



Enbridge
915 North Eldridge Parkway
Suite 1100
Houston, Texas 77079

January 24, 2025

David Roberts
State of Connecticut Department of Energy and Environmental Protection (CTDEEP)
Bureau of Air Management
79 Elm Street
Hartford, CT 06106-5127

RE: Request for Order to Limit Premise-Wide Actual Volatile Organic Compounds for Algonquin Gas Transmission, LLC – Oxford Compressor Station - January 15, 2025 Additional Information Request

Dear Mr. Roberts:

On May 9, 2024, Algonquin Gas Transmission, LLC (Algonquin) requested a federally enforceable consent order limiting premise-wide actual emissions of VOCs to twenty-five (25) tons per calendar year for the Oxford Compressor Station (facility) to comply with VOC RACT.

The May 9, 2024 submittal included a summary table providing the potential emissions of VOC for each piece of VOC-emitting equipment located at the facility. On January 15, 2025, you requested by email the supporting calculations, including emission factors and their sources, used in determining the total amount of potential emissions of VOCs for each piece of VOC-emitting equipment at the facility. The information you requested is provided as Attachment 1 to this letter.

If there are any questions concerning this additional information, please contact Jimmy Ryan of TRC at (510) 666-5146 or by email at jtryan@trccompanies.com.

Sincerely,

A handwritten signature in black ink that reads 'Erika M. St. Pierre'.

Erika St. Pierre
Supervisor Environment - Air

Attachment

Attachment 1

Algonquin Oxford Compressor Station VOC Potential to Emit Summary

VOC Emitting Equipment			Rated Capacity		VOC Potential to Emit (tpy)
FIN	GIN	Description			
EU-001	GEU-001	Turbine	15,000	bhp (ISO)	5.3227
EU-002	GEU-001	Turbine	7,700	bhp (ISO)	3.6496
EU-003	GEU-001	Turbine	15,000	bhp (ISO)	5.3227
EU-004	GEU-001	Turbine	7,700	bhp (ISO)	2.6303
EU-005		IC Engine	585	bhp	0.2037
OXFO BLR 01		Boilers/Heaters	2.800	MMBTU/hr (output)	0.0388
OXFO FHTR 01		Boilers/Heaters	1.000	MMBTU/hr (output)	0.2388
OXFO FHTR 02		Boilers/Heaters	0.150	MMBTU/hr (output)	0.0358
OXFO HVAC 01		Boilers/Heaters	0.056	MMBTU/hr (output)	0.0021
OXFO HVAC 02		Boilers/Heaters	0.056	MMBTU/hr (output)	0.0021
OXFO HVAC 03		Boilers/Heaters	0.056	MMBTU/hr (output)	0.0021
OXFO SHTR 01		Boilers/Heaters	0.060	MMBTU/hr (output)	0.0026
OXFO SHTR 02		Boilers/Heaters	0.060	MMBTU/hr (output)	0.0026
OXFO SHTR 03		Boilers/Heaters	0.060	MMBTU/hr (output)	0.0026
OXFO SHTR 04		Boilers/Heaters	0.060	MMBTU/hr (output)	0.0026
OXFO SHTR 05		Boilers/Heaters	0.060	MMBTU/hr (output)	0.0026
OXFO SHTR 06		Boilers/Heaters	0.060	MMBTU/hr (output)	0.0026
OXFO SHTR 07		Boilers/Heaters	0.060	MMBTU/hr (output)	0.0026
OXFO SHTR 08		Boilers/Heaters	0.060	MMBTU/hr (output)	0.0026
OXFO SHTR 09		Boilers/Heaters	0.058	MMBTU/hr (output)	0.0025
OXFO SHTR 10		Boilers/Heaters	0.058	MMBTU/hr (output)	0.0025
OXFO SHTR 11		Boilers/Heaters	0.058	MMBTU/hr (output)	0.0025
OXFO SHTR 12		Boilers/Heaters	0.058	MMBTU/hr (output)	0.0025
OXFO SHTR 13		Boilers/Heaters	0.058	MMBTU/hr (output)	0.0025
OXFO SHTR 14		Boilers/Heaters	0.058	MMBTU/hr (output)	0.0025
OXFO SHTR 15		Boilers/Heaters	0.058	MMBTU/hr (output)	0.0025
OXFO SVL V11		Storage Tank	400	gal (accum)	0.1030
OXFO SVL V10		Pressure Vessel	313	gal (accum)	0.6652
OXFO SVL V20		Pressure Vessel	173	gal (accum)	0.0453
OXFO TNK V05		Storage Tank	2,260	gal	0.2891
OXFO TNK OW01		Storage Tank	570	gal	0.0001
OXFO TL PL		Truck Loading Area	150	gpm	0.0112
OXFO TL OW		Truck Loading Area	150	gpm	0.0001
OXFO GR		Gas Release Events	48,729,520	scf/yr	34.2298
OXFO PC		Piping Components	N/A		8.6328
OXFO-PW		Parts Washer	120	gal/yr	0.4103
TOTAL VOC PTE					61.8745

EU - 1 and 3 Solar Mars 100 Turbines: Emissions Calculations

TABLE B-1ABa Ambient Temperature, Start Model, and Utilization Data PTE - 100% Fuel Utilization at 100% Power Output			
Month	#Days	Daily Average	Weighted Daily Average
JAN	31.00	24.50	2.08
FEB	28.50	27.50	2.14
MAR	31.00	37.45	3.18
APR	30.00	48.70	4.00
MAY	31.00	59.60	5.05
JUN	30.00	68.45	5.62
JUL	31.00	73.60	6.24
AUG	31.00	71.55	6.07
SEP	30.00	63.30	5.20
OCT	31.00	52.20	4.43
NOV	30.00	41.90	3.44
DEC	31.00	29.40	2.49
Annual	365.50	49.85	49.94
Low Temperature Data			
Below 0°F Hours		16 hrs/yr	
Below -20°F Hours		0 hrs/yr	
NOTES			
1. Please refer to TABLE B-0.			
Start Model and Utilization			
Utilization		100.00%	
Start Model		AGT - Low	
Starts		312.00 starts/yr	

TABLE B-1ABb
Manufacturer's Operating and Emissions Data
Normal Operations
PTE - 100% Fuel Utilization at 100% Power Output

Parameters			Curve Fitting			Vendor Data							
Ambient	Temperature	°F	-20.00	-20.00	49.85	-0.01	0.01	20.00	40.00	60.00	80.00	100.00	
	Altitude	ft	0	0	0	0	0	0	0	0	0	0	
	Pressure	psia	14.702	14.702	14.702	14.702	14.702	14.702	14.702	14.702	14.702	14.702	
	Relative Humidity	%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	
	Specific Humidity	lb _{H2O} /lb _{Dry Air}	0.0003	0.0003	0.0040	0.0006	0.0006	0.0013	0.0028	0.0058	0.0124	0.0262	
Fuel	Lower Heating Value (LHV)	BTU/scf	939.2	939.2	939.2	939.2	939.2	939.2	939.2	939.2	939.2	939.2	
	Higher Heating Value (HHV)	BTU/scf	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	
Turbine	Net Output Power	hp	17,485	17,485	15,146	16,939	16,939	16,394	15,678	14,532	13,410	12,112	
	Fuel Consumption	scf/hr	137,909	137,909	121,720	133,901	133,901	129,898	125,128	117,856	110,892	103,641	
	Heat Input at LHV	MMBTU/hr	129.52	129.52	114.32	125.76	125.76	122.00	117.52	110.69	104.15	97.34	
	Heat Input at HHV	MMBTU/hr	143.92	143.92	127.02	139.73	139.73	135.56	130.58	122.99	115.72	108.16	
	Heat Rate at LHV	BTU/hp-hr	7,408	7,408	7,548	7,424	7,424	7,442	7,496	7,617	7,767	8,037	
	Heat Rate at HHV	BTU/hp-hr	8,231	8,231	8,387	8,249	8,249	8,269	8,329	8,463	8,630	8,930	
Exhaust	Temperature	°F	845	845	905	862	862	879	898	913	931	954	
	Water Fraction	%, by vol	5.52%	5.52%	6.20%	5.64%	5.64%	5.76%	6.01%	6.48%	7.40%	9.09%	
	Non-Water Fraction	%, by vol	94.48%	94.48%	93.80%	94.36%	94.36%	94.24%	93.99%	93.52%	92.60%	90.91%	
	O ₂ Content	%, by vol (dry)	15.57%	15.57%	15.60%	15.57%	15.57%	15.57%	15.58%	15.62%	15.65%	15.64%	
	Molecular Weight	lb/lb-mol	28.63	28.63	28.55	28.61	28.61	28.59	28.57	28.51	28.41	28.22	
	Flow Rate	lb/hr	378,251	378,251	335,747	367,552	367,552	356,864	343,875	326,657	308,732	288,020	
NO _x Emissions		scfm (1 atm, 68°F)	85,016	85,016	75,639	82,600	82,600	80,249	77,402	73,654	69,843	65,637	
		acfm	210,041	210,041	195,533	206,735	206,735	203,432	199,000	191,454	183,929	175,712	
lb/lb-mol		46.01	46.01	46.01	46.01	46.01	46.01	46.01	46.01	46.01	46.01		
	ppmvd, 15% O ₂	120	42	15	42	15	15	15	15	15	15		
	ppmvw	102.42	35.85	12.64	35.80	12.79	12.77	12.71	12.55	12.36	12.16		
	lb/hr	62.26	21.79	6.84	21.16	7.56	7.33	7.04	6.62	6.18	5.71		
CO Emissions	lb/lb-mol		28.01	28.01	28.01	28.01	28.01	28.01	28.01	28.01	28.01	28.01	
		ppmvd, 15% O ₂	150	100	25	100	25	25	25	25	25	25	
		ppmvw	128.03	85.35	21.07	85.24	21.31	21.28	21.19	20.92	20.60	20.26	
		lb/hr	47.38	31.59	6.94	30.67	7.67	7.44	7.14	6.71	6.27	5.79	
UHC Emissions	lb/lb-mol		18.37	18.37	18.37	18.37	18.37	18.37	18.37	18.37	18.37	18.37	
		ppmvd, 15% O ₂	75	50	25	50	25	25	25	25	25	25	
		ppmvw	64.01	42.68	21.07	42.62	21.31	21.28	21.19	20.92	20.60	20.26	
		lb/hr	15.54	10.36	4.55	10.06	5.03	4.88	4.69	4.40	4.11	3.80	

NOTES

- Operating and emissions data was provided by the manufacturer for the following ambient temperatures: 0°F, 20°F, 40°F, 60°F, 80°F, and 100°F.
Specific Humidity is estimate using curve fitting equation: $6.15E-04e^{3.75E-02T}$
All other parameter values estimated using cubic spline.
- Pollutant concentrations (ppmvd at 15% O₂) for 0°F and -20°F based on information provided in a document published by the manufacturer.
- Ambient pressure and humidity will vary. However, it is believed that any variation would not affect compliance with the proposed emission representations.
- The heating value of the natural gas used to fuel the turbine will vary. However, it is believed that any variation would not affect compliance with the proposed emission representations.

TABLE B-1ABb
Manufacturer's Operating and Emissions Data
Normal Operations
PTE - 100% Fuel Utilization at 100% Power Output

Vendor Data																				
Make:	Solar																			
Model:	100-15002S3																			
Rate	15,000 hp (ISO)																			
Capacity:	13,300 hp (NEMA)																			
Load:	100%																			
Ambient	Temperature	°F			-0.01	0.01	20.00	40.00	60.00	80.00	100.00									
	Specific Humidity	lb _{H2O} /lb _{Dry Air}			0.0006	0.0006	0.0014	0.0031	0.0066	0.0133	0.0253									
Fuel	Lower Heating Value (LHV)	BTU/scf			939.2	939.2	939.2	939.2	939.2	939.2	939.2									
Turbine	Net Output Power	hp			16,939	16,939	16,394	15,678	14,532	13,410	12,112									
	Heat Input at LHV	MMBTU/hr			125.76	125.76	122.00	117.52	110.69	104.15	97.34									
Exhaust	Temperature	°F			862	862	879	898	913	931	954									
	Water Fraction	%			5.64%	5.64%	5.76%	6.01%	6.48%	7.40%	9.09%									
	O ₂ Content	% (dry)			15.57%	15.57%	15.57%	15.58%	15.62%	15.65%	15.64%									
	Molecular Weight	lb/lb-mol			28.61	28.61	28.59	28.57	28.51	28.41	28.22									
	Flow Rate	lb/hr			367,552	367,552	356,864	343,875	326,657	308,732	288,020									
		acfm			206,735	206,735	203,432	199,000	191,454	183,929	175,712									
Guaranteed Emissions	NO _x	ppmvd, 15% O ₂	120	42	42	15	15	15	15	15	15									
	CO	ppmvd, 15% O ₂	150	100	100	25	25	25	25	25	25									
	UHC	ppmvd, 15% O ₂	75	50	50	25	25	25	25	25	25									

TABLE B-1ABc Gas-Fired Turbines Emission Estimates Normal Operations <i>PTE - 100% Fuel Utilization at 100% Power Output</i>					
Make	Solar				
Model	100-15002S3				
Normal Operating Load	100%				
Fuel	Natural Gas				
Fuel Higher Heating Value (HHV)	1,020 BTU/scf			1,020 BTU/scf	
Ambient Temperature	49.85 °F			0.01 °F	
Power Output	15,146 bhp (mech.)			16,939 bhp (mech.)	
	11,295 kW (elec.)			12,632 kW (elec.)	
Heat Rate at HHV	8,387 BTU/hp-hr			8,249 BTU/hp-hr	
Operating Hours	8,760 hrs/yr				
Fuel Consumption	124,531 scfh			136,993 scfh	
	1,090.892 MMscf/yr				
Heat Input at HHV	127.02 MMBTU/hr			139.73 MMBTU/hr	
	1,112,710 MMBTU/yr	Average	Maximum		Maximum
NO _x	54.95 lb/MMscf	6.8428 lb/hr	29.9714 tpy	55.17 lb/MMscf	7.5580 lb/hr
CO	55.75 lb/MMscf	6.9429 lb/hr	30.4100 tpy	55.98 lb/MMscf	7.6686 lb/hr
SO ₂	14.29 lb/MMscf	1.7790 lb/hr	7.7921 tpy	14.29 lb/MMscf	1.9570 lb/hr
PM _{10/2.5}	6.73 lb/MMscf	0.8383 lb/hr	3.6719 tpy	6.73 lb/MMscf	0.9222 lb/hr
CO _{2-e}	120,800 lb/MMscf	15,043 lb/hr	65,890 tpy	120,802 lb/MMscf	16,549 lb/hr
CO ₂	120,017 lb/MMscf	14,946 lb/hr	65,463 tpy	120,017 lb/MMscf	16,442 lb/hr
N ₂ O	0.23 lb/MMscf	0.0282 lb/hr	0.1234 tpy	0.23 lb/MMscf	0.0310 lb/hr
TOC (Total)	36.57 lb/MMscf	4.5539 lb/hr	19.9459 tpy	36.72 lb/MMscf	5.0299 lb/hr
Methane	28.59 lb/MMscf	3.5603 lb/hr	15.5941 tpy	28.71 lb/MMscf	3.9324 lb/hr
Ethane	1.00 lb/MMscf	0.1242 lb/hr	0.5440 tpy	1.00 lb/MMscf	0.1372 lb/hr
VOC (Total)	6.98 lb/MMscf	0.8694 lb/hr	3.8079 tpy	7.01 lb/MMscf	0.9602 lb/hr
VOC (non-HAP)	3.57 lb/MMscf	0.4441 lb/hr	1.9450 tpy	3.58 lb/MMscf	0.4905 lb/hr
HAP (Total)	3.42 lb/MMscf	0.4253 lb/hr	1.8628 tpy	3.43 lb/MMscf	0.4698 lb/hr
Acetaldehyde	1.33E-01 lb/MMscf	0.0166 lb/hr	0.0725 tpy	1.34E-01 lb/MMscf	0.0183 lb/hr
Acrolein	2.13E-02 lb/MMscf	0.0026 lb/hr	0.0116 tpy	2.14E-02 lb/MMscf	0.0029 lb/hr
Benzene	3.99E-02 lb/MMscf	0.0050 lb/hr	0.0218 tpy	4.01E-02 lb/MMscf	0.0055 lb/hr
Biphenyl					
Butadiene (1,3-)	1.43E-03 lb/MMscf	0.0002 lb/hr	0.0008 tpy	1.44E-03 lb/MMscf	0.0002 lb/hr
Carbon Tetrachloride					
Chlorobenzene					
Chloroform					
Dichloropropene (1,3-)					
Ethylbenzene	1.06E-01 lb/MMscf	0.0132 lb/hr	0.0580 tpy	1.07E-01 lb/MMscf	0.0146 lb/hr
Ethylene Dibromide					
Formaldehyde	2.36E+00 lb/MMscf	0.2939 lb/hr	1.2874 tpy	2.37E+00 lb/MMscf	0.3247 lb/hr
Hexane (n-)					
Methanol					
Methylene Chloride					
Methylnaphthalene (2-)					
Naphthalene	4.32E-03 lb/MMscf	0.0005 lb/hr	0.0024 tpy	4.34E-03 lb/MMscf	0.0006 lb/hr
PAH	7.31E-03 lb/MMscf	0.0009 lb/hr	0.0040 tpy	7.34E-03 lb/MMscf	0.0010 lb/hr
Phenol					
Propylene Oxide	9.64E-02 lb/MMscf	0.0120 lb/hr	0.0526 tpy	9.68E-02 lb/MMscf	0.0133 lb/hr
Styrene					
Tetrachloroethane (1,1,2,2-)					
Toluene	4.32E-01 lb/MMscf	0.0538 lb/hr	0.2357 tpy	4.34E-01 lb/MMscf	0.0594 lb/hr
Trichloroethane (1,1,2-)					
Trimethylpentane (2,2,4-)					
Vinyl Chloride					
Xylenes	2.13E-01 lb/MMscf	0.0265 lb/hr	0.1160 tpy	2.14E-01 lb/MMscf	0.0293 lb/hr
NOTES					
1. Fuel higher heating value selected to correspond to AP-42 emissions factors. 2. Manufacturer provided operating and emissions data (TABLE B-1ABb). 3. The annual emissions are based on a representative annual average ambient temperature (TABLE B-1ABa). Maximum hourly emissions are based on an ambient temperature of 0°F. 4. NOX, CO, and TOC (Total) emission factor based on Vendor Guarantee. 5. CO2 and N2O emission factors based on 40 CFR 98, Subpart C, Table C-1 and 40 CFR 98, Subpart C, Table C-2, respectively. 6. SO2 emission factor based on AP-42, Section 3.1 (Revised 4/00), Table 3.1-2a using Tariff (5 gr/100 scf). 7. PM10/2.5 emission factor based on AP-42, Section 3.1 (Revised 4/00), Table 3.1-2a, not Solar's PIL 171 dated 5/6/2015 (which is 127% greater). 8. Methane, Ethane, and VOC (Total) emissions based on scaling of AP-42, Section 3.1 (Revised 4/00), Table 3.1-2a using Vendor Guarantee. Speciated VOC (non-HAP) emissions based on scaling of AP-42, Section 3.1 (Revised 4/00), Table 3.1-2a using Vendor Guarantee. $EF_{Scaled} = (EF_{AP42})(EF_{TOC}/EF_{TOC-AP42})$					

TABLE B-1ABd Manufacturer's Operating and Emissions Data Startup/Shutdown Step 2: Ignition-Idle PTE - 100% Fuel Utilization at 100% Power Output										
Parameters			Interpolated	Vendor Data						
Ambient	Temperature	°F	49.85	0.01	20.00	40.00	60.00	80.00	100.00	
	Altitude	ft	0	0	0	0	0	0	0	
	Pressure	psia	14.702	14.702	14.702	14.702	14.702	14.702	14.702	
	Relative Humidity	%	60%	60%	60%	60%	60%	60%	60%	
	Specific Humidity	lb _{H2O} /lb _{Dry Air}	0.0040	0.0006	0.0013	0.0028	0.0058	0.0124	0.0262	
Fuel	Lower Heating Value (LHV)	BTU/scf	939.2	939.2	939.2	939.2	939.2	939.2	939.2	
	Higher Heating Value (HHV)	BTU/scf	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	
Turbine	Net Output Power	hp	1,515	1,694	1,639	1,568	1,453	1,341	1,211	
	Fuel Consumption	scf/hr	28,950	29,152	29,206	29,121	28,705	28,311	27,822	
	Heat Input at LHV	MMBTU/hr	27.19	27.38	27.43	27.35	26.96	26.59	26.13	
	Heat Input at HHV	MMBTU/hr	30.21	30.42	30.48	30.39	29.96	29.54	29.03	
	Heat Rate at LHV	BTU/hp-hr	17,951	16,163	16,736	17,443	18,555	19,828	21,577	
	Heat Rate at HHV	BTU/hp-hr	19,945	17,959	18,595	19,381	20,616	22,032	23,975	
Exhaust	Temperature	°F	622	521	562	603	642	682	720	
	Water Fraction	%, by vol	3.63%	2.74%	2.98%	3.36%	3.99%	5.09%	6.95%	
	Non-Water Fraction	%, by vol	96.37%	97.26%	97.02%	96.64%	96.01%	94.91%	93.05%	
	O ₂ Content	%, by vol (dry)	18.19%	18.46%	18.35%	18.24%	18.14%	18.03%	17.90%	
	Molecular Weight	lb/lb-mol	28.70	28.79	28.77	28.73	28.67	28.55	28.35	
	Flow Rate	lb/hr	151,703	168,773	162,193	155,399	147,782	140,184	132,241	
		scfm (1 atm, 68°F)	33,985	37,693	36,256	34,767	33,139	31,551	29,985	
		acfm	69,633	70,006	70,150	69,969	69,138	68,214	66,986	
NO _x Emissions		lb/lb-mol	46.01	46.01	46.01	46.01	46.01	46.01	46.01	
		ppmvd, 15% O ₂	50	50	50	50	50	50	50	
		ppmvw	22.13	20.11	20.97	21.78	22.46	23.08	23.66	
		lb/hr	5.38	5.42	5.44	5.42	5.33	5.22	5.08	
CO Emissions		lb/lb-mol	28.01	28.01	28.01	28.01	28.01	28.01	28.01	
		ppmvd, 15% O ₂	10,000	10,000	10,000	10,000	10,000	10,000	10,000	
		ppmvw	4,425.29	4,022.28	4,193.24	4,356.99	4,491.32	4,616.81	4,731.36	
		lb/hr	655.09	660.46	662.15	660.10	648.46	634.96	618.18	
UHC Emissions		lb/lb-mol	18.37	18.37	18.37	18.37	18.37	18.37	18.37	
		ppmvd, 15% O ₂	3,790	3,790	3,790	3,790	3,790	3,790	3,790	
		ppmvw	1,677.18	1,524.44	1,589.24	1,651.30	1,702.21	1,749.77	1,793.18	
		lb/hr	162.85	164.18	164.60	164.09	161.20	157.84	153.67	
NOTES										
1. Footnotes 1 thru 4 of TABLE B-1ABb.										

TABLE B-1ABd Manufacturer's Operating and Emissions Data Startup/Shutdown Step 2: Ignition-Idle PTE - 100% Fuel Utilization at 100% Power Output										
Vendor Data										
Make:	Solar									
Model:	100-15002S3									
Rate	15,000 hp (ISO)									
Capacity:	13,300 hp (NEMA)									
Load:	10%									
Ambient	Temperature	°F		0.01	20.00	40.00	60.00	80.00	100.00	
	Specific Humidity	lb _{H2O} /lb _{Dry Air}		0.0006	0.0014	0.0031	0.0066	0.0133	0.0253	
Fuel	Lower Heating Value (LHV)	BTU/scf		939.2	939.2	939.2	939.2	939.2	939.2	
Turbine	Net Output Power	hp		1,694	1,639	1,568	1,453	1,341	1,211	
	Heat Input at LHV	MMBTU/hr		27.38	27.43	27.35	26.96	26.59	26.13	
Exhaust	Temperature	°F		521	562	603	642	682	720	
	Water Fraction	%		2.74%	2.98%	3.36%	3.99%	5.09%	6.95%	
	O ₂ Content	% (dry)		18.46%	18.35%	18.24%	18.14%	18.03%	17.90%	
	Molecular Weight	lb/lb-mol		28.79	28.77	28.73	28.67	28.55	28.35	
	Flow Rate	lb/hr		168,773	162,193	155,399	147,782	140,184	132,241	
		acfm		70,006	70,150	69,969	69,138	68,214	66,986	
Estimated Emissions	NO _x	ppmvd, 15% O ₂		50	50	50	50	50	50	
	CO	ppmvd, 15% O ₂		10,000	10,000	10,000	10,000	10,000	10,000	
	UHC	ppmvd, 15% O ₂		3,790	3,790	3,790	3,790	3,790	3,790	

TABLE B-1ABe Manufacturer's Operating and Emissions Data Startup/Shutdown Step 3: Loading/Thermal Stabilization PTE - 100% Fuel Utilization at 100% Power Output									
Parameters			Interpolated	Vendor Data					
Ambient	Temperature	°F	49.85	0.01	20.00	40.00	60.00	80.00	100.00
	Altitude	ft	0	0	0	0	0	0	0
	Pressure	psia	14.702	14.702	14.702	14.702	14.702	14.702	14.702
	Relative Humidity	%	60%	60%	60%	60%	60%	60%	60%
	Specific Humidity	lb _{H2O} /lb _{Dry Air}	0.0040	0.0006	0.0013	0.0028	0.0058	0.0124	0.0262
Fuel	Lower Heating Value (LHV)	BTU/scf	939.2	939.2	939.2	939.2	939.2	939.2	939.2
	Higher Heating Value (HHV)	BTU/scf	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6
Turbine	Net Output Power	hp	4,544	5,082	4,918	4,704	4,359	4,023	3,634
	Fuel Consumption	scf/hr	51,716	53,801	53,333	52,502	50,745	48,999	46,859
	Heat Input at LHV	MMBTU/hr	48.57	50.53	50.09	49.31	47.66	46.02	44.01
	Heat Input at HHV	MMBTU/hr	53.97	56.14	55.66	54.79	52.96	51.13	48.90
	Heat Rate at LHV	BTU/hp-hr	10,690	9,943	10,185	10,483	10,934	11,439	12,111
	Heat Rate at HHV	BTU/hp-hr	11,877	11,048	11,317	11,647	12,149	12,710	13,456
Exhaust	Temperature	°F	711	609	651	692	729	765	798
	Water Fraction	%, by vol	4.37%	3.51%	3.74%	4.11%	4.71%	5.77%	7.56%
	Non-Water Fraction	%, by vol	95.63%	96.49%	96.26%	95.89%	95.29%	94.23%	92.44%
	O ₂ Content	%, by vol (dry)	17.46%	17.71%	17.60%	17.50%	17.42%	17.34%	17.27%
	Molecular Weight	lb/lb-mol	28.65	28.74	28.72	28.68	28.62	28.51	28.31
	Flow Rate	lb/hr	215,466	241,192	231,306	221,199	209,346	197,776	185,454
		scfm (1 atm, 68°F)	48,331	53,928	51,762	49,550	47,008	44,595	42,119
NO _x Emissions		acfm	107,103	109,142	108,875	108,068	105,817	103,425	100,313
		lb/lb-mol	46.01	46.01	46.01	46.01	46.01	46.01	46.01
		ppmvd, 15% O ₂	60	60	60	60	60	60	60
		ppmvw	33.46	31.30	32.30	33.16	33.72	34.11	34.12
CO Emissions		lb/hr	11.58	12.09	11.97	11.77	11.35	10.89	10.29
		lb/lb-mol	28.01	28.01	28.01	28.01	28.01	28.01	28.01
		ppmvd, 15% O ₂	9,000	9,000	9,000	9,000	9,000	9,000	9,000
		ppmvw	5,019.05	4,695.30	4,845.63	4,973.28	5,058.45	5,117.17	5,118.67
UHC Emissions		lb/hr	1,057.12	1,103.70	1,093.12	1,074.38	1,036.39	994.30	939.22
		lb/lb-mol	18.37	18.37	18.37	18.37	18.37	18.37	18.37
		ppmvd, 15% O ₂	2,350	2,350	2,350	2,350	2,350	2,350	2,350
		ppmvw	1,310.53	1,226.00	1,265.25	1,298.58	1,320.82	1,336.15	1,336.54
		lb/hr	181.05	189.02	187.21	184.00	177.50	170.29	160.85
NOTES									
1. Footnotes 1 thru 4 of TABLE B-1ABb.									

TABLE B-1ABe Manufacturer's Operating and Emissions Data Startup/Shutdown Step 3: Loading/Thermal Stabilization PTE - 100% Fuel Utilization at 100% Power Output										
Vendor Data										
Make:	Solar									
Model:	100-15002S3									
Rate	15,000 hp (ISO)									
Capacity:	13,300 hp (NEMA)									
Load:	29%									
Ambient	Temperature	°F		0.01	20.00	40.00	60.00	80.00	100.00	
	Specific Humidity	lb _{H2O} /lb _{Dry Air}		0.0006	0.0014	0.0031	0.0066	0.0133	0.0253	
Fuel	Lower Heating Value (LHV)	BTU/scf		939.2	939.2	939.2	939.2	939.2	939.2	
Turbine	Net Output Power	hp		5,082	4,918	4,704	4,359	4,023	3,634	
	Heat Input at LHV	MMBTU/hr		50.53	50.09	49.31	47.66	46.02	44.01	
Exhaust	Temperature	°F		609	651	692	729	765	798	
	Water Fraction	%		3.51%	3.74%	4.11%	4.71%	5.77%	7.56%	
	O ₂ Content	% (dry)		17.71%	17.60%	17.50%	17.42%	17.34%	17.27%	
	Molecular Weight	lb/lb-mol		28.74	28.72	28.68	28.62	28.51	28.31	
	Flow Rate	lb/hr		241,192	231,306	221,199	209,346	197,776	185,454	
acfm		109,142		108,875	108,068	105,817	103,425	100,313		
Estimated Emissions	NO _x	ppmvd, 15% O ₂		60	60	60	60	60	60	
	CO	ppmvd, 15% O ₂		9,000	9,000	9,000	9,000	9,000	9,000	
	UHC	ppmvd, 15% O ₂		2,350	2,350	2,350	2,350	2,350	2,350	

TABLE B-1ABf Gas-Fired Turbines Emission Estimates Startup <i>PTE - 100% Fuel Utilization at 100% Power Output</i>					
Make	Solar				
Model	100-15002S3				
Fuel	Natural Gas				
Ambient Temperature	49.85 °F			0.01 °F	
Maximum Event Frequency		2 events/hr	312 events/yr		2 events/hr
Maximum Startup Time		18.00 min/hr	46.80 hrs/yr		18.00 min/hr
Fuel Consumption		13,238 scf/hr	2.07 MMscf/yr		13,675 scf/hr
		Average	Maximum		Maximum
NO _x	1.4267 lbs/event	2.8533 lb/hr	0.2226 tpy	1.4799 lbs/event	2.9597 lb/hr
CO	138.4668 lbs/event	276.9337 lb/hr	21.6008 tpy	143.3934 lbs/event	286.7869 lb/hr
SO ₂	0.0946 lbs/event	0.1891 lb/hr	0.0148 tpy	0.0977 lbs/event	0.1954 lb/hr
PM _{10/2.5}	0.0446 lbs/event	0.0891 lb/hr	0.0070 tpy	0.0460 lbs/event	0.0921 lb/hr
CO _{2-e}	1,308 lbs/event	2,616 lb/hr	204 tpy	1,351 lbs/event	2,702 lb/hr
CO ₂	794 lbs/event	1,589 lb/hr	124 tpy	821 lbs/event	1,641 lb/hr
N ₂ O	0.0015 lbs/event	0.0030 lb/hr	0.0002 tpy	0.0015 lbs/event	0.0031 lb/hr
TOC (Total)	26.2469 lbs/event	52.4939 lb/hr	4.0945 tpy	27.1114 lbs/event	54.2229 lb/hr
Methane	20.5203 lbs/event	41.0406 lb/hr	3.2012 tpy	21.1962 lbs/event	42.3924 lb/hr
Ethane	0.7158 lbs/event	1.4317 lb/hr	0.1117 tpy	0.7394 lbs/event	1.4788 lb/hr
VOC (Total)	5.0108 lbs/event	10.0216 lb/hr	0.7817 tpy	5.1758 lbs/event	10.3516 lb/hr
VOC (non-HAP)	2.5595 lbs/event	5.1190 lb/hr	0.3993 tpy	2.6438 lbs/event	5.2876 lb/hr
HAP (Total)	2.4513 lbs/event	4.9026 lb/hr	0.3824 tpy	2.5320 lbs/event	5.0641 lb/hr
Acetaldehyde	9.54E-02 lbs/event	0.1909 lb/hr	0.0149 tpy	9.86E-02 lbs/event	0.1972 lb/hr
Acrolein	1.53E-02 lbs/event	0.0305 lb/hr	0.0024 tpy	1.58E-02 lbs/event	0.0315 lb/hr
Benzene	2.86E-02 lbs/event	0.0573 lb/hr	0.0045 tpy	2.96E-02 lbs/event	0.0592 lb/hr
Biphenyl					
Butadiene (1,3-)	1.03E-03 lbs/event	0.0021 lb/hr	0.0002 tpy	1.06E-03 lbs/event	0.0021 lb/hr
Carbon Tetrachloride					
Chlorobenzene					
Chloroform					
Dichloropropene (1,3-)					
Ethylbenzene	7.64E-02 lbs/event	0.1527 lb/hr	0.0119 tpy	7.89E-02 lbs/event	0.1577 lb/hr
Ethylene Dibromide					
Formaldehyde	1.69E+00 lbs/event	3.3882 lb/hr	0.2643 tpy	1.75E+00 lbs/event	3.4998 lb/hr
Hexane (n-)					
Methanol					
Methylene Chloride					
Methylnaphthalene (2-)					
Naphthalene	3.10E-03 lbs/event	0.0062 lb/hr	0.0005 tpy	3.20E-03 lbs/event	0.0064 lb/hr
PAH	5.25E-03 lbs/event	0.0105 lb/hr	0.0008 tpy	5.42E-03 lbs/event	0.0108 lb/hr
Phenol					
Propylene Oxide	6.92E-02 lbs/event	0.1384 lb/hr	0.0108 tpy	7.15E-02 lbs/event	0.1430 lb/hr
Styrene					
Tetrachloroethane (1,1,2,2-)					
Toluene	3.10E-01 lbs/event	0.6204 lb/hr	0.0484 tpy	3.20E-01 lbs/event	0.6408 lb/hr
Trichloroethane (1,1,2-)					
Trimethylpentane (2,2,4-)					
Vinyl Chloride					
Xylenes	1.53E-01 lbs/event	0.3054 lb/hr	0.0238 tpy	1.58E-01 lbs/event	0.3155 lb/hr
NOTES					
1. Emissions of NO _x , CO, and UHC are estimated using information provided in TABLE B-1ABd and TABLE B-1ABe.					
		49.85 °F		0.01 °F	
		Step 2	Step 3	Step 2	Step 3
Duration		3.00 min/event	6.00 min/event	3.00 min/event	6.00 min/event
NO _x		0.2690 lb/event	1.1576 lb/event	0.2712 lb/event	1.2087 lb/event
CO		32.7545 lb/event	105.7124 lb/event	33.0230 lb/event	110.3704 lb/event
UHC		8.1423 lb/event	18.1046 lb/event	8.2091 lb/event	18.9024 lb/event
Fuel		1,447 scf/event	5,172 scf/event	1,458 scf/event	5,380 scf/event
2. Footnotes 4 thru 8 of TABLE B-1ABc.					
3. The frequency of startup events was provided by Technical Services.					

TABLE B-1ABg Gas-Fired Turbines Emission Estimates Shutdown <i>PTE - 100% Fuel Utilization at 100% Power Output</i>					
Make	Solar				
Model	100-15002S3				
Fuel	Natural Gas				
Ambient Temperature	49.85 °F			0.01 °F	
Maximum Event Frequency		2 events/hr	312 events/yr		2 events/hr
Maximum Startup Time		17.00 min/hr	44.20 hrs/yr		17.00 min/hr
Fuel Consumption		14,653 scf/hr	2.29 MMscf/yr		15,244 scf/hr
		Average	Maximum		Maximum
NO _x	1.6400 lbs/event	3.2800 lb/hr	0.2558 tpy	1.7123 lbs/event	3.4245 lb/hr
CO	149.7592 lbs/event	299.5184 lb/hr	23.3624 tpy	156.3581 lbs/event	312.7162 lb/hr
SO ₂	0.1047 lbs/event	0.2093 lb/hr	0.0163 tpy	0.1089 lbs/event	0.2178 lb/hr
PM _{10/2.5}	0.0493 lbs/event	0.0986 lb/hr	0.0077 tpy	0.0513 lbs/event	0.1026 lb/hr
CO _{2-e}	1,381 lbs/event	2,762 lb/hr	215 tpy	1,439 lbs/event	2,877 lb/hr
CO ₂	879 lbs/event	1,759 lb/hr	137 tpy	915 lbs/event	1,830 lb/hr
N ₂ O	0.0017 lbs/event	0.0033 lb/hr	0.0003 tpy	0.0017 lbs/event	0.0034 lb/hr
TOC (Total)	25.6482 lbs/event	51.2964 lb/hr	4.0011 tpy	26.7784 lbs/event	53.5567 lb/hr
Methane	20.0522 lbs/event	40.1045 lb/hr	3.1281 tpy	20.9358 lbs/event	41.8716 lb/hr
Ethane	0.6995 lbs/event	1.3990 lb/hr	0.1091 tpy	0.7303 lbs/event	1.4606 lb/hr
VOC (Total)	4.8965 lbs/event	9.7929 lb/hr	0.7639 tpy	5.1122 lbs/event	10.2245 lb/hr
VOC (non-HAP)	2.5011 lbs/event	5.0022 lb/hr	0.3902 tpy	2.6113 lbs/event	5.2226 lb/hr
HAP (Total)	2.3954 lbs/event	4.7908 lb/hr	0.3737 tpy	2.5009 lbs/event	5.0019 lb/hr
Acetaldehyde	9.33E-02 lbs/event	0.1865 lb/hr	0.0145 tpy	9.74E-02 lbs/event	0.1948 lb/hr
Acrolein	1.49E-02 lbs/event	0.0298 lb/hr	0.0023 tpy	1.56E-02 lbs/event	0.0312 lb/hr
Benzene	2.80E-02 lbs/event	0.0560 lb/hr	0.0044 tpy	2.92E-02 lbs/event	0.0584 lb/hr
Biphenyl					
Butadiene (1,3-)	1.00E-03 lbs/event	0.0020 lb/hr	0.0002 tpy	1.05E-03 lbs/event	0.0021 lb/hr
Carbon Tetrachloride					
Chlorobenzene					
Chloroform					
Dichloropropene (1,3-)					
Ethylbenzene	7.46E-02 lbs/event	0.1492 lb/hr	0.0116 tpy	7.79E-02 lbs/event	0.1558 lb/hr
Ethylene Dibromide					
Formaldehyde	1.66E+00 lbs/event	3.3109 lb/hr	0.2583 tpy	1.73E+00 lbs/event	3.4568 lb/hr
Hexane (n-)					
Methanol					
Methylene Chloride					
Methylnaphthalene (2-)					
Naphthalene	3.03E-03 lbs/event	0.0061 lb/hr	0.0005 tpy	3.16E-03 lbs/event	0.0063 lb/hr
PAH	5.13E-03 lbs/event	0.0103 lb/hr	0.0008 tpy	5.36E-03 lbs/event	0.0107 lb/hr
Phenol					
Propylene Oxide	6.76E-02 lbs/event	0.1352 lb/hr	0.0105 tpy	7.06E-02 lbs/event	0.1412 lb/hr
Styrene					
Tetrachloroethane (1,1,2,2-)					
Toluene	3.03E-01 lbs/event	0.6062 lb/hr	0.0473 tpy	3.16E-01 lbs/event	0.6329 lb/hr
Trichloroethane (1,1,2-)					
Trimethylpentane (2,2,4-)					
Vinyl Chloride					
Xylenes	1.49E-01 lbs/event	0.2985 lb/hr	0.0233 tpy	1.56E-01 lbs/event	0.3116 lb/hr
NOTES					
1. Emissions of NO _x , CO, and UHC are estimated using information provided in TABLE B-1ABd and TABLE B-1ABe.					
		49.85 °F		0.01 °F	
		Step 2	Step 3	Step 2	Step 3
Duration		0.00 min/event	8.50 min/event	0.00 min/event	8.50 min/event
NO _x		0.0000 lb/event	1.6400 lb/event	0.0000 lb/event	1.7123 lb/event
CO		0.0000 lb/event	149.7592 lb/event	0.0000 lb/event	156.3581 lb/event
UHC		0.0000 lb/event	25.6482 lb/event	0.0000 lb/event	26.7784 lb/event
Fuel		0 scf/event	7,326 scf/event	0 scf/event	7,622 scf/event
2. Footnotes 4 thru 8 of TABLE B-1ABc.					
3. The frequency of startup events was provided by Technical Services.					

TABLE B-1ABh Gas-Fired Turbines Emission Estimates Low Temperatures <i>PTE - 100% Fuel Utilization at 100% Power Output</i>						
Make	Solar					
Model	100-15002S3					
Normal Operating Load	100%					
Fuel	Natural Gas					
Fuel Higher Heating Value (HHV)	1,020 BTU/scf			1,020 BTU/scf		
Ambient Temperature	-20.00 °F			-20.00 °F		
Power Output	17,485 bhp (mech.)			17,485 bhp (mech.)		
	13,038 kW (elec.)			13,038 kW (elec.)		
Heat Rate at HHV	8,231 BTU/hp-hr			8,231 BTU/hp-hr		
Operating Hours	16 hrs/yr			0 hrs/yr		
Fuel Consumption	141,093 scfh			141,093 scfh		
	2.257 MMscf/yr			0.000 MMscf/yr		
Heat Input at HHV	143.92 MMBTU/hr	0°F ≥ T > -20°F		143.92 MMBTU/hr	T ≤ -20°F	
	2,303 MMBTU/yr	Hourly	Annual	0 MMBTU/yr	Hourly	Annual
NO _x	154.44 lb/MMscf	21.7909 lb/hr	0.1743 tpy	441.27 lb/MMscf	62.2597 lb/hr	0.0000 tpy
CO	223.86 lb/MMscf	31.5854 lb/hr	0.2527 tpy	335.79 lb/MMscf	47.3781 lb/hr	0.0000 tpy
SO ₂	14.29 lb/MMscf	2.0156 lb/hr	0.0161 tpy	14.29 lb/MMscf	2.0156 lb/hr	0.0000 tpy
PM _{10/2.5}	6.73 lb/MMscf	0.9498 lb/hr	0.0076 tpy	6.73 lb/MMscf	0.9498 lb/hr	0.0000 tpy
CO _{2-e}	121,520 lb/MMscf	17,146 lb/hr	137 tpy	122,237 lb/MMscf	17,247 lb/hr	0 tpy
CO ₂	120,017 lb/MMscf	16,934 lb/hr	135 tpy	120,017 lb/MMscf	16,934 lb/hr	0 tpy
N ₂ O	0.23 lb/MMscf	0.0319 lb/hr	0.0003 tpy	0.23 lb/MMscf	0.0319 lb/hr	0.0000 tpy
TOC (Total)	73.42 lb/MMscf	10.3585 lb/hr	0.0829 tpy	110.12 lb/MMscf	15.5377 lb/hr	0.0000 tpy
Methane	57.40 lb/MMscf	8.0984 lb/hr	0.0648 tpy	86.10 lb/MMscf	12.1476 lb/hr	0.0000 tpy
Ethane	2.00 lb/MMscf	0.2825 lb/hr	0.0023 tpy	3.00 lb/MMscf	0.4238 lb/hr	0.0000 tpy
VOC (Total)	14.02 lb/MMscf	1.9775 lb/hr	0.0158 tpy	21.02 lb/MMscf	2.9663 lb/hr	0.0000 tpy
VOC (non-HAP)	7.16 lb/MMscf	1.0101 lb/hr	0.0081 tpy	10.74 lb/MMscf	1.5152 lb/hr	0.0000 tpy
HAP (Total)	6.86 lb/MMscf	0.9674 lb/hr	0.0077 tpy	10.28 lb/MMscf	1.4511 lb/hr	0.0000 tpy
Acetaldehyde	2.67E-01 lb/MMscf	0.0377 lb/hr	0.0003 tpy	4.00E-01 lb/MMscf	0.0565 lb/hr	0.0000 tpy
Acrolein	4.27E-02 lb/MMscf	0.0060 lb/hr	0.0000 tpy	6.41E-02 lb/MMscf	0.0090 lb/hr	0.0000 tpy
Benzene	8.01E-02 lb/MMscf	0.0113 lb/hr	0.0001 tpy	1.20E-01 lb/MMscf	0.0170 lb/hr	0.0000 tpy
Biphenyl						
Butadiene (1,3-)	2.87E-03 lb/MMscf	0.0004 lb/hr	0.0000 tpy	4.30E-03 lb/MMscf	0.0006 lb/hr	0.0000 tpy
Carbon Tetrachloride						
Chlorobenzene						
Chloroform						
Dichloropropene (1,3-)						
Ethylbenzene	2.14E-01 lb/MMscf	0.0301 lb/hr	0.0002 tpy	3.20E-01 lb/MMscf	0.0452 lb/hr	0.0000 tpy
Ethylene Dibromide						
Formaldehyde	4.74E+00 lb/MMscf	0.6686 lb/hr	0.0053 tpy	7.11E+00 lb/MMscf	1.0029 lb/hr	0.0000 tpy
Hexane (n-)						
Methanol						
Methylene Chloride						
Methylnaphthalene (2-)						
Naphthalene	8.68E-03 lb/MMscf	0.0012 lb/hr	0.0000 tpy	1.30E-02 lb/MMscf	0.0018 lb/hr	0.0000 tpy
PAH	1.47E-02 lb/MMscf	0.0021 lb/hr	0.0000 tpy	2.20E-02 lb/MMscf	0.0031 lb/hr	0.0000 tpy
Phenol						
Propylene Oxide	1.94E-01 lb/MMscf	0.0273 lb/hr	0.0002 tpy	2.90E-01 lb/MMscf	0.0410 lb/hr	0.0000 tpy
Styrene						
Tetrachloroethane (1,1,2,2-)						
Toluene	8.68E-01 lb/MMscf	0.1224 lb/hr	0.0010 tpy	1.30E+00 lb/MMscf	0.1836 lb/hr	0.0000 tpy
Trichloroethane (1,1,2-)						
Trimethylpentane (2,2,4-)						
Vinyl Chloride						
Xylenes	4.27E-01 lb/MMscf	0.0603 lb/hr	0.0005 tpy	6.41E-01 lb/MMscf	0.0904 lb/hr	0.0000 tpy
NOTES						
1. Fuel higher heating value selected to correspond to AP-42 emissions factors. 2. Operating hours for low ambient temperatures best on best fit of available data (see TABLE B-1ABa). 3. Manufacturer provided data on: power output, heat rate, along with NO _x , CO, and UHC (or TOC) emissions. 4. Footnotes 4 thru 8 of TABLE B-1ABc.						

TABLE B-1ABi Gas-Fired Turbines Maximum Emission Estimates Normal Operations, Startup, Shutdown, and Low Temperature Operations PTE - 100% Fuel Utilization at 100% Power Output																		
Make	Solar																	
Model	100-15002S3																	
Normal Operating Load	100%																	
Operations	Normal			Startup			Shutdown			Startup/Shutdown w/ Normal			Low Temperatures			Combined Operations		
Maximum Annual Combined Event Frequency	8,760 hrs/yr			47 hrs/yr			44 hrs/yr			8,760 hrs/yr			16 hrs/yr			8,760 hrs/yr		
Pollutant	Hourly		Maximum Annual	Hourly		Maximum Annual	Hourly		Maximum Annual	Hourly		Maximum Annual	Hourly		Maximum Annual	Hourly		Maximum Annual
	Average	Maximum		Average	Maximum		Average	Maximum		Average	Maximum		Average	Maximum		Average	Maximum	
NO _x	6.8428 lb/hr	7.5580 lb/hr	29.9714 tpy	2.8533 lb/hr	2.9597 lb/hr	0.2226 tpy	3.2800 lb/hr	3.4245 lb/hr	0.2558 tpy	6.8809 lb/hr	9.5334 lb/hr	30.1384 tpy	21.7909 lb/hr	62.2597 lb/hr	0.1743 tpy	6.9082 lb/hr	62.2597 lb/hr	30.2580 tpy
CO	6.9429 lb/hr	7.6686 lb/hr	30.4100 tpy	276.9337 lb/hr	286.7869 lb/hr	21.6008 tpy	299.5184 lb/hr	312.7162 lb/hr	23.3624 tpy	17.1364 lb/hr	602.6983 lb/hr	75.0573 tpy	31.5854 lb/hr	47.3781 lb/hr	0.2527 tpy	17.1814 lb/hr	602.6983 lb/hr	75.2545 tpy
SO ₂	1.7790 lb/hr	1.9570 lb/hr	7.7921 tpy	0.1891 lb/hr	0.1954 lb/hr	0.0148 tpy	0.2093 lb/hr	0.2178 lb/hr	0.0163 tpy	1.7790 lb/hr	1.9570 lb/hr	7.7921 tpy	2.0156 lb/hr	2.0156 lb/hr	0.0161 tpy	1.7794 lb/hr	2.0156 lb/hr	7.7940 tpy
PM _{10/2.5}	0.8383 lb/hr	0.9222 lb/hr	3.6719 tpy	0.0891 lb/hr	0.0921 lb/hr	0.0070 tpy	0.0986 lb/hr	0.1026 lb/hr	0.0077 tpy	0.8383 lb/hr	0.9222 lb/hr	3.6719 tpy	0.9498 lb/hr	0.9498 lb/hr	0.0076 tpy	0.8385 lb/hr	0.9498 lb/hr	3.6728 tpy
CO _{2-e}	15,043 lb/hr	16,549 lb/hr	65,890 tpy	2,616 lb/hr	2,702 lb/hr	204 tpy	2,762 lb/hr	2,877 lb/hr	215 tpy	15,043 lb/hr	16,549 lb/hr	65,890 tpy	17,146 lb/hr	17,247 lb/hr	137 tpy	15,047 lb/hr	17,247 lb/hr	65,906 tpy
CO ₂	14,946 lb/hr	16,442 lb/hr	65,463 tpy	1,589 lb/hr	1,641 lb/hr	124 tpy	1,759 lb/hr	1,830 lb/hr	137 tpy	14,946 lb/hr	16,442 lb/hr	65,463 tpy	16,934 lb/hr	16,934 lb/hr	135 tpy	14,950 lb/hr	16,934 lb/hr	65,479 tpy
N ₂ O	0.0282 lb/hr	0.0310 lb/hr	0.1234 tpy	0.0030 lb/hr	0.0031 lb/hr	0.0002 tpy	0.0033 lb/hr	0.0034 lb/hr	0.0003 tpy	0.0282 lb/hr	0.0310 lb/hr	0.1234 tpy	0.0319 lb/hr	0.0319 lb/hr	0.0003 tpy	0.0282 lb/hr	0.0319 lb/hr	0.1234 tpy
TOC (Total)	4.5539 lb/hr	5.0299 lb/hr	19.9459 tpy	52.4939 lb/hr	54.2229 lb/hr	4.0945 tpy	51.2964 lb/hr	53.5567 lb/hr	4.0011 tpy	6.3549 lb/hr	109.8753 lb/hr	27.8344 tpy	10.3585 lb/hr	15.5377 lb/hr	0.0829 tpy	6.3655 lb/hr	109.8753 lb/hr	27.8808 tpy
Methane	3.5603 lb/hr	3.9324 lb/hr	15.5941 tpy	41.0406 lb/hr	42.3924 lb/hr	3.2012 tpy	40.1045 lb/hr	41.8716 lb/hr	3.1281 tpy	4.9684 lb/hr	85.9025 lb/hr	21.7614 tpy	8.0984 lb/hr	12.1476 lb/hr	0.0648 tpy	4.9766 lb/hr	85.9025 lb/hr	21.7977 tpy
Ethane	0.1242 lb/hr	0.1372 lb/hr	0.5440 tpy	1.4317 lb/hr	1.4788 lb/hr	0.1117 tpy	1.3990 lb/hr	1.4606 lb/hr	0.1091 tpy	0.1733 lb/hr	2.9966 lb/hr	0.7591 tpy	0.2825 lb/hr	0.4238 lb/hr	0.0023 tpy	0.1736 lb/hr	2.9966 lb/hr	0.7604 tpy
VOC (Total)	0.8694 lb/hr	0.9602 lb/hr	3.8079 tpy	10.0216 lb/hr	10.3516 lb/hr	0.7817 tpy	9.7929 lb/hr	10.2245 lb/hr	0.7639 tpy	1.2132 lb/hr	20.9762 lb/hr	5.3138 tpy	1.9775 lb/hr	2.9663 lb/hr	0.0158 tpy	1.2152 lb/hr	20.9762 lb/hr	5.3227 tpy
VOC (non-HAP)	0.4441 lb/hr	0.4905 lb/hr	1.9450 tpy	5.1190 lb/hr	5.2876 lb/hr	0.3993 tpy	5.0022 lb/hr	5.2226 lb/hr	0.3902 tpy	0.6197 lb/hr	10.7145 lb/hr	2.7143 tpy	1.0101 lb/hr	1.5152 lb/hr	0.0081 tpy	0.6207 lb/hr	10.7145 lb/hr	2.7188 tpy
HAP (Total)	0.4253 lb/hr	0.4698 lb/hr	1.8628 tpy	4.9026 lb/hr	5.0641 lb/hr	0.3824 tpy	4.7908 lb/hr	5.0019 lb/hr	0.3737 tpy	0.5935 lb/hr	10.2617 lb/hr	2.5996 tpy	0.9674 lb/hr	1.4511 lb/hr	0.0077 tpy	0.5945 lb/hr	10.2617 lb/hr	2.6039 tpy
Acetaldehyde	1.66E-02 lb/hr	1.83E-02 lb/hr	7.25E-02 tpy	1.91E-01 lb/hr	1.97E-01 lb/hr	1.49E-02 tpy	1.87E-01 lb/hr	1.95E-01 lb/hr	1.45E-02 tpy	2.31E-02 lb/hr	4.00E-01 lb/hr	1.01E-01 tpy	3.77E-02 lb/hr	5.65E-02 lb/hr	3.01E-04 tpy	2.31E-02 lb/hr	4.00E-01 lb/hr	1.01E-01 tpy
Acrolein	2.65E-03 lb/hr	2.93E-03 lb/hr	1.16E-02 tpy	3.05E-02 lb/hr	3.15E-02 lb/hr	2.38E-03 tpy	2.98E-02 lb/hr	3.12E-02 lb/hr	2.33E-03 tpy	3.70E-03 lb/hr	6.39E-02 lb/hr	1.62E-02 tpy	6.03E-03 lb/hr	9.04E-03 lb/hr	4.82E-05 tpy	3.70E-03 lb/hr	6.39E-02 lb/hr	1.62E-02 tpy
Benzene	4.97E-03 lb/hr	5.49E-03 lb/hr	2.18E-02 tpy	5.73E-02 lb/hr	5.92E-02 lb/hr	4.47E-03 tpy	5.60E-02 lb/hr	5.84E-02 lb/hr	4.36E-03 tpy	6.93E-03 lb/hr	1.20E-01 lb/hr	3.04E-02 tpy	1.13E-02 lb/hr	1.70E-02 lb/hr	9.04E-05 tpy	6.94E-03 lb/hr	1.20E-01 lb/hr	3.04E-02 tpy
Biphenyl																		
Butadiene (1,3-)	1.78E-04 lb/hr	1.97E-04 lb/hr	7.80E-04 tpy	2.05E-03 lb/hr	2.12E-03 lb/hr	1.60E-04 tpy	2.01E-03 lb/hr	2.09E-03 lb/hr	1.56E-04 tpy	2.48E-04 lb/hr	4.30E-03 lb/hr	1.09E-03 tpy	4.05E-04 lb/hr	6.07E-04 lb/hr	3.24E-06 tpy	2.49E-04 lb/hr	4.30E-03 lb/hr	1.09E-03 tpy
Carbon Tetrachloride																		
Chlorobenzene																		
Chloroform																		
Dichloropropene (1,3-)																		
Ethylbenzene	1.32E-02 lb/hr	1.46E-02 lb/hr	5.80E-02 tpy	1.53E-01 lb/hr	1.58E-01 lb/hr	1.19E-02 tpy	1.49E-01 lb/hr	1.56E-01 lb/hr	1.16E-02 tpy	1.85E-02 lb/hr	3.20E-01 lb/hr	8.10E-02 tpy	3.01E-02 lb/hr	4.52E-02 lb/hr	2.41E-04 tpy	1.85E-02 lb/hr	3.20E-01 lb/hr	8.11E-02 tpy
Ethylene Dibromide																		
Formaldehyde	2.94E-01 lb/hr	3.25E-01 lb/hr	1.29E+00 tpy	3.39E+00 lb/hr	3.50E+00 lb/hr	2.64E-01 tpy	3.31E+00 lb/hr	3.46E+00 lb/hr	2.58E-01 tpy	4.10E-01 lb/hr	7.09E+00 lb/hr	1.80E+00 tpy	6.69E-01 lb/hr	1.00E+00 lb/hr	5.35E-03 tpy	4.11E-01 lb/hr	7.09E+00 lb/hr	1.80E+00 tpy
Hexane (n-)																		
Methanol																		
Methylene Chloride																		
Methylnaphthalene (2-)																		
Naphthalene	5.38E-04 lb/hr	5.94E-04 lb/hr	2.36E-03 tpy	6.20E-03 lb/hr	6.41E-03 lb/hr	4.84E-04 tpy	6.06E-03 lb/hr	6.33E-03 lb/hr	4.73E-04 tpy	7.51E-04 lb/hr	1.30E-02 lb/hr	3.29E-03 tpy	1.22E-03 lb/hr	1.84E-03 lb/hr	9.79E-06 tpy	7.52E-04 lb/hr	1.30E-02 lb/hr	3.30E-03 tpy
PAH	9.11E-04 lb/hr	1.01E-03 lb/hr	3.99E-03 tpy	1.05E-02 lb/hr	1.08E-02 lb/hr	8.19E-04 tpy	1.03E-02 lb/hr	1.07E-02 lb/hr	8.00E-04 tpy	1.27E-03 lb/hr	2.20E-02 lb/hr	5.57E-03 tpy	2.07E-03 lb/hr	3.11E-03 lb/hr	1.66E-05 tpy	1.27E-03 lb/hr	2.20E-02 lb/hr	5.58E-03 tpy
Phenol																		
Propylene Oxide	1.20E-02 lb/hr	1.33E-02 lb/hr	5.26E-02 tpy	1.38E-01 lb/hr	1.43E-01 lb/hr	1.08E-02 tpy	1.35E-01 lb/hr	1.41E-01 lb/hr	1.05E-02 tpy	1.68E-02 lb/hr	2.90E-01 lb/hr	7.34E-02 tpy	2.73E-02 lb/hr	4.10E-02 lb/hr	2.18E-04 tpy	1.68E-02 lb/hr	2.90E-01 lb/hr	7.35E-02 tpy
Styrene																		
Tetrachloroethane (1,1,2,2-)																		
Toluene	5.38E-02 lb/hr	5.94E-02 lb/hr	2.36E-01 tpy	6.20E-01 lb/hr	6.41E-01 lb/hr	4.84E-02 tpy	6.06E-01 lb/hr	6.33E-01 lb/hr	4.73E-02 tpy	7.51E-02 lb/hr	1.30E+00 lb/hr	3.29E-01 tpy	1.22E-01 lb/hr	1.84E-01 lb/hr	9.79E-04 tpy	7.52E-02 lb/hr	1.30E+00 lb/hr	3.30E-01 tpy
Trichloroethane (1,1,2-)																		
Trimethylpentane (2,2,4-)																		
Vinyl Chloride																		
Xylenes	2.65E-02 lb/hr	2.93E-02 lb/hr	1.16E-01 tpy	3.05E-01 lb/hr	3.15E-01 lb/hr	2.38E-02 tpy	2.98E-01 lb/hr	3.12E-01 lb/hr	2.33E-02 tpy	3.70E-02 lb/hr	6.39E-01 lb/hr	1.62E-01 tpy	6.03E-02 lb/hr	9.04E-02 lb/hr	4.82E-04 tpy	3.70E-02 lb/hr	6.39E-01 lb/hr	1.62E-01 tpy
NOTES																		
1. See TABLE B-1ABc, TABLE B-1ABf, TABLE B-1ABg, and TABLE B-1ABh. 2. If E(t) _{normal} > E(t) _{transient} , then E(8,760 hrs/yr) _{all} = E(8,760 hrs/yr) _{normal} Otherwise, E(8,760 hrs/yr) _{all} = E(8,760 hrs/yr) _{normal} - E(t) _{normal} + E(t) _{transient} , where t = the duration of transient operation.																		

TABLE B-1BBa Ambient Temperature, Start Model, and Utilization Data PTE - 100% Fuel Utilization at 100% Power Output			
Month	#Days	Daily Average	Weighted Daily Average
JAN	31.00	24.50	2.08
FEB	28.50	27.50	2.14
MAR	31.00	37.45	3.18
APR	30.00	48.70	4.00
MAY	31.00	59.60	5.05
JUN	30.00	68.45	5.62
JUL	31.00	73.60	6.24
AUG	31.00	71.55	6.07
SEP	30.00	63.30	5.20
OCT	31.00	52.20	4.43
NOV	30.00	41.90	3.44
DEC	31.00	29.40	2.49
Annual	365.50	49.85	49.94
Low Temperature Data			
Below 0°F Hours		16 hrs/yr	
Below -20°F Hours		0 hrs/yr	
NOTES			
1. Please refer to TABLE B-0.			
Start Model and Utilization			
Utilization		100.00%	
Start Model		AGT - Low	
Starts		312.00 starts/yr	

TABLE B-1BBb
Manufacturer's Operating and Emissions Data
Normal Operations
PTE - 100% Fuel Utilization at 100% Power Output

Parameters			Curve Fitting			Vendor Data							
Ambient	Temperature	°F	-20.00	-20.00	49.85	-0.01	0.01	20.00	40.00	60.00	80.00	100.00	
	Altitude	ft	0	0	0	0	0	0	0	0	0	0	
	Pressure	psia	14.702	14.702	14.702	14.702	14.702	14.702	14.702	14.702	14.702	14.702	
	Relative Humidity	%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	
	Specific Humidity	lb _{H2O} /lb _{Dry Air}	0.0003	0.0003	0.0040	0.0006	0.0006	0.0013	0.0028	0.0058	0.0124	0.0262	
Fuel	Lower Heating Value (LHV)	BTU/scf	939.2	939.2	939.2	939.2	939.2	939.2	939.2	939.2	939.2	939.2	
	Higher Heating Value (HHV)	BTU/scf	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	
Turbine	Net Output Power	hp	8,664	8,664	7,695	8,414	8,414	8,164	7,876	7,473	6,883	6,242	
	Fuel Consumption	scf/hr	71,786	71,786	65,697	70,241	70,241	68,697	66,823	64,342	60,850	57,261	
	Heat Input at LHV	MMBTU/hr	67.42	67.42	61.70	65.97	65.97	64.52	62.76	60.43	57.15	53.78	
	Heat Input at HHV	MMBTU/hr	74.91	74.91	68.56	73.30	73.30	71.69	69.73	67.14	63.50	59.76	
	Heat Rate at LHV	BTU/hp-hr	7,782	7,782	8,018	7,841	7,841	7,903	7,969	8,086	8,303	8,616	
	Heat Rate at HHV	BTU/hp-hr	8,646	8,646	8,909	8,712	8,712	8,781	8,854	8,985	9,226	9,573	
Exhaust	Temperature	°F	865	865	947	889	889	913	936	957	976	999	
	Water Fraction	%, by vol	5.67%	5.67%	6.46%	5.82%	5.82%	5.97%	6.25%	6.75%	7.67%	9.34%	
	Non-Water Fraction	%, by vol	94.33%	94.33%	93.54%	94.18%	94.18%	94.03%	93.75%	93.25%	92.33%	90.66%	
	O ₂ Content	%, by vol (dry)	15.42%	15.42%	15.34%	15.39%	15.39%	15.36%	15.34%	15.34%	15.36%	15.36%	
	Molecular Weight	lb/lb-mol	28.62	28.62	28.52	28.60	28.60	28.58	28.55	28.49	28.39	28.20	
	Flow Rate	lb/hr	192,068	192,068	173,076	186,881	186,881	181,699	176,118	169,591	161,072	151,663	
NO _x Emissions		scfm (1 atm, 68°F)	43,161	43,161	38,989	42,000	42,000	40,880	39,649	38,247	36,473	34,566	
		acfm	108,268	108,268	103,827	107,265	107,265	106,263	104,789	102,604	99,157	95,478	
lb/lb-mol		46.01	46.01	46.01	46.01	46.01	46.01	46.01	46.01	46.01	46.01		
	ppmvd, 15% O ₂	120	42	15	42	15	15	15	15	15	15		
	ppmvw	105.14	36.80	13.22	36.94	13.19	13.24	13.25	13.18	13.00	12.77		
	lb/hr	32.46	11.36	3.69	11.11	3.97	3.87	3.76	3.61	3.39	3.16		
CO Emissions	lb/lb-mol		28.01	28.01	28.01	28.01	28.01	28.01	28.01	28.01	28.01	28.01	
		ppmvd, 15% O ₂	150	100	25	100	25	25	25	25	25	25	
		ppmvw	131.42	87.61	22.04	87.95	21.99	22.07	22.09	21.97	21.67	21.28	
		lb/hr	24.70	16.47	3.75	16.10	4.02	3.93	3.82	3.66	3.44	3.21	
UHC Emissions	lb/lb-mol		18.37	18.37	18.37	18.37	18.37	18.37	18.37	18.37	18.37	18.37	
		ppmvd, 15% O ₂	75	50	25	50	25	25	25	25	25	25	
		ppmvw	65.71	43.81	22.04	43.98	21.99	22.07	22.09	21.97	21.67	21.28	
		lb/hr	8.10	5.40	2.46	5.28	2.64	2.58	2.50	2.40	2.26	2.10	

NOTES

- Operating and emissions data was provided by the manufacturer for the following ambient temperatures: 0°F, 20°F, 40°F, 60°F, 80°F, and 100°F.
Specific Humidity is estimate using curve fitting equation: $6.15E-04e^{3.75E-02T}$
All other parameter values estimated using cubic spline.
- Pollutant concentrations (ppmvd at 15% O₂) for 0°F and -20°F based on information provided in a document published by the manufacturer.
- Ambient pressure and humidity will vary. However, it is believed that any variation would not affect compliance with the proposed emission representations.
- The heating value of the natural gas used to fuel the turbine will vary. However, it is believed that any variation would not affect compliance with the proposed emission representations.

TABLE B-1BBb
Manufacturer's Operating and Emissions Data
Normal Operations
PTE - 100% Fuel Utilization at 100% Power Output

Vendor Data																						
Make:	Solar																					
Model:	060-07802S3																					
Rate	7,700 hp (ISO)																					
Capacity:	6,800 hp (NEMA)																					
Load:	100%																					
Ambient	Temperature	°F			-0.01	0.01	20.00	40.00	60.00	80.00	100.00											
	Specific Humidity	lb _{H2O} /lb _{Dry Air}			0.0006	0.0006	0.0014	0.0031	0.0066	0.0133	0.0253											
Fuel	Lower Heating Value (LHV)	BTU/scf			939.2	939.2	939.2	939.2	939.2	939.2	939.2											
Turbine	Net Output Power	hp			8,414	8,414	8,164	7,876	7,473	6,883	6,242											
	Heat Input at LHV	MMBTU/hr			65.97	65.97	64.52	62.76	60.43	57.15	53.78											
Exhaust	Temperature	°F			889	889	913	936	957	976	999											
	Water Fraction	%			5.82%	5.82%	5.97%	6.25%	6.75%	7.67%	9.34%											
	O ₂ Content	% (dry)			15.39%	15.39%	15.36%	15.34%	15.34%	15.36%	15.36%											
	Molecular Weight	lb/lb-mol			28.60	28.60	28.58	28.55	28.49	28.39	28.20											
	Flow Rate	lb/hr			186,881	186,881	181,699	176,118	169,591	161,072	151,663											
		acfm			107,265	107,265	106,263	104,789	102,604	99,157	95,478											
Guaranteed Emissions	NO _x	ppmvd, 15% O ₂	120	42	42	15	15	15	15	15	15											
	CO	ppmvd, 15% O ₂	150	100	100	25	25	25	25	25	25											
	UHC	ppmvd, 15% O ₂	75	50	50	25	25	25	25	25	25											

TABLE B-1BBc Gas-Fired Turbines Emission Estimates Normal Operations <i>PTE - 100% Fuel Utilization at 100% Power Output</i>					
Make	Solar				
Model	060-07802S3				
Normal Operating Load	100%				
Fuel	Natural Gas				
Fuel Higher Heating Value (HHV)	1,020 BTU/scf			1,020 BTU/scf	
Ambient Temperature	49.85 °F			0.01 °F	
Power Output	7,695 bhp (mech.)			8,414 bhp (mech.)	
	5,739 kW (elec.)			6,274 kW (elec.)	
Heat Rate at HHV	8,909 BTU/hp-hr			8,712 BTU/hp-hr	
Operating Hours	8,760 hrs/yr				
Fuel Consumption	67,214 scfh			71,863 scfh	
	588,797 MMscf/yr				
Heat Input at HHV	68.56 MMBTU/hr			73.30 MMBTU/hr	
	600,573 MMBTU/yr	Average	Maximum		Maximum
NO _x	54.92 lb/MMscf	3.6913 lb/hr	16.1678 tpy	55.19 lb/MMscf	3.9664 lb/hr
CO	55.72 lb/MMscf	3.7453 lb/hr	16.4044 tpy	56.00 lb/MMscf	4.0245 lb/hr
SO ₂	14.29 lb/MMscf	0.9602 lb/hr	4.2057 tpy	14.29 lb/MMscf	1.0266 lb/hr
PM _{10/2.5}	6.73 lb/MMscf	0.4525 lb/hr	1.9819 tpy	6.73 lb/MMscf	0.4838 lb/hr
CO _{2-e}	120,799 lb/MMscf	8,119 lb/hr	35,563 tpy	120,803 lb/MMscf	8,681 lb/hr
CO ₂	120,017 lb/MMscf	8,067 lb/hr	35,333 tpy	120,017 lb/MMscf	8,625 lb/hr
N ₂ O	0.23 lb/MMscf	0.0152 lb/hr	0.0666 tpy	0.23 lb/MMscf	0.0163 lb/hr
TOC (Total)	36.55 lb/MMscf	2.4565 lb/hr	10.7597 tpy	36.73 lb/MMscf	2.6397 lb/hr
Methane	28.57 lb/MMscf	1.9206 lb/hr	8.4121 tpy	28.72 lb/MMscf	2.0637 lb/hr
Ethane	1.00 lb/MMscf	0.0670 lb/hr	0.2934 tpy	1.00 lb/MMscf	0.0720 lb/hr
VOC (Total)	6.98 lb/MMscf	0.4690 lb/hr	2.0541 tpy	7.01 lb/MMscf	0.5039 lb/hr
VOC (non-HAP)	3.56 lb/MMscf	0.2396 lb/hr	1.0492 tpy	3.58 lb/MMscf	0.2574 lb/hr
HAP (Total)	3.41 lb/MMscf	0.2294 lb/hr	1.0049 tpy	3.43 lb/MMscf	0.2465 lb/hr
Acetaldehyde	1.33E-01 lb/MMscf	0.0089 lb/hr	0.0391 tpy	1.34E-01 lb/MMscf	0.0096 lb/hr
Acrolein	2.13E-02 lb/MMscf	0.0014 lb/hr	0.0063 tpy	2.14E-02 lb/MMscf	0.0015 lb/hr
Benzene	3.99E-02 lb/MMscf	0.0027 lb/hr	0.0117 tpy	4.01E-02 lb/MMscf	0.0029 lb/hr
Biphenyl					
Butadiene (1,3-)	1.43E-03 lb/MMscf	0.0001 lb/hr	0.0004 tpy	1.44E-03 lb/MMscf	0.0001 lb/hr
Carbon Tetrachloride					
Chlorobenzene					
Chloroform					
Dichloropropene (1,3-)					
Ethylbenzene	1.06E-01 lb/MMscf	0.0071 lb/hr	0.0313 tpy	1.07E-01 lb/MMscf	0.0077 lb/hr
Ethylene Dibromide					
Formaldehyde	2.36E+00 lb/MMscf	0.1586 lb/hr	0.6945 tpy	2.37E+00 lb/MMscf	0.1704 lb/hr
Hexane (n-)					
Methanol					
Methylene Chloride					
Methylnaphthalene (2-)					
Naphthalene	4.32E-03 lb/MMscf	0.0003 lb/hr	0.0013 tpy	4.34E-03 lb/MMscf	0.0003 lb/hr
PAH	7.31E-03 lb/MMscf	0.0005 lb/hr	0.0022 tpy	7.35E-03 lb/MMscf	0.0005 lb/hr
Phenol					
Propylene Oxide	9.64E-02 lb/MMscf	0.0065 lb/hr	0.0284 tpy	9.68E-02 lb/MMscf	0.0070 lb/hr
Styrene					
Tetrachloroethane (1,1,2,2-)					
Toluene	4.32E-01 lb/MMscf	0.0290 lb/hr	0.1272 tpy	4.34E-01 lb/MMscf	0.0312 lb/hr
Trichloroethane (1,1,2-)					
Trimethylpentane (2,2,4-)					
Vinyl Chloride					
Xylenes	2.13E-01 lb/MMscf	0.0143 lb/hr	0.0626 tpy	2.14E-01 lb/MMscf	0.0154 lb/hr
NOTES					
1. Fuel higher heating value selected to correspond to AP-42 emissions factors. 2. Manufacturer provided operating and emissions data (TABLE B-1BBb). 3. The annual emissions are based on a representative annual average ambient temperature (TABLE B-1BBa). Maximum hourly emissions are based on an ambient temperature of 0°F. 4. NOX, CO, and TOC (Total) emission factor based on Vendor Guarantee. 5. CO2 and N2O emission factors based on 40 CFR 98, Subpart C, Table C-1 and 40 CFR 98, Subpart C, Table C-2, respectively. 6. SO2 emission factor based on AP-42, Section 3.1 (Revised 4/00), Table 3.1-2a using Tariff (5 gr/100 scf). 7. PM10/2.5 emission factor based on AP-42, Section 3.1 (Revised 4/00), Table 3.1-2a, not Solar's PIL 171 dated 5/6/2015 (which is 127% greater). 8. Methane, Ethane, and VOC (Total) emissions based on scaling of AP-42, Section 3.1 (Revised 4/00), Table 3.1-2a using Vendor Guarantee. Speciated VOC (non-HAP) emissions based on scaling of AP-42, Section 3.1 (Revised 4/00), Table 3.1-2a using Vendor Guarantee. $EF_{Scaled} = (EF_{AP42})(EF_{TOC}/EF_{TOC-AP42})$					

TABLE B-1BBd Manufacturer's Operating and Emissions Data Startup/Shutdown Step 2: Ignition-Idle PTE - 100% Fuel Utilization at 100% Power Output									
Parameters			Interpolated	Vendor Data					
Ambient	Temperature	°F	49.85	0.01	20.00	40.00	60.00	80.00	100.00
	Altitude	ft	0	0	0	0	0	0	0
	Pressure	psia	14.702	14.702	14.702	14.702	14.702	14.702	14.702
	Relative Humidity	%	60%	60%	60%	60%	60%	60%	60%
	Specific Humidity	lb _{H2O} /lb _{Dry Air}	0.0040	0.0006	0.0013	0.0028	0.0058	0.0124	0.0262
Fuel	Lower Heating Value (LHV)	BTU/scf	939.2	939.2	939.2	939.2	939.2	939.2	939.2
	Higher Heating Value (HHV)	BTU/scf	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6
Turbine	Net Output Power	hp	770	841	816	788	747	688	624
	Fuel Consumption	scf/hr	15,515	15,534	15,534	15,577	15,385	15,002	14,566
	Heat Input at LHV	MMBTU/hr	14.57	14.59	14.59	14.63	14.45	14.09	13.68
	Heat Input at HHV	MMBTU/hr	16.19	16.21	16.21	16.26	16.06	15.66	15.20
	Heat Rate at LHV	BTU/hp-hr	18,931	17,348	17,880	18,566	19,344	20,480	21,923
	Heat Rate at HHV	BTU/hp-hr	21,035	19,276	19,867	20,629	21,493	22,755	24,359
Exhaust	Temperature	°F	604	503	543	584	626	670	715
	Water Fraction	%, by vol	3.42%	2.56%	2.78%	3.15%	3.79%	4.89%	6.76%
	Non-Water Fraction	%, by vol	96.58%	97.44%	97.22%	96.85%	96.21%	95.11%	93.24%
	O ₂ Content	%, by vol (dry)	18.39%	18.63%	18.54%	18.44%	18.33%	18.23%	18.10%
	Molecular Weight	lb/lb-mol	28.71	28.80	28.78	28.74	28.68	28.56	28.36
	Flow Rate	lb/hr	80,984	96,424	92,838	83,262	78,987	74,120	68,816
		scfm (1 atm, 68°F)	18,167	21,528	20,744	18,628	17,723	16,683	15,603
NO _x Emissions		acfm	36,611	39,250	39,391	36,819	36,439	35,690	34,709
		lb/lb-mol	46.01	46.01	46.01	46.01	46.01	46.01	46.01
		ppmvd, 15% O ₂	50	50	50	50	50	50	50
		ppmvw	20.58	18.74	19.44	20.19	20.95	21.52	22.12
CO Emissions		lb/hr	2.67	2.89	2.89	2.69	2.66	2.57	2.47
		lb/lb-mol	28.01	28.01	28.01	28.01	28.01	28.01	28.01
		ppmvd, 15% O ₂	10,000	10,000	10,000	10,000	10,000	10,000	10,000
		ppmvw	4,115.40	3,748.96	3,888.80	4,038.15	4,190.84	4,304.13	4,424.95
UHC Emissions		lb/hr	325.10	351.57	351.37	327.68	323.29	312.88	300.75
		lb/lb-mol	18.37	18.37	18.37	18.37	18.37	18.37	18.37
		ppmvd, 15% O ₂	7,700	7,700	7,700	7,700	7,700	7,700	7,700
		ppmvw	3,168.86	2,886.70	2,994.38	3,109.38	3,226.95	3,314.18	3,407.21
		lb/hr	164.19	177.56	177.46	165.49	163.28	158.02	151.89
NOTES									
1. Footnotes 1 thru 4 of TABLE B-1BBb.									

TABLE B-1BBd Manufacturer's Operating and Emissions Data Startup/Shutdown Step 2: Ignition-Idle PTE - 100% Fuel Utilization at 100% Power Output										
Vendor Data										
Make:	Solar									
Model:	060-07802S3									
Rate	7,700 hp (ISO)									
Capacity:	6,800 hp (NEMA)									
Load:	10%									
Ambient	Temperature	°F		0.01	20.00	40.00	60.00	80.00	100.00	
	Specific Humidity	lb _{H2O} /lb _{Dry Air}		0.0006	0.0014	0.0031	0.0066	0.0133	0.0253	
Fuel	Lower Heating Value (LHV)	BTU/scf		939.2	939.2	939.2	939.2	939.2	939.2	
Turbine	Net Output Power	hp		841	816	788	747	688	624	
	Heat Input at LHV	MMBTU/hr		14.59	14.59	14.63	14.45	14.09	13.68	
Exhaust	Temperature	°F		503	543	584	626	670	715	
	Water Fraction	%		2.56%	2.78%	3.15%	3.79%	4.89%	6.76%	
	O ₂ Content	% (dry)		18.63%	18.54%	18.44%	18.33%	18.23%	18.10%	
	Molecular Weight	lb/lb-mol		28.80	28.78	28.74	28.68	28.56	28.36	
	Flow Rate	lb/hr		96,424	92,838	83,262	78,987	74,120	68,816	
		acfm		39,250	39,391	36,819	36,439	35,690	34,709	
Estimated Emissions	NO _x	ppmvd, 15% O ₂		50	50	50	50	50	50	
	CO	ppmvd, 15% O ₂		10,000	10,000	10,000	10,000	10,000	10,000	
	UHC	ppmvd, 15% O ₂		7,700	7,700	7,700	7,700	7,700	7,700	

TABLE B-1BBc Manufacturer's Operating and Emissions Data Startup/Shutdown Step 3: Loading/Thermal Stabilization PTE - 100% Fuel Utilization at 100% Power Output									
Parameters			Interpolated	Vendor Data					
Ambient	Temperature	°F	49.85	0.01	20.00	40.00	60.00	80.00	100.00
	Altitude	ft	0	0	0	0	0	0	0
	Pressure	psia	14.702	14.702	14.702	14.702	14.702	14.702	14.702
	Relative Humidity	%	60%	60%	60%	60%	60%	60%	60%
	Specific Humidity	lb _{H2O} /lb _{Dry Air}	0.0040	0.0006	0.0013	0.0028	0.0058	0.0124	0.0262
Fuel	Lower Heating Value (LHV)	BTU/scf	939.2	939.2	939.2	939.2	939.2	939.2	939.2
	Higher Heating Value (HHV)	BTU/scf	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6
Turbine	Net Output Power	hp	2,309	2,524	2,449	2,363	2,242	2,065	1,873
	Fuel Consumption	scf/hr	28,604	29,152	29,035	28,822	28,279	27,310	26,256
	Heat Input at LHV	MMBTU/hr	26.86	27.38	27.27	27.07	26.56	25.65	24.66
	Heat Input at HHV	MMBTU/hr	29.85	30.42	30.30	30.08	29.51	28.50	27.40
	Heat Rate at LHV	BTU/hp-hr	11,636	10,848	11,135	11,456	11,847	12,421	13,166
	Heat Rate at HHV	BTU/hp-hr	12,929	12,053	12,372	12,729	13,163	13,801	14,629
Exhaust	Temperature	°F	710	607	649	691	728	762	794
	Water Fraction	%, by vol	4.32%	3.45%	3.69%	4.06%	4.67%	5.71%	7.48%
	Non-Water Fraction	%, by vol	95.68%	96.55%	96.31%	95.94%	95.33%	94.29%	92.52%
	O ₂ Content	%, by vol (dry)	17.51%	17.77%	17.66%	17.55%	17.47%	17.41%	17.35%
	Molecular Weight	lb/lb-mol	28.66	28.74	28.72	28.69	28.62	28.51	28.32
	Flow Rate	lb/hr	120,841	132,796	128,069	123,398	118,041	112,104	106,173
		scfm (1 atm, 68°F)	27,112	29,693	28,670	27,643	26,512	25,270	24,101
NO _x Emissions		acfm	60,039	59,982	60,194	60,237	59,630	58,463	57,218
		lb/lb-mol	46.01	46.01	46.01	46.01	46.01	46.01	46.01
		ppmvd, 15% O ₂	60	60	60	60	60	60	60
		ppmvw	33.01	30.73	31.73	32.68	33.25	33.46	33.40
CO Emissions		lb/hr	6.40	6.53	6.51	6.47	6.31	6.05	5.76
		lb/lb-mol	28.01	28.01	28.01	28.01	28.01	28.01	28.01
		ppmvd, 15% O ₂	9,000	9,000	9,000	9,000	9,000	9,000	9,000
		ppmvw	4,951.19	4,609.85	4,760.00	4,902.70	4,987.86	5,019.74	5,010.19
UHC Emissions		lb/hr	584.72	596.62	594.54	590.64	576.22	552.86	526.12
		lb/lb-mol	18.37	18.37	18.37	18.37	18.37	18.37	18.37
		ppmvd, 15% O ₂	4,460	4,460	4,460	4,460	4,460	4,460	4,460
		ppmvw	2,453.59	2,284.44	2,358.84	2,429.56	2,471.76	2,487.56	2,482.83
		lb/hr	190.05	193.92	193.25	191.98	187.29	179.70	171.01
NOTES									
1. Footnotes 1 thru 4 of TABLE B-1BBb.									

TABLE B-1BBc Manufacturer's Operating and Emissions Data Startup/Shutdown Step 3: Loading/Thermal Stabilization PTE - 100% Fuel Utilization at 100% Power Output										
Vendor Data										
Make:	Solar									
Model:	060-07802S3									
Rate	7,700 hp (ISO)									
Capacity:	6,800 hp (NEMA)									
Load:	29%									
Ambient	Temperature	°F		0.01	20.00	40.00	60.00	80.00	100.00	
	Specific Humidity	lb _{H2O} /lb _{Dry Air}		0.0006	0.0014	0.0031	0.0066	0.0133	0.0253	
Fuel	Lower Heating Value (LHV)	BTU/scf		939.2	939.2	939.2	939.2	939.2	939.2	
Turbine	Net Output Power	hp		2,524	2,449	2,363	2,242	2,065	1,873	
	Heat Input at LHV	MMBTU/hr		27.38	27.27	27.07	26.56	25.65	24.66	
Exhaust	Temperature	°F		607	649	691	728	762	794	
	Water Fraction	%		3.45%	3.69%	4.06%	4.67%	5.71%	7.48%	
	O ₂ Content	% (dry)		17.77%	17.66%	17.55%	17.47%	17.41%	17.35%	
	Molecular Weight	lb/lb-mol		28.74	28.72	28.69	28.62	28.51	28.32	
	Flow Rate	lb/hr		132,796	128,069	123,398	118,041	112,104	106,173	
		acfm		59,982	60,194	60,237	59,630	58,463	57,218	
Estimated Emissions	NO _x	ppmvd, 15% O ₂		60	60	60	60	60	60	
	CO	ppmvd, 15% O ₂		9,000	9,000	9,000	9,000	9,000	9,000	
	UHC	ppmvd, 15% O ₂		4,460	4,460	4,460	4,460	4,460	4,460	

TABLE B-1BBf Gas-Fired Turbines Emission Estimates Startup <i>PTE - 100% Fuel Utilization at 100% Power Output</i>					
Make	Solar				
Model	060-07802S3				
Fuel	Natural Gas				
Ambient Temperature	49.85 °F			0.01 °F	
Maximum Event Frequency		2 events/hr	312 events/yr		2 events/hr
Maximum Startup Time		18.00 min/hr	46.80 hrs/yr		18.00 min/hr
Fuel Consumption		7,272 scf/hr	1.13 MMscf/yr		7,384 scf/hr
		Average	Maximum		Maximum
NO _x	0.7738 lbs/event	1.5476 lb/hr	0.1207 tpy	0.7977 lbs/event	1.5955 lb/hr
CO	74.7270 lbs/event	149.4540 lb/hr	11.6574 tpy	77.2408 lbs/event	154.4816 lb/hr
SO ₂	0.0519 lbs/event	0.1039 lb/hr	0.0081 tpy	0.0527 lbs/event	0.1055 lb/hr
PM _{10/2.5}	0.0245 lbs/event	0.0490 lb/hr	0.0038 tpy	0.0249 lbs/event	0.0497 lb/hr
CO _{2-e}	969 lbs/event	1,937 lb/hr	151 tpy	996 lbs/event	1,992 lb/hr
CO ₂	436 lbs/event	873 lb/hr	68 tpy	443 lbs/event	886 lb/hr
N ₂ O	0.0008 lbs/event	0.0016 lb/hr	0.0001 tpy	0.0008 lbs/event	0.0017 lb/hr
TOC (Total)	27.2150 lbs/event	54.4300 lb/hr	4.2455 tpy	28.2703 lbs/event	56.5406 lb/hr
Methane	21.2772 lbs/event	42.5543 lb/hr	3.3192 tpy	22.1022 lbs/event	44.2045 lb/hr
Ethane	0.7422 lbs/event	1.4845 lb/hr	0.1158 tpy	0.7710 lbs/event	1.5420 lb/hr
VOC (Total)	5.1956 lbs/event	10.3912 lb/hr	0.8105 tpy	5.3971 lbs/event	10.7941 lb/hr
VOC (non-HAP)	2.6539 lbs/event	5.3078 lb/hr	0.4140 tpy	2.7568 lbs/event	5.5136 lb/hr
HAP (Total)	2.5417 lbs/event	5.0834 lb/hr	0.3965 tpy	2.6403 lbs/event	5.2805 lb/hr
Acetaldehyde	9.90E-02 lbs/event	0.1979 lb/hr	0.0154 tpy	1.03E-01 lbs/event	0.2056 lb/hr
Acrolein	1.58E-02 lbs/event	0.0317 lb/hr	0.0025 tpy	1.64E-02 lbs/event	0.0329 lb/hr
Benzene	2.97E-02 lbs/event	0.0594 lb/hr	0.0046 tpy	3.08E-02 lbs/event	0.0617 lb/hr
Biphenyl					
Butadiene (1,3-)	1.06E-03 lbs/event	0.0021 lb/hr	0.0002 tpy	1.11E-03 lbs/event	0.0022 lb/hr
Carbon Tetrachloride					
Chlorobenzene					
Chloroform					
Dichloropropene (1,3-)					
Ethylbenzene	7.92E-02 lbs/event	0.1583 lb/hr	0.0124 tpy	8.22E-02 lbs/event	0.1645 lb/hr
Ethylene Dibromide					
Formaldehyde	1.76E+00 lbs/event	3.5132 lb/hr	0.2740 tpy	1.82E+00 lbs/event	3.6494 lb/hr
Hexane (n-)					
Methanol					
Methylene Chloride					
Methylnaphthalene (2-)					
Naphthalene	3.22E-03 lbs/event	0.0064 lb/hr	0.0005 tpy	3.34E-03 lbs/event	0.0067 lb/hr
PAH	5.44E-03 lbs/event	0.0109 lb/hr	0.0008 tpy	5.65E-03 lbs/event	0.0113 lb/hr
Phenol					
Propylene Oxide	7.17E-02 lbs/event	0.1435 lb/hr	0.0112 tpy	7.45E-02 lbs/event	0.1491 lb/hr
Styrene					
Tetrachloroethane (1,1,2,2-)					
Toluene	3.22E-01 lbs/event	0.6433 lb/hr	0.0502 tpy	3.34E-01 lbs/event	0.6682 lb/hr
Trichloroethane (1,1,2-)					
Trimethylpentane (2,2,4-)					
Vinyl Chloride					
Xylenes	1.58E-01 lbs/event	0.3167 lb/hr	0.0247 tpy	1.64E-01 lbs/event	0.3290 lb/hr
NOTES					
1. Emissions of NO _x , CO, and UHC are estimated using information provided in TABLE B-1BBd and TABLE B-1BBc.					
		49.85 °F		0.01 °F	
		Step 2	Step 3	Step 2	Step 3
Duration		3.00 min/event	6.00 min/event	3.00 min/event	6.00 min/event
NO _x		0.1335 lb/event	0.6403 lb/event	0.1444 lb/event	0.6534 lb/event
CO		16.2552 lb/event	58.4718 lb/event	17.5787 lb/event	59.6621 lb/event
UHC		8.2096 lb/event	19.0054 lb/event	8.8780 lb/event	19.3923 lb/event
Fuel		776 scf/event	2,860 scf/event	777 scf/event	2,915 scf/event
2. Footnotes 4 thru 8 of TABLE B-1BBc.					
3. The frequency of startup events was provided by Technical Services.					

TABLE B-1BBg Gas-Fired Turbines Emission Estimates Shutdown PTE - 100% Fuel Utilization at 100% Power Output					
Make	Solar				
Model	060-07802S3				
Fuel	Natural Gas				
Ambient Temperature	49.85 °F			0.01 °F	
Maximum Event Frequency		2 events/hr	312 events/yr		2 events/hr
Maximum Startup Time		17.00 min/hr	44.20 hrs/yr		17.00 min/hr
Fuel Consumption		8,104 scf/hr	1.26 MMscf/yr		8,260 scf/hr
		Average	Maximum		Maximum
NO _x	0.9071 lbs/event	1.8142 lb/hr	0.1415 tpy	0.9256 lbs/event	1.8512 lb/hr
CO	82.8350 lbs/event	165.6700 lb/hr	12.9223 tpy	84.5213 lbs/event	169.0426 lb/hr
SO ₂	0.0579 lbs/event	0.1158 lb/hr	0.0090 tpy	0.0590 lbs/event	0.1180 lb/hr
PM _{10/2.5}	0.0273 lbs/event	0.0546 lb/hr	0.0043 tpy	0.0278 lbs/event	0.0556 lb/hr
CO _{2-e}	1,013 lbs/event	2,026 lb/hr	158 tpy	1,033 lbs/event	2,066 lb/hr
CO ₂	486 lbs/event	973 lb/hr	76 tpy	496 lbs/event	991 lb/hr
N ₂ O	0.0009 lbs/event	0.0018 lb/hr	0.0001 tpy	0.0009 lbs/event	0.0019 lb/hr
TOC (Total)	26.9243 lbs/event	53.8486 lb/hr	4.2002 tpy	27.4724 lbs/event	54.9448 lb/hr
Methane	21.0499 lbs/event	42.0998 lb/hr	3.2838 tpy	21.4784 lbs/event	42.9568 lb/hr
Ethane	0.7343 lbs/event	1.4686 lb/hr	0.1146 tpy	0.7492 lbs/event	1.4985 lb/hr
VOC (Total)	5.1401 lbs/event	10.2802 lb/hr	0.8019 tpy	5.2447 lbs/event	10.4895 lb/hr
VOC (non-HAP)	2.6255 lbs/event	5.2511 lb/hr	0.4096 tpy	2.6790 lbs/event	5.3580 lb/hr
HAP (Total)	2.5146 lbs/event	5.0291 lb/hr	0.3923 tpy	2.5657 lbs/event	5.1315 lb/hr
Acetaldehyde	9.79E-02 lbs/event	0.1958 lb/hr	0.0153 tpy	9.99E-02 lbs/event	0.1998 lb/hr
Acrolein	1.57E-02 lbs/event	0.0313 lb/hr	0.0024 tpy	1.60E-02 lbs/event	0.0320 lb/hr
Benzene	2.94E-02 lbs/event	0.0587 lb/hr	0.0046 tpy	3.00E-02 lbs/event	0.0599 lb/hr
Biphenyl					
Butadiene (1,3-)	1.05E-03 lbs/event	0.0021 lb/hr	0.0002 tpy	1.07E-03 lbs/event	0.0021 lb/hr
Carbon Tetrachloride					
Chlorobenzene					
Chloroform					
Dichloropropene (1,3-)					
Ethylbenzene	7.83E-02 lbs/event	0.1567 lb/hr	0.0122 tpy	7.99E-02 lbs/event	0.1598 lb/hr
Ethylene Dibromide					
Formaldehyde	1.74E+00 lbs/event	3.4757 lb/hr	0.2711 tpy	1.77E+00 lbs/event	3.5464 lb/hr
Hexane (n-)					
Methanol					
Methylene Chloride					
Methylnaphthalene (2-)					
Naphthalene	3.18E-03 lbs/event	0.0064 lb/hr	0.0005 tpy	3.25E-03 lbs/event	0.0065 lb/hr
PAH	5.38E-03 lbs/event	0.0108 lb/hr	0.0008 tpy	5.49E-03 lbs/event	0.0110 lb/hr
Phenol					
Propylene Oxide	7.10E-02 lbs/event	0.1420 lb/hr	0.0111 tpy	7.24E-02 lbs/event	0.1449 lb/hr
Styrene					
Tetrachloroethane (1,1,2,2-)					
Toluene	3.18E-01 lbs/event	0.6364 lb/hr	0.0496 tpy	3.25E-01 lbs/event	0.6493 lb/hr
Trichloroethane (1,1,2-)					
Trimethylpentane (2,2,4-)					
Vinyl Chloride					
Xylenes	1.57E-01 lbs/event	0.3133 lb/hr	0.0244 tpy	1.60E-01 lbs/event	0.3197 lb/hr
NOTES					
1. Emissions of NO _x , CO, and UHC are estimated using information provided in TABLE B-1BBd and TABLE B-1BBe.					
		49.85 °F		0.01 °F	
		Step 2	Step 3	Step 2	Step 3
Duration		0.00 min/event	8.50 min/event	0.00 min/event	8.50 min/event
NO _x		0.0000 lb/event	0.9071 lb/event	0.0000 lb/event	0.9256 lb/event
CO		0.0000 lb/event	82.8350 lb/event	0.0000 lb/event	84.5213 lb/event
UHC		0.0000 lb/event	26.9243 lb/event	0.0000 lb/event	27.4724 lb/event
Fuel		0 scf/event	4,052 scf/event	0 scf/event	4,130 scf/event
2. Footnotes 4 thru 8 of TABLE B-1BBc.					
3. The frequency of startup events was provided by Technical Services.					

TABLE B-1BBh Gas-Fired Turbines Emission Estimates Low Temperatures PTE - 100% Fuel Utilization at 100% Power Output						
Make	Solar					
Model	060-07802S3					
Normal Operating Load	100%					
Fuel	Natural Gas					
Fuel Higher Heating Value (HHV)	1,020 BTU/scf			1,020 BTU/scf		
Ambient Temperature	-20.00 °F			-20.00 °F		
Power Output	8,664 bhp (mech.)			8,664 bhp (mech.)		
	6,461 kW (elec.)			6,461 kW (elec.)		
Heat Rate at HHV	8,646 BTU/hp-hr			8,646 BTU/hp-hr		
Operating Hours	16 hrs/yr			0 hrs/yr		
Fuel Consumption	73,444 scfh			73,444 scfh		
	1.175 MMscf/yr			0.000 MMscf/yr		
Heat Input at HHV	74.91 MMBTU/hr	0°F ≥ T > -20°F		74.91 MMBTU/hr	T ≤ -20°F	
	1,199 MMBTU/yr	Hourly	Annual	0 MMBTU/yr	Hourly	Annual
NO _x	154.71 lb/MMscf	11.3622 lb/hr	0.0909 tpy	442.02 lb/MMscf	32.4635 lb/hr	0.0000 tpy
CO	224.24 lb/MMscf	16.4693 lb/hr	0.1318 tpy	336.37 lb/MMscf	24.7040 lb/hr	0.0000 tpy
SO ₂	14.29 lb/MMscf	1.0492 lb/hr	0.0084 tpy	14.29 lb/MMscf	1.0492 lb/hr	0.0000 tpy
PM _{10/2.5}	6.73 lb/MMscf	0.4944 lb/hr	0.0040 tpy	6.73 lb/MMscf	0.4944 lb/hr	0.0000 tpy
CO _{2-e}	121,522 lb/MMscf	8,925 lb/hr	71 tpy	122,241 lb/MMscf	8,978 lb/hr	0 tpy
CO ₂	120,017 lb/MMscf	8,815 lb/hr	71 tpy	120,017 lb/MMscf	8,815 lb/hr	0 tpy
N ₂ O	0.23 lb/MMscf	0.0166 lb/hr	0.0001 tpy	0.23 lb/MMscf	0.0166 lb/hr	0.0000 tpy
TOC (Total)	73.54 lb/MMscf	5.4011 lb/hr	0.0432 tpy	110.31 lb/MMscf	8.1017 lb/hr	0.0000 tpy
Methane	57.50 lb/MMscf	4.2227 lb/hr	0.0338 tpy	86.24 lb/MMscf	6.3340 lb/hr	0.0000 tpy
Ethane	2.01 lb/MMscf	0.1473 lb/hr	0.0012 tpy	3.01 lb/MMscf	0.2210 lb/hr	0.0000 tpy
VOC (Total)	14.04 lb/MMscf	1.0311 lb/hr	0.0082 tpy	21.06 lb/MMscf	1.5467 lb/hr	0.0000 tpy
VOC (non-HAP)	7.17 lb/MMscf	0.5267 lb/hr	0.0042 tpy	10.76 lb/MMscf	0.7900 lb/hr	0.0000 tpy
HAP (Total)	6.87 lb/MMscf	0.5044 lb/hr	0.0040 tpy	10.30 lb/MMscf	0.7566 lb/hr	0.0000 tpy
Acetaldehyde	2.67E-01 lb/MMscf	0.0196 lb/hr	0.0002 tpy	4.01E-01 lb/MMscf	0.0295 lb/hr	0.0000 tpy
Acrolein	4.28E-02 lb/MMscf	0.0031 lb/hr	0.0000 tpy	6.42E-02 lb/MMscf	0.0047 lb/hr	0.0000 tpy
Benzene	8.02E-02 lb/MMscf	0.0059 lb/hr	0.0000 tpy	1.20E-01 lb/MMscf	0.0088 lb/hr	0.0000 tpy
Biphenyl						
Butadiene (1,3-)	2.87E-03 lb/MMscf	0.0002 lb/hr	0.0000 tpy	4.31E-03 lb/MMscf	0.0003 lb/hr	0.0000 tpy
Carbon Tetrachloride						
Chlorobenzene						
Chloroform						
Dichloropropene (1,3-)						
Ethylbenzene	2.14E-01 lb/MMscf	0.0157 lb/hr	0.0001 tpy	3.21E-01 lb/MMscf	0.0236 lb/hr	0.0000 tpy
Ethylene Dibromide						
Formaldehyde	4.75E+00 lb/MMscf	0.3486 lb/hr	0.0028 tpy	7.12E+00 lb/MMscf	0.5229 lb/hr	0.0000 tpy
Hexane (n-)						
Methanol						
Methylene Chloride						
Methylnaphthalene (2-)						
Naphthalene	8.69E-03 lb/MMscf	0.0006 lb/hr	0.0000 tpy	1.30E-02 lb/MMscf	0.0010 lb/hr	0.0000 tpy
PAH	1.47E-02 lb/MMscf	0.0011 lb/hr	0.0000 tpy	2.21E-02 lb/MMscf	0.0016 lb/hr	0.0000 tpy
Phenol						
Propylene Oxide	1.94E-01 lb/MMscf	0.0142 lb/hr	0.0001 tpy	2.91E-01 lb/MMscf	0.0214 lb/hr	0.0000 tpy
Styrene						
Tetrachloroethane (1,1,2,2-)						
Toluene	8.69E-01 lb/MMscf	0.0638 lb/hr	0.0005 tpy	1.30E+00 lb/MMscf	0.0957 lb/hr	0.0000 tpy
Trichloroethane (1,1,2-)						
Trimethylpentane (2,2,4-)						
Vinyl Chloride						
Xylenes	4.28E-01 lb/MMscf	0.0314 lb/hr	0.0003 tpy	6.42E-01 lb/MMscf	0.0471 lb/hr	0.0000 tpy
NOTES						
1. Fuel higher heating value selected to correspond to AP-42 emissions factors. 2. Operating hours for low ambient temperatures best on best fit of available data (see TABLE B-1BBa). 3. Manufacturer provided data on: power output, heat rate, along with NO _x , CO, and UHC (or TOC) emissions. 4. Footnotes 4 thru 8 of TABLE B-1BBc.						

TABLE B-1BBi Gas-Fired Turbines Maximum Emission Estimates Normal Operations, Startup, Shutdown, and Low Temperature Operations PTE - 100% Fuel Utilization at 100% Power Output																		
Make	Solar																	
Model	060-07802S3																	
Normal Operating Load	100%																	
Operations	Normal			Startup			Shutdown			Startup/Shutdown w/ Normal			Low Temperatures			Combined Operations		
Maximum Annual Combined Event Frequency	8,760 hrs/yr			47 hrs/yr			44 hrs/yr			8,760 hrs/yr			16 hrs/yr			8,760 hrs/yr		
Pollutant	Hourly		Maximum Annual	Hourly		Maximum Annual	Hourly		Maximum Annual	Hourly		Maximum Annual	Hourly		Maximum Annual	Hourly		Maximum Annual
	Average	Maximum		Average	Maximum		Average	Maximum		Average	Maximum		Average	Maximum		Average	Maximum	
NO _x	3.6913 lb/hr	3.9664 lb/hr	16.1678 tpy	1.5476 lb/hr	1.5955 lb/hr	0.1207 tpy	1.8142 lb/hr	1.8512 lb/hr	0.1415 tpy	3.7128 lb/hr	5.0993 lb/hr	16.2621 tpy	11.3622 lb/hr	32.4635 lb/hr	0.0909 tpy	3.7268 lb/hr	32.4635 lb/hr	16.3234 tpy
CO	3.7453 lb/hr	4.0245 lb/hr	16.4044 tpy	149.4540 lb/hr	154.4816 lb/hr	11.6574 tpy	165.6700 lb/hr	169.0426 lb/hr	12.9223 tpy	9.3182 lb/hr	325.2010 lb/hr	40.8137 tpy	16.4693 lb/hr	24.7040 lb/hr	0.1318 tpy	9.3414 lb/hr	325.2010 lb/hr	40.9154 tpy
SO ₂	0.9602 lb/hr	1.0266 lb/hr	4.2057 tpy	0.1039 lb/hr	0.1055 lb/hr	0.0081 tpy	0.1158 lb/hr	0.1180 lb/hr	0.0090 tpy	0.9602 lb/hr	1.0266 lb/hr	4.2057 tpy	1.0492 lb/hr	1.0492 lb/hr	0.0084 tpy	0.9604 lb/hr	1.0492 lb/hr	4.2064 tpy
PM _{10/2.5}	0.4525 lb/hr	0.4838 lb/hr	1.9819 tpy	0.0490 lb/hr	0.0497 lb/hr	0.0038 tpy	0.0546 lb/hr	0.0556 lb/hr	0.0043 tpy	0.4525 lb/hr	0.4838 lb/hr	1.9819 tpy	0.4944 lb/hr	0.4944 lb/hr	0.0040 tpy	0.4526 lb/hr	0.4944 lb/hr	1.9822 tpy
CO _{2-e}	8,119 lb/hr	8,681 lb/hr	35,563 tpy	1,937 lb/hr	1,992 lb/hr	151 tpy	2,026 lb/hr	2,066 lb/hr	158 tpy	8,119 lb/hr	8,681 lb/hr	35,563 tpy	8,925 lb/hr	8,978 lb/hr	71 tpy	8,121 lb/hr	8,978 lb/hr	35,570 tpy
CO ₂	8,067 lb/hr	8,625 lb/hr	35,333 tpy	873 lb/hr	886 lb/hr	68 tpy	973 lb/hr	991 lb/hr	76 tpy	8,067 lb/hr	8,625 lb/hr	35,333 tpy	8,815 lb/hr	8,815 lb/hr	71 tpy	8,068 lb/hr	8,815 lb/hr	35,339 tpy
N ₂ O	0.0152 lb/hr	0.0163 lb/hr	0.0666 tpy	0.0016 lb/hr	0.0017 lb/hr	0.0001 tpy	0.0018 lb/hr	0.0019 lb/hr	0.0001 tpy	0.0152 lb/hr	0.0163 lb/hr	0.0666 tpy	0.0166 lb/hr	0.0166 lb/hr	0.0001 tpy	0.0152 lb/hr	0.0166 lb/hr	0.0666 tpy
TOC (Total)	2.4565 lb/hr	2.6397 lb/hr	10.7597 tpy	54.4300 lb/hr	56.5406 lb/hr	4.2455 tpy	53.8486 lb/hr	54.9448 lb/hr	4.2002 tpy	4.3593 lb/hr	112.5852 lb/hr	19.0936 tpy	5.4011 lb/hr	8.1017 lb/hr	0.0432 tpy	4.3647 lb/hr	112.5852 lb/hr	19.1172 tpy
Methane	1.9206 lb/hr	2.0637 lb/hr	8.4121 tpy	42.5543 lb/hr	44.2045 lb/hr	3.3192 tpy	42.0998 lb/hr	42.9568 lb/hr	3.2838 tpy	3.4082 lb/hr	88.0212 lb/hr	14.9277 tpy	4.2227 lb/hr	6.3340 lb/hr	0.0338 tpy	3.4124 lb/hr	88.0212 lb/hr	14.9461 tpy
Ethane	0.0670 lb/hr	0.0720 lb/hr	0.2934 tpy	1.4845 lb/hr	1.5420 lb/hr	0.1158 tpy	1.4686 lb/hr	1.4985 lb/hr	0.1146 tpy	0.1189 lb/hr	3.0705 lb/hr	4.5207 tpy	0.1473 lb/hr	0.2210 lb/hr	0.0012 tpy	0.1190 lb/hr	3.0705 lb/hr	4.5214 tpy
VOC (Total)	0.4690 lb/hr	0.5039 lb/hr	2.0541 tpy	10.3912 lb/hr	10.7941 lb/hr	0.8105 tpy	10.2802 lb/hr	10.4895 lb/hr	0.8019 tpy	0.8322 lb/hr	21.4935 lb/hr	3.6451 tpy	1.0311 lb/hr	1.5467 lb/hr	0.0082 tpy	0.8333 lb/hr	21.4935 lb/hr	3.6496 tpy
VOC (non-HAP)	0.2396 lb/hr	0.2574 lb/hr	1.0492 tpy	5.3078 lb/hr	5.5136 lb/hr	0.4140 tpy	5.2511 lb/hr	5.3580 lb/hr	0.4096 tpy	0.4251 lb/hr	10.9788 lb/hr	1.8619 tpy	0.5267 lb/hr	0.7900 lb/hr	0.0042 tpy	0.4256 lb/hr	10.9788 lb/hr	1.8642 tpy
HAP (Total)	0.2294 lb/hr	0.2465 lb/hr	1.0049 tpy	5.0834 lb/hr	5.2805 lb/hr	0.3965 tpy	5.0291 lb/hr	5.1315 lb/hr	0.3923 tpy	0.4071 lb/hr	10.5147 lb/hr	1.7832 tpy	0.5044 lb/hr	0.7566 lb/hr	0.0040 tpy	0.4076 lb/hr	10.5147 lb/hr	1.7854 tpy
Acetaldehyde	8.93E-03 lb/hr	9.60E-03 lb/hr	3.91E-02 tpy	1.98E-01 lb/hr	2.06E-01 lb/hr	1.54E-02 tpy	1.96E-01 lb/hr	2.00E-01 lb/hr	1.53E-02 tpy	1.59E-02 lb/hr	4.09E-01 lb/hr	6.94E-02 tpy	1.96E-02 lb/hr	2.95E-02 lb/hr	1.57E-04 tpy	1.59E-02 lb/hr	4.09E-01 lb/hr	6.95E-02 tpy
Acrolein	1.43E-03 lb/hr	1.54E-03 lb/hr	6.26E-03 tpy	3.17E-02 lb/hr	3.29E-02 lb/hr	2.47E-03 tpy	3.13E-02 lb/hr	3.20E-02 lb/hr	2.44E-03 tpy	2.54E-03 lb/hr	6.55E-02 lb/hr	1.11E-02 tpy	3.14E-03 lb/hr	4.71E-03 lb/hr	2.51E-05 tpy	2.54E-03 lb/hr	6.55E-02 lb/hr	1.11E-02 tpy
Benzene	2.68E-03 lb/hr	2.88E-03 lb/hr	1.17E-02 tpy	5.94E-02 lb/hr	6.17E-02 lb/hr	4.63E-03 tpy	5.87E-02 lb/hr	5.99E-02 lb/hr	4.58E-03 tpy	4.76E-03 lb/hr	1.23E-01 lb/hr	2.08E-02 tpy	5.89E-03 lb/hr	8.84E-03 lb/hr	4.71E-05 tpy	4.76E-03 lb/hr	1.23E-01 lb/hr	2.09E-02 tpy
Biphenyl																		
Butadiene (1,3-)	9.60E-05 lb/hr	1.03E-04 lb/hr	4.21E-04 tpy	2.13E-03 lb/hr	2.21E-03 lb/hr	1.66E-04 tpy	2.10E-03 lb/hr	2.15E-03 lb/hr	1.64E-04 tpy	1.70E-04 lb/hr	4.40E-03 lb/hr	7.46E-04 tpy	2.11E-04 lb/hr	3.17E-04 lb/hr	1.69E-06 tpy	1.71E-04 lb/hr	4.40E-03 lb/hr	7.47E-04 tpy
Carbon Tetrachloride																		
Chlorobenzene																		
Chloroform																		
Dichloropropene (1,3-)																		
Ethylbenzene	7.15E-03 lb/hr	7.68E-03 lb/hr	3.13E-02 tpy	1.58E-01 lb/hr	1.64E-01 lb/hr	1.24E-02 tpy	1.57E-01 lb/hr	1.60E-01 lb/hr	1.22E-02 tpy	1.27E-02 lb/hr	3.28E-01 lb/hr	5.55E-02 tpy	1.57E-02 lb/hr	2.36E-02 lb/hr	1.26E-04 tpy	1.27E-02 lb/hr	3.28E-01 lb/hr	5.56E-02 tpy
Ethylene Dibromide																		
Formaldehyde	1.59E-01 lb/hr	1.70E-01 lb/hr	6.94E-01 tpy	3.51E+00 lb/hr	3.65E+00 lb/hr	2.74E-01 tpy	3.48E+00 lb/hr	3.55E+00 lb/hr	2.71E-01 tpy	2.81E-01 lb/hr	7.27E+00 lb/hr	1.23E+00 tpy	3.49E-01 lb/hr	5.23E-01 lb/hr	2.79E-03 tpy	2.82E-01 lb/hr	7.27E+00 lb/hr	1.23E+00 tpy
Hexane (n-)																		
Methanol																		
Methylene Chloride																		
Methylnaphthalene (2-)																		
Naphthalene	2.90E-04 lb/hr	3.12E-04 lb/hr	1.27E-03 tpy	6.43E-03 lb/hr	6.68E-03 lb/hr	5.02E-04 tpy	6.36E-03 lb/hr	6.49E-03 lb/hr	4.96E-04 tpy	5.15E-04 lb/hr	1.33E-02 lb/hr	2.26E-03 tpy	6.38E-04 lb/hr	9.57E-04 lb/hr	5.11E-06 tpy	5.16E-04 lb/hr	1.33E-02 lb/hr	2.26E-03 tpy
PAH	4.91E-04 lb/hr	5.28E-04 lb/hr	2.15E-03 tpy	1.09E-02 lb/hr	1.13E-02 lb/hr	8.49E-04 tpy	1.08E-02 lb/hr	1.10E-02 lb/hr	8.40E-04 tpy	8.72E-04 lb/hr	2.25E-02 lb/hr	3.82E-03 tpy	1.08E-03 lb/hr	1.62E-03 lb/hr	8.64E-06 tpy	8.73E-04 lb/hr	2.25E-02 lb/hr	3.82E-03 tpy
Phenol																		
Propylene Oxide	6.48E-03 lb/hr	6.96E-03 lb/hr	2.84E-02 tpy	1.43E-01 lb/hr	1.49E-01 lb/hr	1.12E-02 tpy	1.42E-01 lb/hr	1.45E-01 lb/hr	1.11E-02 tpy	1.15E-02 lb/hr	2.97E-01 lb/hr	5.03E-02 tpy	1.42E-02 lb/hr	2.14E-02 lb/hr	1.14E-04 tpy	1.15E-02 lb/hr	2.97E-01 lb/hr	5.04E-02 tpy
Styrene																		
Tetrachloroethane (1,1,2,2-)																		
Toluene	2.90E-02 lb/hr	3.12E-02 lb/hr	1.27E-01 tpy	6.43E-01 lb/hr	6.68E-01 lb/hr	5.02E-02 tpy	6.36E-01 lb/hr	6.49E-01 lb/hr	4.96E-02 tpy	5.15E-02 lb/hr	1.33E+00 lb/hr	2.26E-01 tpy	6.38E-02 lb/hr	9.57E-02 lb/hr	5.11E-04 tpy	5.16E-02 lb/hr	1.33E+00 lb/hr	2.26E-01 tpy
Trichloroethane (1,1,2-)																		
Trimethylpentane (2,2,4-)																		
Vinyl Chloride																		
Xylenes	1.43E-02 lb/hr	1.54E-02 lb/hr	6.26E-02 tpy	3.17E-01 lb/hr	3.29E-01 lb/hr	2.47E-02 tpy	3.13E-01 lb/hr	3.20E-01 lb/hr	2.44E-02 tpy	2.54E-02 lb/hr	6.55E-01 lb/hr	1.11E-01 tpy	3.14E-02 lb/hr	4.71E-02 lb/hr	2.51E-04 tpy	2.54E-02 lb/hr	6.55E-01 lb/hr	1.11E-01 tpy
NOTES																		
1. See TABLE B-1BBc, TABLE B-1BBf, TABLE B-1BBg, and TABLE B-1BBh. 2. If E(t) _{normal} > E(t) _{transient} , then E(8,760 hrs/yr) _{all} = E(8,760 hrs/yr) _{normal} Otherwise, E(8,760 hrs/yr) _{all} = E(8,760 hrs/yr) _{normal} - E(t) _{normal} + E(t) _{transient} , where t = the duration of transient operation.																		

TABLE B-1Ca Ambient Temperature, Start Model, and Utilization Data PTE - 100% Fuel Utilization at 100% Power Output			
Month	#Days	Daily Average	Weighted Daily Average
JAN	31.00	24.50	2.08
FEB	28.50	27.50	2.14
MAR	31.00	37.45	3.18
APR	30.00	48.70	4.00
MAY	31.00	59.60	5.05
JUN	30.00	68.45	5.62
JUL	31.00	73.60	6.24
AUG	31.00	71.55	6.07
SEP	30.00	63.30	5.20
OCT	31.00	52.20	4.43
NOV	30.00	41.90	3.44
DEC	31.00	29.40	2.49
Annual	365.50	49.85	49.94
Low Temperature Data			
Below 0°F Hours		16 hrs/yr	
Below -20°F Hours		0 hrs/yr	
NOTES			
1. Please refer to TABLE B-0.			
Start Model and Utilization			
Utilization		100.00%	
Start Model		AGT - Medium	
Starts		416.00 starts/yr	

TABLE B-1Cb
Manufacturer's Operating and Emissions Data
Normal Operations
PTE - 100% Fuel Utilization at 100% Power Output

Parameters			Curve Fitting			Vendor Data							
Ambient	Temperature	°F	-20.00	-20.00	49.85	-0.01	0.01	20.00	40.00	60.00	80.00	100.00	
	Altitude	ft	0	0	0	0	0	0	0	0	0	0	
	Pressure	psia	14.702	14.702	14.702	14.702	14.702	14.702	14.702	14.702	14.702	14.702	
	Relative Humidity	%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	
	Specific Humidity	lb _{H2O} /lb _{Dry Air}	0.0003	0.0003	0.0040	0.0006	0.0006	0.0013	0.0028	0.0058	0.0124	0.0262	
Fuel	Lower Heating Value (LHV)	BTU/scf	939.2	939.2	939.2	939.2	939.2	939.2	939.2	939.2	939.2	939.2	
	Higher Heating Value (HHV)	BTU/scf	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	
Turbine	Net Output Power	hp	8,664	8,664	7,695	8,414	8,414	8,164	7,876	7,473	6,883	6,242	
	Fuel Consumption	scf/hr	71,786	71,786	65,697	70,241	70,241	68,697	66,823	64,342	60,850	57,261	
	Heat Input at LHV	MMBTU/hr	67.42	67.42	61.70	65.97	65.97	64.52	62.76	60.43	57.15	53.78	
	Heat Input at HHV	MMBTU/hr	74.91	74.91	68.56	73.30	73.30	71.69	69.73	67.14	63.50	59.76	
	Heat Rate at LHV	BTU/hp-hr	7,782	7,782	8,018	7,841	7,841	7,903	7,969	8,086	8,303	8,616	
	Heat Rate at HHV	BTU/hp-hr	8,646	8,646	8,909	8,712	8,712	8,781	8,854	8,985	9,226	9,573	
Exhaust	Temperature	°F	865	865	947	889	889	913	936	957	976	999	
	Water Fraction	%, by vol	5.67%	5.67%	6.46%	5.82%	5.82%	5.97%	6.25%	6.75%	7.67%	9.34%	
	Non-Water Fraction	%, by vol	94.33%	94.33%	93.54%	94.18%	94.18%	94.03%	93.75%	93.25%	92.33%	90.66%	
	O ₂ Content	%, by vol (dry)	15.42%	15.42%	15.34%	15.39%	15.39%	15.36%	15.34%	15.34%	15.36%	15.36%	
	Molecular Weight	lb/lb-mol	28.62	28.62	28.52	28.60	28.60	28.58	28.55	28.49	28.39	28.20	
	Flow Rate	lb/hr	192,068	192,068	173,076	186,881	186,881	181,699	176,118	169,591	161,072	151,663	
NO _x Emissions		scfm (1 atm, 68°F)	43,161	43,161	38,989	42,000	42,000	40,880	39,649	38,247	36,473	34,566	
		acfm	108,268	108,268	103,827	107,265	107,265	106,263	104,789	102,604	99,157	95,478	
lb/lb-mol		46.01	46.01	46.01	46.01	46.01	46.01	46.01	46.01	46.01	46.01		
	ppmvd, 15% O ₂	120	42	9	42	9	9	9	9	9	9		
	ppmvw	105.14	36.80	7.93	36.94	7.92	7.95	7.95	7.91	7.80	7.66		
	lb/hr	32.46	11.36	2.21	11.11	2.38	2.32	2.26	2.17	2.04	1.90		
CO Emissions	lb/lb-mol		28.01	28.01	28.01	28.01	28.01	28.01	28.01	28.01	28.01	28.01	
		ppmvd, 15% O ₂	150	100	25	100	25	25	25	25	25	25	
		ppmvw	131.42	87.61	22.04	87.95	21.99	22.07	22.09	21.97	21.67	21.28	
		lb/hr	24.70	16.47	3.75	16.10	4.02	3.93	3.82	3.66	3.44	3.21	
UHC Emissions	lb/lb-mol		18.37	18.37	18.37	18.37	18.37	18.37	18.37	18.37	18.37	18.37	
		ppmvd, 15% O ₂	75	50	25	50	25	25	25	25	25	25	
		ppmvw	65.71	43.81	22.04	43.98	21.99	22.07	22.09	21.97	21.67	21.28	
		lb/hr	8.10	5.40	2.46	5.28	2.64	2.58	2.50	2.40	2.26	2.10	

NOTES

- Operating and emissions data was provided by the manufacturer for the following ambient temperatures: 0°F, 20°F, 40°F, 60°F, 80°F, and 100°F.
Specific Humidity is estimate using curve fitting equation: $6.15E-04e^{3.75E-02T}$
All other parameter values estimated using cubic spline.
- Pollutant concentrations (ppmvd at 15% O₂) for 0°F and -20°F based on information provided in a document published by the manufacturer.
- Ambient pressure and humidity will vary. However, it is believed that any variation would not affect compliance with the proposed emission representations.
- The heating value of the natural gas used to fuel the turbine will vary. However, it is believed that any variation would not affect compliance with the proposed emission representations.

TABLE B-1Cb
Manufacturer's Operating and Emissions Data
Normal Operations
PTE - 100% Fuel Utilization at 100% Power Output

Vendor Data																				
Make:	Solar																			
Model:	060-07802S4																			
Rate	7,700 hp (ISO)																			
Capacity:	6,800 hp (NEMA)																			
Load:	100%																			
Ambient	Temperature	°F			-0.01	0.01	20.00	40.00	60.00	80.00	100.00									
	Specific Humidity	lb _{H2O} /lb _{Dry Air}			0.0006	0.0006	0.0014	0.0031	0.0066	0.0133	0.0253									
Fuel	Lower Heating Value (LHV)	BTU/scf			939.2	939.2	939.2	939.2	939.2	939.2	939.2									
Turbine	Net Output Power	hp			8,414	8,414	8,164	7,876	7,473	6,883	6,242									
	Heat Input at LHV	MMBTU/hr			65.97	65.97	64.52	62.76	60.43	57.15	53.78									
Exhaust	Temperature	°F			889	889	913	936	957	976	999									
	Water Fraction	%			5.82%	5.82%	5.97%	6.25%	6.75%	7.67%	9.34%									
	O ₂ Content	% (dry)			15.39%	15.39%	15.36%	15.34%	15.34%	15.36%	15.36%									
	Molecular Weight	lb/lb-mol			28.60	28.60	28.58	28.55	28.49	28.39	28.20									
	Flow Rate	lb/hr			186,881	186,881	181,699	176,118	169,591	161,072	151,663									
Guaranteed Emissions		acfm			107,265	107,265	106,263	104,789	102,604	99,157	95,478									
	NO _x	ppmvd, 15% O ₂	120	42	42	9	9	9	9	9	9									
	CO	ppmvd, 15% O ₂	150	100	100	25	25	25	25	25	25									
	UHC	ppmvd, 15% O ₂	75	50	50	25	25	25	25	25	25									

TABLE B-1Cc Gas-Fired Turbines Emission Estimates Normal Operations <i>PTE - 100% Fuel Utilization at 100% Power Output</i>					
Make	Solar				
Model	060-07802S4				
Normal Operating Load	100%				
Fuel	Natural Gas				
Fuel Higher Heating Value (HHV)	1,020 BTU/scf			1,020 BTU/scf	
Ambient Temperature	49.85 °F			0.01 °F	
Power Output	7,695 bhp (mech.)			8,414 bhp (mech.)	
	5,739 kW (elec.)			6,274 kW (elec.)	
Heat Rate at HHV	8,909 BTU/hp-hr			8,712 BTU/hp-hr	
Operating Hours	8,760 hrs/yr				
	67,214 scfh			71,863 scfh	
Fuel Consumption	588.797 MMscf/yr				
	68.56 MMBTU/hr			73.30 MMBTU/hr	
Heat Input at HHV	600,573 MMBTU/yr	Average	Maximum		Maximum
NO _x	32.95 lb/MMscf	2.2148 lb/hr	9.7007 tpy	33.12 lb/MMscf	2.3799 lb/hr
CO	55.72 lb/MMscf	3.7453 lb/hr	16.4044 tpy	56.00 lb/MMscf	4.0245 lb/hr
SO ₂	14.29 lb/MMscf	0.9602 lb/hr	4.2057 tpy	14.29 lb/MMscf	1.0266 lb/hr
PM _{10/2.5}	6.73 lb/MMscf	0.4525 lb/hr	1.9819 tpy	6.73 lb/MMscf	0.4838 lb/hr
CO _{2-e}	120,799 lb/MMscf	8,119 lb/hr	35,563 tpy	120,803 lb/MMscf	8,681 lb/hr
CO ₂	120,017 lb/MMscf	8,067 lb/hr	35,333 tpy	120,017 lb/MMscf	8,625 lb/hr
N ₂ O	0.23 lb/MMscf	0.0152 lb/hr	0.0666 tpy	0.23 lb/MMscf	0.0163 lb/hr
TOC (Total)	36.55 lb/MMscf	2.4565 lb/hr	10.7597 tpy	36.73 lb/MMscf	2.6397 lb/hr
Methane	28.57 lb/MMscf	1.9206 lb/hr	8.4121 tpy	28.72 lb/MMscf	2.0637 lb/hr
Ethane	1.00 lb/MMscf	0.0670 lb/hr	0.2934 tpy	1.00 lb/MMscf	0.0720 lb/hr
VOC (Total)	6.98 lb/MMscf	0.4690 lb/hr	2.0541 tpy	7.01 lb/MMscf	0.5039 lb/hr
VOC (non-HAP)	3.56 lb/MMscf	0.2396 lb/hr	1.0492 tpy	3.58 lb/MMscf	0.2574 lb/hr
HAP (Total)	3.41 lb/MMscf	0.2294 lb/hr	1.0049 tpy	3.43 lb/MMscf	0.2465 lb/hr
Acetaldehyde	1.33E-01 lb/MMscf	0.0089 lb/hr	0.0391 tpy	1.34E-01 lb/MMscf	0.0096 lb/hr
Acrolein	2.13E-02 lb/MMscf	0.0014 lb/hr	0.0063 tpy	2.14E-02 lb/MMscf	0.0015 lb/hr
Benzene	3.99E-02 lb/MMscf	0.0027 lb/hr	0.0117 tpy	4.01E-02 lb/MMscf	0.0029 lb/hr
Biphenyl					
Butadiene (1,3-)	1.43E-03 lb/MMscf	0.0001 lb/hr	0.0004 tpy	1.44E-03 lb/MMscf	0.0001 lb/hr
Carbon Tetrachloride					
Chlorobenzene					
Chloroform					
Dichloropropene (1,3-)					
Ethylbenzene	1.06E-01 lb/MMscf	0.0071 lb/hr	0.0313 tpy	1.07E-01 lb/MMscf	0.0077 lb/hr
Ethylene Dibromide					
Formaldehyde	2.36E+00 lb/MMscf	0.1586 lb/hr	0.6945 tpy	2.37E+00 lb/MMscf	0.1704 lb/hr
Hexane (n-)					
Methanol					
Methylene Chloride					
Methylnaphthalene (2-)					
Naphthalene	4.32E-03 lb/MMscf	0.0003 lb/hr	0.0013 tpy	4.34E-03 lb/MMscf	0.0003 lb/hr
PAH	7.31E-03 lb/MMscf	0.0005 lb/hr	0.0022 tpy	7.35E-03 lb/MMscf	0.0005 lb/hr
Phenol					
Propylene Oxide	9.64E-02 lb/MMscf	0.0065 lb/hr	0.0284 tpy	9.68E-02 lb/MMscf	0.0070 lb/hr
Styrene					
Tetrachloroethane (1,1,2,2-)					
Toluene	4.32E-01 lb/MMscf	0.0290 lb/hr	0.1272 tpy	4.34E-01 lb/MMscf	0.0312 lb/hr
Trichloroethane (1,1,2-)					
Trimethylpentane (2,2,4-)					
Vinyl Chloride					
Xylenes	2.13E-01 lb/MMscf	0.0143 lb/hr	0.0626 tpy	2.14E-01 lb/MMscf	0.0154 lb/hr
NOTES					
1. Fuel higher heating value selected to correspond to AP-42 emissions factors. 2. Manufacturer provided operating and emissions data (TABLE B-1Cb). 3. The annual emissions are based on a representative annual average ambient temperature (TABLE B-1Ca). Maximum hourly emissions are based on an ambient temperature of 0°F. 4. NO_x, CO, and TOC (Total) emission factor based on Vendor Guarantee. 5. CO₂ and N₂O emission factors based on 40 CFR 98, Subpart C, Table C-1 and 40 CFR 98, Subpart C, Table C-2, respectively. 6. SO₂ emission factor based on AP-42, Section 3.1 (Revised 4/00), Table 3.1-2a using Tariff (5 gr/100 scf). 7. PM_{10/2.5} emission factor based on AP-42, Section 3.1 (Revised 4/00), Table 3.1-2a, not Solar's PIL 171 dated 5/6/2015 (which is 127% greater). 8. Methane, Ethane, and VOC (Total) emissions based on scaling of AP-42, Section 3.1 (Revised 4/00), Table 3.1-2a using Vendor Guarantee. Speciated VOC (non-HAP) emissions based on scaling of AP-42, Section 3.1 (Revised 4/00), Table 3.1-2a using Vendor Guarantee. $EF_{Scaled} = (EF_{AP42})(EF_{TOC}/EF_{TOC-AP42})$					

TABLE B-1Cd Manufacturer's Operating and Emissions Data Startup/Shutdown Step 2: Ignition-Idle PTE - 100% Fuel Utilization at 100% Power Output										
Parameters			Interpolated	Vendor Data						
Ambient	Temperature	°F	49.85	0.01	20.00	40.00	60.00	80.00	100.00	
	Altitude	ft	0	0	0	0	0	0	0	
	Pressure	psia	14.702	14.702	14.702	14.702	14.702	14.702	14.702	
	Relative Humidity	%	60%	60%	60%	60%	60%	60%	60%	
	Specific Humidity	lb _{H2O} /lb _{Dry Air}	0.0040	0.0006	0.0013	0.0028	0.0058	0.0124	0.0262	
Fuel	Lower Heating Value (LHV)	BTU/scf	939.2	939.2	939.2	939.2	939.2	939.2	939.2	
	Higher Heating Value (HHV)	BTU/scf	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	
Turbine	Net Output Power	hp	770	841	816	788	747	688	624	
	Fuel Consumption	scf/hr	15,515	15,534	15,534	15,577	15,385	15,002	14,566	
	Heat Input at LHV	MMBTU/hr	14.57	14.59	14.59	14.63	14.45	14.09	13.68	
	Heat Input at HHV	MMBTU/hr	16.19	16.21	16.21	16.26	16.06	15.66	15.20	
	Heat Rate at LHV	BTU/hp-hr	18,931	17,348	17,880	18,566	19,344	20,480	21,923	
	Heat Rate at HHV	BTU/hp-hr	21,035	19,276	19,867	20,629	21,493	22,755	24,359	
Exhaust	Temperature	°F	604	503	543	584	626	670	715	
	Water Fraction	%, by vol	3.42%	2.56%	2.78%	3.15%	3.79%	4.89%	6.76%	
	Non-Water Fraction	%, by vol	96.58%	97.44%	97.22%	96.85%	96.21%	95.11%	93.24%	
	O ₂ Content	%, by vol (dry)	18.39%	18.63%	18.54%	18.44%	18.33%	18.23%	18.10%	
	Molecular Weight	lb/lb-mol	28.71	28.80	28.78	28.74	28.68	28.56	28.36	
	Flow Rate	lb/hr	80,984	96,424	92,838	83,262	78,987	74,120	68,816	
		scfm (1 atm, 68°F)	18,167	21,528	20,744	18,628	17,723	16,683	15,603	
NO _x Emissions		acfm	36,611	39,250	39,391	36,819	36,439	35,690	34,709	
		lb/lb-mol	46.01	46.01	46.01	46.01	46.01	46.01	46.01	
		ppmvd, 15% O ₂	50	50	50	50	50	50	50	
		ppmvw	20.58	18.74	19.44	20.19	20.95	21.52	22.12	
CO Emissions		lb/hr	2.67	2.89	2.89	2.69	2.66	2.57	2.47	
	lb/lb-mol	28.01	28.01	28.01	28.01	28.01	28.01	28.01		
	ppmvd, 15% O ₂	10,000	10,000	10,000	10,000	10,000	10,000	10,000		
	ppmvw	4,115.40	3,748.96	3,888.80	4,038.15	4,190.84	4,304.13	4,424.95		
	UHC Emissions		lb/hr	325.10	351.57	351.37	327.68	323.29	312.88	300.75
	lb/lb-mol	18.37	18.37	18.37	18.37	18.37	18.37	18.37		
	ppmvd, 15% O ₂	7,700	7,700	7,700	7,700	7,700	7,700	7,700		
	ppmvw	3,168.86	2,886.70	2,994.38	3,109.38	3,226.95	3,314.18	3,407.21		
	lb/hr	164.19	177.56	177.46	165.49	163.28	158.02	151.89		
	NOTES									
	1. Footnotes 1 thru 4 of TABLE B-1Cb.									

TABLE B-1Cd Manufacturer's Operating and Emissions Data Startup/Shutdown Step 2: Ignition-Idle PTE - 100% Fuel Utilization at 100% Power Output										
Vendor Data										
Make:	Solar									
Model:	060-07802S4									
Rate	7,700 hp (ISO)									
Capacity:	6,800 hp (NEMA)									
Load:	10%									
Ambient	Temperature	°F		0.01	20.00	40.00	60.00	80.00	100.00	
	Specific Humidity	lb _{H2O} /lb _{Dry Air}		0.0006	0.0014	0.0031	0.0066	0.0133	0.0253	
Fuel	Lower Heating Value (LHV)	BTU/scf		939.2	939.2	939.2	939.2	939.2	939.2	
Turbine	Net Output Power	hp		841	816	788	747	688	624	
	Heat Input at LHV	MMBTU/hr		14.59	14.59	14.63	14.45	14.09	13.68	
Exhaust	Temperature	°F		503	543	584	626	670	715	
	Water Fraction	%		2.56%	2.78%	3.15%	3.79%	4.89%	6.76%	
	O ₂ Content	% (dry)		18.63%	18.54%	18.44%	18.33%	18.23%	18.10%	
	Molecular Weight	lb/lb-mol		28.80	28.78	28.74	28.68	28.56	28.36	
	Flow Rate	lb/hr		96,424	92,838	83,262	78,987	74,120	68,816	
		acfm		39,250	39,391	36,819	36,439	35,690	34,709	
Estimated Emissions	NO _x	ppmvd, 15% O ₂		50	50	50	50	50	50	
	CO	ppmvd, 15% O ₂		10,000	10,000	10,000	10,000	10,000	10,000	
	UHC	ppmvd, 15% O ₂		7,700	7,700	7,700	7,700	7,700	7,700	

TABLE B-1Ce Manufacturer's Operating and Emissions Data Startup/Shutdown Step 3: Loading/Thermal Stabilization PTE - 100% Fuel Utilization at 100% Power Output									
Parameters			Interpolated	Vendor Data					
Ambient	Temperature	°F	49.85	0.01	20.00	40.00	60.00	80.00	100.00
	Altitude	ft	0	0	0	0	0	0	0
	Pressure	psia	14.702	14.702	14.702	14.702	14.702	14.702	14.702
	Relative Humidity	%	60%	60%	60%	60%	60%	60%	60%
	Specific Humidity	lb _{H2O} /lb _{Dry Air}	0.0040	0.0006	0.0013	0.0028	0.0058	0.0124	0.0262
Fuel	Lower Heating Value (LHV)	BTU/scf	939.2	939.2	939.2	939.2	939.2	939.2	939.2
	Higher Heating Value (HHV)	BTU/scf	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6	1,043.6
Turbine	Net Output Power	hp	2,309	2,524	2,449	2,363	2,242	2,065	1,873
	Fuel Consumption	scf/hr	28,604	29,152	29,035	28,822	28,279	27,310	26,256
	Heat Input at LHV	MMBTU/hr	26.86	27.38	27.27	27.07	26.56	25.65	24.66
	Heat Input at HHV	MMBTU/hr	29.85	30.42	30.30	30.08	29.51	28.50	27.40
	Heat Rate at LHV	BTU/hp-hr	11,636	10,848	11,135	11,456	11,847	12,421	13,166
	Heat Rate at HHV	BTU/hp-hr	12,929	12,053	12,372	12,729	13,163	13,801	14,629
Exhaust	Temperature	°F	710	607	649	691	728	762	794
	Water Fraction	%, by vol	4.32%	3.45%	3.69%	4.06%	4.67%	5.71%	7.48%
	Non-Water Fraction	%, by vol	95.68%	96.55%	96.31%	95.94%	95.33%	94.29%	92.52%
	O ₂ Content	%, by vol (dry)	17.51%	17.77%	17.66%	17.55%	17.47%	17.41%	17.35%
	Molecular Weight	lb/lb-mol	28.66	28.74	28.72	28.69	28.62	28.51	28.32
	Flow Rate	lb/hr	120,841	132,796	128,069	123,398	118,041	112,104	106,173
		scfm (1 atm, 68°F)	27,112	29,693	28,670	27,643	26,512	25,270	24,101
NO _x Emissions		acfm	60,039	59,982	60,194	60,237	59,630	58,463	57,218
		lb/lb-mol	46.01	46.01	46.01	46.01	46.01	46.01	46.01
		ppmvd, 15% O ₂	60	60	60	60	60	60	60
		ppmvw	33.01	30.73	31.73	32.68	33.25	33.46	33.40
CO Emissions		lb/hr	6.40	6.53	6.51	6.47	6.31	6.05	5.76
		lb/lb-mol	28.01	28.01	28.01	28.01	28.01	28.01	28.01
		ppmvd, 15% O ₂	9,000	9,000	9,000	9,000	9,000	9,000	9,000
		ppmvw	4,951.19	4,609.85	4,760.00	4,902.70	4,987.86	5,019.74	5,010.19
UHC Emissions		lb/hr	584.72	596.62	594.54	590.64	576.22	552.86	526.12
		lb/lb-mol	18.37	18.37	18.37	18.37	18.37	18.37	18.37
		ppmvd, 15% O ₂	4,460	4,460	4,460	4,460	4,460	4,460	4,460
		ppmvw	2,453.59	2,284.44	2,358.84	2,429.56	2,471.76	2,487.56	2,482.83
		lb/hr	190.05	193.92	193.25	191.98	187.29	179.70	171.01
NOTES									
1. Footnotes 1 thru 4 of TABLE B-1Cb.									

TABLE B-1Ce Manufacturer's Operating and Emissions Data Startup/Shutdown Step 3: Loading/Thermal Stabilization PTE - 100% Fuel Utilization at 100% Power Output																		
Vendor Data																		
Make:	Solar																	
Model:	060-07802S4																	
Rate	7,700 hp (ISO)																	
Capacity:	6,800 hp (NEMA)																	
Load:	29%																	
Ambient	Temperature	°F		0.01	20.00	40.00	60.00	80.00	100.00									
	Specific Humidity	lb _{H2O} /lb _{Dry Air}		0.0006	0.0014	0.0031	0.0066	0.0133	0.0253									
Fuel	Lower Heating Value (LHV)	BTU/scf		939.2	939.2	939.2	939.2	939.2	939.2									
Turbine	Net Output Power	hp		2,524	2,449	2,363	2,242	2,065	1,873									
	Heat Input at LHV	MMBTU/hr		27.38	27.27	27.07	26.56	25.65	24.66									
Exhaust	Temperature	°F		607	649	691	728	762	794									
	Water Fraction	%		3.45%	3.69%	4.06%	4.67%	5.71%	7.48%									
	O ₂ Content	% (dry)		17.77%	17.66%	17.55%	17.47%	17.41%	17.35%									
	Molecular Weight	lb/lb-mol		28.74	28.72	28.69	28.62	28.51	28.32									
	Flow Rate	lb/hr		132,796	128,069	123,398	118,041	112,104	106,173									
Estimated Emissions		acfm		59,982	60,194	60,237	59,630	58,463	57,218									
NO _x	ppmvd, 15% O ₂	60		60	60	60	60	60										
CO	ppmvd, 15% O ₂	9,000		9,000	9,000	9,000	9,000	9,000										
UHC	ppmvd, 15% O ₂	4,460		4,460	4,460	4,460	4,460	4,460										

TABLE B-1Cf Gas-Fired Turbines Emission Estimates Startup PTE - 100% Fuel Utilization at 100% Power Output					
Make	Solar				
Model	060-07802S4				
Fuel	Natural Gas				
Ambient Temperature	49.85 °F			0.01 °F	
Maximum Event Frequency		2 events/hr	416 events/yr		2 events/hr
Maximum Startup Time		18.00 min/hr	62.40 hrs/yr		18.00 min/hr
Fuel Consumption		7,272 scf/hr	1.51 MMscf/yr		7,384 scf/hr
		Average	Maximum		Maximum
NO _x	0.7738 lbs/event	1.5476 lb/hr	0.1610 tpy	0.7977 lbs/event	1.5955 lb/hr
CO	74.7270 lbs/event	149.4540 lb/hr	15.5432 tpy	77.2408 lbs/event	154.4816 lb/hr
SO ₂	0.0519 lbs/event	0.1039 lb/hr	0.0108 tpy	0.0527 lbs/event	0.1055 lb/hr
PM _{10/2.5}	0.0245 lbs/event	0.0490 lb/hr	0.0051 tpy	0.0249 lbs/event	0.0497 lb/hr
CO _{2-e}	969 lbs/event	1,937 lb/hr	201 tpy	996 lbs/event	1,992 lb/hr
CO ₂	436 lbs/event	873 lb/hr	91 tpy	443 lbs/event	886 lb/hr
N ₂ O	0.0008 lbs/event	0.0016 lb/hr	0.0002 tpy	0.0008 lbs/event	0.0017 lb/hr
TOC (Total)	27.2150 lbs/event	54.4300 lb/hr	5.6607 tpy	28.2703 lbs/event	56.5406 lb/hr
Methane	21.2772 lbs/event	42.5543 lb/hr	4.4257 tpy	22.1022 lbs/event	44.2045 lb/hr
Ethane	0.7422 lbs/event	1.4845 lb/hr	0.1544 tpy	0.7710 lbs/event	1.5420 lb/hr
VOC (Total)	5.1956 lbs/event	10.3912 lb/hr	1.0807 tpy	5.3971 lbs/event	10.7941 lb/hr
VOC (non-HAP)	2.6539 lbs/event	5.3078 lb/hr	0.5520 tpy	2.7568 lbs/event	5.5136 lb/hr
HAP (Total)	2.5417 lbs/event	5.0834 lb/hr	0.5287 tpy	2.6403 lbs/event	5.2805 lb/hr
Acetaldehyde	9.90E-02 lbs/event	0.1979 lb/hr	0.0206 tpy	1.03E-01 lbs/event	0.2056 lb/hr
Acrolein	1.58E-02 lbs/event	0.0317 lb/hr	0.0033 tpy	1.64E-02 lbs/event	0.0329 lb/hr
Benzene	2.97E-02 lbs/event	0.0594 lb/hr	0.0062 tpy	3.08E-02 lbs/event	0.0617 lb/hr
Biphenyl					
Butadiene (1,3-)	1.06E-03 lbs/event	0.0021 lb/hr	0.0002 tpy	1.11E-03 lbs/event	0.0022 lb/hr
Carbon Tetrachloride					
Chlorobenzene					
Chloroform					
Dichloropropene (1,3-)					
Ethylbenzene	7.92E-02 lbs/event	0.1583 lb/hr	0.0165 tpy	8.22E-02 lbs/event	0.1645 lb/hr
Ethylene Dibromide					
Formaldehyde	1.76E+00 lbs/event	3.5132 lb/hr	0.3654 tpy	1.82E+00 lbs/event	3.6494 lb/hr
Hexane (n-)					
Methanol					
Methylene Chloride					
Methylnaphthalene (2-)					
Naphthalene	3.22E-03 lbs/event	0.0064 lb/hr	0.0007 tpy	3.34E-03 lbs/event	0.0067 lb/hr
PAH	5.44E-03 lbs/event	0.0109 lb/hr	0.0011 tpy	5.65E-03 lbs/event	0.0113 lb/hr
Phenol					
Propylene Oxide	7.17E-02 lbs/event	0.1435 lb/hr	0.0149 tpy	7.45E-02 lbs/event	0.1491 lb/hr
Styrene					
Tetrachloroethane (1,1,2,2-)					
Toluene	3.22E-01 lbs/event	0.6433 lb/hr	0.0669 tpy	3.34E-01 lbs/event	0.6682 lb/hr
Trichloroethane (1,1,2-)					
Trimethylpentane (2,2,4-)					
Vinyl Chloride					
Xylenes	1.58E-01 lbs/event	0.3167 lb/hr	0.0329 tpy	1.64E-01 lbs/event	0.3290 lb/hr
NOTES					
1. Emissions of NO _x , CO, and UHC are estimated using information provided in TABLE B-1Cd and TABLE B-1Ce.					
		49.85 °F		0.01 °F	
		Step 2	Step 3	Step 2	Step 3
Duration		3.00 min/event	6.00 min/event	3.00 min/event	6.00 min/event
NO _x		0.1335 lb/event	0.6403 lb/event	0.1444 lb/event	0.6534 lb/event
CO		16.2552 lb/event	58.4718 lb/event	17.5787 lb/event	59.6621 lb/event
UHC		8.2096 lb/event	19.0054 lb/event	8.8780 lb/event	19.3923 lb/event
Fuel		776 scf/event	2,860 scf/event	777 scf/event	2,915 scf/event
2. Footnotes 4 thru 8 of TABLE B-1Cc.					
3. The frequency of startup events was provided by Technical Services.					

TABLE B-1Cg Gas-Fired Turbines Emission Estimates Shutdown <i>PTE - 100% Fuel Utilization at 100% Power Output</i>					
Make	Solar				
Model	060-07802S4				
Fuel	Natural Gas				
Ambient Temperature	49.85 °F			0.01 °F	
Maximum Event Frequency		2 events/hr	416 events/yr		2 events/hr
Maximum Startup Time		17.00 min/hr	58.93 hrs/yr		17.00 min/hr
Fuel Consumption		8,104 scf/hr	1.69 MMscf/yr		8,260 scf/hr
		Average	Maximum		Maximum
NO _x	0.9071 lbs/event	1.8142 lb/hr	0.1887 tpy	0.9256 lbs/event	1.8512 lb/hr
CO	82.8350 lbs/event	165.6700 lb/hr	17.2297 tpy	84.5213 lbs/event	169.0426 lb/hr
SO ₂	0.0579 lbs/event	0.1158 lb/hr	0.0120 tpy	0.0590 lbs/event	0.1180 lb/hr
PM _{10/2.5}	0.0273 lbs/event	0.0546 lb/hr	0.0057 tpy	0.0278 lbs/event	0.0556 lb/hr
CO _{2-e}	1,013 lbs/event	2,026 lb/hr	211 tpy	1,033 lbs/event	2,066 lb/hr
CO ₂	486 lbs/event	973 lb/hr	101 tpy	496 lbs/event	991 lb/hr
N ₂ O	0.0009 lbs/event	0.0018 lb/hr	0.0002 tpy	0.0009 lbs/event	0.0019 lb/hr
TOC (Total)	26.9243 lbs/event	53.8486 lb/hr	5.6003 tpy	27.4724 lbs/event	54.9448 lb/hr
Methane	21.0499 lbs/event	42.0998 lb/hr	4.3784 tpy	21.4784 lbs/event	42.9568 lb/hr
Ethane	0.7343 lbs/event	1.4686 lb/hr	0.1527 tpy	0.7492 lbs/event	1.4985 lb/hr
VOC (Total)	5.1401 lbs/event	10.2802 lb/hr	1.0691 tpy	5.2447 lbs/event	10.4895 lb/hr
VOC (non-HAP)	2.6255 lbs/event	5.2511 lb/hr	0.5461 tpy	2.6790 lbs/event	5.3580 lb/hr
HAP (Total)	2.5146 lbs/event	5.0291 lb/hr	0.5230 tpy	2.5657 lbs/event	5.1315 lb/hr
Acetaldehyde	9.79E-02 lbs/event	0.1958 lb/hr	0.0204 tpy	9.99E-02 lbs/event	0.1998 lb/hr
Acrolein	1.57E-02 lbs/event	0.0313 lb/hr	0.0033 tpy	1.60E-02 lbs/event	0.0320 lb/hr
Benzene	2.94E-02 lbs/event	0.0587 lb/hr	0.0061 tpy	3.00E-02 lbs/event	0.0599 lb/hr
Biphenyl					
Butadiene (1,3-)	1.05E-03 lbs/event	0.0021 lb/hr	0.0002 tpy	1.07E-03 lbs/event	0.0021 lb/hr
Carbon Tetrachloride					
Chlorobenzene					
Chloroform					
Dichloropropene (1,3-)					
Ethylbenzene	7.83E-02 lbs/event	0.1567 lb/hr	0.0163 tpy	7.99E-02 lbs/event	0.1598 lb/hr
Ethylene Dibromide					
Formaldehyde	1.74E+00 lbs/event	3.4757 lb/hr	0.3615 tpy	1.77E+00 lbs/event	3.5464 lb/hr
Hexane (n-)					
Methanol					
Methylene Chloride					
Methylnaphthalene (2-)					
Naphthalene	3.18E-03 lbs/event	0.0064 lb/hr	0.0007 tpy	3.25E-03 lbs/event	0.0065 lb/hr
PAH	5.38E-03 lbs/event	0.0108 lb/hr	0.0011 tpy	5.49E-03 lbs/event	0.0110 lb/hr
Phenol					
Propylene Oxide	7.10E-02 lbs/event	0.1420 lb/hr	0.0148 tpy	7.24E-02 lbs/event	0.1449 lb/hr
Styrene					
Tetrachloroethane (1,1,2,2-)					
Toluene	3.18E-01 lbs/event	0.6364 lb/hr	0.0662 tpy	3.25E-01 lbs/event	0.6493 lb/hr
Trichloroethane (1,1,2-)					
Trimethylpentane (2,2,4-)					
Vinyl Chloride					
Xylenes	1.57E-01 lbs/event	0.3133 lb/hr	0.0326 tpy	1.60E-01 lbs/event	0.3197 lb/hr
NOTES					
1. Emissions of NO _x , CO, and UHC are estimated using information provided in TABLE B-1Cd and TABLE B-1Ce.					
		49.85 °F		0.01 °F	
		Step 2	Step 3	Step 2	Step 3
Duration		0.00 min/event	8.50 min/event	0.00 min/event	8.50 min/event
NO _x		0.0000 lb/event	0.9071 lb/event	0.0000 lb/event	0.9256 lb/event
CO		0.0000 lb/event	82.8350 lb/event	0.0000 lb/event	84.5213 lb/event
UHC		0.0000 lb/event	26.9243 lb/event	0.0000 lb/event	27.4724 lb/event
Fuel		0 scf/event	4,052 scf/event	0 scf/event	4,130 scf/event
2. Footnotes 4 thru 8 of TABLE B-1Cc.					
3. The frequency of startup events was provided by Technical Services.					

TABLE B-1Ch Gas-Fired Turbines Emission Estimates Low Temperatures <i>PTE - 100% Fuel Utilization at 100% Power Output</i>						
Make	Solar					
Model	060-07802S4					
Normal Operating Load	100%					
Fuel	Natural Gas					
Fuel Higher Heating Value (HHV)	1,020 BTU/scf			1,020 BTU/scf		
Ambient Temperature	-20.00 °F			-20.00 °F		
Power Output	8,664 bhp (mech.)			8,664 bhp (mech.)		
	6,461 kW (elec.)			6,461 kW (elec.)		
Heat Rate at HHV	8,646 BTU/hp-hr			8,646 BTU/hp-hr		
Operating Hours	16 hrs/yr			0 hrs/yr		
Fuel Consumption	73,444 scfh			73,444 scfh		
	1.175 MMscf/yr			0.000 MMscf/yr		
Heat Input at HHV	74.91 MMBTU/hr	0°F ≥ T > -20°F		74.91 MMBTU/hr	T ≤ -20°F	
	1,199 MMBTU/yr	Hourly	Annual	0 MMBTU/yr	Hourly	Annual
NO _x	154.71 lb/MMscf	11.3622 lb/hr	0.0909 tpy	442.02 lb/MMscf	32.4635 lb/hr	0.0000 tpy
CO	224.24 lb/MMscf	16.4693 lb/hr	0.1318 tpy	336.37 lb/MMscf	24.7040 lb/hr	0.0000 tpy
SO ₂	14.29 lb/MMscf	1.0492 lb/hr	0.0084 tpy	14.29 lb/MMscf	1.0492 lb/hr	0.0000 tpy
PM _{10/2.5}	6.73 lb/MMscf	0.4944 lb/hr	0.0040 tpy	6.73 lb/MMscf	0.4944 lb/hr	0.0000 tpy
CO _{2-e}	121,522 lb/MMscf	8,925 lb/hr	71 tpy	122,241 lb/MMscf	8,978 lb/hr	0 tpy
CO ₂	120,017 lb/MMscf	8,815 lb/hr	71 tpy	120,017 lb/MMscf	8,815 lb/hr	0 tpy
N ₂ O	0.23 lb/MMscf	0.0166 lb/hr	0.0001 tpy	0.23 lb/MMscf	0.0166 lb/hr	0.0000 tpy
TOC (Total)	73.54 lb/MMscf	5.4011 lb/hr	0.0432 tpy	110.31 lb/MMscf	8.1017 lb/hr	0.0000 tpy
Methane	57.50 lb/MMscf	4.2227 lb/hr	0.0338 tpy	86.24 lb/MMscf	6.3340 lb/hr	0.0000 tpy
Ethane	2.01 lb/MMscf	0.1473 lb/hr	0.0012 tpy	3.01 lb/MMscf	0.2210 lb/hr	0.0000 tpy
VOC (Total)	14.04 lb/MMscf	1.0311 lb/hr	0.0082 tpy	21.06 lb/MMscf	1.5467 lb/hr	0.0000 tpy
VOC (non-HAP)	7.17 lb/MMscf	0.5267 lb/hr	0.0042 tpy	10.76 lb/MMscf	0.7900 lb/hr	0.0000 tpy
HAP (Total)	6.87 lb/MMscf	0.5044 lb/hr	0.0040 tpy	10.30 lb/MMscf	0.7566 lb/hr	0.0000 tpy
Acetaldehyde	2.67E-01 lb/MMscf	0.0196 lb/hr	0.0002 tpy	4.01E-01 lb/MMscf	0.0295 lb/hr	0.0000 tpy
Acrolein	4.28E-02 lb/MMscf	0.0031 lb/hr	0.0000 tpy	6.42E-02 lb/MMscf	0.0047 lb/hr	0.0000 tpy
Benzene	8.02E-02 lb/MMscf	0.0059 lb/hr	0.0000 tpy	1.20E-01 lb/MMscf	0.0088 lb/hr	0.0000 tpy
Biphenyl						
Butadiene (1,3-)	2.87E-03 lb/MMscf	0.0002 lb/hr	0.0000 tpy	4.31E-03 lb/MMscf	0.0003 lb/hr	0.0000 tpy
Carbon Tetrachloride						
Chlorobenzene						
Chloroform						
Dichloropropene (1,3-)						
Ethylbenzene	2.14E-01 lb/MMscf	0.0157 lb/hr	0.0001 tpy	3.21E-01 lb/MMscf	0.0236 lb/hr	0.0000 tpy
Ethylene Dibromide						
Formaldehyde	4.75E+00 lb/MMscf	0.3486 lb/hr	0.0028 tpy	7.12E+00 lb/MMscf	0.5229 lb/hr	0.0000 tpy
Hexane (n-)						
Methanol						
Methylene Chloride						
Methylnaphthalene (2-)						
Naphthalene	8.69E-03 lb/MMscf	0.0006 lb/hr	0.0000 tpy	1.30E-02 lb/MMscf	0.0010 lb/hr	0.0000 tpy
PAH	1.47E-02 lb/MMscf	0.0011 lb/hr	0.0000 tpy	2.21E-02 lb/MMscf	0.0016 lb/hr	0.0000 tpy
Phenol						
Propylene Oxide	1.94E-01 lb/MMscf	0.0142 lb/hr	0.0001 tpy	2.91E-01 lb/MMscf	0.0214 lb/hr	0.0000 tpy
Styrene						
Tetrachloroethane (1,1,2,2-)						
Toluene	8.69E-01 lb/MMscf	0.0638 lb/hr	0.0005 tpy	1.30E+00 lb/MMscf	0.0957 lb/hr	0.0000 tpy
Trichloroethane (1,1,2-)						
Trimethylpentane (2,2,4-)						
Vinyl Chloride						
Xylenes	4.28E-01 lb/MMscf	0.0314 lb/hr	0.0003 tpy	6.42E-01 lb/MMscf	0.0471 lb/hr	0.0000 tpy
NOTES						
1. Fuel higher heating value selected to correspond to AP-42 emissions factors. 2. Operating hours for low ambient temperatures best on best fit of available data (see TABLE B-1Ca). 3. Manufacturer provided data on: power output, heat rate, along with NO _x , CO, and UHC (or TOC) emissions. 4. Footnotes 4 thru 8 of TABLE B-1Cc.						

TABLE B-1Cj Gas-Fired Turbines Maximum Emission Estimates Normal Operations, Startup, Shutdown, and Low Temperature Operations PTE - 100% Fuel Utilization at 100% Power Output																			
Make		Solar																	
Model		060-07802S4																	
Normal Operating Load		100%																	
Operations		Normal			Startup			Shutdown			Startup/Shutdown w/ Normal			Low Temperatures			Combined Operations		
Maximum Annual Combined Event Frequency		8,760 hrs/yr			62 hrs/yr			59 hrs/yr			8,760 hrs/yr			16 hrs/yr			8,760 hrs/yr		
Pollutant	Control Efficiency	Hourly		Maximum Annual	Hourly		Maximum Annual	Hourly		Maximum Annual	Hourly		Maximum Annual	Hourly		Maximum Annual	Hourly		Maximum Annual
		Average	Maximum		Average	Maximum		Average	Maximum		Average	Maximum		Average	Maximum		Average	Maximum	
NO _x		2.2148 lb/hr	2.3799 lb/hr	9.7007 tpy	1.5476 lb/hr	1.5955 lb/hr	0.1610 tpy	1.8142 lb/hr	1.8512 lb/hr	0.1887 tpy	2.2639 lb/hr	4.4382 lb/hr	9.9159 tpy	11.3622 lb/hr	32.4635 lb/hr	0.0909 tpy	2.2806 lb/hr	32.4635 lb/hr	9.9891 tpy
CO	95.00% by weight	0.1873 lb/hr	0.2012 lb/hr	0.8202 tpy	149.4540 lb/hr	154.4816 lb/hr	15.5432 tpy	8.2835 lb/hr	8.4521 lb/hr	0.8615 tpy	3.9300 lb/hr	163.0176 lb/hr	17.2136 tpy	0.8235 lb/hr	1.2352 lb/hr	0.0066 tpy	3.9312 lb/hr	163.0176 lb/hr	17.2186 tpy
SO ₂		0.9602 lb/hr	1.0266 lb/hr	4.2057 tpy	0.1039 lb/hr	0.1055 lb/hr	0.0108 tpy	0.1158 lb/hr	0.1180 lb/hr	0.0120 tpy	0.9602 lb/hr	1.0266 lb/hr	4.2057 tpy	1.0492 lb/hr	1.0492 lb/hr	0.0084 tpy	0.9604 lb/hr	1.0492 lb/hr	4.2064 tpy
PM _{10/2.5}		0.4525 lb/hr	0.4838 lb/hr	1.9819 tpy	0.0490 lb/hr	0.0497 lb/hr	0.0051 tpy	0.0546 lb/hr	0.0556 lb/hr	0.0057 tpy	0.4525 lb/hr	0.4838 lb/hr	1.9819 tpy	0.4944 lb/hr	0.4944 lb/hr	0.0040 tpy	0.4526 lb/hr	0.4944 lb/hr	1.9822 tpy
CO _{2-e}		8,125 lb/hr	8,687 lb/hr	35,588 tpy	1,937 lb/hr	1,992 lb/hr	201 tpy	2,273 lb/hr	2,318 lb/hr	236 tpy	8,125 lb/hr	8,687 lb/hr	35,588 tpy	8,950 lb/hr	9,015 lb/hr	72 tpy	8,127 lb/hr	11,057 lb/hr	35,594 tpy
CO ₂		8,072 lb/hr	8,631 lb/hr	35,357 tpy	873 lb/hr	886 lb/hr	91 tpy	1,220 lb/hr	1,244 lb/hr	127 tpy	8,072 lb/hr	8,631 lb/hr	35,357 tpy	8,839 lb/hr	8,851 lb/hr	71 tpy	8,074 lb/hr	8,851 lb/hr	35,364 tpy
N ₂ O		0.0152 lb/hr	0.0163 lb/hr	0.0666 tpy	0.0016 lb/hr	0.0017 lb/hr	0.0002 tpy	0.0018 lb/hr	0.0019 lb/hr	0.0002 tpy	0.0152 lb/hr	0.0163 lb/hr	0.0666 tpy	0.0166 lb/hr	0.0166 lb/hr	0.0001 tpy	0.0152 lb/hr	0.0166 lb/hr	0.0666 tpy
TOC (Total)	10.91% by weight	2.1886 lb/hr	2.3517 lb/hr	9.5859 tpy	54.4300 lb/hr	56.5406 lb/hr	5.6607 tpy	47.9742 lb/hr	48.9508 lb/hr	4.9893 tpy	4.5898 lb/hr	106.4713 lb/hr	20.1031 tpy	4.8119 lb/hr	7.2179 lb/hr	0.0385 tpy	4.5945 lb/hr	106.4713 lb/hr	20.1241 tpy
Methane	0.00% by weight	1.9206 lb/hr	2.0637 lb/hr	8.4121 tpy	42.5543 lb/hr	44.2045 lb/hr	4.4257 tpy	42.0998 lb/hr	42.9568 lb/hr	4.3784 tpy	3.9040 lb/hr	88.0212 lb/hr	17.0996 tpy	4.2227 lb/hr	6.3340 lb/hr	0.0338 tpy	3.9082 lb/hr	88.0212 lb/hr	17.1180 tpy
Ethane	50.00% by weight	0.0335 lb/hr	0.0360 lb/hr	0.1467 tpy	1.4845 lb/hr	1.5420 lb/hr	0.1544 tpy	0.7343 lb/hr	0.7492 lb/hr	0.0764 tpy	0.0857 lb/hr	2.3063 lb/hr	0.3754 tpy	0.0737 lb/hr	0.1105 lb/hr	0.0006 tpy	0.0858 lb/hr	2.3063 lb/hr	0.3758 tpy
VOC (Total)	50.00% by weight	0.2345 lb/hr	0.2520 lb/hr	1.0271 tpy	10.3912 lb/hr	10.7941 lb/hr	1.0807 tpy	5.1401 lb/hr	5.2447 lb/hr	0.5346 tpy	0.6000 lb/hr	16.1438 lb/hr	2.6281 tpy	0.5156 lb/hr	0.7733 lb/hr	0.0041 tpy	0.6005 lb/hr	16.1438 lb/hr	2.6303 tpy
VOC (non-HAP)	19.10% by weight	0.1938 lb/hr	0.2083 lb/hr	0.8489 tpy	5.3078 lb/hr	5.5136 lb/hr	0.5520 tpy	4.2483 lb/hr	4.3348 lb/hr	0.4418 tpy	0.4180 lb/hr	9.9352 lb/hr	1.8309 tpy	0.4261 lb/hr	0.6392 lb/hr	0.0034 tpy	0.4184 lb/hr	9.9352 lb/hr	1.8328 tpy
HAP (Total)	8.23E-01 by weight	0.0407 lb/hr	0.0437 lb/hr	0.1782 tpy	5.0834 lb/hr	5.2805 lb/hr	0.5287 tpy	0.8918 lb/hr	0.9099 lb/hr	0.0927 tpy	0.1820 lb/hr	6.2087 lb/hr	0.7971 tpy	0.0894 lb/hr	0.1342 lb/hr	0.0007 tpy	0.1821 lb/hr	6.2087 lb/hr	0.7975 tpy
Acetaldehyde	80.00% by weight	1.79E-03 lb/hr	1.92E-03 lb/hr	7.83E-03 tpy	1.98E-01 lb/hr	2.06E-01 lb/hr	2.06E-02 tpy	3.92E-02 lb/hr	4.00E-02 lb/hr	4.07E-03 tpy	7.39E-03 lb/hr	2.46E-01 lb/hr	3.24E-02 tpy	3.93E-03 lb/hr	5.89E-03 lb/hr	3.14E-05 tpy	7.40E-03 lb/hr	2.46E-01 lb/hr	3.24E-02 tpy
Acrolein	50.00% by weight	7.15E-04 lb/hr	7.68E-04 lb/hr	3.13E-03 tpy	3.17E-02 lb/hr	3.29E-02 lb/hr	3.29E-03 tpy	1.57E-02 lb/hr	1.60E-02 lb/hr	1.63E-03 tpy	1.83E-03 lb/hr	4.92E-02 lb/hr	8.01E-03 tpy	1.57E-03 lb/hr	2.36E-03 lb/hr	1.26E-05 tpy	1.83E-03 lb/hr	4.92E-02 lb/hr	8.02E-03 tpy
Benzene	50.00% by weight	1.34E-03 lb/hr	1.44E-03 lb/hr	5.87E-03 tpy	5.94E-02 lb/hr	6.17E-02 lb/hr	6.18E-03 tpy	2.94E-02 lb/hr	3.00E-02 lb/hr	3.05E-03 tpy	3.43E-03 lb/hr	9.23E-02 lb/hr	1.50E-02 tpy	2.95E-03 lb/hr	4.42E-03 lb/hr	2.36E-05 tpy	3.43E-03 lb/hr	9.23E-02 lb/hr	1.50E-02 tpy
Biphenyl	0.00% by weight																		
Butadiene (1,3-)	50.00% by weight	4.80E-05 lb/hr	5.16E-05 lb/hr	2.10E-04 tpy	2.13E-03 lb/hr	2.21E-03 lb/hr	2.21E-04 tpy	1.05E-03 lb/hr	1.07E-03 lb/hr	1.09E-04 tpy	1.23E-04 lb/hr	3.31E-03 lb/hr	5.38E-04 tpy	1.06E-04 lb/hr	1.58E-04 lb/hr	8.45E-07 tpy	1.23E-04 lb/hr	3.31E-03 lb/hr	5.39E-04 tpy
Carbon Tetrachloride	50.00% by weight																		
Chlorobenzene	50.00% by weight																		
Chloroform	50.00% by weight																		
Dichloropropene (1,3-)	50.00% by weight																		
Ethylbenzene	50.00% by weight	3.57E-03 lb/hr	3.84E-03 lb/hr	1.57E-02 tpy	1.58E-01 lb/hr	1.64E-01 lb/hr	1.65E-02 tpy	7.83E-02 lb/hr	7.99E-02 lb/hr	8.15E-03 tpy	9.14E-03 lb/hr	2.46E-01 lb/hr	4.00E-02 tpy	7.86E-03 lb/hr	1.18E-02 lb/hr	6.28E-05 tpy	9.15E-03 lb/hr	2.46E-01 lb/hr	4.01E-02 tpy
Ethylene Dibromide	50.00% by weight																		
Formaldehyde	95.00% by weight	7.93E-03 lb/hr	8.52E-03 lb/hr	3.47E-02 tpy	3.51E+00 lb/hr	3.65E+00 lb/hr	3.65E-01 tpy	1.74E-01 lb/hr	1.77E-01 lb/hr	1.81E-02 tpy	9.54E-02 lb/hr	3.83E+00 lb/hr	4.18E-01 tpy	1.74E-02 lb/hr	2.61E-02 lb/hr	1.39E-04 tpy	9.54E-02 lb/hr	3.83E+00 lb/hr	4.18E-01 tpy
Hexane (n-)	50.00% by weight																		
Methanol	95.00% by weight																		
Methylene Chloride	50.00% by weight																		
Methylnaphthalene (2-)	50.00% by weight																		
Naphthalene	50.00% by weight	1.45E-04 lb/hr	1.56E-04 lb/hr	6.36E-04 tpy	6.43E-03 lb/hr	6.68E-03 lb/hr	6.69E-04 tpy	3.18E-03 lb/hr	3.25E-03 lb/hr	3.31E-04 tpy	3.71E-04 lb/hr	9.99E-03 lb/hr	1.63E-03 tpy	3.19E-04 lb/hr	4.79E-04 lb/hr	2.55E-06 tpy	3.72E-04 lb/hr	9.99E-03 lb/hr	1.63E-03 tpy
PAH	50.00% by weight	2.46E-04 lb/hr	2.64E-04 lb/hr	1.08E-03 tpy	1.09E-02 lb/hr	1.13E-02 lb/hr	1.13E-03 tpy	5.38E-03 lb/hr	5.49E-03 lb/hr	5.60E-04 tpy	6.29E-04 lb/hr	1.69E-02 lb/hr	2.75E-03 tpy	5.40E-04 lb/hr	8.10E-04 lb/hr	4.32E-06 tpy	6.29E-04 lb/hr	1.69E-02 lb/hr	2.76E-03 tpy
Phenol	50.00% by weight																		
Propylene Oxide	50.00% by weight	3.24E-03 lb/hr	3.48E-03 lb/hr	1.42E-02 tpy	1.43E-01 lb/hr	1.49E-01 lb/hr	1.49E-02 tpy	7.10E-02 lb/hr	7.24E-02 lb/hr	7.38E-03 tpy	8.29E-03 lb/hr	2.23E-01 lb/hr	3.63E-02 tpy	7.12E-03 lb/hr	1.07E-02 lb/hr	5.70E-05 tpy	8.29E-03 lb/hr	2.23E-01 lb/hr	3.63E-02 tpy
Styrene	0.00% by weight																		
Tetrachloroethane (1,1,2,2-)	50.00% by weight																		
Toluene	50.00% by weight	1.45E-02 lb/hr	1.56E-02 lb/hr	6.36E-02 tpy	6.43E-01 lb/hr	6.68E-01 lb/hr	6.69E-02 tpy	3.18E-01 lb/hr	3.25E-01 lb/hr	3.31E-02 tpy	3.71E-02 lb/hr	9.99E-01 lb/hr	1.63E-01 tpy	3.19E-02 lb/hr	4.79E-02 lb/hr	2.55E-04 tpy	3.72E-02 lb/hr	9.99E-01 lb/hr	1.63E-01 tpy
Trichloroethane (1,1,2-)	50.00% by weight																		
Trimethylpentane (2,2,4-)	50.00% by weight																		
Vinyl Chloride	0.00% by weight																		
Xylenes	50.00% by weight	7.15E-03 lb/hr	7.68E-03 lb/hr	3.13E-02 tpy	3.17E-01 lb/hr	3.29E-01 lb/hr	3.29E-02 tpy	1.57E-01 lb/hr	1.60E-01 lb/hr	1.63E-02 tpy	1.83E-02 lb/hr	4.92E-01 lb/hr	8.01E-02 tpy	1.57E-02 lb/hr	2.36E-02 lb/hr	1.26E-04 tpy	1.83E-02 lb/hr	4.92E-01 lb/hr	8.02E-02 tpy
NOTES																			
1. See TABLE B-1Ci. 2. It's assumed that oxidation catalyst will be ineffective during startup events. 3. CO2 = CO2_{uncontrolled} + CE_{CO-control efficiency} * CO_{uncontrolled} * (MW_{CO2}/MW_{CO}) = CO2_{uncontrolled} + CE_{CO-control efficiency} * CO_{uncontrolled} * (44.0095/28.0101).																			

TABLE C-1A
4-Stroke Lean-Burn Reciprocating Engines
Hourly and Annual Emission Estimates
Uncontrolled

Type	4slb					
Service	Emergency					
JJJJ Relevant Date	Remanufactured or Modified: On or After 06/12/2006					
ZZZZ Status	New RICE at Major HAP Source					
Make	Waukesha					
Model	VGF24GL					
Fuel	Natural Gas					
Fuel Higher Heating Value (HHV)	1,020 BTU/scf				1,020 BTU/scf	
Ambient Temperature	80 °F				80 °F	
Power Output	585 bhp (mech.)				585 bhp (mech.)	
	405 kW (elec.)				405 kW (elec.)	
Heat Rate at HHV	7,911 BTU/hp-hr				7,911 BTU/hp-hr	
Operating Hours	300 hrs/yr					
Fuel Consumption	4,537 scfh				4,537 scfh	
	1.361 MMscf/yr					
Heat Input at HHV	4.63 MMBTU/hr				4.63 MMBTU/hr	
	1,388 MMBTU/yr	Uncontrolled		Uncontrolled		Uncontrolled
Pollutant	Control Efficiency	Uncontrolled	Average Hourly	Maximum Annual	Uncontrolled	Maximum Hourly
NO _x		594.07 lb/MMscf	2.6954 lb/hr	0.4043 tpy	594.07 lb/MMscf	2.6954 lb/hr
CO		497.43 lb/MMscf	2.2569 lb/hr	0.3385 tpy	497.43 lb/MMscf	2.2569 lb/hr
SO ₂		14.29 lb/MMscf	0.0648 lb/hr	0.0097 tpy	14.29 lb/MMscf	0.0648 lb/hr
PM _{10/2.5}		10.19 lb/MMscf	0.0462 lb/hr	0.0069 tpy	10.19 lb/MMscf	0.0462 lb/hr
CO _{2-e}		198,413 lb/MMscf	900 lb/hr	135 tpy	198,413 lb/MMscf	900 lb/hr
CO ₂		120,017 lb/MMscf	545 lb/hr	82 tpy	120,017 lb/MMscf	545 lb/hr
N ₂ O		0.23 lb/MMscf	0.0010 lb/hr	0.0002 tpy	0.23 lb/MMscf	0.0010 lb/hr
TOC (Total)		3,684.56 lb/MMscf	16.7178 lb/hr	2.5077 tpy	3,684.56 lb/MMscf	16.7178 lb/hr
Methane		3,133.13 lb/MMscf	14.2158 lb/hr	2.1324 tpy	3,133.13 lb/MMscf	14.2158 lb/hr
Ethane		252.15 lb/MMscf	1.1441 lb/hr	0.1716 tpy	252.15 lb/MMscf	1.1441 lb/hr
VOC (Total)		299.28 lb/MMscf	1.3579 lb/hr	0.2037 tpy	299.28 lb/MMscf	1.3579 lb/hr
VOC (non-HAP)		118.32 lb/MMscf	0.5369 lb/hr	0.0805 tpy	118.32 lb/MMscf	0.5369 lb/hr
HAP (Total)		180.96 lb/MMscf	0.8211 lb/hr	0.1232 tpy	180.96 lb/MMscf	0.8211 lb/hr
Acetaldehyde		2.10E+01 lb/MMscf	9.51E-02 lb/hr	1.43E-02 tpy	2.10E+01 lb/MMscf	9.51E-02 lb/hr
Acrolein		1.29E+01 lb/MMscf	5.85E-02 lb/hr	8.77E-03 tpy	1.29E+01 lb/MMscf	5.85E-02 lb/hr
Benzene		1.10E+00 lb/MMscf	5.00E-03 lb/hr	7.51E-04 tpy	1.10E+00 lb/MMscf	5.00E-03 lb/hr
Biphenyl		5.31E-01 lb/MMscf	2.41E-03 lb/hr	3.62E-04 tpy	5.31E-01 lb/MMscf	2.41E-03 lb/hr
Butadiene (1,3-)		6.69E-01 lb/MMscf	3.04E-03 lb/hr	4.55E-04 tpy	6.69E-01 lb/MMscf	3.04E-03 lb/hr
Carbon Tetrachloride		9.20E-02 lb/MMscf	4.17E-04 lb/hr	6.26E-05 tpy	9.20E-02 lb/MMscf	4.17E-04 lb/hr
Chlorobenzene		7.62E-02 lb/MMscf	3.46E-04 lb/hr	5.19E-05 tpy	7.62E-02 lb/MMscf	3.46E-04 lb/hr
Chloroform		7.14E-02 lb/MMscf	3.24E-04 lb/hr	4.86E-05 tpy	7.14E-02 lb/MMscf	3.24E-04 lb/hr
Dichloropropene (1,3-)		6.62E-02 lb/MMscf	3.00E-04 lb/hr	4.50E-05 tpy	6.62E-02 lb/MMscf	3.00E-04 lb/hr
Ethylbenzene		9.95E-02 lb/MMscf	4.51E-04 lb/hr	6.77E-05 tpy	9.95E-02 lb/MMscf	4.51E-04 lb/hr
Ethylene Dibromide		1.11E-01 lb/MMscf	5.04E-04 lb/hr	7.56E-05 tpy	1.11E-01 lb/MMscf	5.04E-04 lb/hr
Formaldehyde		1.32E+02 lb/MMscf	6.00E-01 lb/hr	9.01E-02 tpy	1.32E+02 lb/MMscf	6.00E-01 lb/hr
Hexane (n-)		2.78E+00 lb/MMscf	1.26E-02 lb/hr	1.89E-03 tpy	2.78E+00 lb/MMscf	1.26E-02 lb/hr
Methanol		6.27E+00 lb/MMscf	2.84E-02 lb/hr	4.26E-03 tpy	6.27E+00 lb/MMscf	2.84E-02 lb/hr
Methylene Chloride		5.01E-02 lb/MMscf	2.27E-04 lb/hr	3.41E-05 tpy	5.01E-02 lb/MMscf	2.27E-04 lb/hr
Methylnaphthalene (2-)		8.32E-02 lb/MMscf	3.78E-04 lb/hr	5.66E-05 tpy	8.32E-02 lb/MMscf	3.78E-04 lb/hr
Naphthalene		1.86E-01 lb/MMscf	8.46E-04 lb/hr	1.27E-04 tpy	1.86E-01 lb/MMscf	8.46E-04 lb/hr
PAH		6.74E-02 lb/MMscf	3.06E-04 lb/hr	4.59E-05 tpy	6.74E-02 lb/MMscf	3.06E-04 lb/hr
Phenol		6.02E-02 lb/MMscf	2.73E-04 lb/hr	4.09E-05 tpy	6.02E-02 lb/MMscf	2.73E-04 lb/hr
Propylene Oxide						
Styrene		5.92E-02 lb/MMscf	2.68E-04 lb/hr	4.03E-05 tpy	5.92E-02 lb/MMscf	2.68E-04 lb/hr
Tetrachloroethane (1,1,2,2-)		1.06E-01 lb/MMscf	4.83E-04 lb/hr	7.25E-05 tpy	1.06E-01 lb/MMscf	4.83E-04 lb/hr
Toluene		1.02E+00 lb/MMscf	4.64E-03 lb/hr	6.96E-04 tpy	1.02E+00 lb/MMscf	4.64E-03 lb/hr
Trichloroethane (1,1,2-)		7.97E-02 lb/MMscf	3.62E-04 lb/hr	5.42E-05 tpy	7.97E-02 lb/MMscf	3.62E-04 lb/hr
Trimethylpentane (2,2,4-)		6.27E-01 lb/MMscf	2.84E-03 lb/hr	4.26E-04 tpy	6.27E-01 lb/MMscf	2.84E-03 lb/hr
Vinyl Chloride		3.73E-02 lb/MMscf	1.69E-04 lb/hr	2.54E-05 tpy	3.73E-02 lb/MMscf	1.69E-04 lb/hr
Xylenes		4.61E-01 lb/MMscf	2.09E-03 lb/hr	3.14E-04 tpy	4.61E-01 lb/MMscf	2.09E-03 lb/hr

NOTES

1. Fuel higher heating value selected to correspond to AP-42 emissions factors.
2. Maximum hourly emissions based on 100% of rated capacity.
3. Vendor provided data on power output and heat rate.
4. SO₂ emission factor based on AP-42, Section 3.2 (Revised 7/00), Table 3.2-1 using Tariff (5 gr/100 scf).
5. PM_{10/2.5} emission factor based on AP-42, Section 3.2 (Revised 7/00), Table 3.2-2.
6. CO₂ and N₂O emission factors based on 40 CFR 98, Subpart C, Table C-1 and 40 CFR 98, Subpart C, Table C-2, respectively.
7. NO_x, CO and TOC (Total) emission factors based on Vendor Data.
8. TOC (Total) and TOC specie emissions are estimated based on scaling of AP-42 using vendor nmHC data.
Emission factors based on: $EF_i = [EF_{(nmHC)}] / [(EF_{nmHC-AP42})] (EF_{i-AP42})$

TABLE D-1A
Natural Gas Combustion
Hourly and Annual Emission Estimates
Uncontrolled

Application		Boiler				
Combustion Process		Low NOx Burners				
Add-on Controls		None				
Package (Make: Model)		Cleaver-Brooks: CB-FLEX 350				
Burner (Make: Model)		Unknown: Unknown				
Fuel		Natural Gas				
Fuel Higher Heating Value (HHV)		1,020 BTU/scf	Uncontrolled		1,020 BTU/scf	Uncontrolled
Heat Output at HHV		2,800 MMBTU/hr			2,940 MMBTU/hr	
Thermal Efficiency		80%			80%	
Operating Hours		8,760 hrs/yr				
Fuel Consumption		3,431 scfh			3,603 scfh	
		30.059 MMscf/yr				
Heat Input at HHV		3,500 MMBTU/hr			3,675 MMBTU/hr	
		30,660 MMBTU/yr				
Pollutant	Control Efficiency	Uncontrolled	Average Hourly	Maximum Annual	Uncontrolled	Maximum Hourly
NO _x		36.91 lb/MMscf	0.1267 lb/hr	0.5548 tpy	36.91 lb/MMscf	0.1330 lb/hr
CO		75.00 lb/MMscf	0.2574 lb/hr	1.1272 tpy	75.00 lb/MMscf	0.2702 lb/hr
SO ₂		14.29 lb/MMscf	0.0490 lb/hr	0.2147 tpy	14.29 lb/MMscf	0.0515 lb/hr
PM _{10/2.5}		7.60 lb/MMscf	0.0261 lb/hr	0.1142 tpy	7.60 lb/MMscf	0.0274 lb/hr
CO _{2,e}		120,103.00 lb/MMscf	412.1181 lb/hr	1,805.0775 tpy	120,103.00 lb/MMscf	432.7241 lb/hr
CO ₂		120,017.45 lb/MMscf	411.8246 lb/hr	1,803.7917 tpy	120,017.45 lb/MMscf	432.4158 lb/hr
N ₂ O		0.23 lb/MMscf	0.0008 lb/hr	0.0034 tpy	0.23 lb/MMscf	0.0008 lb/hr
TOC (Total)		4.29 lb/MMscf	0.0147 lb/hr	0.0644 tpy	4.29 lb/MMscf	0.0154 lb/hr
Methane		0.73 lb/MMscf	0.0025 lb/hr	0.0109 tpy	0.73 lb/MMscf	0.0026 lb/hr
Ethane		0.98 lb/MMscf	0.0034 lb/hr	0.0147 tpy	0.98 lb/MMscf	0.0035 lb/hr
VOC (Total)		2.58 lb/MMscf	0.0089 lb/hr	0.0388 tpy	2.58 lb/MMscf	0.0093 lb/hr
VOC (non-HAP)		1.99 lb/MMscf	0.0068 lb/hr	0.0299 tpy	1.99 lb/MMscf	0.0072 lb/hr
HAP (Total)		0.59 lb/MMscf	0.0020 lb/hr	0.0089 tpy	0.59 lb/MMscf	0.0021 lb/hr
Acetaldehyde						
Acrolein						
Benzene		6.63E-04 lb/MMscf	2.27E-06 lb/hr	9.96E-06 tpy	6.63E-04 lb/MMscf	2.39E-06 lb/hr
Biphenyl						
Butadiene (1,3-)						
Carbon Tetrachloride						
Chlorobenzene						
Chloroform						
Dichloropropene (1,3-)						
Ethylbenzene						
Ethylene Dibromide						
Formaldehyde		2.37E-02 lb/MMscf	8.12E-05 lb/hr	3.56E-04 tpy	2.37E-02 lb/MMscf	8.53E-05 lb/hr
Hexane (n-)		5.68E-01 lb/MMscf	1.95E-03 lb/hr	8.54E-03 tpy	5.68E-01 lb/MMscf	2.05E-03 lb/hr
Methanol						
Methylene Chloride						
Methylnaphthalene (2-)		7.57E-06 lb/MMscf	2.60E-08 lb/hr	1.14E-07 tpy	7.57E-06 lb/MMscf	2.73E-08 lb/hr
Naphthalene		1.92E-04 lb/MMscf	6.60E-07 lb/hr	2.89E-06 tpy	1.92E-04 lb/MMscf	6.93E-07 lb/hr
PAH						
Phenol						
Propylene Oxide						
Styrene						
Tetrachloroethane (1,1,2,2-)						
Toluene		1.07E-03 lb/MMscf	3.68E-06 lb/hr	1.61E-05 tpy	1.07E-03 lb/MMscf	3.87E-06 lb/hr
Trichloroethane (1,1,2-)						
Trimethylpentane (2,2,4-)						
Vinyl Chloride						
Xylenes						

NOTES

- Fuel higher heating value selected to correspond to AP-42 emissions factors.
- Maximum hourly emissions based on 105% of rated capacity.
- Vendor provided data on: heat output and heat input.
- CO₂ and N₂O emission factors based on 40 CFR 98, Subpart C, Table C-1 and 40 CFR 98, Subpart C, Table C-2, respectively.
- NO_x, CO and TOC (Total) emission factors based on vendor data.
- SO₂ emission factors based on AP-42, Section 1.4 (Revised 3/98), Table 1.4-2 using Tariff (5 gr/100 scf).
- PM_{10/2.5} emission factors based on AP-42, Section 1.4 (Revised 3/98), Table 1.4-2.
- Remaining TOC specie emission factors based on scaling of AP-42, Section 1.4 (Revised 3/98), Table 1.4-3 using vendor HC data.
 $EF_i = (EF_{HC}/EF_{TOC-AP42})(EF_{i-AP42})$

TABLE D-1B
Natural Gas Combustion
Hourly and Annual Emission Estimates
Uncontrolled

Application		Process Heater				
Combustion Process		Conventional				
Add-on Controls		None				
Package (Make: Model)		Exterran: N/A				
Burner (Make: Model)		Unknown: Unknown				
Fuel		Natural Gas				
Fuel Higher Heating Value (HHV)		1,020 BTU/scf	Uncontrolled		1,020 BTU/scf	Uncontrolled
Heat Output at HHV		1,000 MMBTU/hr			1,050 MMBTU/hr	
Thermal Efficiency		65%			65%	
Operating Hours		8,760 hrs/yr				
Fuel Consumption		1,508 scfh			1,584 scfh	
		13,213 MMscf/yr				
Heat Input at HHV		1,538 MMBTU/hr			1,615 MMBTU/hr	
		13,477 MMBTU/yr				
Pollutant	Control Efficiency	Uncontrolled	Average Hourly	Maximum Annual	Uncontrolled	Maximum Hourly
NO _x		98.43 lb/MMscf	0.1485 lb/hr	0.6503 tpy	98.43 lb/MMscf	0.1559 lb/hr
CO		150.00 lb/MMscf	0.2262 lb/hr	0.9910 tpy	150.00 lb/MMscf	0.2376 lb/hr
SO ₂		14.29 lb/MMscf	0.0215 lb/hr	0.0944 tpy	14.29 lb/MMscf	0.0226 lb/hr
PM _{10/2.5}		7.60 lb/MMscf	0.0115 lb/hr	0.0502 tpy	7.60 lb/MMscf	0.0120 lb/hr
CO _{2,e}		120,338.86 lb/MMscf	181.5066 lb/hr	794.9988 tpy	120,338.86 lb/MMscf	190.5819 lb/hr
CO ₂		120,017.45 lb/MMscf	181.0218 lb/hr	792.8755 tpy	120,017.45 lb/MMscf	190.0729 lb/hr
N ₂ O		0.23 lb/MMscf	0.0003 lb/hr	0.0015 tpy	0.23 lb/MMscf	0.0004 lb/hr
TOC (Total)		60.00 lb/MMscf	0.0905 lb/hr	0.3964 tpy	60.00 lb/MMscf	0.0950 lb/hr
Methane		10.16 lb/MMscf	0.0153 lb/hr	0.0671 tpy	10.16 lb/MMscf	0.0161 lb/hr
Ethane		13.69 lb/MMscf	0.0207 lb/hr	0.0905 tpy	13.69 lb/MMscf	0.0217 lb/hr
VOC (Total)		36.15 lb/MMscf	0.0545 lb/hr	0.2388 tpy	36.15 lb/MMscf	0.0572 lb/hr
VOC (non-HAP)		27.83 lb/MMscf	0.0420 lb/hr	0.1839 tpy	27.83 lb/MMscf	0.0441 lb/hr
HAP (Total)		8.32 lb/MMscf	0.0125 lb/hr	0.0549 tpy	8.32 lb/MMscf	0.0132 lb/hr
Acetaldehyde						
Acrolein						
Benzene		9.28E-03 lb/MMscf	1.40E-05 lb/hr	6.13E-05 tpy	9.28E-03 lb/MMscf	1.47E-05 lb/hr
Biphenyl						
Butadiene (1,3-)						
Carbon Tetrachloride						
Chlorobenzene						
Chloroform						
Dichloropropene (1,3-)						
Ethylbenzene						
Ethylene Dibromide						
Formaldehyde		3.31E-01 lb/MMscf	5.00E-04 lb/hr	2.19E-03 tpy	3.31E-01 lb/MMscf	5.25E-04 lb/hr
Hexane (n-)		7.95E+00 lb/MMscf	1.20E-02 lb/hr	5.25E-02 tpy	7.95E+00 lb/MMscf	1.26E-02 lb/hr
Methanol						
Methylene Chloride						
Methylnaphthalene (2-)		1.06E-04 lb/MMscf	1.60E-07 lb/hr	7.00E-07 tpy	1.06E-04 lb/MMscf	1.68E-07 lb/hr
Naphthalene		2.69E-03 lb/MMscf	4.06E-06 lb/hr	1.78E-05 tpy	2.69E-03 lb/MMscf	4.27E-06 lb/hr
PAH						
Phenol						
Propylene Oxide						
Styrene						
Tetrachloroethane (1,1,2,2-)						
Toluene		1.50E-02 lb/MMscf	2.27E-05 lb/hr	9.92E-05 tpy	1.50E-02 lb/MMscf	2.38E-05 lb/hr
Trichloroethane (1,1,2-)						
Trimethylpentane (2,2,4-)						
Vinyl Chloride						
Xylenes						

NOTES

- Fuel higher heating value selected to correspond to AP-42 emissions factors.
- Maximum hourly emissions based on 105% of rated capacity.
- Vendor provided data on: heat output and heat input.
- CO₂ and N₂O emission factors based on 40 CFR 98, Subpart C, Table C-1 and 40 CFR 98, Subpart C, Table C-2, respectively.
- NO_x, CO and TOC (Total) emission factors based on vendor data.
- SO₂ emission factors based on AP-42, Section 1.4 (Revised 3/98), Table 1.4-2 using Tariff (5 gr/100 scf).
- PM_{10/2.5} emission factors based on AP-42, Section 1.4 (Revised 3/98), Table 1.4-2.
- Remaining TOC specie emission factors based on scaling of AP-42, Section 1.4 (Revised 3/98), Table 1.4-3 using vendor HC data.
 $EF_i = (EF_{HC}/EF_{TOC-AP42})(EF_{i-AP42})$

TABLE D-1E
Natural Gas Combustion
Hourly and Annual Emission Estimates
Uncontrolled

Application		Process Heater				
Combustion Process		Conventional				
Add-on Controls		None				
Package (Make: Model)		Sivalls: IH-3005-T2-150M				
Burner (Make: Model)		Unknown: Unknown				
Fuel		Natural Gas				
Fuel Higher Heating Value (HHV)		1,020 BTU/scf			1,020 BTU/scf	
Heat Output at HHV		0.150 MMBTU/hr			0.158 MMBTU/hr	
Thermal Efficiency		65%			65%	
Operating Hours		8,760 hrs/yr				
Fuel Consumption		226 scfh			238 scfh	
		1.982 MMscf/yr				
Heat Input at HHV		0.231 MMBTU/hr			0.242 MMBTU/hr	
		2,022 MMBTU/yr	Uncontrolled			Uncontrolled
Pollutant	Control Efficiency	Uncontrolled	Average Hourly	Maximum Annual	Uncontrolled	Maximum Hourly
NO _x		98.43 lb/MMscf	0.0223 lb/hr	0.0975 tpy	98.43 lb/MMscf	0.0234 lb/hr
CO		150.00 lb/MMscf	0.0339 lb/hr	0.1486 tpy	150.00 lb/MMscf	0.0356 lb/hr
SO ₂		14.29 lb/MMscf	0.0032 lb/hr	0.0142 tpy	14.29 lb/MMscf	0.0034 lb/hr
PM _{10/2.5}		7.60 lb/MMscf	0.0017 lb/hr	0.0075 tpy	7.60 lb/MMscf	0.0018 lb/hr
CO _{2,e}		120,338.86 lb/MMscf	27.2260 lb/hr	119.2498 tpy	120,338.86 lb/MMscf	28.5873 lb/hr
CO ₂		120,017.45 lb/MMscf	27.1533 lb/hr	118.9313 tpy	120,017.45 lb/MMscf	28.5109 lb/hr
N ₂ O		0.23 lb/MMscf	0.0001 lb/hr	0.0002 tpy	0.23 lb/MMscf	0.0001 lb/hr
TOC (Total)		60.00 lb/MMscf	0.0136 lb/hr	0.0595 tpy	60.00 lb/MMscf	0.0143 lb/hr
Methane		10.16 lb/MMscf	0.0023 lb/hr	0.0101 tpy	10.16 lb/MMscf	0.0024 lb/hr
Ethane		13.69 lb/MMscf	0.0031 lb/hr	0.0136 tpy	13.69 lb/MMscf	0.0033 lb/hr
VOC (Total)		36.15 lb/MMscf	0.0082 lb/hr	0.0358 tpy	36.15 lb/MMscf	0.0086 lb/hr
VOC (non-HAP)		27.83 lb/MMscf	0.0063 lb/hr	0.0276 tpy	27.83 lb/MMscf	0.0066 lb/hr
HAP (Total)		8.32 lb/MMscf	0.0019 lb/hr	0.0082 tpy	8.32 lb/MMscf	0.0020 lb/hr
Acetaldehyde						
Acrolein						
Benzene		9.28E-03 lb/MMscf	2.10E-06 lb/hr	9.19E-06 tpy	9.28E-03 lb/MMscf	2.20E-06 lb/hr
Biphenyl						
Butadiene (1,3-)						
Carbon Tetrachloride						
Chlorobenzene						
Chloroform						
Dichloropropene (1,3-)						
Ethylbenzene						
Ethylene Dibromide						
Formaldehyde		3.31E-01 lb/MMscf	7.50E-05 lb/hr	3.28E-04 tpy	3.31E-01 lb/MMscf	7.87E-05 lb/hr
Hexane (n-)		7.95E+00 lb/MMscf	1.80E-03 lb/hr	7.88E-03 tpy	7.95E+00 lb/MMscf	1.89E-03 lb/hr
Methanol						
Methylene Chloride						
Methylnaphthalene (2-)		1.06E-04 lb/MMscf	2.40E-08 lb/hr	1.05E-07 tpy	1.06E-04 lb/MMscf	2.52E-08 lb/hr
Naphthalene		2.69E-03 lb/MMscf	6.10E-07 lb/hr	2.67E-06 tpy	2.69E-03 lb/MMscf	6.40E-07 lb/hr
PAH						
Phenol						
Propylene Oxide						
Styrene						
Tetrachloroethane (1,1,2,2-)						
Toluene		1.50E-02 lb/MMscf	3.40E-06 lb/hr	1.49E-05 tpy	1.50E-02 lb/MMscf	3.57E-06 lb/hr
Trichloroethane (1,1,2-)						
Trimethylpentane (2,2,4-)						
Vinyl Chloride						
Xylenes						

NOTES

- Fuel higher heating value selected to correspond to AP-42 emissions factors.
- Maximum hourly emissions based on 105% of rated capacity.
- Vendor provided data on: heat output and heat input.
- CO₂ and N₂O emission factors based on 40 CFR 98, Subpart C, Table C-1 and 40 CFR 98, Subpart C, Table C-2, respectively.
- NO_x, CO and TOC (Total) emission factors based on vendor data.
- SO₂ emission factors based on AP-42, Section 1.4 (Revised 3/98), Table 1.4-2 using Tariff (5 gr/100 scf).
- PM_{10/2.5} emission factors based on AP-42, Section 1.4 (Revised 3/98), Table 1.4-2.
- Remaining TOC specie emission factors based on scaling of AP-42, Section 1.4 (Revised 3/98), Table 1.4-3 using vendor HC data.
 $EF_i = (EF_{HC}/EF_{TOC-AP42})(EF_{i-AP42})$

TABLE D-1D
Natural Gas Combustion
Hourly and Annual Emission Estimates
Uncontrolled

Application		HVAC				
Combustion Process		Conventional				
Add-on Controls		None				
Package (Make: Model)		Carrier: Infinity 58MVB060				
Burner (Make: Model)		Unknown: Unknown				
Fuel		Natural Gas				
Fuel Higher Heating Value (HHV)		1,020 BTU/scf	Uncontrolled		1,020 BTU/scf	Uncontrolled
Heat Output at HHV		0.056 MMBTU/hr			0.059 MMBTU/hr	
Thermal Efficiency		93%			93%	
Operating Hours		8,760 hrs/yr				
Fuel Consumption		59 scfh			62 scfh	
		0.515 MMscf/yr				
Heat Input at HHV		0.060 MMBTU/hr			0.063 MMBTU/hr	
		526 MMBTU/yr				
Pollutant	Control Efficiency	Uncontrolled	Average Hourly	Maximum Annual	Uncontrolled	Maximum Hourly
NO _x		94.00 lb/MMscf	0.0055 lb/hr	0.0242 tpy	94.00 lb/MMscf	0.0058 lb/hr
CO		40.00 lb/MMscf	0.0024 lb/hr	0.0103 tpy	40.00 lb/MMscf	0.0025 lb/hr
SO ₂		14.29 lb/MMscf	0.0008 lb/hr	0.0037 tpy	14.29 lb/MMscf	0.0009 lb/hr
PM _{10/2.5}		7.60 lb/MMscf	0.0004 lb/hr	0.0020 tpy	7.60 lb/MMscf	0.0005 lb/hr
CO _{2-e}		120,142.36 lb/MMscf	7.0672 lb/hr	30.9543 tpy	120,142.36 lb/MMscf	7.4206 lb/hr
CO ₂		120,017.45 lb/MMscf	7.0599 lb/hr	30.9221 tpy	120,017.45 lb/MMscf	7.4128 lb/hr
N ₂ O		0.23 lb/MMscf	0.0000 lb/hr	0.0001 tpy	0.23 lb/MMscf	0.0000 lb/hr
TOC (Total)		13.58 lb/MMscf	0.0008 lb/hr	0.0035 tpy	13.58 lb/MMscf	0.0008 lb/hr
Methane		2.30 lb/MMscf	0.0001 lb/hr	0.0006 tpy	2.30 lb/MMscf	0.0001 lb/hr
Ethane		3.10 lb/MMscf	0.0002 lb/hr	0.0008 tpy	3.10 lb/MMscf	0.0002 lb/hr
VOC (Total)		8.18 lb/MMscf	0.0005 lb/hr	0.0021 tpy	8.18 lb/MMscf	0.0005 lb/hr
VOC (non-HAP)		6.30 lb/MMscf	0.0004 lb/hr	0.0016 tpy	6.30 lb/MMscf	0.0004 lb/hr
HAP (Total)		1.88 lb/MMscf	0.0001 lb/hr	0.0005 tpy	1.88 lb/MMscf	0.0001 lb/hr
Acetaldehyde						
Acrolein						
Benzene		2.10E-03 lb/MMscf	1.24E-07 lb/hr	5.41E-07 tpy	2.10E-03 lb/MMscf	1.30E-07 lb/hr
Biphenyl						
Butadiene (1,3-)						
Carbon Tetrachloride						
Chlorobenzene						
Chloroform						
Dichloropropene (1,3-)						
Ethylbenzene						
Ethylene Dibromide						
Formaldehyde		7.50E-02 lb/MMscf	4.41E-06 lb/hr	1.93E-05 tpy	7.50E-02 lb/MMscf	4.63E-06 lb/hr
Hexane (n-)		1.80E+00 lb/MMscf	1.06E-04 lb/hr	4.64E-04 tpy	1.80E+00 lb/MMscf	1.11E-04 lb/hr
Methanol						
Methylene Chloride						
Methylnaphthalene (2-)		2.40E-05 lb/MMscf	1.41E-09 lb/hr	6.18E-09 tpy	2.40E-05 lb/MMscf	1.48E-09 lb/hr
Naphthalene		6.10E-04 lb/MMscf	3.59E-08 lb/hr	1.57E-07 tpy	6.10E-04 lb/MMscf	3.77E-08 lb/hr
PAH						
Phenol						
Propylene Oxide						
Styrene						
Tetrachloroethane (1,1,2,2-)						
Toluene		3.40E-03 lb/MMscf	2.00E-07 lb/hr	8.76E-07 tpy	3.40E-03 lb/MMscf	2.10E-07 lb/hr
Trichloroethane (1,1,2-)						
Trimethylpentane (2,2,4-)						
Vinyl Chloride						
Xylenes						

NOTES

- Fuel higher heating value selected to correspond to AP-42 emissions factors.
- Maximum hourly emissions based on 105% of rated capacity.
- Vendor provided data on: heat output and heat input.
- CO₂ and N₂O emission factors based on 40 CFR 98, Subpart C, Table C-1 and 40 CFR 98, Subpart C, Table C-2, respectively.
- NO_x, CO and TOC (Total) emission factors based on AP-42, Section 1.4 (Revised 3/98), Table 1.4-1 : Residential Furnace (< 0.3 MMBTU/hr) - Uncontrolled.
- SO₂ emission factors based on AP-42, Section 1.4 (Revised 3/98), Table 1.4-2 using Tariff (5 gr/100 scf).
- PM_{10/2.5} emission factors based on AP-42, Section 1.4 (Revised 3/98), Table 1.4-2.
- Remaining TOC specie emission factors based on AP-42, Section 1.4 (Revised 3/98), Table 1.4-3.

TABLE D-1E
Natural Gas Combustion
Hourly and Annual Emission Estimates
Uncontrolled

Application		Space Heater				
Combustion Process		Conventional				
Add-on Controls		None				
Package (Make: Model)		Modine: HDB075				
Burner (Make: Model)		Unknown: Unknown				
Fuel		Natural Gas				
Fuel Higher Heating Value (HHV)		1,020 BTU/scf	Uncontrolled		1,020 BTU/scf	Uncontrolled
Heat Output at HHV		0.060 MMBTU/hr			0.063 MMBTU/hr	
Thermal Efficiency		80%			80%	
Operating Hours		8,760 hrs/yr				
Fuel Consumption		74 scfh			77 scfh	
		0.644 MMscf/yr				
Heat Input at HHV		0.075 MMBTU/hr			0.079 MMBTU/hr	
		657 MMBTU/yr				
Pollutant	Control Efficiency	Uncontrolled	Average Hourly	Maximum Annual	Uncontrolled	Maximum Hourly
NO _x		94.00 lb/MMscf	0.0069 lb/hr	0.0303 tpy	94.00 lb/MMscf	0.0073 lb/hr
CO		40.00 lb/MMscf	0.0029 lb/hr	0.0129 tpy	40.00 lb/MMscf	0.0031 lb/hr
SO ₂		14.29 lb/MMscf	0.0011 lb/hr	0.0046 tpy	14.29 lb/MMscf	0.0011 lb/hr
PM _{10/2.5}		7.60 lb/MMscf	0.0006 lb/hr	0.0024 tpy	7.60 lb/MMscf	0.0006 lb/hr
CO _{2-e}		120,142.36 lb/MMscf	8.8340 lb/hr	38.6929 tpy	120,142.36 lb/MMscf	9.2757 lb/hr
CO ₂		120,017.45 lb/MMscf	8.8248 lb/hr	38.6527 tpy	120,017.45 lb/MMscf	9.2661 lb/hr
N ₂ O		0.23 lb/MMscf	0.0000 lb/hr	0.0001 tpy	0.23 lb/MMscf	0.0000 lb/hr
TOC (Total)		13.58 lb/MMscf	0.0010 lb/hr	0.0044 tpy	13.58 lb/MMscf	0.0010 lb/hr
Methane		2.30 lb/MMscf	0.0002 lb/hr	0.0007 tpy	2.30 lb/MMscf	0.0002 lb/hr
Ethane		3.10 lb/MMscf	0.0002 lb/hr	0.0010 tpy	3.10 lb/MMscf	0.0002 lb/hr
VOC (Total)		8.18 lb/MMscf	0.0006 lb/hr	0.0026 tpy	8.18 lb/MMscf	0.0006 lb/hr
VOC (non-HAP)		6.30 lb/MMscf	0.0005 lb/hr	0.0020 tpy	6.30 lb/MMscf	0.0005 lb/hr
HAP (Total)		1.88 lb/MMscf	0.0001 lb/hr	0.0006 tpy	1.88 lb/MMscf	0.0001 lb/hr
Acetaldehyde						
Acrolein						
Benzene		2.10E-03 lb/MMscf	1.54E-07 lb/hr	6.76E-07 tpy	2.10E-03 lb/MMscf	1.62E-07 lb/hr
Biphenyl						
Butadiene (1,3-)						
Carbon Tetrachloride						
Chlorobenzene						
Chloroform						
Dichloropropene (1,3-)						
Ethylbenzene						
Ethylene Dibromide						
Formaldehyde		7.50E-02 lb/MMscf	5.51E-06 lb/hr	2.42E-05 tpy	7.50E-02 lb/MMscf	5.79E-06 lb/hr
Hexane (n-)		1.80E+00 lb/MMscf	1.32E-04 lb/hr	5.80E-04 tpy	1.80E+00 lb/MMscf	1.39E-04 lb/hr
Methanol						
Methylene Chloride						
Methylnaphthalene (2-)		2.40E-05 lb/MMscf	1.76E-09 lb/hr	7.73E-09 tpy	2.40E-05 lb/MMscf	1.85E-09 lb/hr
Naphthalene		6.10E-04 lb/MMscf	4.49E-08 lb/hr	1.96E-07 tpy	6.10E-04 lb/MMscf	4.71E-08 lb/hr
PAH						
Phenol						
Propylene Oxide						
Styrene						
Tetrachloroethane (1,1,2,2-)						
Toluene		3.40E-03 lb/MMscf	2.50E-07 lb/hr	1.10E-06 tpy	3.40E-03 lb/MMscf	2.63E-07 lb/hr
Trichloroethane (1,1,2-)						
Trimethylpentane (2,2,4-)						
Vinyl Chloride						
Xylenes						

NOTES

- Fuel higher heating value selected to correspond to AP-42 emissions factors.
- Maximum hourly emissions based on 105% of rated capacity.
- Vendor provided data on: heat output and heat input.
- CO₂ and N₂O emission factors based on 40 CFR 98, Subpart C, Table C-1 and 40 CFR 98, Subpart C, Table C-2, respectively.
- NO_x, CO and TOC (Total) emission factors based on AP-42, Section 1.4 (Revised 3/98), Table 1.4-1 : Residential Furnace (< 0.3 MMBTU/hr) - Uncontrolled.
- SO₂ emission factors based on AP-42, Section 1.4 (Revised 3/98), Table 1.4-2 using Tariff (5 gr/100 scf).
- PM_{10/2.5} emission factors based on AP-42, Section 1.4 (Revised 3/98), Table 1.4-2.
- Remaining TOC specie emission factors based on AP-42, Section 1.4 (Revised 3/98), Table 1.4-3.

TABLE D-1F
Natural Gas Combustion
Hourly and Annual Emission Estimates
Uncontrolled

Application		Space Heater				
Combustion Process		Conventional				
Add-on Controls		None				
Package (Make: Model)		Bruest: CSA 24-72				
Burner (Make: Model)		Unknown: Unknown				
Fuel		Natural Gas				
Fuel Higher Heating Value (HHV)		1,020 BTU/scf	Uncontrolled		1,020 BTU/scf	Uncontrolled
Heat Output at HHV		0.058 MMBTU/hr			0.060 MMBTU/hr	
Thermal Efficiency		80%			80%	
Operating Hours		8,760 hrs/yr				
		71 scfh			74 scfh	
Fuel Consumption		0.618 MMscf/yr				
		0.072 MMBTU/hr			0.076 MMBTU/hr	
Heat Input at HHV		631 MMBTU/yr				
Pollutant	Control Efficiency	Uncontrolled	Average Hourly	Maximum Annual	Uncontrolled	Maximum Hourly
NO _x		94.00 lb/MMscf	0.0066 lb/hr	0.0291 tpy	94.00 lb/MMscf	0.0070 lb/hr
CO		40.00 lb/MMscf	0.0028 lb/hr	0.0124 tpy	40.00 lb/MMscf	0.0030 lb/hr
SO ₂		14.29 lb/MMscf	0.0010 lb/hr	0.0044 tpy	14.29 lb/MMscf	0.0011 lb/hr
PM _{10/2.5}		7.60 lb/MMscf	0.0005 lb/hr	0.0023 tpy	7.60 lb/MMscf	0.0006 lb/hr
CO _{2,e}		120,142.36 lb/MMscf	8.4806 lb/hr	37.1452 tpy	120,142.36 lb/MMscf	8.9047 lb/hr
CO ₂		120,017.45 lb/MMscf	8.4718 lb/hr	37.1066 tpy	120,017.45 lb/MMscf	8.8954 lb/hr
N ₂ O		0.23 lb/MMscf	0.0000 lb/hr	0.0001 tpy	0.23 lb/MMscf	0.0000 lb/hr
TOC (Total)		13.58 lb/MMscf	0.0010 lb/hr	0.0042 tpy	13.58 lb/MMscf	0.0010 lb/hr
Methane		2.30 lb/MMscf	0.0002 lb/hr	0.0007 tpy	2.30 lb/MMscf	0.0002 lb/hr
Ethane		3.10 lb/MMscf	0.0002 lb/hr	0.0010 tpy	3.10 lb/MMscf	0.0002 lb/hr
VOC (Total)		8.18 lb/MMscf	0.0006 lb/hr	0.0025 tpy	8.18 lb/MMscf	0.0006 lb/hr
VOC (non-HAP)		6.30 lb/MMscf	0.0004 lb/hr	0.0019 tpy	6.30 lb/MMscf	0.0005 lb/hr
HAP (Total)		1.88 lb/MMscf	0.0001 lb/hr	0.0006 tpy	1.88 lb/MMscf	0.0001 lb/hr
Acetaldehyde						
Acrolein						
Benzene		2.10E-03 lb/MMscf	1.48E-07 lb/hr	6.49E-07 tpy	2.10E-03 lb/MMscf	1.56E-07 lb/hr
Biphenyl						
Butadiene (1,3-)						
Carbon Tetrachloride						
Chlorobenzene						
Chloroform						
Dichloropropene (1,3-)						
Ethylbenzene						
Ethylene Dibromide						
Formaldehyde		7.50E-02 lb/MMscf	5.29E-06 lb/hr	2.32E-05 tpy	7.50E-02 lb/MMscf	5.56E-06 lb/hr
Hexane (n-)		1.80E+00 lb/MMscf	1.27E-04 lb/hr	5.57E-04 tpy	1.80E+00 lb/MMscf	1.33E-04 lb/hr
Methanol						
Methylene Chloride						
Methylnaphthalene (2-)		2.40E-05 lb/MMscf	1.69E-09 lb/hr	7.42E-09 tpy	2.40E-05 lb/MMscf	1.78E-09 lb/hr
Naphthalene		6.10E-04 lb/MMscf	4.31E-08 lb/hr	1.89E-07 tpy	6.10E-04 lb/MMscf	4.52E-08 lb/hr
PAH						
Phenol						
Propylene Oxide						
Styrene						
Tetrachloroethane (1,1,2,2-)						
Toluene		3.40E-03 lb/MMscf	2.40E-07 lb/hr	1.05E-06 tpy	3.40E-03 lb/MMscf	2.52E-07 lb/hr
Trichloroethane (1,1,2-)						
Trimethylpentane (2,2,4-)						
Vinyl Chloride						
Xylenes						

NOTES

- Fuel higher heating value selected to correspond to AP-42 emissions factors.
- Maximum hourly emissions based on 105% of rated capacity.
- Vendor provided data on: heat output and heat input.
- CO₂ and N₂O emission factors based on 40 CFR 98, Subpart C, Table C-1 and 40 CFR 98, Subpart C, Table C-2, respectively.
- NO_x, CO and TOC (Total) emission factors based on AP-42, Section 1.4 (Revised 3/98), Table 1.4-1 : Residential Furnace (< 0.3 MMBTU/hr) - Uncontrolled.
- SO₂ and PM_{10/2.5} emission factors based on AP-42, Section 1.4 (Revised 3/98), Table 1.4-2.
- Remaining TOC specie emission factors based on AP-42, Section 1.4 (Revised 3/98), Table 1.4-3.

TABLE F-2
Volatile Organic Liquids Storage Tanks
Hourly and Annual Emission Estimates
Standing & Working Losses

Source	OXFO-SV-V11				
Service	Pipeline Liquids				
Capacity	400 gal				400 gal
Temperature of Stored Liquid	59.93 °F				84.72 °F
Vapor Pressure	5.2442 psia				8.1944 psia
Pumping Rate	150 gal/min				150 gal/min
Throughput	0.57 turnover/yr				
	226 gal/yr				400 gal/hr
Standing Losses					July
					744 hrs/month
					30.4299 lbs/month
	204.0530 lb/yr				0.0409 lb/hr
Working Losses	8.24E-03 lb/gal				1.04E-02 lb/gal
	1.8625 lb/yr	Average	Maximum	4.1708 lb/hr	Maximum
Residual Liquid	Stand	358.84% by weight	0.0836 lb/hr	0.3661 tpy	0.1468 lb/hr
	Work		0.0008 lb/hr	0.0033 tpy	14.9663 lb/hr
	Total		0.0843 lb/hr	0.3695 tpy	15.1131 lb/hr
CO _{2e}	5398.27% by weight	1.2689 lb/hr	5.5579 tpy	5398.27% by weight	227 lb/hr
CO ₂	7.83% by weight	0.0018 lb/hr	0.0081 tpy	7.83% by weight	0.3299 lb/hr
TOC (Total)	351.00% by weight	0.0825 lb/hr	0.3614 tpy	351.00% by weight	14.7831 lb/hr
Methane	215.62% by weight	0.0507 lb/hr	0.2220 tpy	215.62% by weight	9.0811 lb/hr
Ethane	35.39% by weight	0.0083 lb/hr	0.0364 tpy	35.39% by weight	1.4904 lb/hr
VOC (Total)	100.00% by weight	0.0235 lb/hr	0.1030 tpy	100.00% by weight	4.2117 lb/hr
HAP (Total)	6.23% by weight	0.0015 lb/hr	0.0064 tpy	6.23% by weight	0.2623 lb/hr
Benzene	1.5063% by weight	3.54E-04 lb/hr	1.55E-03 tpy	1.5063% by weight	6.34E-02 lb/hr
Ethylbenzene	0.0477% by weight	1.12E-05 lb/hr	4.91E-05 tpy	0.0477% by weight	2.01E-03 lb/hr
Hexane (n-)	2.8866% by weight	6.79E-04 lb/hr	2.97E-03 tpy	2.8866% by weight	1.22E-01 lb/hr
Methanol					
Naphthalene					
Toluene	1.3668% by weight	3.21E-04 lb/hr	1.41E-03 tpy	1.3668% by weight	5.76E-02 lb/hr
Trimethylpentane (2,2,4-)	0.0139% by weight	3.26E-06 lb/hr	1.43E-05 tpy	0.0139% by weight	5.85E-04 lb/hr
Xylenes	0.4073% by weight	9.58E-05 lb/hr	4.19E-04 tpy	0.4073% by weight	1.72E-02 lb/hr

NOTES

1. Tank Characteristics:		TANKS 4.09d			
Orientation	Vertical Fixed Roof Tank		Above Ground?	Yes	
Height/Length	10.00 ft		Shell/Roof Color	Gray/Medium	or less solar absorptance
Diameter	4.50 ft		Shell Condition	Good	
Capacity (estimated)	1,190 gal		Vacuum Setting	-0.03 psig	
Capacity (nominal)	1,200 gal		Pressure Setting	0.03 psig	
2. Stored Liquid Characteristics:					
Basis	USEPA TANKS 4.09d	MET Station:	Bridgeport, Connecticut		
Material	Gasoline (RVP 10)	Selection based on VOC vapor pressure (see TABLE F-1).			
Liquid Molecular Weight	92.00 lb/lb-mol	Vapor Molecular Weight		66.00 lb/lb-mol	
Monthly Data	Days	Vapor Pressure		Liquid Surface Temperature	
		avg	max	avg	max
January	31	3.9723	4.4287	46.61	51.99
February	28	4.1361	4.7229	48.59	55.22
March	31	4.5970	5.4043	53.86	62.14
April	30	5.1707	6.2662	59.85	69.95
May	31	5.7725	7.1086	65.59	76.79
June	30	6.3213	7.8568	70.42	82.34
July	31	6.6353	8.1944	73.03	84.72
August	31	6.4635	7.8475	71.61	82.28
September	30	5.9072	7.0232	66.81	76.13
October	31	5.2206	6.0452	60.35	68.03
November	30	4.6146	5.1519	54.05	59.66
December	31	4.1198	4.5331	48.40	53.16
ALL	365	5.2442	8.1944	59.93	84.72
3. Emission Estimate Basis:		USEPA TANKS 4.09d	&	TCEQ RG-166/01	
4. Speciation of emissions is based on vapor weight percentages in TABLE F-1 normalized on VOC to assure methodology is conservative.					

TABLE F-3
Volatile Organic Liquids Storage Tanks
Hourly and Annual Emission Estimates
Standing & Working Losses

Source	OXFO-SV-V10				
Service	Pipeline Liquids				
Capacity	313 gal			313 gal	
Temperature of Stored Liquid	59.93 °F			84.72 °F	
Vapor Pressure	5.2442 psia			8.1944 psia	
Pumping Rate	150 gal/min			150 gal/min	
Throughput	14.43 turnover/yr				
	4,520 gal/yr			313 gal/hr	
Standing Losses				July	
				744 hrs/month	
				23,9889 lbs/month	
	160.8211 lb/yr			0.0322 lb/hr	
Working Losses	8.24E-03 lb/gal			1.04E-02 lb/gal	
	37.2491 lb/yr	Average	Maximum	3.2671 lb/hr	Maximum
Residual Liquid	Stand	0.0659 lb/hr	0.2885 tpy	358.84% by weight	0.1157 lb/hr
	Work	0.0153 lb/hr	0.0668 tpy		11.7236 lb/hr
	Total	0.0811 lb/hr	0.3554 tpy		11.8393 lb/hr
CO _{2e}	5398.27% by weight	1.2206 lb/hr	5.3462 tpy	5398.27% by weight	178 lb/hr
CO ₂	7.83% by weight	0.0018 lb/hr	0.0078 tpy	7.83% by weight	0.2585 lb/hr
TOC (Total)	351.00% by weight	0.0794 lb/hr	0.3476 tpy	351.00% by weight	11.5808 lb/hr
Methane	215.62% by weight	0.0488 lb/hr	0.2135 tpy	215.62% by weight	7.1140 lb/hr
Ethane	35.39% by weight	0.0080 lb/hr	0.0350 tpy	35.39% by weight	1.1675 lb/hr
VOC (Total)	100.00% by weight	0.0226 lb/hr	0.0990 tpy	100.00% by weight	3.2993 lb/hr
HAP (Total)	6.23% by weight	0.0014 lb/hr	0.0062 tpy	6.23% by weight	0.2055 lb/hr
Benzene	1.5063% by weight	3.41E-04 lb/hr	1.49E-03 tpy	1.5063% by weight	4.97E-02 lb/hr
Ethylbenzene	0.0477% by weight	1.08E-05 lb/hr	4.72E-05 tpy	0.0477% by weight	1.57E-03 lb/hr
Hexane (n-)	2.8866% by weight	6.53E-04 lb/hr	2.86E-03 tpy	2.8866% by weight	9.52E-02 lb/hr
Methanol					
Naphthalene					
Toluene	1.3668% by weight	3.09E-04 lb/hr	1.35E-03 tpy	1.3668% by weight	4.51E-02 lb/hr
Trimethylpentane (2,2,4-)	0.0139% by weight	3.14E-06 lb/hr	1.38E-05 tpy	0.0139% by weight	4.58E-04 lb/hr
Xylenes	0.4073% by weight	9.21E-05 lb/hr	4.03E-04 tpy	0.4073% by weight	1.34E-02 lb/hr

NOTES

1. Tank Characteristics:		TANKS 4.09d						
Orientation	Vertical Fixed Roof Tank	Above Ground?	Yes	or less solar absorptance				
Height/Length	10.00 ft	Shell/Roof Color	Gray/Medium					
Diameter	4.00 ft	Shell Condition	Good					
Capacity (estimated)	940 gal	Vacuum Setting	-0.03 psig					
Capacity (nominal)	940 gal	Pressure Setting	0.03 psig					
2. Stored Liquid Characteristics:								
Basis	USEPA TANKS 4.09d	MET Station:	Bridgeport, Connecticut					
Material	Gasoline (RVP 10)	Selection based on VOC vapor pressure (see TABLE F-1).						
Liquid Molecular Weight	92.00 lb/lb-mol	Vapor Molecular Weight	66.00 lb/lb-mol					
Monthly Data	Days	Vapor Pressure		Liquid Surface Temperature		TANKS Output		TANKS Flow
		avg	max	avg	max	standing	working	
January	31	3.9723	4.4287	46.61	51.99	5.5522	5.8676	940
February	28	4.1361	4.7229	48.59	55.22	6.5294	6.1096	940
March	31	4.5970	5.4043	53.86	62.14	10.2982	6.7904	940
April	30	5.1707	6.2662	59.85	69.95	14.1329	7.6379	940
May	31	5.7725	7.1086	65.59	76.79	18.7869	8.5267	940
June	30	6.3213	7.8568	70.42	82.34	22.0497	9.3374	940
July	31	6.6353	8.1944	73.03	84.72	23.9889	9.8013	940
August	31	6.4635	7.8475	71.61	82.28	21.0005	9.5475	940
September	30	5.9072	7.0232	66.81	76.13	15.5442	8.7258	940
October	31	5.2206	6.0452	60.35	68.03	11.1657	7.7115	940
November	30	4.6146	5.1519	54.05	59.66	6.6880	6.8164	940
December	31	4.1198	4.5331	48.40	53.16	5.0845	6.0856	940
ALL	365	5.2442	8.1944	59.93	84.72	160.8211	92.9580	11,280
3. Emission Estimate Basis:		USEPA TANKS 4.09d		&	TCEQ RG-166/01			
4. Speciation of emissions is based on vapor weight percentages in TABLE F-1 normalized on VOC to assure methodology is conservative.								

TABLE E-4a
Flash Analysis
Maximum Hourly and Annual Emission Estimates

Station ID	OXFO-SV-V10				
Service	Pipeline Liquids				
Liquids Holding Capacity	313 gal			313 gal	
Liquids Input Rate	4,520 gal/yr			313 gal/hr	
Flash Gas Density	0.0769 lb/scf			0.0769 lb/scf	
Flash Factor	328.03 scf/bbl			328.03 scf/bbl	
Flash Gas Rate	35,302 scf/yr			2,447 scfh	
Flash Losses	2,716 lb/yr	Average	Maximum	188 lb/hr	Maximum
Flash Gas	100.00% by weight	0.3101 lb/hr	1.3581 tpy	100.00% by weight	188.2887 lb/hr
CO _{2-e}	1039.07% by weight	3.2218 lb/hr	14.1115 tpy	1039.07% by weight	1,956 lb/hr
CO ₂	5.17% by weight	0.0160 lb/hr	0.0702 tpy	5.17% by weight	9.7297 lb/hr
TOC (Total)	94.73% by weight	0.2937 lb/hr	1.2865 tpy	94.73% by weight	178.3612 lb/hr
Methane	41.36% by weight	0.1282 lb/hr	0.5617 tpy	41.36% by weight	77.8690 lb/hr
Ethane	11.68% by weight	0.0362 lb/hr	0.1587 tpy	11.68% by weight	21.9986 lb/hr
VOC (Total)	41.69% by weight	0.1293 lb/hr	0.5662 tpy	41.69% by weight	78.4936 lb/hr
HAP (Total)	2.49% by weight	0.0077 lb/hr	0.0338 tpy	2.49% by weight	4.6925 lb/hr
Benzene	0.5089% by weight	0.0016 lb/hr	0.0069 tpy	0.5089% by weight	0.9581 lb/hr
Ethylbenzene	0.0275% by weight	0.0001 lb/hr	0.0004 tpy	0.0275% by weight	0.0518 lb/hr
Hexane (n-)	1.7932% by weight	0.0056 lb/hr	0.0244 tpy	1.7932% by weight	3.3764 lb/hr
Methanol					
Naphthalene					
Toluene	0.6253% by weight	0.0019 lb/hr	0.0085 tpy	0.6253% by weight	1.1774 lb/hr
Trimethylpentane (2,2,4-)	0.0091% by weight	0.0000 lb/hr	0.0001 tpy	0.0091% by weight	0.0172 lb/hr
Xylenes	0.3706% by weight	0.0011 lb/hr	0.0050 tpy	0.3706% by weight	0.6979 lb/hr

NOTES

- Separator Characteristics: Flash is represented for separators that receive majority of liquids, but flash may be emitted other separators.
 Orientation Vertical Fixed Roof Tank
 Height/Length 10.00 ft
 Diameter 4.00 ft
 Capacity (physical) 940 gal
 Capacity (liquid) 313 gal 33% of physical capacity
- Liquid input rates:
 - maximum hourly based on operator experience; 313 gal
 - maximum annual based on operating experience and safety factor; and 4,520 gal
 - average hourly is just the maximum annual divided by 8,760 hrs/yr.
- Flash gas density is 110% of the value extracted from TABLE E-3b.
 Density (TABLE E-3b): 0.0699 lb/scf Safety Factor: 110%
- Flash factor extracted from TABLE E-1.
- Speciated emissions vapor weight percentages extracted from TABLE E-3b.

TABLE F-1
Volatile Organic Liquid Storage Tanks
Vapor Physical Property and Composition Estimates
Raoult's Law

Component Data													Liquid Data		Vapor Data	
Component			MW (lb/mol) _i M _i	Yaws Vapor Pressure Coefficients							VP Datum		mol% (mol/mol _L) f _{v-i}	wt% (lb/lb _L) f _{m-i}	y _i (mol/mol _v)	wt% _i (lb/lb _v)
Name (i)	Type	HAP		A	B	C	D	E	T _{Min} (°F)	T _{Max} (°F)	T (°F)	P _i (psia)				
Nitrogen			28.013	3.7362	2.6465E+02	-6.7880E+00	0.0000E+00	0.0000E+00	-345.75	-232.60	68.00		0.000%	0.000%	0.000%	0.000%
Carbon Dioxide	GHG		44.010	35.0169	-1.5119E+03	-1.1334E+01	9.3368E-03	1.7136E-09	-68.80	87.80	68.00	833.1743	0.038%	0.013%	1.087%	2.183%
Methane	GHG		16.042	14.6667	-5.7097E+02	-3.3373E+00	-2.1999E-09	1.3096E-05	-295.60	-115.60	68.00	7,889.8148	0.303%	0.038%	82.053%	60.088%
Ethane			30.069	20.6973	-1.1341E+03	-5.2514E+00	-9.8774E-11	6.7329E-06	-297.40	89.60	68.00	546.5426	0.383%	0.090%	7.185%	9.862%
Propane	VOC		44.096	21.4469	-1.4627E+03	-5.2610E+00	3.2820E-11	3.7349E-06	-306.40	206.60	68.00	121.5870	0.838%	0.288%	3.497%	7.039%
Butane (i-)	VOC		58.122	31.2541	-1.9532E+03	-8.8060E+00	8.9246E-11	5.7501E-06	-254.20	275.00	68.00	44.2751	0.849%	0.385%	1.290%	3.423%
Butane (n-)	VOC		58.122	27.0441	-1.9049E+03	-7.1805E+00	-6.6845E-11	4.2190E-06	-216.40	305.60	68.00	30.1688	1.391%	0.630%	1.440%	3.821%
Pentane (i-)	VOC		72.149	29.2963	-2.1762E+03	-7.8830E+00	-4.6512E-11	3.8997E-06	-256.00	368.60	68.00	11.1082	2.544%	1.430%	0.970%	3.193%
Pentane (n-)	VOC		72.149	33.3239	-2.4227E+03	-9.2354E+00	9.0199E-11	4.1050E-06	-202.00	386.60	68.00	8.1938	1.859%	1.045%	0.523%	1.722%
Dimethylbutane (2,2-)	VOC		86.175	33.1285	-2.4527E+03	-9.2016E+00	-4.7077E-10	4.1755E-06	-146.20	420.80	68.00	5.0720	0.227%	0.152%	0.039%	0.155%
Dimethylbutane (2,3-)	VOC		86.175	33.6319	-2.5524E+03	-9.3142E+00	1.4759E-10	3.9140E-06	-223.60	500.00	68.00	3.6998	0.000%	0.000%	0.000%	0.000%
Cyclopentane	VOC		70.133	29.1547	-2.3512E+03	-7.6965E+00	-1.6212E-10	3.1250E-06	-137.20	462.20	68.00	5.0181	0.000%	0.000%	0.000%	0.000%
Methylpentane (2-)	VOC		86.175	30.7477	-2.4888E+03	-8.2295E+00	-2.3723E-11	3.2402E-06	-243.40	437.00	68.00	3.3041	1.586%	1.065%	0.180%	0.707%
Methylpentane (3-)	VOC		86.175	35.2848	-2.6773E+03	-9.8546E+00	2.2352E-11	4.0277E-06	-261.40	447.80	68.00	2.9617	1.188%	0.797%	0.121%	0.475%
Hexane (n-)	VOC	X	86.175	69.7378	-3.6278E+03	-2.3927E+01	1.2810E-02	-1.6844E-16	-139.00	453.20	68.00	2.3626	2.522%	1.693%	0.204%	0.804%
Dimethylpentane (2,2-)	VOC		100.202	6.2875	-2.1682E+03	2.6936E+00	-1.5525E-02	1.0917E-05	-191.20	478.40	68.00	1.6191	0.430%	0.335%	0.024%	0.109%
Methylcyclopentane	VOC		84.159	32.4766	-2.6434E+03	-8.7933E+00	2.0749E-11	3.2158E-06	-223.60	500.00	68.00	2.1257	1.567%	1.027%	0.114%	0.439%
Dimethylpentane (2,4-)	VOC		100.202	35.9436	-2.8460E+03	-9.9938E+00	8.0693E-11	3.6419E-06	-182.20	476.60	68.00	1.5074	0.177%	0.138%	0.009%	0.042%
Trimethylbutane (2,2,3-)	VOC		100.202	32.3633	-2.6614E+03	-8.7743E+00	-7.6870E-10	3.2006E-06	-11.20	496.40	68.00	1.5789	0.000%	0.000%	0.000%	0.000%
Benzene	VOC	X	78.112	31.7718	-2.7254E+03	-8.4443E+00	-5.3534E-09	2.7187E-06	42.80	552.20	68.00	1.4495	2.367%	1.440%	0.118%	0.420%
Dimethylpentane (3,3-)	VOC		100.202	30.2570	-2.6313E+03	-7.9839E+00	4.6848E-13	2.7170E-06	-209.20	505.40	68.00	1.2681	0.305%	0.238%	0.013%	0.061%
Cyclohexane	VOC		84.159	48.5529	-3.0874E+03	-1.5521E+01	7.3830E-03	6.3563E-12	44.60	537.80	68.00	1.5112	1.528%	1.002%	0.079%	0.304%
Methylhexane (2-)	VOC		100.202	54.1075	-3.3785E+03	-1.7547E+01	8.2594E-03	-3.4967E-14	-180.40	494.60	68.00	0.9987	3.167%	2.472%	0.109%	0.496%
Dimethylpentane (2,3-)	VOC		100.202	39.7737	-2.9050E+03	-1.2012E+01	5.1334E-03	-2.3807E-14	-171.40	507.20	68.00	1.0467	0.000%	0.000%	0.000%	0.000%
Dimethylcyclopentane (1,1-)	VOC		98.186	58.1943	-3.4151E+03	-1.9294E+01	9.6704E-03	-2.4361E-15	-94.00	525.20	68.00	1.1616	0.833%	0.637%	0.033%	0.149%
Methylhexane (3-)	VOC		100.202	35.2535	-2.9310E+03	-9.6667E+00	-5.2026E-11	3.2107E-06	-182.20	503.60	68.00	0.9291	3.287%	2.566%	0.105%	0.479%
Dimethylcyclopentane (1,1,3-)	VOC		98.186	53.1912	-3.3121E+03	-1.7277E+01	8.3107E-03	5.0896E-14	-209.20	536.00	68.00	0.9791	0.225%	0.172%	0.008%	0.034%
Dimethylcyclopentane (1,1,3-)	VOC		98.186	35.4255	-2.7286E+03	-1.0444E+01	4.6608E-03	1.7565E-14	-209.20	532.40	68.00	1.0075	0.368%	0.281%	0.013%	0.057%
Ethylpentane (3-)	VOC		100.202	8.5463	-2.2979E+03	1.5503E+00	-1.2233E-02	8.2670E-06	-180.40	514.40	68.00	0.8755	0.040%	0.031%	0.001%	0.006%
Dimethylcyclopentane (1,1,2-)	VOC		98.186	36.8109	-2.9536E+03	-1.0275E+01	-4.6212E-12	3.6730E-06	-178.60	536.00	68.00	0.9713	0.307%	0.235%	0.010%	0.046%
Trimethylpentane (2,2,4-)	VOC	X	114.229	50.3422	-3.2789E+03	-1.6111E+01	7.4260E-03	-9.1804E-14	-160.60	519.80	68.00	0.7453	0.029%	0.026%	0.001%	0.004%
Heptane (n-)	VOC		100.202	65.0257	-3.8188E+03	-2.1684E+01	1.0387E-02	1.0206E-14	-130.00	512.60	68.00	0.6808	5.170%	4.036%	0.121%	0.552%
Methylcyclohexane	VOC		98.186	38.0955	-3.0738E+03	-1.0684E+01	-5.1766E-11	3.5282E-06	-194.80	570.20	68.00	0.6925	4.647%	3.555%	0.110%	0.495%
Trimethylcyclopentane (1,1,3-)	VOC		112.213	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.317%	0.277%	0.000%	0.001%
Dimethylhexane (2,2-)	VOC		114.229	38.7670	-3.1841E+03	-1.0857E+01	1.9275E-12	3.4797E-06	-185.80	530.60	68.00	0.5066	0.134%	0.119%	0.002%	0.012%
Dimethylcyclopentane (1,1,2-)	VOC		98.186	36.3623	-3.0025E+03	-1.0070E+01	-1.0435E-09	3.3726E-06	-65.20	557.60	68.00	0.7110	1.194%	0.913%	0.029%	0.131%
Dimethylhexane (2,5-)	VOC		114.229	40.0260	-2.9647E+03	-1.1282E+01	-6.5408E-10	3.6200E-06	-131.80	530.60	68.00	0.4490	0.000%	0.000%	0.000%	0.000%
Dimethylhexane (2,4-)	VOC		114.229	56.2877	-3.6225E+03	-1.8225E+01	8.1864E-03	8.7232E-12	30.20	537.80	68.00	0.4499	0.201%	0.179%	0.003%	0.016%
Ethylcyclopentane	VOC		98.186	36.3631	-3.0448E+03	-1.0038E+01	3.5007E-11	3.2347E-06	-216.40	566.60	68.00	0.5963	0.653%	0.500%	0.013%	0.060%
Trimethylpentane (2,2,3-)	VOC		114.229	35.9540	-3.0569E+03	-9.8896E+00	-7.2916E-11	3.1060E-06	-169.60	555.80	68.00	0.4788	0.039%	0.035%	0.001%	0.003%
Trimethylcyclopentane (1,1,2,3-)	VOC		112.213	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.000%	0.000%	0.000%	0.000%
Dimethylhexane (3,3-)	VOC		114.229	38.0712	-3.1736E+03	-1.0617E+01	6.3090E-11	3.3817E-06	-194.80	552.20	68.00	0.4250	0.000%	0.000%	0.000%	0.000%
Trimethylcyclopentane (1,1,2,3-)	VOC		112.213	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.000%	0.000%	0.000%	0.000%

TABLE F-1
Volatile Organic Liquid Storage Tanks
Vapor Physical Property and Composition Estimates
Raoult's Law

Component Data													Liquid Data		Vapor Data	
Component			MW (lb/mol) _i M _i	Yaws Vapor Pressure Coefficients							VP Datum		mol% (mol/mol _L) f _{v,i}	wt% (lb _f /lb _L) f _{m,i}	y _i (mol _f /mol _v)	wt% _i (lb _f /lb _v)
Name (i)	Type	HAP		A	B	C	D	E	T _{Min} (°F)	T _{Max} (°F)	T (°F)	P _i (psia)				
Trimethylpentane (2,3,4-)	VOC		114.229	34.1565	-3.0232E+03	-9.2267E+00	2.7691E-11	2.7828E-06	-164.20	559.40	68.00	0.4029	0.000%	0.000%	0.000%	0.000%
Dimethylhexane (2,3-)	VOC		114.229	57.3778	-3.7143E+03	-1.8599E+01	8.2907E-03	-2.8441E-12	30.20	554.00	68.00	0.3451	0.000%	0.000%	0.000%	0.000%
Toluene	VOC	X	92.138	34.0775	-3.0379E+03	-9.1635E+00	1.0289E-11	2.7035E-06	-139.00	606.20	68.00	0.4219	6.256%	4.491%	0.091%	0.381%
Trimethylcyclopentane (1,1,2-)	VOC		112.213	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.522%	0.457%	0.000%	0.001%
Dimethylhexane (3,4-)	VOC		114.229	38.6119	-3.2685E+03	-1.0752E+01	3.6386E-09	3.2771E-06	30.20	564.80	68.00	0.3186	4.934%	4.391%	0.054%	0.281%
Methylheptane (2-)	VOC		114.229	37.6930	-3.2611E+03	-1.0391E+01	-1.0524E-12	3.0560E-06	-164.20	548.60	68.00	0.3028	0.000%	0.000%	0.000%	0.000%
Methylheptane (4-)	VOC		114.229	40.2080	-3.3661E+03	-1.1279E+01	-8.7855E-11	3.4055E-06	-185.80	552.20	68.00	0.3001	4.077%	3.628%	0.042%	0.219%
Dimethylhexane (3,4-)	VOC		114.229	38.6119	-3.2685E+03	-1.0752E+01	3.6386E-09	3.2771E-06	30.20	564.80	68.00	0.3186	0.000%	0.000%	0.000%	0.000%
Methylheptane (3-)	VOC		114.229	52.8828	-3.6231E+03	-1.6804E+01	7.1828E-03	7.4077E-14	-184.00	555.80	68.00	0.2869	0.586%	0.521%	0.006%	0.030%
Ethylhexane (3-)	VOC		114.229	40.2079	-3.3651E+03	-1.1285E+01	-5.4180E-09	3.4199E-06	30.20	557.60	68.00	0.2931	0.156%	0.139%	0.002%	0.008%
Trimethylcyclopentane (1,c-2,t-4-)	VOC		112.213	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.039%	0.034%	0.000%	0.000%
Dimethylcyclohexane (1,c-3-)	VOC		112.213	32.4775	-3.0067E+03	-8.5896E+00	7.0258E-11	2.1739E-06	-103.00	604.40	68.00	0.3176	0.239%	0.209%	0.003%	0.013%
Trimethylcyclopentane (1,c-2,t-3-)	VOC		112.213	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.239%	0.209%	0.000%	0.001%
Dimethylcyclohexane (1,t-4-)	VOC		112.213	32.5731	-2.9872E+03	-8.6494E+00	-2.1355E-09	2.2946E-06	-34.60	602.60	68.00	0.3364	0.000%	0.000%	0.000%	0.000%
Trimethylhexane (2,2,5-)	VOC		128.255	7.8816	-2.6422E+03	2.3902E+00	-1.5376E-02	9.7931E-06	-158.80	563.00	68.00	0.2426	0.000%	0.000%	0.000%	0.000%
Dimethylcyclohexane (1,1-)	VOC		112.213	33.1329	-3.0084E+03	-8.8498E+00	-4.3621E-10	2.3704E-06	-27.40	604.40	68.00	0.3361	0.000%	0.000%	0.000%	0.000%
Ethylcyclopentane (1-methyl-t-3-)	VOC		112.213	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.000%	0.000%	0.000%	0.000%
Ethylcyclopentane (1-methyl-c-3-)	VOC		112.213	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.000%	0.000%	0.000%	0.000%
Ethylcyclopentane (1-methyl-t-2-)	VOC		112.213	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.000%	0.000%	0.000%	0.000%
Trimethylhexane (2,2,4-)	VOC		128.255	33.1285	-2.4527E+03	-9.2016E+00	-4.7077E-10	4.1755E-06	-146.20	420.80	68.00	5.0720	0.000%	0.000%	0.000%	0.000%
Ethylcyclopentane (1-methyl-t-1-)	VOC		112.213	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.000%	0.000%	0.000%	0.000%
Cycloheptane	VOC		98.186	54.0858	-3.6109E+03	-1.7331E+01	7.5272E-03	1.7553E-12	17.60	627.80	68.00	0.3185	0.000%	0.000%	0.000%	0.000%
Octane (n-)	VOC		114.229	29.0948	-3.0114E+03	-7.2653E+00	-2.2696E-11	1.4680E-06	-70.60	564.80	68.00	0.2040	6.155%	5.477%	0.043%	0.225%
Trimethylhexane (2,4,4-)	VOC		128.255	33.1285	-2.4527E+03	-9.2016E+00	-4.7077E-10	4.1755E-06	-146.20	420.80	68.00	5.0720	0.269%	0.269%	0.047%	0.275%
Tetramethylpentane (2,2,4,4-)	VOC		128.255	-3.8184	-2.2442E+03	7.0671E+00	-1.9644E-02	1.1435E-05	-86.80	568.40	68.00	0.2957	0.000%	0.000%	0.000%	0.000%
Dimethylcyclohexane (1,t-3-)	VOC		112.213	32.4384	-3.0550E+03	-8.5372E+00	2.2892E-10	2.0099E-06	-130.00	617.00	68.00	0.2590	0.075%	0.066%	0.001%	0.003%
Dimethylcyclohexane (1,c-4-)	VOC		112.213	31.9151	-3.0253E+03	-8.3613E+00	5.7055E-12	1.9673E-06	-124.60	617.00	68.00	0.2640	0.075%	0.066%	0.001%	0.003%
Trimethylcyclopentane (1,c-2,c-3-)	VOC		112.213	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.075%	0.066%	0.000%	0.000%
Propylcyclopentane (i-)	VOC		112.213	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.493%	0.431%	0.000%	0.001%
Trimethylhexane (2,3,5-)	VOC		128.255	33.1285	-2.4527E+03	-9.2016E+00	-4.7077E-10	4.1755E-06	-146.20	420.80	68.00	5.0720	0.009%	0.009%	0.001%	0.009%
Dimethylheptane (2,2-)	VOC		128.255	33.1285	-2.4527E+03	-9.2016E+00	-4.7077E-10	4.1755E-06	-146.20	420.80	68.00	5.0720	0.000%	0.000%	0.000%	0.000%
Dimethylheptane (2,4-)	VOC		128.255	33.1285	-2.4527E+03	-9.2016E+00	-4.7077E-10	4.1755E-06	-146.20	420.80	68.00	5.0720	0.224%	0.224%	0.039%	0.228%
Methylcyclopentane (1-ethyl-c-2-)	VOC		112.213	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.257%	0.224%	0.000%	0.001%
Trimethylhexane (2,2,3-)	VOC		128.255	33.1285	-2.4527E+03	-9.2016E+00	-4.7077E-10	4.1755E-06	-146.20	420.80	68.00	5.0720	0.000%	0.000%	0.000%	0.000%
Dimethylcyclohexane (1,c-2-)	VOC		112.213	32.1635	-3.0728E+03	-8.4344E+00	6.8943E-10	1.9558E-06	-58.00	631.40	68.00	0.2121	0.723%	0.632%	0.005%	0.027%
Dimethylheptane (2,6-)	VOC		128.255	33.1285	-2.4527E+03	-9.2016E+00	-4.7077E-10	4.1755E-06	-146.20	420.80	68.00	5.0720	0.159%	0.159%	0.028%	0.162%
Propylcyclopentane (n-)	VOC		112.213	33.9220	-3.2097E+03	-8.9914E+00	-3.2992E-11	2.0684E-06	-178.60	626.00	68.00	0.1793	0.000%	0.000%	0.000%	0.000%
Trimethylcyclohexane (1,c-3,c-5-)	VOC		126.239	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.000%	0.000%	0.000%	0.000%
Ethylcyclohexane	VOC		112.213	32.7090	-3.1283E+03	-8.6023E+00	-3.9268E-11	1.9935E-06	-167.80	636.80	68.00	0.1870	1.935%	1.692%	0.012%	0.064%
Dimethylheptane (2,5-)	VOC		128.255	33.1285	-2.4527E+03	-9.2016E+00	-4.7077E-10	4.1755E-06	-146.20	420.80	68.00	5.0720	0.095%	0.095%	0.017%	0.097%
Dimethylheptane (3,5-)	VOC		128.255	33.1285	-2.4527E+03	-9.2016E+00	-4.7077E-10	4.1755E-06	-146.20	420.80	68.00	5.0720	0.095%	0.095%	0.017%	0.097%
Trimethylcyclohexane (1,1,3-)	VOC		126.239	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.109%	0.107%	0.000%	0.000%
Trimethylhexane (2,3,3-)	VOC		128.255	33.1285	-2.4527E+03	-9.2016E+00	-4.7077E-10	4.1755E-06	-146.20	420.80	68.00	5.0720	0.054%	0.054%	0.009%	0.055%

TABLE F-1
Volatile Organic Liquid Storage Tanks
Vapor Physical Property and Composition Estimates
Raoult's Law

Component Data												Liquid Data		Vapor Data		
Component			MW (lb/mol) _i M _i	Yaws Vapor Pressure Coefficients							VP Datum		mol% (mol/lb _L) f _{v,i}	wt% (lb/lb _L) f _{m,i}	y _i (mol/mol _v)	wt% _i (lb/lb _v)
Name (i)	Type	HAP		A	B	C	D	E	T _{Min} (°F)	T _{Max} (°F)	T (°F)	P _i (psia)				
Dimethylheptane (3,3-)	VOC		128.255	33.1285	-2.4527E+03	-9.2016E+00	-4.7077E-10	4.1755E-06	-146.20	420.80	68.00	5.0720	0.054%	0.054%	0.009%	0.055%
Trimethylcyclohexane (1,1,4-)	VOC		126.239	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.000%	0.000%	0.000%	0.000%
Tetramethylpentane (2,2,3,3-)	VOC		128.255	35.4216	-3.2760E+03	-9.5678E+00	9.0298E-10	2.4355E-06	14.00	640.40	68.00	0.1369	0.370%	0.370%	0.002%	0.010%
Ethylbenzene	VOC	X	106.165	36.1998	-3.3402E+03	-9.7970E+00	-1.1467E-11	2.5758E-06	-139.00	651.20	68.00	0.1388	0.576%	0.476%	0.003%	0.013%
Trimethylhexane (2,3,4-)	VOC		128.255	33.1285	-2.4527E+03	-9.2016E+00	-4.7077E-10	4.1755E-06	-146.20	420.80	68.00	5.0720	0.010%	0.010%	0.002%	0.010%
Trimethylcyclohexane (1,t-2,t-4-)	VOC		126.239	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.000%	0.000%	0.000%	0.000%
Dimethylheptane (2,3-)	VOC		128.255	33.1285	-2.4527E+03	-9.2016E+00	-4.7077E-10	4.1755E-06	-146.20	420.80	68.00	5.0720	0.000%	0.000%	0.000%	0.000%
Trimethylcyclohexane (1,c-3,t-5-)	VOC		126.239	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.000%	0.000%	0.000%	0.000%
Xylene (m-)	VOC	X	106.165	34.6803	-3.2981E+03	-9.2570E+00	-4.3563E-10	-2.4103E-06	-54.40	649.40	68.00	0.0468	3.491%	2.887%	0.006%	0.027%
Xylene (p-)	VOC	X	106.165	60.0531	-4.0159E+03	-1.9441E+01	8.2881E-03	-2.3647E-12	55.40	649.40	68.00	0.1277	3.491%	2.887%	0.015%	0.074%
Dimethylheptane (3,4-)	VOC		128.255	33.1285	-2.4527E+03	-9.2016E+00	-4.7077E-10	4.1755E-06	-146.20	420.80	68.00	5.0720	0.130%	0.130%	0.023%	0.133%
Methyloctane (2-)	VOC		128.255	6.0191	-2.8579E+03	3.4068E+00	-1.6572E-02	9.8047E-06	-112.00	597.20	68.00	0.0881	1.109%	1.108%	0.003%	0.020%
Methyloctane (4-)	VOC		128.255	11.2012	-2.9467E+03	1.2133E+00	-1.4423E-02	9.1770E-06	-171.40	599.00	68.00	0.0974	1.109%	1.108%	0.004%	0.022%
Dimethylheptane (3,4-)	VOC		128.255	33.1285	-2.4527E+03	-9.2016E+00	-4.7077E-10	4.1755E-06	-146.20	420.80	68.00	5.0720	0.000%	0.000%	0.000%	0.000%
Methyloctane (3-)	VOC		128.255	9.8147	-2.9609E+03	1.9061E+00	-1.5675E-02	9.7961E-06	-160.60	602.60	68.00	0.0889	0.000%	0.000%	0.000%	0.000%
Butylcyclopentane (i-)	VOC		126.239	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.000%	0.000%	0.000%	0.000%
Trimethylcyclohexane (1,t-2,c-3-)	VOC		126.239	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.328%	0.322%	0.000%	0.001%
Trimethylcyclohexane (1,t-2,c-4-)	VOC		126.239	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.328%	0.322%	0.000%	0.001%
Xylene (o-)	VOC	X	106.165	37.2413	-3.4573E+03	-1.0126E+01	9.0676E-11	2.6123E-06	-13.00	674.60	68.00	0.0946	0.776%	0.641%	0.003%	0.012%
Trimethylcyclohexane (1,1,2-)	VOC		126.239	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.000%	0.000%	0.000%	0.000%
Trimethylcyclohexane (1,c-2,t-4-)	VOC		126.239	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.284%	0.279%	0.000%	0.001%
Trimethylcyclohexane (1,c-2,c-4-)	VOC		126.239	11.0144	-2.9801E+03	2.7007E-01	-6.7946E-03	3.5409E-06	-63.40	734.00	68.00	0.0130	0.000%	0.000%	0.000%	0.000%
Nonane (n-)	VOC		128.255	8.8817	-2.8042E+03	1.5262E+00	-1.0464E-02	5.7972E-06	-63.40	613.40	68.00	0.0627	4.089%	4.086%	0.009%	0.051%
Unknowns	VOC		283.170	116.5157	-8.0140E+03	-3.8799E+01	1.3398E-02	-4.4444E-13	50.00	813.20	68.00	0.0000	15.292%	33.734%	0.000%	0.000%
Residual Liquid	Liquid		128.362 lb/lb-mol	Vapor	68.00 °F		29.1420 psia		21.907 lb/lb-mol				100.000%	100.000%	100.000%	100.000%
TOC (Total)			128.394 lb/lb-mol		68.00 °F		28.8362 psia		21.664 lb/lb-mol				99.962%	99.987%	98.913%	97.817%
VOC (Total)			129.116 lb/lb-mol		68.00 °F		2.8403 psia		63.095 lb/lb-mol				99.276%	99.859%	9.676%	27.868%
HAP (Total)			95.690 lb/lb-mol		68.00 °F		0.6569 psia		86.481 lb/lb-mol				19.507%	14.542%	0.440%	1.736%
Xylenes			106.165 lb/lb-mol		68.00 °F		0.0880 psia		106.165 lb/lb-mol				7.757%	6.416%	0.023%	0.114%

NOTES

- Liquid composition of residual liquid based on SPL flash analysis (see TABLE E-3c).
- Vapor pressure data for unknowns based on: Pentadecane (n-)

TABLE F-8
Volatile Organic Liquids Storage Tanks
Hourly and Annual Emission Estimates
Standing & Working Losses

Source	OXFO-SV-V20				
Service	Pipeline Liquids				
Capacity	173 gal			173 gal	
Temperature of Stored Liquid	59.93 °F			84.72 °F	
Vapor Pressure	5.2442 psia			8.1944 psia	
Pumping Rate	150 gal/min			150 gal/min	
Throughput	1.15 turnover/yr				
	200 gal/yr			173 gal/hr	
Standing Losses				July	
				744 hrs/month	
				13.2830 lbs/month	
	88.8927 lb/yr			0.0179 lb/hr	
Working Losses	8.24E-03 lb/gal			1.04E-02 lb/gal	
	1.6482 lb/yr	Average	Maximum	1.8073 lb/hr	Maximum
Residual Liquid	Stand	0.0364 lb/hr	0.1595 tpy	358.84% by weight	0.0641 lb/hr
	Work	0.0007 lb/hr	0.0030 tpy		6.4854 lb/hr
	Total	0.0371 lb/hr	0.1624 tpy		6.5495 lb/hr
CO _{2e}	5398.27% by weight	0.5579 lb/hr	2.4438 tpy	5398.27% by weight	99 lb/hr
CO ₂	7.83% by weight	0.0008 lb/hr	0.0035 tpy	7.83% by weight	0.1430 lb/hr
TOC (Total)	351.00% by weight	0.0363 lb/hr	0.1589 tpy	351.00% by weight	6.4065 lb/hr
Methane	215.62% by weight	0.0223 lb/hr	0.0976 tpy	215.62% by weight	3.9354 lb/hr
Ethane	35.39% by weight	0.0037 lb/hr	0.0160 tpy	35.39% by weight	0.6459 lb/hr
VOC (Total)	100.00% by weight	0.0103 lb/hr	0.0453 tpy	100.00% by weight	1.8252 lb/hr
HAP (Total)	6.23% by weight	0.0006 lb/hr	0.0028 tpy	6.23% by weight	0.1137 lb/hr
Benzene	1.5063% by weight	1.56E-04 lb/hr	6.82E-04 tpy	1.5063% by weight	2.75E-02 lb/hr
Ethylbenzene	0.0477% by weight	4.93E-06 lb/hr	2.16E-05 tpy	0.0477% by weight	8.70E-04 lb/hr
Hexane (n-)	2.8866% by weight	2.98E-04 lb/hr	1.31E-03 tpy	2.8866% by weight	5.27E-02 lb/hr
Methanol					
Naphthalene					
Toluene	1.3668% by weight	1.41E-04 lb/hr	6.19E-04 tpy	1.3668% by weight	2.49E-02 lb/hr
Trimethylpentane (2,2,4-)	0.0139% by weight	1.44E-06 lb/hr	6.29E-06 tpy	0.0139% by weight	2.53E-04 lb/hr
Xylenes	0.4073% by weight	4.21E-05 lb/hr	1.84E-04 tpy	0.4073% by weight	7.43E-03 lb/hr

NOTES

1. Tank Characteristics:		TANKS 4.09d			
Orientation	Vertical Fixed Roof Tank		Above Ground?	Yes	
Height/Length	9.67 ft	9.67 ft	Shell/Roof Color	Gray/Medium	or less solar absorptance
Diameter	3.00 ft		Shell Condition	Good	
Capacity (estimated)	511 gal		Vacuum Setting	-0.03 psig	
Capacity (nominal)	520 gal		Pressure Setting	0.03 psig	
2. Stored Liquid Characteristics:					
Basis	USEPA TANKS 4.09d	MET Station:	Bridgeport, Connecticut		
Material	Gasoline (RVP 10)	Selection based on VOC vapor pressure (see TABLE F-1).			
Liquid Molecular Weight	92.00 lb/lb-mol	Vapor Molecular Weight		66.00 lb/lb-mol	
Monthly Data	Days	Vapor Pressure		Liquid Surface Temperature	
		avg	max	avg	max
January	31	3.9723	4.4287	46.61	51.99
February	28	4.1361	4.7229	48.59	55.22
March	31	4.5970	5.4043	53.86	62.14
April	30	5.1707	6.2662	59.85	69.95
May	31	5.7725	7.1086	65.59	76.79
June	30	6.3213	7.8568	70.42	82.34
July	31	6.6353	8.1944	73.03	84.72
August	31	6.4635	7.8475	71.61	82.28
September	30	5.9072	7.0232	66.81	76.13
October	31	5.2206	6.0452	60.35	68.03
November	30	4.6146	5.1519	54.05	59.66
December	31	4.1198	4.5331	48.40	53.16
ALL	365	5.2442	8.1944	59.93	84.72
3. Emission Estimate Basis:		USEPA TANKS 4.09d	&	TCEQ RG-166/01	
4. Speciation of emissions is based on vapor weight percentages in TABLE F-1 normalized on VOC to assure methodology is conservative.					

TABLE F-4
Volatile Organic Liquids Storage Tanks
Hourly and Annual Emission Estimates
Standing & Working Losses

Source	OXFO-TK-V05				
Service	Pipeline Liquids				
Capacity	2,260 gal			2,260 gal	
Temperature of Stored Liquid	59.93 °F			84.72 °F	
Vapor Pressure	5.2442 psia			8.1944 psia	
Pumping Rate	150 gal/min			150 gal/min	
Throughput	2.00 turnover/yr				
	4,520 gal/yr			2,260 gal/hr	
Standing Losses				July	
				744 hrs/month	
				81.9911 lbs/month	
	540.9359 lb/yr			0.1102 lb/hr	
Working Losses	8.24E-03 lb/gal			1.04E-02 lb/gal	
	37.2491 lb/yr	Average	Maximum	23.5648 lb/hr	Maximum
Residual Liquid	Stand	0.2216 lb/hr	0.9705 tpy	358.84% by weight	0.3955 lb/hr
	Work	0.0153 lb/hr	0.0668 tpy		84.5596 lb/hr
	Total	0.2368 lb/hr	1.0374 tpy		84.9550 lb/hr
CO _{2e}	5398.27% by weight	3.5630 lb/hr	15.6060 tpy	5398.27% by weight	1.278 lb/hr
CO ₂	7.83% by weight	0.0052 lb/hr	0.0226 tpy	7.83% by weight	1.8546 lb/hr
TOC (Total)	351.00% by weight	0.2317 lb/hr	1.0147 tpy	351.00% by weight	83.1004 lb/hr
Methane	215.62% by weight	0.1423 lb/hr	0.6233 tpy	215.62% by weight	51.0475 lb/hr
Ethane	35.39% by weight	0.0234 lb/hr	0.1023 tpy	35.39% by weight	8.3779 lb/hr
VOC (Total)	100.00% by weight	0.0660 lb/hr	0.2891 tpy	100.00% by weight	23.6750 lb/hr
HAP (Total)	6.23% by weight	0.0041 lb/hr	0.0180 tpy	6.23% by weight	1.4746 lb/hr
Benzene	1.5063% by weight	9.94E-04 lb/hr	4.35E-03 tpy	1.5063% by weight	3.57E-01 lb/hr
Ethylbenzene	0.0477% by weight	3.15E-05 lb/hr	1.38E-04 tpy	0.0477% by weight	1.13E-02 lb/hr
Hexane (n-)	2.8866% by weight	1.91E-03 lb/hr	8.35E-03 tpy	2.8866% by weight	6.83E-01 lb/hr
Methanol					
Naphthalene					
Toluene	1.3668% by weight	9.02E-04 lb/hr	3.95E-03 tpy	1.3668% by weight	3.24E-01 lb/hr
Trimethylpentane (2,2,4-)	0.0139% by weight	9.16E-06 lb/hr	4.01E-05 tpy	0.0139% by weight	3.29E-03 lb/hr
Xylenes	0.4073% by weight	2.69E-04 lb/hr	1.18E-03 tpy	0.4073% by weight	9.64E-02 lb/hr

NOTES

1. Tank Characteristics:		TANKS 4.09d			
Orientation	Vertical Fixed Roof Tank	Above Ground?	Yes	or less solar absorptance	
Height/Length	6.00 ft	Shell/Roof Color	Gray/Medium		
Diameter	8.00 ft	Shell Condition	Good		
Capacity (estimated)	2,256 gal	Vacuum Setting	-0.03 psig		
Capacity (nominal)	2,260 gal	Pressure Setting	0.03 psig		
2. Stored Liquid Characteristics:					
Basis	USEPA TANKS 4.09d	MET Station:	Bridgeport, Connecticut		
Material	Gasoline (RVP 10)	Selection based on VOC vapor pressure (see TABLE F-1).			
Liquid Molecular Weight	92.00 lb/lb-mol	Vapor Molecular Weight	66.00 lb/lb-mol		
Monthly Data	Days	Vapor Pressure	Liquid Surface Temperature	TANKS Output	TANKS Flow
		avg	avg	standing	working
January	31	3.9723	46.61	18.0502	14.1072
February	28	4.1361	48.59	21.3118	14.6892
March	31	4.5970	53.86	33.9652	16.3259
April	30	5.1707	59.85	47.1555	18.3635
May	31	5.7725	65.59	63.3601	20.5005
June	30	6.3213	70.42	75.0165	22.4496
July	31	6.6353	73.03	81.9911	23.5648
August	31	6.4635	71.61	71.5987	22.9547
September	30	5.9072	66.81	52.5411	20.9792
October	31	5.2206	60.35	37.2902	18.5405
November	30	4.6146	54.05	22.0665	16.3884
December	31	4.1198	48.40	16.5891	14.6313
ALL	365	5.2442	59.93	540.9359	223.4946
3. Emission Estimate Basis:		USEPA TANKS 4.09d & TCEQ RG-166/01			
4. Speciation of emissions is based on vapor weight percentages in TABLE F-1 normalized on VOC to assure methodology is conservative.					

TABLE F-5
Volatile Organic Liquids Storage Tanks
Hourly and Annual Emission Estimates
Standing & Working Losses

Source		OXFO-TK-OW01						
Service		Oil						
Capacity		570 gal			570 gal			
Temperature of Stored Liquid		59.93 °F			84.72 °F			
Vapor Pressure		0.0067 psia			0.0139 psia			
Pumping Rate		150 gal/min			150 gal/min			
Throughput		12.00 turnover/yr						
		6,840 gal/yr			570 gal/hr			
Standing Losses					July			
					744 hrs/month			
					0.0241 lbs/month			
		0.1571 lb/yr			0.00003 lb/hr			
Working Losses		2.09E-05 lb/gal			3.07E-05 lb/gal			
		0.1427 lb/yr		Average	Maximum	Maximum		
Liquid	Stand	100.00% by weight	0.0000 lb/hr	0.0001 tpy	100.00% by weight	0.0000 lb/hr		
	Work		0.0000 lb/hr	0.0001 tpy		0.0175 lb/hr		
	Total		0.0000 lb/hr	0.0001 tpy		0.0175 lb/hr		
TOC (Total)		100.00% by weight	0.0000 lb/hr	0.0001 tpy	100.00% by weight	0.0175 lb/hr		
Methane								
Ethane								
VOC (Total)		100.00% by weight	0.0000 lb/hr	0.0001 tpy	100.00% by weight	0.0175 lb/hr		
HAP (Total)								
Benzene								
Ethylbenzene								
Hexane (n-)								
Methanol								
Naphthalene								
Toluene								
Trimethylpentane (2,2,4-)								
Xylenes								
NOTES								
1. Tank Characteristics:		TANKS 4.09d						
Orientation	Vertical Fixed Roof Tank		Above Ground?		Yes	or less solar absorptance		
Height/Length	6.00 ft		Shell/Roof Color		Gray/Medium			
Diameter	4.00 ft		Shell Condition		Good			
Capacity (estimated)	564 gal		Vacuum Setting		-0.03 psig			
Capacity (nominal)	570 gal		Pressure Setting		0.03 psig			
2. Stored Liquid Characteristics:								
Basis	USEPA TANKS 4.09d		MET Station:		Bridgeport, Connecticut			
Material	Distillate fuel oil no. 2		Selected purely for a worst-case scenario.					
Liquid Molecular Weight	188.00 lb/lb-mol		Vapor Molecular Weight		130.00 lb/lb-mol			
Monthly Data	Days	Vapor Pressure		Liquid Surface Temperature		TANKS Output	TANKS	
		avg	max	avg	max	standing	working	Flow
January	31	0.0040	0.0049	46.61	51.99	0.0047	0.0071	570
February	28	0.0043	0.0055	48.59	55.22	0.0057	0.0076	570
March	31	0.0053	0.0070	53.86	62.14	0.0096	0.0093	570
April	30	0.0065	0.0090	59.85	69.95	0.0138	0.0114	570
May	31	0.0079	0.0110	65.59	76.79	0.0189	0.0139	570
June	30	0.0091	0.0129	70.42	82.34	0.0222	0.0161	570
July	31	0.0099	0.0139	73.03	84.72	0.0241	0.0175	570
August	31	0.0095	0.0129	71.61	82.28	0.0211	0.0167	570
September	30	0.0082	0.0108	66.81	76.13	0.0156	0.0145	570
October	31	0.0066	0.0085	60.35	68.03	0.0108	0.0116	570
November	30	0.0053	0.0064	54.05	59.66	0.0061	0.0094	570
December	31	0.0043	0.0051	48.40	53.16	0.0043	0.0075	570
ALL	365	0.0067	0.0139	59.93	84.72	0.1571	0.1427	6,840
3. Emission Estimate Basis:		USEPA TANKS 4.09d		& TCEQ RG-166/01				
4. There is no basis for speciation of emissions.								

TABLE F-6
Volatile Organic Liquids Loading (Tanker Trucks)
Hourly and Annual Emission Estimates

Source	OXFO-TL-PL				
Supply Vessel	OXFO-TK-V05				
	Pipeline Liquids				
	2,260 gal			2,260 gal	
Tanker Truck Service	Dedicated Normal			Dedicated Normal	
Loading Method	Submerged			Submerged	
Saturation Factor	0.60 n.d.			0.60 n.d.	
Vapor Molecular Weight	66.00 lb/lb-mol			66.00 lb/lb-mol	
Bulk Liquid Temperature	59.93 °F			84.72 °F	
	519.93 R			544.72 R	
Vapor Pressure	5.2442 psia			8.1944 psia	
Loading Loss Factor	4.9768 lb/kgal			7.4227 lb/kgal	
Pumping Rate				150 gpm	
Throughput	2.00 turnover/yr				
	4,520 gal/yr			2,260 gal/hr	
Loading Losses	22.4952 lb/yr	Average	Maximum	16.7753 lb/hr	Maximum
Residual Liquid	358.84% by weight	0.0092 lb/hr	0.0404 tpy	358.84% by weight	60.1963 lb/hr
CO _{2-c}	5398.27% by weight	0.1386 lb/hr	0.6072 tpy	5398.27% by weight	905.5767 lb/hr
CO ₂	7.83% by weight	0.0002 lb/hr	0.0009 tpy	7.83% by weight	1.3141 lb/hr
TOC (Total)	351.00% by weight	0.0090 lb/hr	0.0395 tpy	351.00% by weight	58.8821 lb/hr
Methane	215.62% by weight	0.0055 lb/hr	0.0243 tpy	215.62% by weight	36.1705 lb/hr
Ethane	35.39% by weight	0.0009 lb/hr	0.0040 tpy	35.39% by weight	5.9363 lb/hr
VOC (Total)	100.00% by weight	0.0026 lb/hr	0.0112 tpy	100.00% by weight	16.7753 lb/hr
HAP (Total)	6.23% by weight	0.0002 lb/hr	0.0007 tpy	6.23% by weight	1.0449 lb/hr
Benzene	1.5063% by weight	3.87E-05 lb/hr	1.69E-04 tpy	1.5063% by weight	2.53E-01 lb/hr
Ethylbenzene	0.0477% by weight	1.22E-06 lb/hr	5.36E-06 tpy	0.0477% by weight	8.00E-03 lb/hr
Hexane (n-)	2.8866% by weight	7.41E-05 lb/hr	3.25E-04 tpy	2.8866% by weight	4.84E-01 lb/hr
Methanol					
Naphthalene					
Toluene	1.3668% by weight	3.51E-05 lb/hr	1.54E-04 tpy	1.3668% by weight	2.29E-01 lb/hr
Trimethylpentane (2,2,4-)	0.0139% by weight	3.57E-07 lb/hr	1.56E-06 tpy	0.0139% by weight	2.33E-03 lb/hr
Xylenes	0.4073% by weight	1.05E-05 lb/hr	4.58E-05 tpy	0.4073% by weight	6.83E-02 lb/hr

NOTES

- Emissions calculated using methods provided in USEPA, AP-42 Section 5.2 dated 1/95. $L_L = 12.46[(S)M_v/P/T]$
- Physical property, throughput and speciation data based data from supply vessel emission calculation spreadsheet.

TABLE F-7
Volatile Organic Liquids Loading (Tanker Trucks)
Hourly and Annual Emission Estimates

Source	OXFO-TL-OW				
Supply Vessel	OXFO-TK-OW01				
	Oil				
	570 gal			570 gal	
Tanker Truck Service	Dedicated Normal			Dedicated Normal	
Loading Method	Splash			Splash	
Saturation Factor	1.45 n.d.			1.45 n.d.	
Vapor Molecular Weight	130.00 lb/lb-mol			130.00 lb/lb-mol	
Bulk Liquid Temperature	59.93 °F			84.72 °F	
	519.93 R			544.72 R	
Vapor Pressure	0.0067 psia			0.0139 psia	
Loading Loss Factor	0.0304 lb/kgal			0.0599 lb/kgal	
Pumping Rate				150 gpm	
Throughput	12.00 turnover/yr				
	6,840 gal/yr			570 gal/hr	
Loading Losses	0.2082 lb/yr	Average	Maximum	0.0341 lb/hr	Maximum
Residual Liquid	100.00% by weight	0.00002 lb/hr	0.0001 tpy	100.00% by weight	0.0341 lb/hr
TOC (Total)	100.00% by weight	0.00002 lb/hr	0.0001 tpy	100.00% by weight	0.0341 lb/hr
Methane					
Ethane					
VOC (Total)	100.00% by weight	0.00002 lb/hr	0.0001 tpy	100.00% by weight	0.0341 lb/hr
HAP (Total)					
Benzene					
Ethylbenzene					
Hexane (n-)					
Methanol					
Naphthalene					
Toluene					
Trimethylpentane (2,2,4-)					
Xylenes					
NOTES					
1. Emissions calculated using methods provided in USEPA, AP-42 Section 5.2 dated 1/95. $L_L = 12.46[(S)M_V P/T]$					
2. Physical property, throughput and speciation data based data from supply vessel emission calculation spreadsheet.					

TABLE G-1Aa
Gas Releases
Hourly and Annual Emission Estimates

Category	Station Operations					
Source	OXFO-GR-ST			OXFO-GR-PL		
	Avg. Hourly	Max. Annual	Max. Hourly	Avg. Hourly	Max. Annual	Max. Hourly
Gas Release	5,351 scfh	46,875,083 scf/yr	3,013,546 scfh	1,341 scfh	11,750,155 scf/yr	4,700,062 scfh
	242 lb/hr	2,123,847 lb/yr	147,006 lb/hr	61 lb/hr	532,384 lb/yr	229,277 lb/hr
NO _x						
CO						
SO ₂						
PM _{10/2.5}						
CO _{2-e}	5,782 lb/hr	25,326 tpy	3,558,921 lb/hr	1,449 lb/hr	6,349 tpy	5,550,653 lb/hr
CO ₂	8.2596 lb/hr	36.1771 tpy	6,989.6158 lb/hr	2.0704 lb/hr	9.0685 tpy	10,901.3181 lb/hr
N ₂ O						
TOC (Total)	242 lb/hr	1,062 tpy	147,006 lb/hr	61 lb/hr	266 tpy	229,277 lb/hr
Methane	231 lb/hr	1,012 tpy	142,077 lb/hr	58 lb/hr	254 tpy	221,590 lb/hr
Ethane	31 lb/hr	135 tpy	28,758 lb/hr	8 lb/hr	34 tpy	44,852 lb/hr
VOC (Total)	5.3293 lb/hr	23.3423 tpy	13,961.5278 lb/hr	2.4857 lb/hr	10.8875 tpy	21,775.0245 lb/hr
VOC (non-HAP)	5.1665 lb/hr	22.6291 tpy	13,633.5578 lb/hr	2.4273 lb/hr	10.6318 tpy	21,263.5078 lb/hr
HAP (Total)	0.1628 lb/hr	0.7132 tpy	327.9700 lb/hr	0.0584 lb/hr	0.2558 tpy	511.5167 lb/hr
Acetaldehyde						
Acrolein						
Benzene	0.0445 lb/hr	0.1948 tpy	117.3210 lb/hr	0.0209 lb/hr	0.0915 tpy	182.9791 lb/hr
Biphenyl						
Butadiene (1,3-)						
Carbon Tetrachloride						
Chlorobenzene						
Chloroform						
Dichloropropene (1,3-)						
Ethylbenzene	0.0200 lb/hr	0.0875 tpy	18.0761 lb/hr	0.0050 lb/hr	0.0219 tpy	28.1922 lb/hr
Ethylene Dibromide						
Formaldehyde						
Hexane (n-)	0.0945 lb/hr	0.4141 tpy	327.9700 lb/hr	0.0584 lb/hr	0.2558 tpy	511.5167 lb/hr
Methanol						
Methylene Chloride						
Methylnaphthalene (2-)						
Naphthalene						
PAH						
Phenol						
Propylene Oxide						
Styrene						
Tetrachloroethane (1,1,2,2-)						
Toluene	0.0501 lb/hr	0.2194 tpy	101.8178 lb/hr	0.0181 lb/hr	0.0794 tpy	158.7996 lb/hr
Trichloroethane (1,1,2-)						
Trimethylpentane (2,2,4-)	0.0167 lb/hr	0.0731 tpy	10.1781 lb/hr	0.0042 lb/hr	0.0183 tpy	15.8742 lb/hr
Vinyl Chloride						
Xylenes	0.0607 lb/hr	0.2661 tpy	153.6466 lb/hr	0.0274 lb/hr	0.1198 tpy	239.6341 lb/hr

NOTES

- Gas release estimates based on engineering evaluation of several other compressor stations.
- Data used in estimates is based upon model deemed to be most representative of natural gas at the site.
There are five (5) models to choose from which are based on laboratory extended analysis of samples collected at various locations along Enbridge pipelines.
Selected Grouping of Available Samples: **PLQNG** Samples that conform with Tariff
Number of Samples in Grouping: 421
States Represented in Grouping: AR, CT, IN, KY, LA, MA, MD, ME, MO, MS, NJ, NS, NY, OH, OK, PA, RI, TN, TX, VA and WV
Dates Represented in Grouping: 2011 thru 2016
Selected Class for Grouping: **WC** → Selected Model: **PLQNG: WC**
- If necessary, customizations (SF) are applied to make the models more representative of natural gas at the site.

	Average		Maximum	
Upper Percentile Limit Applied:	90%	SF	100%	SF
Heating Value (BTU/scf)	1,069 BTU/scf	100%	1,109 BTU/scf	100%
Density (lb/scf) at USEPA Standard Conditions	0.0453 lb/scf	100%	0.0488 lb/scf	100%
VOC (Total)	2.20% by wt.	100%	9.50% by wt.	100%
HAP (Total)	0.07% by wt.	100%	0.22% by wt.	100%

TABLE H-1Ba
Piping Components
Hourly and Annual Emission Estimates

Source			OXFO-PC-NG				
Service			Gas				
			Natural Gas				
Minimum hours when component purged with inert gas			0 hrs/yr				
Component	Valves	Count	784 components				
		Emission Factor					
	Connectors	Count					
		Emission Factor					
	Flanges	Count					
		Emission Factor					
	Open-Ended Lines	Count					
		Emission Factor					
	Pump Seals	Count					
		Emission Factor					
	Other	Count	82 components				
		Emission Factor					
			Emissions				
			Avg. Hourly	Max. Annual	Max. Hourly		
Speciation	CO _{2-e}		2330.28% by weight	278.7077 lb/hr	1,220.7396 tpy	286.3126 lb/hr	
	CO ₂		2.22% by weight	0.2650 lb/hr	1.1605 tpy	0.5612 lb/hr	
	TOC (Total)		98.90% by weight	11.8284 lb/hr	51.8082 tpy	11.9059 lb/hr	
	Methane		93.123% by weight	11.1377 lb/hr	48.7832 tpy	11.4301 lb/hr	
	Ethane		9.001% by weight	1.0765 lb/hr	4.7152 tpy	1.5384 lb/hr	
	VOC (Total)		2.707% by weight	0.3238 lb/hr	1.4182 tpy	1.1016 lb/hr	
	VOC (non-HAP)		2.578% by weight	0.3083 lb/hr	1.3504 tpy	1.0327 lb/hr	
	HAP (Total)		0.129% by weight	0.0155 lb/hr	0.0677 tpy	0.0689 lb/hr	
	Benzene		0.028% by weight	3.32E-03 lb/hr	1.45E-02 tpy	1.68E-02 lb/hr	
	Ethylbenzene		0.007% by weight	8.42E-04 lb/hr	3.69E-03 tpy	3.56E-03 lb/hr	
	Hexane (n-)		0.074% by weight	8.84E-03 lb/hr	3.87E-02 tpy	5.62E-02 lb/hr	
	Methanol						
	Naphthalene						
	Toluene		0.023% by weight	2.70E-03 lb/hr	1.18E-02 tpy	1.42E-02 lb/hr	
	Trimethylpentane (2,2,4-)		0.001% by weight	1.02E-04 lb/hr	4.49E-04 tpy	7.66E-04 lb/hr	
	Xylenes		0.016% by weight	1.96E-03 lb/hr	8.57E-03 tpy	4.98E-03 lb/hr	

NOTES

1. Emission factors obtained from Table 2-4 (Oil & Gas Production Operations) of Protocol for Equipment Leak Emission Estimates (EPA 453/R-95-017). The average SOCMi w/o ethylene emission factor is used for pumps in heavy oil service (Table 2-1) since an emission factor isn't provided in Table 2-4.
2. Piping component counts based on design drawings for a similar compressor station.
3. The component type "Other" includes blowdown valves, relief valves, and compressor seals.
4. Weight percents based on gas analysis used to estimate gas release annual emissions (TABLE G-1B).
Maximum hourly emissions are based on the worst-case short-term weight percents even though the values are NOT presented.

TABLE H-1Bb Piping Components Hourly and Annual Emission Estimates								
Source			OXFO-PC-PL					
Service			Light Oil					
			Pipeline Liquids					
Minimum hours when component purged with inert gas			0 hrs/yr					
Component	Valves	Count	111 components					
		Emission Factor	2.50E-03 kg/hr/component					
	Connectors	Count	584 components					
		Emission Factor	2.10E-04 kg/hr/component					
	Flanges	Count	256 components					
		Emission Factor	1.10E-04 kg/hr/component					
	Open-Ended Lines	Count	38 components					
		Emission Factor	1.40E-03 kg/hr/component					
	Pump Seals	Count	1 components					
		Emission Factor	1.30E-02 kg/hr/component					
	Other	Count	1 components	Emissions				
		Emission Factor	7.50E-03 kg/hr/component	Avg. Hourly	Max. Annual	Max. Hourly		
Speciation	CO _{2-e}		0.96% by weight	0.0106 lb/hr	0.0465 tpy	0.0127 lb/hr		
	CO ₂		0.01% by weight	0.0001 lb/hr	0.0006 tpy	0.0002 lb/hr		
	TOC (Total)		99.99% by weight	1.1066 lb/hr	4.8467 tpy	1.3279 lb/hr		
	Methane		0.04% by weight	0.0004 lb/hr	0.0018 tpy	0.0005 lb/hr		
	Ethane		0.09% by weight	0.0010 lb/hr	0.0044 tpy	0.0012 lb/hr		
	VOC (Total)		99.86% by weight	1.1051 lb/hr	4.8405 tpy	1.3262 lb/hr		
	VOC (non-HAP)		85.32% by weight	0.9442 lb/hr	4.1356 tpy	1.1330 lb/hr		
	HAP (Total)		14.54% by weight	0.1609 lb/hr	0.7049 tpy	0.1931 lb/hr		
	Benzene		1.44% by weight	1.59E-02 lb/hr	6.98E-02 tpy	1.91E-02 lb/hr		
	Ethylbenzene		0.48% by weight	5.27E-03 lb/hr	2.31E-02 tpy	6.32E-03 lb/hr		
	Hexane (n-)		1.69% by weight	1.87E-02 lb/hr	8.21E-02 tpy	2.25E-02 lb/hr		
	Methanol							
	Naphthalene							
	Toluene		4.49% by weight	4.97E-02 lb/hr	2.18E-01 tpy	5.96E-02 lb/hr		
	Trimethylpentane (2,2,4-)		0.03% by weight	2.86E-04 lb/hr	1.25E-03 tpy	3.43E-04 lb/hr		
	Xylenes		6.42% by weight	7.10E-02 lb/hr	3.11E-01 tpy	8.52E-02 lb/hr		
NOTES								
1. Emission factors obtained from Table 2-4 (Oil & Gas Production Operations) of Protocol for Equipment Leak Emission Estimates (EPA 453/R-95-017). The average SOCMi w/o ethylene emission factor is used for pumps in heavy oil service (Table 2-1) since an emission factor isn't provided in Table 2-4. 2. Piping component counts based on design drawings for a similar compressor station. 3. The component type "Other" includes blowdown valves, relief valves, and compressor seals. 4. Weight percents based on composition estimate (TABLE F-1). 5. Maximum hourly emissions are based on 120% of the hourly emissions estimated in an effort to be conservative.								

TABLE H-1Bc
Piping Components
Hourly and Annual Emission Estimates

Source			OXFO-PC-OIL			
Service			Heavy Oil			
			Oil			
Minimum hours when component purged with inert gas			0 hrs/yr			
Component	Valves	Count	397 components			
		Emission Factor	8.40E-06 kg/hr/component			
	Connectors	Count	1,275 components			
		Emission Factor	7.50E-06 kg/hr/component			
	Flanges	Count	268 components			
		Emission Factor	3.90E-07 kg/hr/component			
	Open-Ended Lines	Count	0 components			
		Emission Factor	1.40E-04 kg/hr/component			
	Pump Seals	Count	27 components			
		Emission Factor	8.62E-03 kg/hr/component			
	Other	Count	5 components	Emissions		
		Emission Factor	3.20E-05 kg/hr/component	Avg. Hourly	Max. Annual	Max. Hourly
Speciation	CO _{2-e}					
	CO ₂					
	TOC (Total)		100.00% by weight	0.5420 lb/hr	2.3740 tpy	0.6504 lb/hr
	Methane					
	Ethane					
	VOC (Total)		100.00% by weight	0.5420 lb/hr	2.3740 tpy	0.6504 lb/hr
	VOC (non-HAP)		100.00% by weight	0.5420 lb/hr	2.3740 tpy	0.6504 lb/hr
	HAP (Total)					
	Benzene					
	Ethylbenzene					
	Hexane (n-)					
	Methanol					
	Naphthalene					
	Toluene					
	Trimethylpentane (2,2,4-)					
	Xylenes					

NOTES

1. Emission factors obtained from Table 2-4 (Oil & Gas Production Operations) of Protocol for Equipment Leak Emission Estimates (EPA 453/R-95-017). The emission factor for pumps in heavy oil service is obtained from Table 2-1.
2. Piping component counts based on design drawings for a similar compressor station.
3. The component type "Other" includes blowdown valves, relief valves, and compressor seals.
4. Weight percents based listed on MSDS.
5. Maximum hourly emissions are based on 120% of the hourly emissions estimated in an effort to be conservative.

TABLE H-1Bd
Piping Components
Hourly and Annual Emission Estimates

Source			OXFO-PC-EC			
Service			Water/Oil			
			Coolant			
Minimum hours when component purged with inert gas			0 hrs/yr			
Component	Valves	Count	0 components			
		Emission Factor	9.80E-05 kg/hr/component			
	Connectors	Count	0 components			
		Emission Factor	1.10E-04 kg/hr/component			
	Flanges	Count	0 components			
		Emission Factor	2.90E-06 kg/hr/component			
	Open-Ended Lines	Count	0 components			
		Emission Factor	2.50E-04 kg/hr/component			
	Pump Seals	Count	0 components			
		Emission Factor	2.40E-05 kg/hr/component			
	Other	Count	0 components	Emissions		
		Emission Factor	1.40E-02 kg/hr/component	Avg. Hourly	Max. Annual	Max. Hourly
Speciation	CO _{2-e}					
	CO ₂					
	TOC (Total)		60.00% by weight	0.0000 lb/hr	0.0000 tpy	0.0000 lb/hr
	Methane					
	Ethane					
	VOC (Total)		60.00% by weight	0.0000 lb/hr	0.0000 tpy	0.0000 lb/hr
	VOC (non-HAP)					
	HAP (Total)		60.00% by weight	0.0000 lb/hr	0.0000 tpy	0.0000 lb/hr
	Benzene					
	Ethylbenzene					
	Hexane (n-)					
	Methanol					
	Naphthalene					
	Toluene					
	Trimethylpentane (2,2,4-)					
	Xylenes					

NOTES

1. Emission factors obtained from Table 2-4 (Oil & Gas Production Operations) of Protocol for Equipment Leak Emission Estimates (EPA 453/R-95-017). The average SOCM I w/o ethylene emission factor is used for pumps in heavy oil service (Table 2-1) since an emission factor isn't provided in Table 2-4.
2. Piping component counts based on design drawings for a similar compressor station.
3. The component type "Other" includes blowdown valves, relief valves, and compressor seals.
4. Weight percents based listed on MSDS.
5. Maximum hourly emissions are based on 120% of the hourly emissions estimated in an effort to be conservative.

TABLE I-1
Parts Washer
Hourly and Annual Emission Estimates

Solvent			Eversol 143			
Solvent Density			6.84 lb/gal			
Potential Make-up Solvent Requirement	Hourly	Maximum	0.3288 gal/hr			
		Average	0.0137 gal/hr			
	Annual		120.00 gal/yr	Emissions		
Speciation				Avg. Hourly	Max. Hourly	Max. Annual
	TOC (Total)		100.00% by weight	0.0937 lb/hr	2.2484 lb/hr	0.4103 tpy
	Methane					
	Ethane					
	VOC (Total)		100.00% by weight	0.0937 lb/hr	2.2484 lb/hr	0.4103 tpy
	HAP (Total)					
	Benzene					
	Ethylbenzene					
	Hexane (n-)					
	Naphthalene					
	Toluene					
	Trimethylpentane (2,2,4-)					
	Xylenes					

NOTES

1. Although emissions are estimated based on the physical properties and chemical speciation of Eversol 143, other solvents may be used as long as the represented solvent density and chemical species weight percents are not exceeded. MSDS indicate that the vapor pressure at 100°F is less than 5 mmHg (0.097 psia).
2. Potential maximum annual solvent make-up is based on past experience and a safety factor.
3. Potential maximum hourly solvent make-up is the potential maximum annual solvent make-up divided by 365 day/yr.
4. Potential average hourly solvent make-up is the potential maximum annual solvent make-up divided by 8,760 hrs/yr.