Reviewer AmB
cc:
Modeler
D.E.
File A0001227
IMP FID F025305

Transmittal by Overnight Mail

June 19, 2015

Mr. Cole Anderson, NSR Program Manager
Air Quality Division
Wyoming Department of Environmental Quality
122 West 25th Street
Cheyenne, Wyoming 82002

Re: Sinclair Transportation Company, Cheyenne Station
Tank Truck Unloading and Storage Tank Expansion Project
Transmittal of Construction Permit Application

Mr. Anderson:

Sinclair Transportation Company (STC) currently operates the Cheyenne Station facility[1] under the provisions of Permit Waiver wv-14630, issued on April 9, 2013. STC planning to expand its operations at this facility which will include installation and operation of the following major equipment items:

- A 4-bay crude oil tank truck unloading station;
- Two (2) Lease Automatic Custody Transfer units;
- One (1) crude oil tank with a nominal capacity of 16,800 barrels each (existing);
- One (1) crude oil storage tank with a nominal capacity of 84,200 barrels
- Associated piping and piping components (i.e. pumps, valves, connectors, etc.) needed for the conveyance of crude oil.

The new 84,200 barrel storage tank will be subject to the Wyoming Air Quality Standards and Regulations Chapter 5, Section 2 (b) which incorporates 40 CFR 60 Subpart Kb by reference. STC recently purchased the existing 16,800 bbl storage tank which has been idled. STC believes this tank is currently a grandfathered source and does not have any formal air quality permitting history. However, STC will accept the 40 CFR 60 Subpart Kb storage tank standards and inspection provisions as applicable requirements for this tank.

The estimated emissions increase from the equipment associated with this project is provided in Table 1.0 below.

[1] The facility location is 1500 Parsley Ave., Cheyenne, Wyoming

Table 1.0 Project Emissions Increase

Source	VOC tpy	HAP tpy
Tank 1	5.3	0.18
Tank 2	2.1	0.07
Fugitive Emissions	0.6	0.03
Total	8.0	0.28

Volatile Organic Compounds (VOC) is the only criteria pollutant associated with this permitting action. As listed in Table 1.0, the VOC emissions increase from this project is well below the PSD significance threshold of 40 tpy. In addition, STC is providing the facility-wide Potential to Emit (PTE) which includes the existing and proposed sources in Table 2.0 below.

Table 2.0 Facility-Wide PTE

Source	VOC tpy	HAP tpy
Tank 1	5.3	0.18
Tank 2	2.1	0.07
Tank 6	5.2	0.17
Fugitive Emissions	1.2	0.05
Total	13.7	0.47

As shown in Table 2.0, the facility-wide PTE will remain less than the major source thresholds for VOC and HAP. Because the facility is located in an area that is designated as attainment with all National Ambient Air Quality Standards, Non-attainment New Source Review is not required. In addition, the increase in Greenhouse Gas (GHG) emissions associated with this project is very small and is substantially less than the PSD significance threshold for GHG.

The estimated emissions calculations supporting this construction permit application are provided in the following Appendices:

Appendix B: VOC/HAP Emission Calculations
Appendix C: Fugitive Emissions Calculations – VOC/HAP

Because the potential emissions from this project are small and the facility wide potential emissions are also small, STC requests the Division waive formal permitting requirements for this project. To support this request, STC is submitting the IMPACT construction permit

application forms with this correspondence (see Appendix A). STC appreciates the Division's assistance with this project. Please contact me at (801) 524-2729 with any questions or comments regarding this correspondence.

Respectfully,

Samuel B. Greene P.E.
Corporate Environmental Engineer
Sinclair Transportation Company

SBG/sbg

attachments

cc: electronic
M. Petersen
R. Hall
B. Bluth
C. Flack
M. Babcock
J. Brown
P. Bunten

Appendix A: Permit Application Forms

Revised 11/3/2014

Department of Environmental Quality Air Quality Division

Permit Application Form

Is this a revision to an existing application?

Yes _____ No X

Previous Application #:

Date of Application: 6/19/2015

COMPANY INFORMATION:

Company Name: Sinclair Transportation Company
Address: 550 East South Temple
City: Salt Lake City State: Utah Zip Code: 84102
Country: Salt Lake Phone Number: 801-524-2700

FACILITY INFORMATION:

Facility Name: Cheyenne Station
New Facility or Existing Facility: Existing
Facility Description: Receipt, storage and transfer of crude oil
Facility Class: Area Source Operating Status: Operating
Facility Type: Crude Oil Terminal

For Oil & Gas Production Sites ONLY:
First Date of Production (FDOP)/Date of Modification: **N/A**
Does production at this facility contain H2S?* N/A
If yes, contact the Division.
API Number(s): N/A

NAICS Code: 424710

FACILITY LOCATION:

***Enter the facility location in either the latitude/longitude area or section/township/range area. Both are not required.**
Physical Address: 1500 Parsley Ave.
City: Cheyenne Zip Code: 82007
State: WY County: Laramie

OR

Latitude: 41.10499 Longitude: -104.83256 County: Laramie
Quarter Quarter: N/A Quarter: N/A
Section: N/A Township: N/A Range: **N/A**

For longitude and latitude, use NAD 83/WGS84 datum and 5 digits after the decimal (i.e. 41.12345, -107.56789)

CONTACT INFORMATION:

***Note that an Environmental AND NSR Permitting Contact is required for your application to be deemed complete by the agency.**
Title: Mr. First Name: Sam
Last Name: Greene
Company Name: Sinclair Transportation Company
Job Title: Environmental Engineer
Address: 550 East South Temple
City: Salt Lake City State: Utah
Zip Code: 84102
Primary Phone No.: 801-524-2729 E-mail: sgreene@sinclairoil.com
Mobile Phone No.: N/A Fax No.: 801-524-2878
Contact Type: NSR Permitting Start Date: 6/19/2015

Additional Contact Type (if needed): Operations

Title: Mr. First Name: Chris

Last Name: Flack

Company Name: Sinclair Transportation Company

Job Title: Operations Supervisor

Address: P. O. Box 185

City: Sinclair State: Wyoming

Zip Code: 82334

Primary Phone No.: 307-328-3669 E-mail: cflack@sinclairoil.com

Mobile Phone No.: N/A Fax No.: 307-328-3571

Contact Type: Operations Start Date: 6/19/2015

FACILITY APPLICATION INFORMATION:

General Info:

Has the facility changed location or is it a new/ greenfield facility?	No
Has a Land Use Planning document been included in this application?	No
Is the facility located in a sage grouse core area?*	No
If the facility is in a sage grouse core area, what is the WER number?	N/A

** For questions about sage grouse core area, contact WY Game & Fish Department.*

Federal Rules Applicability - Facility Level:

Prevention of Significant Deterioration (PSD):	No
Non-Attainment New Source Review:	No

Modeling Section:

Has the Air Quality Division been contacted to determine if modeling is required?	Yes
Is a modeling analysis part of this application?	No
Is the proposed project subject to Prevention of Significant Deterioration (PSD) requirements?	No
Has the Air Quality Division been notified to schedule a pre-application meeting?	Yes
Has a modeling protocol been submitted to and approved by the Air Quality Division?	N/A
Has the Air Quality Division received a Q/D analysis to submit to the respective FLMs to determine the need for an AQRV analysis?	N/A

Required Attachments:

Facility Map	☑	
Process Flow Diagram	☑	
Modeling Analysis (if applicable)	☐	N/A
Land Use Planning Document	☐	N/A
Detailed Project Description	☑	
Emissions Calculations	☑	

I, Mark Petersen President Sinclair Transportation Company

Responsible Official (Printed Name) Title

an Official Representative of the Company, state that I have knowledge of the facts herein set forth and that the same are true and correct to the best of my knowledge and belief. I further certify that the operational information provided and emission rates listed on this application reflect the anticipated emissions due to the operation of this facility. The facility will operate in compliance with all applicable Wyoming Air Quality Standards and Regulations.

Signature: Date: 6-19-15

(ink)

Revised 11/3/2014

Specific Emission Unit Attributes:

Storage Tank/Silo

Company Equipment ID: Tank #1
Company Equipment Description: Crude oil storage tank

Operating Status: Idled
Initial Construction Commencement Date:
Initial Operation Commencement Date: 3rd quarter 2015 (est)
Most Recent Construction/ Modification Commencement Date: N/A

Most Recent Operation Commencement Date: N/A

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Increased crude oil storage capacity at facility.

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

N/A

Material Type: Liquid
Description of Material Stored: Crude oil

Capacity: 16,800 (nominal) Units: barrels
Maximum Throughput: 20,000 Units: barrels/day
Maximum Hourly Throughput: 833 (annual average) Units: barrels/hr
Operating Pressure (psig): atmospheric
Vapor Pressure of Material Stored (psig): 2.2 psia (typical), not to exceed 11.1 psia max. true Pvap.
Is Tank Heated?: No

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

40301109, 40301117

Potential Operating Schedule: Provide the operating schedule for this emission unit.
Hours/day: 24
Hours/year: 8,760

Control Equipment: N/A

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: VOC

Proposed BACT: External floating roof storage tank

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: N/A

Proposed LAER: N/A

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

New Source Performance Standard are listed under 40 CFR 60-Standards of Performance for New Stationary Sources.

NSPS Subpart: *N/A*

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): Not Affected

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: N/A

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): Not Affected

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: N/A

Prevention of Significant Deterioration (PSD): Not Affected

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: Not Affected

These rules are found under WAQSR Chapter 6, Section 13.

Revised 11/3/2014

Specific Emission Unit Attributes:

Storage Tank/Silo

Company Equipment ID: Tank #2
Company Equipment Description: Crude oil storage tank

Operating Status: Not Yet Installed
Initial Construction Commencement Date:
Initial Operation Commencement Date: 3rd quarter 2015 (est)
Most Recent Construction/ Modification Commencement Date: N/A

Most Recent Operation Commencement Date: N/A

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Increased crude oil storage capacity at facility.

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

N/A

Material Type: Liquid
Description of Material Stored: Crude oil

Capacity: 84,200 (nominal) Units: barrels
Maximum Throughput: 20,000 Units: barrels/day
Maximum Hourly Throughput: 833 (annual average) Units: barrels/hr
Operating Pressure (psig): atmospheric
Vapor Pressure of Material Stored (psig): 2.2 psia (typical), not to exceed 11.1 psia max. true Pvap.
Is Tank Heated?: No

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

40400160, 40400179

Potential Operating Schedule: Provide the operating schedule for this emission unit.
Hours/day: 24
Hours/year: 8,760

Control Equipment: N/A

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: VOC

Proposed BACT: Internal floating roof storage tank

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: N/A

Proposed LAER: N/A

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Subject to subpart

New Source Performance Standard are listed under 40 CFR 60-Standards of Performance for New Stationary Sources.

NSPS Subpart: *Kb*

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): Not Affected

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: N/A

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): Not Affected

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: N/A

Prevention of Significant Deterioration (PSD): Not Affected

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: Not Affected

These rules are found under WAQSR Chapter 6, Section 13.

Revised 11/3/2014

Specific Emission Unit Attributes:

Fugitives

Company Equipment ID: N/A

Company Equipment Description: Piping Component Equipment Leaks

Operating Status: Not Yet Installed

Initial Construction Commencement Date: 3rd quarter 2015 (est)

Initial Operation Commencement Date: 3rd quarter 2015 (est)

Most Recent Construction/ Modification Commencement Date: N/A

Most Recent Operation Commencement Date: N/A

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: New air emission fugitive sources

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

N/A

Type of Fugitive Emission: Fugitive Leaks - Crude Terminal

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

30600801 30600803 30600805 30600807 30600816 30600817 30600822 40400151

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24

Hours/year: 8,760

Control Equipment: N/A

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: VOC

Proposed BACT: Periodic inspections for leaks by visual, audible, olfactory, or any other detection method.

*If yes, attach BACT Analysis with this application. N/A

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ No

Pollutant: N/A

Proposed LAER: N/A

*If yes, attach LAER Analysis with this application. N/A

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: *N/A*

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): Not Affected

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: N/A

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): Not Affected

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: N/A

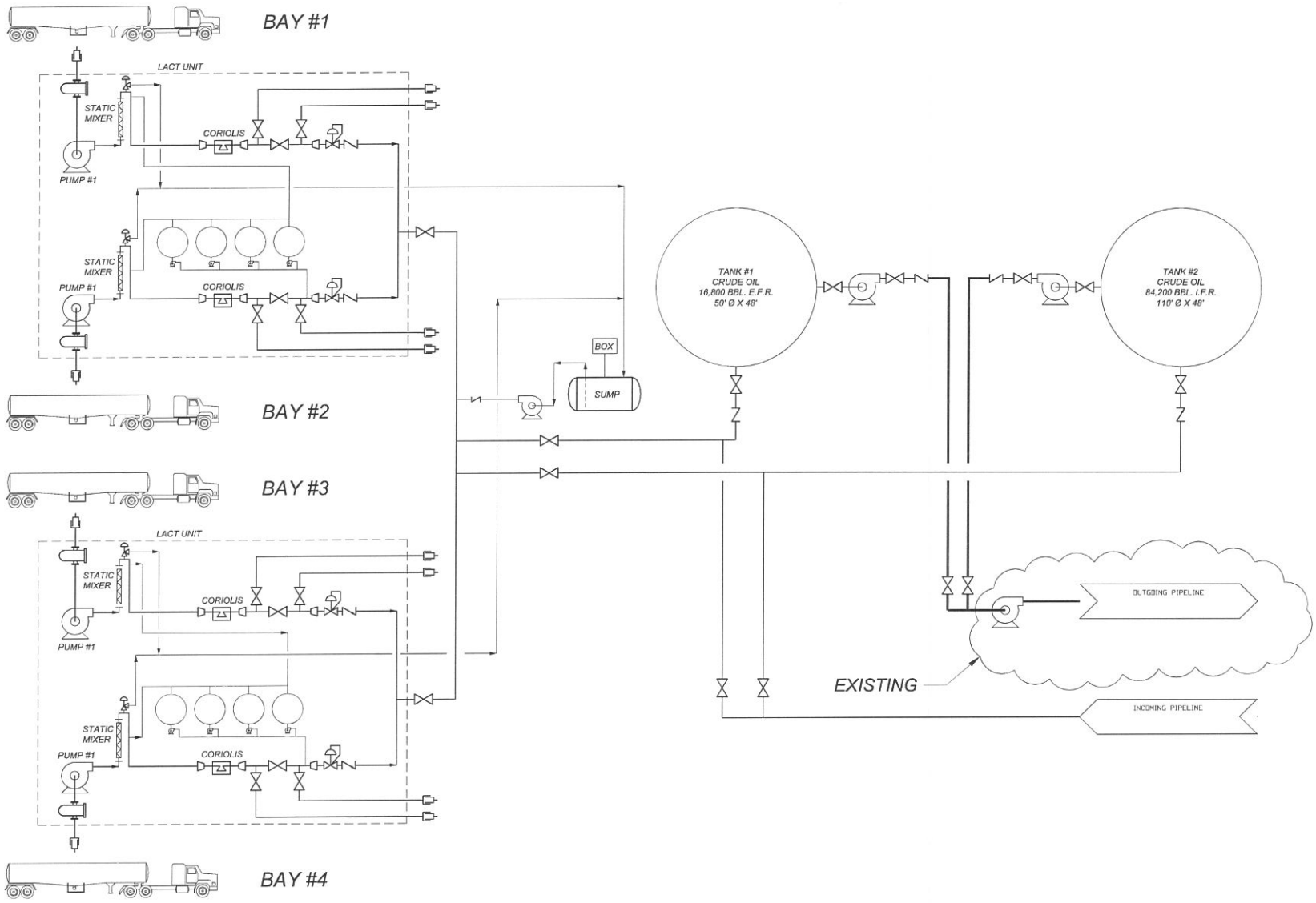
Prevention of Significant Deterioration (PSD): Not Affected

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: Not Affected

These rules are found under WAQSR Chapter 6, Section 13.

Figure A.1 Process Flow Diagram – New/Modified Equipment



REFERENCES	DWG. NO.	REV.	REVISION DESCRIPTION	MADE BY	DATE
		5			
		4			
		3			
		2			
		1	Revised for Edits	RJM	4/30/2015

THIS DRAWING IS THE PROPERTY OF SINCLAIR TRANSPORTATION COMPANY AND MAY NOT BE USED EXCEPT IN CONNECTION WITH THIS COMPANY. ALL RIGHTS OF DESIGN OR INVENTION RESERVED.

	NAME	DATE
DRAWN BY:	RJM	4/30/2015
CHECKED BY:		
APPROVED BY:		

Sinclair Oil Company
Cheyenne Crude Unloading Expansion
Air Permit Drawing

LOCATION: Cheyenne Station
DRAWING NO.
CS-F-AP-100
REV. 1

CS-F-AP-100.dwg

Figure A.2 Facility Plot Plan

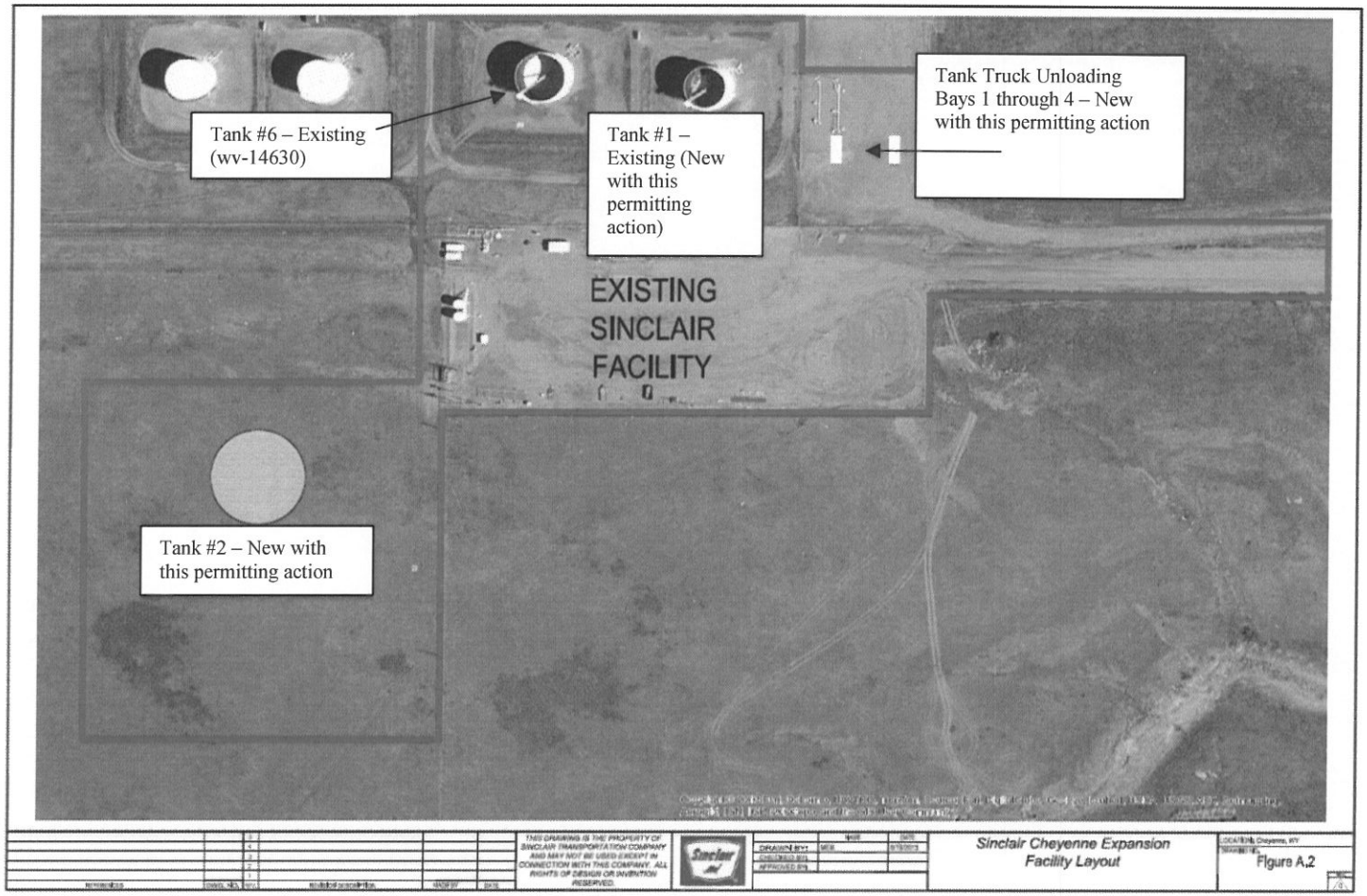
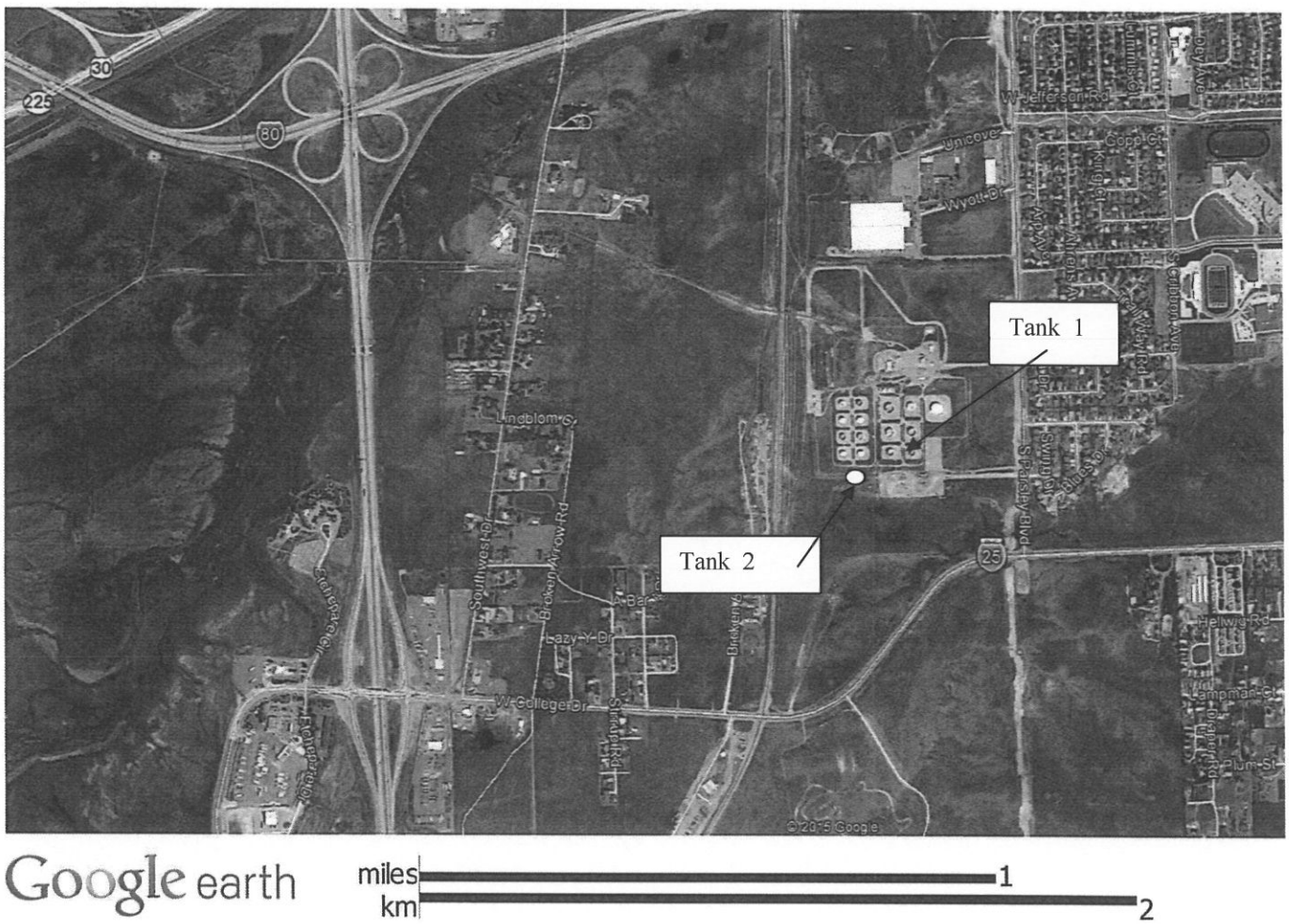


Figure A.3 Facility Location Drawing



Appendix B – VOC/HAP Emission Calculations – Tanks 1 and 2

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

Identification

User Identification:	Tank 1
City:	Cheyenne
State:	Wyoming
Company:	STC
Type of Tank:	External Floating Roof Tank
Description:	Cheyenne Station - Expansion 2015

Tank Dimensions

Diameter (ft):	50.00
Volume (gallons):	705,600.00
Turnovers:	434.52

Paint Characteristics

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

Roof Characteristics

Type:	Double Deck
Fitting Category	Typical

Tank Construction and Rim-Seal System

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

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Drain (3-in. Diameter)/Open	1
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	8
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: Cheyenne, Wyoming (Avg Atmospheric Pressure = 11.76 psia)

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

Tank 1 - External Floating Roof Tank
Cheyenne, Wyoming

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 5)	All	47.49	41.37	53.62	45.62	2.2374	N/A	N/A	50.0000			207.00	Option 4: RVP=5
2,2,4-Trimethylpentane (isooctane)						0.4109	N/A	N/A	114.2300	0.0010	0.0008	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						0.8169	N/A	N/A	78.1100	0.0060	0.0091	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.0693	N/A	N/A	106.1700	0.0040	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						1.3685	N/A	N/A	86.1700	0.0040	0.0101	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isopropyl benzene						0.0297	N/A	N/A	120.2000	0.0010	0.0001	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Toluene						0.2210	N/A	N/A	92.1300	0.0100	0.0041	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						2.4123	N/A	N/A	49.4464	0.9600	0.9739	217.56	
Xylene (-m)						0.0574	N/A	N/A	106.1700	0.0140	0.0015	106.17	Option 2: A=7.009, B=1462.266, C=215.11

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

Tank 1 - External Floating Roof Tank
Cheyenne, Wyoming

Annual Emission Calcaulations

Rim Seal Losses (lb):	1,034.4251
Seal Factor A (lb-mole/ft-yr):	1.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.3000
Average Wind Speed (mph):	12.9333
Seal-related Wind Speed Exponent:	1.6000
Value of Vapor Pressure Function:	0.0527
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	2.2374
Tank Diameter (ft):	50.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000
Product Factor:	0.4000
Withdrawal Losses (lb):	5,865.0828
Annual Net Throughput (gal/yr.):	306,600,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060
Average Organic Liquid Density (lb/gal):	7.1000
Tank Diameter (ft):	50.0000
Roof Fitting Losses (lb):	3,612.1472
Value of Vapor Pressure Function:	0.0527
Vapor Molecular Weight (lb/lb-mole):	50.0000
Product Factor:	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	3,426.3380
Average Wind Speed (mph):	12.9333
Total Losses (lb):	10,511.6551

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	1.6868
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	79.0011
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	16.5712
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1	31.00	150.00	1.40	3,488.5593
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	0.6742
Roof Drain (3-in. Diameter)/Open	1	1.50	0.21	1.70	10.9511
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	8	0.82	0.53	0.14	13.0007
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1	0.71	0.10	1.00	1.7029

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

Emissions Report for: Annual

Tank 1 - External Floating Roof Tank
Cheyenne, Wyoming

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 5)	1,034.43	5,865.08	3,612.15	0.00	10,511.66
Hexane (-n)	10.48	23.46	36.59	0.00	70.53
Benzene	9.38	35.19	32.76	0.00	77.33
2,2,4-Trimethylpentane (isooctane)	0.79	5.87	2.75	0.00	9.40
Toluene	4.23	58.65	14.77	0.00	77.65
Ethylbenzene	0.53	23.46	1.85	0.00	25.84
Xylene (-m)	1.54	82.11	5.37	0.00	89.02
Isopropyl benzene	0.06	5.87	0.20	0.00	6.12
Unidentified Components	1,007.42	5,630.48	3,517.86	0.00	10,155.76

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

Identification

User Identification:	Tank 2
City:	Cheyenne
State:	Wyoming
Company:	STC
Type of Tank:	Internal Floating Roof Tank
Description:	Cheyenne Station - Expansion 2015

Tank Dimensions

Diameter (ft):	110.00
Volume (gallons):	3,536,400.00
Turnovers:	86.70
Self Supp. Roof? (y/n):	N
No. of Columns:	7.00
Eff. Col. Diam. (ft):	1.00

Paint Characteristics

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

Rim-Seal System

Primary Seal:	Mechanical Shoe
Secondary Seal	None

Deck Characteristics

Deck Fitting Category:	Detail
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Column Well (24-in. Diam.)/Built-Up Col.-Sliding Cover, Ungask.	7
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	49
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Ungask.	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Ungask.	1
Slotted Guide-Pole/Sample Well/Ungask. Sliding Cover, w/o Float	1
Roof Drain (3-in. Diameter)/Open	1
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Ungask.	2
Ladder Well (36-in. Diam.)/Sliding Cover, Ungasketed	1

Meterological Data used in Emissions Calculations: Cheyenne, Wyoming (Avg Atmospheric Pressure = 11.76 psia)

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

Tank 2 - Internal Floating Roof Tank
Cheyenne, Wyoming

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 5)	All	47.49	41.37	53.62	45.62	2.2374	N/A	N/A	50.0000			207.00	Option 4: RVP=5
2,2,4-Trimethylpentane (isooctane)						0.4109	N/A	N/A	114.2300	0.0010	0.0008	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						0.8169	N/A	N/A	78.1100	0.0060	0.0091	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.0693	N/A	N/A	106.1700	0.0040	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						1.3685	N/A	N/A	86.1700	0.0040	0.0101	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isopropyl benzene						0.0297	N/A	N/A	120.2000	0.0010	0.0001	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Toluene						0.2210	N/A	N/A	92.1300	0.0100	0.0041	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						2.4123	N/A	N/A	49.4464	0.9600	0.9739	217.56	
Xylene (-m)						0.0574	N/A	N/A	106.1700	0.0140	0.0015	106.17	Option 2: A=7.009, B=1462.266, C=215.11

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

Tank 2 - Internal Floating Roof Tank
Cheyenne, Wyoming

Annual Emission Calcaulations	
Rim Seal Losses (lb):	672.5985
Seal Factor A (lb-mole/ft-yr):	5.8000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.3000
Value of Vapor Pressure Function:	0.0527
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	2.2374
Tank Diameter (ft):	110.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000
Product Factor:	0.4000
Withdrawal Losses (lb):	2,835.5979
Number of Columns:	7.0000
Effective Column Diameter (ft):	1.0000
Annual Net Throughput (gal/yr.):	306,600,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060
Average Organic Liquid Density (lb/gal):	7.1000
Tank Diameter (ft):	110.0000
Deck Fitting Losses (lb):	641.9837
Value of Vapor Pressure Function:	0.0527
Vapor Molecular Weight (lb/lb-mole):	50.0000
Product Factor:	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	608.9600
Deck Seam Losses (lb):	0.0000
Deck Seam Length (ft):	0.0000
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000
Deck Seam Length Factor(ft/sqft):	0.0000
Tank Diameter (ft):	110.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000
Product Factor:	0.4000
Total Losses (lb):	4,150.1801

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1	36.00	5.90	1.20	37.9523
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	14.7592
Column Well (24-in. Diam.)/Built-Up Col.-Sliding Cover, Ungask.	7	47.00	0.00	0.00	346.8416
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	49	2.00	0.37	0.91	103.3145
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Ungask.	1	2.30	0.00	0.00	2.4247
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Ungask.	1	7.80	0.01	4.00	8.2230
Slotted Guide-Pole/Sample Well/Ungask. Sliding Cover, w/o Float	1	43.00	270.00	1.40	45.3319
Roof Drain (3-in. Diameter)/Open	1	1.50	0.21	1.70	1.5813
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Ungask.	2	0.68	1.80	1.00	1.4338
Ladder Well (36-in. Diam.)/Sliding Cover, Ungasketed	1	76.00	0.00	0.00	80.1215

TANKS 4.0.9d
Emissions Report - Detail Format

Individual Tank Emission Totals

Emissions Report for: Annual

Tank 2 - Internal Floating Roof Tank
Cheyenne, Wyoming

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 5)	672.60	2,835.60	641.98	0.00	4,150.18
Hexane (-n)	6.81	11.34	6.50	0.00	24.66
Benzene	6.10	17.01	5.82	0.00	28.94
Toluene	2.75	28.36	2.63	0.00	33.73
Ethylbenzene	0.34	11.34	0.33	0.00	12.02
Xylene (-m)	1.00	39.70	0.96	0.00	41.65
Isopropyl benzene	0.04	2.84	0.04	0.00	2.91
2,2,4-Trimethylpentane (isooctane)	0.51	2.84	0.49	0.00	3.84
Unidentified Components	655.04	2,722.17	625.23	0.00	4,002.44

Appendix C – Fugitive Emissions Calculations – VOC

Cheyenne Station
Fugitive Emissions
Construction permit application

Fugitive VOC emissions

Re: Protocol for Equipment Leak Emission Estimates
(EPA-453/R-95-017, Table 2-3)
AP-42, 4 ed, (Fugitive Emission Factors, Table 9.1-2)

	Source	Pump Seals	Valves	Fittings (note #1)	Others (note #2)	Drains	VOC Emission Rate (TPY)
	Light Liquid Service						
	Quantity	24	112	280	100	1	
	Emissions Factor (lb/hr-source	0.001190484	0.000095	0.0000176	0.000287	0.07	
	Emissions (TPY)	0.125	0.047	0.022	0.126	0.307	0.63
	TOTAL VOC EMISSIONS						0.63

Note #1 connectors and flanges
Note #2 equipment other than fittings, pumps and valves

Fugitive emissions - crude oil service

Component	Liquid Mass Fraction (note #3)	VOC Emission Rate (TPY)	HAP Emission Rate (TPY)
Benzene	0.006	0.0038	0.0038
Hexane	0.004	0.0025	0.0025
Xylene(mixed isomers)	0.014	0.0088	0.0088
Toluene	0.010	0.0063	0.0063
Ethylbenzene	0.004	0.0025	0.0025
Trimethylpentane (2,2,4)	0.001	0.0006	0.0006
Cumene	0.001	0.0006	0.0006
Non-HAP Crude oil components	0.960	0.6004	
TOTAL	1.000	0.63	0.03

Note #3 HAP speciation from Tanks 4.0.9d report