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## Memorandum

**To:** Seng Phouthakoun, Rickey Bouffard, and Jacob Felton  
(CTDEEP)  
**From:** James Ryan  
Project Engineer  
**Subject:** AGT Cromwell VOC RACT Plan – Response to Connecticut Department of  
Energy & Environmental Protection (CTDEEP) Requests  
**Date:** February 22, 2023  
**CC:** Barry Goodrich (Enbridge), Caitlin Shaw (Enbridge), Phillip Wiedenfeld  
(Enbridge), Kate Brown (Enbridge), Albert Wilder (TRC),  
**Project No.:** 505556

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This memorandum provides responses to information requested by Seng Phouthakoun on January 9, 2023. The requested information regards the VOC RACT Compliance Plan submitted to CTDEEP on December 20, 2021, for the Algonquin Cromwell Compressor Station (the Facility). TRC provided a memorandum to CTDEEP on March 15, 2022, which provided additional information in response to a CTDEEP request.

### Supporting Emissions Calculations

**a) Supporting emissions calculations for “Tanks (not including lube oil) PTE determination (model inputs/outputs, prob from TANKS).”**

A summary of the tank VOC PTE is provided in Table 1. The supporting calculations are provided in Attachment 1. All tank emissions include standing and working losses and the process vessels include flash emissions. Flash emissions are included as the potential for them to occur does exist, but most of the liquid in the vessel is condensed moisture from the pipeline gas due to the temperature drop caused by pressure drop during operation.

New Source Performance Standard OOOOa (NSPS OOOOa) defines storage vessels as tanks or other vessels that “contains an accumulation of crude oil, condensate, intermediate hydrocarbon liquids, or produced water, and that is constructed primarily of non-earthen materials (such as wood, concrete, steel, fiberglass, or plastic) which provide structural support” and excludes process vessels.

The only vessel that meets this definition at Cromwell is TK-V5. All other vessels either contain other fluids or are process vessels at the site. Algonquin proposed grouping all vessels together to compare to the 6 tpy limit for VOC. As noted below, the emissions are still far below the applicability threshold. Storage vessels are defined the same under NSPS OOOOa and NSPS OOOOc.

The following conservative assumptions regarding materials stored in the process vessels and storage tanks are provided below as well as in the supporting calculations in Attachment 1.

- Vessels and tanks storing pipeline liquids are assumed to be storing gasoline which is an extremely conservative assumption as these vessels store very minimal amounts of pipeline liquids on an annual basis.
- The oil storage tanks, and oily water storage tanks are all conservatively assumed to be storing distillate fuel oil No. 2.
- The coolant tanks were conservatively assumed to be storing propylene glycol.

**Table 1 – Tank VOC PTE**

ID	Description	Rated Capacity		Annual VOC PTE (tpy)	Supporting Calculations	NSPS OOOOa Applicability?
			gal			
CROM TK V1C1	Process Vessel	218	gal	0.0759	TABLE F-1AA and TABLE E-1AA	No
CROM TK V1C2	Process Vessel	218	gal	0.0759	TABLE F-1AB and TABLE E-1AB	No
CROM TK V1C3	Process Vessel	218	gal	0.0759	TABLE F-1AC and TABLE E-1AC	No
CROM TK V2A	Process Vessel	218	gal	0.0906	TABLE F-1BA and TABLE E-1BA	No
CROM TK V2B	Process Vessel	940	gal	0.3940	TABLE F-1BB and TABLE E-1BB	No
CROM TK V5	Storage Tank	2,940	gal	0.4395	TABLE F-1C	Yes
CROM TK OIL1	Storage Tank	750	gal	0.0020	TABLE F-1D	No
CROM TK OIL2	Storage Tank	1,000	gal	0.0026	TABLE F-1E	No
CROM TK OW1	Storage Tank	1,000	gal	0.0038	TABLE F-1F	No
CROM TK EC1	Storage Tank	2,790	gal	0.0009	TABLE F-1G	No
CROM TK EC2	Storage Tank	350	gal	0.0001	TABLE F-1H	No
<b>Total</b>				<b>1.2 tpy</b>		

**b) Supporting emissions calculations for “Intermittent-bleed valves- EF and # of such valves on site.”**

A summary of the emissions calculations for the intermittent bleed valves (pneumatic actuators) is provided in Table 2.

**Table 2 - Pneumatic Actuator PTE**

Actuator	Number of Actuators	Total Gas Vented (scf/yr)	Annual VOC PTE (tpy)
Shafer - 6.5 X 8	8	6,000	0.003
Shafer - 9 X 12	3	5,000	0.002
Shafer - 12.5 X 8	11	408,000	0.203
Shafer - 12.5 X 12	36	274,000	0.136
Shafer - 14.5 X 16	6	84,000	0.042
Shafer - 16.5 X 16	1	69,000	0.034
Becker	1	2,000	0.001
<b>Totals</b>		<b>848,000</b>	<b>0.5</b>

Annual gas venting volume from pneumatic actuators is dependent upon two values, the volume of gas venting per actuation, and the number of actuations per year. The above table

represents an approximation of the upper limit on venting from all actuators at the station. As described in the March 15, 2022 memo, VOC emissions from gas venting are quantified by applying the VOC content of the gas, which can vary greatly based on the shippers' gas sources.

Thus, to calculate potential VOC emissions from gas venting, Algonquin assumes a VOC content of 2.2% by weight which is equivalent to the 90<sup>th</sup> percentile of analyzed samples collected across the entire Enbridge gas transportation system. To illustrate how conservative the represented emissions calculations are, the 2021 average measured VOC content of the gas in Algonquin's system was 0.12% by weight, as was reported in the March 15, 2022 memo.

**c) Supporting emissions calculations for “Compressor seals - EF and # of seals before switch.”**

As stated in the December 20, 2021 VOC RACT plan there have been two compressor units upgraded from wet to dry seals:

*“Wet seals result in higher natural gas leakage than dry seals. The **two (2)** oldest compressor units [EU-07, EU-08] at the Facility were installed with wet seals in 1985, but have since been upgraded to dry seal systems. The three (3) newest compressor units at the Facility [EU-09, EU-10, EU-11] were installed with dry seal systems. Dry seals are a compliance alternative to installing additional controls for wet seals (see NSPS OOOOa) and achieve a 95% reduction in VOC emissions compared to wet seals (USEPA, 2016). Properly operating dry seals represent RACT for these sources of VOC emissions. Therefore, no additional enhancements or work practice changes are proposed for these sources.”*

The last compressor upgrade was performed in conjunction with the NOx RACT program on EU-08 with two wet seals replaced with dry seals on EU-08. The emission estimates used to determine the VOC PTE reductions from replacing compressor seals provided in Table 3 utilize the same conservative assumption for gas VOC content as found in Section b) above.

**Table 3 – Compressor Seal PTE**

Type of Compressor Seal	Number of Seals Per Compressor	Annual Gas Released Per Seal (scf/yr)	Annual Total Gas Released (scf/yr)	Annual VOC PTE (tpy)
Dry	2	1,577,000	3,154,000	<b>1.6</b>
Wet	2	19,209,600	38,419,200	<b>19.1</b>

**d) Supporting emissions calculations for “Fugitive components w/ LDAR - for each component type (e.g., flange, thread, valve...) EF before LDAR, EF after LDAR control efficiency applied, and component count.”**

A summary of the VOC PTE calculations for fugitive components is provided in Table 4.

The methodology implemented for calculating fugitive emissions uses an estimated number of fugitive components by type, a population average emission factor for each, and an estimate of the speciation of the fugitive emissions. Details of the calculations are provided in the supporting calculations provided in Attachment 2. No control efficiency was applied to the emissions from fugitive components in the VOC RACT plan. Table 4 provides the uncontrolled VOC emissions as well as abated emissions assuming the 80% control efficiency derived from NSPS OOOOa and proposed in the VOC RACT plan.

Speciation assumptions used for each component service type (natural gas, pipeline liquids, and oil service) are as follows:

- For piping components in natural gas service see pneumatic actuator section regarding natural gas VOC content assumptions.
- For piping components in pipeline liquids service see Table H-1Bb. Algonquin conservatively assumes the components are in liquid service 8,760 hours per year, when in reality only small quantities of pipeline liquids are received at the facility intermittently. The last time liquids were received at the Cromwell station was approximately spring of 2016.
- For piping components in oil service see Table H-1Bc. Components are assumed to be leaking 8,760 hours per year when actually there are no leaks detected at these sources.

**Table 4 – Fugitive Components PTE**

ID	FIN	Description	Material	Annual VOC PTE (tpy)	Supporting Calculations
CROM PC	CROM PC NG	Piping Components	Natural Gas	1.3	TABLE H-1Ba
	CROM PC PL	Piping Components	Pipeline Liquids	5.5	TABLE H-1Bb
	CROM PC OIL	Piping Components	Oil	3.1	TABLE H-1Bc
<b>Total</b>				<b>9.9</b>	
<b>Total with 80% OOOOa Control</b>				<b>2.0</b>	

**e) Supporting emissions calculations for “Gas-powered starter - PTE assumptions.**

A summary of the VOC PTE calculations for the gas-powered starter is provided in Table 5. The emission estimates used to determine the VOC PTE reductions from replacing the gas-powered started provided in Table 5 utilize the same conservative assumption for gas VOC content as found in Section b) above.

**Table 5 - Gas Starter PTE**

Permitted Starts Per Year	Gas Released Per Start (scf)	Annual Gas Released (scf/yr)	VOC PTE (tpy)
312	15,000	4,680,000	<b>2.4</b>

**RACT Recommendations**

The following table was provided by CTDEEP as a summary of recommended RACT measures. Sections f) through k) address each recommended RACT measure.

<i>Emission Sources</i>	<i>Recommended RACT</i>
<i>Storage Vessel</i>	<i>Install an air pollution control if PTE VOC emissions are &gt; 6 TPY and also, the cumulative VOC emissions of all storage vessels are &gt; than 1.16 tons for each 12 consecutive months (2016 CTG O&amp;NG Industry &amp; proposed RACT Plan).</i>
<i>Pneumatic Controller (intermittent bleed)</i>	<i>Zero VOC emissions (proposed rule 40 CFR Part 60 Subpart OOOOc for methane -§60.541c(c)(1))</i>
<i>Blowdown (Station &amp; Unit)</i>	<i>No RACT requirement (no state or federal rules).</i>
<i>Compressor *seal  *Starter</i>	<i>*Dry Seals (2016 CTG O&amp;NG) and restrict volumetric flow rate to equal to or less than 3 scfm (proposed Subpart OOOOc - §60.5410c(c)(1) through (4)).  *Restrict to electric starter (proposed RACT Plan)</i>
<i>Fugitives piping components</i>	<i>Leak detection and repair (LDAR) program (Title V permit and Subpart OOOOa) and also, conduct monthly audio/visual/olfactory inspections (proposed Subpart OOOOc - §60.5397c(g)(iv)(A) and (B)).</i>

- f) *Storage Vessels: Install an air pollution control if PTE VOC emissions are > 6 TPY and also, the cumulative VOC emissions of all storage vessels are > than 1.16 tons for each 12 consecutive months (2016 CTG O&NG Industry & proposed RACT Plan).***

This Facility is compliant with this recommended RACT measure and has no comment.

- g) *Pneumatic Controller: (intermittent bleed): Zero VOC emissions (proposed rule 40 CFR Part 60 Subpart OOOOc for methane -§60.541c(c)(1)).***

40 CFR Part 60 Subpart OOOOc is a proposed Federal New Source Performance Standard which has not been finalized and is currently undergoing public comment prior to EPA finalizing the standard. Following the finalization of the NSPS OOOOc emission guidelines, each state must create regulations that meet EPA’s proposal. Following promulgation of the final NSPS OOOOc regulation, states are expected to take several years to develop and submit their plans. Following submittal, EPA will then review and potentially approve the plan.

As of February 19, 2023, over 800,000 comments on the proposed NSPS OOOOb/c rules had been received by the EPA. The Interstate Natural Gas Association of America submitted significant substantive comments on NSPS OOOOb/c which detail extensive revisions that need to be addressed prior to finalization of the regulation. Algonquin staff members contributed to the development of these comments, and it is evident that significant changes to the regulation are likely to occur before promulgation.

Due to the uncertainty of the final NSPS OOOOc requirements, as well as the expected timeline for implementation, requiring compliance with draft NSPS OOOOc requirements through the VOC RACT plan could potentially result in costly compliance issues when the final version of the regulation takes effect. Therefore, Algonquin respectfully requests that any NSPS OOOOc draft requirements be omitted from the RACT recommendation.

**h) *Blowdown (Station & Unit): No RACT requirement (no state or federal rules)***

With the 2019 upgrades to the Cromwell Compressor Station, blowdown emissions are now the largest single source of VOC emissions from the facility. Algonquin has proposed significant reductions in the potential emissions from these sources in our VOC RACT plan.

**i) *Compressor Seals: Dry Seals (2016 CTG O&NG) and restrict volumetric flow rate to equal to or less than 3 scfm (proposed Subpart OOOOc - §60.5410c(c)(1) through (4)).***

See response in Section g).

**j) *Compressor Starters: Restrict to electric starter (proposed RACT Plan)***

This RACT measure was proposed in the submitted VOC RACT plan and there is no comment.

**k) *Fugitives piping components: Leak detection and repair (LDAR) program (Title V permit and Subpart OOOOa) and also, conduct monthly audio/visual/olfactory inspections (proposed Subpart OOOOc - §60.5397c(g)(iv)(A) and (B)).***

See response in Section g).

# ATTACHMENT 1: TANK PTE SUPPORTING CALCULATIONS

**TABLE F-1AA**  
**Volatile Organic Liquids Storage Tanks**  
**Hourly and Annual Emission Estimates**  
**Standing & Working Losses**

Source	CROM-SV-V01C1					
Service	Pipeline Liquids					
Capacity	218 gal				218 gal	
Temperature of Stored Liquid	58.05 °F				84.96 °F	
Vapor Pressure	5.0625 psia				8.2300 psia	
Pumping Rate	135 gal/min				135 gal/min	
Throughput	0.20 turnover/yr					
	44 gal/yr				44 gal/hr	
Standing Losses					<b>July</b>	
					744 hrs/month	
					<b>21.1600</b> lbs/month	
Working Losses	<b>140.5300</b> lb/yr				0.0284 lb/hr	
	<b>7.96E-03</b> lb/gal			<b>1.02E-02</b> lb/gal		
	0.3461 lb/yr	Average	Maximum	0.4450 lb/hr	Maximum	
Residual Liquid	Stand Work Total	358.84% by weight	0.0576 lb/hr	0.2521 tpy	358.84% by weight	0.1021 lb/hr
			0.0001 lb/hr	0.0006 tpy		1.5968 lb/hr
			0.0577 lb/hr	0.2528 tpy		1.6989 lb/hr
CO <sub>2-c</sub>	5398.27% by weight	0.8681 lb/hr	3.8024 tpy	5398.27% by weight	26 lb/hr	
CO <sub>2</sub>	7.83% by weight	0.0013 lb/hr	0.0055 tpy	7.83% by weight	0.0371 lb/hr	
TOC (Total)	351.00% by weight	0.0564 lb/hr	0.2472 tpy	351.00% by weight	1.6618 lb/hr	
Methane	215.62% by weight	0.0347 lb/hr	0.1519 tpy	215.62% by weight	1.0208 lb/hr	
Ethane	35.39% by weight	0.0057 lb/hr	0.0249 tpy	35.39% by weight	0.1675 lb/hr	
VOC (Total)	100.00% by weight	0.0161 lb/hr	0.0704 tpy	100.00% by weight	0.4734 lb/hr	
HAP (Total)	6.23% by weight	0.0010 lb/hr	0.0044 tpy	6.23% by weight	0.0295 lb/hr	
Benzene	1.5063% by weight	2.42E-04 lb/hr	1.06E-03 tpy	1.5063% by weight	7.13E-03 lb/hr	
Ethylbenzene	0.0477% by weight	7.67E-06 lb/hr	3.36E-05 tpy	0.0477% by weight	2.26E-04 lb/hr	
Hexane (n-)	2.8866% by weight	4.64E-04 lb/hr	2.03E-03 tpy	2.8866% by weight	1.37E-02 lb/hr	
Methanol						
Naphthalene						
Toluene	1.3668% by weight	2.20E-04 lb/hr	9.63E-04 tpy	1.3668% by weight	6.47E-03 lb/hr	
Trimethylpentane (2,2,4-)	0.0139% by weight	2.23E-06 lb/hr	9.78E-06 tpy	0.0139% by weight	6.57E-05 lb/hr	
Xylenes	0.4073% by weight	6.55E-05 lb/hr	2.87E-04 tpy	0.4073% by weight	1.93E-03 lb/hr	

**NOTES**

1. Tank Characteristics:		TANKS 4.09d						
Orientation	Vertical Fixed Roof Tank	Above Ground?	Yes					
Height/Length	12.00 ft	Shell/Roof Color	Gray/Medium					
Diameter	3.50 ft	Shell Condition	Good					
Capacity (estimated)	864 gal	Vacuum Setting	-0.03 psig					
Capacity (nominal)	870 gal	Pressure Setting	0.03 psig					
2. Stored Liquid Characteristics:		USEPA TANKS 4.09d						
Basis	Gasoline (RVP 10)	MET Station:	Hartford, Connecticut					
Material	Gasoline (RVP 10)	Selection based on VOC vapor pressure (see TABLE F-0).						
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
		avg	max	avg	max	standing	working	Flow
January	31	3.7300	4.2100	43.60	49.55	4.7900	5.1000	870
February	28	3.9400	4.5700	46.32	53.58	5.6600	5.3900	870
March	31	4.4600	5.3100	52.34	61.22	8.8300	6.0900	870
April	30	5.0800	6.2700	58.99	70.04	12.5000	6.9500	870
May	31	5.7200	7.2100	65.11	77.64	17.0600	7.8200	870
June	30	6.2500	7.9300	69.82	82.89	19.4900	8.5400	870
July	31	6.5100	8.2300	72.01	84.96	21.1600	8.9000	870
August	31	6.2500	7.7500	69.86	81.62	18.0900	8.5500	870
September	30	5.6500	6.8600	64.49	74.84	13.3700	7.7300	870
October	31	4.9500	5.8400	57.64	66.24	9.6700	6.7700	870
November	30	4.3600	4.9200	51.23	57.30	5.6200	5.9600	870
December	31	3.8500	4.2800	45.14	50.33	4.2900	5.2600	870
ALL	365	5.0625	8.2300	58.05	84.96	140.5300	83.0600	10,440
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-0 normalized on VOC to assure methodology is conservative.								



**TABLE F-1AB**  
**Volatile Organic Liquids Storage Tanks**  
**Hourly and Annual Emission Estimates**  
**Standing & Working Losses**

Source	CROM-SV-V01C2				
Service	Pipeline Liquids				
Capacity	218 gal				218 gal
Temperature of Stored Liquid	58.05 °F				84.96 °F
Vapor Pressure	5.0625 psia				8.2300 psia
Pumping Rate	135 gal/min				135 gal/min
Throughput	0.20 turnover/yr				
	44 gal/yr				44 gal/hr
Standing Losses					<b>July</b>
					744 hrs/month
					<b>21.1600</b> lbs/month
	<b>140.5300</b> lb/yr				0.0284 lb/hr
Working Losses	<b>7.96E-03</b> lb/gal			<b>1.02E-02</b> lb/gal	
	0.3461 lb/yr	Average	Maximum	0.4450 lb/hr	Maximum
Residual Liquid	Stand Work Total	358.84% by weight	0.0576 lb/hr	0.2521 tpy	0.1021 lb/hr
			0.0001 lb/hr	0.0006 tpy	1.5968 lb/hr
			0.0577 lb/hr	0.2528 tpy	1.6989 lb/hr
CO <sub>2-c</sub>	5398.27% by weight	0.8681 lb/hr	3.8024 tpy	5398.27% by weight	26 lb/hr
CO <sub>2</sub>	7.83% by weight	0.0013 lb/hr	0.0055 tpy	7.83% by weight	0.0371 lb/hr
TOC (Total)	351.00% by weight	0.0564 lb/hr	0.2472 tpy	351.00% by weight	1.6618 lb/hr
Methane	215.62% by weight	0.0347 lb/hr	0.1519 tpy	215.62% by weight	1.0208 lb/hr
Ethane	35.39% by weight	0.0057 lb/hr	0.0249 tpy	35.39% by weight	0.1675 lb/hr
VOC (Total)	100.00% by weight	0.0161 lb/hr	0.0704 tpy	100.00% by weight	0.4734 lb/hr
HAP (Total)	6.23% by weight	0.0010 lb/hr	0.0044 tpy	6.23% by weight	0.0295 lb/hr
Benzene	1.5063% by weight	2.42E-04 lb/hr	1.06E-03 tpy	1.5063% by weight	7.13E-03 lb/hr
Ethylbenzene	0.0477% by weight	7.67E-06 lb/hr	3.36E-05 tpy	0.0477% by weight	2.26E-04 lb/hr
Hexane (n-)	2.8866% by weight	4.64E-04 lb/hr	2.03E-03 tpy	2.8866% by weight	1.37E-02 lb/hr
Methanol					
Naphthalene					
Toluene	1.3668% by weight	2.20E-04 lb/hr	9.63E-04 tpy	1.3668% by weight	6.47E-03 lb/hr
Trimethylpentane (2,2,4-)	0.0139% by weight	2.23E-06 lb/hr	9.78E-06 tpy	0.0139% by weight	6.57E-05 lb/hr
Xylenes	0.4073% by weight	6.55E-05 lb/hr	2.87E-04 tpy	0.4073% by weight	1.93E-03 lb/hr

**NOTES**

1. Tank Characteristics:		TANKS 4.09d						
Orientation	Vertical Fixed Roof Tank	Above Ground?	Yes					
Height/Length	12.00 ft	Shell/Roof Color	Gray/Medium					
Diameter	3.50 ft	Shell Condition	Good					
Capacity (estimated)	864 gal	Vacuum Setting	-0.03 psig					
Capacity (nominal)	870 gal	Pressure Setting	0.03 psig					
2. Stored Liquid Characteristics:		USEPA TANKS 4.09d MET Station: Hartford, Connecticut						
Material	Gasoline (RVP 10)	Selection based on VOC vapor pressure (see TABLE F-0).						
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
		avg	max	avg	max	standing	working	Flow
January	31	3.7300	4.2100	43.60	49.55	4.7900	5.1000	870
February	28	3.9400	4.5700	46.32	53.58	5.6600	5.3900	870
March	31	4.4600	5.3100	52.34	61.22	8.8300	6.0900	870
April	30	5.0800	6.2700	58.99	70.04	12.5000	6.9500	870
May	31	5.7200	7.2100	65.11	77.64	17.0600	7.8200	870
June	30	6.2500	7.9300	69.82	82.89	19.4900	8.5400	870
July	31	6.5100	8.2300	72.01	84.96	21.1600	8.9000	870
August	31	6.2500	7.7500	69.86	81.62	18.0900	8.5500	870
September	30	5.6500	6.8600	64.49	74.84	13.3700	7.7300	870
October	31	4.9500	5.8400	57.64	66.24	9.6700	6.7700	870
November	30	4.3600	4.9200	51.23	57.30	5.6200	5.9600	870
December	31	3.8500	4.2800	45.14	50.33	4.2900	5.2600	870
ALL	365	5.0625	8.2300	58.05	84.96	140.5300	83.0600	10,440
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-0 normalized on VOC to assure methodology is conservative.								

**TABLE F-1AC**  
**Volatile Organic Liquids Storage Tanks**  
**Hourly and Annual Emission Estimates**  
**Standing & Working Losses**

Source		CROM-SV-V01C3				
Service		Pipeline Liquids				
Capacity	218 gal			218 gal		
Temperature of Stored Liquid	58.05 °F		84.96 °F			
Vapor Pressure	5.0625 psia		8.2300 psia			
Pumping Rate	135 gal/min		135 gal/min			
Throughput	0.20 turnover/yr					
	44 gal/yr		44 gal/hr			
Standing Losses			<b>July</b>			
			744 hrs/month			
			<b>21.1600</b> lbs/month			
	<b>140.5300</b> lb/yr		0.0284 lb/hr			
Working Losses	<b>7.96E-03</b> lb/gal	<b>1.02E-02</b> lb/gal				
	0.3461 lb/yr	Average	Maximum	0.4450 lb/hr	Maximum	
Residual Liquid	Stand	358.84% by weight	0.0576 lb/hr	0.2521 tpy	358.84% by weight	0.1021 lb/hr
	Work		0.0001 lb/hr	0.0006 tpy		1.5968 lb/hr
	Total		0.0577 lb/hr	0.2528 tpy		1.6989 lb/hr
CO <sub>2-c</sub>	5398.27% by weight	0.8681 lb/hr	3.8024 tpy	5398.27% by weight	26 lb/hr	
CO <sub>2</sub>	7.83% by weight	0.0013 lb/hr	0.0055 tpy	7.83% by weight	0.0371 lb/hr	
TOC (Total)	351.00% by weight	0.0564 lb/hr	0.2472 tpy	351.00% by weight	1.6618 lb/hr	
Methane	215.62% by weight	0.0347 lb/hr	0.1519 tpy	215.62% by weight	1.0208 lb/hr	
Ethane	35.39% by weight	0.0057 lb/hr	0.0249 tpy	35.39% by weight	0.1675 lb/hr	
VOC (Total)	100.00% by weight	0.0161 lb/hr	0.0704 tpy	100.00% by weight	0.4734 lb/hr	
HAP (Total)	6.23% by weight	0.0010 lb/hr	0.0044 tpy	6.23% by weight	0.0295 lb/hr	
Benzene	1.5063% by weight	2.42E-04 lb/hr	1.06E-03 tpy	1.5063% by weight	7.13E-03 lb/hr	
Ethylbenzene	0.0477% by weight	7.67E-06 lb/hr	3.36E-05 tpy	0.0477% by weight	2.26E-04 lb/hr	
Hexane (n-)	2.8866% by weight	4.64E-04 lb/hr	2.03E-03 tpy	2.8866% by weight	1.37E-02 lb/hr	
Methanol						
Naphthalene						
Toluene	1.3668% by weight	2.20E-04 lb/hr	9.63E-04 tpy	1.3668% by weight	6.47E-03 lb/hr	
Trimethylpentane (2,2,4-)	0.0139% by weight	2.23E-06 lb/hr	9.78E-06 tpy	0.0139% by weight	6.57E-05 lb/hr	
Xylenes	0.4073% by weight	6.55E-05 lb/hr	2.87E-04 tpy	0.4073% by weight	1.93E-03 lb/hr	

**NOTES**

1. Tank Characteristics:		TANKS 4.09d						
Orientation	Vertical Fixed Roof Tank	Above Ground?	Yes					
Height/Length	12.00 ft	Shell/Roof Color	Gray/Medium or less solar absorptance					
Diameter	3.50 ft	Shell Condition	Good					
Capacity (estimated)	864 gal	Vacuum Setting	-0.03 psig					
Capacity (nominal)	870 gal	Pressure Setting	0.03 psig					
2. Stored Liquid Characteristics:		USEPA TANKS 4.09d MET Station: Hartford, Connecticut						
Basis	Gasoline (RVP 10)	Selection based on VOC vapor pressure (see TABLE F-0).						
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	3.7300	4.2100	43.60	49.55	4.7900	5.1000	870
February	28	3.9400	4.5700	46.32	53.58	5.6600	5.3900	870
March	31	4.4600	5.3100	52.34	61.22	8.8300	6.0900	870
April	30	5.0800	6.2700	58.99	70.04	12.5000	6.9500	870
May	31	5.7200	7.2100	65.11	77.64	17.0600	7.8200	870
June	30	6.2500	7.9300	69.82	82.89	19.4900	8.5400	870
July	31	6.5100	8.2300	72.01	84.96	21.1600	8.9000	870
August	31	6.2500	7.7500	69.86	81.62	18.0900	8.5500	870
September	30	5.6500	6.8600	64.49	74.84	13.3700	7.7300	870
October	31	4.9500	5.8400	57.64	66.24	9.6700	6.7700	870
November	30	4.3600	4.9200	51.23	57.30	5.6200	5.9600	870
December	31	3.8500	4.2800	45.14	50.33	4.2900	5.2600	870
ALL	365	5.0625	8.2300	58.05	84.96	140.5300	83.0600	10,440

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-0 normalized on VOC to assure methodology is conservative.

**TABLE F-1BA**  
**Volatile Organic Liquids Storage Tanks**  
**Hourly and Annual Emission Estimates**  
**Standing & Working Losses**

Source	CROM-SV-V02A				
Service	Pipeline Liquids				
Capacity	220 gal			220 gal	
Temperature of Stored Liquid	58.05 °F			84.96 °F	
Vapor Pressure	5.0625 psia			8.2300 psia	
Pumping Rate	135 gal/min			135 gal/min	
Throughput	2.53 turnover/yr				
	558 gal/yr			220 gal/hr	
Standing Losses				<b>July</b>	
				744 hrs/month	
				<b>5.6100</b> lbs/month	
	<b>37.1300</b> lb/yr			0.0075 lb/hr	
Working Losses	<b>7.94E-03</b> lb/gal			<b>1.02E-02</b> lb/gal	
	4.4290 lb/yr	Average	Maximum	2.2500 lb/hr	Maximum
Residual Liquid	Stand Work Total	358.84% by weight	0.0152 lb/hr	0.0666 tpy	0.0271 lb/hr
			0.0018 lb/hr	0.0079 tpy	8.0739 lb/hr
			0.0170 lb/hr	0.0746 tpy	8.1009 lb/hr
CO <sub>2-c</sub>	5398.27% by weight	0.2561 lb/hr	1.1217 tpy	5398.27% by weight	122 lb/hr
CO <sub>2</sub>	7.83% by weight	0.0004 lb/hr	0.0016 tpy	7.83% by weight	0.1768 lb/hr
TOC (Total)	351.00% by weight	0.0167 lb/hr	0.0729 tpy	351.00% by weight	7.9241 lb/hr
Methane	215.62% by weight	0.0102 lb/hr	0.0448 tpy	215.62% by weight	4.8676 lb/hr
Ethane	35.39% by weight	0.0017 lb/hr	0.0074 tpy	35.39% by weight	0.7989 lb/hr
VOC (Total)	100.00% by weight	0.0047 lb/hr	0.0208 tpy	100.00% by weight	2.2575 lb/hr
HAP (Total)	6.23% by weight	0.0003 lb/hr	0.0013 tpy	6.23% by weight	0.1406 lb/hr
Benzene	1.5063% by weight	7.15E-05 lb/hr	3.13E-04 tpy	1.5063% by weight	3.40E-02 lb/hr
Ethylbenzene	0.0477% by weight	2.26E-06 lb/hr	9.91E-06 tpy	0.0477% by weight	1.08E-03 lb/hr
Hexane (n-)	2.8866% by weight	1.37E-04 lb/hr	6.00E-04 tpy	2.8866% by weight	6.52E-02 lb/hr
Methanol					
Naphthalene					
Toluene	1.3668% by weight	6.48E-05 lb/hr	2.84E-04 tpy	1.3668% by weight	3.09E-02 lb/hr
Trimethylpentane (2,2,4-)	0.0139% by weight	6.59E-07 lb/hr	2.89E-06 tpy	0.0139% by weight	3.13E-04 lb/hr
Xylenes	0.4073% by weight	1.93E-05 lb/hr	8.46E-05 tpy	0.4073% by weight	9.20E-03 lb/hr

**NOTES**

1. Tank Characteristics:		TANKS 4.09d						
Orientation	Vertical Fixed Roof Tank			Above Ground?	Yes			
Height/Length	11.17 ft	11.17 ft		Shell/Roof Color	Gray/Medium		or less solar absorptance	
Diameter	1.83 ft	1.83 ft		Shell Condition	Good			
Capacity (estimated)	221 gal			Vacuum Setting	-0.03 psig			
Capacity (nominal)	220 gal			Pressure Setting	0.03 psig			
2. Stored Liquid Characteristics:								
Basis	USEPA TANKS 4.09d	MET Station:		Hartford, Connecticut				
Material	Gasoline (RVP 10)	Selection based on VOC vapor pressure (see TABLE F-0).						
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	3.7300	4.2100	43.60	49.55	1.2500	1.2900	220
February	28	3.9400	4.5700	46.32	53.58	1.4800	1.3600	220
March	31	4.4600	5.3100	52.34	61.22	2.3200	1.5400	220
April	30	5.0800	6.2700	58.99	70.04	3.3000	1.7500	220
May	31	5.7200	7.2100	65.11	77.64	4.5100	1.9700	220
June	30	6.2500	7.9300	69.82	82.89	5.1700	2.1600	220
July	31	6.5100	8.2300	72.01	84.96	5.6100	2.2500	220
August	31	6.2500	7.7500	69.86	81.62	4.8000	2.1600	220
September	30	5.6500	6.8600	64.49	74.84	3.5400	1.9500	220
October	31	4.9500	5.8400	57.64	66.24	2.5500	1.7100	220
November	30	4.3600	4.9200	51.23	57.30	1.4800	1.5000	220
December	31	3.8500	4.2800	45.14	50.33	1.1200	1.3300	220
ALL	365	5.0625	8.2300	58.05	84.96	37.1300	20.9700	2,640
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-0 normalized on VOC to assure methodology is conservative.

**TABLE F-1BB**  
**Volatile Organic Liquids Storage Tanks**  
**Hourly and Annual Emission Estimates**  
**Standing & Working Losses**

Source	CROM-SV-V02B				
Service	Pipeline Liquids				
Capacity	940 gal				940 gal
Temperature of Stored Liquid	58.05 °F				84.96 °F
Vapor Pressure	5.0625 psia				8.2300 psia
Pumping Rate	135 gal/min				135 gal/min
Throughput	2.53 turnover/yr				
	2,382 gal/yr				940 gal/hr
Standing Losses					<b>July</b>
					744 hrs/month
					<b>26.1200</b> lbs/month
	<b>172.2800</b> lb/yr				0.0351 lb/hr
Working Losses	<b>7.96E-03</b> lb/gal			<b>1.02E-02</b> lb/gal	
	18.9558 lb/yr	Average	Maximum	9.6100 lb/hr	Maximum
Residual Liquid	Stand Work Total	358.84% by weight	0.0706 lb/hr	0.3091 tpy	0.1260 lb/hr
			0.0078 lb/hr	0.0340 tpy	34.4844 lb/hr
			0.0783 lb/hr	0.3431 tpy	34.6103 lb/hr
CO <sub>2-c</sub>	5398.27% by weight	1.1785 lb/hr	5.1617 tpy	5398.27% by weight	521 lb/hr
CO <sub>2</sub>	7.83% by weight	0.0017 lb/hr	0.0075 tpy	7.83% by weight	0.7556 lb/hr
TOC (Total)	351.00% by weight	0.0766 lb/hr	0.3356 tpy	351.00% by weight	33.8548 lb/hr
Methane	215.62% by weight	0.0471 lb/hr	0.2062 tpy	215.62% by weight	20.7965 lb/hr
Ethane	35.39% by weight	0.0077 lb/hr	0.0338 tpy	35.39% by weight	3.4131 lb/hr
VOC (Total)	100.00% by weight	0.0218 lb/hr	0.0956 tpy	100.00% by weight	9.6451 lb/hr
HAP (Total)	6.23% by weight	0.0014 lb/hr	0.0060 tpy	6.23% by weight	0.6008 lb/hr
Benzene	1.5063% by weight	3.29E-04 lb/hr	1.44E-03 tpy	1.5063% by weight	1.45E-01 lb/hr
Ethylbenzene	0.0477% by weight	1.04E-05 lb/hr	4.56E-05 tpy	0.0477% by weight	4.60E-03 lb/hr
Hexane (n-)	2.8866% by weight	6.30E-04 lb/hr	2.76E-03 tpy	2.8866% by weight	2.78E-01 lb/hr
Methanol					
Naphthalene					
Toluene	1.3668% by weight	2.98E-04 lb/hr	1.31E-03 tpy	1.3668% by weight	1.32E-01 lb/hr
Trimethylpentane (2,2,4-)	0.0139% by weight	3.03E-06 lb/hr	1.33E-05 tpy	0.0139% by weight	1.34E-03 lb/hr
Xylenes	0.4073% by weight	8.89E-05 lb/hr	3.89E-04 tpy	0.4073% by weight	3.93E-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					
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:		USEPA TANKS 4.09d						
Basis	Gasoline (RVP 10)	MET Station:	Hartford, Connecticut					
Material	Gasoline (RVP 10)	Selection based on VOC vapor pressure (see TABLE F-0).						
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
		avg	max	avg	max	standing	working	Flow
January	31	3.7300	4.2100	43.60	49.55	5.7800	5.5100	940
February	28	3.9400	4.5700	46.32	53.58	6.8500	5.8300	940
March	31	4.4600	5.3100	52.34	61.22	10.7400	6.5800	940
April	30	5.0800	6.2700	58.99	70.04	15.2800	7.5100	940
May	31	5.7200	7.2100	65.11	77.64	20.9500	8.4500	940
June	30	6.2500	7.9300	69.82	82.89	24.0200	9.2300	940
July	31	6.5100	8.2300	72.01	84.96	26.1200	9.6100	940
August	31	6.2500	7.7500	69.86	81.62	22.3000	9.2400	940
September	30	5.6500	6.8600	64.49	74.84	16.4100	8.3500	940
October	31	4.9500	5.8400	57.64	66.24	11.8100	7.3100	940
November	30	4.3600	4.9200	51.23	57.30	6.8300	6.4400	940
December	31	3.8500	4.2800	45.14	50.33	5.1900	5.6900	940
ALL	365	5.0625	8.2300	58.05	84.96	172.2800	89.7500	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-0 normalized on VOC to assure methodology is conservative.								

**TABLE F-1C  
Volatile Organic Liquids Storage Tanks  
Hourly and Annual Emission Estimates  
Standing & Working Losses**

Source		CROM-TK-V05			
Service		Pipeline Liquids			
Capacity	2,940 gal			2,940 gal	
Temperature of Stored Liquid	58.05 °F			84.96 °F	
Vapor Pressure	5.0662 psia			8.2305 psia	
Pumping Rate	150 gal/min			150 gal/min	
Throughput	1.00 turnover/yr				
	2,940 gal/yr			2,940 gal/hr	
Standing Losses				<b>July</b>	
				744 hrs/month	
				<b>132.4745</b> lbs/month	
				0.1781 lb/hr	
Working Losses				<b>1.02E-02</b> lb/gal	
		23.4057 lb/yr	Average	Maximum	30.0829 lb/hr
Residual Liquid	Stand	358.84% by weight	0.3504 lb/hr	1.5349 tpy	0.6389 lb/hr
	Work		0.0096 lb/hr	0.0420 tpy	107.9491 lb/hr
	Total		0.3600 lb/hr	1.5769 tpy	108.5881 lb/hr
CO <sub>2-c</sub>	5398.27% by weight	5.4162 lb/hr	23.7228 tpy	5398.27% by weight	1.634 lb/hr
CO <sub>2</sub>	7.83% by weight	0.0079 lb/hr	0.0344 tpy	7.83% by weight	2.3706 lb/hr
TOC (Total)	351.00% by weight	0.3522 lb/hr	1.5425 tpy	351.00% by weight	106.2175 lb/hr
Methane	215.62% by weight	0.2163 lb/hr	0.9475 tpy	215.62% by weight	65.2480 lb/hr
Ethane	35.39% by weight	0.0355 lb/hr	0.1555 tpy	35.39% by weight	10.7085 lb/hr
VOC (Total)	100.00% by weight	0.1003 lb/hr	0.4395 tpy	100.00% by weight	30.2610 lb/hr
HAP (Total)	6.23% by weight	0.0062 lb/hr	0.0274 tpy	6.23% by weight	1.8848 lb/hr
Benzene	1.5063% by weight	1.51E-03 lb/hr	6.62E-03 tpy	1.5063% by weight	4.56E-01 lb/hr
Ethylbenzene	0.0477% by weight	4.78E-05 lb/hr	2.09E-04 tpy	0.0477% by weight	1.44E-02 lb/hr
Hexane (n-)	2.8866% by weight	2.90E-03 lb/hr	1.27E-02 tpy	2.8866% by weight	8.74E-01 lb/hr
Methanol					
Naphthalene					
Toluene	1.3668% by weight	1.37E-03 lb/hr	6.01E-03 tpy	1.3668% by weight	4.14E-01 lb/hr
Trimethylpentane (2,2,4-)	0.0139% by weight	1.39E-05 lb/hr	6.10E-05 tpy	0.0139% by weight	4.20E-03 lb/hr
Xylenes	0.4073% by weight	4.09E-04 lb/hr	1.79E-03 tpy	0.4073% by weight	1.23E-01 lb/hr

**NOTES**

1. Tank Characteristics:		TANKS 4.09d						
Orientation	Vertical Fixed Roof Tank	Above Ground?	Yes					
Height/Length	5.00 ft	Shell/Roof Color	Gray/Medium					
Diameter	10.00 ft	Shell Condition	Good					
Capacity (estimated)	2,938 gal	Vacuum Setting	-0.03 psig					
Capacity (nominal)	2,940 gal	Pressure Setting	0.03 psig					
2. Stored Liquid Characteristics:								
Basis	USEPA TANKS 4.09d	MET Station:	Hartford, Connecticut					
Material	Gasoline (RVP 10)	Selection based on VOC vapor pressure (see TABLE F-0).						
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	3.7342	4.2173	43.60	49.56	27.3935	17.2522	2,940
February	28	3.9492	4.5724	46.32	53.59	32.6450	18.2452	2,940
March	31	4.4602	5.3101	52.34	61.23	51.9904	20.6060	2,940
April	30	5.0850	6.2776	58.99	70.04	75.1820	23.4925	2,940
May	31	5.7214	7.2195	65.12	77.64	104.6037	26.4329	2,940
June	30	6.2518	7.9349	69.82	82.90	121.2470	28.8832	2,940
July	31	6.5115	8.2305	72.01	84.96	132.4745	30.0829	2,940
August	31	6.2568	7.7570	69.87	81.63	112.5649	28.9065	2,940
September	30	5.6543	6.8612	64.50	74.85	81.8359	26.1227	2,940
October	31	4.9531	5.8454	57.64	66.25	57.9169	22.8835	2,940
November	30	4.3620	4.9202	51.23	57.30	32.9624	20.1525	2,940
December	31	3.8546	4.2839	45.14	50.33	24.6811	17.8083	2,940
ALL	365	5.0662	8.2305	58.05	84.96	855.4972	280.8684	35,280

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-0 normalized on VOC to assure methodology is conservative.

**TABLE F-1D**  
**Volatile Organic Liquids Storage Tanks**  
**Hourly and Annual Emission Estimates**  
**Standing & Working Losses**

Source		CROM-TK-LO01				
Service		Oil				
Capacity	750 gal			750 gal		
Temperature of Stored Liquid	49.29 °F		59.74 °F			
Vapor Pressure	0.0046 psia		0.0064 psia			
Pumping Rate	150 gal/min		150 gal/min			
Throughput	365.00 turnover/yr					
	273,750 gal/yr		750 gal/hr			
Standing Losses			<b>July</b>			
			744 hrs/month			
	<b>0.0000</b> lb/yr		<b>0.0000</b> lbs/month			
Working Losses	<b>1.43E-05</b> lb/gal			<b>2.00E-05</b> lb/gal		
	3.9010 lb/yr	Average	Maximum	0.0150 lb/hr	Maximum	
Liquid	Stand	100.00% by weight	0.0000 lb/hr	0.0000 tpy	0.0000 lb/hr	
	Work		0.0004 lb/hr	0.0020 tpy	100.00% by weight	0.0150 lb/hr
	Total		0.0004 lb/hr	0.0020 tpy		0.0150 lb/hr
TOC (Total)	100.00% by weight	0.0004 lb/hr	0.0020 tpy	100.00% by weight	0.0150 lb/hr	
Methane						
Ethane						
VOC (Total)	100.00% by weight	0.0004 lb/hr	0.0020 tpy	100.00% by weight	0.0150 lb/hr	
HAP (Total)						
Benzene						
Ethylbenzene						
Hexane (n-)						
Methanol						
Naphthalene						
Toluene						
Trimethylpentane (2,2,4-)						
Xylenes						

**NOTES**

1. Tank Characteristics:

	<u>TANKS 4.09d</u>			
Orientation	Horizontal Tank	Above Ground?	No	
Height/Length	6.50 ft	Shell/Roof Color	0	or less solar absorptance
Diameter	4.33 ft	Shell Condition	0	
Capacity (estimated)	717 gal	Vacuum Setting	-0.03 psig	
Capacity (nominal)	750 gal	Pressure Setting	0.03 psig	

2. Stored Liquid Characteristics:

Basis	USEPA TANKS 4.09d	MET Station:	Hartford, 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 Flow	
	avg	max	avg	max	standing	working		
January	31	0.0031	0.0031	38.13	38.13	0.0000	0.0072	750
February	28	0.0031	0.0031	39.45	39.45	0.0000	0.0072	750
March	31	0.0036	0.0036	43.83	43.83	0.0000	0.0084	750
April	30	0.0043	0.0043	48.78	48.78	0.0000	0.0101	750
May	31	0.0052	0.0052	53.58	53.58	0.0000	0.0121	750
June	30	0.0060	0.0060	57.47	57.47	0.0000	0.0139	750
July	31	0.0064	0.0064	59.74	59.74	0.0000	0.0150	750
August	31	0.0063	0.0063	58.84	58.84	0.0000	0.0145	750
September	30	0.0055	0.0055	55.21	55.21	0.0000	0.0129	750
October	31	0.0046	0.0046	50.32	50.32	0.0000	0.0106	750
November	30	0.0039	0.0039	45.79	45.79	0.0000	0.0091	750
December	31	0.0031	0.0031	40.29	40.29	0.0000	0.0073	750
ALL	365	0.0046	0.0064	49.29	59.74	0.0000	0.1283	9,000

3. Emission Estimate Basis: USEPA TANKS 4.09d & TCEQ RG-166/01

4. There is no basis for speciation of emissions.

**TABLE F-1E**  
**Volatile Organic Liquids Storage Tanks**  
**Hourly and Annual Emission Estimates**  
**Standing & Working Losses**

Source		CROM-TK-LO02				
Service		Oil				
Capacity	1,000 gal			1,000 gal		
Temperature of Stored Liquid	49.29 °F		59.74 °F			
Vapor Pressure	0.0046 psia		0.0064 psia			
Pumping Rate	150 gal/min		150 gal/min			
Throughput	365.00 turnover/yr					
	365,000 gal/yr		1,000 gal/hr			
Standing Losses			<b>July</b>			
			744 hrs/month			
			<b>0.0000</b> lbs/month			
	<b>0.0000</b> lb/yr		0.00000 lb/hr			
Working Losses	<b>1.43E-05</b> lb/gal	<b>2.00E-05</b> lb/gal				
	5.2013 lb/yr	Average	Maximum	0.0200 lb/hr	Maximum	
Liquid	Stand	100.00% by weight	0.0000 lb/hr	0.0000 tpy	100.00% by weight	0.0000 lb/hr
	Work		0.0006 lb/hr	0.0026 tpy		0.0200 lb/hr
	Total		0.0006 lb/hr	0.0026 tpy		0.0200 lb/hr
TOC (Total)	100.00% by weight	0.0006 lb/hr	0.0026 tpy	100.00% by weight	0.0200 lb/hr	
Methane						
Ethane						
VOC (Total)	100.00% by weight	0.0006 lb/hr	0.0026 tpy	100.00% by weight	0.0200 lb/hr	
HAP (Total)						
Benzene						
Ethylbenzene						
Hexane (n-)						
Methanol						
Naphthalene						
Toluene						
Trimethylpentane (2,2,4-)						
Xylenes						

**NOTES**

1. Tank Characteristics: TANKS 4.09d

Orientation	Horizontal Tank	Above Ground?	No	} or less solar absorbance
Height/Length	12.00 ft	Shell/Roof Color	0	
Diameter	3.92 ft	Shell Condition	0	
Capacity (estimated)	1,083 gal	Vacuum Setting	-0.03 psig	
Capacity (nominal)	1,000 gal	Pressure Setting	0.03 psig	

2. Stored Liquid Characteristics:

Basis	USEPA TANKS 4.09d	MET Station:	Hartford, 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 Flow
		avg	max	avg	max	standing	working	
January	31	0.0031	0.0031	38.13	38.13	0.0000	0.0096	1,000
February	28	0.0031	0.0031	39.45	39.45	0.0000	0.0096	1,000
March	31	0.0036	0.0036	43.83	43.83	0.0000	0.0113	1,000
April	30	0.0043	0.0043	48.78	48.78	0.0000	0.0134	1,000
May	31	0.0052	0.0052	53.58	53.58	0.0000	0.0161	1,000
June	30	0.0060	0.0060	57.47	57.47	0.0000	0.0186	1,000
July	31	0.0064	0.0064	59.74	59.74	0.0000	0.0200	1,000
August	31	0.0063	0.0063	58.84	58.84	0.0000	0.0194	1,000
September	30	0.0055	0.0055	55.21	55.21	0.0000	0.0172	1,000
October	31	0.0046	0.0046	50.32	50.32	0.0000	0.0141	1,000
November	30	0.0039	0.0039	45.79	45.79	0.0000	0.0121	1,000
December	31	0.0031	0.0031	40.29	40.29	0.0000	0.0097	1,000
ALL	365	0.0046	0.0064	49.29	59.74	0.0000	0.1710	12,000

3. Emission Estimate Basis: USEPA TANKS 4.09d & TCEQ RG-166/01

4. There is no basis for speciation of emissions.

**TABLE F-1F**  
**Volatile Organic Liquids Storage Tanks**  
**Hourly and Annual Emission Estimates**  
**Standing & Working Losses**

Source		CROM-TK-OW01			
Service		Oily Water			
Capacity	1,000 gal			1,000 gal	
Temperature of Stored Liquid	58.05 °F		84.96 °F		
Vapor Pressure	0.0064 psia		0.0140 psia		
Pumping Rate	150 gal/min		150 gal/min		
Throughput	365.00 turnover/yr				
	365,000 gal/yr		1,000 gal/hr		
Standing Losses			<b>July</b>		
			744 hrs/month		
	<b>0.3740 lb/yr</b>		<b>0.0587 lbs/month</b>		
Working Losses	<b>1.97E-05 lb/gal</b>			0.00008 lb/hr	
	7.1910 lb/yr	Average	Maximum	0.0297 lb/hr	Maximum
Liquid	Stand	100.00% by weight	0.0000 lb/hr	0.0002 tpy	0.0001 lb/hr
	Work		0.0008 lb/hr	0.0036 tpy	0.0297 lb/hr
	Total		0.0009 lb/hr	0.0038 tpy	0.0298 lb/hr
TOC (Total)	100.00% by weight	0.0009 lb/hr	0.0038 tpy	100.00% by weight	0.0298 lb/hr
Methane					
Ethane					
VOC (Total)	100.00% by weight	0.0009 lb/hr	0.0038 tpy	100.00% by weight	0.0298 lb/hr
HAP (Total)					
Benzene					
Ethylbenzene					
Hexane (n-)					
Methanol					
Naphthalene					
Toluene					
Trimethylpentane (2,2,4-)					
Xylenes					

**NOTES**

1. Tank Characteristics: TANKS 4.09d

Orientation	Horizontal Tank	Above Ground?	Yes	or less solar absorptance
Height/Length	12.00 ft	Shell/Roof Color	Gray/Medium	
Diameter	3.92 ft	Shell Condition	Good	
Capacity (estimated)	1,083 gal	Vacuum Setting	-0.03 psig	
Capacity (nominal)	1,000 gal	Pressure Setting	0.03 psig	

2. Stored Liquid Characteristics:

Basis	USEPA TANKS 4.09d	MET Station:	Hartford, 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 Flow
		avg	max	avg	max	standing	working	
January	31	0.0036	0.0044	43.60	49.56	0.0107	0.0112	1,000
February	28	0.0040	0.0052	46.32	53.59	0.0132	0.0123	1,000
March	31	0.0050	0.0068	52.34	61.23	0.0220	0.0154	1,000
April	30	0.0063	0.0090	58.99	70.04	0.0331	0.0195	1,000
May	31	0.0078	0.0113	65.12	77.64	0.0471	0.0241	1,000
June	30	0.0090	0.0132	69.82	82.90	0.0539	0.0277	1,000
July	31	0.0096	0.0140	72.01	84.96	0.0587	0.0297	1,000
August	31	0.0090	0.0127	69.87	81.63	0.0499	0.0278	1,000
September	30	0.0076	0.0105	64.50	74.85	0.0367	0.0236	1,000
October	31	0.0060	0.0081	57.64	66.25	0.0253	0.0187	1,000
November	30	0.0047	0.0060	51.23	57.30	0.0136	0.0147	1,000
December	31	0.0038	0.0046	45.14	50.33	0.0097	0.0118	1,000
ALL	365	0.0064	0.0140	58.05	84.96	0.3740	0.2364	12,000

3. Emission Estimate Basis: USEPA TANKS 4.09d & TCEQ RG-166/01

4. There is no basis for speciation of emissions.



**TABLE F-1G**  
**Volatile Organic Liquids Storage Tanks**  
**Hourly and Annual Emission Estimates**  
**Standing & Working Losses**

Source	CROM-TK-EC01					
Service	Coolant					
Capacity	2,790 gal			2,790 gal		
Temperature of Stored Liquid	58.05 °F		84.96 °F			
Vapor Pressure	0.0010 psia		0.0035 psia			
Pumping Rate	150 gal/min		150 gal/min			
Throughput	365.00 turnover/yr					
	1,018,350 gal/yr		2,790 gal/hr			
Standing Losses			<b>July</b>			
			744 hrs/month			
	<b>0.0721 lb/yr</b>		<b>0.0134 lbs/month</b>			
Working Losses	<b>1.75E-06 lb/gal</b>			0.00002 lb/hr		
	1.7776 lb/yr	Average	Maximum	0.0091 lb/hr	Maximum	
Liquid	Stand	100.00% by weight	0.0000 lb/hr	0.0000 tpy	0.0000 lb/hr	
	Work		0.0002 lb/hr	0.0009 tpy	100.00% by weight	0.0091 lb/hr
	Total		0.0002 lb/hr	0.0009 tpy	0.0091 lb/hr	
TOC (Total)	100.00% by weight	0.0002 lb/hr	0.0009 tpy	100.00% by weight	0.0091 lb/hr	
Methane						
Ethane						
VOC (Total)	100.00% by weight	0.0002 lb/hr	0.0009 tpy	100.00% by weight	0.0091 lb/hr	
HAP (Total)	100.00% by weight	0.0002 lb/hr	0.0009 tpy	100.00% by weight	0.0091 lb/hr	
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	
Height/Length	19.00 ft	Shell/Roof Color	Gray/Medium	or less solar absorptance
Diameter	5.00 ft	Shell Condition	Good	
Capacity (estimated)	2,791 gal	Vacuum Setting	-0.03 psig	
Capacity (nominal)	2,790 gal	Pressure Setting	0.03 psig	

2. Stored Liquid Characteristics:

Basis	USEPA TANKS 4.09d	MET Station:	Hartford, Connecticut
Material	Propylene glycol	Selected purely for a worst-case scenario.	
Liquid Molecular Weight	76.11 lb/lb-mol	Vapor Molecular Weight	76.11 lb/lb-mol

Monthly Data	Days	Vapor Pressure		Liquid Surface Temperature		TANKS Output		TANKS Flow
		avg	max	avg	max	standing	working	
January	31	0.0004	0.0005	43.60	49.56	0.0013	0.0018	2,790
February	28	0.0004	0.0007	46.32	53.59	0.0017	0.0022	2,790
March	31	0.0006	0.0010	52.34	61.23	0.0033	0.0031	2,790
April	30	0.0009	0.0016	58.99	70.04	0.0057	0.0045	2,790
May	31	0.0012	0.0024	65.12	77.64	0.0092	0.0063	2,790
June	30	0.0016	0.0031	69.82	82.90	0.0118	0.0081	2,790
July	31	0.0018	0.0035	72.01	84.96	0.0134	0.0091	2,790
August	31	0.0016	0.0029	69.87	81.63	0.0109	0.0081	2,790
September	30	0.0012	0.0021	64.50	74.85	0.0071	0.0061	2,790
October	31	0.0008	0.0013	57.64	66.25	0.0042	0.0042	2,790
November	30	0.0006	0.0008	51.23	57.30	0.0020	0.0029	2,790
December	31	0.0004	0.0005	45.14	50.33	0.0012	0.0020	2,790
ALL	365	0.0010	0.0035	58.05	84.96	0.0721	0.0584	33,480

3. Emission Estimate Basis: USEPA TANKS 4.09d & TCEQ RG-166/01

4. There is no basis for speciation of emissions.

**TABLE F-1H**  
**Volatile Organic Liquids Storage Tanks**  
**Hourly and Annual Emission Estimates**  
**Standing & Working Losses**

Source	CROM-TK-EC02					
Service	Coolant					
Capacity	350 gal			350 gal		
Temperature of Stored Liquid	58.05 °F		84.96 °F			
Vapor Pressure	0.0010 psia		0.0035 psia			
Pumping Rate	150 gal/min		150 gal/min			
Throughput	365.00 turnover/yr					
	127,750 gal/yr		350 gal/hr			
Standing Losses			<b>July</b>			
			744 hrs/month			
	<b>0.0090</b> lb/yr		<b>0.0017</b> lbs/month			
Working Losses	<b>1.75E-06</b> lb/gal			0.00000 lb/hr		
	0.2230 lb/yr	Average	Maximum	0.0011 lb/hr	Maximum	
Liquid	Stand	100.00% by weight	0.0000 lb/hr	0.0000 tpy	100.00% by weight	0.0000 lb/hr
	Work		0.0000 lb/hr	0.0001 tpy		0.0011 lb/hr
	Total		0.0000 lb/hr	0.0001 tpy		0.0011 lb/hr
TOC (Total)	100.00% by weight	0.0000 lb/hr	0.0001 tpy	100.00% by weight	0.0011 lb/hr	
Methane						
Ethane						
VOC (Total)	100.00% by weight	0.0000 lb/hr	0.0001 tpy	100.00% by weight	0.0011 lb/hr	
HAP (Total)	100.00% by weight	0.0000 lb/hr	0.0001 tpy	100.00% by weight	0.0011 lb/hr	
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	
Height/Length	15.00 ft	Shell/Roof Color	Gray/Medium	or less solar absorptance
Diameter	2.00 ft	Shell Condition	Good	
Capacity (estimated)	353 gal	Vacuum Setting	-0.03 psig	
Capacity (nominal)	350 gal	Pressure Setting	0.03 psig	

2. Stored Liquid Characteristics:

Basis	USEPA TANKS 4.09d	MET Station:	Hartford, Connecticut
Material	Propylene glycol	Selected purely for a worst-case scenario.	
Liquid Molecular Weight	76.11 lb/lb-mol	Vapor Molecular Weight	76.11 lb/lb-mol

Monthly Data	Days	Vapor Pressure		Liquid Surface Temperature		TANKS Output		TANKS Flow
		avg	max	avg	max	standing	working	
January	31	0.0004	0.0005	43.60	49.56	0.0002	0.0002	350
February	28	0.0004	0.0007	46.32	53.59	0.0002	0.0003	350
March	31	0.0006	0.0010	52.34	61.23	0.0004	0.0004	350
April	30	0.0009	0.0016	58.99	70.04	0.0007	0.0006	350
May	31	0.0012	0.0024	65.12	77.64	0.0011	0.0008	350
June	30	0.0016	0.0031	69.82	82.90	0.0015	0.0010	350
July	31	0.0018	0.0035	72.01	84.96	0.0017	0.0011	350
August	31	0.0016	0.0029	69.87	81.63	0.0014	0.0010	350
September	30	0.0012	0.0021	64.50	74.85	0.0009	0.0008	350
October	31	0.0008	0.0013	57.64	66.25	0.0005	0.0005	350
November	30	0.0006	0.0008	51.23	57.30	0.0002	0.0004	350
December	31	0.0004	0.0005	45.14	50.33	0.0002	0.0003	350
ALL	365	0.0010	0.0035	58.05	84.96	0.0090	0.0073	4,200

3. Emission Estimate Basis: USEPA TANKS 4.09d & TCEQ RG-166/01

4. There is no basis for speciation of emissions.

**TABLE E-0a(i)**  
**Flash Analysis**  
**Summary of Laboratory Analysis**

	FEED Pressurized Liquid	VAPOR Flash Gas	LIQUID Residual Liquid
Pressure	575.000 psig	0.034 psig	0.034 psig
	589.696 psia	14.730 psia	14.730 psia
Temperature	72 °F	60 °F	60 °F
API Gravity at 60°F	73.960 n.d.	788.526 n.d.	61.227 n.d.
Specific Gravity at 60°F	0.6887 n.d. (water)	0.1538 n.d. (water)	0.7342 n.d. (water)
	3.3880 n.d. (air)	0.9301 n.d. (air)	4.4320 n.d. (air)
Molecular Weight	98.125 lb/lb-mol	26.938 lb/lb-mol	128.362 lb/lb-mol
Density at 60°F and 14.730 psia	5.747 lb/gal	1.283 lb/gal	6.126 lb/gal
	0.2593 lb/ft <sup>3</sup>	0.0712 lb/ft <sup>3</sup>	0.3392 lb/ft <sup>3</sup>
	22.1622 ft <sup>3</sup> /gal	18.0282 ft <sup>3</sup> /gal	18.0610 ft <sup>3</sup> /gal
	930.8120 ft <sup>3</sup> /bbl	757.1853 ft <sup>3</sup> /bbl	758.5600 ft <sup>3</sup> /bbl
	378.4123 ft <sup>3</sup> /lb-mol	378.4123 ft <sup>3</sup> /lb-mol	378.4123 ft <sup>3</sup> /lb-mol
	17.0747 gal/lb-mol	20.9900 gal/lb-mol	20.9520 gal/lb-mol
	2.4598 lb-mol/bbl	2.0010 lb-mol/bbl	2.0046 lb-mol/bbl
Density at 68°F and 14.696 psia	947.3299 scf/bbl	770.6220 scf/bbl	772.0211 scf/bbl
	385.1275 scf/lb-mol	385.1275 scf/lb-mol	385.1275 scf/lb-mol
	2.4598 lb-mol/bbl	2.0010 lb-mol/bbl	2.0046 lb-mol/bbl
Vapor to Liquid Mole Ratio (V/L)	0.4249 n.d. (lb-mol <sub>VAPOR</sub> /lb-mol <sub>LIQUID</sub> )		
Mole Balance	1.0000 bbl	0.3666 bbl	0.8612 bbl
	2.4598 lb-mol	0.7335 lb-mol	1.7263 lb-mol
	947.3299 scf	282.4903 scf	664.8396 scf
Flash Factor (FF)	328.0318 scf <sub>VAPOR</sub> /bbl <sub>LIQUID</sub>		

**NOTES**

- |                          |           |                           |                           |
|--------------------------|-----------|---------------------------|---------------------------|
| 1. Sample Data:          | Location: | Atlanta, TX               |                           |
|                          | Date:     | 04/15/09                  |                           |
|                          | Time:     | Not Recorded              |                           |
| 2. Reference Conditions: |           | SPL                       | Standard                  |
|                          | T =       | 60 °F                     | 68 °F                     |
|                          | P =       | 14.730 psia               | 14.696 psia               |
|                          | Water     | 8.344 lb/gal              | 8.338 lb/gal              |
|                          | Air       | 0.0765 lb/ft <sup>3</sup> | 0.0752 lb/ft <sup>3</sup> |
3.  $V + L = F \Rightarrow F = (1 + V/L)L$  {Overall Mole Balance}.

**TABLE E-0a(ii)**  
**Flash Analysis**  
**Extrapolation of Specie Mole Percentages**

Component						Liquid Dump Flash Data				
						Input			Output	
						Liquid	Scaled	Calculated	Vapor	Liquid
Name (i)	GC Postition	SPL Class	Formula	Type	HAP	$z_i$ (mol <sub>i,F</sub> /mol <sub>F</sub> )		$z_i$ (mol <sub>i,F</sub> /mol <sub>F</sub> )	$y_i$ (mol <sub>i,V</sub> /mol <sub>V</sub> )	$x_i$ (mol <sub>i,L</sub> /mol <sub>L</sub> )
Nitrogen	1		N2	0	0	0.034%	0.034%	0.030%	0.101%	0.000%
Carbon Dioxide	3		CO2	GHG	0	0.968%	0.968%	0.970%	3.163%	0.038%
Methane	2		C01H04	GHG	0	20.922%	20.922%	20.921%	69.445%	0.303%
Ethane	4		C02H06	0	0	3.391%	3.391%	3.390%	10.467%	0.383%
Propane	5		C03H08	VOC	0	2.183%	2.183%	2.180%	5.339%	0.838%
Butane (i-)	6		C04H10	VOC	0	1.232%	1.232%	1.230%	2.126%	0.849%
Butane (n-)	7		C04H10	VOC	0	1.721%	1.721%	1.720%	2.495%	1.391%
Pentane (i-)	8		C05H12	VOC	0	2.354%	2.354%	2.350%	1.895%	2.543%
Pentane (n-)	9		C05H12	VOC	0	1.622%	1.622%	1.620%	1.056%	1.859%
Dimethylbutane (2,2-)	10	Hexanes	C06H14	VOC	0	0.174%	0.174%	0.174%	0.050%	0.227%
Dimethylbutane (2,3-)	11	Hexanes	C06H14	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Cyclopentane	12	Hexanes	C05H10	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Methylpentane (2-)	13	Hexanes	C06H14	VOC	0	1.218%	1.218%	1.218%	0.352%	1.586%
Methylpentane (3-)	14	Hexanes	C06H14	VOC	0	0.912%	0.912%	0.912%	0.264%	1.187%
Hexane (n-)	15	Hexanes	C06H14	VOC	X	1.937%	1.937%	1.937%	0.561%	2.522%
Dimethylpentane (2,2-)	16	Heptanes	C07H16	VOC	0	0.311%	0.311%	0.311%	0.032%	0.430%
Methylcyclopentane	17	Heptanes	C06H12	VOC	0	1.134%	1.134%	1.134%	0.116%	1.566%
Dimethylpentane (2,4-)	18	Heptanes	C07H16	VOC	0	0.128%	0.128%	0.128%	0.013%	0.177%
Trimethylbutane (2,2,3-)	19	Heptanes	C07H16	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Benzene	20	Heptanes	C06H06	VOC	X	1.713%	1.713%	1.713%	0.175%	2.366%
Dimethylpentane (3,3-)	21	Heptanes	C07H16	VOC	0	0.221%	0.221%	0.221%	0.023%	0.305%
Cyclohexane	22	Heptanes	C06H12	VOC	0	1.106%	1.106%	1.106%	0.113%	1.528%
Methylhexane (2-)	23	Heptanes	C07H16	VOC	0	2.292%	2.292%	2.292%	0.235%	3.166%
Dimethylpentane (2,3-)	24	Heptanes	C07H16	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Dimethylcyclopentane (1,1-)	25	Heptanes	C07H14	VOC	0	0.603%	0.603%	0.603%	0.062%	0.833%
Methylhexane (3-)	26	Heptanes	C07H16	VOC	0	2.379%	2.379%	2.379%	0.244%	3.286%
Dimethylcyclopentane (1,t-3-)	27	Heptanes	C07H14	VOC	0	0.163%	0.163%	0.163%	0.017%	0.225%
Dimethylcyclopentane (1,c-3-)	28	Heptanes	C07H14	VOC	0	0.266%	0.266%	0.266%	0.027%	0.367%
Ethylpentane (3-)	29	Heptanes	C07H16	VOC	0	0.029%	0.029%	0.029%	0.003%	0.040%
Dimethylcyclopentane (1,t-2-)	30	Heptanes	C07H14	VOC	0	0.222%	0.222%	0.222%	0.023%	0.307%
Trimethylpentane (2,2,4-)	31	Heptanes	C08H18	VOC	X	0.021%	0.021%	0.021%	0.002%	0.029%
Heptane (n-)	32	Heptanes	C07H16	VOC	0	3.742%	3.742%	3.742%	0.383%	5.169%
Methylcyclohexane	33	Octanes	C07H14	VOC	0	3.301%	3.301%	3.301%	0.136%	4.646%
Trimethylcyclopentane (1,1,3-)	34	Octanes	C08H16	VOC	0	0.225%	0.225%	0.225%	0.009%	0.317%
Dimethylhexane (2,2-)	35	Octanes	C08H18	VOC	0	0.095%	0.095%	0.095%	0.004%	0.134%
Dimethylcyclopentane (1,c-2-)	36	Octanes	C07H14	VOC	0	0.848%	0.848%	0.848%	0.035%	1.193%
Dimethylhexane (2,5-)	37	Octanes	C08H18	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Dimethylhexane (2,4-)	38	Octanes	C08H18	VOC	0	0.143%	0.143%	0.143%	0.006%	0.201%
Ethylcyclopentane	39	Octanes	C07H14	VOC	0	0.464%	0.464%	0.464%	0.019%	0.653%
Trimethylpentane (2,2,3-)	40	Octanes	C08H18	VOC	0	0.028%	0.028%	0.028%	0.001%	0.039%
Trimethylcyclopentane (1,t-2,c-4-)	41	Octanes	C08H16	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Dimethylhexane (3,3-)	42	Octanes	C08H18	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Trimethylcyclopentane (1,t-2,c-3-)	43	Octanes	C08H16	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Trimethylpentane (2,3,4-)	44	Octanes	C08H18	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Dimethylhexane (2,3-)	45	Octanes	C08H18	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Toluene	46	Octanes	C07H08	VOC	X	4.444%	4.444%	4.444%	0.183%	6.255%
Trimethylcyclopentane (1,1,2-)	47	Octanes	C08H16	VOC	0	0.371%	0.371%	0.371%	0.015%	0.522%
Dimethylhexane (3,4-)	48	Octanes	C08H18	VOC	0	3.505%	3.505%	3.505%	0.144%	4.933%
Methylheptane (2-)	49	Octanes	C08H18	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Methylheptane (4-)	50	Octanes	C08H18	VOC	0	2.896%	2.896%	2.896%	0.119%	4.076%
Dimethylhexane (3,4-)	51	Octanes	C08H18	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Methylheptane (3-)	52	Octanes	C08H18	VOC	0	0.416%	0.416%	0.416%	0.017%	0.585%
Ethylhexane (3-)	53	Octanes	C08H18	VOC	0	0.111%	0.111%	0.111%	0.005%	0.156%
Trimethylcyclopentane (1,c-2,t-4-)	54	Octanes	C08H16	VOC	0	0.028%	0.028%	0.028%	0.001%	0.039%
Dimethylcyclohexane (1,c-3-)	55	Octanes	C08H16	VOC	0	0.170%	0.170%	0.170%	0.007%	0.239%
Trimethylcyclopentane (1,c-2,t-3-)	56	Octanes	C08H16	VOC	0	0.170%	0.170%	0.170%	0.007%	0.239%
Dimethylcyclohexane (1,t-4-)	57	Octanes	C08H16	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Trimethylhexane (2,2,5-)	58	Octanes	C09H20	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Dimethylcyclohexane (1,1-)	59	Octanes	C08H16	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Ethylcyclopentane (1-methyl-t-3-)	60	Octanes	C08H16	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Ethylcyclopentane (1-methyl-c-3-)	61	Octanes	C08H16	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Ethylcyclopentane (1-methyl-t-2-)	62	Octanes	C08H16	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Trimethylhexane (2,2,4-)	63	Octanes	C09H20	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Ethylcyclopentane (1-methyl-t-1-)	64	Octanes	C08H16	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Cycloheptane	65	Octanes	C07H14	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Octane (n-)	66	Octanes	C08H18	VOC	0	4.372%	4.372%	4.372%	0.180%	6.153%
Trimethylhexane (2,4,4-)	67	Nonanes	C09H20	VOC	0	0.190%	0.190%	0.190%	0.003%	0.269%
Tetramethylpentane (2,2,4,4-)	68	Nonanes	C09H20	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Dimethylcyclohexane (1,t-3-)	69	Nonanes	C08H16	VOC	0	0.053%	0.053%	0.053%	0.001%	0.075%
Dimethylcyclohexane (1,c-4-)	70	Nonanes	C08H16	VOC	0	0.053%	0.053%	0.053%	0.001%	0.075%
Trimethylcyclopentane (1,c-2,c-3-)	71	Nonanes	C08H16	VOC	0	0.053%	0.053%	0.053%	0.001%	0.075%
Propylcyclopentane (i-)	72	Nonanes	C08H16	VOC	0	0.348%	0.348%	0.348%	0.006%	0.493%
Trimethylhexane (2,3,5-)	73	Nonanes	C09H20	VOC	0	0.006%	0.006%	0.006%	0.000%	0.009%
Dimethylheptane (2,2-)	74	Nonanes	C09H20	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Dimethylheptane (2,4-)	75	Nonanes	C09H20	VOC	0	0.158%	0.158%	0.158%	0.003%	0.224%
Methylcyclopentane (1-ethyl-c-2-)	76	Nonanes	C08H16	VOC	0	0.181%	0.181%	0.181%	0.003%	0.257%
Trimethylhexane (2,2,3-)	77	Nonanes	C09H20	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%
Dimethylcyclohexane (1,c-2-)	78	Nonanes	C08H16	VOC	0	0.510%	0.510%	0.510%	0.009%	0.723%
Dimethylheptane (2,6-)	79	Nonanes	C09H20	VOC	0	0.112%	0.112%	0.112%	0.002%	0.159%
Propylcyclopentane (n-)	80	Nonanes	C08H16	VOC	0	0.000%	0.000%	0.000%	0.000%	0.000%

**TABLE E-0a(ii)**  
**Flash Analysis**  
**Extrapolation of Specie Mole Percentages**

Component						Liquid Dump Flash Data				
						Input			Output	
						Liquid	Scaled	Calculated	Vapor	Liquid
Name (i)	GC Postition	SPL Class	Formula	Type	HAP	$z_i$ (mol <sub>i,F</sub> /mol <sub>F</sub> )		$z_i$ (mol <sub>i,F</sub> /mol <sub>F</sub> )	$y_i$ (mol <sub>i,v</sub> /mol <sub>v</sub> )	$x_i$ (mol <sub>i,L</sub> /mol <sub>L</sub> )
Trimethylcyclohexane (1,c-3,c-5-)	81	Nonanes	C09H18	VOC	0	0.000%		0.000%	0.000%	0.000%
Ethylcyclohexane	82	Nonanes	C08H16	VOC	0	1.365%		1.365%	1.365%	0.023%
Dimethylheptane (2,5-)	83	Nonanes	C09H20	VOC	0	0.067%		0.067%	0.067%	0.001%
Dimethylheptane (3,5-)	84	Nonanes	C09H20	VOC	0	0.067%		0.067%	0.067%	0.001%
Trimethylcyclohexane (1,1,3-)	85	Nonanes	C09H18	VOC	0	0.077%		0.077%	0.077%	0.001%
Trimethylhexane (2,3,3-)	86	Nonanes	C09H20	VOC	0	0.038%		0.038%	0.038%	0.001%
Dimethylheptane (3,3-)	87	Nonanes	C09H20	VOC	0	0.038%		0.038%	0.038%	0.001%
Trimethylcyclohexane (1,1,4-)	88	Nonanes	C09H18	VOC	0	0.000%		0.000%	0.000%	0.000%
Tetramethylpentane (2,2,3,3-)	89	Nonanes	C09H20	VOC	0	0.261%		0.261%	0.261%	0.004%
Ethylbenzene	90	Nonanes	C08H10	VOC	X	0.406%		0.406%	0.406%	0.007%
Trimethylhexane (2,3,4-)	91	Nonanes	C09H20	VOC	0	0.007%		0.007%	0.007%	0.000%
Trimethylcyclohexane (1,t-2,t-4-)	92	Nonanes	C09H18	VOC	0	0.000%		0.000%	0.000%	0.000%
Dimethylheptane (2,3-)	93	Nonanes	C09H20	VOC	0	0.000%		0.000%	0.000%	0.000%
Trimethylcyclohexane (1,c-3,t-5-)	94	Nonanes	C09H18	VOC	0	0.000%		0.000%	0.000%	0.000%
Xylene (m-)	95	Nonanes	C08H10	VOC	X	2.462%		2.462%	2.462%	0.042%
Xylene (p-)	96	Nonanes	C08H10	VOC	X	2.462%		2.462%	2.462%	0.042%
Dimethylheptane (3,4-)	97	Nonanes	C09H20	VOC	0	0.092%		0.092%	0.092%	0.002%
Methyloctane (2-)	98	Nonanes	C09H20	VOC	0	0.782%		0.782%	0.782%	0.013%
Methyloctane (4-)	99	Nonanes	C09H20	VOC	0	0.782%		0.782%	0.782%	0.013%
Dimethylheptane (3,4-)	100	Nonanes	C09H20	VOC	0	0.000%		0.000%	0.000%	0.000%
Methyloctane (3-)	101	Nonanes	C09H20	VOC	0	0.000%		0.000%	0.000%	0.000%
Butylcyclopentane (i-)	102	Nonanes	C09H18	VOC	0	0.000%		0.000%	0.000%	0.000%
Trimethylcyclohexane (1,t-2,c-3-)	103	Nonanes	C09H18	VOC	0	0.231%		0.231%	0.231%	0.004%
Trimethylcyclohexane (1,t-2,c-4-)	104	Nonanes	C09H18	VOC	0	0.231%		0.231%	0.231%	0.004%
Xylene (o-)	105	Nonanes	C08H10	VOC	X	0.547%		0.547%	0.547%	0.009%
Trimethylcyclohexane (1,1,2-)	106	Nonanes	C09H18	VOC	0	0.000%		0.000%	0.000%	0.000%
Trimethylcyclohexane (1,c-2,t-4-)	107	Nonanes	C09H18	VOC	0	0.200%		0.200%	0.200%	0.003%
Trimethylcyclohexane (1,c-2,c-4-)	108	Nonanes	C09H18	VOC	0	0.000%		0.000%	0.000%	0.000%
Nonane (n-)	109	Nonanes	C09H20	VOC	0	2.884%		2.884%	2.884%	0.050%
Unknowns	110	Decanes+	C10+	VOC		10.753%		10.753%	10.753%	0.079%
TOTAL						100.001%		100.000%	99.984%	100.001%
TOC (Total)						98.999%		98.998%	98.984%	96.737%
VOC (Total)						74.686%		74.685%	74.673%	16.825%
Hexanes						4.241%		4.240%	4.241%	1.227%
Heptanes						14.330%		14.310%	14.330%	1.468%
Octanes						21.587%		21.610%	21.587%	0.888%
Nonanes						14.663%		14.660%	14.663%	0.252%
Decanes+						10.753%		10.770%	10.753%	0.079%
HAP (Total)						89.248%		89.248%	89.231%	99.922%
Xylenes						1.209%		1.209%	1.209%	0.021%

**NOTES**

- Sample Data: Location: Atlanta, TX  
Date: 04/15/09  
Time: Not Recorded
  - $v_i + l_i = f_i$ ;  $y_i = v_i/V$ ;  $x_i = l_i/L$ ;  $z_i = f_i/F \Rightarrow y_i V + x_i L = z_i F \Rightarrow y_i (V/L) + x_i L = z_i (1 + V/L) \Rightarrow z_i = [y_i (V/L) + x_i] / [1 + (V/L)]$  {Mole Balance}.
  - $V/L = 0.4249$        $1 + V/L = 1.4249$
  - $z_i$  is refined to the same number of significant digits as  $y_i$  and  $x_i$  using the component mole balance and laboratory results for  $V/L$ .
  - $z_i$  is scaled using the hydrocarbon (e.g., hexanes+)  $z_i$  percentage in the flash analysis results, with the exception of HAP species.
  - $[y_i ; x_i]$  mole percent for species of hydrocarbons is estimated using scaled lab mole percent results for  $z_i$  and  $[y ; x]_{HC}$  for the hydrocarbon.  
(assumes  $v_i/l_i$  is same for all hydrocarbon species)
- |                          |                              |                           |                           |
|--------------------------|------------------------------|---------------------------|---------------------------|
| $y_{hexanes} = 1.227\%$  | $(v/l)_{hexanes} = 0.2219$   | $x_{hexanes} = 5.520\%$   | $z_{hexanes} = 4.240\%$   |
|                          | $y_i = z_i (y/z)_{hexanes}$  | $= 0.2894 z_i$            |                           |
|                          | $x_i = z_i (x/z)_{hexanes}$  | $= 1.3019 z_i$            |                           |
|                          |                              |                           |                           |
| $y_{heptanes} = 1.466\%$ | $(v/l)_{heptanes} = 0.0740$  | $x_{heptanes} = 19.767\%$ | $z_{heptanes} = 14.310\%$ |
|                          | $y_i = z_i (y/z)_{heptanes}$ | $= 0.1024 z_i$            |                           |
|                          | $x_i = z_i (x/z)_{heptanes}$ | $= 1.3814 z_i$            |                           |
|                          |                              |                           |                           |
| $y_{octanes} = 0.889\%$  | $(v/l)_{octanes} = 0.0292$   | $x_{octanes} = 30.414\%$  | $z_{octanes} = 21.610\%$  |
|                          | $y_i = z_i (y/z)_{octanes}$  | $= 0.0411 z_i$            |                           |
|                          | $x_i = z_i (x/z)_{octanes}$  | $= 1.4074 z_i$            |                           |
|                          |                              |                           |                           |
| $y_{nonanes} = 0.252\%$  | $(v/l)_{nonanes} = 0.0121$   | $x_{nonanes} = 20.782\%$  | $z_{nonanes} = 14.660\%$  |
|                          | $y_i = z_i (y/z)_{nonanes}$  | $= 0.0172 z_i$            |                           |
|                          | $x_i = z_i (x/z)_{nonanes}$  | $= 1.4176 z_i$            |                           |
|                          |                              |                           |                           |
| $y_{decanes+} = 0.079\%$ | $(v/l)_{decanes+} = 0.0051$  | $x_{decanes+} = 15.313\%$ | $z_{decanes+} = 10.770\%$ |
|                          | $y_i = z_i (y/z)_{decanes+}$ | $= 0.0073 z_i$            |                           |
|                          | $x_i = z_i (x/z)_{decanes+}$ | $= 1.4218 z_i$            |                           |

**TABLE E-0b(i)**  
**Flash Analysis**  
**Estimation of Specie Weight Percentages**  
**Pressurized Liquid**

Component			Molecular Weight (lb/mol) <sub>i</sub>	Density (lb/scf) <sub>i</sub>	Mole Percent (mol <sub>i</sub> /mol <sub>T</sub> )	Weight Percent (lb <sub>i</sub> /lb <sub>T</sub> )
Name (i)	Type	HAP				
Nitrogen	0	0	28.013	0.0727	0.030%	0.009%
Carbon Dioxide	GHG	0	44.010	0.1143	0.970%	0.435%
Methane	GHG	0	16.042	0.0417	20.924%	3.421%
Ethane	0	0	30.069	0.0781	3.391%	1.039%
Propane	VOC	0	44.096	0.1145	2.181%	0.980%
Butane (i-)	VOC	0	58.122	0.1509	1.230%	0.729%
Butane (n-)	VOC	0	58.122	0.1509	1.720%	1.019%
Pentane (i-)	VOC	0	72.149	0.1873	2.350%	1.728%
Pentane (n-)	VOC	0	72.149	0.1873	1.620%	1.191%
Dimethylbutane (2,2-)	VOC	0	86.175	0.2238	0.174%	0.153%
Dimethylbutane (2,3-)	VOC	0	86.175	0.2238	0.000%	0.000%
Cyclopentane	VOC	0	70.133	0.1821	0.000%	0.000%
Methylpentane (2-)	VOC	0	86.175	0.2238	1.218%	1.070%
Methylpentane (3-)	VOC	0	86.175	0.2238	0.912%	0.801%
Hexane (n-)	VOC	X	86.175	0.2238	1.937%	1.701%
Dimethylpentane (2,2-)	VOC	0	100.202	0.2602	0.311%	0.318%
Methylcyclopentane	VOC	0	84.159	0.2185	1.134%	0.973%
Dimethylpentane (2,4-)	VOC	0	100.202	0.2602	0.128%	0.131%
Trimethylbutane (2,2,3-)	VOC	0	100.202	0.2602	0.000%	0.000%
Benzene	VOC	X	78.112	0.2028	1.713%	1.364%
Dimethylpentane (3,3-)	VOC	0	100.202	0.2602	0.221%	0.226%
Cyclohexane	VOC	0	84.159	0.2185	1.106%	0.949%
Methylhexane (2-)	VOC	0	100.202	0.2602	2.292%	2.341%
Dimethylpentane (2,3-)	VOC	0	100.202	0.2602	0.000%	0.000%
Dimethylcyclopentane (1,1-)	VOC	0	98.186	0.2549	0.603%	0.603%
Methylhexane (3-)	VOC	0	100.202	0.2602	2.379%	2.430%
Dimethylcyclopentane (1,t-3-)	VOC	0	98.186	0.2549	0.163%	0.163%
Dimethylcyclopentane (1,c-3-)	VOC	0	98.186	0.2549	0.266%	0.266%
Ethylpentane (3-)	VOC	0	100.202	0.2602	0.029%	0.030%
Dimethylcyclopentane (1,t-2-)	VOC	0	98.186	0.2549	0.222%	0.222%
Trimethylpentane (2,2,4-)	VOC	X	114.229	0.2966	0.021%	0.024%
Heptane (n-)	VOC	0	100.202	0.2602	3.743%	3.822%
Methylcyclohexane	VOC	0	98.186	0.2549	3.302%	3.304%
Trimethylcyclopentane (1,1,3-)	VOC	0	112.213	0.2914	0.225%	0.257%
Dimethylhexane (2,2-)	VOC	0	114.229	0.2966	0.095%	0.111%
Dimethylcyclopentane (1,c-2-)	VOC	0	98.186	0.2549	0.848%	0.849%
Dimethylhexane (2,5-)	VOC	0	114.229	0.2966	0.000%	0.000%
Dimethylhexane (2,4-)	VOC	0	114.229	0.2966	0.143%	0.166%
Ethylcyclopentane	VOC	0	98.186	0.2549	0.464%	0.464%
Trimethylpentane (2,2,3-)	VOC	0	114.229	0.2966	0.028%	0.033%
Trimethylcyclopentane (1,t-2,c-4-)	VOC	0	112.213	0.2914	0.000%	0.000%
Dimethylhexane (3,3-)	VOC	0	114.229	0.2966	0.000%	0.000%
Trimethylcyclopentane (1,t-2,c-3-)	VOC	0	112.213	0.2914	0.000%	0.000%
Trimethylpentane (2,3,4-)	VOC	0	114.229	0.2966	0.000%	0.000%
Dimethylhexane (2,3-)	VOC	0	114.229	0.2966	0.000%	0.000%
Toluene	VOC	X	92.138	0.2392	4.445%	4.174%
Trimethylcyclopentane (1,1,2-)	VOC	0	112.213	0.2914	0.371%	0.424%
Dimethylhexane (3,4-)	VOC	0	114.229	0.2966	3.506%	4.081%
Methylheptane (2-)	VOC	0	114.229	0.2966	0.000%	0.000%
Methylheptane (4-)	VOC	0	114.229	0.2966	2.896%	3.372%
Dimethylhexane (3,4-)	VOC	0	114.229	0.2966	0.000%	0.000%
Methylheptane (3-)	VOC	0	114.229	0.2966	0.416%	0.484%
Ethylhexane (3-)	VOC	0	114.229	0.2966	0.111%	0.129%
Trimethylcyclopentane (1,c-2,t-4-)	VOC	0	112.213	0.2914	0.028%	0.032%
Dimethylcyclohexane (1,c-3-)	VOC	0	112.213	0.2914	0.170%	0.194%
Trimethylcyclopentane (1,c-2,t-3-)	VOC	0	112.213	0.2914	0.170%	0.194%
Dimethylcyclohexane (1,t-4-)	VOC	0	112.213	0.2914	0.000%	0.000%
Trimethylhexane (2,2,5-)	VOC	0	128.255	0.3330	0.000%	0.000%
Dimethylcyclohexane (1,1-)	VOC	0	112.213	0.2914	0.000%	0.000%
Ethylcyclopentane (1-methyl-t-3-)	VOC	0	112.213	0.2914	0.000%	0.000%
Ethylcyclopentane (1-methyl-c-3-)	VOC	0	112.213	0.2914	0.000%	0.000%
Ethylcyclopentane (1-methyl-t-2-)	VOC	0	112.213	0.2914	0.000%	0.000%
Trimethylhexane (2,2,4-)	VOC	0	128.255	0.3330	0.000%	0.000%
Ethylcyclopentane (1-methyl-t-1-)	VOC	0	112.213	0.2914	0.000%	0.000%
Cycloheptane	VOC	0	98.186	0.2549	0.000%	0.000%
Octane (n-)	VOC	0	114.229	0.2966	4.373%	5.090%
Trimethylhexane (2,4,4-)	VOC	0	128.255	0.3330	0.190%	0.248%
Tetramethylpentane (2,2,4,4-)	VOC	0	128.255	0.3330	0.000%	0.000%
Dimethylcyclohexane (1,t-3-)	VOC	0	112.213	0.2914	0.053%	0.061%
Dimethylcyclohexane (1,c-4-)	VOC	0	112.213	0.2914	0.053%	0.061%
Trimethylcyclopentane (1,c-2,c-3-)	VOC	0	112.213	0.2914	0.053%	0.061%
Propylcyclopentane (i-)	VOC	0	112.213	0.2914	0.348%	0.398%
Trimethylhexane (2,3,5-)	VOC	0	128.255	0.3330	0.006%	0.008%
Dimethylheptane (2,2-)	VOC	0	128.255	0.3330	0.000%	0.000%
Dimethylheptane (2,4-)	VOC	0	128.255	0.3330	0.158%	0.207%
Methylcyclopentane (1-ethyl-c-2-)	VOC	0	112.213	0.2914	0.181%	0.207%
Trimethylhexane (2,2,3-)	VOC	0	128.255	0.3330	0.000%	0.000%
Dimethylcyclohexane (1,c-2-)	VOC	0	112.213	0.2914	0.510%	0.583%

**TABLE E-0b(i)**  
**Flash Analysis**  
**Estimation of Specie Weight Percentages**  
**Pressurized Liquid**

Component			Molecular Weight (lb/mol) <sub>i</sub>	Density (lb/scf) <sub>i</sub>	Mole Percent (mol <sub>i</sub> /mol <sub>T</sub> )	Weight Percent (lb <sub>i</sub> /lb <sub>T</sub> )
Name (i)	Type	HAP				
Dimethylheptane (2,6-)	VOC	0	128.255	0.3330	0.112%	0.146%
Propylcyclopentane (n-)	VOC	0	112.213	0.2914	0.000%	0.000%
Trimethylcyclohexane (1,c-3,c-5-)	VOC	0	126.239	0.3278	0.000%	0.000%
Ethylcyclohexane	VOC	0	112.213	0.2914	1.365%	1.561%
Dimethylheptane (2,5-)	VOC	0	128.255	0.3330	0.067%	0.088%
Dimethylheptane (3,5-)	VOC	0	128.255	0.3330	0.067%	0.088%
Trimethylcyclohexane (1,1,3-)	VOC	0	126.239	0.3278	0.077%	0.099%
Trimethylhexane (2,3,3-)	VOC	0	128.255	0.3330	0.038%	0.050%
Dimethylheptane (3,3-)	VOC	0	128.255	0.3330	0.038%	0.050%
Trimethylcyclohexane (1,1,4-)	VOC	0	126.239	0.3278	0.000%	0.000%
Tetramethylpentane (2,2,3,3-)	VOC	0	128.255	0.3330	0.261%	0.341%
Ethylbenzene	VOC	X	106.165	0.2757	0.406%	0.439%
Trimethylhexane (2,3,4-)	VOC	0	128.255	0.3330	0.007%	0.009%
Trimethylcyclohexane (1,t-2,t-4-)	VOC	0	126.239	0.3278	0.000%	0.000%
Dimethylheptane (2,3-)	VOC	0	128.255	0.3330	0.000%	0.000%
Trimethylcyclohexane (1,c-3,t-5-)	VOC	0	126.239	0.3278	0.000%	0.000%
Xylene (m-)	VOC	X	106.165	0.2757	2.462%	2.664%
Xylene (p-)	VOC	X	106.165	0.2757	2.462%	2.664%
Dimethylheptane (3,4-)	VOC	0	128.255	0.3330	0.092%	0.120%
Methyloctane (2-)	VOC	0	128.255	0.3330	0.782%	1.022%
Methyloctane (4-)	VOC	0	128.255	0.3330	0.782%	1.022%
Dimethylheptane (3,4-)	VOC	0	128.255	0.3330	0.000%	0.000%
Methyloctane (3-)	VOC	0	128.255	0.3330	0.000%	0.000%
Butylcyclopentane (i-)	VOC	0	126.239	0.3278	0.000%	0.000%
Trimethylcyclohexane (1,t-2,c-3-)	VOC	0	126.239	0.3278	0.231%	0.297%
Trimethylcyclohexane (1,t-2,c-4-)	VOC	0	126.239	0.3278	0.231%	0.297%
Xylene (o-)	VOC	X	106.165	0.2757	0.547%	0.592%
Trimethylcyclohexane (1,1,2-)	VOC	0	126.239	0.3278	0.000%	0.000%
Trimethylcyclohexane (1,c-2,t-4-)	VOC	0	126.239	0.3278	0.200%	0.257%
Trimethylcyclohexane (1,c-2,c-4-)	VOC	0	126.239	0.3278	0.000%	0.000%
Nonane (n-)	VOC	0	128.255	0.3330	2.884%	3.770%
Unknowns	VOC		<b>283.704</b>	0.7366	10.755%	31.094%
<b>Pressurized Liquid</b>			98.125	0.2548	100.000%	100.000%
TOC (Total)			98.677	0.2562	99.000%	99.556%
VOC (Total)			124.943	0.3244	74.685%	95.096%
HAP (Total)			72.610	0.1885	79.059%	58.502%
Xylenes			106.165	0.2757	5.472%	5.920%

**NOTES**

1. Normalized mole percentages from TABLE E-0a(ii) to make total 100.000%.
2. Determined molecular weight of unknowns via iteration to match TABLE E-0a(i).

MW = 98.125 lb/lb-mol

**TABLE E-0b(ii)**  
**Flash Analysis**  
**Estimation of Specie Weight Percentages**  
**Flash Gas**

Component			Molecular Weight (lb/mol) <sub>i</sub>	Density (lb/scf) <sub>i</sub>	Mole Percent (mol <sub>i</sub> /mol <sub>T</sub> )	Weight Percent (lb <sub>i</sub> /lb <sub>T</sub> )
Name (i)	Type	HAP				
Nitrogen			28.013	0.0727	0.101%	0.105%
Carbon Dioxide	GHG		44.010	0.1143	3.163%	5.167%
Methane	GHG		16.042	0.0417	69.444%	41.356%
Ethane			30.069	0.0781	10.467%	11.683%
Propane	VOC		44.096	0.1145	5.339%	8.739%
Butane (i-)	VOC		58.122	0.1509	2.126%	4.587%
Butane (n-)	VOC		58.122	0.1509	2.495%	5.383%
Pentane (i-)	VOC		72.149	0.1873	1.895%	5.075%
Pentane (n-)	VOC		72.149	0.1873	1.056%	2.828%
Dimethylbutane (2,2-)	VOC		86.175	0.2238	0.050%	0.161%
Dimethylbutane (2,3-)	VOC		86.175	0.2238	0.000%	0.000%
Cyclopentane	VOC		70.133	0.1821	0.000%	0.000%
Methylpentane (2-)	VOC		86.175	0.2238	0.352%	1.128%
Methylpentane (3-)	VOC		86.175	0.2238	0.264%	0.844%
Hexane (n-)	VOC	X	86.175	0.2238	0.561%	1.793%
Dimethylpentane (2,2-)	VOC		100.202	0.2602	0.032%	0.119%
Methylcyclopentane	VOC		84.159	0.2185	0.116%	0.363%
Dimethylpentane (2,4-)	VOC		100.202	0.2602	0.013%	0.049%
Trimethylbutane (2,2,3-)	VOC		100.202	0.2602	0.000%	0.000%
Benzene	VOC	X	78.112	0.2028	0.175%	0.509%
Dimethylpentane (3,3-)	VOC		100.202	0.2602	0.023%	0.084%
Cyclohexane	VOC		84.159	0.2185	0.113%	0.354%
Methylhexane (2-)	VOC		100.202	0.2602	0.235%	0.873%
Dimethylpentane (2,3-)	VOC		100.202	0.2602	0.000%	0.000%
Dimethylcyclopentane (1,1-)	VOC		98.186	0.2549	0.062%	0.225%
Methylhexane (3-)	VOC		100.202	0.2602	0.244%	0.907%
Dimethylcyclopentane (1,t-3-)	VOC		98.186	0.2549	0.017%	0.061%
Dimethylcyclopentane (1,c-3-)	VOC		98.186	0.2549	0.027%	0.099%
Ethylpentane (3-)	VOC		100.202	0.2602	0.003%	0.011%
Dimethylcyclopentane (1,t-2-)	VOC		98.186	0.2549	0.023%	0.083%
Trimethylpentane (2,2,4-)	VOC	X	114.229	0.2966	0.002%	0.009%
Heptane (n-)	VOC		100.202	0.2602	0.383%	1.426%
Methylcyclohexane	VOC		98.186	0.2549	0.136%	0.495%
Trimethylcyclopentane (1,1,3-)	VOC		112.213	0.2914	0.009%	0.039%
Dimethylhexane (2,2-)	VOC		114.229	0.2966	0.004%	0.017%
Dimethylcyclopentane (1,c-2-)	VOC		98.186	0.2549	0.035%	0.127%
Dimethylhexane (2,5-)	VOC		114.229	0.2966	0.000%	0.000%
Dimethylhexane (2,4-)	VOC		114.229	0.2966	0.006%	0.025%
Ethylcyclopentane	VOC		98.186	0.2549	0.019%	0.070%
Trimethylpentane (2,2,3-)	VOC		114.229	0.2966	0.001%	0.005%
Trimethylcyclopentane (1,t-2,c-4-)	VOC		112.213	0.2914	0.000%	0.000%
Dimethylhexane (3,3-)	VOC		114.229	0.2966	0.000%	0.000%
Trimethylcyclopentane (1,t-2,c-3-)	VOC		112.213	0.2914	0.000%	0.000%
Trimethylpentane (2,3,4-)	VOC		114.229	0.2966	0.000%	0.000%
Dimethylhexane (2,3-)	VOC		114.229	0.2966	0.000%	0.000%
Toluene	VOC	X	92.138	0.2392	0.183%	0.625%
Trimethylcyclopentane (1,1,2-)	VOC		112.213	0.2914	0.015%	0.064%
Dimethylhexane (3,4-)	VOC		114.229	0.2966	0.144%	0.611%
Methylheptane (2-)	VOC		114.229	0.2966	0.000%	0.000%
Methylheptane (4-)	VOC		114.229	0.2966	0.119%	0.505%
Dimethylhexane (3,4-)	VOC		114.229	0.2966	0.000%	0.000%
Methylheptane (3-)	VOC		114.229	0.2966	0.017%	0.073%
Ethylhexane (3-)	VOC		114.229	0.2966	0.005%	0.019%
Trimethylcyclopentane (1,c-2,t-4-)	VOC		112.213	0.2914	0.001%	0.005%
Dimethylcyclohexane (1,c-3-)	VOC		112.213	0.2914	0.007%	0.029%
Trimethylcyclopentane (1,c-2,t-3-)	VOC		112.213	0.2914	0.007%	0.029%
Dimethylcyclohexane (1,t-4-)	VOC		112.213	0.2914	0.000%	0.000%
Trimethylhexane (2,2,5-)	VOC		128.255	0.3330	0.000%	0.000%
Dimethylcyclohexane (1,1-)	VOC		112.213	0.2914	0.000%	0.000%
Ethylcyclopentane (1-methyl-t-3-)	VOC		112.213	0.2914	0.000%	0.000%
Ethylcyclopentane (1-methyl-c-3-)	VOC		112.213	0.2914	0.000%	0.000%
Ethylcyclopentane (1-methyl-t-2-)	VOC		112.213	0.2914	0.000%	0.000%
Trimethylhexane (2,2,4-)	VOC		128.255	0.3330	0.000%	0.000%
Ethylcyclopentane (1-methyl-t-1-)	VOC		112.213	0.2914	0.000%	0.000%
Cycloheptane	VOC		98.186	0.2549	0.000%	0.000%
Octane (n-)	VOC		114.229	0.2966	0.180%	0.763%
Trimethylhexane (2,4,4-)	VOC		128.255	0.3330	0.003%	0.016%
Tetramethylpentane (2,2,4,4-)	VOC		128.255	0.3330	0.000%	0.000%
Dimethylcyclohexane (1,t-3-)	VOC		112.213	0.2914	0.001%	0.004%
Dimethylcyclohexane (1,c-4-)	VOC		112.213	0.2914	0.001%	0.004%
Trimethylcyclopentane (1,c-2,c-3-)	VOC		112.213	0.2914	0.001%	0.004%
Propylcyclopentane (i-)	VOC		112.213	0.2914	0.006%	0.025%
Trimethylhexane (2,3,5-)	VOC		128.255	0.3330	0.000%	0.000%
Dimethylheptane (2,2-)	VOC		128.255	0.3330	0.000%	0.000%
Dimethylheptane (2,4-)	VOC		128.255	0.3330	0.003%	0.013%
Methylcyclopentane (1-ethyl-c-2-)	VOC		112.213	0.2914	0.003%	0.013%
Trimethylhexane (2,2,3-)	VOC		128.255	0.3330	0.000%	0.000%
Dimethylcyclohexane (1,c-2-)	VOC		112.213	0.2914	0.009%	0.037%



**TABLE E-0b(ii)**  
**Flash Analysis**  
**Estimation of Specie Weight Percentages**  
**Flash Gas**

Component			Molecular Weight (lb/mol) <sub>i</sub>	Density (lb/scf) <sub>i</sub>	Mole Percent (mol <sub>i</sub> /mol <sub>T</sub> )	Weight Percent (lb <sub>i</sub> /lb <sub>T</sub> )
Name (i)	Type	HAP				
Dimethylheptane (2,6-)	VOC		128.255	0.3330	0.002%	0.009%
Propylcyclopentane (n-)	VOC		112.213	0.2914	0.000%	0.000%
Trimethylcyclohexane (1,c-3,c-5-)	VOC		126.239	0.3278	0.000%	0.000%
Ethylcyclohexane	VOC		112.213	0.2914	0.023%	0.098%
Dimethylheptane (2,5-)	VOC		128.255	0.3330	0.001%	0.005%
Dimethylheptane (3,5-)	VOC		128.255	0.3330	0.001%	0.005%
Trimethylcyclohexane (1,1,3-)	VOC		126.239	0.3278	0.001%	0.006%
Trimethylhexane (2,3,3-)	VOC		128.255	0.3330	0.001%	0.003%
Dimethylheptane (3,3-)	VOC		128.255	0.3330	0.001%	0.003%
Trimethylcyclohexane (1,1,4-)	VOC		126.239	0.3278	0.000%	0.000%
Tetramethylpentane (2,2,3,3-)	VOC		128.255	0.3330	0.004%	0.021%
Ethylbenzene	VOC	X	106.165	0.2757	0.007%	0.028%
Trimethylhexane (2,3,4-)	VOC		128.255	0.3330	0.000%	0.001%
Trimethylcyclohexane (1,t-2,t-4-)	VOC		126.239	0.3278	0.000%	0.000%
Dimethylheptane (2,3-)	VOC		128.255	0.3330	0.000%	0.000%
Trimethylcyclohexane (1,c-3,t-5-)	VOC		126.239	0.3278	0.000%	0.000%
Xylene (m-)	VOC	X	106.165	0.2757	0.042%	0.167%
Xylene (p-)	VOC	X	106.165	0.2757	0.042%	0.167%
Dimethylheptane (3,4-)	VOC		128.255	0.3330	0.002%	0.008%
Methyloctane (2-)	VOC		128.255	0.3330	0.013%	0.064%
Methyloctane (4-)	VOC		128.255	0.3330	0.013%	0.064%
Dimethylheptane (3,4-)	VOC		128.255	0.3330	0.000%	0.000%
Methyloctane (3-)	VOC		128.255	0.3330	0.000%	0.000%
Butylcyclopentane (i-)	VOC		126.239	0.3278	0.000%	0.000%
Trimethylcyclohexane (1,t-2,c-3-)	VOC		126.239	0.3278	0.004%	0.019%
Trimethylcyclohexane (1,t-2,c-4-)	VOC		126.239	0.3278	0.004%	0.019%
Xylene (o-)	VOC	X	106.165	0.2757	0.009%	0.037%
Trimethylcyclohexane (1,1,2-)	VOC		126.239	0.3278	0.000%	0.000%
Trimethylcyclohexane (1,c-2,t-4-)	VOC		126.239	0.3278	0.003%	0.016%
Trimethylcyclohexane (1,c-2,c-4-)	VOC		126.239	0.3278	0.000%	0.000%
Nonane (n-)	VOC		128.255	0.3330	0.050%	0.236%
Unknowns	VOC		<b>473.700</b>	1.2300	0.079%	1.387%
<b>Flash Gas</b>			26.938	0.0699	100.000%	100.000%
TOC (Total)			26.379	0.0685	96.736%	94.728%
VOC (Total)			66.745	0.1733	16.825%	41.688%
HAP (Total)			88.115	0.2288	0.762%	2.492%
Xylenes			106.165	0.2757	0.094%	0.371%

**NOTES**

1. Normalized mole percentages from TABLE E-0a(ii) to make total 100.000%.
2. Determined molecular weight of unknowns via iteration to match TABLE E-0a(i), unless value negative.  
MW = 26.938 lb/lb-mol

**TABLE E-0b(iii)**  
**Flash Analysis**  
**Estimation of Specie Weight Percentages**  
**Residual Liquid**

Component			Molecular Weight (lb/mol) <sub>i</sub>	Density (lb/scf) <sub>i</sub>	Mole Percent (mol <sub>i</sub> /mol <sub>T</sub> )	Weight Percent (lb <sub>i</sub> /lb <sub>T</sub> )
Name (i)	Type	HAP				
Nitrogen	0	0	28.013	0.0727	0.000%	0.000%
Carbon Dioxide	GHG	0	44.010	0.1143	0.038%	0.013%
Methane	GHG	0	16.042	0.0417	0.303%	0.038%
Ethane	0	0	30.069	0.0781	0.383%	0.090%
Propane	VOC	0	44.096	0.1145	0.838%	0.288%
Butane (i-)	VOC	0	58.122	0.1509	0.849%	0.385%
Butane (n-)	VOC	0	58.122	0.1509	1.391%	0.630%
Pentane (i-)	VOC	0	72.149	0.1873	2.544%	1.430%
Pentane (n-)	VOC	0	72.149	0.1873	1.859%	1.045%
Dimethylbutane (2,2-)	VOC	0	86.175	0.2238	0.227%	0.152%
Dimethylbutane (2,3-)	VOC	0	86.175	0.2238	0.000%	0.000%
Cyclopentane	VOC	0	70.133	0.1821	0.000%	0.000%
Methylpentane (2-)	VOC	0	86.175	0.2238	1.586%	1.065%
Methylpentane (3-)	VOC	0	86.175	0.2238	1.188%	0.797%
Hexane (n-)	VOC	X	86.175	0.2238	2.522%	1.693%
Dimethylpentane (2,2-)	VOC	0	100.202	0.2602	0.430%	0.335%
Methylcyclopentane	VOC	0	84.159	0.2185	1.567%	1.027%
Dimethylpentane (2,4-)	VOC	0	100.202	0.2602	0.177%	0.138%
Trimethylbutane (2,2,3-)	VOC	0	100.202	0.2602	0.000%	0.000%
Benzene	VOC	X	78.112	0.2028	2.367%	1.440%
Dimethylpentane (3,3-)	VOC	0	100.202	0.2602	0.305%	0.238%
Cyclohexane	VOC	0	84.159	0.2185	1.528%	1.002%
Methylhexane (2-)	VOC	0	100.202	0.2602	3.167%	2.472%
Dimethylpentane (2,3-)	VOC	0	100.202	0.2602	0.000%	0.000%
Dimethylcyclopentane (1,1-)	VOC	0	98.186	0.2549	0.833%	0.637%
Methylhexane (3-)	VOC	0	100.202	0.2602	3.287%	2.566%
Dimethylcyclopentane (1,t-3-)	VOC	0	98.186	0.2549	0.225%	0.172%
Dimethylcyclopentane (1,c-3-)	VOC	0	98.186	0.2549	0.368%	0.281%
Ethylpentane (3-)	VOC	0	100.202	0.2602	0.040%	0.031%
Dimethylcyclopentane (1,t-2-)	VOC	0	98.186	0.2549	0.307%	0.235%
Trimethylpentane (2,2,4-)	VOC	X	114.229	0.2966	0.029%	0.026%
Heptane (n-)	VOC	0	100.202	0.2602	5.170%	4.036%
Methylcyclohexane	VOC	0	98.186	0.2549	4.647%	3.555%
Trimethylcyclopentane (1,1,3-)	VOC	0	112.213	0.2914	0.317%	0.277%
Dimethylhexane (2,2-)	VOC	0	114.229	0.2966	0.134%	0.119%
Dimethylcyclopentane (1,c-2-)	VOC	0	98.186	0.2549	1.194%	0.913%
Dimethylhexane (2,5-)	VOC	0	114.229	0.2966	0.000%	0.000%
Dimethylhexane (2,4-)	VOC	0	114.229	0.2966	0.201%	0.179%
Ethylcyclopentane	VOC	0	98.186	0.2549	0.653%	0.500%
Trimethylpentane (2,2,3-)	VOC	0	114.229	0.2966	0.039%	0.035%
Trimethylcyclopentane (1,t-2,c-4-)	VOC	0	112.213	0.2914	0.000%	0.000%
Dimethylhexane (3,3-)	VOC	0	114.229	0.2966	0.000%	0.000%
Trimethylcyclopentane (1,t-2,c-3-)	VOC	0	112.213	0.2914	0.000%	0.000%
Trimethylpentane (2,3,4-)	VOC	0	114.229	0.2966	0.000%	0.000%
Dimethylhexane (2,3-)	VOC	0	114.229	0.2966	0.000%	0.000%
Toluene	VOC	X	92.138	0.2392	6.256%	4.491%
Trimethylcyclopentane (1,1,2-)	VOC	0	112.213	0.2914	0.522%	0.457%
Dimethylhexane (3,4-)	VOC	0	114.229	0.2966	4.934%	4.391%
Methylheptane (2-)	VOC	0	114.229	0.2966	0.000%	0.000%

**TABLE E-0b(iii)**  
**Flash Analysis**  
**Estimation of Specie Weight Percentages**  
**Residual Liquid**

Component			Molecular Weight (lb/mol) <sub>i</sub>	Density (lb/scf) <sub>i</sub>	Mole Percent (mol <sub>i</sub> /mol <sub>T</sub> )	Weight Percent (lb <sub>i</sub> /lb <sub>T</sub> )
Name (i)	Type	HAP				
Methylheptane (4-)	VOC	0	114.229	0.2966	4.077%	3.628%
Dimethylhexane (3,4-)	VOC	0	114.229	0.2966	0.000%	0.000%
Methylheptane (3-)	VOC	0	114.229	0.2966	0.586%	0.521%
Ethylhexane (3-)	VOC	0	114.229	0.2966	0.156%	0.139%
Trimethylcyclopentane (1,c-2,t-4-)	VOC	0	112.213	0.2914	0.039%	0.034%
Dimethylcyclohexane (1,c-3-)	VOC	0	112.213	0.2914	0.239%	0.209%
Trimethylcyclopentane (1,c-2,t-3-)	VOC	0	112.213	0.2914	0.239%	0.209%
Dimethylcyclohexane (1,t-4-)	VOC	0	112.213	0.2914	0.000%	0.000%
Trimethylhexane (2,2,5-)	VOC	0	128.255	0.3330	0.000%	0.000%
Dimethylcyclohexane (1,1-)	VOC	0	112.213	0.2914	0.000%	0.000%
Ethylcyclopentane (1-methyl-t-3-)	VOC	0	112.213	0.2914	0.000%	0.000%
Ethylcyclopentane (1-methyl-c-3-)	VOC	0	112.213	0.2914	0.000%	0.000%
Ethylcyclopentane (1-methyl-t-2-)	VOC	0	112.213	0.2914	0.000%	0.000%
Trimethylhexane (2,2,4-)	VOC	0	128.255	0.3330	0.000%	0.000%
Ethylcyclopentane (1-methyl-t-1-)	VOC	0	112.213	0.2914	0.000%	0.000%
Cycloheptane	VOC	0	98.186	0.2549	0.000%	0.000%
Octane (n-)	VOC	0	114.229	0.2966	6.155%	5.477%
Trimethylhexane (2,4,4-)	VOC	0	128.255	0.3330	0.269%	0.269%
Tetramethylpentane (2,2,4,4-)	VOC	0	128.255	0.3330	0.000%	0.000%
Dimethylcyclohexane (1,t-3-)	VOC	0	112.213	0.2914	0.075%	0.066%
Dimethylcyclohexane (1,c-4-)	VOC	0	112.213	0.2914	0.075%	0.066%
Trimethylcyclopentane (1,c-2,c-3-)	VOC	0	112.213	0.2914	0.075%	0.066%
Propylcyclopentane (i-)	VOC	0	112.213	0.2914	0.493%	0.431%
Trimethylhexane (2,3,5-)	VOC	0	128.255	0.3330	0.009%	0.009%
Dimethylheptane (2,2-)	VOC	0	128.255	0.3330	0.000%	0.000%
Dimethylheptane (2,4-)	VOC	0	128.255	0.3330	0.224%	0.224%
Methylcyclopentane (1-ethyl-c-2-)	VOC	0	112.213	0.2914	0.257%	0.224%
Trimethylhexane (2,2,3-)	VOC	0	128.255	0.3330	0.000%	0.000%
Dimethylcyclohexane (1,c-2-)	VOC	0	112.213	0.2914	0.723%	0.632%
Dimethylheptane (2,6-)	VOC	0	128.255	0.3330	0.159%	0.159%
Propylcyclopentane (n-)	VOC	0	112.213	0.2914	0.000%	0.000%
Trimethylcyclohexane (1,c-3,c-5-)	VOC	0	126.239	0.3278	0.000%	0.000%
Ethylcyclohexane	VOC	0	112.213	0.2914	1.935%	1.692%
Dimethylheptane (2,5-)	VOC	0	128.255	0.3330	0.095%	0.095%
Dimethylheptane (3,5-)	VOC	0	128.255	0.3330	0.095%	0.095%
Trimethylcyclohexane (1,1,3-)	VOC	0	126.239	0.3278	0.109%	0.107%
Trimethylhexane (2,3,3-)	VOC	0	128.255	0.3330	0.054%	0.054%
Dimethylheptane (3,3-)	VOC	0	128.255	0.3330	0.054%	0.054%
Trimethylcyclohexane (1,1,4-)	VOC	0	126.239	0.3278	0.000%	0.000%
Tetramethylpentane (2,2,3,3-)	VOC	0	128.255	0.3330	0.370%	0.370%
Ethylbenzene	VOC	X	106.165	0.2757	0.576%	0.476%
Trimethylhexane (2,3,4-)	VOC	0	128.255	0.3330	0.010%	0.010%
Trimethylcyclohexane (1,t-2,t-4-)	VOC	0	126.239	0.3278	0.000%	0.000%
Dimethylheptane (2,3-)	VOC	0	128.255	0.3330	0.000%	0.000%
Trimethylcyclohexane (1,c-3,t-5-)	VOC	0	126.239	0.3278	0.000%	0.000%
Xylene (m-)	VOC	X	106.165	0.2757	3.491%	2.887%
Xylene (p-)	VOC	X	106.165	0.2757	3.491%	2.887%
Dimethylheptane (3,4-)	VOC	0	128.255	0.3330	0.130%	0.130%
Methyloctane (2-)	VOC	0	128.255	0.3330	1.109%	1.108%
Methyloctane (4-)	VOC	0	128.255	0.3330	1.109%	1.108%
Dimethylheptane (3,4-)	VOC	0	128.255	0.3330	0.000%	0.000%
Methyloctane (3-)	VOC	0	128.255	0.3330	0.000%	0.000%
Butylcyclopentane (i-)	VOC	0	126.239	0.3278	0.000%	0.000%
Trimethylcyclohexane (1,t-2,c-3-)	VOC	0	126.239	0.3278	0.328%	0.322%
Trimethylcyclohexane (1,t-2,c-4-)	VOC	0	126.239	0.3278	0.328%	0.322%
Xylene (o-)	VOC	X	106.165	0.2757	0.776%	0.641%
Trimethylcyclohexane (1,1,2-)	VOC	0	126.239	0.3278	0.000%	0.000%
Trimethylcyclohexane (1,c-2,t-4-)	VOC	0	126.239	0.3278	0.284%	0.279%
Trimethylcyclohexane (1,c-2,c-4-)	VOC	0	126.239	0.3278	0.000%	0.000%
Nonane (n-)	VOC	0	128.255	0.3330	4.089%	4.086%
Unknowns	VOC		<b>283.170</b>	0.7353	15.292%	33.734%
<b>Residual Liquid</b>			128.362	0.3333	100.000%	100.000%
TOC (Total)			128.394	0.3334	99.962%	99.987%
VOC (Total)			129.116	0.3353	99.276%	99.859%
HAP (Total)			99.384	0.2581	71.672%	55.491%
Xylenes			106.165	0.2757	7.757%	6.416%

**NOTES**

1. Normalized mole percentages from TABLE E-0a(ii) to make total 100.000%.
2. Determined molecular weight of unknowns via iteration to match TABLE E-0a(i).

MW = 128.362 lb/lb-mol

**TABLE E-1AA**  
**Flash Analysis**  
**Maximum Hourly and Annual Emission Estimates**

Station ID	CROM-SV-V01C1				
Service	Pipeline Liquids				
Liquids Holding Capacity	218 gal			218 gal	
Liquids Input Rate	44 gal/yr			44 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	340 scf/yr			340 scfh	
Flash Losses	26 lb/yr	Average	Maximum	26 lb/hr	Maximum
Flash Gas	100.00% by weight	0.0030 lb/hr	0.0131 tpy	100.00% by weight	26.1401 lb/hr
CO <sub>2-e</sub>	1039.07% by weight	0.0310 lb/hr	0.1358 tpy	1039.07% by weight	272 lb/hr
CO <sub>2</sub>	5.17% by weight	0.0002 lb/hr	0.0007 tpy	5.17% by weight	1.3508 lb/hr
TOC (Total)	94.73% by weight	0.0028 lb/hr	0.0124 tpy	94.73% by weight	24.7619 lb/hr
Methane	41.36% by weight	0.0012 lb/hr	0.0054 tpy	41.36% by weight	10.8105 lb/hr
Ethane	11.68% by weight	0.0003 lb/hr	0.0015 tpy	11.68% by weight	3.0541 lb/hr
VOC (Total)	41.69% by weight	0.0012 lb/hr	0.0054 tpy	41.69% by weight	10.8972 lb/hr
HAP (Total)	2.49% by weight	0.0001 lb/hr	0.0003 tpy	2.49% by weight	0.6515 lb/hr
Benzene	0.5089% by weight	0.0000 lb/hr	0.0001 tpy	0.5089% by weight	0.1330 lb/hr
Ethylbenzene	0.0275% by weight	0.0000 lb/hr	0.0000 tpy	0.0275% by weight	0.0072 lb/hr
Hexane (n-)	1.7932% by weight	0.0001 lb/hr	0.0002 tpy	1.7932% by weight	0.4687 lb/hr
Methanol					
Naphthalene					
Toluene	0.6253% by weight	0.0000 lb/hr	0.0001 tpy	0.6253% by weight	0.1635 lb/hr
Trimethylpentane (2,2,4-)	0.0091% by weight	0.0000 lb/hr	0.0000 tpy	0.0091% by weight	0.0024 lb/hr
Xylenes	0.3706% by weight	0.0000 lb/hr	0.0000 tpy	0.3706% by weight	0.0969 lb/hr

**NOTES**

1. Separator Characteristics: Flash is only represented because the potential exists. The vast majority of liquids in this separator is moisture from ambient air due to temperature drop caused by pressure drop during a gas release.

Orientation	Vertical Fixed Roof Tank	
Height/Length	12.00 ft	
Diameter	3.50 ft	
Capacity (physical)	864 gal	
Capacity (liquid)	218 gal	25% of physical capacity

2. Liquid input rates:

- |  |           |
|--|-----------|
| a. maximum hourly based on operator experience;                        | 44 gal/hr |
| b. maximum annual based on operating experience and safety factor; and | 44 gal/yr |
| c. average hourly is just the maximum annual divided by 8,760 hrs/yr.  |           |

3. Flash gas density is 110% of the value extracted from TABLE E-0b(ii).

Density (TABLE E-0b(ii)):	0.0699 lb/scf	Safety Factor:	110%
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4. Flash factor extracted from TABLE E-0a(i).

5. Speciated emissions vapor weight percentages extracted from TABLE E-0b(ii).

**TABLE E-1AB**  
**Flash Analysis**  
**Maximum Hourly and Annual Emission Estimates**

Station ID	CROM-SV-V01C2				
Service	Pipeline Liquids				
Liquids Holding Capacity	218 gal			218 gal	
Liquids Input Rate	44 gal/yr			44 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	340 scf/yr			340 scfh	
Flash Losses	26 lb/yr	Average	Maximum	26 lb/hr	Maximum
Flash Gas	100.00% by weight	0.0030 lb/hr	0.0131 tpy	100.00% by weight	26.1401 lb/hr
CO <sub>2-e</sub>	1039.07% by weight	0.0310 lb/hr	0.1358 tpy	1039.07% by weight	272 lb/hr
CO <sub>2</sub>	5.17% by weight	0.0002 lb/hr	0.0007 tpy	5.17% by weight	1.3508 lb/hr
TOC (Total)	94.73% by weight	0.0028 lb/hr	0.0124 tpy	94.73% by weight	24.7619 lb/hr
Methane	41.36% by weight	0.0012 lb/hr	0.0054 tpy	41.36% by weight	10.8105 lb/hr
Ethane	11.68% by weight	0.0003 lb/hr	0.0015 tpy	11.68% by weight	3.0541 lb/hr
VOC (Total)	41.69% by weight	0.0012 lb/hr	0.0054 tpy	41.69% by weight	10.8972 lb/hr
HAP (Total)	2.49% by weight	0.0001 lb/hr	0.0003 tpy	2.49% by weight	0.6515 lb/hr
Benzene	0.5089% by weight	0.0000 lb/hr	0.0001 tpy	0.5089% by weight	0.1330 lb/hr
Ethylbenzene	0.0275% by weight	0.0000 lb/hr	0.0000 tpy	0.0275% by weight	0.0072 lb/hr
Hexane (n-)	1.7932% by weight	0.0001 lb/hr	0.0002 tpy	1.7932% by weight	0.4687 lb/hr
Methanol					
Naphthalene					
Toluene	0.6253% by weight	0.0000 lb/hr	0.0001 tpy	0.6253% by weight	0.1635 lb/hr
Trimethylpentane (2,2,4-)	0.0091% by weight	0.0000 lb/hr	0.0000 tpy	0.0091% by weight	0.0024 lb/hr
Xylenes	0.3706% by weight	0.0000 lb/hr	0.0000 tpy	0.3706% by weight	0.0969 lb/hr

**NOTES**

1. Separator Characteristics: Flash is only represented because the potential exists. The vast majority of liquids in this separator is moisture from ambient air due to temperature drop caused by pressure drop during a gas release.

Orientation	Vertical Fixed Roof Tank		
Height/Length	12.00 ft		
Diameter	3.50 ft		
Capacity (physical)	864 gal		
Capacity (liquid)	218 gal	25% of physical capacity	

2. Liquid input rates:

a. maximum hourly based on operator experience;	44 gal/hr
b. maximum annual based on operating experience and safety factor; and	44 gal/yr
c. average hourly is just the maximum annual divided by 8,760 hrs/yr.	

3. Flash gas density is 110% of the value extracted from TABLE E-0b(ii).

Density (TABLE E-0b(ii)):	0.0699 lb/scf	Safety Factor:	110%
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4. Flash factor extracted from TABLE E-0a(i).

5. Speciated emissions vapor weight percentages extracted from TABLE E-0b(ii).

**TABLE E-1AC**  
**Flash Analysis**  
**Maximum Hourly and Annual Emission Estimates**

Station ID	CROM-SV-V01C3				
Service	Pipeline Liquids				
Liquids Holding Capacity	218 gal			218 gal	
Liquids Input Rate	44 gal/yr			44 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	340 scf/yr			340 scfh	
Flash Losses	26 lb/yr	Average	Maximum	26 lb/hr	Maximum
Flash Gas	100.00% by weight	0.0030 lb/hr	0.0131 tpy	100.00% by weight	26.1401 lb/hr
CO <sub>2-e</sub>	1039.07% by weight	0.0310 lb/hr	0.1358 tpy	1039.07% by weight	272 lb/hr
CO <sub>2</sub>	5.17% by weight	0.0002 lb/hr	0.0007 tpy	5.17% by weight	1.3508 lb/hr
TOC (Total)	94.73% by weight	0.0028 lb/hr	0.0124 tpy	94.73% by weight	24.7619 lb/hr
Methane	41.36% by weight	0.0012 lb/hr	0.0054 tpy	41.36% by weight	10.8105 lb/hr
Ethane	11.68% by weight	0.0003 lb/hr	0.0015 tpy	11.68% by weight	3.0541 lb/hr
VOC (Total)	41.69% by weight	0.0012 lb/hr	0.0054 tpy	41.69% by weight	10.8972 lb/hr
HAP (Total)	2.49% by weight	0.0001 lb/hr	0.0003 tpy	2.49% by weight	0.6515 lb/hr
Benzene	0.5089% by weight	0.0000 lb/hr	0.0001 tpy	0.5089% by weight	0.1330 lb/hr
Ethylbenzene	0.0275% by weight	0.0000 lb/hr	0.0000 tpy	0.0275% by weight	0.0072 lb/hr
Hexane (n-)	1.7932% by weight	0.0001 lb/hr	0.0002 tpy	1.7932% by weight	0.4687 lb/hr
Methanol					
Naphthalene					
Toluene	0.6253% by weight	0.0000 lb/hr	0.0001 tpy	0.6253% by weight	0.1635 lb/hr
Trimethylpentane (2,2,4-)	0.0091% by weight	0.0000 lb/hr	0.0000 tpy	0.0091% by weight	0.0024 lb/hr
Xylenes	0.3706% by weight	0.0000 lb/hr	0.0000 tpy	0.3706% by weight	0.0969 lb/hr

**NOTES**

1. Separator Characteristics: Flash is only represented because the potential exists. The vast majority of liquids in this separator is moisture from ambient air due to temperature drop caused by pressure drop during a gas release.

Orientation	Vertical Fixed Roof Tank	
Height/Length	12.00 ft	
Diameter	3.50 ft	
Capacity (physical)	864 gal	
Capacity (liquid)	218 gal	25% of physical capacity

2. Liquid input rates:

a. maximum hourly based on operator experience;	44 gal/hr
b. maximum annual based on operating experience and safety factor; and	44 gal/yr
c. average hourly is just the maximum annual divided by 8,760 hrs/yr.	

3. Flash gas density is 110% of the value extracted from TABLE E-0b(ii).

Density (TABLE E-0b(ii)):	0.0699 lb/scf	Safety Factor:	110%
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4. Flash factor extracted from TABLE E-0a(i).

5. Speciated emissions vapor weight percentages extracted from TABLE E-0b(ii).

**TABLE E-1BA**  
**Flash Analysis**  
**Maximum Hourly and Annual Emission Estimates**

Station ID	CROM-SV-V02A				
Service	Pipeline Liquids				
Liquids Holding Capacity	220 gal			220 gal	
Liquids Input Rate	558 gal/yr			220 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	4,355 scf/yr			1,718 scfh	
Flash Losses	335 lb/yr	Average	Maximum	132 lb/hr	Maximum
Flash Gas	100.00% by weight	0.0382 lb/hr	0.1675 tpy	100.00% by weight	132.2027 lb/hr
CO <sub>2-c</sub>	1039.07% by weight	0.3974 lb/hr	1.7408 tpy	1039.07% by weight	1,374 lb/hr
CO <sub>2</sub>	5.17% by weight	0.0020 lb/hr	0.0087 tpy	5.17% by weight	6.8315 lb/hr
TOC (Total)	94.73% by weight	0.0362 lb/hr	0.1587 tpy	94.73% by weight	125.2324 lb/hr
Methane	41.36% by weight	0.0158 lb/hr	0.0693 tpy	41.36% by weight	54.6740 lb/hr
Ethane	11.68% by weight	0.0045 lb/hr	0.0196 tpy	11.68% by weight	15.4458 lb/hr
VOC (Total)	41.69% by weight	0.0159 lb/hr	0.0698 tpy	41.69% by weight	55.1125 lb/hr
HAP (Total)	2.49% by weight	0.0010 lb/hr	0.0042 tpy	2.49% by weight	3.2948 lb/hr
Benzene	0.5089% by weight	0.0002 lb/hr	0.0009 tpy	0.5089% by weight	0.6727 lb/hr
Ethylbenzene	0.0275% by weight	0.0000 lb/hr	0.0000 tpy	0.0275% by weight	0.0364 lb/hr
Hexane (n-)	1.7932% by weight	0.0007 lb/hr	0.0030 tpy	1.7932% by weight	2.3707 lb/hr
Methanol					
Naphthalene					
Toluene	0.6253% by weight	0.0002 lb/hr	0.0010 tpy	0.6253% by weight	0.8267 lb/hr
Trimethylpentane (2,2,4-)	0.0091% by weight	0.0000 lb/hr	0.0000 tpy	0.0091% by weight	0.0121 lb/hr
Xylenes	0.3706% by weight	0.0001 lb/hr	0.0006 tpy	0.3706% by weight	0.4900 lb/hr

**NOTES**

1. Separator Characteristics: Entire flashable liquids throughput is distributed through V2 separators since V2 separators WILL receive vast majority of flashable liquids.

Orientation	Vertical Fixed Roof Tank		
Height/Length	11.17 ft		
Diameter	1.83 ft		
Capacity (physical)	220 gal		
Capacity (liquid)	220 gal	100% of physical capacity	

2. Liquid input rates:

- |  |            |
|--|------------|
| a. maximum hourly based on operator experience;                        | 220 gal/hr |
| b. maximum annual based on operating experience and safety factor; and | 558 gal/yr |
| c. average hourly is just the maximum annual divided by 8,760 hrs/yr.  |            |

3. Flash gas density is 110% of the value extracted from TABLE E-0b(ii).

Density (TABLE E-0b(ii)):	0.0699 lb/scf	Safety Factor:	110%
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4. Flash factor extracted from TABLE E-0a(i).

5. Speciated emissions vapor weight percentages extracted from TABLE E-0b(ii).

**TABLE E-1BB**  
**Flash Analysis**  
**Maximum Hourly and Annual Emission Estimates**

Station ID	CROM-SV-V02B				
Service	Pipeline Liquids				
Liquids Holding Capacity	940 gal			940 gal	
Liquids Input Rate	2,382 gal/yr			940 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	18,607 scf/yr			7,342 scfh	
Flash Losses	1,432 lb/yr	Average	Maximum	565 lb/hr	Maximum
Flash Gas	100.00% by weight	0.1634 lb/hr	0.7158 tpy	100.00% by weight	564.8660 lb/hr
CO <sub>2-c</sub>	1039.07% by weight	1.6982 lb/hr	7.4379 tpy	1039.07% by weight	5,869 lb/hr
CO <sub>2</sub>	5.17% by weight	0.0084 lb/hr	0.0370 tpy	5.17% by weight	29.1890 lb/hr
TOC (Total)	94.73% by weight	0.1548 lb/hr	0.6781 tpy	94.73% by weight	535.0837 lb/hr
Methane	41.36% by weight	0.0676 lb/hr	0.2960 tpy	41.36% by weight	233.6071 lb/hr
Ethane	11.68% by weight	0.0191 lb/hr	0.0836 tpy	11.68% by weight	65.9957 lb/hr
VOC (Total)	41.69% by weight	0.0681 lb/hr	0.2984 tpy	41.69% by weight	235.4808 lb/hr
HAP (Total)	2.49% by weight	0.0041 lb/hr	0.0178 tpy	2.49% by weight	14.0776 lb/hr
Benzene	0.5089% by weight	0.0008 lb/hr	0.0036 tpy	0.5089% by weight	2.8744 lb/hr
Ethylbenzene	0.0275% by weight	0.0000 lb/hr	0.0002 tpy	0.0275% by weight	0.1554 lb/hr
Hexane (n-)	1.7932% by weight	0.0029 lb/hr	0.0128 tpy	1.7932% by weight	10.1293 lb/hr
Methanol					
Naphthalene					
Toluene	0.6253% by weight	0.0010 lb/hr	0.0045 tpy	0.6253% by weight	3.5321 lb/hr
Trimethylpentane (2,2,4-)	0.0091% by weight	0.0000 lb/hr	0.0001 tpy	0.0091% by weight	0.0515 lb/hr
Xylenes	0.3706% by weight	0.0006 lb/hr	0.0027 tpy	0.3706% by weight	2.0936 lb/hr

**NOTES**

1. Separator Characteristics: Entire flashable liquids throughput is distributed through V2 separators since V2 separators WILL receive vast majority of flashable liquids.

Orientation	Vertical Fixed Roof Tank	
Height/Length	10.00 ft	
Diameter	4.00 ft	
Capacity (physical)	940 gal	
Capacity (liquid)	940 gal	100% of physical capacity

2. Liquid input rates:

- a. maximum hourly based on operator experience; 940 gal/hr
- b. maximum annual based on operating experience and safety factor; and 2,382 gal/yr
- c. average hourly is just the maximum annual divided by 8,760 hrs/yr.

3. Flash gas density is 110% of the value extracted from TABLE E-0b(ii).

Density (TABLE E-0b(ii)):	0.0699 lb/scf	Safety Factor:	110%
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4. Flash factor extracted from TABLE E-0a(i).

5. Speciated emissions vapor weight percentages extracted from TABLE E-0b(ii).



ATTACHMENT 2: PIPING COMPONENTS  
FUGITIVE PTE SUPPORTING  
CALCULATIONS

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

Source		CROM-PC-NG			
Service		Gas			
		Natural Gas			
Minimum hours when component purged with inert gas		0 hrs/yr			
Component	Valves	Count	870 components		
		Emission Factor	4.50E-03 kg/hr/component		
	Connectors	Count	4,854 components		
		Emission Factor	2.00E-04 kg/hr/component		
	Flanges	Count	580 components		
		Emission Factor	3.90E-04 kg/hr/component		
	Open-Ended Lines	Count	60 components		
		Emission Factor	2.00E-03 kg/hr/component		
	Pump Seals	Count	0 components		
		Emission Factor	2.40E-03 kg/hr/component		
	Other	Count	93 components		
		Emission Factor	8.80E-03 kg/hr/component		
		<b>Emissions</b>			
		<b>Avg. Hourly</b>	<b>Max. Annual</b>	<b>Max. Hourly</b>	
Speciation	CO <sub>2-e</sub>	2384.96% by weight	318.1202 lb/hr	1,393.3665 tpy	322.9197 lb/hr
	CO <sub>2</sub>	3.41% by weight	0.4544 lb/hr	1.9903 tpy	0.6342 lb/hr
	TOC (Total)	100.00% by weight	13.3386 lb/hr	58.4232 tpy	13.3386 lb/hr
	Methane	95.262% by weight	12.7066 lb/hr	55.6550 tpy	12.8914 lb/hr
	Ethane	12.751% by weight	1.7008 lb/hr	7.4495 tpy	2.6094 lb/hr
	VOC (Total)	2.198% by weight	0.2932 lb/hr	1.2842 tpy	1.2668 lb/hr
	VOC (non-HAP)	2.131% by weight	0.2842 lb/hr	1.2450 tpy	1.2370 lb/hr
	HAP (Total)	0.067% by weight	0.0090 lb/hr	0.0392 tpy	0.0298 lb/hr
	Benzene	0.018% by weight	2.45E-03 lb/hr	1.07E-02 tpy	1.06E-02 lb/hr
	Ethylbenzene	0.008% by weight	1.10E-03 lb/hr	4.81E-03 tpy	1.64E-03 lb/hr
	Hexane (n-)	0.039% by weight	5.20E-03 lb/hr	2.28E-02 tpy	2.98E-02 lb/hr
	Methanol				
	Naphthalene				
	Toluene	0.021% by weight	2.76E-03 lb/hr	1.21E-02 tpy	9.24E-03 lb/hr
	Trimethylpentane (2,2,4-)	0.007% by weight	9.18E-04 lb/hr	4.02E-03 tpy	9.24E-04 lb/hr
Xylenes	0.025% by weight	3.34E-03 lb/hr	1.46E-02 tpy	1.39E-02 lb/hr	

**NOTES**

- 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.
- Piping component counts based on design drawings for a similar compressor station.
- The component type "Other" includes blowdown valves, relief valves, and compressor seals.
- 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		CROM-PC-PL			
Service		Light Oil			
		Pipeline Liquids			
Minimum hours when component purged with inert gas		0 hrs/yr			
Component	Valves	Count	123 components		
		Emission Factor	2.50E-03 kg/hr/component		
	Connectors	Count	593 components		
		Emission Factor	2.10E-04 kg/hr/component		
	Flanges	Count	303 components		
		Emission Factor	1.10E-04 kg/hr/component		
	Open-Ended Lines	Count	60 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			
	Emission Factor	7.50E-03 kg/hr/component			
		<b>Emissions</b>			
		<b>Avg. Hourly</b>	<b>Max. Annual</b>	<b>Max. Hourly</b>	
Speciation	CO <sub>2-e</sub>	0.96% by weight	0.0121 lb/hr	0.0528 tpy	0.0145 lb/hr
	CO <sub>2</sub>	0.01% by weight	0.0002 lb/hr	0.0007 tpy	0.0002 lb/hr
	TOC (Total)	99.99% by weight	1.2561 lb/hr	5.5019 tpy	1.5074 lb/hr
	Methane	0.04% by weight	0.0005 lb/hr	0.0021 tpy	0.0006 lb/hr
	Ethane	0.09% by weight	0.0011 lb/hr	0.0049 tpy	0.0014 lb/hr
	VOC (Total)	99.86% by weight	1.2545 lb/hr	5.4949 tpy	1.5054 lb/hr
	VOC (non-HAP)	85.32% by weight	1.0718 lb/hr	4.6947 tpy	1.2862 lb/hr
	HAP (Total)	14.54% by weight	0.1827 lb/hr	0.8002 tpy	0.2192 lb/hr
	Benzene	1.44% by weight	1.81E-02 lb/hr	7.93E-02 tpy	2.17E-02 lb/hr
	Ethylbenzene	0.48% by weight	5.98E-03 lb/hr	2.62E-02 tpy	7.18E-03 lb/hr
	Hexane (n-)	1.69% by weight	2.13E-02 lb/hr	9.32E-02 tpy	2.55E-02 lb/hr
	Methanol				
	Naphthalene				
	Toluene	4.49% by weight	5.64E-02 lb/hr	2.47E-01 tpy	6.77E-02 lb/hr
	Trimethylpentane (2,2,4-)	0.03% by weight	3.24E-04 lb/hr	1.42E-03 tpy	3.89E-04 lb/hr
	Xylenes	6.42% by weight	8.06E-02 lb/hr	3.53E-01 tpy	9.67E-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 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 on composition estimate (TABLE F-0).
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		CROM-PC-OIL			
Service		Heavy Oil			
Minimum hours when component purged with inert gas		0 hrs/yr			
Component	Valves	Count	600 components		
		Emission Factor	8.40E-06 kg/hr/component		
	Connectors	Count	1,705 components		
		Emission Factor	7.50E-06 kg/hr/component		
	Flanges	Count	325 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	35 components		
		Emission Factor	8.62E-03 kg/hr/component		
Other	Count	6 components			
	Emission Factor	3.20E-05 kg/hr/component			
		<b>Emissions</b>			
		<b>Avg. Hourly</b>	<b>Max. Annual</b>	<b>Max. Hourly</b>	
Speciation	CO <sub>2-e</sub>				
	CO <sub>2</sub>				
	TOC (Total)	100.00% by weight	0.7050 lb/hr	3.0879 tpy	0.8460 lb/hr
	Methane				
	Ethane				
	VOC (Total)	100.00% by weight	0.7050 lb/hr	3.0879 tpy	0.8460 lb/hr
	VOC (non-HAP)	100.00% by weight	0.7050 lb/hr	3.0879 tpy	0.8460 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.