Denbury

March 21, 2023

Mississippi Department of Environmental Quality
Office of Pollution Control
Environmental Permits Division
515 E. Amite Street
Jackson, MS 39201

RE: Notice of Intent for Coverage Under the Oil Production General Permit
Denbury Onshore, LLC
Martinville EOR Facility
AI No.: 22924; Permit No.: 2480-00068
Simpson County, MS

In accordance with MAC Title 11, Part 2, submitted with this are two (2) bound sets of the referenced material. An electronic copy has also been submitted through the EPD Electronic Application Submittal webpage. Request is hereby made for coverage under the Oil Production General Permit (OPGP).

The facility functions as an oil & gas production site and operates controls such that criteria pollutant emissions will not exceed emission rates restricted in the Oil Production General Permit, nor will hazardous air pollutant (HAP) emissions exceed any HAP emission rates restricted in the Oil Production General Permit. Details of the operations, emission estimates, and associated emission programs are included herein and verify that the facility should be classified as a synthetic minor source under the State and Federal air permitting programs. All measures should be taken in the review process to assure that the minor classification is federally recognized.

A copy of the public notice is enclosed and will be published in the Simpson County News. Additionally, a copy of the public notice and the complete OPGP NOI will be provided to the Mendenhall Public Library. The public notice, notarized proof of publication, and library proof of receipt will be submitted to MDEQ when available.

If any other information is required regarding these matters, please do not hesitate to contact HLP Engineering, Inc. at (337) 839-1075. All written correspondence should be directed to my attention at: **Denbury Onshore, LLC, 5851 Legacy Circle, Plano, TX 75024**. Thank you in advance for your assistance with this matter.

Sincerely,
DENBURY ONSHORE, LLC

Kevin Hendricks
Enclosures

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Oil Production General Permit Public Notice
Mississippi Environmental Quality Permit Board
P. O. Box 2261
Jackson, Mississippi 39225
Telephone No. (601) 961-5171

Public Notice Start Date: 3/30/2023

Denbury Onshore, LLC Martinville EOR Facility located *at 31 59 56.80, -89 45 48.60* in *Mendenhall, Simpson County,* Mississippi, *972-673-2529,* has applied to the Mississippi Department of Environmental Quality (MDEQ) for coverage and/or modification under MDEQ's Oil Production General Permit to construct and operate an oil production facility.

The Oil Production General Permit has been developed to ensure compliance with all State and Federal regulations. Facilities granted coverage under this permit and adhering to the conditions contained therein should operate within State and Federal environmental laws and standards concerning the operation of air emissions equipment.

The proposed project consists of construction and/or operation of *an oil and gas production facility including various wells, 4 separators, 1 heater treater, 5 oil storage tanks, 3 water storage tanks, 2 control flares, and other ancillary activities associated with oil & gas production.* The facility will operate control(s) such that criteria pollutant emissions will not exceed emission rates restricted in the Oil Production General Permit, nor will hazardous air pollutant (HAP) emissions exceed any HAP emission rates restricted in the Oil Production General Permit. This project will result in new sources of potential emissions of regulated air pollutants. However, emissions will be below the Prevention of Significant Deterioration significance levels as specified in the Mississippi Regulations for the Prevention of Significant Deterioration of Air Quality, 11 Miss. Admin. Code Pt. 2, Ch. 5., and in 40 CFR Part 52.21. Potential emissions will also be below the Air Title V Major Source thresholds as specified in 11 Miss. Admin. Code Pt. 2, Ch. 6. and in 40 CFR Part 70.

Persons wishing to comment upon or object to the proposed request are invited to submit comments in writing to the **Air 1 Branch Chief, Environmental Permits Division** at the Permit Board's address shown above no later than 30-days from the date of publication of this notice. All comments received or postmarked by this date will be considered in the determination regarding the coverage approval. After receipt of public comments and thorough consideration of all comments, MDEQ will formulate its recommendations regarding coverage approval.

Additional details about the proposed project are available by writing or calling the **Air 1 Branch Chief, Environmental Permits Division** at the above Permit Board address and telephone number and on the MDEQ's website at: https://www.mdeq.ms.gov/ensearch/recently-received-general-permit-noi/. This information is also available for review at the following location during normal business hours:

Mississippi Department of Environmental Quality
Office of Pollution Control
515 East Amite Street,
Jackson, MS 39201
(601) 961-5171

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Please bring the foregoing to the attention of persons whom you know will be interested.

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Notice of Intent for Oil Production General Permit

Denbury Onshore, LLC

Martinville EOR Facility
Simpson County, MS

March 2023

Denbury

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Table of Contents

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Facility (Agency Interest) Information | **Section OPGP - A**

1. Name, Address, and Location of Facility

A. Owner/Company Name: Denbury Onshore, LLC

B. Facility Name (*if different than A. above*): Martinville EOR Facility

C. Facility Air Permit/Coverage No. (*if known*): 2480-00068

D. Agency Interest No. (*if known*): 22924

E. Physical Address
1. Street Address: 327 Coho Drive
2. City: Mendenhall
3. State: MS
4. County: Simpson
5. Zip Code: 39114
6. Telephone No.: 972-673-2529
7. Fax No.:
8. Are facility records kept at this location? ☐ Yes ☑ No. Please complete Item 10.

F. Mailing Address
1. Street Address or P.O. Box: 5851 Legacy Circle, Suite 1200
2. City: Plano
3. State: TX
4. Zip Code: 75024

G. Latitude/Longitude Data
1. Collection Point (*check one*):
☐ Site Entrance ☑ Other: facility center
2. Method of Collection (*check one*):
☐ GPS Specify coordinate system (NAD 83, etc.)
☐ Map Interpolation (Google Earth, etc.) ☑ Other: Plot plan
3. Latitude (*degrees/minutes/seconds*): 31 59 56.80
4. Longitude (*degrees/minutes/seconds*): 89 45 48.60
5. Elevation (*feet*): 475±

H. SIC Code: 1311

2. Name and Address of Facility Contact

A. Name: Kevin Hendricks Title: Environmental Compliance Coordinator

B. Mailing Address
1. Street Address or P.O. Box: 5851 Legacy Circle, Suite 1200
2. City: Plano
3. State: TX
4. Zip Code: 75024
5. Fax No.:
6. Telephone No.: 972-673-2529
7. Email: kevin.hendricks@denbury.com

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Facility (Agency Interest) Information | **Section OPGP - A**

3. Name and Address of Air Contact (*if different from Facility Contact*)

A. Name: _____ Title: _____

B. Mailing Address
1. Street Address or P.O. Box: _____
2. City: _____ 3. State: _____
4. Zip Code: _____ 5. Fax No.: _____
6. Telephone No.: _____
7. Email: _____

4. Name and Address of Responsible Official for the Facility

The Form must be signed by a Responsible Official as defined in 11 Miss. Admin. Code Pt.2, R. 2.1.C(24).

A. Name: Randy Robichaux Title: VP-Health, Safety, and Environmental

B. Mailing Address
1. Street Address or P.O. Box: 5851 Legacy Circle, Suite 1200
2. City: Plano 3. State: TX
4. Zip Code: 75024 5. Fax No.: _____
6. Telephone No.: 972-673-2073
7. Email: randy.robichaux@denbury.com

C. Is the person above a duly authorized representative and not a corporate officer?
☐ Yes ☑ No

If yes, has written notification of such authorization been submitted to MDEQ?
☐ Yes ☐ No ☐ Request for authorization is attached

5. Type of Oil Production Notice of Intent (*Check all that apply*)

☑ Initial Coverage ☐ Re-Coverage for existing Coverage

☐ Modification with Public Notice ☐ Modification without Public Notice

☐ Update Compliance Plan

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MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Facility (Agency Interest) Information | **Section OPGP - A**

6. Equipment List (*Check all that apply*)

Complete supporting emission calculations must be included for each potential emission unit selected below.

- ☑ Heater Treater. Include a completed Section OPGP-C Form for each unit.
- ☑ Condensation Storage Vessel. Include a completed Section OPGP-E Form for each unit.
- ☑ Water Storage Vessel. Include a completed Section OPGP-E Form for each unit.
- ☐ Internal Combustion Engine. Include a completed Section OPGP-D Form for each unit.
- ☑ Flare. Include a completed Section OPGP-F Form for each unit.
- ☑ Oil Truck Loading (Section OPGP-B Form)
- ☑ Component Fugitive Emissions (Section OPGP-B Form)
- ☑ Other: Compressor Blowdowns & Heater Treater Waste Gas

7. Process/Product Details

Maximum Anticipated Well(s) Production for Faciltiy:

Produced Material	Throughput	Units
Gas		MMCF/day
Oil	1,950	barrels/day
Water	5,000	barrels/day
Other (Specify)		

Maximum Anticipated Throughput for Principal Product(s) (*as applicable*):

Produced Material	Throughput	Units
Flared Gas	0.35	MMCF/day
Oil	1,950	barrels/day
Water	5,000	barrels/day
Other (Specify)		

8. Zoning

A. Is the facility (either existing or proposed) located in accordance with any applicable city and/or county zoning ordinances? If no, please explain
Yes

B. Is the facility (either existing or proposed) required to obtain any zoning variance to locate/expand the facility at this site? If yes, please explain.
No

C. Is the required USGS quadrangle map or equivalent attached? ☑ Yes ☐ No

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MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Facility (Agency Interest) Information | **Section OPGP - A**

9. MS Secretary of State Registration / Certificate of Good Standing

No permit will be issued to a company that is not authorized to conduct business in Mississippi. If the company applying for the permit is a corporation, limited liability company, a partnership or a business trust, the application package should include proof of registration with the Mississippi Secretary of State and/or a copy of the company's Certificate of Good Standing. The name listed on the permit will include the company name as it is registered with the Mississippi Secretary of State.

It should be noted that for an application submitted in accordance with 11 Miss. Admin. Code Pt. 2, R. 2.8.B. to renew a State Permit to Operate or in accordance with 11 Miss. Admin. Code Pt. 2, R. 6.2.A(1)(c). to renew a Title V Permit to be considered timely and complete, the applicant shall be registered and in good standing with the Mississippi Secretary of State to conduct business in Mississippi.

10. Address and Location of Facility Records

Physical Address

1. Street Address: 5851 Legacy Circle, Suite 1200
2. City: Plano
3. State: TX
4. County: Collin
5. Zip Code: 75024
6. Telephone No.: 972-673-2529
7. Fax No.:

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MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Facility (Agency Interest) Information	Section OPGP - A

11. Certification

The Form must be signed by a Responsible Official as defined in 11 Miss. Admin. Code Pt. 2, R. 2.1.C.(24).

I certify that to the best of my knowledge and belief formed after reasonable inquiry, the statements and information in this application are true, complete, and accurate, and that as a responsible official, my signature shall constitute an agreement that the applicant assumes the responsibility for any alteration, additions, or changes in operation that may be necessary to achieve and maintain compliance with all applicable Rules and Regulations. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Randy J Robichaux — 03/16/23

Signature of Responsible Official/DAR — **Date**

Randy Robichaux — 03/16/23

Printed Name — **Date**

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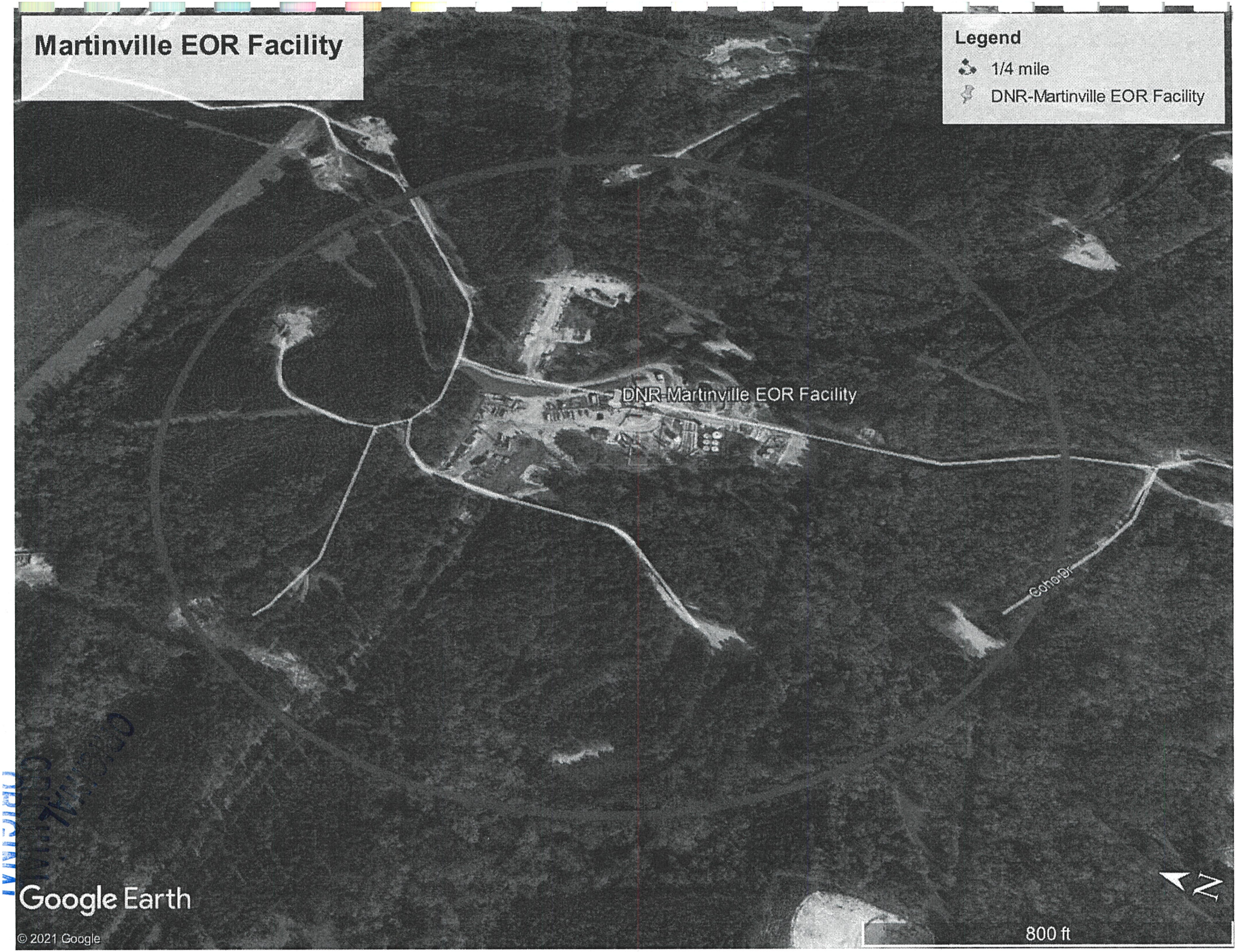
Martinville EOR Facility



DELORME

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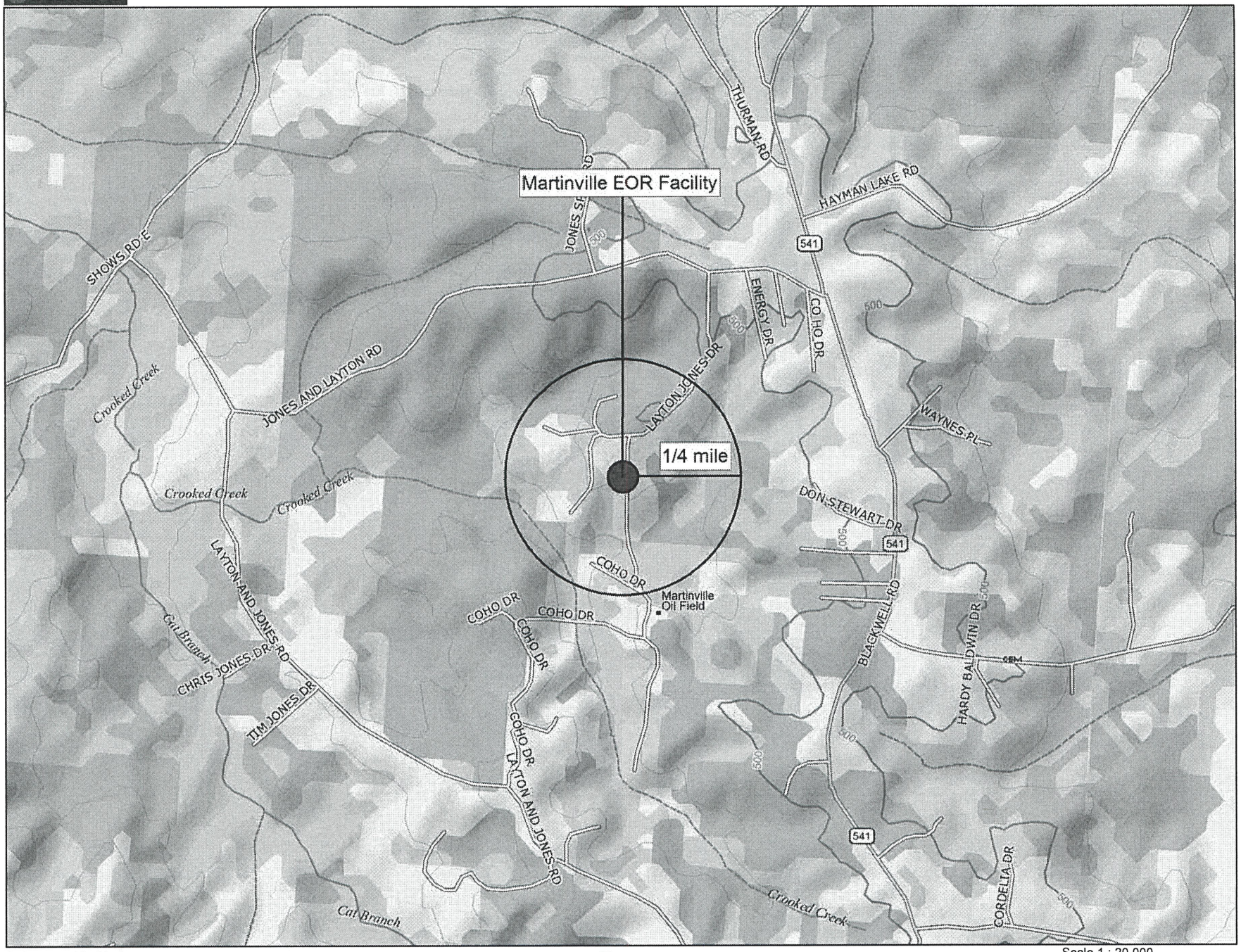

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TN

MN (1.8°W)

Scale 1 : 20,000

0 600 1200 1800 2400 3000 ft

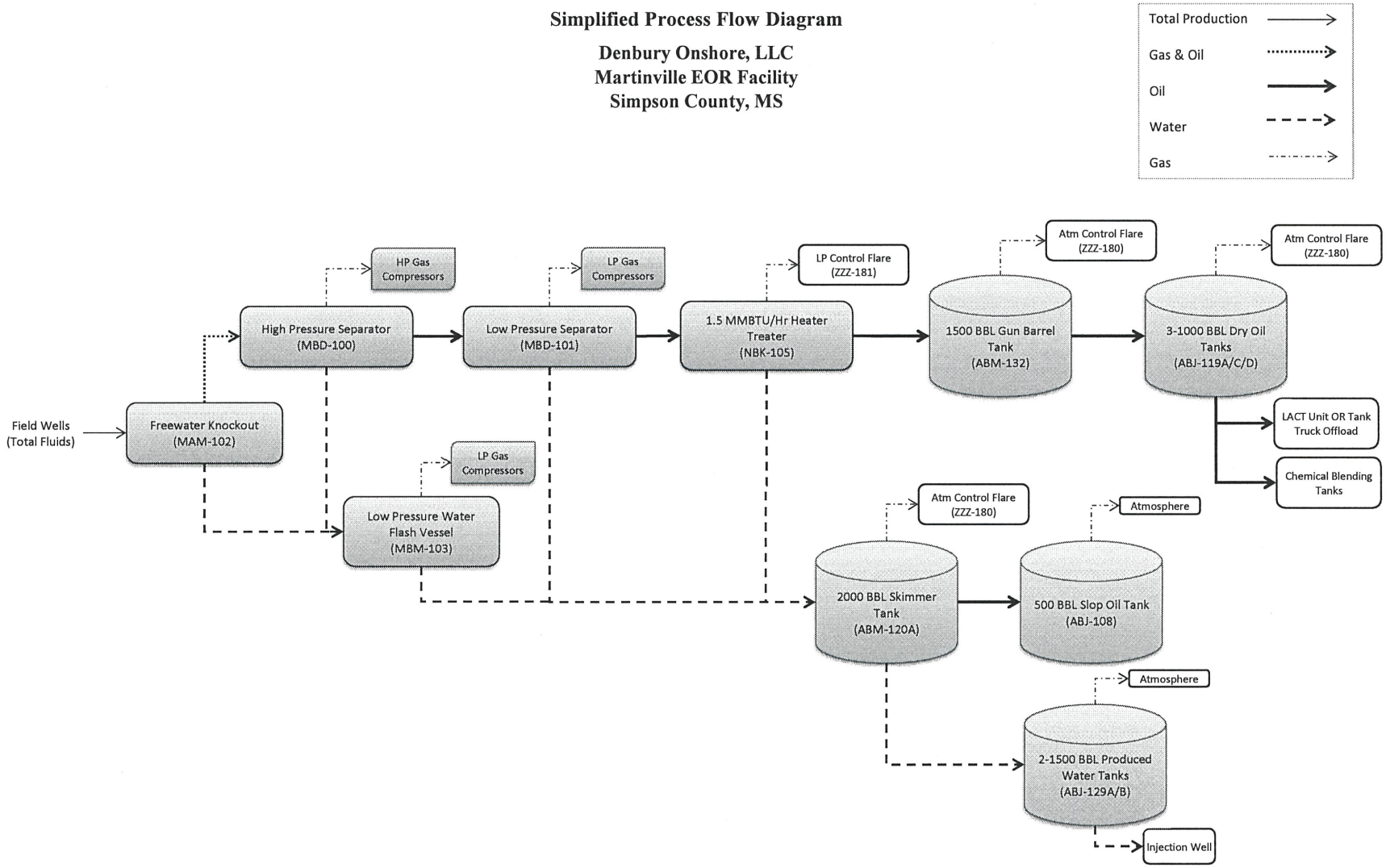
0 180 360 540 720 900 m

1" = 1,666.7 ft

Data Zoom 13-2

Simplified Process Flow Diagram

Denbury Onshore, LLC
Martinville EOR Facility
Simpson County, MS



Section OPGP-B.1: Maximum Uncontrolled Emissions (under normal operating conditions)

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Maximum Uncontrolled Emissions are the emissions at maximum capacity and prior to (in the absence of) pollution control, emission-reducing process equipment, or any other emission reduction. Calculate the hourly emissions using the worst case hourly emissions for each pollutant. For each pollutant, calculate the annual emissions as if the facility were operating at maximum plant capacity without pollution controls for 8760 hours per year, unless otherwise approved by the Department. List Hazardous Air Pollutants (HAP) in Section OGP-B.3 and GHGs in Section OGP-B.4. Emission Point numbering must be consistent throughout the application package. Fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Emissions > 0.01 TPY must be included. Please do not change the column widths on this table.

Emission Point ID	TSP[1] (PM)		PM-10[1]		PM-2.5[1]		SO_2		NOx		CO		VOC		TRS[2]		Lead		Total HAPs	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
1-05-LH-BS	0.01	0.05	0.02	0.10	0.02	0.10	0.00	0.02	0.30	1.32	0.25	1.11	0.02	0.07	-	-	-	-	-	-
2-05-HT-BS	0.01	0.03	0.01	0.06	0.01	0.06	0.00	0.01	0.18	0.79	0.15	0.67	0.01	0.04	-	-	-	-	-	-
3-05-LH-BS	0.00	0.01	0.00	0.02	0.00	0.02	0.00	0.00	0.06	0.26	0.05	0.22	0.00	0.01	-	-	-	-	-	-
4-05-HT-BS	0.00	0.01	0.00	0.02	0.00	0.02	0.00	0.00	0.06	0.26	0.05	0.22	0.00	0.01	-	-	-	-	-	-
5-05-SBP	-	-	-	-	-	-	-	-	-	-	-	-	2.60	0.95	-	-	-	-	0.53	0.19
6a-05-GBT-CV	-	-	-	-	-	-	-	-	-	-	-	-	50.77	222.36	-	-	-	-	8.32	36.45
6b-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	1.66	7.28	-	-	-	-	0.15	0.66
6c-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	1.66	7.28	-	-	-	-	0.15	0.66
6d-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	1.66	7.28	-	-	-	-	0.15	0.66
6e-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.34	1.51	-	-	-	-	0.03	0.14
6f-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.34	1.51	-	-	-	-	0.03	0.14
7-05-ST-V	-	-	-	-	-	-	-	-	-	-	-	-	1.69	7.44	-	-	-	-	0.23	0.99
8-05-WST-V	-	-	-	-	-	-	-	-	-	-	-	-	0.88	3.87	-	-	-	-	0.04	0.18
9-05-WST-V	-	-	-	-	-	-	-	-	-	-	-	-	0.88	3.87	-	-	-	-	0.04	0.18
10-05-SOT-V	-	-	-	-	-	-	-	-	-	-	-	-	0.15	0.66	-	-	-	-	0.01	0.06
11-05-IOT-V	-	-	-	-	-	-	-	-	-	-	-	-	3.27	14.36	-	-	-	-	0.36	1.60
12-05-IOT-V	-	-	-	-	-	-	-	-	-	-	-	-	3.27	14.36	-	-	-	-	0.36	1.60
14-05-GST	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.09	-	-	-	-	-	-
16a-05-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.11	0.47	-	-	-	-	0.01	0.04
17-05-SEP	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	-	-	-	-	-	-
18-05-FE	-	-	-	-	-	-	-	-	-	-	-	-	0.46	2.04	-	-	-	-	0.05	0.23
19-05-F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20-05-F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21-05-CB	-	-	-	-	-	-	-	-	-	-	-	-	120.76	0.72	-	-	-	-	24.67	0.15
22-05-CB	-	-	-	-	-	-	-	-	-	-	-	-	120.76	0.72	-	-	-	-	24.67	0.15
23-05-CB	-	-	-	-	-	-	-	-	-	-	-	-	120.76	0.72	-	-	-	-	24.67	0.15
24-05-CB	-	-	-	-	-	-	-	-	-	-	-	-	120.76	0.72	-	-	-	-	24.67	0.15
25-05-HT-WG	-	-	-	-	-	-	-	-	-	-	-	-	350.70	1536.09	-	-	-	-	22.84	100.03
26-10-ST	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.09	-	-	-	-	-	-
27-21-LL	-	-	-	-	-	-	-	-	-	-	-	-	25.38	12.87	-	-	-	-	2.30	1.17
Totals	**0.02**	**0.10**	**0.03**	**0.20**	**0.03**	**0.20**	**0.00**	**0.03**	**0.60**	**2.63**	**0.50**	**2.22**	**929.14**	**1848.31**	**0.00**	**0.00**	**0.00**	**0.00**	**134.29**	**145.62**

[1] **Condensables:** Include condensable particulate matter emissions in particulate matter calculations for PM-10 and PM-2.5, but not for TSP (PM).

[2] **TRS:** Total reduced sulfur (TRS) is the sum of the sulfur compounds hydrogen sulfide (H_2S), methyl mercaptan (CH_4S), dimethyl sulfide (C_2H_6S), and dimethyl disulfide ($C_2H_6S_2$).

Section OPGP-B.2: Proposed Allowable Emissions

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Proposed Allowable Emissions (Potential to Emit) are those emissions the facility is currently permitted to emit as limited by a specific permit requirement or federal/state standard (e.g., a MACT standard); or the emission rate at which the facility proposes to emit considering emissions control devices, restrictions to operating rates/hours, or other requested permit limits that reduce the maximum emission rates. Emission Point numbering must be consistent throughout the application package. Fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Additional columns may be added if there are regulated pollutants (other than HAPs and GHGs) emitted at the facility.

Emission Point ID	TSP[1]		PM10[1]		PM2.5[1]		SO_2		NOx		CO		VOC		TRS		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
1-05-LH-BS	0.01	0.05	0.02	0.10	0.02	0.10	0.00	0.02	0.30	1.32	0.25	1.11	0.02	0.07	-	-	-	-
2-05-HT-BS	0.01	0.03	0.01	0.06	0.01	0.06	0.00	0.01	0.18	0.79	0.15	0.67	0.01	0.04	-	-	-	-
3-05-LH-BS	0.00	0.01	0.00	0.02	0.00	0.02	0.00	0.00	0.06	0.26	0.05	0.22	0.00	0.01	-	-	-	-
4-05-HT-BS	0.00	0.01	0.00	0.02	0.00	0.02	0.00	0.00	0.06	0.26	0.05	0.22	0.00	0.01	-	-	-	-
5-05-SBP	-	-	-	-	-	-	-	-	-	-	-	-	2.60	0.95	-	-	-	-
6a-05-GBT-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.13	0.59	-	-	-	-
6b-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.13	0.49	-	-	-	-
6c-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.13	0.49	-	-	-	-
6d-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.13	0.49	-	-	-	-
6e-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.01	-	-	-	-
6f-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.01	-	-	-	-
7-05-ST-V	-	-	-	-	-	-	-	-	-	-	-	-	0.01	0.03	-	-	-	-
8-05-WST-V	-	-	-	-	-	-	-	-	-	-	-	-	0.88	3.87	-	-	-	-
9-05-WST-V	-	-	-	-	-	-	-	-		-	-	-	0.88	3.87	-	-	-	-
10-05-SOT-V	-	-	-	-	-	-	-	-	-	-	-	-	0.15	0.66	-	-	-	-
11-05-IOT-V	-	-	-	-	-	-	-	-	-	-	-	-	3.27	14.36	-	-	-	-
12-05-IOT-V	-	-	-	-	-	-	-	-	-	-	-	-	3.27	14.36	-	-	-	-
14-05-GST	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.09	-	-	-	-
16a-05-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.11	0.47	-	-	-	-
17-05-SEP	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	-	-	-	-
18-05-FE	-	-	-	-	-	-	-	-	-	-	-	-	0.46	2.04	-	-	-	-
19-05-F	0.03	0.14	0.03	0.14	0.03	0.14	0.02	0.09	0.04	0.19	0.38	1.66	0.12	0.53	-	-	-	-
20-05-F	0.13	0.57	0.13	0.57	0.13	0.57	0.09	0.40	0.16	0.70	1.36	5.97	1.00	4.37	-	-	-	-
21-05-CB	-	-	-	-	-	-	-	-	-	-	-	-	120.76	0.72	-	-	-	-
22-05-CB	-	-	-	-	-	-	-	-	-	-	-	-	120.76	0.72	-	-	-	-
23-05-CB	-	-	-	-	-	-	-	-	-	-	-	-	120.76	0.72	-	-	-	-
24-05-CB	-	-	-	-	-	-	-	-	-	-	-	-	120.76	0.72	-	-	-	-
25-05-HT-WG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26-10-ST	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.09	-	-	-	-
27-21-LL	-	-	-	-	-	-	-	-	-	-	-	-	25.38	12.87	-	-	-	-
Totals	**0.18**	**0.81**	**0.19**	**0.91**	**0.19**	**0.91**	**0.11**	**0.52**	**0.80**	**3.52**	**2.24**	**9.85**	**521.76**	**63.65**	**0.00**	**0.00**	**0.00**	**0.00**

[1] **Condensables:** Include condensable particulate matter emissions in particulate matter calculations for PM-10 and PM-2.5, but not for TSP (PM).

[2] **TRS:** Total reduced sulfur (TRS) is the sum of the sulfur compounds hydrogen sulfide (H_2S), methyl mercaptan (CH_4S), dimethyl sulfide (C_2H_6S), and dimethyl disulfide ($C_2H_6S_2$).

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Section OPGP-B.3: Proposed Allowable Hazardous Air Pollutants (HAPs)

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

In the table below, report the Proposed Allowable Emissions (Potential to Emit) for each HAP from each regulated emission unit if the HAP > 0.01 tpy. Each facility-wide Individual HAP total and the facility-wide Total HAPs shall be the sum of all HAP sources. Use the HAP nomenclature as it appears in the Instructions. Emission Point numbering must be consistent throughout the application package. For each HAP listed, fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected or the pollutant is emitted in a quantity less than the threshold amounts described above. Additional columns may be added as necessary to address each HAP.

Emission Point ID	Total HAPs		1,3-Butadiene		2,2,4-Trimethyl-pentane		Acetaldehyde		Acrolein		Benzene		Ethylbenzene		Formaldehyde		n-Hexane		Methanol		Toluene		Xylenes	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
1-05-LH-BS	0.01	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.01	0.02	-	-	-	-	-	-
2-05-HT-BS	0.00	0.01			-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.01	-	-	-	-	-	-
3-05-LH-BS	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	-	-	-	-	-	-
4-05-HT-BS	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	-	-	-	-	-	-
5-05-SBP	0.53	0.19	-	-	0.18	0.07	-	-	-	-	0.04	0.01	0.00	0.00	-	-	0.30	0.11	-	-	0.01	0.00	0.01	0.00
6a-05-GBT-CV	0.03	0.11	-	-	0.01	0.03	-	-	-	-	0.00	0.01	0.00	0.00	-	-	0.02	0.07	-	-	0.00	0.00	0.00	0.00
6b-05-OST-CV	0.01	0.04	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.01	0.04			0.00	0.00	0.00	0.00
6c-05-OST-CV	0.01	0.04	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.01	0.04	-	-	0.00	0.00	0.00	0.00
6d-05-OST-CV	0.01	0.04	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.01	0.04	-	-	0.00	0.00	0.00	0.00
6e-05-OST-CV	0.00	0.00	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	-	-	0.00	0.00	0.00	0.00
6f-05-OST-CV	0.00	0.00	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	-	-	0.00	0.00	0.00	0.00
7-05-ST-V	0.00	0.00	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00	-	-	0.00	0.00	0.00	0.00
8-05-WST-V	0.03	0.18	-	-	0.00	0.02	-	-	-	-	0.00	0.02	0.00	0.00	-	-	0.03	0.12	-	-	0.00	0.02	0.00	0.00
9-05-WST-V	0.03	0.18	-	-	0.00	0.02	-	-	-	-	0.00	0.02	0.00	0.00	-	-	0.03	0.12	-	-	0.00	0.02	0.00	0.00
10-05-SOT-V	0.01	0.06	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.01	0.06	-	-	0.00	0.00	0.00	0.00
11-05-IOT-V	0.28	1.28	-	-	0.00	0.00	-	-	-	-	0.00	0.02	0.00	0.00	-	-	0.28	1.25	-	-	0.00	0.00	0.00	0.01
12-05-IOT-V	0.28	1.28	-	-	0.00	0.00	-	-	-	-	0.00	0.02	0.00	0.00	-	-	0.28	1.25	-	-	0.00	0.00	0.00	0.01
14-05-GST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16a-05-WST-CV	0.01	0.04	-	-	0.00	0.00	-	-	-	-	0.00	0.00	0.00	0.00	-	-	0.01	0.04	-	-	0.00	0.00	0.00	0.00
17-05-SEP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18-05-FE	0.05	0.22	-	-	0.02	0.07	-	-	-	-	0.00	0.02	0.00	0.00	-	-	0.03	0.12	-	-	0.00	0.01	0.00	0.00
19-05-F	0.03	0.15	-	-	0.02	0.08	-	-	-	-	0.00	0.01	0.00	0.01	-	-	0.01	0.05	-	-	0.00	0.00	0.00	0.00
20-05-F	0.26	1.14	-	-	0.12	0.51	-	-	-	-	0.02	0.07	0.00	0.02	-	-	0.11	0.50	-	-	0.01	0.03	0.00	0.01
21-05-CB	24.56	0.14	-	-	8.31	0.05	-	-	-	-	1.62	0.01	0.13	0.00	-	-	13.90	0.08	-	-	0.28	0.00	0.32	0.00
22-05-CB	24.56	0.14	-	-	8.31	0.05	-	-	-	-	1.62	0.01	0.13	0.00	-	-	13.90	0.08	-	-	0.28	0.00	0.32	0.00
23-05-CB	24.56	0.14	-	-	8.31	0.05	-	-	-	-	1.62	0.01	0.13	0.00	-	-	13.90	0.08	-	-	0.28	0.00	0.32	0.00
24-05-CB	24.56	0.14	-	-	8.31	0.05	-	-	-	-	1.62	0.01	0.13	0.00	-	-	13.90	0.08	-	-	0.28	0.00	0.32	0.00
25-05-HT-WG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26-10-ST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27-21-LL	2.30	1.16	-	-	0.00	0.00	-	-	-	-	0.03	0.01	0.00	0.00	-	-	2.27	1.15	-	-	0.00	0.00	0.00	0.00
Totals:	**102.12**	**6.70**	**0.00**	**0.00**	**33.59**	**1.00**	**0.00**	**0.00**	**0.00**	**0.00**	**6.57**	**0.25**	**0.52**	**0.03**	**0.00**	**0.00**	**59.02**	**5.31**	**0.00**	**0.00**	**1.14**	**0.08**	**1.29**	**0.03**

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Section OPGP-B.4: Greenhouse Gas Emissions

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Applicants must report potential emission rates in SHORT TONS per year, as opposed to metric tons required by Part 98. Emission Point numbering must be consistent throughout the application package and, for existing emission points, should match any MDEQ ID's in the current permit.

		CO_2 (non-biogenic) ton/yr	CO_2 (biogenic)[2] ton/yr	N_2O ton/yr	CH_4 ton/yr	SF_6 ton/yr	PFC/HFC[3] ton/yr					Total GHG Mass Basis ton/yr[5]	Total CO_2e ton/yr[6]
Emission Point ID	**GWPs [1]**	**1**	**1**	**298**	**25**	**22,800**	**footnote 4**						
1-05-LH-BS	**mass GHG**	1599.92	0.00	0.00	0.03	0.00	0.00					1599.95	
	CO_2e	1599.92	0.00	0.00	0.83	0.00	0.00						1600.74
2-05-HT-BS	**mass GHG**	959.95	0.00	0.00	0.02	0.00	0.00					959.97	
	CO_2e	959.95	0.00	0.00	0.55	0.00	0.00						960.50
3-05-LH-BS	**mass GHG**	319.98	0.00	0.00	0.01	0.00	0.00					319.99	
	CO_2e	319.98	0.00	0.00	0.28	0.00	0.00						320.25
4-05-HT-BS	**mass GHG**	319.98	0.00	0.00	0.01	0.00	0.00					319.99	
	CO_2e	319.98	0.00	0.00	0.28	0.00	0.00						320.25
5-05-SBP	**mass GHG**	19.07	0.00	0.00	0.43	0.00	0.00					19.50	
	CO_2e	19.07	0.00	0.00	10.75	0.00	0.00						29.82
6a-05-GBT-CV	**mass GHG**	2.27	0.00	0.00	0.00	0.00	0.00					2.27	
	CO_2e	2.27	0.00	0.00	0.00	0.00	0.00						2.27
6b-05-OST-CV	**mass GHG**	0.00	0.00	0.00	0.03	0.00	0.00					0.03	
	CO_2e	0.00	0.00	0.00	0.83	0.00	0.00						0.83
6c-05-OST-CV	**mass GHG**	0.00	0.00	0.00	0.03	0.00	0.00					0.03	
	CO_2e	0.00	0.00	0.00	0.83	0.00	0.00						0.83
6d-05-OST-CV	**mass GHG**	0.00	0.00	0.00	0.03	0.00	0.00					0.03	
	CO_2e	0.00	0.00	0.00	0.83	0.00	0.00						0.83
6e-05-OST-CV	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO_2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
6f-05-OST-CV	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO_2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
7-05-ST-V	**mass GHG**	0.15	0.00	0.00	0.00	0.00	0.00					0.15	
	CO_2e	0.15	0.00	0.00	0.00	0.00	0.00						0.15
8-05-WST-V	**mass GHG**	3.41	0.00	0.00	103.33	0.00	0.00					106.74	
	CO_2e	3.41	0.00	0.00	2583.27	0.00	0.00						2586.67
9-05-WST-V	**mass GHG**	3.41	0.00	0.00	103.33	0.00	0.00					106.74	
	CO_2e	3.41	0.00	0.00	2583.27	0.00	0.00						2586.67
10-05-SOT-V	**mass GHG**	0.00	0.00	0.00	0.04	0.00	0.00					0.04	
	CO_2e	0.00	0.00	0.00	1.10	0.00	0.00						1.10
11-05-IOT-V	**mass GHG**	0.13	0.00	0.00	4.21	0.00	0.00					4.34	
	CO_2e	0.13	0.00	0.00	105.27	0.00	0.00						105.40
12-05-IOT-V	**mass GHG**	0.13	0.00	0.00	4.21	0.00	0.00					4.34	
	CO_2e	0.13	0.00	0.00	105.27	0.00	0.00						105.40
14-05-GST	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO_2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
16a-05-WST-CV	**mass GHG**	0.00	0.00	0.00	0.03	0.00	0.00					0.03	
	CO_2e	0.00	0.00	0.00	0.83	0.00	0.00						0.83
17-05-SEP	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO_2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
18-05-FE	**mass GHG**	21.24	0.00	0.00	0.47	0.00	0.00					21.72	
	CO_2e	21.24	0.00	0.00	11.85	0.00	0.00						33.09

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		CO_2 (non-biogenic) ton/yr	CO_2 (biogenic)[2] ton/yr	N_2O ton/yr	CH_4 ton/yr	SF_6 ton/yr	PFC/HFC[3] ton/yr					Total GHG Mass Basis ton/yr[5]	Total CO_2e ton/yr[6]
Emission Point ID	**GWPs [1]**	**1**	**1**	**298**	**25**	**22,800**	**footnote 4**						
19-05-F	**mass GHG**	479.90	0.00	0.00	2.01	0.00	0.00					481.91	
	CO_2e	479.90	0.00	0.00	50.16	0.00	0.00						530.06
20-05-F	**mass GHG**	5842.24	0.00	0.00	5.22	0.00	0.00					5847.46	
	CO_2e	5842.24	0.00	0.00	130.62	0.00	0.00						5972.86
21-05-CB	**mass GHG**	14.54	0.00	0.00	0.32	0.00	0.00					14.86	
	CO_2e	14.54	0.00	0.00	7.99	0.00	0.00						22.53
22-05-CB	**mass GHG**	14.54	0.00	0.00	0.32	0.00	0.00					14.86	
	CO_2e	14.54	0.00	0.00	7.99	0.00	0.00						22.53
23-05-CB	**mass GHG**	14.54	0.00	0.00	0.32	0.00	0.00					14.86	
	CO_2e	14.54	0.00	0.00	7.99	0.00	0.00						22.53
24-05-CB	**mass GHG**	14.54	0.00	0.00	0.32	0.00	0.00					14.86	
	CO_2e	14.54	0.00	0.00	7.99	0.00	0.00						22.53
25-05-HT-WG	**mass GHG**	-	-	-	-	-	-	-	-	-	-	-	-
	CO_2e	-	-	-	-	-	-	-	-	-	-	-	-
26-10-ST	**mass GHG**	0.00	0.00	0.00	0.00	0.00	0.00					0.00	
	CO_2e	0.00	0.00	0.00	0.00	0.00	0.00						0.00
27-21-LL	**mass GHG**	0.00	0.00	0.00	0.90	0.00	0.00					0.90	
	CO_2e	0.00	0.00	0.00	22.60	0.00	0.00						22.60
FACILITY TOTAL	**mass GHG**	**9629.93**	**0.00**	**0.00**	**225.65**	**0.00**	**0.00**					**9855.59**	
	CO_2e	**9629.93**	**0.00**	**0.00**	**5641.35**	**0.00**	**0.00**						**15271.28**

[1] **GWP** (Global Warming Potential): Applicants must use the most current GWPs codified in Table A-1 of 40 CFR part 98. GWPs are subject to change, therefore, applicants need to check 40 CFR 98 to confirm GWP values.

[2] Biogenic CO2 is defined as carbon dioxide emissions resulting from the combustion or decomposition of non-fossilized and biodegradable organic material originating from plants, animals, or micro-organisms.
[3] For **HFCs** or **PFCs** describe the specific HFC or PFC compound and use a separate column for each individual compound.
[4] For each new compound, enter the appropriate GWP for each HFC or PFC compound from Table A-1 in 40 CFR 98.
[5] Greenhouse gas emissions on a **mass basis** is the ton per year greenhouse gas emission before adjustment with its GWP. Do not include biogenic CO_2 in this total.
[6] **CO_2e** means Carbon Dioxide Equivalent and is calculated by multiplying the TPY mass emissions of the greenhouse gas by its GWP. Do not include biogenic CO_2e in this total.

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Section OPGP-B.5: Stack Parameters and Exit Conditions

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Emission Point numbering must be consistent throughout the application package.

Emission Point ID	Orientation (H-Horizontal V=Vertical)	Rain Caps (Yes or No)	Height Above Ground (ft)	Base Elevation (ft)	Exit Temp. (°F)	Inside Diameter or Dimensions (ft)	Velocity (ft/sec)	Moisture by Volume (%)	Geographic Position (degrees/minutes/seconds)	
									Latitude	Longitude
1-05-LH-BS	V	No	20	475±	500	2.0	5.8	0	31 59 56.80	89 45 48.60
2-05-HT-BS	V	No	20	475±	500	1.7	4.8	0	31 59 56.80	89 45 48.60
3-05-LH-BS	V	No	18	475±	500	0.67	10	0	31 59 56.80	89 45 48.60
4-05-HT-BS	V	No	18	475±	500	0.67	10	0	31 59 56.80	89 45 48.60
6a-05-GBT-CV	V	No	24.1	475±	70	0.5	0.01	0	31 59 56.80	89 45 48.60
6b-05-OST-CV	V	No	16.1	475±	1500	0.5	<0.01	0	31 59 56.80	89 45 48.60
6c-05-OST-CV	V	No	16.1	475±	70	0.5	<0.01	0	31 59 56.80	89 45 48.60
6d-05-OST-CV	V	No	16.1	475±	70	0.5	<0.01	0	31 59 56.80	89 45 48.60
6e-05-OST-CV	V	No	16.1	475±	70	0.5	<0.01	0	31 59 56.80	89 45 48.60
6f-05-OST-CV	V	No	16.1	475±	70	0.5	<0.01	0	31 59 56.80	89 45 48.60
7-05-ST-V	V	No	16.1	475±	70	0.5	<0.01	0	31 59 56.80	89 45 48.60
8-05-WST-V	V	No	17	475±	70	0.2	5	0	31 59 56.80	89 45 48.60
9-05-WST-V	V	No	17	475±	70	0.2	5	0	31 59 56.80	89 45 48.60
10-05-SOT-V	V	No	28	475±	70	0.2	0.1	0	31 59 56.80	89 45 48.60
11-05-IOT-V	V	No	22	475±	70	0.2	0.50	0	31 59 56.80	89 45 48.60
12-05-IOT-V	V	No	22	475±	70	0.2	0.5	0	31 59 56.80	89 45 48.60
16a-05-WST-CV	V	No	18	475±	70	0.2	0.05	0	31 59 56.80	89 45 48.60
19-05-F	V	No	25	475±	1500	0.5	285	0	31 59 56.80	89 45 48.60
20-05-F	V	No	25	475±	1500	0.5	831	0	31 59 56.80	89 45 48.60
27-21-LL	V	No	5	475±	80	0.3	0.84	0	31 59 56.80	89 45 48.60

[1] A WAAS-capable GPS receiver should be used and in the WGS84 or NAD83 coordinate system.

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Denbury Onshore, LLC
Martinville EOR Facility
Simpson County, MS

Section B.6: EMISSION POINT SOURCE LIST

Facility Ref. No.:	MDEQ EPN:	Footnote:	Emission Point Description:	Routes To:	Operating Rate/Capacity	Operating Schedule:		
						Hrs/Day or (Hrs/Yr)	Days/Wk	Wks/Yr
1-05-LH-BS	AA-001		2.5 MMBTU/Hr Line Heater-Burner Stack (BAP-401)		2.5 MMBTU/Hr	24	7	52.143
2-05-HT-BS	AA-003b		1.5 MMBTU/Hr Heater Treater-Burner Stack (NBK-105)		1.5 MMBTU/Hr	24	7	52.143
3-05-LH-BS	AAA-002		500 MBTU/Hr Line Heater-Burner Stack (BAP-138)		500 MBTU/Hr	24	7	52.143
4-05-HT-BS	AA-003a		500 MBTU/Hr Heater Treater-Burner Stack (NBK-109)		500 MBTU/Hr	24	7	52.143
5-05-SBP	AA-004		Sand Blowdown Pit (ZZZ-130)		50 BBLs/Hr Brine	(730)	-	-
6a-05-GBT-CV	AA-005	a	1500 BBL Gun Barrel Tank-Common Vent (ABM-132)	19-05-F	711,750 BOPY	24	7	52.143
6b-05-OST-CV	AA-006a	a	1000 BBL Dry Oil Tank-Common Vent (ABJ-119A/C/D)	19-05-F	237,250 BOPY	24	7	52.143
6c-05-OST-CV	AA-006b	a	1000 BBL Dry Oil Tank-Common Vent (ABJ-119A/C/D)	19-05-F	237,250 BOPY	24	7	52.143
6d-05-OST-CV	AA-006c	a	1000 BBL Dry Oil Tank-Common Vent (ABJ-119A/C/D)	19-05-F	237,250 BOPY	24	7	52.143
6e-05-OST-CV	AA-007	a	1000 BBL Wet Oil Tank-Common Vent (ABJ-118)	19-05-F	1,000 BOPY	24	7	52.143
6f-05-OST-CV	AA-008	a	1000 BBL Wet/Dry Oil Tank-Common Vent (ABJ-119B)	19-05-F	1,000 BOPY	24	7	52.143
7-05-ST-V	AA-009	a	2000 BBL Skimmer Tank-Common Vent (ABM-120A)	19-05-F	1,825,000 BWPY & 1,825 BOPY	24	7	52.143
8-05-WST-V	AA-010a		1500 BBL Produced Water Tank-Common Vent (ABJ-129A/B)		912,500 BWPY	24	7	52.143
9-05-WST-V	AA-010b		1500 BBL Produced Water Tank-Common Vent (ABJ-129A/B)		912,500 BWPY	24	7	52.143
10-05-SOT-V	AA-011		500 BBL Slop Oil Tank-Common Vent (ABJ-108)		2,007.5 BOPY	24	7	52.143
11-05-IOT-V	AA-012a		400 BBL Inhibitor Oil Blending Tank-Vent (BBJ-133A/B)		36,000 BOPY	24	7	52.143
12-05-IOT-V	AA-012b		400 BBL Inhibitor Oil Blending Tank-Vent (BBJ-133A/B)		36,000 BOPY	24	7	52.143
14-05-GST	AA-013		Glycol Storage Tank (BBJ-137)		550 Gallons	24	7	52.143
16a-05-WST-CV	AA-015		400 BBL API Water Holding Tank-Vent (ABM-165A)		16,800 Gallons	24	7	52.143
17-05-SEP	AA-016		API Separator (ABH-128)		682,550 Gallons/Yr	24	7	52.143
18-05-FE	AA-017		Fugitive Emissions		N/A	24	7	52.143
19-05-F	AA-018	b	Atmospheric Control Flare (ZZZ-180)		25.0 MMSCF/Yr	24	7	52.143
20-05-F	AA-019	c	LP Control Flare (ZZZ-181)		104 MMSCF/Yr	24	7	52.143
21-05-CB	AA-020		High Pressure Compressor Blowdown Vent #1		278 MSCF/Yr	(12)	-	-
22-05-CB	AA-020		High Pressure Compressor Blowdown Vent #2		278 MSCF/Yr	(12)	-	-
23-05-CB	AA-021		Low Pressure Compressor Blowdown Vent #1		278 MSCF/Yr	(12)	-	-
24-05-CB	AA-021		Low Pressure Compressor Blowdown Vent #1		278 MSCF/Yr	(12)	-	-
25-05-HT-WG	AA-003c	d	Heater Treater-Flash Gas	20-05-F	94.2 MMSCF/Yr	24	7	52.143

ORIGINAL

Facility Ref. No.:	MDEQ EPN:	Footnote:	Emission Point Description:	Routes To:	Operating Rate/Capacity	Operating Schedule:		
						Hrs/Day or (Hrs/Yr)	Days/Wk	Wks/Yr
26-10-ST	AA-022		Inhibitor Transfer Tank		1,350 Gallons	24	7	52.143
27-21-LL	AA-023		Loading Losses-Oil Transfer to Tank Truck		182,500 BOPY	(1014)	-	-

Footnotes:

a *Vapors from this source are routed to the atmospheric control flare (EPN: 19-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.*

b *Routine emission limits for this source account for vapors from the storage tanks (EPNs: 6a-05-GBT-CV through 7-05-ST-V), pilot gas, and purge gas. This source may also combust gas from the facility's pressure release system on an emergency and non-routine basis.*

c *Routine emission limits for this source account for off-gas from the heater treater, pilot gas, and purge gas. This source may also combust gas from the facility's pressure release system on an emergency and non-routine basis.*

d *Off-gas from this source is routed to the LP control flare (EPN: 20-05-F) for combustion.*

ORIGINAL

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Fuel Burning Equipment – External Combustion Sources

Section OPGP-C

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-001 (1-05-LH-BS)

B. Equipment Description: Line Heater-Burner Stack

C. Manufacturer: Unknown

D. Date of Manufacture and No.: Unknown

E. Maximum Heat Input (higher heating value): 2.5 MMBtu/hr

F. Nominal Heat Input Capacity: 2.5 MMBtu/hr

G. Use: ☒ Line Heater ☐ Heater Treater ☐ TEG Burner

☐ Space Heat ☐ Process Heat ☐ Other (describe): _____

H. Heat Mechanism: ☐ Direct ☒ Indirect

I. Burner Type (e.g., forced draft, natural draft, etc.): _____

J. Additional Design Controls (e.g., FGR, etc.): N/A

K. Status: ☒ Operating ☐ Proposed ☐ Under Construction

2005

2. Fuel Type

Complete the following table, identifying each type of fuel and the amount used. Specify the units for heat content, hourly usage, and yearly usage.

FUEL TYPE	HEAT CONTENT	% SULFUR	% ASH	MAXIMUM HOURLY USAGE	MAXIMUM YEARLY USAGE
Produced Field Gas	1037 BTU/ft^3	<0.0007	N/A	3,014 scf	26.4 MMscf

Please list any fuel components that are hazardous air pollutants and the percentage in the fuel:

_____

_____

ORIGINAL

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Fuel Burning Equipment – External Combustion Sources

Section OPGP-C

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-003b (2-05-HT-BS)

B. Equipment Description: Heater Treater-Burner Stack

C. Manufacturer: Unknown

D. Date of Manufacture and No.: Unknown

E. Maximum Heat Input (higher heating value): 1.5 MMBtu/hr

F. Nominal Heat Input Capacity: 1.5 MMBtu/hr

G. Use: ☐ Line Heater ☒ Heater Treater ☐ TEG Burner

☐ Space Heat ☐ Process Heat ☐ Other (describe): _____

H. Heat Mechanism: ☐ Direct ☒ Indirect

I. Burner Type (e.g., forced draft, natural draft, etc.): _____

J. Additional Design Controls (e.g., FGR, etc.): N/A

K. Status: ☒ Operating ☐ Proposed ☐ Under Construction

2005

2. Fuel Type

Complete the following table, identifying each type of fuel and the amount used. Specify the units for heat content, hourly usage, and yearly usage.

FUEL TYPE	HEAT CONTENT	% SULFUR	% ASH	MAXIMUM HOURLY USAGE	MAXIMUM YEARLY USAGE
Produced Field Gas	1037 BTU/ft^3	<0.0007	N/A	1,808 scf	15.8 MMscf

Please list any fuel components that are hazardous air pollutants and the percentage in the fuel:

_____

_____

ORIGINAL

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Fuel Burning Equipment – External Combustion Sources

Section OPGP-C

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-002 (3-05-LH-BS)

B. Equipment Description: Line Heater-Burner Stack

C. Manufacturer: Unknown

D. Date of Manufacture and No.: Unknown

E. Maximum Heat Input (higher heating value): 0.500 MMBtu/hr

F. Nominal Heat Input Capacity: 0.500 MMBtu/hr

G. Use: ☒ Line Heater ☐ Heater Treater ☐ TEG Burner

☐ Space Heat ☐ Process Heat ☐ Other (describe): _____

H. Heat Mechanism: ☐ Direct ☒ Indirect

I. Burner Type (e.g., forced draft, natural draft, etc.): _____

J. Additional Design Controls (e.g., FGR, etc.): N/A

K. Status: ☒ Operating ☐ Proposed ☐ Under Construction

2005

2. Fuel Type

Complete the following table, identifying each type of fuel and the amount used. Specify the units for heat content, hourly usage, and yearly usage.

FUEL TYPE	HEAT CONTENT	% SULFUR	% ASH	MAXIMUM HOURLY USAGE	MAXIMUM YEARLY USAGE
Produced Field Gas	1037 BTU/ft^3	<0.0007	N/A	603 scf	5.28 MMscf

Please list any fuel components that are hazardous air pollutants and the percentage in the fuel:

_____

ORIGINAL

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Fuel Burning Equipment – External Combustion Sources

Section OPGP-C

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-003a (4-05-HT-BS)

B. Equipment Description: Heater Treater-Burner Stack

C. Manufacturer: Unknown

D. Date of Manufacture and No.: Unknown

E. Maximum Heat Input (higher heating value): 0.500 MMBtu/hr

F. Nominal Heat Input Capacity: 0.500 MMBtu/hr

G. Use: ☐ Line Heater ☒ Heater Treater ☐ TEG Burner

☐ Space Heat ☐ Process Heat ☐ Other (describe): _____

H. Heat Mechanism: ☐ Direct ☒ Indirect

I. Burner Type (e.g., forced draft, natural draft, etc.): _____

J. Additional Design Controls (e.g., FGR, etc.): N/A

K. Status: ☒ Operating ☐ Proposed ☐ Under Construction

2005

2. Fuel Type

Complete the following table, identifying each type of fuel and the amount used. Specify the units for heat content, hourly usage, and yearly usage.

FUEL TYPE	HEAT CONTENT	% SULFUR	% ASH	MAXIMUM HOURLY USAGE	MAXIMUM YEARLY USAGE
Produced Field Gas	1037 BTU/ft^3	<0.0007	N/A	603 scf	5.28 MMscf

Please list any fuel components that are hazardous air pollutants and the percentage in the fuel:

_____

_____

ORIGINAL

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary — Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-005 (6a-05-GBT-CV)

B. Product(s) Stored: Produced Oil

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity	63,000	gallons		
2.	True vapor pressure at storage temperature:	4.594	psia @	69.67	°F
3.	Maximum true vapor pressure (as defined in §60.111b)	5.279	psia @	77.50	°F
4.	Reid vapor pressure at storage temperature:	6.18	psia @	69.67	°F
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	50	lb/lbmol		

B. Tank Orientation: ☒ Vertical ☐ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☒ Yes ☐ No

If yes, describe below and include the efficiency of each.

Vapors from these sources are routed to the control flare (EPN: 19-05-F) for combustion with a combustion efficiency of 98%.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

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MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary — Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: _____ feet
B. Shell Diameter: _____ feet
C. Working Volume: _____ gal
D. Maximum Throughput: _____ gal/yr
E. Is the tank heated? ☐ Yes ☐ No
F. Is the tank underground? ☐ Yes ☐ No
G. Shell Color/Shade:
☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
H. Shell Condition: ☐ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: 24.1 feet
2. Shell Diameter: 21.6 feet
3. Maximum Liquid Height: 23.1 feet
4. Average Liquid Height: 11.55 feet
5. Working Volume: 63,000 gal
6. Turnovers per year: 472.05
7. Maximum throughput: 711,750 BBLs/yr
8. Is the tank heated? ☐ Yes ☒ No

B. Shell Characteristics:
1. Shell Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☒ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Shell Condition: ☒ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☒ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Roof Condition: ☒ Good ☐ Poor
3. Type: ☒ Cone ☐ Dome
4. Height: 0.68 feet

ORIGINAL

Tank Summary — Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:
   - ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   - ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck
2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted
2. Primary Seal:
   ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
3. Secondary Seal
   ☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	60.33*	1.59*	61.92*

**It should be noted that the emissions listed above represent the fixed roof emissions prior to emissions being routed to the control flare for combustion.*

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary — Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-006a, AA-006b, & AA-006c (6b-05-OST-CV, 6c-05-OST-CV, & 6d-05-OST-CV)

B. Product(s) Stored: Produced Oil

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity	42,000	gallons		
2.	True vapor pressure at storage temperature:	4.616	psia @	69.93	°F
3.	Maximum true vapor pressure (as defined in §60.111b)	5.303	psia @	77.77	°F
4.	Reid vapor pressure at storage temperature:	6.18	psia @	69.93	°F
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	50	lb/lbmol		

B. Tank Orientation: ☒ Vertical ☐ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☒ Yes ☐ No

If yes, describe below and include the efficiency of each.

Vapors from these sources are routed to the control flare (EPN: 19-05-F) for combustion with a combustion efficiency of 98%.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

Tank Summary — Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: _____ feet
B. Shell Diameter: _____ feet
C. Working Volume: _____ gal
D. Maximum Throughput: _____ gal/yr
E. Is the tank heated? ☐ Yes ☐ No
F. Is the tank underground? ☐ Yes ☐ No
G. Shell Color/Shade:
☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
H. Shell Condition: ☐ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: 16.1 feet
2. Shell Diameter: 21.5 feet
3. Maximum Liquid Height: 15.1 feet
4. Average Liquid Height: 7.55 feet
5. Working Volume: 42,000 gal
6. Turnovers per year: 242.96
7. Maximum throughput: 237,250 BBLs/yr
8. Is the tank heated? ☐ Yes ☒ No

B. Shell Characteristics:
1. Shell Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☒ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Shell Condition: ☒ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☒ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Roof Condition: ☒ Good ☐ Poor
3. Type: ☒ Cone ☐ Dome
4. Height: 0.67 feet

Tank Summary | Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

Tank Summary — Section OPGP-E

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:
   - ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   - ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck
2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted
2. Primary Seal:
   ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
3. Secondary Seal
   ☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	5.86*	1.42*	7.28*

**It should be noted that the emissions listed above represent the fixed roof emissions prior to emissions being routed to the control flare for combustion.*

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary — Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-007 & AA-008 (6e-05-OST-CV & 6f-05-OST-CV)

B. Product(s) Stored: Produced Oil

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity	42,000	gallons		
2.	True vapor pressure at storage temperature:	4.616	psia @	69.93	°F
3.	Maximum true vapor pressure (as defined in §60.111b)	5.303	psia @	77.77	°F
4.	Reid vapor pressure at storage temperature:	6.18	psia @	69.93	°F
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	50	lb/lbmol		

B. Tank Orientation: ☒ Vertical ☐ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☒ Yes ☐ No

If yes, describe below and include the efficiency of each.

Vapors from these sources are routed to the control flare (EPN: 19-05-F) for combustion with a combustion efficiency of 98%.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

Tank Summary — Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: _____ feet
B. Shell Diameter: _____ feet
C. Working Volume: _____ gal
D. Maximum Throughput: _____ gal/yr
E. Is the tank heated? ☐ Yes ☐ No
F. Is the tank underground? ☐ Yes ☐ No
G. Shell Color/Shade:
☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
H. Shell Condition: ☐ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: 16.1 feet
2. Shell Diameter: 21.5 feet
3. Maximum Liquid Height: 15.1 feet
4. Average Liquid Height: 7.55 feet
5. Working Volume: 42,000 gal
6. Turnovers per year: 1.02
7. Maximum throughput: 1,000.10 BBLs/yr
8. Is the tank heated? ☐ Yes ☒ No

B. Shell Characteristics:
1. Shell Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☒ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Shell Condition: ☒ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☒ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Roof Condition: ☒ Good ☐ Poor
3. Type: ☒ Cone ☐ Dome
4. Height: 0.67 feet

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary — Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck

2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted

2. Primary Seal:
   ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted

3. Secondary Seal
   ☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	0.09*	1.42*	1.51*

**It should be noted that the emissions listed above represent the fixed roof emissions prior to emissions being routed to the control flare for combustion.*

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary — Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-009 (7-05-ST-CV)

B. Product(s) Stored: Produced Oil & Produced Water

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity	84,000	gallons		
2.	True vapor pressure at storage temperature:	0.369	psia @	70.14	°F
3.	Maximum true vapor pressure (as defined in §60.111b)	0.479	psia @	77.98	°F
4.	Reid vapor pressure at storage temperature:	0.369	psia @	70.14	°F
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	18.42	lb/lbmol		

B. Tank Orientation: ☒ Vertical ☐ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☒ Yes ☐ No

If yes, describe below and include the efficiency of each.

Vapors from these sources are routed to the control flare (EPN: 19-05-F) for combustion with a combustion efficiency of 98%.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

Tank Summary — Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: _____ feet
B. Shell Diameter: _____ feet
C. Working Volume: _____ gal
D. Maximum Throughput: _____ gal/yr
E. Is the tank heated? ☐ Yes ☐ No
F. Is the tank underground? ☐ Yes ☐ No
G. Shell Color/Shade:
☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

H. Shell Condition: ☐ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: 16.1 feet
2. Shell Diameter: 29.7 feet
3. Maximum Liquid Height: 15.1 feet
4. Average Liquid Height: 7.55 feet
5. Working Volume: 84,000 gal
6. Turnovers per year: 980.37
7. Maximum throughput: 1,826,825 BBLs/yr
8. Is the tank heated? ☐ Yes ☒ No

B. Shell Characteristics:
1. Shell Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☒ Gray/Light ☐ Gray/Medium ☐ Red/Primer

2. Shell Condition: ☒ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☒ Gray/Light ☐ Gray/Medium ☐ Red/Primer

2. Roof Condition: ☒ Good ☐ Poor

3. Type: ☒ Cone ☐ Dome

4. Height: 0.67 feet

Tank Summary — Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:
   - ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   - ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck
2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted
2. Primary Seal:
   - ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
3. Secondary Seal
   - ☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	4.58*	0.08*	4.66*

**It should be noted that the emissions listed above represent the fixed roof emissions prior to emissions being routed to the control flare for combustion.*

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary — Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-010a & AA-010b (8-05-WST-V & 9-05-WST-V)

B. Product(s) Stored: Produced Water

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity	63,000	gallons		
2.	True vapor pressure at storage temperature:	0.362	psia @	69.93	°F
3.	Maximum true vapor pressure (as defined in §60.111b)	0.471	psia @	77.77	°F
4.	Reid vapor pressure at storage temperature:	0.362	psia @	69.93	°F
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	18.02	lb/lbmol		

B. Tank Orientation: ☒ Vertical ☐ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☒ Yes ☐ No

If yes, describe below and include the efficiency of each.

Vapors from these sources are routed to the control flare (EPN: 19-05-F) for combustion with a combustion efficiency of 98%.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

Tank Summary

Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: _____ feet
B. Shell Diameter: _____ feet
C. Working Volume: _____ gal
D. Maximum Throughput: _____ gal/yr
E. Is the tank heated? ☐ Yes ☐ No
F. Is the tank underground? ☐ Yes ☐ No
G. Shell Color/Shade:
☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

H. Shell Condition: ☐ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: 16.1 feet
2. Shell Diameter: 21.5 feet
3. Maximum Liquid Height: 15.1 feet
4. Average Liquid Height: 7.55 feet
5. Working Volume: 63,000 gal
6. Turnovers per year: 934.46
7. Maximum throughput: 912,500 BBLs/yr
8. Is the tank heated? ☐ Yes ☒ No

B. Shell Characteristics:
1. Shell Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☒ Gray/Light ☐ Gray/Medium ☐ Red/Primer

2. Shell Condition: ☒ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☒ Gray/Light ☐ Gray/Medium ☐ Red/Primer

2. Roof Condition: ☒ Good ☐ Poor

3. Type: ☒ Cone ☐ Dome

4. Height: 0.67 feet

Tank Summary — Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:
   - ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   - ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck
2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted
2. Primary Seal:
   ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
3. Secondary Seal
   ☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	0.44*	0.04*	0.48*

**It should be noted that the emissions listed above represent the fixed roof emissions prior to emissions being routed to the control flare for combustion.*

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary — Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-011 (10-05-SOT-V)

B. Product(s) Stored: Produced Oil

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity	21,000	gallons		
2.	True vapor pressure at storage temperature:	4.562	psia @	69.29	°F
3.	Maximum true vapor pressure (as defined in §60.111b)	5.244	psia @	77.12	°F
4.	Reid vapor pressure at storage temperature:	6.18	psia @	69.29	°F
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	50	lb/lbmol		

B. Tank Orientation: ☒ Vertical ☐ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☒ Yes ☐ No

If yes, describe below and include the efficiency of each.

Vapors from these sources are routed to the control flare (EPN: 19-05-F) for combustion with a combustion efficiency of 98%.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

Tank Summary — Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: _____ feet
B. Shell Diameter: _____ feet
C. Working Volume: _____ gal
D. Maximum Throughput: _____ gal/yr
E. Is the tank heated? ☐ Yes ☐ No
F. Is the tank underground? ☐ Yes ☐ No
G. Shell Color/Shade:
☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

H. Shell Condition: ☐ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: 25 feet
2. Shell Diameter: 12 feet
3. Maximum Liquid Height: 24 feet
4. Average Liquid Height: 12 feet
5. Working Volume: 21,000 gal
6. Turnovers per year: 4.14
7. Maximum throughput: 2000.20 BBLs/yr
8. Is the tank heated? ☐ Yes ☒ No

B. Shell Characteristics:
1. Shell Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☒ Gray/Light ☐ Gray/Medium ☐ Red/Primer

2. Shell Condition: ☒ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☒ Gray/Light ☐ Gray/Medium ☐ Red/Primer

2. Roof Condition: ☒ Good ☐ Poor

3. Type: ☒ Cone ☐ Dome

4. Height: 0.38 feet

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary — Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:
   - ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   - ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck
2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted
2. Primary Seal:
   - ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
3. Secondary Seal
   - ☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	0.17*	0.49*	0.66*

**It should be noted that the emissions listed above represent the fixed roof emissions prior to emissions being routed to the control flare for combustion.*

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary — Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-012a & AA-012b (11-05-IOT-V & 12-05-IOT-V)

B. Product(s) Stored: Produced Oil

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity	16,800	gallons		
2.	True vapor pressure at storage temperature:	4.573	psia @	69.41	°F
3.	Maximum true vapor pressure (as defined in §60.111b)	5.256	psia @	77.25	°F
4.	Reid vapor pressure at storage temperature:	6.18	psia @	69.41	°F
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	50	lb/lbmol		

B. Tank Orientation: ☒ Vertical ☐ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☒ Yes ☐ No

If yes, describe below and include the efficiency of each.

Vapors from these sources are routed to the control flare (EPN: 19-05-F) for combustion with a combustion efficiency of 98%.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

Tank Summary — Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: _____ feet
B. Shell Diameter: _____ feet
C. Working Volume: _____ gal
D. Maximum Throughput: _____ gal/yr
E. Is the tank heated? ☐ Yes ☐ No
F. Is the tank underground? ☐ Yes ☐ No
G. Shell Color/Shade:
☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

H. Shell Condition: ☐ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: 20 feet
2. Shell Diameter: 12 feet
3. Maximum Liquid Height: 19 feet
4. Average Liquid Height: 9.5 feet
5. Working Volume: 16,800 gal
6. Turnovers per year: 94.05
7. Maximum throughput: 36,000 BBLs/yr
8. Is the tank heated? ☐ Yes ☒ No

B. Shell Characteristics:
1. Shell Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☒ Gray/Light ☐ Gray/Medium ☐ Red/Primer

2. Shell Condition: ☒ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☒ Gray/Light ☐ Gray/Medium ☐ Red/Primer

2. Roof Condition: ☒ Good ☐ Poor

3. Type: ☒ Cone ☐ Dome

4. Height: 0.38 feet

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary — Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer

7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck

2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted

2. Primary Seal:
   ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted

3. Secondary Seal
   ☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	1.48*	0.46*	1.94*

**It should be noted that the emissions listed above represent the fixed roof emissions prior to emissions being routed to the control flare for combustion.*

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary — Section OPGP-E

1. Emission Point Description

A. Emission Point Designation (Ref. No.): AA-015 (16a-05-WST-CV)

B. Product(s) Stored: Produced Oil

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

D. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction: 2005

2. Tank Data

A. Tank Specifications:

1.	Design capacity	16,800	gallons		
2.	True vapor pressure at storage temperature:	4.573	psia @	69.41	°F
3.	Maximum true vapor pressure (as defined in §60.111b)	5.256	psia @	77.25	°F
4.	Reid vapor pressure at storage temperature:	6.18	psia @	69.41	°F
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	50	lb/lbmol		

B. Tank Orientation: ☒ Vertical ☐ Horizontal

C. Type of Tank:

☒ Fixed Roof ☐ External Floating Roof ☐ Internal Floating Roof

☐ Pressure ☐ Variable Vapor Space ☐ Other: _____

D. Is the tank equipped with a Vapor Recovery System and/or flare? ☒ Yes ☐ No

If yes, describe below and include the efficiency of each.

Vapors from these sources are routed to the control flare (EPN: 19-05-F) for combustion with a combustion efficiency of 98%.

E. Closest City:

☒ Jackson, MS ☐ Meridian, MS ☐ Tupelo, MS ☐ Mobile, AL

☐ New Orleans, LA ☐ Memphis, TN ☐ Baton Rouge, LA

F. Is an E&P or similar report described in Condition 5.4(5) of the General Permit included for this tank in the Notice of Intent? ☒ Yes ☐ No

Tank Summary — Section OPGP-E

3. Horizontal Fixed Roof Tank

A. Shell Length: _____ feet
B. Shell Diameter: _____ feet
C. Working Volume: _____ gal
D. Maximum Throughput: _____ gal/yr
E. Is the tank heated? ☐ Yes ☐ No
F. Is the tank underground? ☐ Yes ☐ No
G. Shell Color/Shade:
☐ ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
H. Shell Condition: ☐ Good ☐ Poor

4. Vertical Fixed Roof Tank

A. Dimensions:
1. Shell Height: 20 feet
2. Shell Diameter: 12 feet
3. Maximum Liquid Height: 19 feet
4. Average Liquid Height: 9.5 feet
5. Working Volume: 16,800 gal
6. Turnovers per year: 0.00
7. Maximum throughput: 0.00 BBLs/yr
8. Is the tank heated? ☐ Yes ☒ No

B. Shell Characteristics:
1. Shell Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☒ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Shell Condition: ☒ Good ☐ Poor

C. Roof Characteristics:
1. Roof Color/Shade:
☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
☒ Gray/Light ☐ Gray/Medium ☐ Red/Primer
2. Roof Condition: ☒ Good ☐ Poor
3. Type: ☒ Cone ☐ Dome
4. Height: 0.38 feet

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Tank Summary — Section OPGP-E

5. Internal Floating Roof Tank

A. Tank Characteristics:

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Number of Columns: _____
6. Self-Supporting Roof? ☐ Yes ☐ No
7. Effective Column Diameter:
   ☐ 9"x7" Built-up Column ☐ 8" Diameter Pipe ☐ Unknown
8. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining
9. External Shell Color/Shade:
   ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
10. External Shell Condition: ☐ Good ☐ Poor
11. Roof Color/Shade:
    ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
    ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
12. Roof Condition: ☐ Good ☐ Poor

B. Rim Seal System:

1. Primary Seal: ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
2. Secondary Seal: ☐ Shoe-mounted ☐ Rim-mounted ☐ None

C. Deck Characteristics:

1. Deck Type: ☐ Bolted ☐ Welded
2. Deck Fitting Category: ☐ Typical ☐ Detail

6. External Floating Roof Tank

A. Tank Characteristics

1. Diameter: _____ feet
2. Tank Volume: _____ gal
3. Turnovers per year: _____
4. Maximum Throughput: _____ gal/yr
5. Internal Shell Condition:
   ☐ Light Rust ☐ Dense Rust ☐ Gunite Lining

Tank Summary — Section OPGP-E

6. External Floating Roof Tank (continued)

A. Tank Characteristics (continued):

6. Paint Color/Shade:
   - ☐ White/White ☐ Aluminum/Specular ☐ Aluminum/Diffuse
   - ☐ Gray/Light ☐ Gray/Medium ☐ Red/Primer
7. Paint Condition: ☐ Good ☐ Poor

B. Roof Characteristics

1. Roof Type: ☐ Pontoon ☐ Double Deck
2. Roof Fitting Category: ☐ Typical ☐ Detail

C. Tank Construction and Rim-Seal System:

1. Tank Construction: ☐ Welded ☐ Riveted
2. Primary Seal:
   ☐ Mechanical Shoe ☐ Liquid-mounted ☐ Vapor-mounted
3. Secondary Seal
   ☐ None ☐ Shoe-mounted ☐ Rim-mounted ☐ Weather shield

7. Pollutant Emissions

A. Fixed Roof Emissions:

Pollutant[1]	Working Loss (tons/yr)	Breathing Loss (tons/yr)	Total Emissions (tons/yr)
VOC	0.00*	0.47*	0.47*

**It should be noted that the emissions listed above represent the fixed roof emissions prior to emissions being routed to the control flare for combustion.*

B. Floating Roof Emissions:

Pollutant[1]	Rim Seal Loss (tons/yr)	Withdrawal Loss (tons/yr)	Deck Fitting Loss (tons/yr)	Deck Seam Loss (tons/yr)	Landing Loss[2] (tons/yr)	Total Emissions (tons/yr)

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with the OGP Application Instructions. A list of regulated air pollutants and a link to EPA's list of hazardous air pollutants is provided in the OGP Application Instructions.
2. Landing losses should be determined according to the procedures in *Organic Liquid Storage Tanks* chapter of EPA's AP-42 emission factors. If the roof is not landed at least once/yr, enter "NA".

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Flare — Section OPGP-F

1. Equipment Description

A. Emission Point Designation (Ref. No.): AA-018 (19-05-F)

B. Equipment Description (include the process(es) that the flare controls emissions from):
Control flare to combust emissions from storage tanks (EPNs: 6a-05-GBT-CV through 7-05-ST-V).

C. Manufacturer: N/A D. Model: N/A

E. Status: ☒ Operating ☐ Proposed ☐ Under Construction

F. ☐ Requesting a federally enforceable condition to route tank emissions to the flare.

2. System Data

A. Efficiency: 98 % Controlling the following pollutant(s): VOC, HAPs
Efficiency: ____ % Controlling the following pollutant(s): ____
Reason for different efficiency: ____

B. Flare Data (if applicable):

1. Flare type: ☒ Non-assisted ☐ Steam-assisted ☐ Air-assisted ☐ Other: ____

2. Net heating value of combusted gas: 245 Btu/scf

3. Design exit velocity: N/A ft/sec

4. System: ☒ Auto-ignitor ☒ Continuous Flame

5. Is the presence of a flare pilot flame monitored? ☒ Yes ☐ No

   If yes, please describe the monitoring: The presence of the flare pilot flame is continuously monitored by use of a thermocouple.*

6. Is the auto-ignitor system monitored? ☒ Yes ☐ No

   If yes, please describe the monitoring: The flare is equipped with an auto-igniter.*

*Denbury will maintain a flare pilot flame or auto-igniter system at all times when emissions may be vented to the flare. Denbury will either continuously monitor & record the presence of the flare pilot flame by use of a thermocouple OR maintain & operate an auto-igniter system on the flare to ensure a flame is immediately restored when emissions are being sent to the flare.

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Flare — Section OPGP-F

1. Equipment Description

A. Emission Point Designation (Ref. No.): AA-019 (20-05-F)

B. Equipment Description (include the process(es) that the flare controls emissions from):
Control flare to combust emissions from heater treater waste gas (EPN: 25-05-HT-WG).

C. Manufacturer: N/A D. Model: N/A

E. Status: ☒ Operating ☐ Proposed ☐ Under Construction

F. ☐ Requesting a federally enforceable condition to route tank emissions to the flare.

2. System Data

A. Efficiency: 98 % Controlling the following pollutant(s): VOC, HAPs
Efficiency: _____ % Controlling the following pollutant(s): _____
Reason for different efficiency: _____

B. Flare Data (if applicable):

1. Flare type: ☒ Non-assisted ☐ Steam-assisted ☐ Air-assisted ☐ Other: _____

2. Net heating value of combusted gas: 212 Btu/scf

3. Design exit velocity: N/A ft/sec

4. System: ☒ Auto-ignitor ☒ Continuous Flame

5. Is the presence of a flare pilot flame monitored? ☒ Yes ☐ No

   If yes, please describe the monitoring: The presence of the flare pilot flame is continuously monitored by use of a thermocouple.*

6. Is the auto-ignitor system monitored? ☒ Yes ☐ No

   If yes, please describe the monitoring: The flare is equipped with an auto-igniter.*

*Denbury will maintain a flare pilot flame or auto-igniter system at all times when emissions may be vented to the flare. Denbury will either continuously monitor & record the presence of the flare pilot flame by use of a thermocouple OR maintain & operate an auto-igniter system on the flare to ensure a flame is immediately restored when emissions are being sent to the flare.

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE	
Compliance Plan	**Section OPGP-G**

Part 1. Equipment List

List all equipment and the corresponding federal and/or state regulation that is applicable. Clearly identify federal regulations from state requirements. Provide the expected or actual construction date, startup date and removal date if the equipment is no longer on site.

EMISSION UNIT (Ref No.)	FEDERAL or STATE REGULATION Ex. 40 CFR Part _____, Subpart _____ Ex. 11 Miss. Admin. Code Pt. 2, R. 1.4.B(2).	CONSTRUCTION DATE	STARTUP DATE	REMOVAL DATE
1-05-LH-BS *Line Heater* 2-05-HT-BS *Heater Treater* 3-05-LH-BS *Line Heater* 4-05-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R. 1.3.A.	2005	2005	N/A
1-05-LH-BS *Line Heater* 2-05-HT-BS *Heater Treater* 3-05-LH-BS *Line Heater* 4-05-HT-BS *Heater Treater*	11 Miss Admin Code Pt. 2, R. 1.3 B.	2005	2005	N/A
1-05-LH-BS *Line Heater* 2-05-HT-BS *Heater Treater* 3-05-LH-BS *Line Heater* 4-05-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R. 1.3. D(1)(b).	2005	2005	N/A
1-05-LH-BS *Line Heater* 2-05-HT-BS *Heater Treater* 3-05-LH-BS *Line Heater* 4-05-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R. 1.3. D(1)(a).	2005	2005	N/A

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE

Compliance Plan — Section OPGP-G

Part 1. Equipment List

List all equipment and the corresponding federal and/or state regulation that is applicable. Clearly identify federal regulations from state requirements. Provide the expected or actual construction date, startup date and removal date if the equipment is no longer on site.

EMISSION UNIT (Ref No.)	FEDERAL or STATE REGULATION Ex. 40 CFR Part _____, Subpart _____ Ex. 11 Miss. Admin. Code Pt. 2, R. 1.4.B(2).	CONSTRUCTION DATE	STARTUP DATE	REMOVAL DATE
1-05-LH-BS *Line Heater* 2-05-HT-BS *Heater Treater* 3-05-LH-BS *Line Heater* 4-05-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R.1.4.A(1).	2005	2005	N/A
19-05-F *Control Flare* 20-05-F *Control Flare*	11 Miss. Admin. Code Pt. 2, R.1.4.B(2).	2005	2005	N/A

MDEQ NOTICE OF INTENT FOR COVERAGE UNDER THE OIL PRODUCTION GENERAL PERMIT TO CONSTRUCT/OPERATE AIR EMISSIONS EQUIPMENT AT A SYNTHETIC MINOR SOURCE	
Compliance Plan	**Section OPGP-G**
Part 2. Applicable Requirements	
List all applicable state and federal requirements, including emission limits, operating restrictions, etc., and the applicable test methods or monitoring used to demonstrate compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.	

EMISSION UNIT (Ref No.)	APPLICABLE REQUIREMENT (Specific Regulatory citation)	POLLUTANT	LIMITS/ REQUIREMENTS	TEST METHOD/ COMPLIANCE MONITORING
1-05-LH-BS *Line Heater* 2-05-HT-BS *Heater Treater* 3-05-LH-BS *Line Heater* 4-05-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R. 1.3.A.	Opacity	40%	N/A
1-05-LH-BS *Line Heater* 2-05-HT-BS *Heater Treater* 3-05-LH-BS *Line Heater* 4-05-HT-BS *Heater Treater*	11 Miss Admin Code Pt. 2, R. 1.3 B.	Opacity	Equivalent Opacity	N/A
1-05-LH-BS *Line Heater* 2-05-HT-BS *Heater Treater* 3-05-LH-BS *Line Heater* 4-05-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R. 1.3. D(1)(b).	PM	$E = 0.8808*I^{-0.1667}$	N/A
1-05-LH-BS *Line Heater* 2-05-HT-BS *Heater Treater* 3-05-LH-BS *Line Heater* 4-05-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R. 1.3. D(1)(a).	PM	0.6 lb/MMBTU	N/A

Part 2. Applicable Requirements

List all applicable state and federal requirements, including emission limits, operating restrictions, etc., and the applicable test methods or monitoring used to demonstrate compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

1-05-LH-BS *Line Heater* 2-05-HT-BS *Heater Treater* 3-05-LH-BS *Line Heater* 4-05-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R.1.4.A(1).	SO_2	4.8 lbs/MMBTU	N/A
19-05-F *Control Flare* 20-05-F *Control Flare*	11 Miss. Admin. Code Pt. 2, R.1.4.B(2).	H_2S	1 grain H_2S per 100 standard cubic feet (1 gr/100 scf)	Recordkeeping of H_2S composition of gas by gas analysis; Maintenance of continuous flame for gas combustion.

Part 2. Applicable Requirements

List all applicable state and federal requirements, including emission limits, operating restrictions, etc., and the applicable test methods or monitoring used to demonstrate compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

19-05-F *Control Flare* 20-05-F *Control Flare*	11 Miss. Admin. Code Pt. 2, R.2.2.B(10).	VOC, HAPs	Flare Operating Requirements	The flare shall be operated at all times when emissions may be vented to it. The flare is anticipated to provide a significant reduction in hydrocarbon emissions. Based on manufacturer's data, a minimum of 98% reduction can be expected. It should also be noted that the facility will operate the flare such that criteria pollutant emissions will not exceed emission rates restricted in the Oil Production General Permit, nor will hazardous air pollutant (HAP) emissions exceed any HAP emission rates restricted in the Oil Production General Permit.

Part 2. Applicable Requirements

List all applicable state and federal requirements, including emission limits, operating restrictions, etc., and the applicable test methods or monitoring used to demonstrate compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

19-05-F *Control Flare* 20-05-F *Control Flare*	11 Miss. Admin. Code Pt. 2, R.2.2.B(11).	VOC, HAPs	Monitoring and recordkeeping	Denbury shall maintain a flare pilot flame or auto-igniter system at all times when emissions may be vented to the flare. Denbury will either continuously monitor & record the presence of the flare pilot flame by use of a thermocouple OR maintain & operate an auto-igniter system on the flare to ensure a flame is immediately restored when emissions are being sent to the flare. The flare shall be operated with no visible emissions as determined by EPA Method 22, except for periods not to exceed a total of five (5) minutes during any two (2) consecutive hours. Records of all visual observations/tests and corrective action shall be maintained.

Emission Calculations

POINT SOURCE I.D. NUMBER: *1-05-LH-BS*

EMISSION SOURCE DESCRIPTION: *2.5 MMBTU/Hr Line Heater-Burner Stack (BAP-401)*

DATA:

Emission Source:	*External Combustion Burner*
Hours of Operation:	*8760*
Maximum Burner Rating (MMBTU/Hr):	*2.5*
Fuel Gas Heat of Combustion (BTU/scf): *(based on a typical fuel gas analysis)*	*1037*
Sulfur Concentration of Fuel Gas (ppmv): *(conservative estimate)*	*7*
Fuel Source:	*Natural Gas*

Max. Hourly Fuel Consumption (SCFH): = burner rating/fuel gas heat of combustion/80% efficiency = ***3,013.50***

Max. Annual Fuel Consumption (MSCF/Yr): = hourly fuel consumption x hours = ***26,398.26***

EMISSION FACTORS:
Unless otherwise noted, emission factors taken from EPA Publication AP-42, "Compilation of Air Pollution Emission Factors" - Natural Gas Combustion (Small Boilers). SO_2 emission factor based on 100% conversion of sulfur compounds in fuel gas, using H_2S fuel composition noted above.

EMISSION CALCULATIONS:

POLLUTANT:	EMISSION FACTOR ($LBS/10^6$ SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
Particulate Matter (filterable + condensable)	7.6	0.0229	0.1003
Sulfur Dioxide	1.182	0.0036	0.0156
Nitrogen Oxides	100	0.3014	1.3199
Carbon Monoxide	84	0.2531	1.1087
Methane (excluded from VOC total)	2.3	0.0069	0.0304
VOC	5.5	0.0166	0.0726
TOC	11	0.0331	0.1452
2-Methylnaphthalene (TAP)	0.0000240	0.0000	0.0000
3-Methylchloranthrene (TAP)	0.0000018	0.0000	0.0000
7,12-Dimethylbenz(a)anthrancene (TAP)	0.0000160	0.0000	0.0000
Acenaphthene (TAP)	0.0000018	0.0000	0.0000
Acenaphthylene (TAP)	0.0000018	0.0000	0.0000
Anthracene (TAP)	0.0000024	0.0000	0.0000
Benz(a)anthracene (TAP)	0.0000018	0.0000	0.0000
Benzene (TAP)	0.0021000	0.0000	0.0000
Benzo(a)pyrene (TAP)	0.0000012	0.0000	0.0000
Benzo(b)fluoranthene (TAP)	0.0000018	0.0000	0.0000

Emission Calculations

POINT SOURCE I.D. NUMBER: *2-05-HT-BS*

EMISSION SOURCE DESCRIPTION: *1.5 MMBTU/Hr Heater Treater-Burner Stack (NBK-105)*

DATA:

Emission Source:	*External Combustion Burner*
Hours of Operation:	*8760*
Maximum Burner Rating (MMBTU/Hr):	*1.5*
Fuel Gas Heat of Combustion (BTU/scf): *(based on a typical fuel gas analysis)*	*1037*
Sulfur Concentration of Fuel Gas (ppmv): *(conservative estimate)*	*7*
Fuel Source:	*Natural Gas*

Max. Hourly Fuel Consumption (SCFH): = burner rating/fuel gas heat of combustion/80% efficiency = ***1,808.10***

Max. Annual Fuel Consumption (MSCF/Yr): = hourly fuel consumption x hours = ***15,838.96***

EMISSION FACTORS:

Unless otherwise noted, emission factors taken from EPA Publication AP-42, "Compilation of Air Pollution Emission Factors" - Natural Gas Combustion (Small Boilers). SO_2 emission factor based on 100% conversion of sulfur compounds in fuel gas, using H_2S fuel composition noted above.

EMISSION CALCULATIONS:

POLLUTANT:	EMISSION FACTOR ($LBS/10^6$ SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
Particulate Matter (filterable + condensable)	7.6	0.0137	0.0602
Sulfur Dioxide	1.182	0.0021	0.0094
Nitrogen Oxides	100	0.1808	0.7919
Carbon Monoxide	84	0.1519	0.6652
Methane (excluded from VOC total)	2.3	0.0042	0.0182
VOC	5.5	0.0099	0.0436
TOC	11	0.0199	0.0871
2-Methylnaphthalene (TAP)	0.0000240	0.0000	0.0000
3-Methylchloranthrene (TAP)	0.0000018	0.0000	0.0000
7,12-Dimethylbenz(a)anthrancene (TAP)	0.0000160	0.0000	0.0000
Acenaphthene (TAP)	0.0000018	0.0000	0.0000
Acenaphthylene (TAP)	0.0000018	0.0000	0.0000
Anthracene (TAP)	0.0000024	0.0000	0.0000
Benz(a)anthracene (TAP)	0.0000018	0.0000	0.0000
Benzene (TAP)	0.0021000	0.0000	0.0000
Benzo(a)pyrene (TAP)	0.0000012	0.0000	0.0000
Benzo(b)fluoranthene (TAP)	0.0000018	0.0000	0.0000

Emission Calculations

POINT SOURCE I.D. NUMBER: *3-05-LH-BS*

EMISSION SOURCE DESCRIPTION: *500 MBTU/Hr Line Heater-Burner Stack (BAP-138)*

DATA:

Emission Source:	*External Combustion Burner*
Hours of Operation:	*8760*
Maximum Burner Rating (MMBTU/Hr):	*0.500*
Fuel Gas Heat of Combustion (BTU/scf): *(based on a typical fuel gas analysis)*	*1037*
Sulfur Concentration of Fuel Gas (ppmv): *(conservative estimate)*	*7*
Fuel Source:	*Natural Gas*

Max. Hourly Fuel Consumption (SCFH):	=	burner rating/fuel gas heat of combustion/80% efficiency	=	***602.70***
Max. Annual Fuel Consumption (MSCF/Yr):	=	hourly fuel consumption x hours	=	***5,279.65***

EMISSION FACTORS:

Unless otherwise noted, emission factors taken from EPA Publication AP-42, "Compilation of Air Pollution Emission Factors" - Natural Gas Combustion (Small Boilers). SO_2 emission factor based on 100% conversion of sulfur compounds in fuel gas, using H_2S fuel composition noted above.

EMISSION CALCULATIONS:

POLLUTANT:	EMISSION FACTOR ($LBS/10^6$ SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
Particulate Matter (filterable + condensable)	7.6	0.0046	0.0201
Sulfur Dioxide	1.182	0.0007	0.0031
Nitrogen Oxides	100	0.0603	0.2640
Carbon Monoxide	84	0.0506	0.2217
Methane (excluded from VOC total)	2.3	0.0014	0.0061
VOC	5.5	0.0033	0.0145
TOC	11	0.0066	0.0290
2-Methylnaphthalene (TAP)	0.0000240	0.0000	0.0000
3-Methylchloranthrene (TAP)	0.0000018	0.0000	0.0000
7,12-Dimethylbenz(a)anthrancene (TAP)	0.0000160	0.0000	0.0000
Acenaphthene (TAP)	0.0000018	0.0000	0.0000
Acenaphthylene (TAP)	0.0000018	0.0000	0.0000
Anthracene (TAP)	0.0000024	0.0000	0.0000
Benz(a)anthracene (TAP)	0.0000018	0.0000	0.0000
Benzene (TAP)	0.0021000	0.0000	0.0000
Benzo(a)pyrene (TAP)	0.0000012	0.0000	0.0000
Benzo(b)fluoranthene (TAP)	0.0000018	0.0000	0.0000

Emission Calculations

POINT SOURCE I.D. NUMBER: *4-05-HT-BS*

EMISSION SOURCE DESCRIPTION: *500 MBTU/Hr Heater Treater-Burner Stack (NBK-109)*

DATA:

Emission Source:	*External Combustion Burner*
Hours of Operation:	*8760*
Maximum Burner Rating (MMBTU/Hr):	*0.500*
Fuel Gas Heat of Combustion (BTU/scf): *(based on a typical fuel gas analysis)*	*1037*
Sulfur Concentration of Fuel Gas (ppmv): *(conservative estimate)*	*7*
Fuel Source:	*Natural Gas*

Max. Hourly Fuel Consumption (SCFH):	=	burner rating/fuel gas heat of combustion/80% efficiency	=	***602.70***
Max. Annual Fuel Consumption (MSCF/Yr):	=	hourly fuel consumption x hours	=	***5,279.65***

EMISSION FACTORS:

Unless otherwise noted, emission factors taken from EPA Publication AP-42, "Compilation of Air Pollution Emission Factors" - Natural Gas Combustion (Small Boilers). SO_2 emission factor based on 100% conversion of sulfur compounds in fuel gas, using H_2S fuel composition noted above.

EMISSION CALCULATIONS:

POLLUTANT:	EMISSION FACTOR ($LBS/10^6$ SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
Particulate Matter (filterable + condensable)	7.6	0.0046	0.0201
Sulfur Dioxide	1.182	0.0007	0.0031
Nitrogen Oxides	100	0.0603	0.2640
Carbon Monoxide	84	0.0506	0.2217
Methane (excluded from VOC total)	2.3	0.0014	0.0061
VOC	5.5	0.0033	0.0145
TOC	11	0.0066	0.0290
2-Methylnaphthalene (TAP)	0.0000240	0.0000	0.0000
3-Methylchloranthrene (TAP)	0.0000018	0.0000	0.0000
7,12-Dimethylbenz(a)anthrancene (TAP)	0.0000160	0.0000	0.0000
Acenaphthene (TAP)	0.0000018	0.0000	0.0000
Acenaphthylene (TAP)	0.0000018	0.0000	0.0000
Anthracene (TAP)	0.0000024	0.0000	0.0000
Benz(a)anthracene (TAP)	0.0000018	0.0000	0.0000
Benzene (TAP)	0.0021000	0.0000	0.0000
Benzo(a)pyrene (TAP)	0.0000012	0.0000	0.0000
Benzo(b)fluoranthene (TAP)	0.0000018	0.0000	0.0000

Emission Calculations

POINT SOURCE I.D. NUMBER: *5-05-SBP*

EMISSION SOURCE DESCRIPTION: *Sand Blowdown Pit (ZZZ-130)*

DATA:

Emission Source:	*Flash Gas from Brine Solution**
Max. Pressure Drop of Brine Solution: (psig)	*1000*
Approx. Temperature of Brine Solution: (°F)	*80*
Flash Gas Specific Gravity: *(based on an actual wet gas analysis)*	*1.4830*
Avg. Brine Throughput: (BBL/Hr)	*50*
Max. Brine Throughput: (BBL/Hr)	*50*
Blowdown Hours:	*730*
Gas to Water Ratio: (SCF/BBL of Brine; GWR)	*10.0*
Basis of Emission Estimates:	*API Documentation & Actual Wet Gas Analysis*

**Associated with vessel blowdowns*

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Brine Rate * GWR	=	**500.00**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**56.65**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Hourly * Ratio of Max. Water Rate to Avg. Water Rate	=	**56.65**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * Blowdown Hours/2000	=	**20.68**

EMISSION ESTIMATES:

The magnitude of the solubility of natural gas in the interstitial water present in oil sands was studied by The American Petroleum Institute (API) and presented in a 1944 document entitled, "P-V-T and Solubility Relations" (refer to supporting documentation). Results of these studies have been projected to provide estimates of gas volumes present in the brine solution handled at this site within the specific pressure and temperature ranges expected. The composition of this gas is based on an actual wet gas analysis and normalized to account for the presence of H2S; refer to Southern Flow Companies, Inc. LP Compressor Suction Report in supporting documentation.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.3771	0.2136	0.2136	0.0780
Carbon Dioxide (excluded from VOC total)	92.2018	52.2329	52.2329	19.0648
Methane (excluded from VOC total)	2.0567	1.1651	1.1651	0.4253
Ethane (excluded from VOC total)	0.7662	0.4341	0.4341	0.1584
Hydrogen Sulfide (excluded from VOC total)	0.0040	0.0022	0.0022	0.0008
Propane	0.4111	0.2329	0.2329	0.0850
Iso-Butane	0.2622	0.1485	0.1485	0.0542
N-Butane	0.5851	0.3315	0.3315	0.1210
Iso-Pentane	0.4697	0.2661	0.2661	0.0971

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the gun barrel tank are routed to the atmospheric control flare (EPN: 19-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: ***6a-05-GBT-CV***

EMISSION SOURCE DESCRIPTION: ***1500 BBL Gun Barrel Tank-Common Vent (ABM-132)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: (Annual Average; BBLD - Q_{avg})	***1950***
Maximum Daily Oil Throughput: (BBLD - Q_{max})	***1950***
Average VOC Working Losses - L_W (lb/yr):	***120,635.130***
Average VOC Standing Losses - L_S (lb/yr):	***3,175.263***
Basis of Estimates:	***AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to supporting documentation for summary***

Avg. Hourly Uncontrolled THC Losses (lb/hr)	=	(Lw + Ls) * 1.134/8760	=	**16.03**
Max. Hourly Uncontrolled THC Losses (lb/hr)	=	(Ls + (Lw * (Total QMax ÷ Total Qavg))) * 1.134/8760	=	**16.03**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**70.20**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; page 258; concentrations normalized to account for the presence of H_2S, refer to supporting documentation.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (excluded from VOC total)	0.0033	0.0005	0.0005	0.0023
Methane (excluded from VOC total)	6.1995	0.9936	0.9936	4.3521
Ethane (excluded from VOC total)	5.5993	0.8974	0.8974	3.9308
Propane	17.5997	2.8208	2.8208	12.3550
Iso-Butane	1.5004	0.2405	0.2405	1.0533
N-Butane	27.0994	4.3434	4.3434	19.0239
Iso-Pentane	1.4996	0.2403	0.2403	1.0527
N-Pentane	14.5991	2.3399	2.3399	10.2487
Heptane	9.2001	1.4745	1.4745	6.4585
Octane	6.8992	1.1058	1.1058	4.8433
Other NM/NE Hydrocarbons	1.7994	0.2884	0.2884	1.2632

VASQUEZ-BEGGS CORRELATION		
INPUT	*Stock Tank Oil API Gravity (API) =*	*41*
	Flash Gas Specific Gravity (SG_i) =	*1.4772*
	Flash Gas Pressure Drop (psig) (P_i) =	*45*
	Pressure Vessel Temperature (°F) (T_i) =	*120*
	Atmospheric Pressure (P_{atm}) =	*14.7*
	Dissolved Gas Gravity @ 100-psig (SG_x) = $(SG_i)*[1.0+0.00005912*API*T_i*Log((P_i+P_{atm})/114.7)]$	*1.3553*

Constants

°API →	°API Gravity < 30	°API Gravity ≥ 30	Constants Used based on API Gravity
C1	0.0362	0.0178	0.0178
C2	1.0937	1.187	1.187
C3	25.724	23.931	23.931

GOR = $(C1) * (SG_x) * ((P_i+P_{atm})^{C2}) * e^{[(C3)(API)/(T_i+460)]}$ = **16.80** scf/bbl

refer to "Correlations for Fluid Physical Property Prediction" Journal of Petroleum Technology, Society of Petroleum Engineers, 1980

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Oil Rate * GOR	=	**2024.75**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**228.51**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Avg. Emissions * Ratio of Max. Oil Rate to Avg. Oil Rate	=	**228.51**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**1000.87**

SPECIATION FACTORS:

Speciation of the flash gas mixture taken from the referenced laboratory results and normalized to account for the presence of H2S; refer to Southern Flow Companies, Inc. Oil Flash Gas Report in supporting documentation.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	15.0319	34.3493	34.3493	150.4504
Carbon Dioxide (excluded from VOC total)	68.1780	155.7931	155.7931	682.3756
Methane (excluded from VOC total)	0.1502	0.3431	0.3431	1.5030
Ethane (excluded from VOC total)	0.6064	1.3858	1.3858	6.0698
Hydrogen Sulfide (excluded from VOC total)	0.0040	0.0091	0.0091	0.0398
Propane	1.1004	2.5144	2.5144	11.0132
Iso-Butane	0.9144	2.0896	2.0896	9.1524
N-Butane	2.2535	5.1495	5.1495	22.5551
Iso-Pentane	1.8543	4.2372	4.2372	18.5588
N-Pentane	2.3949	5.4725	5.4725	23.9697
Iso-Hexane	2.0920	4.7805	4.7805	20.9388
N-Hexane (TAP)	1.8688	4.2703	4.2703	18.7040

EMISSION SUMMARY (based on the above referenced oil flash analysis):				
POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	15.0319	0.126	3.064	0.551
Carbon Dioxide (excluded from VOC total)	68.1780	0.571	13.895	2.501
Methane (excluded from VOC total)	0.1502	0.001	0.031	0.006
Ethane (excluded from VOC total)	0.6064	0.005	0.124	0.022
Hydrogen Sulfide (excluded from VOC total)	0.0040	0.000	0.001	0.000
Propane	1.1004	0.009	0.224	0.040
Iso-Butane	0.9144	0.008	0.186	0.034
N-Butane	2.2535	0.019	0.459	0.083
Iso-Pentane	1.8543	0.016	0.378	0.068
N-Pentane	2.3949	0.020	0.488	0.088
Iso-Hexane	2.0920	0.018	0.426	0.077
N-Hexane (TAP)	1.8688	0.016	0.381	0.069
Methylcyclopentane	0.0000	0.000	0.000	0.000
Benzene (TAP)	0.2699	0.002	0.055	0.010
Cyclohexane	0.1198	0.001	0.024	0.004
Heptanes	1.9484	0.016	0.397	0.071
Methylcyclohexane	0.0000	0.000	0.000	0.000
Toluene (TAP)	0.0344	0.000	0.007	0.001
2,2,4-Trimethylpentane (TAP)	0.8585	0.007	0.175	0.031
Octanes	0.0000	0.000	0.000	0.000
Ethylbenzene (TAP)	0.0099	0.000	0.002	0.000
Xylenes (TAP)	0.0347	0.000	0.007	0.001
Nonanes	0.1826	0.002	0.037	0.007
Decanes Plus	0.0930	0.001	0.019	0.003
Other NM/NE HC	0.0000	0.000	0.000	0.000
Total Weight Percent:	100.0000			
Total TAP Emissions		0.03	0.63	0.11
Total VOC Emissions		**0.13**	**3.27**	**0.59**
Total Non VOC & Non TAP-HC		0.01	0.15	0.03
Total Emissions		0.84	20.38	3.67

Emission Calculations

This is a sample calculation for EPNs: 6b-05-OST-CV through 6d-05-OST-CV.

Emission calculations shown below are presented for informational purposes only as vapors from the dry oil tanks are routed to the atmospheric control flare (EPN: 19-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: ***"See Above"***

EMISSION SOURCE DESCRIPTION: ***1000 BBL Dry Oil Tank-Common Vent (ABJ-119A/C/D)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: (Annual Average; BBLD/Tank - Q_{avg})	***650***
Maximum Daily Oil Throughput: (BBLD/Tank - Q_{max})	***1,950***
Average VOC Working Losses - L_w (lb/yr):	***11,711.214***
Average VOC Standing Losses - Ls (lb/yr):	***2,844.460***
Basis of Estimates:	***AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to supporting documentation for summary***

Avg. Hourly Uncontrolled THC Losses (lb/hr)	=	(Lw + Ls) * 1.134/8760	=	**1.88**
Max. Hourly Uncontrolled THC Losses (lb/hr)	=	(Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**4.92**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**8.25**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; page 258 and normalized to account for the presence of H_2S; reference supporting documentation.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (excluded from VOC total)	0.0033	0.0001	0.0002	0.0003
Methane (excluded from VOC total)	6.1995	0.1168	0.3048	0.5116
Ethane (excluded from VOC total)	5.5993	0.1055	0.2753	0.4621
Propane	17.5997	0.3316	0.8653	1.4525
Iso-Butane	1.5004	0.0283	0.0738	0.1238
N-Butane	27.0994	0.5106	1.3323	2.2365
Iso-Pentane	1.4996	0.0283	0.0737	0.1238
N-Pentane	14.5991	0.2751	0.7177	1.2049
Heptane	9.2001	0.1734	0.4523	0.7593
Octane	6.8992	0.1300	0.3392	0.5694

N-Hexane (TAP)	7.9004	0.010	0.097	0.045
Benzene (TAP)	0.1005	0.000	0.001	0.001
Heptanes	9.2001	0.012	0.113	0.052
Octanes	6.8992	0.009	0.085	0.039
Other NM/NE HC	1.7994	0.022	0.010	0.000
Total Weight Percent:	100.0000			
Total TAP Emissions		0.01	0.10	0.05
Total VOC Emissions		**0.13**	**1.07**	**0.49**
Total Non VOC & Non TAP-HC		0.02	0.15	0.07
Total Emissions		0.15	1.22	0.55

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the wet oil tank are routed to the atmospheric control flare (EPN: 19-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: *6e-05-OST-CV*

EMISSION SOURCE DESCRIPTION: *1000 BBL Wet Oil Tank-Common Vent (ABJ-118)*

DATA:

Emission Source:	*Crude Oil Storage Vapors ('Working' & 'Standing')*
Average Daily Oil Throughput: (Annual Average; BBLD - Q_{avg})	*2.74*
Maximum Daily Oil Throughput: (BBLD - Q_{max})	*5.48*
Average VOC Working Losses - L_w (lb/yr):	*170.148*
Average VOC Standing Losses - Ls (lb/yr):	*2,844.460*
Basis of Estimates:	*AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to supporting documentation for summary*

Avg. Hourly Uncontrolled THC Losses (lb/hr)	=	(Lw + Ls) * 1.134/8760	=	**0.39**
Max. Hourly Uncontrolled THC Losses (lb/hr)	=	(Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**0.41**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**1.71**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; page 258 and normalized to account for the presence of H_2S; reference supporting documentation.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (excluded from VOC total)	0.0033	0.0000	0.0000	0.0001
Methane (excluded from VOC total)	6.1995	0.0242	0.0256	0.1060
Ethane (excluded from VOC total)	5.5993	0.0219	0.0231	0.0957
Propane	17.5997	0.0687	0.0726	0.3008
Iso-Butane	1.5004	0.0059	0.0062	0.0256
N-Butane	27.0994	0.1058	0.1117	0.4632
Iso-Pentane	1.4996	0.0059	0.0062	0.0256
N-Pentane	14.5991	0.0570	0.0602	0.2495
Heptane	9.2001	0.0359	0.0379	0.1573
Octane	6.8992	0.0269	0.0284	0.1179
Other NM/NE Hydrocarbons	1.7994	0.0070	0.0074	0.0308

Octanes	6.8992	0.000	0.007	0.000
Other NM/NE HC	1.7994	0.002	0.000	0.000
Total Weight Percent:	100.0000			
Total TAP Emissions		0.00	0.01	0.00
Total VOC Emissions		**0.00**	**0.09**	**0.01**
Total Non VOC & Non TAP-HC		0.00	0.01	0.00
Total Emissions		0.00	0.10	0.01

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the wet/dry oil tank are routed to the atmospheric control flare (EPN: 19-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: *6f-05-OST-CV*

EMISSION SOURCE DESCRIPTION: *1000 BBL Wet/Dry Oil Tank-Common Vent (ABJ-119B)*

DATA:

Emission Source:	*Crude Oil Storage Vapors ('Working' & 'Standing')*
Average Daily Oil Throughput: (Annual Average; BBLD - Q_{avg})	*2.74*
Maximum Daily Oil Throughput: (BBLD - Q_{max})	*5.48*
Average VOC Working Losses - L_w (lb/yr):	*170.148*
Average VOC Standing Losses - Ls (lb/yr):	*2,844.460*
Basis of Estimates:	*AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to supporting documentation for summary*

Avg. Hourly Uncontrolled THC Losses (lb/hr)	=	(Lw + Ls) * 1.134/8760	=	**0.39**
Max. Hourly Uncontrolled THC Losses (lb/hr)	=	(Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**0.41**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**1.71**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; page 258 and normalized to account for the presence of H2S; reference supporting documentation.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (excluded from VOC total)	0.0033	0.0000	0.0000	0.0001
Methane (excluded from VOC total)	6.1995	0.0242	0.0256	0.1060
Ethane (excluded from VOC total)	5.5993	0.0219	0.0231	0.0957
Propane	17.5997	0.0687	0.0726	0.3008
Iso-Butane	1.5004	0.0059	0.0062	0.0256
N-Butane	27.0994	0.1058	0.1117	0.4632
Iso-Pentane	1.4996	0.0059	0.0062	0.0256
N-Pentane	14.5991	0.0570	0.0602	0.2495
Heptane	9.2001	0.0359	0.0379	0.1573
Octane	6.8992	0.0269	0.0284	0.1179
Other NM/NE Hydrocarbons	1.7994	0.0070	0.0074	0.0308

Octanes	6.8992	0.000	0.007	0.000
Other NM/NE HC	1.7994	0.002	0.000	0.000
Total Weight Percent:	100.0000			
Total TAP Emissions		0.00	0.01	0.00
Total VOC Emissions		**0.00**	**0.09**	**0.01**
Total Non VOC & Non TAP-HC		0.00	0.01	0.00
Total Emissions		0.00	0.10	0.01

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the skimmer tank are routed to the atmospheric control flare (EPN: 19-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: *7-05-ST-V*

EMISSION SOURCE DESCRIPTION: *2000 BBL Skimmer Tank-Common Vent (ABM-120A)*

DATA:

Emission Source:	*Crude Oil/Water Storage Vapors ('Working' & 'Standing')*
Average Daily Oil Throughput: (Annual Average; BBLD - Q_{avg})	*5*
Maximum Daily Oil Throughput: (BBLD - Q_{max})	*5*
Average Daily Water Throughput: (Annual Average; BBLD - Q_{avg})	*5000*
Maximum Daily Water Throughput: (BBLD - Q_{max})	*5000*
Average VOC Working Losses - L_W (lb/yr):	*9,148.968*
Average VOC Standing Losses - L_S (lb/yr):	*165.991*
Basis of Estimates:	*AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to supporting documentation for summary*

Avg. Hourly Uncontrolled THC Losses (lb/hr)	=	(Lw + Ls) * 1.134/8760	=	**1.21**
Max. Hourly Uncontrolled THC Losses (lb/hr)	=	(Ls + (Lw * (Total QMax ÷ Total Qavg))) * 1.134/8760	=	**1.21**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**5.28**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; page 258; concentrations normalized to account for the presence of H_2S, refer to supporting documentation.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (excluded from VOC total)	0.0033	0.0000	0.0000	0.0002
Methane (excluded from VOC total)	6.1995	0.0748	0.0748	0.3274
Ethane (excluded from VOC total)	5.5993	0.0675	0.0675	0.2957
Propane	17.5997	0.2122	0.2122	0.9295
Iso-Butane	1.5004	0.0181	0.0181	0.0792
N-Butane	27.0994	0.3268	0.3268	1.4313
Iso-Pentane	1.4996	0.0181	0.0181	0.0792
N-Pentane	14.5991	0.1760	0.1760	0.7711

VASQUEZ-BEGGS CORRELATION		
INPUT	*Stock Tank Oil API Gravity (API) =*	*41*
	Flash Gas Specific Gravity (SG_i) =	*1.4772*
	Flash Gas Pressure Drop (psig) (P_i) =	*45*
	Pressure Vessel Temperature (°F) (T_i) =	*120*
	Atmospheric Pressure (P_{atm}) =	*14.7*
	Dissolved Gas Gravity @ 100-psig (SG_x) = $(SG_i)*[1.0+0.00005912*API*T_i*Log((P_i+P_{atm})/114.7)]$	*1.3553*

Constants

°API →	°API Gravity < 30	°API Gravity ≥ 30	Constants Used based on API Gravity
C1	0.0362	0.0178	0.0178
C2	1.0937	1.187	1.187
C3	25.724	23.931	23.931

GOR = $(C1) * (SG_x) * ((P_i+P_{atm})^{C2}) * e^{[(C3)(API)/(T_i+460)]}$ = **16.80** scf/bbl

refer to "Correlations for Fluid Physical Property Prediction" Journal of Petroleum Technology, Society of Petroleum Engineers, 1980

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Oil Rate * GOR	=	**5.19**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**0.59**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Avg. Emissions * Ratio of Max. Oil Rate to Avg. Oil Rate	=	**0.59**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**2.58**

SPECIATION FACTORS:

Speciation of the flash gas mixture taken from the referenced laboratory results and normalized to account for the presence of H2S; refer to Southern Flow Companies, Inc. Oil Flash Gas Report in supporting documentation.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	15.0319	0.0880	0.0880	0.3885
Carbon Dioxide (excluded from VOC total)	68.1780	0.3993	0.3993	1.7619
Methane (excluded from VOC total)	0.1502	0.0009	0.0009	0.0039
Ethane (excluded from VOC total)	0.6064	0.0036	0.0036	0.0157
Hydrogen Sulfide (excluded from VOC total)	0.0040	0.0000	0.0000	0.0001
Propane	1.1004	0.0064	0.0064	0.0284
Iso-Butane	0.9144	0.0054	0.0054	0.0236
N-Butane	2.2535	0.0132	0.0132	0.0582
Iso-Pentane	1.8543	0.0109	0.0109	0.0479
N-Pentane	2.3949	0.0140	0.0140	0.0619
Iso-Hexane	2.0920	0.0123	0.0123	0.0541
N-Hexane (TAP)	1.8688	0.0109	0.0109	0.0483

EMISSION ESTIMATES:

The magnitude of the solubility of natural gas in the interstitial water present in oil sands was studied by The American Petroleum Institute (API) and presented in a 1944 document entitled, "P-V-T and Solubility Relations" (refer to supporting documentation). Results of these studies have been projected to provide estimates of gas volumes present in the brine solution handled at this site within the specific pressure and temperature ranges expected. The composition of this gas is based on an actual wet gas analysis and normalized to account for the presence of H2S; refer to Southern Flow Companies, Inc. LP Compressor Suction Report in supporting documentation.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.3771	0.0445	0.0445	0.1949
Carbon Dioxide (excluded from VOC total)	92.2018	10.8822	10.8822	47.6536
Methane (excluded from VOC total)	2.0567	0.2427	0.2427	1.0630
Ethane (excluded from VOC total)	0.7662	0.0904	0.0904	0.3960
Hydrogen Sulfide (excluded from VOC total)	0.0040	0.0005	0.0005	0.0020
Propane	0.4111	0.0485	0.0485	0.2125
Iso-Butane	0.2622	0.0309	0.0309	0.1355
N-Butane	0.5851	0.0691	0.0691	0.3024
Iso-Pentane	0.4697	0.0554	0.0554	0.2428
N-Pentane	0.5938	0.0701	0.0701	0.3069
Iso-Hexane	0.5891	0.0695	0.0695	0.3045
N-Hexane (TAP)	0.5290	0.0624	0.0624	0.2734
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0617	0.0073	0.0073	0.0319
Cyclohexane	0.0333	0.0039	0.0039	0.0172
Heptanes	0.6360	0.0751	0.0751	0.3287
Methylcyclohexane	0.0000	0.0000	0.0000	0.0000
Toluene (TAP)	0.0107	0.0013	0.0013	0.0055
2,2,4-Trimethylpentane (TAP)	0.3160	0.0373	0.0373	0.1633
Octanes	0.0000	0.0000	0.0000	0.0000
Ethylbenzene (TAP)	0.0049	0.0006	0.0006	0.0026
Xylenes (TAP)	0.0123	0.0015	0.0015	0.0064
Nonanes	0.0626	0.0074	0.0074	0.0324
Decanes Plus	0.0165	0.0020	0.0020	0.0085
Total Weight Percent:	100.0000			
Total TAP Emissions		0.11	0.11	0.49
Total VOC Emissions		**0.54**	**0.54**	**2.37**
Total Non VOC & Non TAP-HC		0.33	0.33	1.46
Total Emissions		11.80	11.80	51.68

Toluene (TAP)	0.0108	0.000	0.000	0.000
2,2,4-Trimethylpentane (TAP)	0.3113	0.000	0.004	0.001
Octanes	0.0047	0.000	0.000	0.000
Ethylbenzene (TAP)	0.0122	0.000	0.000	0.000
Xylenes (TAP)	0.6139	0.000	0.007	0.001
Nonanes	0.0622	0.000	0.001	0.000
Decanes Plus	0.0184	0.000	0.000	0.000
Other NM/NE HC	0.1601	0.000	0.002	0.000
Total Weight Percent:	100.0000			
Total TAP Emissions		0.00	0.02	0.00
Total VOC Emissions		**0.01**	**0.14**	**0.03**
Total Non VOC & Non TAP-HC		0.00	0.04	0.01
Total Emissions		0.05	1.13	0.20

Emission Calculations

This is a sample calculation for EPNs: 8-05-WST-V & 9-05-WST-V.

POINT SOURCE I.D. NUMBER: ***"See Above"***

EMISSION SOURCE DESCRIPTION: ***1500 BBL Produced Water Tank-Common Vent (ABJ-129A/B)***

DATA:

Emission Source:	***Water Storage Vapors ('Working' & 'Standing')***
Average Daily Water Throughput: (Annual Average; BBLD/Tank - Q_{avg})	***2500***
Maximum Daily Water Throughput: (BBLD/Tank - Q_{max})	***5000***
Average VOC Working Losses - L_w (lb/yr):	***872.742***
Average VOC Standing Losses - Ls (lb/yr):	***82.946***
Basis of Estimates:	***AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to supporting documentation for summary***

Avg. Hourly Uncontrolled THC Losses (lb/hr)	=	(Lw + Ls) * 1.134/8760	=	**0.12**
Max. Hourly Uncontrolled THC Losses (lb/hr)	=	(Ls + (Ls * QMax ÷ Qavg)) * 1.134/8760	=	**0.24**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**0.54**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; page 258 and normalized to account for the presence of H2S; reference supporting documentation.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (excluded from VOC total)	0.0033	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.1995	0.0077	0.0147	0.0336
Ethane (excluded from VOC total)	5.5993	0.0069	0.0133	0.0303
Carbon Dioxide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	17.5997	0.0218	0.0417	0.0954
Iso-Butane	1.5004	0.0019	0.0036	0.0081
N-Butane	27.0994	0.0335	0.0641	0.1468
Iso-Pentane	1.4996	0.0019	0.0035	0.0081
N-Pentane	14.5991	0.0181	0.0346	0.0791
Heptane	9.2001	0.0114	0.0218	0.0499
Octane	6.8992	0.0085	0.0163	0.0374
Other NM/NE Hydrocarbons	1.7994	0.0022	0.0043	0.0098

Benzene (TAP)	0.0137	0.0036	0.0073	0.0159
Cyclohexane	0.0000	0.0000	0.0000	0.0000
Heptanes	0.0366	0.0097	0.0193	0.0424
Methylcyclohexane	0.0000	0.0000	0.0000	0.0000
Toluene (TAP)	0.0140	0.0037	0.0074	0.0162
2,2,4-Trimethylpentane (TAP)	0.0162	0.0043	0.0086	0.0188
Octanes Plus	0.0368	0.0097	0.0195	0.0427
Ethylbenzene (TAP)	0.0008	0.0002	0.0004	0.0009
Xylenes (TAP)	0.0041	0.0011	0.0021	0.0047
Total Weight Percent:	100.0000			
Total TAP Emissions		0.03	0.06	0.14
Total VOC Emissions		**0.77**	**1.54**	**3.39**
Total Non VOC & Non TAP-HC		24.75	49.42	108.40
Total Emissions		26.48	52.87	115.97

VOC Emission Total (TPY)	=	Storage Vapors + Blanket Gas	=	**3.87**

Emission Calculations

POINT SOURCE I.D. NUMBER: *10-05-SOT-V*

EMISSION SOURCE DESCRIPTION: *500 BBL Slop Oil Tank-Common Vent (ABJ-108)*

DATA:

Emission Source:	*Crude Oil Storage Vapors ('Working' & 'Standing')*
Average Daily Oil Throughput: (Annual Average; BBLD - Q_{avg})	*5.48*
Maximum Daily Oil Throughput: (BBLD - Q_{max})	*5.48*
Average VOC Working Losses - L_w (lb/yr):	*337.175*
Average VOC Standing Losses - Ls (lb/yr):	*980.630*
Basis of Estimates:	*AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to supporting documentation for summary*

Avg. Hourly Uncontrolled THC Losses (lb/hr)	=	(Lw + Ls) * 1.134/8760	=	**0.17**
Max. Hourly Uncontrolled THC Losses (lb/hr)	=	(Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**0.17**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**0.75**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; page 258 and normalized to account for the presence of H_2S; reference supporting documentation.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (excluded from VOC total)	0.0033	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.1995	0.0106	0.0106	0.0463
Ethane (excluded from VOC total)	5.5993	0.0096	0.0096	0.0418
Carbon Dioxide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	17.5997	0.0300	0.0300	0.1315
Iso-Butane	1.5004	0.0026	0.0026	0.0112
N-Butane	27.0994	0.0462	0.0462	0.2025
Iso-Pentane	1.4996	0.0026	0.0026	0.0112
N-Pentane	14.5991	0.0249	0.0249	0.1091
Heptane	9.2001	0.0157	0.0157	0.0687
Octane	6.8992	0.0118	0.0118	0.0516
Other NM/NE Hydrocarbons	1.7994	0.0031	0.0031	0.0134

Emission Calculations

This is a sample calculation for EPNs: 11-05-IOT-V & 12-05-IOT-V.

POINT SOURCE I.D. NUMBER: ***"See Above"***

EMISSION SOURCE DESCRIPTION: ***400 BBL Inhibitor Oil Blending Tank-Vent (BBJ-133A/B)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: (Annual Average; BBLD/Tank - Q_{avg})	***98.63***
Maximum Daily Oil Throughput: (BBLD/Tank - Q_{max})	***197.26***
Average VOC Working Losses - L_w (lb/yr):	***2,952.533***
Average VOC Standing Losses - Ls (lb/yr):	***930.223***
Basis of Estimates:	***AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to supporting documentation for summary***

Avg. Hourly Uncontrolled THC Losses (lb/hr)	=	(Lw + Ls) * 1.134/8760	=	**0.50**
Max. Hourly Uncontrolled THC Losses (lb/hr)	=	(Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**0.88**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**2.20**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; page 258 and normalized to account for the presence of H_2S; reference supporting documentation.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (excluded from VOC total)	0.0033	0.0000	0.0000	0.0001
Methane (excluded from VOC total)	6.1995	0.0312	0.0549	0.1365
Ethane (excluded from VOC total)	5.5993	0.0281	0.0495	0.1233
Propane	17.5997	0.0885	0.1557	0.3875
Iso-Butane	1.5004	0.0075	0.0133	0.0330
N-Butane	27.0994	0.1362	0.2398	0.5966
Iso-Pentane	1.4996	0.0075	0.0133	0.0330
N-Pentane	14.5991	0.0734	0.1292	0.3214
Heptane	9.2001	0.0462	0.0814	0.2025
Octane	6.8992	0.0347	0.0610	0.1519
Other NM/NE Hydrocarbons	1.7994	0.0090	0.0159	0.0396

Chemical Material #2:	Paraffin Inhibitor			
CHEMICAL USAGE			CHEMICAL THROUGHPUT	
Gallons/Year	Hours/Year	Specific Gravity	Hourly (lb/hr)	Annual (TPY)
3,150.00	8760	0.880	2.64	11.56

*Emission Factors**					
A_1	*A_2*	*A_5*	*A_6*	*Throughput Factor (lb)*	*City Factor*
34	*1*	*34*	*1*	*50,000*	*1.31*
A_1 (lb/yr) = 20.59		A_2 (lb/yr) = 0.61		A_5 (lb/yr) = 20.59	A_6 (lb/yr) = 0.61
				Total ΣTPY=	0.02

POLLUTANT:**	Weight Percent	CALCULATED EMISSION RATES	
		Hourly (lb/hr)	Annual (TPY)
1,2,4-Trimethylbenzene	10.00	0.0005	0.0021
1,2,3-Trimethylbenzene	5.00	0.0002	0.0011
1,3,5-Trimethylbenzene	5.00	0.0002	0.0011
Light Aromatic Naphtha	20.00	0.0010	0.0042
Xylenes (TAP)	50.00	0.0024	0.0106
Ethylbenzene (TAP)	10.00	0.0005	0.0021
Total Weight Percent:	100.00		
Total TAP Emissions		0.00	0.01
Total VOC Emissions		**0.00**	**0.02**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.00	0.02

**EPA document 745-R-99-005 entitled "Look-up Tables for Estimating Toxic Release Inventory Air Emissions from Chemical Distribution Facilities" was used for determining the emissions; refer to supporting documentation for copy.*

***HAP-Hazardous/Toxic Air Pollutant (listing taken from LAC 33:III.5112)*

NOTE: Emission factors for n-Hexane were used since the above solution is not listed in the EPA document and both are believed to have similar evaporation rates.

Chemical Material #3:	Asphaltine Inhibitor			
CHEMICAL USAGE			CHEMICAL THROUGHPUT	
Gallons/Year	Hours/Year	Specific Gravity	Hourly (lb/hr)	Annual (TPY)
1,890.00	8760	0.93	1.67	7.33

*Emission Factors**					
A_1	*A_2*	*A_5*	*A_6*	*Throughput Factor (lb)*	*City Factor*
34	*1*	*34*	*1*	*50,000*	*1.31*
A_1 (lb/yr) = 13.06		A_2 (lb/yr) = 0.38		A_5 (lb/yr) = 13.06	A_6 (lb/yr) = 0.38
				Total ΣTPY=	0.01

POLLUTANT:**	Weight Percent	CALCULATED EMISSION RATES	
		Hourly (lb/hr)	Annual (TPY)
1,2,4-Trimethylbenzene	18.00	0.0006	0.0024
1,2,3-Trimethylbenzene	3.00	0.0001	0.0004
1,3,5-Trimethylbenzene	3.00	0.0001	0.0004
Light Aromatic Naphtha	18.00	0.0006	0.0024
Polymer	37.00	0.0011	0.0050

DATA:

Emission Source:	***Blanket Gas***
Average Annual Tank Throughput (BBLs):	***36,000***
Gross Blanket Gas Required (MSCF):	***202***
Gas from Process to Tank(s) (MSCF):	***0***
Calculated Volume Requirement (MSCF):	***202***
Net Blanket Gas Supplied (MSCF):	***202***
Maximum Hourly Fill Rate (BBLs/Hr):	***8.22***
Blanket Gas Specific Gravity: *(based on a typical fuel gas analysis)*	***0.5925***
Basis of Estimates:	***Manufacturers Gas Consumption Data & Typical Fuel Gas Analysis***

Avg. Hourly Uncontrolled Emissions (lb/hr)	=	Gas Rate/ 8760 * 0.0764 * SG	=	**1.04**
Max. Hourly Uncontrolled Emissions (lb/hr)	=	Max. Fill Rate * 42/7.48 * 0.0764 * SG	=	**2.03**
Annual Potential Uncontrolled Emissions (TPY)	=	Gas Rate * 0.0764 * SG/2000	=	**4.57**

SPECIATION FACTORS:

Speciation of the blanket gas is based on a typical fuel gas analysis provided by operator; refer to report in supporting documentation.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.6661	0.0070	0.0135	0.0305
Carbon Dioxide (excluded from VOC total)	2.9413	0.0307	0.0598	0.1345
Methane (excluded from VOC total)	89.0707	0.9297	1.8111	4.0723
Ethane (excluded from VOC total)	4.4023	0.0460	0.0895	0.2013
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	1.2597	0.0131	0.0256	0.0576
Iso-Butane	0.4244	0.0044	0.0086	0.0194
N-Butane	0.4075	0.0043	0.0083	0.0186
Iso-Pentane	0.2192	0.0023	0.0045	0.0100
N-Pentane	0.1264	0.0013	0.0026	0.0058
Iso-Hexane	0.2925	0.0031	0.0059	0.0134
N-Hexane (TAP)	0.0678	0.0007	0.0014	0.0031
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0137	0.0001	0.0003	0.0006
Cyclohexane	0.0000	0.0000	0.0000	0.0000
Heptanes	0.0366	0.0004	0.0007	0.0017
Methylcyclohexane	0.0000	0.0000	0.0000	0.0000
Toluene (TAP)	0.0140	0.0001	0.0003	0.0006
2,2,4-Trimethylpentane (TAP)	0.0162	0.0002	0.0003	0.0007

Emission Calculations

POINT SOURCE I.D. NUMBER: *14-05-GST*

EMISSION SOURCE DESCRIPTION: *Glycol Storage Tank (BBJ-137)*

DATA:

Emission Source:	*"Working" & "Standing" Losses*
Maximum Throughput: (Gallons/Yr)	*21,000*
Average VOC Working Losses - L_w (lb/yr):	*21.092*
Average VOC Standing Losses - Ls (lb/yr):	*166.249*
Basis of Estimates:	*AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to supporting documentation for summary*

Avg. Hourly Uncontrolled THC Losses (lb/hr)	=	(Lw + Ls)/8760	=	**0.02**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**0.09**

For purposes of permitting and/or providing conservative emission estimates, emissions were calculated using Toluene as the stored material for this tank. A tank size of 10,000 gallons and an annual throughput of approximately 21,000 gallons were used in the emissions model in an effort to demonstrate a conservative potential emissions estimate.

Emission Calculations

POINT SOURCE I.D. NUMBER: *16a-05-WST-CV*

EMISSION SOURCE DESCRIPTION: *400 BBL API Water Holding Tank-Vent (ABM-165A)*

DATA:

Emission Source:	*Crude Oil Storage Vapors ('Working' & 'Standing')*
Average Daily Oil Throughput: (Average; BBLD - Q_{avg})	*0*
Maximum Daily Oil Throughput: (BBLD - Q_{max})	*0*
Average VOC Working Losses - L_w (lb/yr):	*0.00*
Average VOC Standing Losses - Ls (lb/yr):	*930.22*
Basis of Estimates:	*AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to supporting documentation for summary*

Avg. Hourly Uncontrolled THC Losses (lb/hr)	=	(Lw + Ls) * 1.134/8760	=	**0.12**
Max. Hourly Uncontrolled THC Losses (lb/hr)	=	(Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**0.12**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**0.53**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; page 258 and normalized to account for the presence of H_2S; reference supporting documentation.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (excluded from VOC total)	0.0033	0.0000	0.0000	0.0000
Methane (excluded from VOC total)	6.1995	0.0075	0.0075	0.0327
Ethane (excluded from VOC total)	5.5993	0.0067	0.0067	0.0295
Carbon Dioxide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	17.5997	0.0212	0.0212	0.0928
Iso-Butane	1.5004	0.0018	0.0018	0.0079
N-Butane	27.0994	0.0326	0.0326	0.1429
Iso-Pentane	1.4996	0.0018	0.0018	0.0079
N-Pentane	14.5991	0.0176	0.0176	0.0770
Heptane	9.2001	0.0111	0.0111	0.0485
Octane	6.8992	0.0083	0.0083	0.0364
Other NM/NE Hydrocarbons	1.7994	0.0022	0.0022	0.0095

Emission Calculations

POINT SOURCE I.D. NUMBER: *17-05-SEP*

EMISSION SOURCE DESCRIPTION: *API Separator (ABH-128)*

DATA:

Emission Source:	*Crude Oil Storage Vapors ('Working' & 'Standing')*
Average Daily Oil Throughput: (Annual Average; BBLD - Q_{avg})	*44.52*
Maximum Daily Oil Throughput: (BBLD - Q_{max})	*44.52*
Average VOC Working Losses - L_w (lb/yr):	*1,819.74*
Average VOC Standing Losses - Ls (lb/yr):	*1,255.08*
Basis of Estimates:	*AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to supporting documentation for summary*

Avg. Hourly Uncontrolled THC Losses (lb/hr)	=	(Lw + Ls) * 1.134/8760	=	**0.40**
Max. Hourly Uncontrolled THC Losses (lb/hr)	=	(Ls + (Lw * QMax ÷ Qavg)) * 1.134/8760	=	**0.40**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**1.74**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; page 258 and normalized to account for the presence of H_2S; reference supporting documentation.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (excluded from VOC total)	0.0033	0.0000	0.0000	0.0001
Methane (excluded from VOC total)	6.1995	0.0247	0.0247	0.1081
Ethane (excluded from VOC total)	5.5993	0.0223	0.0223	0.0976
Propane	17.5997	0.0701	0.0701	0.3068
Iso-Butane	1.5004	0.0060	0.0060	0.0262
N-Butane	27.0994	0.1079	0.1079	0.4725
Iso-Pentane	1.4996	0.0060	0.0060	0.0261
N-Pentane	14.5991	0.0581	0.0581	0.2545
Heptane	9.2001	0.0366	0.0366	0.1604
Octane	6.8992	0.0275	0.0275	0.1203
Other NM/NE Hydrocarbons	1.7994	0.0072	0.0072	0.0314

Emission Calculations

POINT SOURCE I.D. NUMBERS: *18-05-FE*

EMISSION SOURCE DESCRIPTION: *Fugitive Emissions*

DATA:

Emission Source:	*Fugitive from Light Liquid & Gas-Service Components*
Basis of Emission Estimates:	*U.S. EPA*

EMISSION CALCULATIONS:

	Count - by Service			THC Emission Factors [c] (kg/hr/source)		Calculated THC Emissions			
						Hourly Emissions (lb/hr)		Annual Emissions (TPY)	
	Lt. Liquid	Gas	Total	Lt. Liquid Service	Gas Service	LL	Gas	LL	Gas
Connectors	88	1,270	1358	2.1E-04	2.0E-04	0.041	0.560	0.18	2.45
Flanges	92	0	92	1.1E-04	3.9E-04	0.022	0.000	0.10	0.00
Open Ends	0	40	40	1.4E-03	2.0E-03	0.000	0.176	0.00	0.77
Pumps[a]	15		15	1.3E-02	2.4E-03	0.430	N/A	1.88	N/A
Valves	50	456	506	2.5E-03	4.5E-03	0.276	4.524	1.21	19.81
"Others"[b]	0	0	0	7.5E-03	8.8E-03	0.000	0.000	0.00	0.00
TOTALS:	**245**	**1,766**	**2,011**			**0.77**	**5.26**	**3.37**	**23.04**

[a] Process Pumps Only

[b] "Others" equipment derived from compressors, diaphragms, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, relief valves, and vents

[c] Refer to EPA Publication No. 453/R-95-017, "Protocol for Equipment Leak Emission Estimates", copy included in supporting documentation.

LIGHT LIQUID-SERVICE SPECIATION FACTORS:

Speciation of the emission stream from components in light liquid service was taken from EPA Publication No.: 453/R-95-017; "Protocol for Equipment Leak Emission Estimates" and normalized to account for the presence of H_2S.

EMISSIONS SUMMARY:

Component	Weight Percent	Calculated Emission Rate	
		Avg. Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (TAP; excluded from VOC total)	0.0075	0.0001	0.0003
NMEHC (expressed as VOC)	29.1968	0.2244	0.9828
Benzene (TAP)	0.0345	0.0003	0.0012
Ethylbenzene (TAP)	0.0000	0.0000	0.0000

Emission Calculations

POINT SOURCE I.D. NUMBER: *19-05-F*

EMISSION SOURCE DESCRIPTION: *Atmospheric Control Flare (ZZZ-180)*

DATA:

Emission Source:	***Unburned Hydrocarbons and Products of Combustion***
Atmospheric Gas Streams:	
Gas Stream #1:	***Storage Tank Vapors***
Gas Heat of Combustion (BTU/Ft^3-actual flare gas analysis):	***56***
Pilot Gas Feed:	***Yes***
Gas Heat of Combustion (BTU/Ft^3-typical fuel gas analysis):	***1037***
Purge Gas Feed:	***Yes***
Gas Heat of Combustion (BTU/Ft^3-typical fuel gas analysis):	***1037***
Combustion Efficiency:	***98% for all HC***

Gas Stream #1 - Storage Tank Vapors

Gas volume estimates are supported by the calculations associated with EPNs: 6a-05-GBT-CV through 7-05-ST-V and are outlined below:

INPUT				
Maximum Gas Flowrate (scf/hr)	*Operating Time (hrs)*	*Burn Efficiency (%)*	*Gas Heat of Combustion (BTU/FT^3)*	*Specific Gravity of Gas*
2,309.22	*8760*	*98*	*56*	*1.0425*

CALCULATIONS						
Gas Combusted (annual hourly average)	=	*gas rate (scf/hr)*	*x*	*efficiency*	*x*	*usage (hrs)*
	=	*2,309*	*x*	*0.98*	*x*	*8,760*
	=	***19,824,192 scf***		=	***2,263 SCF/hr***	
Heat Content (annual hourly average)	=	gas rate (scf/yr)	x	gas heat of combustion (BTU/scf)		
	=	*19,824,192*	*x*	*56*		
	=	***0.1267 MMBTU/Hr***				
Uncontrolled Max. Hourly Emissions (lbs/hr)	=	*gas specific gravity*	*x*	*density of air (lb/SCF)*	*x*	*Maximum Gas Rate (SCF/Hr)*
	=	*1.0425*	*x*	*0.0764*	*x*	*2,309*
	=	***183.92 lbs/hr***				
Uncontrolled Annual Emissions (TPY)	=	*gas specific gravity*	*x*	*density of air (tons/SCF)*	*x*	*Total Gas Rate (SCF/Yr)*
	=	*1.0425*	*x*	*0.0000382*	*x*	*20,228,767*
	=	***805.58 TPY***				

Pilot Gas (maximum gas flowrate based on conservative estimate):

INPUT				
Maximum Gas Flowrate (scf/hr)	*Operating Time (hrs)*	*Burn Efficiency (%)*	*Gas Heat of Combustion (BTU/FT^3)*	*Specific Gravity of Gas*
150	*8760*	*98*	*1037*	*0.5925*

CALCULATIONS						
Gas Combusted (annual hourly average)	=	*gas rate (scf/hr)*	*x*	*efficiency*	*x*	*usage (hrs)*
	=	*150*	*x*	*0.98*	*x*	*8,760*
	=	***1,287,720 scf***		=	***147 SCF/hr***	
Heat Content (annual hourly average)	=	*gas rate (scf/yr)*	x	gas heat of combustion (BTU/scf)		
	=	*1,287,720*	*x*	*1037*		
	=	***0.1524 MMBTU/Hr***				
Uncontrolled Max. Hourly Emissions (lbs/hr)	=	*gas specific gravity*	*x*	*density of air (lb/SCF)*	*x*	*Maximum Gas Rate (SCF/Hr)*
	=	*0.5925*	*x*	*0.0764*	*x*	*150*
	=	***6.79 lbs/hr***				
Uncontrolled Annual Emissions (TPY)	=	*gas specific gravity*	*x*	*density of air (tons/SCF)*	*x*	*Total Gas Rate (SCF/Yr)*
	=	*0.5925*	*x*	*0.0000382*	*x*	*1,314,000*
	=	***29.74 TPY***				

SPECIATION FACTORS:

Speciation of the pilot gas is based on a typical fuel gas analysis provided by operator; refer to report in supporting documentation.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.6661	0.0452	0.0452	0.1981
Carbon Dioxide (excluded from VOC total)	2.9413	0.1997	0.1997	0.8748
Methane (excluded from VOC total)	89.0707	0.1210	0.1210	0.5298
Ethane (excluded from VOC total)	4.4023	0.0060	0.0060	0.0262
Hydrogen Sulfide (TAP; excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	1.2597	0.0017	0.0017	0.0075
Iso-Butane	0.4244	0.0006	0.0006	0.0025
N-Butane	0.4075	0.0006	0.0006	0.0024
Iso-Pentane	0.2192	0.0003	0.0003	0.0013
N-Pentane	0.1264	0.0002	0.0002	0.0008
Iso-Hexanes	0.2925	0.0004	0.0004	0.0017
N-Hexane (TAP)	0.0678	0.0001	0.0001	0.0004
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0137	0.0000	0.0000	0.0001
Cyclohexane	0.0000	0.0000	0.0000	0.0000

SPECIATION FACTORS:

Speciation of the purge gas is based on a typical fuel gas analysis provided by operator; refer to report in supporting documentation.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.6661	0.1206	0.1206	0.5282
Carbon Dioxide (excluded from VOC total)	2.9413	0.5326	0.5326	2.3327
Methane (excluded from VOC total)	89.0707	0.3226	0.3226	1.4128
Ethane (excluded from VOC total)	4.4023	0.0159	0.0159	0.0698
Hydrogen Sulfide (TAP; excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	1.2597	0.0046	0.0046	0.0200
Iso-Butane	0.4244	0.0015	0.0015	0.0067
N-Butane	0.4075	0.0015	0.0015	0.0065
Iso-Pentane	0.2192	0.0008	0.0008	0.0035
N-Pentane	0.1264	0.0005	0.0005	0.0020
Iso-Hexanes	0.2925	0.0011	0.0011	0.0046
N-Hexane (TAP)	0.0678	0.0002	0.0002	0.0011
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0137	0.0000	0.0000	0.0002
Cyclohexane	0.0000	0.0000	0.0000	0.0000
Heptanes	0.0366	0.0001	0.0001	0.0006
Methylcyclohexane	0.0000	0.0000	0.0000	0.0000
Toluene (TAP)	0.0140	0.0001	0.0001	0.0002
2,2,4-Trimethylpentane (TAP)	0.0162	0.0001	0.0001	0.0003
Octanes Plus	0.0368	0.0001	0.0001	0.0006
Ethylbenzene (TAP)	0.0008	0.0000	0.0000	0.0000
Xylenes (TAP)	0.0041	0.0000	0.0000	0.0001
TOTAL WEIGHT PERCENT:	100.0000			
TOTAL TAP EMISSIONS:		0.00	0.00	0.00
TOTAL VOC EMISSIONS:		**0.01**	**0.01**	**0.05**
TOTAL Non-VOC & Non-TAP HC:		0.34	0.34	1.48
TOTAL EMISSIONS:		1.00	1.00	4.39

Total of Average Hourly VOC emissions estimated for this source:	**0.12 Lbs/Hr**
Total of Maximum Hourly VOC emissions estimated for this source:	**0.12 Lbs/Hr**
Total of Maximum Annual VOC emissions estimated for this source:	**0.53 TPY**

Emission Calculations

POINT SOURCE I.D. NUMBER: *20-05-F*

EMISSION SOURCE DESCRIPTION: *LP Control Flare (ZZZ-181)*

DATA:

Emission Source:	***Unburned Hydrocarbons and Products of Combustion***
Low Pressure Gas Streams:	
Gas Stream #1:	***Heater Treater-Flash Gas***
Gas Heat of Combustion (BTU/Ft^3-actual flare gas analysis):	*124*
Pilot Gas Feed:	***Yes***
Gas Heat of Combustion (BTU/Ft^3-typical fuel gas analysis):	*1037*
Purge Gas Feed:	***Yes***
Gas Heat of Combustion (BTU/Ft^3-typical fuel gas analysis):	*1037*
Combustion Efficiency:	***98% for all HC***

Gas Stream #1 - Heater Treater-Flash Gas

Gas volume estimates are supported by the calculations associated with EPN: 25-05-HT-WG and are outlined below:

INPUT						
Maximum Gas Flowrate (scf/hr)	*Operating Time (hrs)*	*Burn Efficiency (%)*	*Gas Heat of Combustion (BTU/FT^3)*		*Specific Gravity of Gas*	
10,751	*8760*	*98*	*124*		*1.4558*	
CALCULATIONS						
Gas Combusted (annual hourly average)	=	*gas rate (scf/hr)*	*x*	*efficiency*	*x*	*usage (hrs)*
	=	*10,751*	*x*	*0.98*	*x*	*8,760*
	=	***92,295,185***	***scf***	=	***10,536***	***SCF/hr***
Heat Content (annual hourly average)	=	*gas rate (scf/yr)*	x	gas heat of combustion (BTU/scf)		
	=	*92,295,185*	*x*	*124*		
	=				***1.3065***	***MMBTU/Hr***
Uncontrolled Max. Hourly Emissions (lbs/hr)	=	*gas specific gravity*	*x*	*density of air (lb/SCF)*	*x*	*Maximum Gas Rate (SCF/Hr)*
	=	*1.4558*	*x*	*0.0764*	*x*	*10,751*
	=	***1,195.76***	***lbs/hr***			
Uncontrolled Annual Emissions (TPY)	=	*gas specific gravity*	*x*	*density of air (tons/SCF)*	*x*	*Total Gas Rate (SCF/Yr)*
	=	*1.4558*	*x*	*0.0000382*	*x*	*94,178,760*
	=	***5,237.43***	***TPY***			

Pilot Gas (maximum gas flowrate based on conservative estimate):

INPUT						
Maximum Gas Flowrate (scf/hr)	*Operating Time (hrs)*	*Burn Efficiency (%)*	*Gas Heat of Combustion (BTU/FT^3)*		*Specific Gravity of Gas*	
150	*8760*	*98*	*1037*		*0.5925*	
CALCULATIONS						
Gas Combusted (annual hourly average)	=	*gas rate (scf/hr)*	*x*	*efficiency*	*x*	*usage (hrs)*
	=	*150*	*x*	*0.98*	*x*	*8,760*
	=	***1,287,720***	***scf***	=	***147 SCF/hr***	
Heat Content (annual hourly average)	=	*gas rate (scf/yr)*	x	gas heat of combustion (BTU/scf)		
	=	*1,287,720*	*x*	*1037*		
	=	***0.1524 MMBTU/Hr***				
Uncontrolled Max. Hourly Emissions (lbs/hr)	=	*gas specific gravity*	*x*	*density of air (lb/SCF)*	*x*	*Maximum Gas Rate (SCF/Hr)*
	=	*0.5925*	*x*	*0.0764*	*x*	*150*
	=	***6.79 lbs/hr***				
Uncontrolled Annual Emissions (TPY)	=	*gas specific gravity*	*x*	*density of air (tons/SCF)*	*x*	*Total Gas Rate (SCF/Yr)*
	=	*0.5925*	*x*	*0.0000382*	*x*	*1,314,000*
	=	***29.74 TPY***				

SPECIATION FACTORS:

Speciation of the pilot gas is based on a typical fuel gas analysis provided by operator; refer to report in supporting documentation.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.6661	0.0452	0.0452	0.1981
Carbon Dioxide (excluded from VOC total)	2.9413	0.1997	0.1997	0.8748
Methane (excluded from VOC total)	89.0707	0.1210	0.1210	0.5298
Ethane (excluded from VOC total)	4.4023	0.0060	0.0060	0.0262
Hydrogen Sulfide (TAP; excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	1.2597	0.0017	0.0017	0.0075
Iso-Butane	0.4244	0.0006	0.0006	0.0025
N-Butane	0.4075	0.0006	0.0006	0.0024
Iso-Pentane	0.2192	0.0003	0.0003	0.0013
N-Pentane	0.1264	0.0002	0.0002	0.0008
Iso-Hexanes	0.2925	0.0004	0.0004	0.0017
N-Hexane (TAP)	0.0678	0.0001	0.0001	0.0004
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0137	0.0000	0.0000	0.0001
Cyclohexane	0.0000	0.0000	0.0000	0.0000

SPECIATION FACTORS:

Speciation of the purge gas is based on a typical fuel gas analysis provided by operator; refer to report in supporting documentation.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.6661	0.3015	0.3015	1.3206
Carbon Dioxide (excluded from VOC total)	2.9413	1.3314	1.3314	5.8317
Methane (excluded from VOC total)	89.0707	0.8064	0.8064	3.5320
Ethane (excluded from VOC total)	4.4023	0.0399	0.0399	0.1746
Hydrogen Sulfide (TAP; excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	1.2597	0.0114	0.0114	0.0500
Iso-Butane	0.4244	0.0038	0.0038	0.0168
N-Butane	0.4075	0.0037	0.0037	0.0162
Iso-Pentane	0.2192	0.0020	0.0020	0.0087
N-Pentane	0.1264	0.0011	0.0011	0.0050
Iso-Hexanes	0.2925	0.0026	0.0026	0.0116
N-Hexane (TAP)	0.0678	0.0006	0.0006	0.0027
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0137	0.0001	0.0001	0.0005
Cyclohexane	0.0000	0.0000	0.0000	0.0000
Heptanes	0.0366	0.0003	0.0003	0.0015
Methylcyclohexane	0.0000	0.0000	0.0000	0.0000
Toluene (TAP)	0.0140	0.0001	0.0001	0.0006
2,2,4-Trimethylpentane (TAP)	0.0162	0.0001	0.0001	0.0006
Octanes Plus	0.0368	0.0003	0.0003	0.0015
Ethylbenzene (TAP)	0.0008	0.0000	0.0000	0.0000
Xylenes (TAP)	0.0041	0.0000	0.0000	0.0002
TOTAL WEIGHT PERCENT:	100.0000			
TOTAL TAP EMISSIONS:		0.00	0.00	0.00
TOTAL VOC EMISSIONS:		**0.03**	**0.03**	**0.12**
TOTAL Non-VOC & Non-TAP HC:		0.85	0.85	3.71
TOTAL EMISSIONS:		2.51	2.51	10.97

Total of Average Hourly VOC emissions estimated for this source:	**1.00 Lbs/Hr**
Total of Maximum Hourly VOC emissions estimated for this source:	**1.00 Lbs/Hr**
Total of Maximum Annual VOC emissions estimated for this source:	**4.37 TPY**

Emission Calculations

POINT SOURCE I.D. NUMBER: *21-05-CB*

EMISSION SOURCE DESCRIPTION: *High Pressure Compressor Blowdown Vent #1*

DATA:

Emission Source:	*High Pressure Compressor Blowdown Vent*
Gas Specific Gravity:	*1.4830*
Maximum Volume per Blowdown (MSCF): *(conservative estimate provided by operator)*	*23.2*
Maximum Number of Blowdowns:	*12*
Basis of Emission Estimates:	*Conservative Estimate Provided by Operator & Actual Wet Gas Analysis*

Blowdown Gas Volume (SCF/Yr)	=	Volume per Blowdown * # of Blowdowns	=	**278400.00**
Avg. Hourly Uncontrolled Emissions (lb/hr)	=	Gas Gravity * Density of Air * Volume per Blowdown	=	**2628.59**
Max. Hourly Uncontrolled Emissions (lb/hr)	=	Avg. Emissions	=	**2628.59**
Annual Potential Uncontrolled Emissions (TPY)	=	Hourly * # of Blowdowns / 2000	=	**15.77**

SPECIATION FACTORS:

Speciation of the blowdown gas mixture is based on an actual wet gas analysis and normalized to account for the presence of H_2S; refer to Southern Flow Companies, Inc. LP Compressor Suction Report in supporting documentation.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.3771	9.9127	9.9127	0.0595
Carbon Dioxide (excluded from VOC total)	92.2018	2423.6043	2423.6043	14.5416
Methane (excluded from VOC total)	2.0567	54.0629	54.0629	0.3244
Ethane (excluded from VOC total)	0.7662	20.1415	20.1415	0.1208
Hydrogen Sulfide (excluded from VOC total)	0.0040	0.1041	0.1041	0.0006
Propane	0.4111	10.8069	10.8069	0.0648
Iso-Butane	0.2622	6.8912	6.8912	0.0413
N-Butane	0.5851	15.3809	15.3809	0.0923
Iso-Pentane	0.4697	12.3464	12.3464	0.0741
N-Pentane	0.5938	15.6094	15.6094	0.0937
Iso-Hexane	0.5891	15.4841	15.4841	0.0929
N-Hexane (TAP)	0.5290	13.9041	13.9041	0.0834
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0617	1.6231	1.6231	0.0097
Cyclohexane	0.0333	0.8744	0.8744	0.0052
Heptanes	0.6360	16.7184	16.7184	0.1003
Methylcyclohexane	0.0000	0.0000	0.0000	0.0000

Emission Calculations

POINT SOURCE I.D. NUMBER: *22-05-CB*

EMISSION SOURCE DESCRIPTION: *High Pressure Compressor Blowdown Vent #2*

DATA:

Emission Source:	*High Pressure Compressor Blowdown Vent*
Gas Specific Gravity:	*1.4830*
Maximum Volume per Blowdown (MSCF): *(conservative estimate provided by operator)*	*23.2*
Maximum Number of Blowdowns:	*12*
Basis of Emission Estimates:	*Conservative Estimate Provided by Operator & Actual Wet Gas Analysis*

Blowdown Gas Volume (SCF/Yr)	=	Volume per Blowdown * # of Blowdowns	=	**278400.00**
Avg. Hourly Uncontrolled Emissions (lb/hr)	=	Gas Gravity * Density of Air * Volume per Blowdown	=	**2628.59**
Max. Hourly Uncontrolled Emissions (lb/hr)	=	Avg. Emissions	=	**2628.59**
Annual Potential Uncontrolled Emissions (TPY)	=	Hourly * # of Blowdowns / 2000	=	**15.77**

SPECIATION FACTORS:

Speciation of the blowdown gas mixture is based on an actual wet gas analysis and normalized to account for the presence of H_2S; refer to Southern Flow Companies, Inc. LP Compressor Suction Report in supporting documentation.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.3771	9.9127	9.9127	0.0595
Carbon Dioxide (excluded from VOC total)	92.2018	2423.6043	2423.6043	14.5416
Methane (excluded from VOC total)	2.0567	54.0629	54.0629	0.3244
Ethane (excluded from VOC total)	0.7662	20.1415	20.1415	0.1208
Hydrogen Sulfide (excluded from VOC total)	0.0040	0.1041	0.1041	0.0006
Propane	0.4111	10.8069	10.8069	0.0648
Iso-Butane	0.2622	6.8912	6.8912	0.0413
N-Butane	0.5851	15.3809	15.3809	0.0923
Iso-Pentane	0.4697	12.3464	12.3464	0.0741
N-Pentane	0.5938	15.6094	15.6094	0.0937
Iso-Hexane	0.5891	15.4841	15.4841	0.0929
N-Hexane (TAP)	0.5290	13.9041	13.9041	0.0834
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0617	1.6231	1.6231	0.0097
Cyclohexane	0.0333	0.8744	0.8744	0.0052
Heptanes	0.6360	16.7184	16.7184	0.1003

Emission Calculations

POINT SOURCE I.D. NUMBER: *23-05-CB*

EMISSION SOURCE DESCRIPTION: *Low Pressure Compressor Blowdown Vent #1*

DATA:

Emission Source:	*Low Pressure Compressor Blowdown Vent*
Gas Specific Gravity:	*1.4830*
Maximum Volume per Blowdown (MSCF): *(conservative estimate provided by operator)*	*23.2*
Maximum Number of Blowdowns:	*12*
Basis of Emission Estimates:	*Conservative Estimate Provided by Operator & Actual Wet Gas Analysis*

Blowdown Gas Volume (SCF/Yr)	=	Volume per Blowdown * # of Blowdowns	=	**278400.00**
Avg. Hourly Uncontrolled Emissions (lb/hr)	=	Gas Gravity * Density of Air * Volume per Blowdown	=	**2628.59**
Max. Hourly Uncontrolled Emissions (lb/hr)	=	Avg. Emissions	=	**2628.59**
Annual Potential Uncontrolled Emissions (TPY)	=	Hourly * # of Blowdowns / 2000	=	**15.77**

SPECIATION FACTORS:

Speciation of the blowdown gas mixture is based on an actual wet gas analysis and normalized to account for the presence of H_2S; refer to Southern Flow Companies, Inc. LP Compressor Suction Report in supporting documentation.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.3771	9.9127	9.9127	0.0595
Carbon Dioxide (excluded from VOC total)	92.2018	2423.6043	2423.6043	14.5416
Methane (excluded from VOC total)	2.0567	54.0629	54.0629	0.3244
Ethane (excluded from VOC total)	0.7662	20.1415	20.1415	0.1208
Hydrogen Sulfide (excluded from VOC total)	0.0040	0.1041	0.1041	0.0006
Propane	0.4111	10.8069	10.8069	0.0648
Iso-Butane	0.2622	6.8912	6.8912	0.0413
N-Butane	0.5851	15.3809	15.3809	0.0923
Iso-Pentane	0.4697	12.3464	12.3464	0.0741
N-Pentane	0.5938	15.6094	15.6094	0.0937
Iso-Hexane	0.5891	15.4841	15.4841	0.0929
N-Hexane (TAP)	0.5290	13.9041	13.9041	0.0834
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0617	1.6231	1.6231	0.0097
Cyclohexane	0.0333	0.8744	0.8744	0.0052
Heptanes	0.6360	16.7184	16.7184	0.1003

Emission Calculations

POINT SOURCE I.D. NUMBER: *24-05-CB*

EMISSION SOURCE DESCRIPTION: *Low Pressure Compressor Blowdown Vent #2*

DATA:

Emission Source:	*Low Pressure Compressor Blowdown Vent*
Gas Specific Gravity:	*1.4830*
Maximum Volume per Blowdown (MSCF): *(conservative estimate provided by operator)*	*23.2*
Maximum Number of Blowdowns:	*12*
Basis of Emission Estimates:	*Conservative Estimate Provided by Operator & Actual Wet Gas Analysis*

Blowdown Gas Volume (SCF/Yr)	=	Volume per Blowdown * # of Blowdowns	=	**278400.00**
Avg. Hourly Uncontrolled Emissions (lb/hr)	=	Gas Gravity * Density of Air * Volume per Blowdown	=	**2628.59**
Max. Hourly Uncontrolled Emissions (lb/hr)	=	Avg. Emissions	=	**2628.59**
Annual Potential Uncontrolled Emissions (TPY)	=	Hourly * # of Blowdowns / 2000	=	**15.77**

SPECIATION FACTORS:

Speciation of the blowdown gas mixture is based on an actual wet gas analysis and normalized to account for the presence of H_2S; refer to Southern Flow Companies, Inc. LP Compressor Suction Report in supporting documentation.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.3771	9.9127	9.9127	0.0595
Carbon Dioxide (excluded from VOC total)	92.2018	2423.6043	2423.6043	14.5416
Methane (excluded from VOC total)	2.0567	54.0629	54.0629	0.3244
Ethane (excluded from VOC total)	0.7662	20.1415	20.1415	0.1208
Hydrogen Sulfide (excluded from VOC total)	0.0040	0.1041	0.1041	0.0006
Propane	0.4111	10.8069	10.8069	0.0648
Iso-Butane	0.2622	6.8912	6.8912	0.0413
N-Butane	0.5851	15.3809	15.3809	0.0923
Iso-Pentane	0.4697	12.3464	12.3464	0.0741
N-Pentane	0.5938	15.6094	15.6094	0.0937
Iso-Hexane	0.5891	15.4841	15.4841	0.0929
N-Hexane (TAP)	0.5290	13.9041	13.9041	0.0834
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0617	1.6231	1.6231	0.0097
Cyclohexane	0.0333	0.8744	0.8744	0.0052
Heptanes	0.6360	16.7184	16.7184	0.1003

Emission Calculations

Emission calculations shown below are presented for informational purposes only as off-gas from the heater treater is routed to the LP control flare (EPN: 20-05-F) for combustion.

POINT SOURCE I.D. NUMBER: ***25-05-HT-WG***

EMISSION SOURCE DESCRIPTION: ***Heater Treater-Flash Gas***

DATA:

Emission Source:	***Heater Treater Flash Gas***
Flash Gas Specific Gravity:	***1.6195***
Maximum Oil Throughput: (BBLD)	***1,950***
Basis of Emission Estimates:	***Comparable Analysis/Vasquez-Beggs Correlation***

Estimates for gas volumes and composition associated with this stage of the process were derived from a laboratory test of an oil sample collected at another site under similar conditions (pressure & temperature); refer to PENCOR Report No.: 30705-5005048371 in supporting documentation. This representative analysis is expected to yield a comparable VOC total but individual component values may vary from site to site. The following table shows the field conditions compared to the results from the laboratory test:

API Oil Gravity @ 60°F	Process Conditions		Gas/Oil Ratio
	Pressure (PSIG)	Temperature (°F)	(SCF/BBL)
Actual Facility Conditions:			
41	200	90	
	45	120	Unknown
Laboratory Conditions:			
39.2	189	82	
	25	125	137
		Prorated GOR Estimate:	**132.32**

Since an oil flash analysis has not been performed on an actual sample collected from this particular producing zone, the "Gas to Oil" (GOR) ratio estimated above will be compared with a value derived from the Vasquez-Beggs Correlation presented in the following table. For purposes of permitting, the higher of the two GOR values will be used within these emission estimates.

Methylcyclopentane	0.597	7.9372	7.9372	34.7648
Benzene (TAP)	0.239	3.1857	3.1857	13.9533
Cyclohexane	0.349	4.6479	4.6479	20.3578
Heptanes	1.214	16.1476	16.1476	70.7267
Methylcyclohexane	0.581	7.7300	7.7300	33.8574
Toluene (TAP)	0.190	2.5313	2.5313	11.0869
2,2,4-Trimethylpentane (TAP)	0.143	1.9086	1.9086	8.3595
Octanes	0.615	8.1842	8.1842	35.8467
Ethylbenzene (TAP)	0.018	0.2405	0.2405	1.0536
Xylenes (TAP)	0.072	0.9622	0.9622	4.2143
Nonanes	0.257	3.4143	3.4143	14.9545
Decanes Plus	0.167	2.2162	2.2162	9.7072
Total Weight Percent:	100.000			
Total TAP Emissions		22.84	22.84	100.03
Total VOC Emissions		**350.70**	**350.70**	**1536.09**
Total Non VOC & Non TAP-HC		27.40	27.40	120.01
Total Emissions		1330.22	1330.22	5826.36

Uncontrolled VOC Emission Total (TPY)	Heater Treater Flash Gas	=	**1536.09**

Emission Calculations

POINT SOURCE I.D. NUMBER: *26-10-ST*

EMISSION SOURCE DESCRIPTION: *Inhibitor Transfer Tank*

DATA:

Emission Source:	*"Working" & "Standing" Losses*
Maximum Throughput: (Gallons/Yr)	*21,000*
Average VOC Working Losses - L_w (lb/yr):	*21.092*
Average VOC Standing Losses - Ls (lb/yr):	*166.249*
Basis of Estimates:	*AP-42, Chapter 7 (June 2020, Section 7.1.3.1); Refer to supporting documentation for summary*

Avg. Hourly Uncontrolled THC Losses (lb/hr)	=	(Lw + Ls)/8760	=	**0.02**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**0.09**

For purposes of permitting and/or providing conservative emission estimates, emissions were calculated using Toluene as the stored material for this tank. A tank size of 10,000 gallons and an annual throughput of approximately 21,000 gallons were used in the emissions model in an effort to demonstrate a conservative potential emissions estimate.

Emission Calculations

POINT SOURCE I.D. NUMBER: *27-21-LL*

EMISSION SOURCE DESCRIPTION: *Loading Losses-Oil Transfer to Tank Truck*

DATA:

Emission Source:	*Vapors from Oil Truck Loading*
Monthly Loading Volume-Barrels (Q):	*182,500*
Average Oil Temperature - °F:	*80*
Average Oil Temperature - °R (T):	*540*
API Oil Gravity@ 100 °F (APIG):	*44.0*
Vapor Molecular Weight - lb/lb/mole (M):	*50*
Saturation Factor (S):	*0.6*
Reid Vapor Pressure = -1.699 + (0.179 x APIG): (from Eq. 3-5 of API Pub. No.: 4683; refer to supporting documentation)	*6.18*
True Vapor Pressure (P): (from Fig. 7.1-13b of AP-42; refer to supporting documentation)	*5.54*
Loading Rate-Barrels/Hr (R): (conservative estimate)	*180*
Basis of Loading Loss Estimates:	*AP-42; June 2008 edition; refer to supporting documentation*

Annual Uncontrolled Total Emissions (TPY)	=	12.46 * S * P * M/T*Q*42/2000/1000 gallons loaded	=	**14.59**
Hourly Uncontrolled Total Emissions (lb/hr)	=	12.46 * S * P * M/T*R*42/1000 gallons loaded	=	**28.78**
Max. Hourly Uncontrolled Total Emissions (lb/hr)	=	12.46 * S * P * M/T*R*42/1000 gallons loaded	=	**28.78**

SPECIATION FACTORS:

Speciation factors were taken from "Air Emissions Species Manual - Volume I: Volatile Organic Compound Species Profiles", 2nd edition; Report No.: EPA-450/2-90-001a; page 258; concentrations normalized to account for the presence of H_2S, reference supporting documentation.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Hydrogen Sulfide (excluded from VOC total)	0.0033	0.0010	0.0010	0.0005
Methane (excluded from VOC total)	6.1994	1.7842	1.7842	0.9045
Ethane (excluded from VOC total)	5.5993	1.6115	1.6115	0.8169
Propane	17.5995	5.0651	5.0651	2.5678
Iso-Butane	1.5004	0.4318	0.4318	0.2189
N-Butane	27.0992	7.7992	7.7992	3.9538
Iso-Pentane	1.4996	0.4316	0.4316	0.2188
N-Pentane	14.5990	4.2016	4.2016	2.1300
Heptane	9.2000	2.6478	2.6478	1.3423
Octane	6.8999	1.9858	1.9858	1.0067

MCComb-Summit City Gate Gas Sample1
Gulf South Pipeline Company, LP
Houston, Texas
CERTIFICATE OF ANALYSIS
for 03/05

04/08/05 07:31:19
PAGE 1

Station ID: 002489
Station Name: MCCOMB-SUMMIT #1 CITY GATE
Analysis Source:

Effective Date: 03/01/05
Analyzed Date: 03/24/05
Sample Date On: 02/07/05
Sample Date Off: 03/08/05
Sample Type: C

Lab ID: 00052472
Analysis ID: 184246

Component	Mol %	GPM
H2S	0.0000	
CO2	1.1440	
N2	0.4070	
Methane	95.0360	
Ethane	2.5060	0.670
Propane	0.4890	0.135
I-butane	0.1250	0.041
N-butane	0.1200	0.038
I-pentane	0.0520	0.019
N-pentane	0.0300	0.011
Hexanes+(C6+)	0.0910	0.041
TOTAL	100.0000	0.955
Pentane+		0.071

Sample Pressure(psig): 525.0
Line Pressure(psig): 280.0

Line Temp (deg F): 48.0

Ideal Gravity: 0.5912
Sample Gravity: 0.5925

Compress. Factor: 1.0020

LBs of H2O: 2.0

Grains H2S/100 CF: 0.00
PPM H2S: 0.0

Dry BTU @ 14.730: 1037.3000
Wet BTU @ 14.730: 1019.3000
AWC BTU @ 14.730: 1037.3000

Dry BTU @ 14.730 w/o H2S: 1037.3000
Wet BTU @ 14.730 w/o H2S: 1019.3000
AWC BTU @ 14.730 w/o H2S: 1037.3000

Calculation Parameters: Pressure Base: 14.730 Temperature Base: 60 F

Grains/PPM H2S equal to 0.00 does not indicate testing for H2S
Remark: 0
□□&l1X□&l60F□&l6D□(8U□(s10h3T□(10U

Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NO_x) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION[a]

Combustor Type (MMBtu/hr Heat Input) [SCC]	NO_x[b]		CO	
	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
Large Wall-Fired Boilers (>100) [1-01-006-01, 1-02-006-01, 1-03-006-01]				
Uncontrolled (Pre-NSPS)[c]	280	A	84	B
Uncontrolled (Post-NSPS)[c]	190	A	84	B
Controlled - Low NO_x burners	140	A	84	B
Controlled - Flue gas recirculation	100	D	84	B
Small Boilers (<100) [1-01-006-02, 1-02-006-02, 1-03-006-02, 1-03-006-03]				
Uncontrolled	100	B	84	B
Controlled - Low NO_x burners	50	D	84	B
Controlled - Low NO_x burners/Flue gas recirculation	32	C	84	B
Tangential-Fired Boilers (All Sizes) [1-01-006-04]				
Uncontrolled	170	A	24	C
Controlled - Flue gas recirculation	76	D	98	D
Residential Furnaces (<0.3) [No SCC]				
Uncontrolled	94	B	40	B

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. Emission factors are based on an average natural gas higher heating value of 1,020 Btu/scf. To convert from $lb/10^6$ scf to lb/MMBtu, divide by 1,020. The emission factors in this table may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to this average heating value. SCC = Source Classification Code. ND = no data. NA = not applicable.

[b] Expressed as NO_2. For large and small wall fired boilers with SNCR control, apply a 24 percent reduction to the appropriate NO_x emission factor. For tangential-fired boilers with SNCR control, apply a 13 percent reduction to the appropriate NO_x emission factor.

[c] NSPS=New Source Performance Standard as defined in 40 CFR 60 Subparts D and Db. Post-NSPS units are boilers with greater than 250 MMBtu/hr of heat input that commenced construction modification, or reconstruction after August 17, 1971, and units with heat input capacities between 100 and 250 MMBtu/hr that commenced construction modification, or reconstruction after June 19, 1984.

TABLE 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION[a]

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
91-57-6	2-Methylnaphthalene[b, c]	2.4E-05	D
56-49-5	3-Methylchloranthrene[b, c]	<1.8E-06	E
	7,12-Dimethylbenz(a)anthracene[b,c]	<1.6E-05	E
83-32-9	Acenaphthene[b,c]	<1.8E-06	E
203-96-8	Acenaphthylene[b,c]	<1.8E-06	E
120-12-7	Anthracene[b,c]	<2.4E-06	E
56-55-3	Benz(a)anthracene[b,c]	<1.8E-06	E
71-43-2	Benzene[b]	2.1E-03	B
50-32-8	Benzo(a)pyrene[b,c]	<1.2E-06	E
205-99-2	Benzo(b)fluoranthene[b,c]	<1.8E-06	E
191-24-2	Benzo(g,h,i)perylene[b,c]	<1.2E-06	E
207-08-9	Benzo(k)fluoranthene[b,c]	<1.8E-06	E
106-97-8	Butane	2.1E+00	E
218-01-9	Chrysene[b,c]	<1.8E-06	E
53-70-3	Dibenzo(a,h)anthracene[b,c]	<1.2E-06	E
25321-22-6	Dichlorobenzene[b]	1.2E-03	E
74-84-0	Ethane	3.1E+00	E
206-44-0	Fluoranthene[b,c]	3.0E-06	E
86-73-7	Fluorene[b,c]	2.8E-06	E
50-00-0	Formaldehyde[b]	7.5E-02	B
110-54-3	Hexane[b]	1.8E+00	E
193-39-5	Indeno(1,2,3-cd)pyrene[b,c]	<1.8E-06	E
91-20-3	Naphthalene[b]	6.1E-04	E
109-66-0	Pentane	2.6E+00	E
85-01-8	Phenanathrene[b,c]	1.7E-05	D
74-98-6	Propane	1.6E+00	E

TABLE 1.4-4. EMISSION FACTORS FOR METALS FROM NATURAL GAS COMBUSTION[a]

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
7440-38-2	Arsenic[b]	2.0E-04	E
7440-39-3	Barium	4.4E-03	D
7440-41-7	Beryllium[b]	<1.2E-05	E
7440-43-9	Cadmium[b]	1.1E-03	D
7440-47-3	Chromium[b]	1.4E-03	D
7440-48-4	Cobalt[b]	8.4E-05	D
7440-50-8	Copper	8.5E-04	C
7439-96-5	Manganese[b]	3.8E-04	D
7439-97-6	Mercury[b]	2.6E-04	D
7439-98-7	Molybdenum	1.1E-03	D
7440-02-0	Nickel[b]	2.1E-03	C
7782-49-2	Selenium[b]	<2.4E-05	E
7440-62-2	Vanadium	2.3E-03	D
7440-66-6	Zinc	2.9E-02	E

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. Data are for all natural gas combustion sources. Emission factors preceeded by a less-than symbol are based on method detection limits. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. To convert from $lb/10^6$ scf to 1b/MMBtu, divide by 1,020.

[b] Hazardous Air Pollutant as defined by Section 112(b) of the Clean Air Act.

SFC SOUTHERN FLOW COMPANIES, INC.

P.O. BOX 51475 LAFAYETTE, LA 70505 (337)233-2066

CUST:	3291-01	Denbury Res.	FOR:	Denbury Res.
FIELD:	1112	Martinville CO2 Facility		P.O. Box 1003
STA:	503	LP Compressor Suction		Heidelburg, MS 39439

SAMPLE DATE:	5/13/2010	PRESS:	198 PSI
SAMPLED BY:	R. Green	TEMP:	111 °F.
SAMPLE OF:	Gas	CYLINDER:	60
MEMO:			

COMPONENT	MOL %	WEIGHT %	GPM (14.696 PSIA)
N2	0.579	0.377	0.063
CO2	90.108	92.214	15.323
METHANE	5.514	2.057	0.932
ETHANE	1.096	0.766	0.293
PROPANE	0.401	0.411	0.110
I-BUTANE	0.194	0.262	0.063
N-BUTANE	0.433	0.585	0.136
I-PENTANE	0.280	0.470	0.102
N-PENTANE	0.354	0.595	0.128
I-HEXANES	0.294	0.589	0.121
N-HEXANE	0.264	0.528	0.108
I-HEPTANES	0.160	0.365	0.069
2,2,4-TMC5	0.006	0.013	0.002
N-HEPTANE	0.113	0.264	0.052
BENZENE	0.034	0.062	0.009
CYCLOHEXANE	0.017	0.034	0.006
TOLUENE	0.005	0.011	0.002
I-OCTANES	0.113	0.299	0.056
N-OCTANE	0.000	0.000	0.000
E-BENZENE	0.002	0.004	0.001
m,o,&p-XYLENE	0.005	0.013	0.002
I-NONANES	0.012	0.035	0.006
N-NONANE	0.009	0.027	0.005
I-DECANES	0.001	0.004	0.001
N-DECANE	0.001	0.005	0.001
I-UNDECANES +	0.003	0.010	0.002
TOTALS	100.000	100.000	17.593

CALCULATED VALUES

	TOTAL	C6+	C7+
MOLECULAR WEIGHT	43.005	92.838	101.668
SPECIFIC GRAVITY(AIR = 1)	1.485	3.436	3.748
REAL DRY BTU @ 15.025, 60°F.	190.2	5604.8	6039.7
REAL DRY BTU @ 14.730, 60°F.	186.5	5494.8	5921.1
REAL DRY BTU @ 14.650, 60°F.	185.5	5464.3	5888.3
REAL WET BTU @ 15.025, 60°F.	187	5509.2	5936.7
REAL WET BTU @ 14.730, 60°F.	183.3	5401.0	5820.1
REAL WET BTU @ 14.650, 60°F.	182.3	5371.1	5787.8
GPM'S @ 15.025 PSIA	17.988	0.453	0.219
GPM'S @ 14.730 PSIA	17.635	0.444	0.214
COMPRESSIBILITY FACTOR	0.99429		

DRILLING AND PRODUCTION PRACTICE

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Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**6a-05-GBT-CV**
Tank Description	**1500 BBL Gun Barrel Tank-Common Vent (ABM-132)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**21.60**
Vertical Height/Horizontal Length (H_S ft)	**24.10**
Roof Height (H_R ft)	**0.68**
Max Liquid Height (H_{LX} ft)	**23.10**
Avg Liquid Height (H_L ft)	**11.55**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.58**
Roof Paint Solar Absorptance (R_A)	**0.58**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.2250**

Tank Shell Color/Shade	**Gray - Light**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Gray - Light**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**711,750.00**
Annual Turnovers, N	**472.05**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**8,464.66**
vapor space outage (H_{VO} ft)	**12.775**
vapor space volume (V_V ft^3)	**4,681.21**

Major City for Meterological Data	**Jackson, MS**
Site Elevation (ft)	**300**
Atmospheric Pressure (P_A psia)	**14.537**
Table 7.1-2 Liquid	**crude oil**
*RVP**	**6.18**
*API gravity**	**40.7**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**40.7**
API gravity at 100F	**44.0**

Working Loss Product Factor (K_P)	**0.75**
working loss turnover factor K_N	**1.000**

*sales oil data determines RVP per API pub 4683

Tank contents (if not selected from Table 7.1-2):

Antoine constants (log_{10}, mmHg, °C)

component	*mole%*	*MW*	*lb/mole*	*wt%*	*A*	*B*	*C*
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
	0.000		0.000	0.000			

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VOC Profile Speciation Report

Profile Name : Fixed Roof Tank - Crude Oil Production
Profile Number : 0296
Data Quality : C

Control Device : Uncontrolled
Reference(s) : 59, 72
Data Source : Engineering evaluation of test data and literature data

SCC Assignments: 40301010, 40301011, 40301012, 40301109

Saroad	CAS Number	Name	Spec_MW	Spec_WT	Peak
43115		C-7 CYCLOPARAFFINS	98.19	1.30	
43116		C-8 CYCLOPARAFFINS	112.23	0.50	
43122		ISOMERS OF PENTANE	72.15	1.50	
43201	74-82-8	METHANE	16.04	6.20	
43202	74-84-0	ETHANE	30.07	5.60	
43204	74-98-6	PROPANE	44.09	17.60	
43212	106-97-8	N-BUTANE	58.12	27.10	
43214	75-28-5	ISO-BUTANE	58.12	1.50	
43220	109-66-0	N-PENTANE	72.15	14.60	
43231	110-54-3	HEXANE	86.17	7.90	
43232	142-82-5	HEPTANE	100.20	9.20	
43233	111-65-9	OCTANE	114.23	6.90	
45201	71-43-2	BENZENE	78.11	0.10	
TOTAL				100.00	

Multi-Stage Separator Test

B.P. 189

Separator Conditions Pressure (psig)	Temperature (°F)	Liquid Density (g/cm^3)	Gas Density (g/cm^3)	Gas Gravity	Solution GOR, Rs (scf/stb)	Solution GOR, Rs (scf/sep bbl)	Liberated GOR, RI (scf/stb)	Separator Shrinkage (stb / bbl @ P,T)
205	**82**	**0.816**		**N/A**	**150**		0	**0.928**
25	125	0.818	0.0057	1.635	13	13	137	0.987
0	75	0.823	0.0025	1.979	0	0	13	1.000

Summary Data

Total Separator Gas-Oil Ratio	150	scf/stb
Stock Tank Oil Gravity	40.4	°API at 75 °F
Separator Volume Factor	1.077	bbls@ Psat/stb

Notes:

- stb: stock tank barrel @ 75 °F.
- sep bbl: volume of separator liquid at P,T.
- Solution GOR is given as the gas volume per stock tank barrel (stb) and per separator barrel (sep bbl).
- Separator Volume Factor is the inverse of the Separator Shrinkage Factor.
- Standard Conditions: 0 psig at 75 °F.

Normalized Component Calculation

Normalized Oil Flash Gas Analysis; Southern Flow Companies, Inc. Oil Flash Gas Report

COMPONENT	mole %	mole % w/extra component	COMPONENT MW	fuel weight	Normalized WT %	component BTU/scf	partial Heating values
Water	0.0000	0.0000	18	0.00	**0.0000**	0	0
Nitrogen	22.9880	22.9869	28.0134	6.44	**15.0319**	0	0
Methane	0.4010	0.4010	16.043	0.06	**0.1502**	1010	4
Carbon Dioxide	66.3660	66.3627	44.01	29.21	**68.1780**	0	0
Ethane	0.8640	0.8640	30.07	0.26	**0.6064**	1770	15
Hydrogen Sulfide	0.0000	0.0000	34.08	0.00	**0.0000**	637	0
Propane	1.0690	1.0689	44.097	0.47	**1.1004**	2516	27
I-Butane	0.6740	0.6740	58.123	0.39	**0.9144**	3252	22
N-Butane	1.6610	1.6609	58.123	0.97	**2.2535**	3262	54
I-Pentane	1.1010	1.1009	72.15	0.79	**1.8543**	4001	44
N-Pentane	1.4220	1.4219	72.15	1.03	**2.3949**	4009	57
Other hexanes	1.0400	1.0399	86.177	0.90	**2.0920**	4750	49
N-hexane	0.9290	0.9290	86.177	0.80	**1.8688**	4756	44
Methylcyclopentane	0.0000	0.0000	84.1608	0.00	**0.0000**	4501	0
benzene	0.1480	0.1480	78.114	0.12	**0.2699**	3742	6
cyclohexane	0.0610	0.0610	84.1608	0.05	**0.1198**	4482	3
heptane	0.8330	0.8330	100.204	0.83	**1.9484**	5503	46
Methylcyclohexane	0.0000	0.0000	98.18	0.00	**0.0000**	5216	0
toluene	0.0160	0.0160	92.141	0.01	**0.0344**	4475	1
iso-octane	0.3220	0.3220	114.22	0.37	**0.8585**	6232	20
octanes	0.0000	0.0000	114.22	0.00	**0.0000**	7000	0
ethylbenzene	0.0040	0.0040	106.167	0.00	**0.0099**	5222	0
xylene	0.0140	0.0140	106.167	0.01	**0.0347**	5208	1
nonanes	0.0610	0.0610	128.25	0.08	**0.1826**	6997	4
Decanes Plus	0.0280	0.0280	142.28	0.04	**0.0930**	7743	2
Other NM/NE HC	0.0000	0.0000	102.09	0.00	**0.0000**	5200	0
Max H2S	0.0050	0.0050	34.08	0.00	**0.0040**	637	0
TOTALS	**100.00**	**100.00**	**MW=**	**42.84**	**100.0000**	**total btu/scf**	**399.26**

sg	**1.4772**
VOC wt%	**16.0295**
Toxic wt%	**3.076**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	56.50	60.80	68.10	75.70	83.00	89.00	91.10	91.20	86.50	77.10	66.30	58.10	75.30
hourly average minimum ambient temperature (T_{AN} °F)	37.00	39.30	45.90	53.30	62.50	69.20	72.10	71.40	65.50	53.90	43.90	37.90	54.30
daily total solar insolation factor (I btu/ft^2 day)	783	1039	1369	1762	1929	2025	1969	1849	1576	1262	922	726	1434
daily average ambient temperature (T_{AA} °F)	46.75	50.05	57.00	64.50	72.75	79.10	81.60	81.30	76.00	65.50	55.10	48.00	64.80
liquid bulk temperature (T_B °F)	48.11	51.86	59.38	67.57	76.11	82.62	85.03	84.52	78.74	67.70	56.70	49.26	67.30
average vapor temperature (T_V °F)	50.99	55.68	64.42	74.05	83.20	90.07	92.27	91.32	84.54	72.34	60.09	51.93	72.57
daily ambient temperature range (ΔT_A °R)	19.50	21.50	22.20	22.40	20.50	19.80	19.00	19.80	21.00	23.20	22.40	20.20	21.00
daily vapor temperature range (ΔT_V °R)	22.97	27.10	31.42	36.12	36.73	37.35	36.14	35.31	32.98	30.88	26.61	22.94	31.33
daily average liquid surface temperature (T_{LA} °F)	49.55	53.77	61.90	70.81	79.65	86.35	88.65	87.92	81.64	70.02	58.40	50.60	69.93
daily maximum liquid surface temperature (T_{LX} °F)	55.30	60.54	69.75	79.84	88.83	95.68	97.68	96.74	89.89	77.74	65.05	56.33	77.77
daily minimum liquid surface temperature (T_{LN} °F)	43.81	46.99	54.04	61.78	70.47	77.01	79.61	79.09	73.39	62.30	51.75	44.86	62.10
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.152	3.419	3.986	4.689	5.481	6.147	6.390	6.312	5.672	4.623	3.733	3.217	4.616
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	3.520	3.886	4.601	5.498	6.410	7.180	7.418	7.306	6.524	5.301	4.224	3.591	5.303
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	2.815	2.998	3.437	3.976	4.661	5.234	5.477	5.427	4.910	4.015	3.289	2.875	4.000
daily vapor pressure range (ΔP_V)	0.7053	0.8882	1.1634	1.5215	1.7493	1.9466	1.9413	1.8784	1.6133	1.2856	0.9353	0.7159	1.3030
vapor space expansion factor (K_E)	0.1071	0.1327	0.1705	0.2226	0.2613	0.3004	0.3042	0.2928	0.2429	0.1880	0.1379	0.1082	0.1905
vapor molecular weight (M_V lb/lbmole)	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
monthly hours with avg = total annual	744	672	744	720	744	720	744	744	720	744	720	744	8,760
throughputs (ft^3/month) and avg = total annual	113,122	102,175	113,122	109,473	113,122	109,473	113,122	113,122	109,473	113,122	109,473	113,122	1,331,922
monthly turnovers (N/month) with avg = total annual	20.63	18.64	20.63	19.97	20.63	19.97	20.63	20.63	19.97	20.63	19.97	20.63	242.96
vented vapor saturation factor (K_S)	0.4056	0.3861	0.3505	0.3144	0.2818	0.2592	0.2518	0.2541	0.2749	0.3175	0.3655	0.4007	0.3178
vent setting correction factor (K_B)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
vapor density (W_V lb/ft^3)	0.0288	0.0309	0.0354	0.0409	0.0470	0.0521	0.0539	0.0534	0.0486	0.0405	0.0335	0.0293	0.0404
standing storage losses (L_S lb/month & avg is lb/yr)	171.95	166.95	211.85	236.83	281.24	301.44	322.51	319.13	280.99	242.06	193.64	175.16	2903.74
working losses (L_W lb/month & avg is lb/yr)	707.97	687.36	872.24	975.09	1157.92	1241.07	1327.83	1313.91	1156.87	996.60	797.27	721.17	11955.30
total losses (L_T lb/month & avg is lb/yr)	879.92	854.31	1084.09	1211.92	1439.16	1542.51	1650.33	1633.03	1437.86	1238.65	990.91	896.33	14859.04
max hourly Q in bbl/hour	152.05	152.05	152.05	152.05	152.05	152.05	152.05	152.05	152.05	152.05	152.05	152.05	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	3.280	3.525	4.041	4.668	5.364	5.941	6.151	6.087	5.538	4.617	3.816	3.341	
breathing/standing loss (L_S lb/hr)	0.231	0.248	0.285	0.380	0.460	0.538	0.548	0.527	0.430	0.325	0.269	0.235	
max hourly total loss (L_T lb/hr)	3.511	3.774	4.325	5.048	5.824	6.479	6.699	6.614	5.968	4.942	4.085	3.576	

L_S sum months	L_W sum months	L_T sum months
2903.74	11955.30	14859.04

The monthly sums will be greater than the annual average since the monthly variables yield higher emissions

Emissions Summary:

	avg lbs/hr	max lbs/hr	lbs/yr
Standing/Breathing Loss L_S	**0.325**	**0.548**	**2,844.460**
Working Loss L_W	**1.337**	**6.151**	**11,711.214**
Total Loss L_T	**1.662**	**6.699**	**14,555.674**

max hourly total loss may not add up to L_S + L_W as their max values may be in different months

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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	56.50	60.80	68.10	75.70	83.00	89.00	91.10	91.20	86.50	77.10	66.30	58.10	75.30
hourly average minimum ambient temperature (T_{AN} °F)	37.00	39.30	45.90	53.30	62.50	69.20	72.10	71.40	65.50	53.90	43.90	37.90	54.30
daily total solar insolation factor (I btu/ft^2 day)	783	1039	1369	1762	1929	2025	1969	1849	1576	1262	922	726	1434
daily average ambient temperature (T_{AA} °F)	46.75	50.05	57.00	64.50	72.75	79.10	81.60	81.30	76.00	65.50	55.10	48.00	64.80
liquid bulk temperature (T_B °F)	48.11	51.86	59.38	67.57	76.11	82.62	85.03	84.52	78.74	67.70	56.70	49.26	67.30
average vapor temperature (T_V °F)	50.99	55.68	64.42	74.05	83.20	90.07	92.27	91.32	84.54	72.34	60.09	51.93	72.57
daily ambient temperature range (ΔT_A °R)	19.50	21.50	22.20	22.40	20.50	19.80	19.00	19.80	21.00	23.20	22.40	20.20	21.00
daily vapor temperature range (ΔT_V °R)	22.97	27.10	31.42	36.12	36.73	37.35	36.14	35.31	32.98	30.88	26.61	22.94	31.33
daily average liquid surface temperature (T_{LA} °F)	49.55	53.77	61.90	70.81	79.65	86.35	88.65	87.92	81.64	70.02	58.40	50.60	69.93
daily maximum liquid surface temperature (T_{LX} °F)	55.30	60.54	69.75	79.84	88.83	95.68	97.68	96.74	89.89	77.74	65.05	56.33	77.77
daily minimum liquid surface temperature (T_{LN} °F)	43.81	46.99	54.04	61.78	70.47	77.01	79.61	79.09	73.39	62.30	51.75	44.86	62.10
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.152	3.419	3.986	4.689	5.481	6.147	6.390	6.312	5.672	4.623	3.733	3.217	4.616
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	3.520	3.886	4.601	5.498	6.410	7.180	7.418	7.306	6.524	5.301	4.224	3.591	5.303
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	2.815	2.998	3.437	3.976	4.661	5.234	5.477	5.427	4.910	4.015	3.289	2.875	4.000
daily vapor pressure range (ΔP_V)	0.7053	0.8882	1.1634	1.5215	1.7493	1.9466	1.9413	1.8784	1.6133	1.2856	0.9353	0.7159	1.3030
vapor space expansion factor (K_E)	0.1071	0.1327	0.1705	0.2226	0.2613	0.3004	0.3042	0.2928	0.2429	0.1880	0.1379	0.1082	0.1905
vapor molecular weight (M_V lb/lbmole)	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
monthly hours with avg = total annual	744	672	744	720	744	720	744	744	720	744	720	744	8,760
throughputs (ft^3/month) and avg = total annual	477	431	477	461	477	461	477	477	461	477	461	477	5,615
monthly turnovers (N/month) with avg = total annual	0.09	0.08	0.09	0.08	0.09	0.08	0.09	0.09	0.08	0.09	0.08	0.09	1.02
vented vapor saturation factor (K_S)	0.4056	0.3861	0.3505	0.3144	0.2818	0.2592	0.2518	0.2541	0.2749	0.3175	0.3655	0.4007	0.3178
vent setting correction factor (K_B)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
vapor density (W_V lb/ft^3)	0.0288	0.0309	0.0354	0.0409	0.0470	0.0521	0.0539	0.0534	0.0486	0.0405	0.0335	0.0293	0.0404
standing storage losses (L_S lb/month & avg is lb/yr)	171.95	166.95	211.85	236.83	281.24	301.44	322.51	319.13	280.99	242.06	193.64	175.16	2903.74
working losses (L_W lb/month & avg is lb/yr)	10.29	9.99	12.67	14.17	16.82	18.03	19.29	19.09	16.81	14.48	11.58	10.48	173.69
total losses (L_T lb/month & avg is lb/yr)	182.24	176.94	224.53	251.00	298.06	319.47	341.80	338.22	297.79	256.54	205.23	185.64	3077.44
max hourly Q in bbl/hour	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.014	0.015	0.017	0.020	0.023	0.025	0.026	0.026	0.023	0.019	0.016	0.014	
breathing/standing loss (L_S lb/hr)	0.231	0.248	0.285	0.380	0.460	0.538	0.548	0.527	0.430	0.325	0.269	0.235	
max hourly total loss (L_T lb/hr)	0.245	0.263	0.302	0.400	0.482	0.563	0.574	0.553	0.454	0.345	0.285	0.250	

L_S sum months	L_W sum months	L_T sum months
2903.74	173.69	3077.44

The monthly sums will be greater than the annual average since the monthly variables yield higher emissions

Emissions Summary:	**avg lbs/hr**	**max lbs/hr**	**lbs/yr**
Standing/Breathing Loss L_S	**0.325**	**0.548**	**2,844.460**
Working Loss L_W	**0.019**	**0.026**	**170.148**
Total Loss L_T	**0.344**	**0.574**	**3,014.608**

max hourly total loss may not add up to L_S + L_W as their max values may be in different months

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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	56.50	60.80	68.10	75.70	83.00	89.00	91.10	91.20	86.50	77.10	66.30	58.10	75.30
hourly average minimum ambient temperature (T_{AN} °F)	37.00	39.30	45.90	53.30	62.50	69.20	72.10	71.40	65.50	53.90	43.90	37.90	54.30
daily total solar insolation factor (I btu/ft^2 day)	783	1039	1369	1762	1929	2025	1969	1849	1576	1262	922	726	1434
daily average ambient temperature (T_{AA} °F)	46.75	50.05	57.00	64.50	72.75	79.10	81.60	81.30	76.00	65.50	55.10	48.00	64.80
liquid bulk temperature (T_B °F)	48.11	51.86	59.38	67.57	76.11	82.62	85.03	84.52	78.74	67.70	56.70	49.26	67.30
average vapor temperature (T_V °F)	50.99	55.68	64.42	74.05	83.20	90.07	92.27	91.32	84.54	72.34	60.09	51.93	72.57
daily ambient temperature range (ΔT_A °R)	19.50	21.50	22.20	22.40	20.50	19.80	19.00	19.80	21.00	23.20	22.40	20.20	21.00
daily vapor temperature range (ΔT_V °R)	22.97	27.10	31.42	36.12	36.73	37.35	36.14	35.31	32.98	30.88	26.61	22.94	31.33
daily average liquid surface temperature (T_{LA} °F)	49.55	53.77	61.90	70.81	79.65	86.35	88.65	87.92	81.64	70.02	58.40	50.60	69.93
daily maximum liquid surface temperature (T_{LX} °F)	55.30	60.54	69.75	79.84	88.83	95.68	97.68	96.74	89.89	77.74	65.05	56.33	77.77
daily minimum liquid surface temperature (T_{LN} °F)	43.81	46.99	54.04	61.78	70.47	77.01	79.61	79.09	73.39	62.30	51.75	44.86	62.10
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.152	3.419	3.986	4.689	5.481	6.147	6.390	6.312	5.672	4.623	3.733	3.217	4.616
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	3.520	3.886	4.601	5.498	6.410	7.180	7.418	7.306	6.524	5.301	4.224	3.591	5.303
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	2.815	2.998	3.437	3.976	4.661	5.234	5.477	5.427	4.910	4.015	3.289	2.875	4.000
daily vapor pressure range (ΔP_V)	0.7053	0.8882	1.1634	1.5215	1.7493	1.9466	1.9413	1.8784	1.6133	1.2856	0.9353	0.7159	1.3030
vapor space expansion factor (K_E)	0.1071	0.1327	0.1705	0.2226	0.2613	0.3004	0.3042	0.2928	0.2429	0.1880	0.1379	0.1082	0.1905
vapor molecular weight (M_V lb/lbmole)	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
monthly hours with avg = total annual	744	672	744	720	744	720	744	744	720	744	720	744	8,760
throughputs (ft^3/month) and avg = total annual	477	431	477	461	477	461	477	477	461	477	461	477	5,615
monthly turnovers (N/month) with avg = total annual	0.09	0.08	0.09	0.08	0.09	0.08	0.09	0.09	0.08	0.09	0.08	0.09	1.02
vented vapor saturation factor (K_S)	0.4056	0.3861	0.3505	0.3144	0.2818	0.2592	0.2518	0.2541	0.2749	0.3175	0.3655	0.4007	0.3178
vent setting correction factor (K_B)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
vapor density (W_V lb/ft^3)	0.0288	0.0309	0.0354	0.0409	0.0470	0.0521	0.0539	0.0534	0.0486	0.0405	0.0335	0.0293	0.0404
standing storage losses (L_S lb/month & avg is lb/yr)	171.95	166.95	211.85	236.83	281.24	301.44	322.51	319.13	280.99	242.06	193.64	175.16	2903.74
working losses (L_W lb/month & avg is lb/yr)	10.29	9.99	12.67	14.17	16.82	18.03	19.29	19.09	16.81	14.48	11.58	10.48	173.69
total losses (L_T lb/month & avg is lb/yr)	182.24	176.94	224.53	251.00	298.06	319.47	341.80	338.22	297.79	256.54	205.23	185.64	3077.44
max hourly Q in bbl/hour	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.014	0.015	0.017	0.020	0.023	0.025	0.026	0.026	0.023	0.019	0.016	0.014	
breathing/standing loss (L_S lb/hr)	0.231	0.248	0.285	0.380	0.460	0.538	0.548	0.527	0.430	0.325	0.269	0.235	
max hourly total loss (L_T lb/hr)	0.245	0.263	0.302	0.400	0.482	0.563	0.574	0.553	0.454	0.345	0.285	0.250	

L_S sum months	L_W sum months	L_T sum months
2903.74	173.69	3077.44

The monthly sums will be greater than the annual average since the monthly variables yield higher emissions

Emissions Summary:	**avg lbs/hr**	**max lbs/hr**	**lbs/yr**
Standing/Breathing Loss L_S	**0.325**	**0.548**	**2,844.460**
Working Loss L_W	**0.019**	**0.026**	**170.148**
Total Loss L_T	**0.344**	**0.574**	**3,014.608**

max hourly total loss may not add up to L_S + L_W as their max values may be in different months

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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	56.50	60.80	68.10	75.70	83.00	89.00	91.10	91.20	86.50	77.10	66.30	58.10	75.30
hourly average minimum ambient temperature (T_{AN} °F)	37.00	39.30	45.90	53.30	62.50	69.20	72.10	71.40	65.50	53.90	43.90	37.90	54.30
daily total solar insolation factor (I btu/ft^2 day)	783	1039	1369	1762	1929	2025	1969	1849	1576	1262	922	726	1434
daily average ambient temperature (T_{AA} °F)	46.75	50.05	57.00	64.50	72.75	79.10	81.60	81.30	76.00	65.50	55.10	48.00	64.80
liquid bulk temperature (T_B °F)	48.11	51.86	59.38	67.57	76.11	82.62	85.03	84.52	78.74	67.70	56.70	49.26	67.30
average vapor temperature (T_V °F)	51.22	55.98	64.82	74.56	83.76	90.66	92.84	91.86	85.00	72.71	60.36	52.15	72.99
daily ambient temperature range (ΔT_A °R)	19.50	21.50	22.20	22.40	20.50	19.80	19.00	19.80	21.00	23.20	22.40	20.20	21.00
daily vapor temperature range (ΔT_V °R)	22.73	27.10	31.42	36.12	36.73	37.35	36.14	35.31	32.98	30.88	26.38	22.61	31.33
daily average liquid surface temperature (T_{LA} °F)	49.67	53.92	62.10	71.06	79.94	86.64	88.93	88.19	81.87	70.20	58.53	50.70	70.14
daily maximum liquid surface temperature (T_{LX} °F)	55.35	60.70	69.95	80.09	89.12	95.98	97.97	97.01	90.12	77.92	65.13	56.36	77.98
daily minimum liquid surface temperature (T_{LN} °F)	43.98	47.14	54.24	62.03	70.75	77.31	79.90	79.36	73.63	62.48	51.94	45.05	62.31
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	0.179	0.209	0.280	0.381	0.511	0.634	0.681	0.666	0.544	0.370	0.247	0.186	0.369
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	0.220	0.266	0.367	0.514	0.685	0.847	0.900	0.874	0.707	0.479	0.311	0.228	0.479
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	0.144	0.163	0.211	0.279	0.377	0.469	0.511	0.502	0.415	0.284	0.194	0.150	0.282
daily vapor pressure range (ΔP_V)	0.0756	0.1036	0.1555	0.2347	0.3084	0.3782	0.3893	0.3726	0.2919	0.1951	0.1166	0.0778	0.1976
vapor space expansion factor (K_E)	0.0499	0.0600	0.0711	0.0846	0.0900	0.0956	0.0940	0.0913	0.0818	0.0720	0.0591	0.0497	0.0731
vapor molecular weight (M_V lb/lbmole)	18.58	18.54	18.47	18.41	18.36	18.33	18.32	18.32	18.35	18.42	18.50	18.57	18.42
monthly hours with avg = total annual	744	672	744	720	744	720	744	744	720	744	720	744	8,760
throughputs (ft^3/month) and avg = total annual	871,040	786,746	871,040	842,942	871,040	842,942	871,040	871,040	842,942	871,040	842,942	871,040	10,255,796
monthly turnovers (N/month) with avg = total annual	83.26	75.21	83.26	80.58	83.26	80.58	83.26	83.26	80.58	83.26	80.58	83.26	980.37
vented vapor saturation factor (K_S)	0.9226	0.9107	0.8839	0.8483	0.8064	0.7706	0.7576	0.7619	0.7965	0.8520	0.8962	0.9198	0.8523
vent setting correction factor (K_B)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
vapor density (W_V lb/ft^3)	0.0006	0.0007	0.0009	0.0012	0.0016	0.0020	0.0021	0.0021	0.0017	0.0012	0.0008	0.0006	0.0012
standing storage losses (L_S lb/month & avg is lb/yr)	7.18	7.49	10.88	14.03	19.07	22.56	24.95	24.42	19.60	14.13	9.38	7.44	181.13
working losses (L_W lb/month & avg is lb/yr)	395.58	412.90	599.76	773.27	1051.25	1243.67	1375.11	1345.87	1080.16	779.00	516.82	410.07	9983.47
total losses (L_T lb/month & avg is lb/yr)	402.75	420.39	610.64	787.30	1070.33	1266.24	1400.06	1370.29	1099.75	793.13	526.20	417.51	10164.60
max hourly Q in bbl/hour	1170.75	1170.75	1170.75	1170.75	1170.75	1170.75	1170.75	1170.75	1170.75	1170.75	1170.75	1170.75	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.532	0.614	0.806	1.074	1.413	1.727	1.848	1.809	1.500	1.047	0.718	0.551	
breathing/standing loss (L_S lb/hr)	0.010	0.011	0.015	0.022	0.030	0.037	0.038	0.037	0.028	0.019	0.013	0.010	
max hourly total loss (L_T lb/hr)	0.541	0.626	0.821	1.096	1.443	1.764	1.887	1.846	1.529	1.066	0.731	0.561	

L_S sum months	L_W sum months	L_T sum months
181.13	9983.47	10164.60

The monthly sums will be greater than the annual average since the monthly variables yield higher emissions

Emissions Summary:	**avg lbs/hr**	**max lbs/hr**	**lbs/yr**
Standing/Breathing Loss L_S	**0.019**	**0.038**	**165.991**
Working Loss L_W	**1.044**	**1.848**	**9,148.968**
Total Loss L_T	**1.063**	**1.887**	**9,314.959**

max hourly total loss may not add up to L_S + L_W as their max values may be in different months

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Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**8-05-WST-V & 9-05-WST-V**
Tank Description	**1500 BBL Produced Water Tank-Common Vent (ABJ-129A/B)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**21.50**
Vertical Height/Horizontal Length (H_S ft)	**16.10**
Roof Height (H_R ft)	**0.67**
Max Liquid Height (H_{LX} ft)	**15.10**
Avg Liquid Height (H_L ft)	**7.55**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.58**
Roof Paint Solar Absorptance (R_A)	**0.58**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.2240**

Tank Shell Color/Shade	**Gray - Light**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Gray - Light**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**912,500.00**
Annual Turnovers, N	**934.46**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**5,482.06**
vapor space outage (H_{VO} ft)	**8.774**
vapor space volume (V_V ft^3)	**3,185.39**

Major City for Meterological Data	**Jackson, MS**
Site Elevation (ft)	**300**
Atmospheric Pressure (P_A psia)	**14.537**
Table 7.1-2 Liquid	
*RVP**	
*API gravity**	
*°F basis for gv**	
bubble point psia	
API gravity at 60F	
API gravity at 100F	
Working Loss Product Factor (K_P)	**0.75**
working loss turnover factor K_N	**0.199**

*sales oil data determines RVP per API pub 4683

Tank contents (if not selected from Table 7.1-2):

component	*mole%*	*MW*	*lb/mole*	*wt%*	*Antoine constants (log_{10}, mmHg, °C) A*	*B*	*C*
Water	100.000	18.015	18.01500	100.00000	8.108	1750.300	235.000
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
	100.000		18.015	100.000			

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Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**10-05-SOT-V**
Tank Description	**500 BBL Slop Oil Tank-Common Vent (ABJ-108)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**12.00**
Vertical Height/Horizontal Length (H_S ft)	**25.00**
Roof Height (H_R ft)	**0.38**
Max Liquid Height (H_{LX} ft)	**24.00**
Avg Liquid Height (H_L ft)	**12.00**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.58**
Roof Paint Solar Absorptance (R_A)	**0.58**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.1250**

Tank Shell Color/Shade	**Gray - Light**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Gray - Light**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**2,000.20**
Annual Turnovers, N	**4.14**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**2,714.34**
vapor space outage (H_{VO} ft)	**13.125**
vapor space volume (V_V ft^3)	**1,484.40**

Major City for Meterological Data	**Jackson, MS**
Site Elevation (ft)	**300**
Atmospheric Pressure (P_A psia)	**14.537**
Table 7.1-2 Liquid	**crude oil**
*RVP**	**6.18**
*API gravity**	**40.7**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**40.7**
API gravity at 100F	**44.0**

Working Loss Product Factor (K_P)	**0.75**
working loss turnover factor K_N	**1.000**

*sales oil data determines RVP per API pub 4683

Tank contents (if not selected from Table 7.1-2):

component	*mole%*	*MW*	*lb/mole*	*wt%*	*Antoine constants (log_{10}, mmHg, °C)* *A*	*B*	*C*
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
	0.000		0.000	0.000			

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Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**11-05-IOT-V & 12-05-IOT-V**
Tank Description	**400 BBL Inhibitor Oil Blending Tank-Vent (BBJ-133A/B)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**12.00**
Vertical Height/Horizontal Length (H_S ft)	**20.00**
Roof Height (H_R ft)	**0.38**
Max Liquid Height (H_{LX} ft)	**19.00**
Avg Liquid Height (H_L ft)	**9.50**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.58**
Roof Paint Solar Absorptance (R_A)	**0.58**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.1250**

Tank Shell Color/Shade	**Gray - Light**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Gray - Light**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**36,000.00**
Annual Turnovers, N	**94.05**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**2,148.85**
vapor space outage (H_{VO} ft)	**10.625**
vapor space volume (V_V ft^3)	**1,201.66**

Major City for Meterological Data	**Jackson, MS**
Site Elevation (ft)	**300**
Atmospheric Pressure (P_A psia)	**14.537**
Table 7.1-2 Liquid	**crude oil**
*RVP**	**6.18**
*API gravity**	**40.7**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**40.7**
API gravity at 100F	**44.0**

Working Loss Product Factor (K_P)	**0.75**
working loss turnover factor K_N	**0.486**

*sales oil data determines RVP per API pub 4683

Tank contents (if not selected from Table 7.1-2):

component	*mole%*	*MW*	*lb/mole*	*wt%*	*Antoine constants (log_{10}, mmHg, °C)* *A*	*B*	*C*
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
	0.000		0.000	0.000			

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United States
Environmental
Protection Agency

Office of Pollution
Prevention and Toxics
Washington, DC 20460

March 1999
EPA 745-R-99-005

EPCRA Section 313

Look-up Tables for Estimating Toxic Release Inventory Air Emissions from Chemical Distribution Facilities

TRI

Section 313 of the Emergency Planning and Community Right-to-Know Act

Toxic Chemical Release Inventory

n-Hexane Look-up Table

(CAS No. 110-54-3)

Air Emissions (in pounds) from bulk unloading, storage, blending and container filling operations at a typical chemical distribution facility in Louisville, KY

Type of Air Release (lb)	Throughput (1,000 lb/yr)									
	50	**100**	**250**	**500**	**750**	**1,000**	**2,000**	**3,000**	**5,000**	**10,000**
A1- Container filling emissions	34	68	170	340	510	679	1,359	2,038	3,397	6,794
A2 - Piping component leaks - delivery of liquid to container filling	1	1	3	6	8	11	22	33	56	112
A3 - Storage tank working + breathing losses (pick closest tank size) 5,000 gallon tank	265	299	400	569	737	905	1,017	1,129	1,354	1,916
10,000 gallon tank	429	463	564	732	901	1,069	1,743	1,862	2,087	2,649
25,000 gallon tank	892	926	1,027	1,195	1,364	1,532	2,206	2,880	4,200	4,762
A4 - Piping component leaks - delivery of liquid to storage tank	1	1	1	1	2	3	6	9	14	28
A5 - Blending/mixing tank emissions	34	67	169	337	506	674	1,348	1,467	1,692	2,253
A6 - Piping component leaks - delivery of liquid to blending/mixing tank	1	2	3	6	9	11	22	33	56	111

Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**14-05-GST & 26-10-ST**
Tank Description	**Storage Tanks < 10,000 Gallons**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Horizontal**
Tank Diameter (D ft)	**8.00**
Vertical Height/Horizontal Length (H_S ft)	**27.00**
Roof Height (H_R ft)	
Max Liquid Height (H_{LX} ft)	**8.00**
Avg Liquid Height (H_L ft)	**4.00**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.90**
Roof Paint Solar Absorptance (R_A)	**0.9**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	

Tank Shell Color/Shade	**Red - Primer**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Red - Primer**
Tank Roof Paint Condition	**average**
Roof Type	**horizontal tank**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**500.00**
Annual Turnovers, N	**2.07**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**1,357.17**
vapor space outage (H_{VO} ft)	**3.142**
vapor space volume (V_V ft^3)	**678.58**

Major City for Meterological Data	**Jackson, MS**
Site Elevation (ft)	**300**
Atmospheric Pressure (P_A psia)	**14.537**
Table 7.1-2 Liquid	
*RVP**	
*API gravity**	
*°F basis for gv**	
bubble point psia	
API gravity at 60F	
API gravity at 100F	
Working Loss Product Factor (K_P)	**1**
working loss turnover factor K_N	**1.000**

*sales oil data determines RVP per API pub 4683

Tank contents (if not selected from Table 7.1-2):

component	*mole%*	*MW*	*lb/mole*	*wt%*	*Antoine constants (log_{10}, mmHg, °C) A*	*B*	*C*
Toluene	100.000	92.141	92.14100	100.00000	7.017	1377.600	222.640
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
	100.000		92.141	100.000			

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Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**16a-05-WST-CV**
Tank Description	**400 BBL API Water Holding Tank-Vent (ABM-165A)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**12.00**
Vertical Height/Horizontal Length (H_S ft)	**20.00**
Roof Height (H_R ft)	**0.38**
Max Liquid Height (H_{LX} ft)	**19.00**
Avg Liquid Height (H_L ft)	**9.50**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.58**
Roof Paint Solar Absorptance (R_A)	**0.58**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	**0.1250**

Tank Shell Color/Shade	**Gray - Light**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Gray - Light**
Tank Roof Paint Condition	**average**
Roof Type	**vertical tank with cone roof**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**0.00**
Annual Turnovers, N	**0.00**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**2,148.85**
vapor space outage (H_{VO} ft)	**10.625**
vapor space volume (V_V ft^3)	**1,201.66**

Major City for Meterological Data	**Jackson, MS**
Site Elevation (ft)	**300**
Atmospheric Pressure (P_A psia)	**14.537**
Table 7.1-2 Liquid	**crude oil**
*RVP**	**6.18**
*API gravity**	**40.7**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**40.7**
API gravity at 100F	**44.0**
Working Loss Product Factor (K_P)	**0.75**
working loss turnover factor K_N	**1.000**

*sales oil data determines RVP per API pub 4683

Tank contents (if not selected from Table 7.1-2):

component	*mole%*	*MW*	*lb/mole*	*wt%*	*Antoine constants (log_{10}, mmHg, °C) A*	*B*	*C*
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
	0.000		0.000	0.000			

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Tank Emission Calculations Based on AP 42 Chapter 7 (June 2020, Section 7.1.3.1), Fixed Roof

Tank ID	**17-05-SEP**
Tank Description	**API Separator (ABH-128)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Horizontal**
Tank Diameter (D ft)	**10.00**
Vertical Height/Horizontal Length (H_S ft)	**10.00**
Roof Height (H_R ft)	
Max Liquid Height (H_{LX} ft)	**10.00**
Avg Liquid Height (H_L ft)	**5.00**
Breather Vent Pressure Setting (P_{BP} psig)	
Breather Vent Vacuum Setting (P_{BV} psig)	
actual tank pressure (P_I psig)	**0.0**
Shell Paint Solar Absorptance (S_A)	**0.71**
Roof Paint Solar Absorptance (R_A)	**0.71**
breather vent pressure range (ΔP_B psi)	**0.00**
roof outage (H_{RO} ft)	

Tank Shell Color/Shade	**Gray - Medium**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Gray - Medium**
Tank Roof Paint Condition	**average**
Roof Type	**horizontal tank**
Tank Insulation	**no insulation**
Tank Underground?	**no**
Annual Throughput (Q bbl/year)	**16,251.19**
Annual Turnovers, N	**116.16**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**785.40**
vapor space outage (H_{VO} ft)	**3.927**
vapor space volume (V_V ft^3)	**392.70**

Major City for Meterological Data	**Jackson, MS**
Site Elevation (ft)	**300**
Atmospheric Pressure (P_A psia)	**14.537**
Table 7.1-2 Liquid	**crude oil**
*RVP**	**8.50**
*API gravity**	**56.0**
*°F basis for gv**	**90.0**
bubble point psia	
API gravity at 60F	**52.8**
API gravity at 100F	**57.0**

Working Loss Product Factor (K_P)	**0.75**
working loss turnover factor K_N	**0.425**

*sales oil data determines RVP per API pub 4683

Tank contents (if not selected from Table 7.1-2):

component	*mole%*	*MW*	*lb/mole*	*wt%*	*Antoine constants (log_{10}, mmHg, °C)* *A*	*B*	*C*
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
0	0.000						
	0.000		0.000	0.000			

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United States
Environmental Protection
Agency

Office of Air Quality
Planning and Standards
Research Triangle Park NC 27711

EPA-453/R-95-017
November 1995

Air

EPA

Protocol for Equipment Leak Emission Estimates

EPA Average Emission Factors

The EPA emission factors used by GRI-HAPCalc 3.01 to estimate fugitive emissions were developed from data obtained during a joint American Petroleum Institute (API)/GRI fugitive testing program at natural gas production and processing sites [U.S. Environmental Protection Agency, 1995; American Petroleum Institute, 1995]. Over 184,000 components at 20 sites were screened for total hydrocarbon (THC) emissions, and the results were averaged for each component type to develop THC emission factors. Furthermore, a statistical analysis conducted by the EPA found no difference in THC fugitive emissions by industry segment for oil and gas production operation. The average THC emission factors for equipment in gas and light liquid service are shown in Table 20.

Table 20. EPA Average Emission Factors for THC

Component	Emission Factor, lb THC/yr		
	Gas Service	Light Liquids Service	Heavy Liquids Service
Connections	3.9	4.1	0.1
Flanges	7.5	2.1	0.0075
Open-Ended Line	39	27	2.7
Pump Seals	46	250	NA
Valves	87	48	0.16
Other*	170	140	0.62

** The "Other" category includes compressors, diaphragms, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, relief valves, and vents.*

To calculate speciated fugitive emissions for BTEX, methane, NMHC, and NMEHC, composition data obtained during a joint American Petroleum Institute (API)/GRI fugitive testing program are used with the THC emission factors above. The average compositions of fugitive leaks from production facilities and natural gas plants are shown in Table 21.

Table 21. Fractional Composition of Fugitive Emissions

Compound	Fractional Composition, lb/lb THC			
	Gas Production/ Compressor Station	Gas Plant	Light Liquid Service	Heavy Liquid Service
Benzene	0.00023	0.00123	0.00027	0.00935
Toluene	0.00039	0.00032	0.00075	0.00344
Ethylbenzene	0.000020	0.000010	0.000170	0.00051
Xylenes (m,p,o)	0.00010	0.000040	0.000360	0.00372
Methane	0.920	0.564	0.613	0.942
NMHC	0.080	0.436	0.387	0.058
NMEHC	0.0350	0.253	0.292	0.030

The following equation shows how annual emission rates are calculated from the above emission factors. The user-entered component count of each type of fugitive emission source is multiplied by the emission factor (lb THC/component/year) and the fractional composition (lb compound *i* / lb THC). This is then converted to an annual emission rate. Note that all calculations in GRI-HAPCalc 3.01 are done in U.S. Standard units and converted to metric units when necessary.

SPL

Certificate of Analysis

Number: 2030-22080365-001A

Broussard Laboratory
101 Ibex Lane
Broussard, LA 70518
Phone 337-210-8044

Richie Green
Denbury
500 Central Avenue
Laurel, MS 39440

Sep. 13, 2022

Field:	Martinville	Sampled By:	TK-SPL
Station Name:	EOR Flare ZZZ180	Sample Of:	Gas Spot
Station Number:		Sample Date:	08/17/2022
Sample Point:	Flare	Sample Conditions:	0 psig, @ 93 °F
Analyzed:	08/30/2022 16:37:21 by CAC	Method:	GPA 2286
		Cylinder No:	2030-007

Analytical Data

Components	Mol. %	Wt. %	GPM at 15.025 psia
Nitrogen	87.826	81.414	
Carbon Dioxide	10.526	15.330	
Methane	0.697	0.370	
Ethane	0.052	0.052	0.014
Propane	0.024	0.035	0.007
Iso-Butane	0.011	0.021	0.004
n-Butane	0.032	0.062	0.010
Iso-Pentane	0.029	0.069	0.011
n-Pentane	0.053	0.127	0.019
i-Hexanes	0.085	0.245	0.036
n-Hexane	0.100	0.288	0.043
Benzene	0.015	0.037	0.004
Cyclohexane	0.056	0.158	0.019
i-Heptanes	0.078	0.252	0.033
n-Heptane	0.098	0.331	0.047
Toluene	0.008	0.025	0.003
i-Octanes	0.134	0.482	0.063
n-Octane	0.051	0.195	0.027
Ethylbenzene	0.015	0.054	0.006
Xylenes	0.003	0.010	0.001
i-Nonanes	0.051	0.199	0.027
n-Nonane	0.018	0.077	0.010
Decane Plus	0.038	0.167	0.444
	100.000	100.000	0.828

GPM TOTAL C2+ 0.828

Calculated Physical Properties	Total	C10+
Calculated Molecular Weight	30.22	140.18
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 15.025 psia & 60°F		
Real Gas Dry BTU	55.53	7645.5
Water Sat. Gas Base BTU	54.58	7510.0
Relative Density Real Gas	1.0437	4.8399
Compressibility Factor	0.9993	

Comments: This sample is leaner than the previous sample from this station.

Patti L. Petro

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

TNRCC

June 1998
RG-109

Air Permit Technical Guidance for Chemical Sources:

Flares and Vapor Oxidizers

printed on recycled paper

New Source Review Permits Division

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Technical Guidance Package for
Chemical Sources

Flare Sources

Texas
Natural
Resource
Conservati
on
Commissio
n

John Hall, Chairman
Pam Reed, Commissioner
Peggy Garner, Commissioner
Dan Pearson, Executive Director

Compiled by TNRCC Chemical Section Engineers
November 1994

Published and distributed by the
Texas Natural Resource Conservation Commission
Post Office Box 13087
Austin, Texas 78711-3087
(512) 239-1250

Type	Waste Gas	NO_x lb/MM Btu	CO lb/MM Btu
Steam Assisted	High Btu (>1000/scf)	0.0485	0.3503
Steam Assisted	Low Btu (192-1000/scf)	0.0680	0.3465
Air & Nonassisted	High Btu (>1000/scf)	0.1380	0.2755
Air & Nonassisted	Low Btu (184-1000/scf)	0.0641	0.5496

Example 2:

For the sample case, calculate the mole percent of each constituent in the waste stream for both the average and maximum scenarios by dividing the individual flow rates by the total flow rates and multiplying by 100 percent.

Table 4: Calculation of constituents in mole percent.

	Average Case		Maximum Case	
	scfm	mole %	scfm	mole %
Butane+	10.16	5.08	12.70	5.08
Propylene	5.94	2.97	7.43	2.97
Propane	5.08	2.54	6.35	2.54
Ethylene	84.74	42.37	105.93	42.37
Ethane	37.28	18.64	46.60	18.64
Hydrogen	22.04	11.02	27.55	11.02
Ammonia	4.24	2.12	5.30	2.12
Inerts	30.50	15.26	38.13	15.26
Totals	200.00	100.00	250.00	100.00

In this case, our calculations are simplified since the average and maximum case waste streams have the same compositions. If they were of different composition, the following heating value calculations would be required for both cases. Note that the maximum case shows the maximum vent stream to the flare under normal operating conditions for the purpose of calculating emissions from the flare (upset and maintenance conditions are not considered).

Next, estimate the net, or lower, heating value of the waste stream

Table 13.5-2. HYDROCARBON COMPOSITION OF FLARE EMISSION[a]

Composition	Volume %	
	Average	Range
Methane	55	14 - 83
Ethane/Ethylene	8	1 - 14
Acetylene	5	0.3 - 23
Propane	7	0 - 16
Propylene	25	1 - 65

[a] Reference 1. The composition presented is an average of a number of test results obtained under the following sets of test conditions: steam-assisted flare using high-Btu-content feed; steam-assisted using low-Btu-content feed; air-assisted flare using high-Btu-content feed; and air-assisted flare using low-Btu-content feed. In all tests, "waste" gas was a synthetic gas consisting of a mixture of propylene and propane.

References For Section 13.5

1. *Flare Efficiency Study*, EPA-600/2-83-052, U. S. Environmental Protection Agency, Cincinnati, OH, July 1983.

2. K. D. Siegel, *Degree Of Conversion Of Flare Gas In Refinery High Flares*, Dissertation, University of Karlsruhe, Karlsruhe, Germany, February 1980.

3. *Manual On Disposal Of Refinery Wastes, Volume On Atmospheric Emissions*, API Publication 931, American Petroleum Institute, Washington, DC, June 1977.

Normalized Component Calculation

Control Flare (ZZZ-181) - Normalized Actual Flare Gas Analysis; SPL Report No.: 2030-22080365-002A

COMPONENT	mole %	mole % w/extra component	COMPONENT MW	fuel weight	Normalized WT %	component BTU/scf	partial Heating values
Water	0.000	0.000	18	0.00	**0.000**	0	0
Nitrogen	11.510	11.509	28.0134	3.22	**7.637**	0	0
Methane	2.855	2.855	16.043	0.46	**1.085**	1010	29
Carbon Dioxide	83.633	83.629	44.01	36.81	**87.177**	0	0
Ethane	0.080	0.080	30.07	0.02	**0.057**	1770	1
Hydrogen Sulfide	0.000	0.000	34.08	0.00	**0.000**	637	0
Propane	0.134	0.134	44.097	0.06	**0.140**	2516	3
I-Butane	0.057	0.057	58.123	0.03	**0.078**	3252	2
N-Butane	0.146	0.146	58.123	0.08	**0.201**	3262	5
I-Pentane	0.106	0.106	72.15	0.08	**0.181**	4001	4
N-Pentane	0.174	0.174	72.15	0.13	**0.297**	4009	7
Other hexanes	0.202	0.202	86.177	0.17	**0.412**	4750	10
N-hexane	0.232	0.232	86.177	0.20	**0.474**	4756	11
Methylcyclopentane	0.000	0.000	84.1608	0.00	**0.000**	4501	0
benzene	0.035	0.035	78.114	0.03	**0.065**	3742	1
cyclohexane	0.020	0.020	84.1608	0.02	**0.040**	4482	1
heptane	0.373	0.373	100.204	0.37	**0.885**	5503	21
Methylcyclohexane	0.000	0.000	98.18	0.00	**0.000**	5216	0
toluene	0.013	0.013	92.141	0.01	**0.028**	4475	1
iso-octane	0.180	0.180	114.22	0.21	**0.487**	6232	11
octanes	0.067	0.067	114.22	0.08	**0.181**	7000	5
ethylbenzene	0.008	0.008	106.167	0.01	**0.020**	5222	0
xylene	0.005	0.005	106.167	0.01	**0.013**	5208	0
nonanes	0.107	0.107	128.25	0.14	**0.325**	6997	7
Decanes Plus	0.063	0.063	142.28	0.09	**0.212**	7743	5
Other NM/NE HC	0.000	0.000	102.09	0.00	**0.000**	5200	0
Max H2S	0.005	0.005	34.08	0.00	**0.004**	637	0
TOTALS	**100.000**	**100.000**	**MW=**	**42.22**	**100.000**	**total btu/scf**	**124.38**

sg	**1.4558**
VOC wt%	**4.0402**
Toxic wt%	**1.086**

HLP Engineering, Inc.
Engr: Thomas LaSalle

Louisiana Environmental Laboratory Accreditation
Certificate No. 01995
Denbury Onshore, LLC
Mallalieu Central Facility
Lincoln County, MS

Compositional Analysis of Multi-Stage Flash Gas

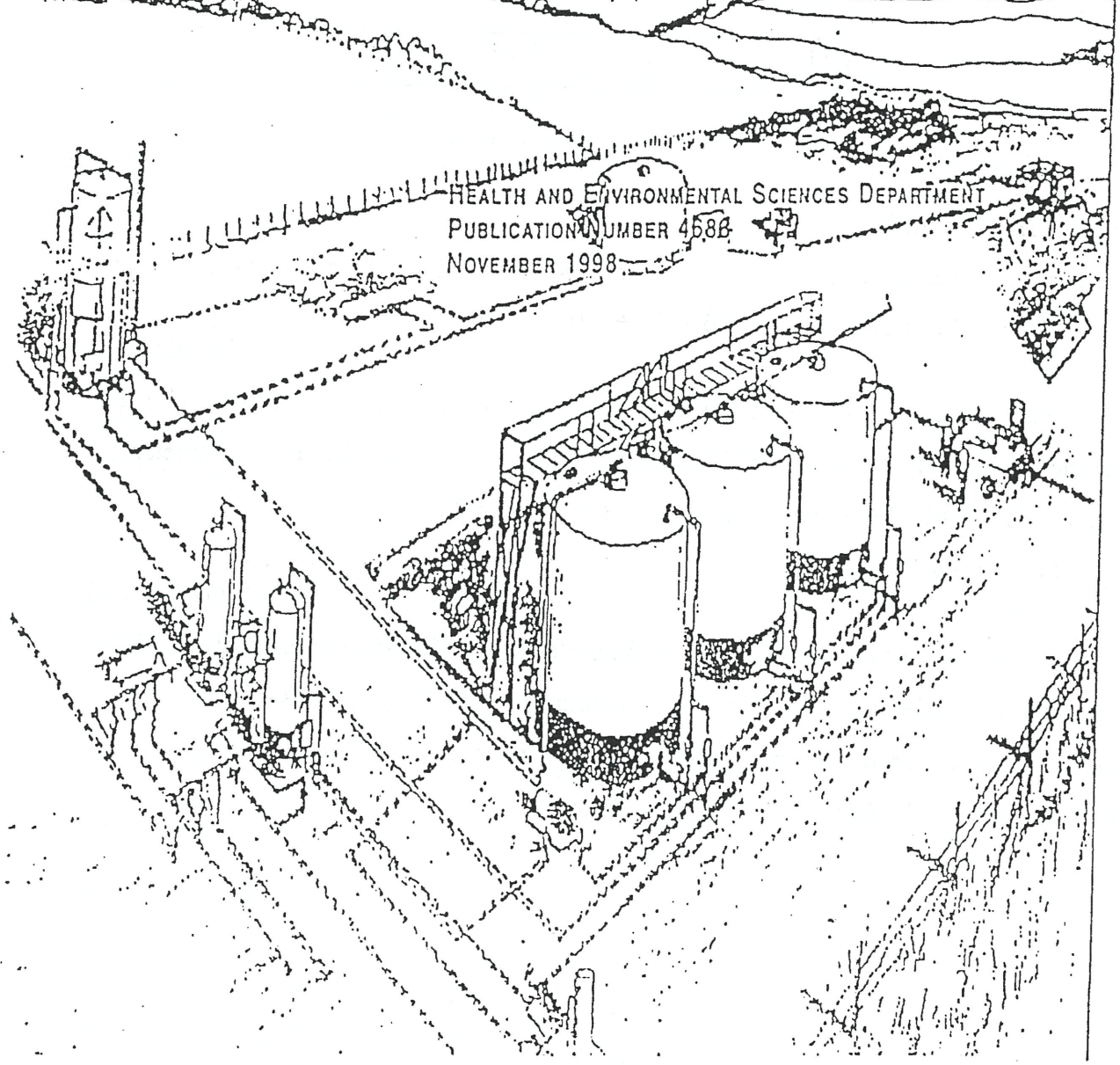
Sampled: 25 psig at 125°F

Component	Mole %	GPM @ 15.025 psia	Wt %	Mole Wt.
Nitrogen	0.159	0.000	0.095	28.013
Carbon Dioxide	76.283	0.000	71.476	44.010
Hydrogen Sulfide	0.000	0.000	0.000	34.082
Methane	2.132	0.000	0.728	16.043
Ethane	2.080	0.567	1.332	30.070
Propane	5.186	1.457	4.868	44.097
Iso-Butane	1.682	0.561	2.081	58.123
N-Butane	4.684	1.506	5.796	58.123
Iso-Pentane	2.248	0.839	3.453	72.150
N-Pentane	1.909	0.705	2.932	72.150
Iso-Hexanes	0.948	0.401	1.740	86.177
N-Hexane	0.572	0.240	1.050	86.177
Methylcyclopentane	0.333	0.120	0.597	84.161
Benzene	0.144	0.041	0.240	78.114
Cyclohexane	0.195	0.068	0.349	84.161
Heptanes	0.569	0.268	1.215	100.204
Methylcyclohexane	0.278	0.114	0.581	98.188
Toluene	0.097	0.033	0.191	92.141
Iso-Octane	0.059	0.031	0.143	114.231
Octanes	0.253	0.132	0.614	114.231
Ethyl Benzene	0.008	0.003	0.018	106.167
Xylenes	0.032	0.012	0.073	106.167
Nonanes	0.094	0.054	0.257	128.258
Decane Plus	0.055	0.035	0.171	145.729
Totals	100.000	7.187	100.000	

Calculated Properties of Gas

Gas Specific Gravity	(Air = 1.00)		=	1.6348	
Net Heat of Combustion	(Btu/Cu.Ft. @ 15.025 Psia @ 60 °F)	Dry	=	711.0	Real
Gross Heat of Combustion	(Btu/Cu.Ft. @ 15.025 Psia @ 60 °F)	Dry	=	770.2	Real
Gross Heat of Combustion - Sat.	(Btu/Cu.Ft. @ 15.025 Psia @ 60 °F)	Wet	=	756.7	Water Sat.
Gas Compressibility	(@ 1 Atm. @ 60 °F)	Z	=	0.9916	

Correlation Equations to Predict Reid Vapor Pressure and Properties of Gaseous Emissions for Exploration and Production Facilities



Health and Environmental Sciences Department
Publication Number 4588
November 1998

$$P = \exp\left\{\left[\left(\frac{2{,}799}{T+459.6}\right) - 2.227\right]\log_{10}(RVP) - \left(\frac{7{,}261}{T+459.6}\right) + 12.82\right\}$$

Where:

P = stock true vapor pressure, in pounds per square inch absolute.
T = stock temperature, in degrees Fahrenheit.
RVP = Reid vapor pressure, in pounds per square inch.

Note: This equation was derived from a regression analysis of points read off Figure 7.1-13a over the full range of Reid vapor pressures, slopes of the ASTM distillation curve at 10 percent evaporated, and stock temperatures. In general, the equation yields *P* values that are within +0.05 pound per square inch absolute of the values obtained directly from the nomograph.

Figure 7.1-13b. Equation for true vapor pressure of crude oils with a Reid vapor pressure of 2 to 15 pounds per square inch.[4] See note at Figure 7.1-13a.

$$P = \exp\left\{\left[0.7553 - \left(\frac{413.0}{T+459.6}\right)\right]S^{0.5}\log_{10}(RVP) - \left[1.854 - \left(\frac{1{,}042}{T+459.6}\right)\right]S^{0.5}\right.$$

$$\left. + \left[\left(\frac{2{,}416}{T+459.6}\right) - 2.013\right]\log_{10}(RVP) - \left(\frac{8{,}742}{T+459.6}\right) + 15.64\right\}$$

Where:

P = stock true vapor pressure, in pounds per square inch absolute.
T = stock temperature, in degrees Fahrenheit.
RVP = Reid vapor pressure, in pounds per square inch.
S = slope of the ASTM distillation curve at 10 percent evaporated, in degrees Fahrenheit per percent.

Note: This equation was derived from a regression analysis of points read off Figure 7.1-14a over the full range of Reid vapor pressures, slopes of the ASTM distillation curve at 10 percent evaporated, and stock temperatures. In general, the equation yields *P* values that are within +0.05 pound per square inch absolute of the values obtained directly from the nomograph.

Figure 7.1-14b. Equation for true vapor pressure of refined petroleum stocks with a Reid vapor pressure of 1 to 20 pounds per square inch.[4] See note at Figure 7.1-14a.

$$A = 15.64 - 1.854\,S^{0.5} - (0.8742 - 0.3280\,S^{0.5})\ln(RVP)$$
$$B = 8{,}742 - 1{,}042\,S^{0.5} - (1{,}049 - 179.4\,S^{0.5})\ln(RVP)$$

where:

RVP = stock Reid vapor pressure, in pounds per square inch
ln = natural logarithm function
S = stock ASTM-D86 distillation slope at 10 volume percent evaporation (°F/vol %)

Figure 7.1-15. Equations to determine vapor pressure constants A and B for refined petroleum stocks.[22]

5.2 Transportation And Marketing Of Petroleum Liquids[1-3]

5.2.1 General

The transportation and marketing of petroleum liquids involve many distinct operations, each of which represents a potential source of evaporation loss. Crude oil is transported from production operations to a refinery by tankers, barges, rail tank cars, tank trucks, and pipelines. Refined petroleum products are conveyed to fuel marketing terminals and petrochemical industries by these same modes. From the fuel marketing terminals, the fuels are delivered by tank trucks to service stations, commercial accounts, and local bulk storage plants. The final destination for gasoline is usually a motor vehicle gasoline tank. Similar distribution paths exist for fuel oils and other petroleum products. A general depiction of these activities is shown in Figure 5.2-1.

5.2.2 Emissions And Controls

Evaporative emissions from the transportation and marketing of petroleum liquids may be considered, by storage equipment and mode of transportation used, in four categories:

1. Rail tank cars, tank trucks, and marine vessels: loading, transit, and ballasting losses.
2. Service stations: bulk fuel drop losses and underground tank breathing losses.
3. Motor vehicle tanks: refueling losses.
4. Large storage tanks: breathing, working, and standing storage losses. (See Chapter 7, "Liquid Storage Tanks".)

Evaporative and exhaust emissions are also associated with motor vehicle operation, and these topics are discussed in AP-42 *Volume II: Mobile Sources*.

5.2.2.1 Rail Tank Cars, Tank Trucks, And Marine Vessels -

Emissions from these sources are from loading losses, ballasting losses, and transit losses.

5.2.2.1.1 Loading Losses -

Loading losses are the primary source of evaporative emissions from rail tank car, tank truck, and marine vessel operations. Loading losses occur as organic vapors in "empty" cargo tanks are displaced to the atmosphere by the liquid being loaded into the tanks. These vapors are a composite of (1) vapors formed in the empty tank by evaporation of residual product from previous loads, (2) vapors transferred to the tank in vapor balance systems as product is being unloaded, and (3) vapors generated in the tank as the new product is being loaded. The quantity of evaporative losses from loading operations is, therefore, a function of the following parameters:

- Physical and chemical characteristics of the previous cargo;
- Method of unloading the previous cargo;
- Operations to transport the empty carrier to a loading terminal;
- Method of loading the new cargo; and
- Physical and chemical characteristics of the new cargo.

The principal methods of cargo carrier loading are illustrated in Figure 5.2-2, Figure 5.2-3, and Figure 5.2-4. In the splash loading method, the fill pipe dispensing the cargo is lowered only part way into the cargo tank. Significant turbulence and vapor/liquid contact occur during the splash

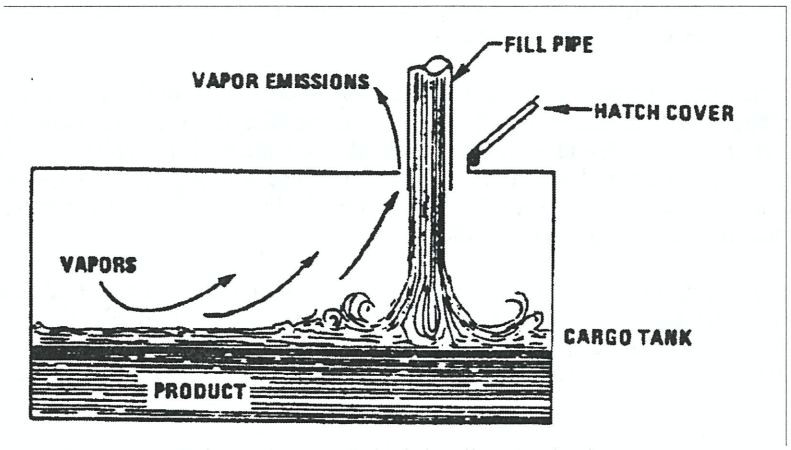


Figure 5.2-2. Splash loading method.

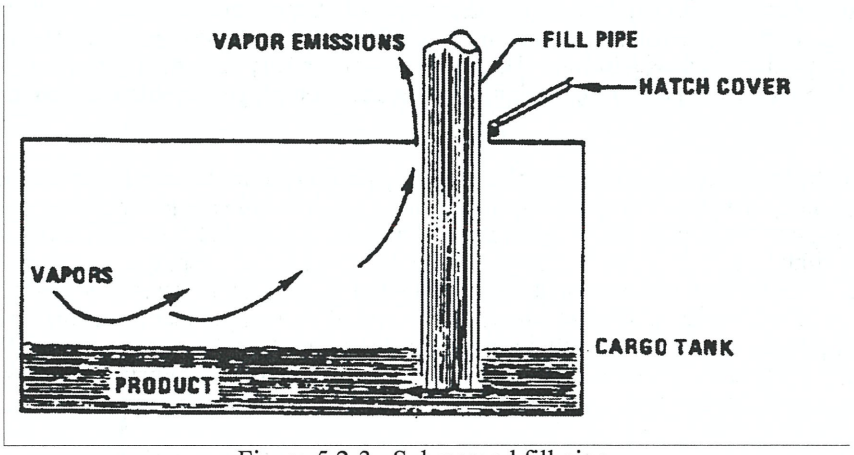


Figure 5.2-3. Submerged fill pipe.

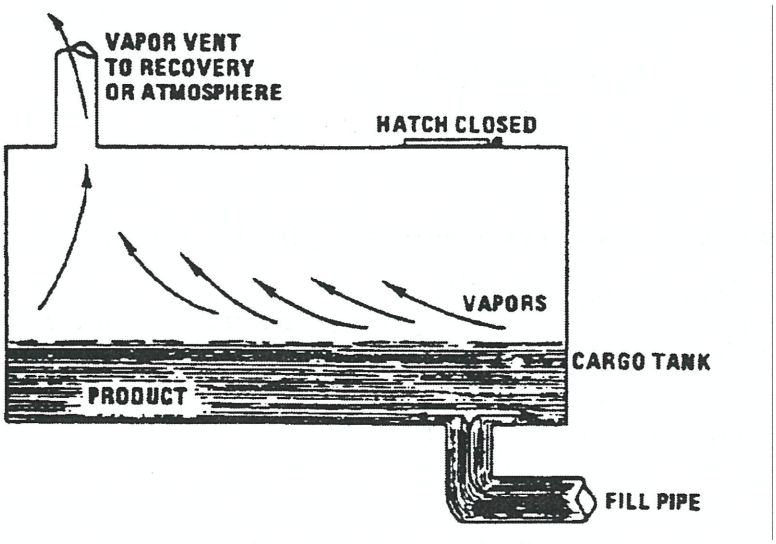


Figure 5.2-4. Bottom loading.

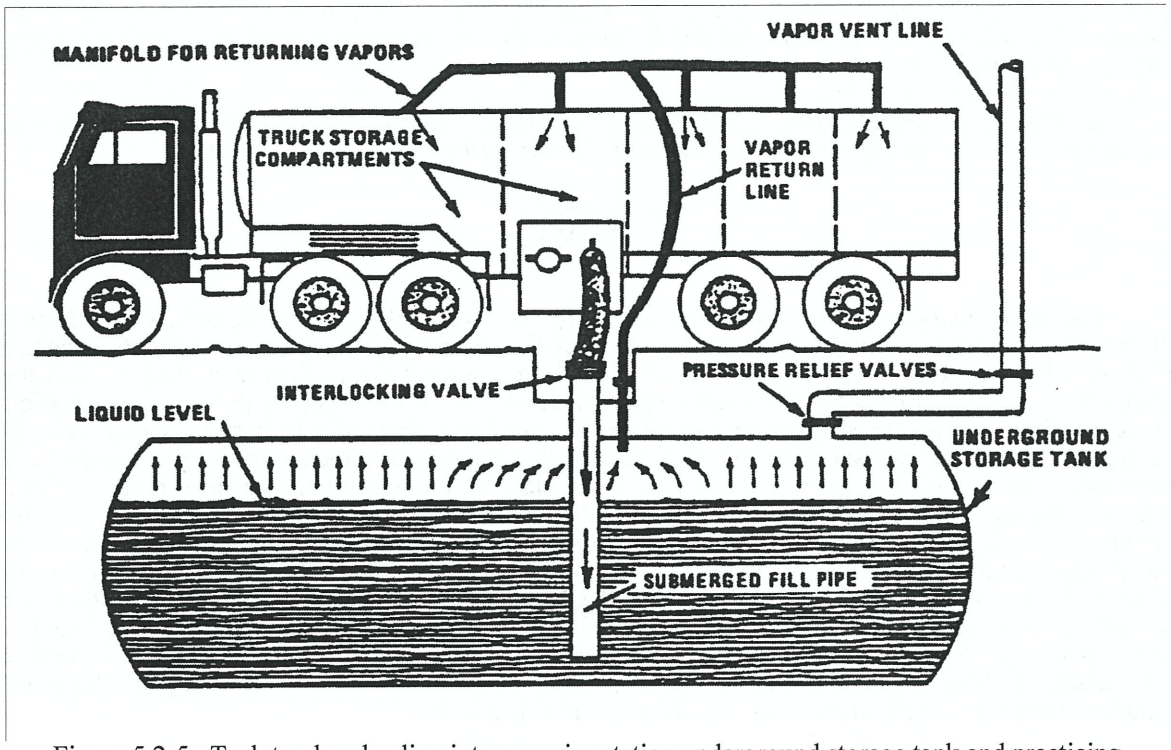


Figure 5.2-5. Tank truck unloading into a service station underground storage tank and practicing "vapor balance" form of emission control.

Table 5.2-1. SATURATION (S) FACTORS FOR CALCULATING PETROLEUM LIQUID LOADING LOSSES

Cargo Carrier	Mode Of Operation	S Factor
Tank trucks and rail tank cars	Submerged loading of a clean cargo tank	0.50
	Submerged loading: dedicated normal service	0.60
	Submerged loading: dedicated vapor balance service	1.00
	Splash loading of a clean cargo tank	1.45
	Splash loading: dedicated normal service	1.45
	Splash loading: dedicated vapor balance service	1.00
Marine vessels[a]	Submerged loading: ships	0.2
	Submerged loading: barges	0.5

[a] For products other than gasoline and crude oil. For marine loading of gasoline, use factors from Table 5.2-2. For marine loading of crude oil, use Equations 2 and 3 and Table 5.2-3.

Sample Calculation -

Loading losses (L_L) from a gasoline tank truck in dedicated vapor balance service and practicing vapor recovery would be calculated as follows, using Equation 1:

Design basis -

Cargo tank volume is 8000 gal
Gasoline Reid vapor pressure (RVP) is 9 psia
Product temperature is 80°F
Vapor recovery efficiency is 95 percent
Vapor collection efficiency is 98.7 percent (NSPS-level annual leak test)

Loading loss equation -

$$L_L = 12.46 \frac{SPM}{T}\left(1 - \frac{eff}{100}\right)$$

where:

S = saturation factor (see Table 5.2-1) - 1.00
P = true vapor pressure of gasoline = 6.6 psia
M = molecular weight of gasoline vapors = 66
T = temperature of gasoline = 540°R
eff = overall reduction efficiency (95 percent control x 98.7 percent collection) = 94 percent

$$L_L = 12.46 \frac{(1.00)(6.6)(66)}{540}\left(1 - \frac{94}{100}\right)$$

$$= 0.60 \text{ lb}/10^3\text{gal}$$

Total loading losses are:

$$(0.60 \text{ lb}/10^3 \text{ gal})(8.0 \times 10^3 \text{ gal}) = 4.8 \text{ pounds (lb)}$$

Measurements of gasoline loading losses from ships and barges have led to the development of emission factors for these specific loading operations.[8] These factors are presented in Table 5.2-2 and should be used instead of Equation 1 for gasoline loading operations at marine terminals. Factors are expressed in units of milligrams per liter (mg/L) and pounds per 1000 gallons (lb/10^3 gal).

5.2-3 (English Units). AVERAGE ARRIVAL EMISSION FACTORS, C_A, FOR CRUDE OIL LOADING EMISSION EQUATION[a]

Ship/Ocean Barge Tank Condition	Previous Cargo	Arrival Emission Factor, lb/10^3 gal
Uncleaned	Volatile[b]	0.86
Ballasted	Volatile	0.46
Cleaned or gas-freed	Volatile	0.33
Any condition	Nonvolatile	0.33

[a] Arrival emission factors (C_A) to be added to generated emission factors (C_G) calculated in Equation 3 to produce total crude oil loading loss (C_L). Factors are for total organic compounds; VOC emission factors average about 15% lower, because VOC does not include methane or ethane.
[b] Volatile cargoes are those with a true vapor pressure greater than 10 kPa (1.5 psia).

This equation was developed empirically from test measurements of several vessel compartments.[8] The quantity C_G can be calculated using Equation 3:

$$C_G = 1.84\ (0.44\ P - 0.42)\ \frac{M\,G}{T} \qquad (3)$$

where:

P = true vapor pressure of loaded crude oil, psia
M = molecular weight of vapors, lb/lb-mole
G = vapor growth factor = 1.02 (dimensionless)
T = temperature of vapors, °R (°F + 460)

Emission factors derived from Equation 3 and Table 5.2-3 represent total organic compounds. Volatile organic compound (VOC) emission factors (which exclude methane and ethane because they are exempted from the regulatory definition of "VOC") for crude oil vapors have been found to range from approximately 55 to 100 weight percent of these total organic factors. When specific vapor composition information is not available, the VOC emission factor can be estimated by taking 85 percent of the total organic factor.[3]

5.2.2.1.2 Ballasting Losses -

Ballasting operations are a major source of evaporative emissions associated with the unloading of petroleum liquids at marine terminals. It is common practice to load several cargo tank compartments with sea water after the cargo has been unloaded. This water, termed "ballast", improves the stability of the empty tanker during the subsequent voyage. Although ballasting practices vary, individual cargo tanks are ballasted typically about 80 percent, and the total vessel 15 to 40 percent, of capacity. Ballasting emissions occur as vapor-laden air in the "empty" cargo tank is displaced to the atmosphere by ballast water being pumped into the tank. Upon arrival at a loading port, the ballast water is pumped from the cargo tanks before the new cargo is loaded. The ballasting of cargo tanks reduces the quantity of vapors returning in the empty tank, thereby reducing the quantity of vapors emitted during subsequent tanker loading. Regulations administered by the U. S. Coast Guard require that, at marine terminals located in ozone nonattainment areas, large tankers with crude oil washing systems contain the organic vapors from ballasting.[10] This is accomplished principally by displacing the vapors during ballasting into a cargo tank being simultaneously unloaded. In other areas, marine vessels emit organic vapors directly to the atmosphere.

Equation 4 has been developed from test data to calculate the ballasting emissions from crude oil ships and ocean barges[8]:

$$L_B = 0.31 + 0.20\ P + 0.01\ PU_A \qquad (4)$$