Denbury

May 2, 2025

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
Soso Central Processing Facility
AI No.: 20543; Permit No.: 1300-00071
Jasper 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 Mary Weems Parker Memorial 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, Suite 1200, Plano, TX 75024**. Thank you in advance for your assistance with this matter.

Sincerely,
DENBURY ONSHORE, LLC

Kevin Hendricks
Enclosures

Notice of Intent for Oil Production General Permit

Denbury Onshore, LLC

Soso Central Processing Facility
Jasper County, MS

April 2025

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)* : Soso Central Processing Facility

C. Facility Air Permit/Coverage No. *(if known)* : 1300-00071

D. Agency Interest No. *(if known)* : 20543

E. Physical Address

1. Street Address: County Road 5331
2. City: Soso
3. State: MS
4. County: Jasper
5. Zip Code: 39480
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:
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 48 19.27
4. Longitude (*degrees/minutes/seconds*): 89 17 03.09
5. Elevation (*feet*): 350±

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@exxonmobil.com

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**

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: Rusty Shaw Title: Director of Regulatory Affairs

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.: 972-673-2777
7. Email: rusty.shaw@exxonmobil.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

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 Flash Gas, Water Flash Drum Flash Gas, Low Pressure Relief Gas

7. Process/Product Details

Maximum Anticipated Well(s) Production for Faciltiy:

Produced Material	Throughput	Units
Gas		MMCF/day
Oil	2,000	barrels/day
Water	7,500	barrels/day
Other (Specify)		

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

Produced Material	Throughput	Units
Flared Gas	0.31	MMCF/day
Oil	2,000	barrels/day
Water	7,500	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

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.:

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.

Rusty Shaw

Signature of Responsible Official/DAR

3/27/25

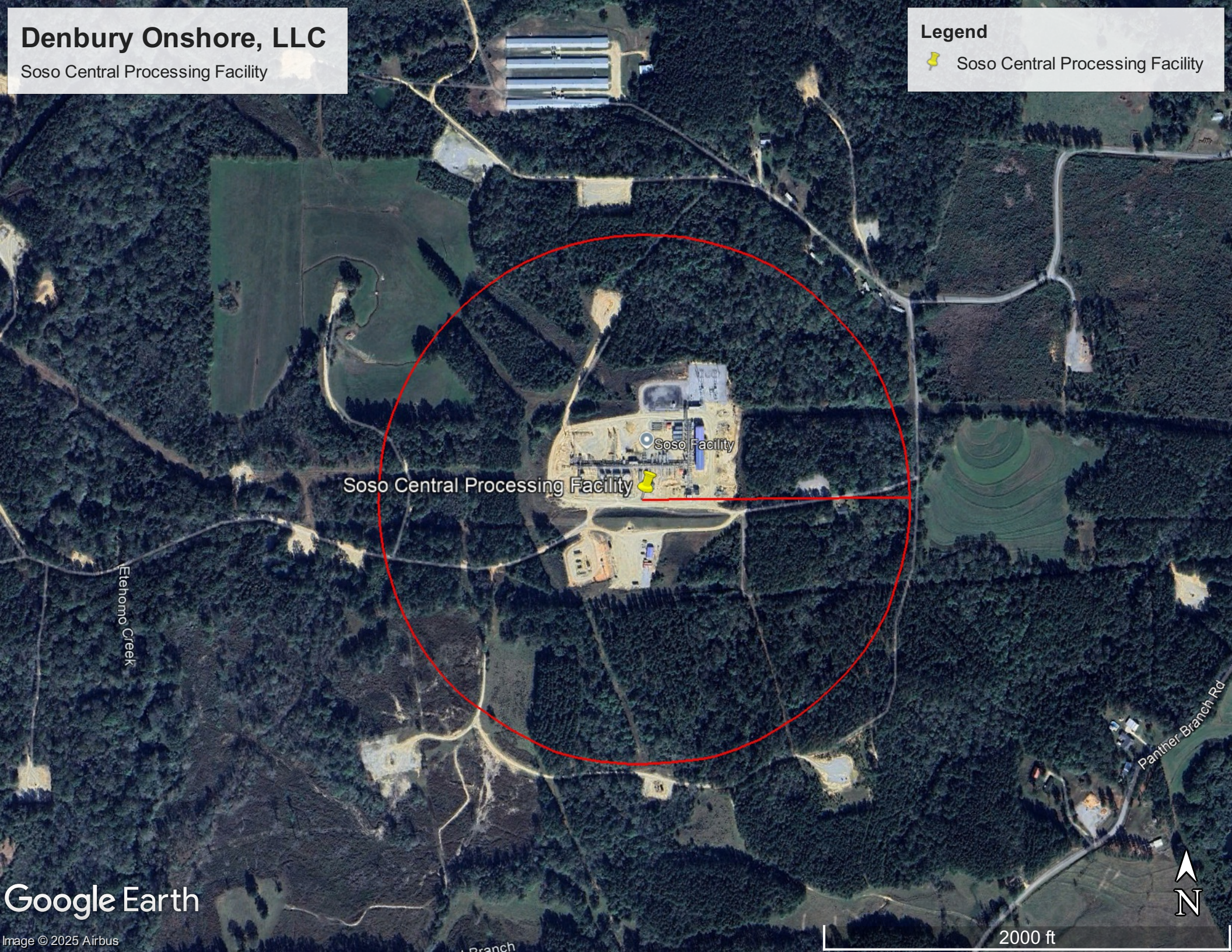
Date

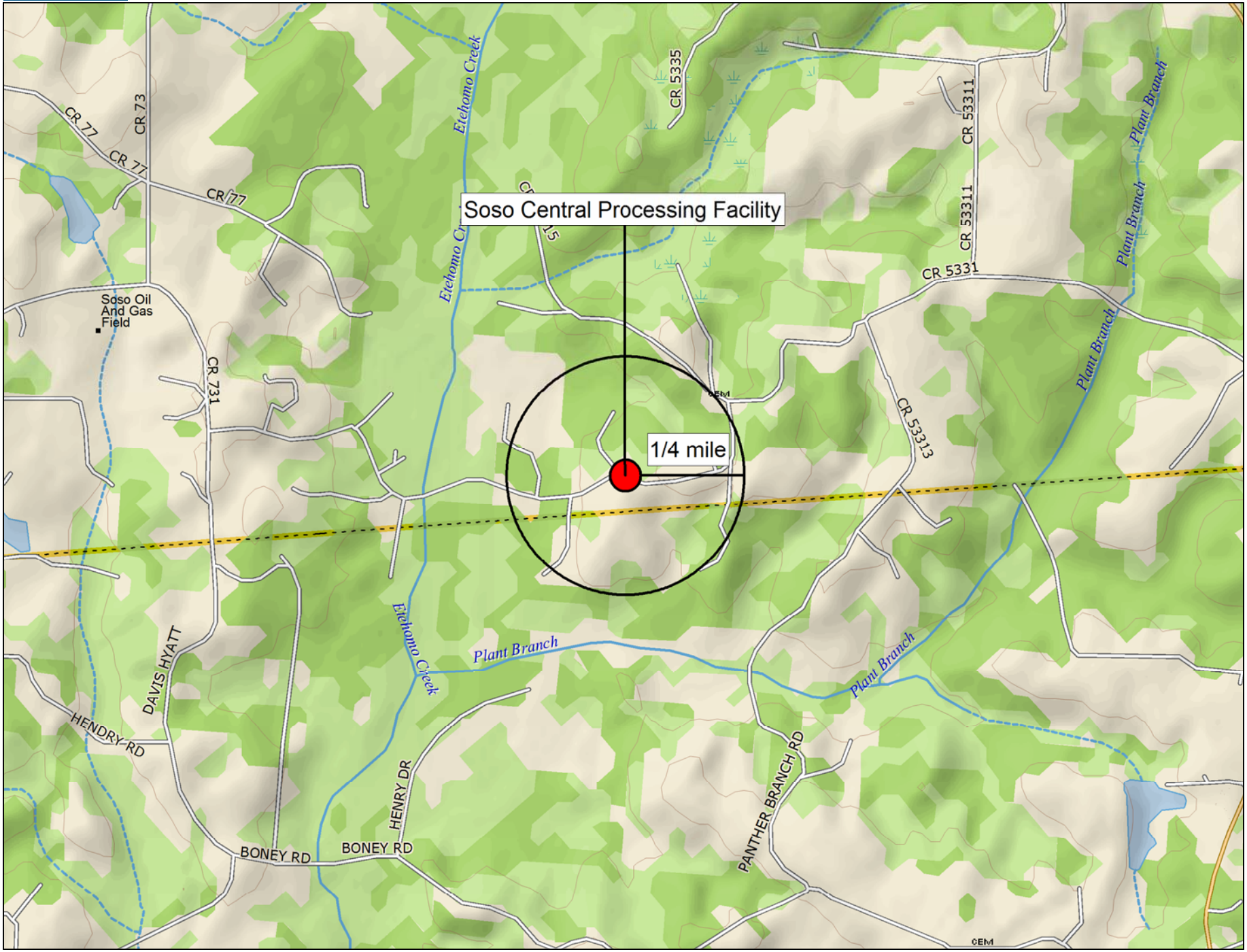
Rusty Shaw

Printed Name

Director of Regulatory Affairs

Title


Denbury Onshore, LLC
Soso Central Processing Facility
Legend
Soso Central Processing Facility
Soso Facility
Soso Central Processing Facility
Etehomo Creek
Panther Branch Rd
Google Earth
Image © 2025 Airbus
N
2000 ft



TN

MN (1.7°W)

Scale 1 : 20,000

0 600 1200 1800 2400 3000 ft

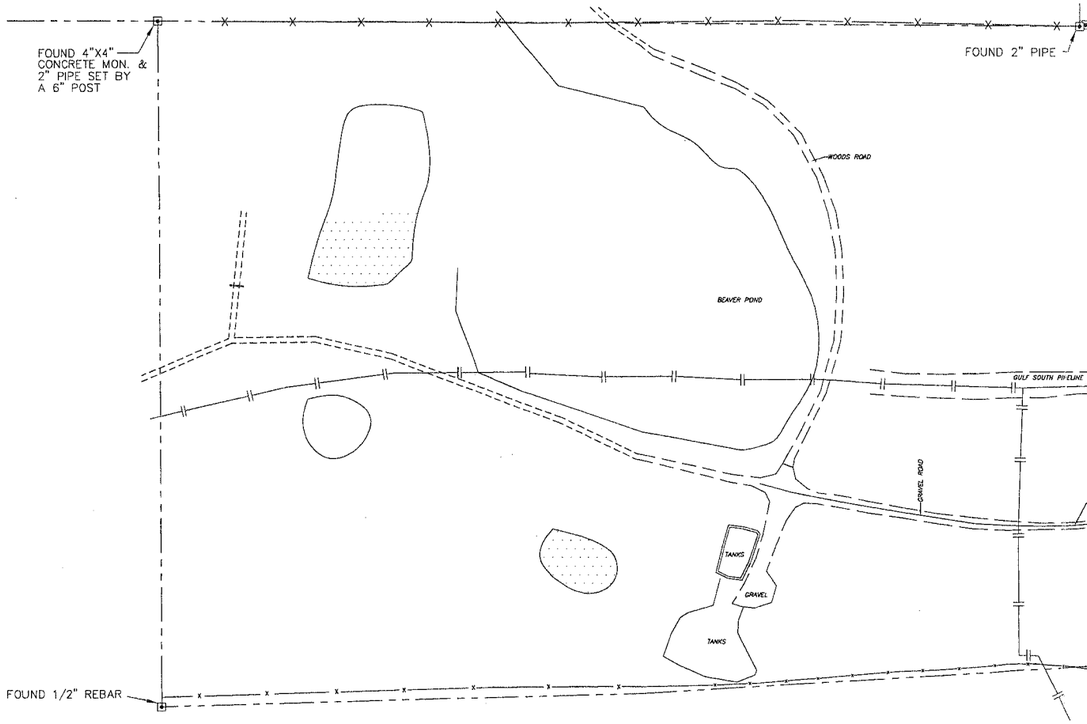
0 180 360 540 720 900 m

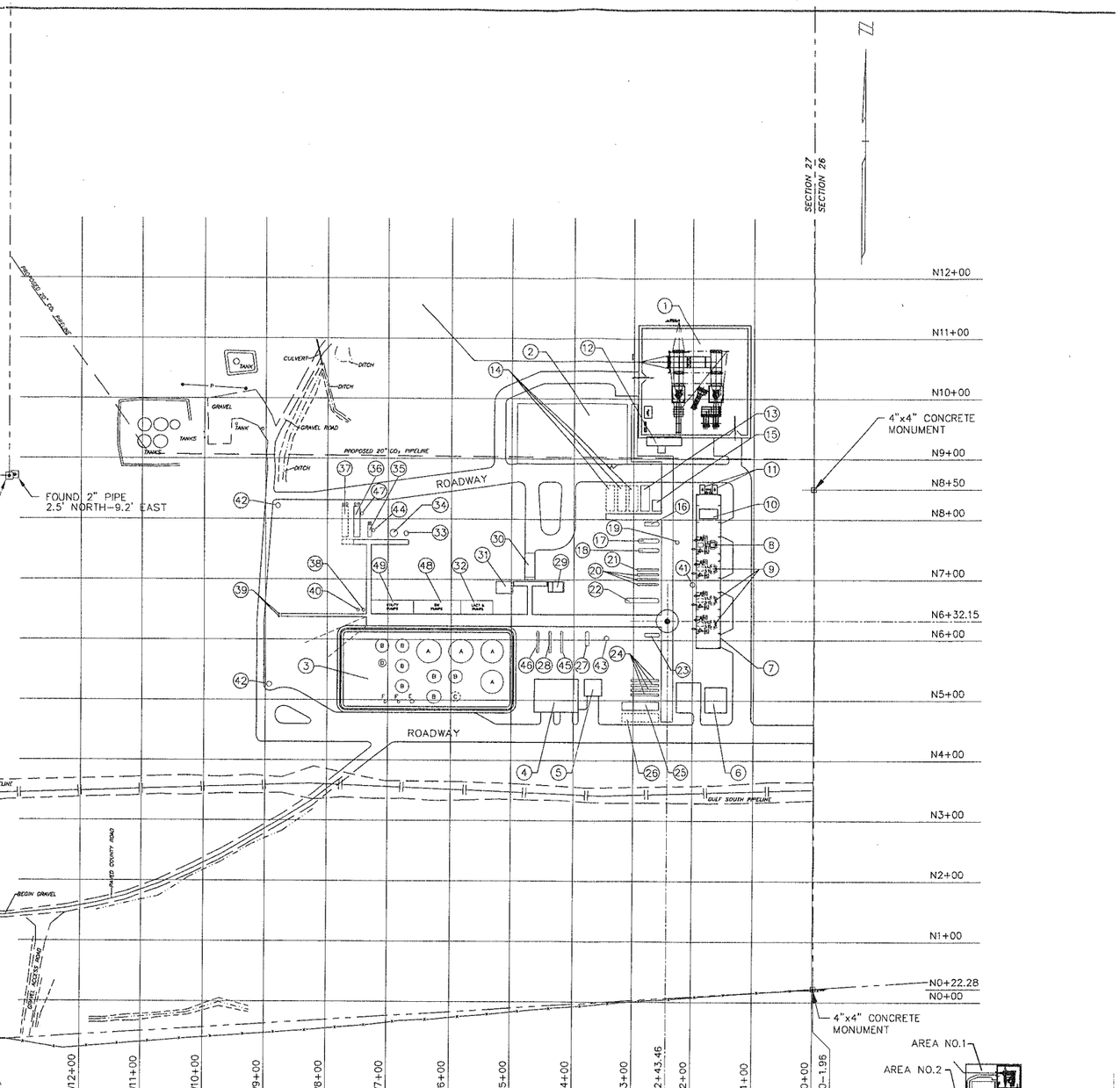
1" = 1,666.7 ft

Data Zoom 13-0

EQUIPMENT SCHEDULE

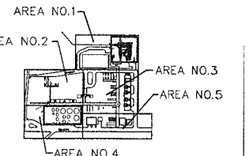
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
1	ELECTRICAL POWER SUB-STATION	15	L.P. COMPRESSOR COOLER	35	HEAT MEDIA HEATER (BAP-138)
2	FUTURE CO2 PIPELINE BOOSTER PUMPS	16	L.P. OIL FLASH VESSEL (MBD-104)	36	HEATER TREATER (NBK-105)
3	TANK AREA	17	L.P. SEPARATOR (MBD-101)	37	HEATER TREATER (FUTURE)
	A = 38'-8" DIA. STORAGE TANK	18	H.P. SEPARATOR (MBD-100)	38	L.P. RELIEF SCRUBBER (MBF-135)
	B = 21'-6" DIA. STORAGE TANK	19	H.P. COMPRESSOR SCRUBBER	39	FLARE STACK (ZZZ-180)
	C = 15'-6" DIA. STORAGE TANK (FUTURE)	20	FWKO ECONOMIZER HEAT EXCHANGER (HBG-110)	40	H.P. RELIEF SCRUBBER (MBF-136)
	D = 12'-0" DIA. STORAGE TANK	21	H.P. GAS ECON. HEAT EXCHANGER (HBG-141)	41	COMPRESSOR BLDG. SUMP (ZZZ-142)
	E = 6'-0" DIA. STORAGE TANK	22	H.P. FWKO (MAM-102)	42	DRAINAGE SUMPS (ZZZ-141A/B)
	F = 4'-0" DIA. STORAGE TANK	23	L.P. WATER FLASH VESSEL (MBM-103)	43	FUEL GAS SCRUBBER (MBF-116)
4	50'W x 70'L WAREHOUSE BUILDING	24	CO2 PIPELINE INJ. PUMPS (PAQ-126A/B/C/D)	44	HEAT MEDIA HEATER FUEL POT (MBL-185)
5	25'W x 30'L SHOP BUILDING	25	CO2 INJECTION AERIAL COOLER (HAL-160A/B)	45	L.P. OIL FLASH HEAT EXCHANGER (HBG-121)
6	35'W x 40'L OFFICE/CONTROL ROOM BUILDING	26	CO2 INJECTION AERIAL COOLER (FUTURE)	46	TREATER HEAT EXCHANGER (HBG-122)
7	40'W x 255'L COMPRESSOR BUILDING	27	WATER FLASH DRUM (MBM-140)	47	TREATER FUEL POT (MBL-020)
8	H.P. COMPRESSOR	28	L.P. OIL ECON. HEAT EXCHANGER (HBG-123)	48	SALTWATER PUMPS
9	H.P. COMPRESSORS (FUTURE)	29	SAND BLOWDOWN PIT (ZZZ-130)	49	UTILITY PUMPS
10	L.P. COMPRESSOR	30	TRUCK WELL		
11	AIR COMPRESSORS (OUTSIDE OF COMP. BLDG.)	31	API SEPARATOR (ZZZ-128)		
12	15'W x 60'L MCC BUILDING	32	LACT UNIT (ZAU-115)		
13	H.P. COMPRESSOR COOLER	33	API OIL DISPOSAL TREATER (NBK-109)		
14	H.P. COMPRESSORS COOLERS (FUTURE)	34	H.P. PROCESS HEATER (BAP-106)		





GENERAL PLANT LAYOUT AND PLOT PLAN

SCALE: 1" = 100'



KEY PLAN

NOTES:

No.	DRN. BY	CHK'D.	APP.	DATE	REVISION DESCRIPTION

W. H. LINDER & Associates, Inc. Consulting Engineers

METAIRIE, LA.
3330 W. ESPLANADE AVENUE, Suite 300
METAIRIE, LOUISIANA 70002
Tel: (504) 835-2577 Fax: (504) 837-5924

HOUSTON, TX.
507 N. SAM HOUSTON PKWY E., Suite 200
HOUSTON, TEXAS 77060
Tel: (281) 448-9665 Fax: (281) 448-9724

DATE:

Denbury Onshore, LLC

PROJECT MANAGER: RHR	DESCRIPTION: SOSO FIELD CO2 CENTRAL PROCESS FACILITY AREA: JASPER COUNTY, MISSISSIPPI		
AFE No.:	SO No.:	DATE: 2/18/05	DRN. BY: L. RODDY
SCALE: NOTED			
CADD. FILE: P:\3035M02\4500\009	CHANGED DATE:	DWG. No.: 009	
DRAWING TITLE: GENERAL PLANT LAYOUT AND PLOT PLAN		REV. No.: △	REV. DATE:

DWG: P:\3035M02\4500\WORKING\3035009_3-22-05.dwg USER: roddy_l
DATE: Mar 23, 2005 4:01pm

Denbury Onshore, LLC
Block Flow Diagram
Soso Field Central Production Facility

BAP-106
Line Heater
10 MMBTU/HR Process Duty
EPN: 1-05-LH-BS

NBK-105
Heater Treater
5.0 MMBTU/HR Process Duty
EPN: 2-05-HT-BS

BBJ-118
Oil Storage Tank
1500 BBL
EPN: 5-05-OST-V

ABM-120A/B
Skimmer Tank
1500 BBL
EPN: 7a-05-ST-CV
7b-05-ST-CV

ABJ-129A/B
Produced Water Tank
5000 BBL
EPN: 9a-05-WST-CV
9b-05-WST-CV

MAM-102
H.P. Freewater Knockout

MBD-104
L.P. Oil
Flash Vessel

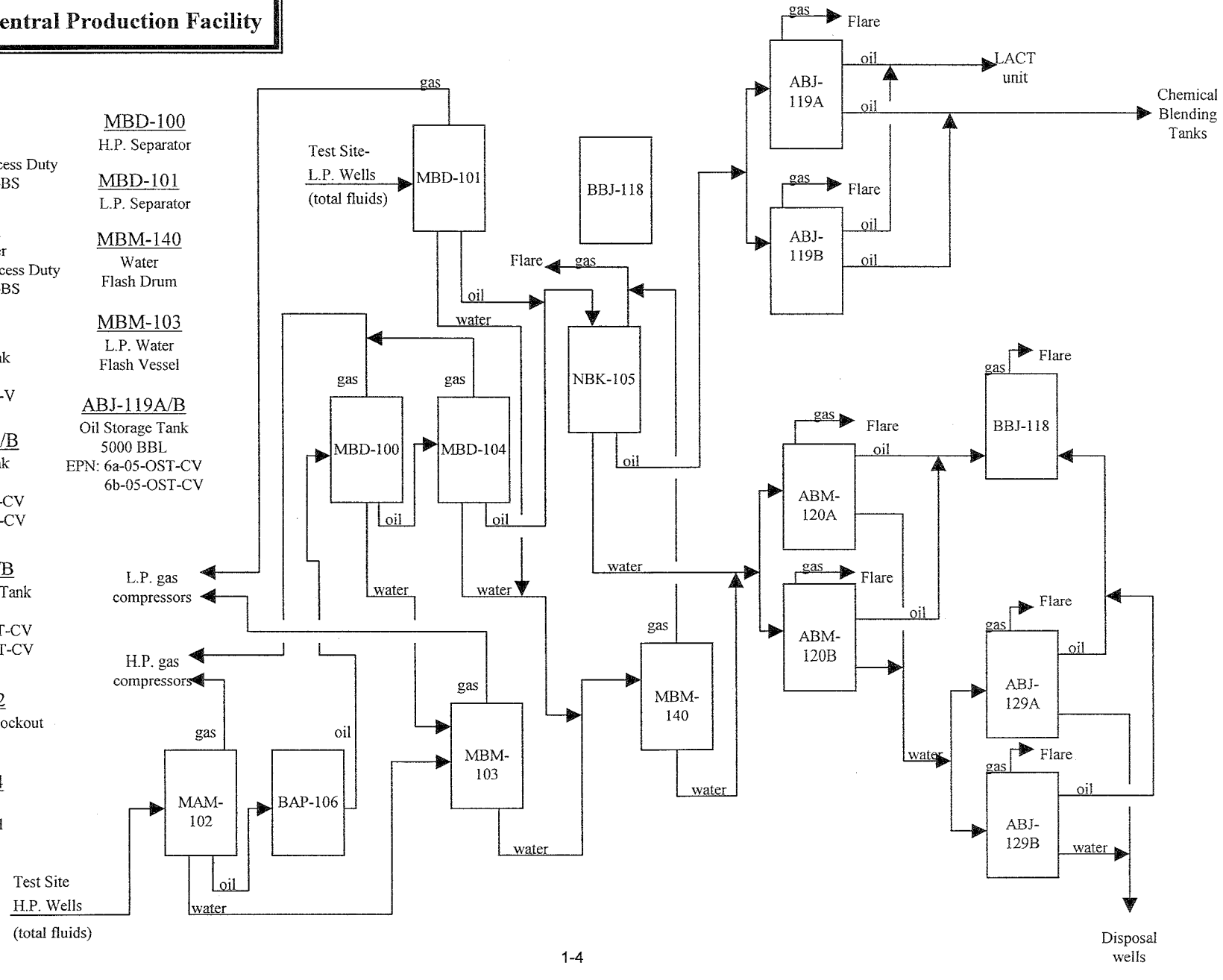
MBD-100
H.P. Separator

MBD-101
L.P. Separator

MBM-140
Water
Flash Drum

MBM-103
L.P. Water
Flash Vessel

ABJ-119A/B
Oil Storage Tank
5000 BBL
EPN: 6a-05-OST-CV
6b-05-OST-CV



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
2-05-HT-BS	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.00	0.06	0.26	0.05	0.22	0.00	0.01	0.00	0.00	-	-	0.00	0.00
4-05-SBP	-	-	-	-	-	-	-	-	-	-	-	-	1.26	0.46	0.00	0.00	-	-	0.09	0.03
5-05-OST-V	-	-	-	-	-	-	-	-	-	-	-	-	0.54	2.35	0.00	0.00	-	-	0.03	4.90
6a-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	46.73	204.69	0.00	0.00	-	-	2.92	12.81
6b-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	46.73	204.69	0.00	0.00	-	-	2.92	12.81
7a-05-ST-CV	-	-	-	-	-	-	-	-	-	-	-	-	8.87	38.89	0.00	0.00	-	-	0.56	2.44
8-05-SEP	-	-	-	-	-	-	-	-	-	-	-	-	0.76	3.31	0.00	0.00	-	-	0.07	0.30
9a-05-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.37	1.61	0.00	0.00	-	-	0.02	0.10
9c-05-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.10	0.00	0.00	-	-	0.00	0.01
9d-05-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.10	0.00	0.00	-	-	0.00	0.01
9e-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.18	0.81	0.00	0.00	-	-	0.01	0.05
10-05-CBT-V	-	-	-	-	-	-	-	-	-	-	-	-	2.19	9.59	0.00	0.00	-	-	0.14	0.63
11-05-CBT-V	-	-	-	-	-	-	-	-	-	-	-	-	2.19	9.59	0.00	0.00	-	-	0.14	0.63
13-05-ST	-	-	-	-	-	-	-	-	-	-	-	-	0.05	0.21	0.00	0.00	-	-	0.05	0.21
14-05-ST	-	-	-	-	-	-	-	-	-	-	-	-	0.01	0.04	0.00	0.00	-	-	0.01	0.04
15-05-ST	-	-	-	-	-	-	-	-	-	-	-	-	0.01	0.04	0.00	0.00	-	-	0.01	0.04
16-05-FE	-	-	-	-	-	-	-	-	-	-	-	-	0.32	1.38	0.00	0.00	-	-	0.01	0.05
17a-05-F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17b-05-F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18-05-CB	-	-	-	-	-	-	-	-	-	-	-	-	200.84	3.62	0.00	0.00	-	-	14.34	0.25
20-05-HT-WG	-	-	-	-	-	-	-	-	-	-	-	-	93.46	409.34	0.00	0.00	-	-	6.36	27.85
21-05-WFD-WG	-	-	-	-	-	-	-	-	-	-	-	-	5.75	25.19	0.00	0.00	-	-	0.39	1.71
22-10-LP-RG	-	-	-	-	-	-	-	-	-	-	-	-	13.49	59.08	0.00	0.00	-	-	1.12	4.90
Totals	**0.00**	**0.02**	**0.00**	**0.02**	**0.00**	**0.02**	**0.00**	**0.00**	**0.06**	**0.26**	**0.05**	**0.22**	**423.79**	**975.10**	**0.00**	**0.00**	**0.00**	**0.00**	**29.19**	**69.77**

[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
2-05-HT-BS	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.00	0.06	0.26	0.05	0.22	0.00	0.01	0.00	0.00	-	-
4-05-SBP	-	-	-	-	-	-	-	-	-	-	-	-	1.26	0.46	0.00	0.00	-	-
5-05-OST-V	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.01	0.00	0.00	-	-
6a-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.31	1.38	0.00	0.00	-	-
6b-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.31	1.38	0.00	0.00	-	-
7a-05-ST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.03	0.13	0.00	0.00	-	-
8-05-SEP	-	-	-	-	-	-	-	-	-	-	-	-	0.76	3.31	0.00	0.00	-	-
9a-05-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.01	0.00	0.00	-	-
9c-05-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
9d-05-WST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
9e-05-OST-CV	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
10-05-CBT-V	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
11-05-CBT-V	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
13-05-ST	-	-	-	-	-	-	-	-	-	-	-	-	0.05	0.21	0.00	0.00	-	-
14-05-ST	-	-	-	-	-	-	-	-	-	-	-	-	0.01	0.04	0.00	0.00	-	-
15-05-ST	-	-	-	-	-	-	-	-	-	-	-	-	0.01	0.04	0.00	0.00	-	-
16-05-FE	-	-	-	-	-	-	-	-	-	-	-	-	0.32	1.38	0.00	0.00	-	-
17a-05-F	0.04	0.16	0.04	0.16	0.04	0.16	0.00	0.00	0.16	0.69	1.36	5.95	2.24	9.82	0.00	0.00	-	-
17b-05-F	0.10	0.46	0.10	0.46	0.10	0.46	0.00	0.00	0.19	0.85	1.65	7.25	2.33	10.24	0.00	0.00	-	-
18-05-CB	-	-	-	-	-	-	-	-	-	-	-	-	200.84	3.62	0.00	0.00	-	-
20-05-HT-WG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21-05-WFD-WG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22-10-LP-RG	-	-	-	-	-	-	-	-	-	-	-	-	13.49	59.08	0.00	0.00	-	-
Totals	**0.14**	**0.64**	**0.14**	**0.64**	**0.14**	**0.64**	**0.00**	**0.00**	**0.41**	**1.80**	**3.06**	**13.42**	**221.96**	**91.12**	**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 ($C_2H_6S_2$).

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		2,2,4-Trimethylpentane		Benzene		Ethylbenzene		Formaldehyde		N-Hexane		Toluene		Xylene	
	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
2-05-HT-BS	0.00	0.00	-	-	0.00	0.00	-	-	0.00	0.00	0.00	0.00	-	-	-	-
4-05-SBP	0.09	0.03	0.00	0.00	0.02	0.01	0.00	0.00	-	-	0.07	0.02	0.00	0.00	0.00	0.00
5-05-OST-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
6a-05-OST-CV	0.02	0.08	0.00	0.00	0.00	0.01	0.00	0.00	-	-	0.02	0.07	0.00	0.00	0.00	0.00
6b-05-OST-CV	0.02	0.08	0.00	0.00	0.00	0.01	0.00	0.00	-	-	0.02	0.07	0.00	0.00	0.00	0.00
7a-05-ST-CV	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.01	0.00	0.00	0.00	0.00
8-05-SEP	0.07	0.30	0.00	0.00	0.00	0.00	0.00	0.00	-	-	0.07	0.30	0.00	0.00	0.00	0.00
9a-05-WST-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
9c-05-WST-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
9d-05-WST-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
9e-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
10-05-CBT-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
11-05-CBT-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
13-05-ST	0.05	0.21	-	-	-	-	-	-	-	-	0.05	0.21	-	-	-	-
14-05-ST	0.01	0.04	-	-	-	-	-	-	-	-	0.01	0.04	-	-	-	-
15-05-ST	0.01	0.04	-	-	-	-	-	-	-	-	0.01	0.04	-	-	-	-
16-05-FE	0.01	0.05	0.00	0.00	0.00	0.01	0.00	0.00	-	-	0.01	0.04	0.00	0.00	0.00	0.00
17a-05-F	0.13	0.57	0.00	0.00	0.02	0.07	0.00	0.00	-	-	0.11	0.50	0.00	0.00	0.00	0.00
17b-05-F	0.13	0.59	0.00	0.00	0.02	0.10	0.00	0.00	-	-	0.11	0.47	0.00	0.01	0.00	0.01
18-05-CB	14.34	0.25	0.00	0.00	2.90	0.05	0.03	0.00	-	-	10.77	0.19	0.42	0.01	0.22	0.00
20-05-HT-WG	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

Emission Point ID	Total HAPs		2,2,4-Trimethylpentane		Benzene		Ethylbenzene		Formaldehyde		N-Hexane		Toluene		Xylene	
	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
21-05-WFD-WG	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
22-10-LP-RG	1.12	4.91	0.00	0.01	0.24	1.05	0.00	0.01	-	-	0.84	3.67	0.02	0.08	0.02	0.09
Totals:	16.00	7.16	0.00	0.01	3.20	1.31	0.03	0.01	0.00	0.00	12.09	5.63	0.44	0.10	0.24	0.10

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**	**265**	**28**	**22,800**	**footnote 4**						
2-05-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	0.31	0.00	0.00						320.29
4-05-SBP	**mass GHG**	18.94	0.00	0.00	0.64	0.00	0.00					19.58	
	CO_2e	18.94	0.00	0.00	17.90	0.00	0.00						36.84
5-05-OST-V	**mass GHG**	0.02	0.00	0.00	0.00	0.00	0.00					0.02	
	CO_2e	0.02	0.00	0.00	0.00	0.00	0.00						0.02
6a-05-OST-CV	**mass GHG**	3.79	0.00	0.00	0.01	0.00	0.00					3.80	
	CO_2e	3.79	0.00	0.00	0.31	0.00	0.00						4.10
6b-05-OST-CV	**mass GHG**	3.79	0.00	0.00	0.01	0.00	0.00					3.80	
	CO_2e	3.79	0.00	0.00	0.31	0.00	0.00						4.10
7a-05-ST-CV	**mass GHG**	0.36	0.00	0.00	0.00	0.00	0.00					0.36	
	CO_2e	0.36	0.00	0.00	0.00	0.00	0.00						0.36
8-05-SEP	**mass GHG**	0.00	0.00	0.00	0.23	0.00	0.00					0.23	
	CO_2e	0.00	0.00	0.00	6.48	0.00	0.00						6.48
9a-05-WST-CV	**mass GHG**	0.01	0.00	0.00	0.00	0.00	0.00					0.01	
	CO_2e	0.01	0.00	0.00	0.00	0.00	0.00						0.01
9c-05-WST-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
9d-05-WST-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
9e-05-OST-CV	**mass GHG**	0.01	0.00	0.00	0.00	0.00	0.00					0.01	
	CO_2e	0.01	0.00	0.00	0.00	0.00	0.00						0.01
10-05-CBT-V	**mass GHG**	0.08	0.00	0.00	0.00	0.00	0.00					0.08	
	CO_2e	0.08	0.00	0.00	0.00	0.00	0.00						0.08
11-05-CBT-V	**mass GHG**	0.08	0.00	0.00	0.00	0.00	0.00					0.08	
	CO_2e	0.08	0.00	0.00	0.00	0.00	0.00						0.08
13-05-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
14-05-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
15-05-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
16-05-FE	**mass GHG**	30.21	0.00	0.00	1.03	0.00	0.00					31.24	
	CO_2e	30.21	0.00	0.00	28.70	0.00	0.00						58.92

		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**	**265**	**28**	**22,800**	**footnote 4**						
17a-05-F	**mass GHG**	2541.62	0.00	0.00	0.26	0.00	0.00					2541.89	
	CO_2e	2541.62	0.00	0.00	7.41	0.00	0.00						2549.03
17b-05-F	**mass GHG**	5710.13	0.00	0.00	1.58	0.00	0.00					5711.70	
	CO_2e	5710.13	0.00	0.00	44.14	0.00	0.00						5754.26
18-05-CB	**mass GHG**	148.46	0.00	0.00	5.02	0.00	0.00					153.47	
	CO_2e	148.46	0.00	0.00	140.43	0.00	0.00						288.89
20-05-HT-WG	**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
21-05-WFD-WG	**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
22-10-LP-RG	**mass GHG**	239.80	0.00	0.00	1.34	0.00	0.00					241.14	
	CO_2e	239.80	0.00	0.00	37.65	0.00	0.00						277.45
FACILITY TOTAL	**mass GHG**	**9017.28**	**0.00**	**0.00**	**10.13**	**0.00**	**0.00**					**9027.41**	**0.00**
	CO_2e	**9017.28**	**0.00**	**0.00**	**283.65**	**0.00**	**0.00**					**0.00**	**9300.93**

[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.

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. (^{o}F)	Inside Diameter or Dimensions (ft)	Velocity (ft/sec)	Moisture by Volume (%)	Geographic Position (degrees/minutes/seconds)	
									Latitude	Longitude
2-05-HT-BS	V	No	20±	350±	500	2.0	1.17	0	31 48 19.27	89 17 03.09
5-05-OST-V	V	No	24±	350±	80	0.6	<0.01	0	31 48 19.27	89 17 03.09
6a-05-OST-CV	V	No	24±	350±	80	0.6	0.01	0	31 48 19.27	89 17 03.09
6b-05-OST-CV	V	No	24±	350±	80	0.6	0.01	0	31 48 19.27	89 17 03.09
7a-05-ST-CV	V	No	24±	350±	80	0.6	<0.01	0	31 48 19.27	89 17 03.09
9a-05-WST-CV	V	No	24±	350±	80	0.6	<0.01	0	31 48 19.27	89 17 03.09
9c-05-WST-CV	V	No	24±	350±	80	0.6	<0.01	0	31 48 19.27	89 17 03.09
9d-05-WST-CV	V	No	24±	350±	80	0.6	<0.01	0	31 48 19.27	89 17 03.09
9e-05-OST-CV	V	No	24±	350±	80	0.6	<0.01	0	31 48 19.27	89 17 03.09
10-05-CBT-V	V	No	24±	350±	80	0.6	<0.01	0	31 48 19.27	89 17 03.09
11-05-CBT-V	V	No	24±	350±	80	0.6	<0.01	0	31 48 19.27	89 17 03.09
13-05-ST	H	No	10±	350±	80	5.9	<0.01	0	31 48 19.27	89 17 03.09
14-05-ST	H	No	5±	350±	80	4.0	<0.01	0	31 48 19.27	89 17 03.09
15-05-ST	H	No	5±	350±	80	4.0	<0.01	0	31 48 19.27	89 17 03.09
17a-05-F	V	No	25±	350±	1500	0.5	373.35	0	31 48 19.27	89 17 03.09
17b-05-F	V	No	25±	350±	1500	0.5	712.51	0	31 48 19.27	89 17 03.09

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

Denbury Onshore, LLC
Soso Central Processing Facility
Jasper County, MS

Section B.6: EMISSION POINT SOURCE LIST

Emission Point ID:	MDEQ EPN:	Footnote:	Emission Point Description:	Routes To:	Operating Rate/Capacity	Operating Schedule:		
						Hrs/Day or (Hrs/Yr)	Days/Wk	Wks/Yr
2-05-HT-BS	AA-002		500 MBTU/Hr Heater Treater-Burner Stack (NBK-105)		500 MBTU/Hr	24	7	52.143
4-05-SBP	AA-004		Sand Blowdown Pit (ZZZ-130)		50 BBLs/Hr Brine	(730)	-	-
5-05-OST-V	AA-005	a	1500 BBL Wet Oil Tank-Common Vent (BBJ-118)	17a-05-F	3,000 BOPY	24	7	52.143
6a-05-OST-CV	AA-006	a	5000 BBL Dry Oil Tank-Common Vent (ABJ-119A)	17a-05-F	365,000 BOPY	24	7	52.143
6b-05-OST-CV	AA-007	a	5000 BBL Dry Oil Tank-Common Vent (ABJ-119B)	17a-05-F	365,000 BOPY	24	7	52.143
7a-05-ST-CV	AA-008	a	2000 BBL Skimmer Tank-Vent (ABM-120A)	17a-05-F	2,737,500 BWPY & 2,737.5 BOPY	24	7	52.143
8-05-SEP	AA-010		API Separator-Vent (ZZZ-128)		292,000 BWPY & 2,007.5 BOPY	24	7	52.143
9a-05-WST-CV	AA-011	a	5000 BBL Produced Water Tank-Common Vent (ABJ-129A)	17a-05-F	2,737,500 BWPY	24	7	52.143
9c-05-WST-CV	AA-013	a	400 BBL Water Disposal Tank-Common Vent (ABJ-165A)	17a-05-F	146,000 BWPY	24	7	52.143
9d-05-WST-CV	AA-014	a	400 BBL Water Disposal Tank-Common Vent (ABJ-165B)	17a-05-F	146,000 BWPY	24	7	52.143
9e-05-OST-CV	AA-015	a	400 BBL Oil Disposal Tank-Common Vent (ABJ-108)	17a-05-F	2,007.5 BOPY	24	7	52.143
10-05-CBT-V	AA-016	a	1500 BBL Chemical Blending Tank-Vent (BBJ-133A)	17a-05-F	36,500 BOPY	24	7	52.143
11-05-CBT-V	AA-017	a	1500 BBL Chemical Blending Tank-Vent (BBJ-133B)	17a-05-F	36,500 BOPY	24	7	52.143
13-05-ST	AA-019		2000 Gallon Chemical Storage Tank		30,000 Gallons/Yr	24	7	52.143
14-05-ST	AA-020		500 Gallon Chemical Storage Tank		4,000 Gallons/Yr	24	7	52.143
15-05-ST	AA-021		500 Gallon Chemical Storage Tank		4,000 Gallons/Yr	24	7	52.143
16-05-FE	AA-029		Fugitive Emissions		N/A	24	7	52.143
17a-05-F	AA-024	b	Atmospheric Control Flare (ZZZ-190B)		29.0 MMSCF/Yr	24	7	52.143
17b-05-F	AA-025	c	Atmospheric Control Flare (ZZZ-190A)		82.9 MMSCF/Yr	24	7	52.143
18-05-CB	AA-027		Compressor Blowdowns		2.86 MMSCF/Yr	(36)	-	-
20-05-HT-WG	AA-022	d	Heater Treater-Flash Gas	17b-05-F	75.6 MMSCF/Yr	24	7	52.143

Emission Point ID:	MDEQ EPN:	Footnote:	Emission Point Description:	Routes To:	Operating Rate/Capacity	Operating Schedule:		
						Hrs/Day or (Hrs/Yr)	Days/Wk	Wks/Yr
21-05-WFD-WG	AA-023	d	Water Flash Drum-Flash Gas	17b-05-F	4.65 MMSCF/Yr	24	7	52.143
22-10-LP-RG	AA-026	e	Low Pressure Relief Gas		5.00 MMSCF/Yr	24	7	52.143

Footnotes:

a *Vapors from this source are routed to the atmospheric control flare (EPN: 17a-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, pilot gas, and assist 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 & water flash drums, pilot gas, and assist 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: 17b-05-F) for combustion.*

e *Relief gas accounts for any venting associated with gas surges in the low pressure compressor system.*

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 [2-05HT-BS (NBK-105)]

B. Equipment Description: 500 MBTU/Hr Heater Treater-Burner Stack

C. Manufacturer: Unknown D. Date of Manufacture and No.: Unknown

E. Maximum Heat Input (higher heating value): 0.5 MMBtu/hr F. Nominal Heat Input Capacity: 0.5 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
Field Gas	1037 BTU/ft^3	<0.0007	N/A	602.70 scf	5.28 MMscf

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

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 [5-05-OST-V (BBJ-118)]

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 or After

2. Tank Data

A. Tank Specifications:

1.	Design capacity	63,000	gallons		
2.	True vapor pressure at storage temperature:	5.539	psia @	69.12	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	6.362	psia @	77.20	ºF
4.	Reid vapor pressure at storage temperature:	7.16	psia @	69.12	ºF
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: 17a-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

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: 24.10 feet
2. Shell Diameter: 21.50 feet
3. Maximum Liquid Height: 23.10 feet
4. Average Liquid Height: 11.55 feet
5. Working Volume: 63,000 gal
6. Turnovers per year: 2.01
7. Maximum throughput: 3,000.00 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: 0.67 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

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

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	0.31*	2.04*	2.35*

**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-006 & AA-007 [6a-05-OST-CV & 6b-05-OST-CV (ABJ-119A & ABJ-119B)]

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 or After

2. Tank Data

A. Tank Specifications:

1.	Design capacity	210,000	gallons		
2.	True vapor pressure at storage temperature:	5.577	psia @	69.51	°F
3.	Maximum true vapor pressure (as defined in §60.111b)	6.404	psia @	77.58	°F
4.	Reid vapor pressure at storage temperature:	7.16	psia @	69.51	°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: 17a-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

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: 24.00 feet
2. Shell Diameter: 38.70 feet
3. Maximum Liquid Height: 23.00 feet
4. Average Liquid Height: 11.50 feet
5. Working Volume: 210,000 gal
6. Turnovers per year: 75.74
7. Maximum throughput: 365,000.00 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: 1.21 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	37.54*	6.66*	44.20*

**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-008 [7a-05-OST-CV (ABM-120A)]

B. Product(s) Stored: Produced Water & 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 or After

2. Tank Data

A. Tank Specifications:

1.	Design capacity	84,000	gallons		
2.	True vapor pressure at storage temperature:	0.363	psia @	69.59	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	0.476	psia @	77.69	ºF
4.	Reid vapor pressure at storage temperature:	7.16	psia @	69.59	ºF
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	18.51	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: 17a-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

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: 16.10 feet
2. Shell Diameter: 29.70 feet
3. Maximum Liquid Height: 15.10 feet
4. Average Liquid Height: 7.55 feet
5. Working Volume: 84,000 gal
6. Turnovers per year: 1470.55
7. Maximum throughput: 2,740,237.50 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: 0.93 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

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

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	19.35*	0.24*	19.59*

**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-010 [8-05-SEP (ZZZ-128)]

B. Product(s) Stored: Produced Water & 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 or After

2. Tank Data

A. Tank Specifications:

1.	Design capacity	50,000±	gallons		
2.	True vapor pressure at storage temperature:	0.383	psia @	68.77	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	0.497	psia @	76.84	ºF
4.	Reid vapor pressure at storage temperature:	7.16	psia @	68.77	ºF
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	21.15	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.

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

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: 40.00 feet
B. Shell Diameter: 20.00 feet
C. Working Volume: 50,000± gal
D. Maximum Throughput: 294,007.50 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: _____ feet
2. Shell Diameter: _____ feet
3. Maximum Liquid Height: _____ feet
4. Average Liquid Height: _____ feet
5. Working Volume: _____ gal
6. Turnovers per year: _____
7. Maximum throughput: _____ 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: _____ 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	3.31	0.00	3.31

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 [9a-05-WST-CV (ABJ-129A)]

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 or After

2. Tank Data

A. Tank Specifications:

1.	Design capacity	210,000	gallons		
2.	True vapor pressure at storage temperature:	0.357	psia @	69.51	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	0.468	psia @	77.58	ºF
4.	Reid vapor pressure at storage temperature:	0.357	psia @	69.51	ºF
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: 17a-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

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: 24.00 feet
2. Shell Diameter: 38.70 feet
3. Maximum Liquid Height: 23.00 feet
4. Average Liquid Height: 11.50 feet
5. Working Volume: 210,000 gal
6. Turnovers per year: 568.05
7. Maximum throughput: 2,737,500 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: 1.21 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

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

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	1.43*	0.19*	1.62*

**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-013 & AA-014 [9c-05-WST-CV & 9d-05-WST-CV (ABM-165A & ABM-165B)]

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 or After

2. Tank Data

A. Tank Specifications:

1.	Design capacity	16,800	gallons		
2.	True vapor pressure at storage temperature:	0.349	psia @	68.87	°F
3.	Maximum true vapor pressure (as defined in §60.111b)	0.459	psia @	76.95	°F
4.	Reid vapor pressure at storage temperature:	0.349	psia @	68.87	°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: 17a-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

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: 20.00 feet
2. Shell Diameter: 12.00 feet
3. Maximum Liquid Height: 19.00 feet
4. Average Liquid Height: 9.50 feet
5. Working Volume: 16,800 gal
6. Turnovers per year: 381.43
7. Maximum throughput: 146,000 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

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

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	0.08*	0.02*	0.10*

**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 [9e-05-OST-CV (ABJ-108)]

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 or After

2. Tank Data

A. Tank Specifications:

1.	Design capacity	16,800	gallons		
2.	True vapor pressure at storage temperature:	5.515	psia @	68.87	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	6.335	psia @	76.95	ºF
4.	Reid vapor pressure at storage temperature:	7.16	psia @	68.87	ºF
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: 17a-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

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: 20.00 feet
2. Shell Diameter: 12.00 feet
3. Maximum Liquid Height: 19.00 feet
4. Average Liquid Height: 9.50 feet
5. Working Volume: 16,800 gal
6. Turnovers per year: 5.23
7. Maximum throughput: 2,000 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

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	0.20*	0.61*	0.81*

**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-016 & AA-017 [10-05-CBT-V & 11-05-CBT-V (BBJ-133A & BBJ-133B)]

B. Product(s) Stored: Produced Oil, Corrosion Inhibitor, Paraffin Inhibitor, Asphaltene Inhibitor

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

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

2. Tank Data

A. Tank Specifications:

1.	Design capacity	63,000	gallons		
2.	True vapor pressure at storage temperature:	5.540	psia @	69.12	°F
3.	Maximum true vapor pressure (as defined in §60.111b)	6.362	psia @	77.20	°F
4.	Reid vapor pressure at storage temperature:	7.16	psia @	69.12	°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: 17a-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

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: 24.00 feet
2. Shell Diameter: 21.50 feet
3. Maximum Liquid Height: 23.00 feet
4. Average Liquid Height: 11.50 feet
5. Working Volume: 63,000 gal
6. Turnovers per year: 24.54
7. Maximum throughput: 36,500 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

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

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

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	3.73*	2.04*	5.77*

**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-019 [13-05-ST]

B. Product(s) Stored: Organic Chemical Blend (Assumes 100% N-Hexane as worst case)

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

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

2. Tank Data

A. Tank Specifications:

1.	Design capacity	2,000	gallons		
2.	True vapor pressure at storage temperature:	2.552	psia @	71.38	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	3.276	psia @	81.73	ºF
4.	Reid vapor pressure at storage temperature:	2.552	psia @	71.38	ºF
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	86.18	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.

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

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: 10.00 feet
B. Shell Diameter: 5.90 feet
C. Working Volume: 2,000 gal
D. Maximum Throughput: 30,000 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: _____ feet
2. Shell Diameter: _____ feet
3. Maximum Liquid Height: _____ feet
4. Average Liquid Height: _____ feet
5. Working Volume: _____ gal
6. Turnovers per year: _____
7. Maximum throughput: _____ 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: _____ 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	0.07	0.14	0.21

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-020 & AA-021 [14-05-ST & 15-05-ST]

B. Product(s) Stored: Organic Chemical Blend (Assumes 100% N-Hexane as worst case)

C. Status: ☒ Operating ☐ Proposed ☐ Under Construction

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

2. Tank Data

A. Tank Specifications:

1.	Design capacity	500	gallons		
2.	True vapor pressure at storage temperature:	2.570	psia @	71.67	ºF
3.	Maximum true vapor pressure (as defined in §60.111b)	3.299	psia @	82.02	ºF
4.	Reid vapor pressure at storage temperature:	2.570	psia @	71.67	ºF
5.	Density of product at storage temperature:	N/A	lb/gal		
6.	Molecular weight of product vapor at storage temp.	86.18	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.

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

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: 5.00 feet
B. Shell Diameter: 4.00 feet
C. Working Volume: 500 gal
D. Maximum Throughput: 4,000 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: _____ feet
2. Shell Diameter: _____ feet
3. Maximum Liquid Height: _____ feet
4. Average Liquid Height: _____ feet
5. Working Volume: _____ gal
6. Turnovers per year: _____
7. Maximum throughput: _____ 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: _____ 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	0.01	0.03	0.04

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-024 [17a-05-F (ZZZ-190B)]

B. Equipment Description (include the process(es) that the flare controls emissions from): Control flare to combust emissions from storage tanks (EPNs: 5-05-OST-V, 6a-05-OST-CV, 6b-05-OST-CV, 7a-05-ST-CV, 9a-05-WST-CV, 9c-05-WST-CV, 9d-05-WST-CV, 9e-05-OST-CV, 10-05-CBT-V, & 11-05-CBT-V).

C. Manufacturer: Unknown D. Model: Unknown

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: 761 Btu/scf

3. Design exit velocity: 374 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-ignitor.*

*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-025 [17b-05-F (ZZZ-190A)]

B. Equipment Description (include the process(es) that the flare controls emissions from): Control flare to combust emissions from heater treater flash gas (EPN: 20-05-HT-WG) and water flash drum flash gas (EPN: 21-05-WFD-WG).

C. Manufacturer: Unknown D. Model: Unknown

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: 325 Btu/scf

3. Design exit velocity: 713 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-ignitor.*

*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
2-05-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R. 1.3.A.	2005	2005	N/A
2-05-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R. 1.3.B.	2005	2005	N/A
2-05-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R. 1.3.D(1)(a)	2005	2005	N/A
2-05-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R. 1.3.D(1)(b)	2005	2005	N/A
2-05-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R. 1.4.A(1)	2005	2005	N/A
4-05-SBP *Sand Blowdown Pit*	11 Miss. Admin. Code Pt. 2, R.2.2.B(10).	2005	2005	N/A
17a-05-F *Control Flare* 17b-05-F *Control Flare*	11 Miss. Admin. Code Pt. 2, R.1.4.B(2)	2005	2005	N/A
17a-05-F *Control Flare* 17b-05-F *Control Flare*	11 Miss. Admin. Code Pt. 2, R.2.2.B(10).	2005	2005	N/A
17a-05-F *Control Flare* 17b-05-F *Control Flare*	11 Miss. Admin. Code Pt. 2, R.2.2.B(11).	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
2-05-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R. 1.3.A.	Opacity	40%	N/A
2-05-HT-BS *Heater Treater*	11 Miss Admin Code Pt. 2, R. 1.3 B.	Opacity	Equivalent Opacity	N/A
2-05-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R. 1.3. D(1)(a).	PM	0.6 lb/MMBTU	N/A
2-05-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
2-05-HT-BS *Heater Treater*	11 Miss. Admin. Code Pt. 2, R.1.4.A(1).	SO_2	4.8 lbs/MMBTU	N/A
4-05-SBP *Sand Blowdown Pit*	11 Miss. Admin. Code Pt. 2, R.2.2.B(10).	VOC	Sand Blowdown Operating Limits	The sand blowdown pit will operate no more than 730 hours during a 12-month period.
17a-05-F *Control Flare* 17b-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.

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
17a-05-F *Control Flare* 17b-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.

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Compliance Plan — Section OPGP-G

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EMISSION UNIT (Ref No.)	APPLICABLE REQUIREMENT (Specific Regulatory citation)	POLLUTANT	LIMITS/ REQUIREMENTS	TEST METHOD/ COMPLIANCE MONITORING
17a-05-F *Control Flare* 17b-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: ***2-05-HT-BS***

EMISSION SOURCE DESCRIPTION: ***500 MBTU/Hr Heater Treater-Burner Stack (NBK-105)***

DATA:

Emission Source:	***External Combustion Burner***
Annual Hours of Operation:	***8760***
Maximum Burner Rating (MMBTU/Hr):	***0.5***
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:	***Field 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 annual 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), refer to supporting documentation.
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

POLLUTANT:	EMISSION FACTOR (LBS/10^6 SCF)	CALCULATED EMISSION RATES:	
		Hourly (lb/hr)	Annual (TPY)
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
Benzo(g,h,I)perylene (TAP)	0.0000012	0.0000	0.0000
Benzo(k)fluoranthene (TAP)	0.0000018	0.0000	0.0000
Chrysene (TAP)	0.0000018	0.0000	0.0000
Dibenzo(a,h)anthrancene (TAP)	0.0000012	0.0000	0.0000
Dichlorobenzene (TAP)	0.0012000	0.0000	0.0000
Fluorathene (TAP)	0.0000030	0.0000	0.0000
Fluorene (TAP)	0.0000028	0.0000	0.0000
Formaldehyde (TAP)	0.0750000	0.0000	0.0002
Hexane (TAP)	1.8000000	0.0011	0.0048
Indeno(1,2,3-cd)pyrene (TAP)	0.0000018	0.0000	0.0000
Naphthalene (TAP)	0.0006100	0.0000	0.0000
Phenanathrene (TAP)	0.0000170	0.0000	0.0000
Pyrene (TAP)	0.0000050	0.0000	0.0000
Toluene (TAP)	0.0034000	0.0000	0.0000
Arsenic (TAP)	0.0002000	0.0000	0.0000
Beryllium (TAP)	0.0000120	0.0000	0.0000
Cadmium (TAP)	0.0011000	0.0000	0.0000
Chromium (TAP)	0.0014000	0.0000	0.0000
Cobalt (TAP)	0.0000840	0.0000	0.0000
Manganese (TAP)	0.0003800	0.0000	0.0000
Mercury (TAP)	0.0002600	0.0000	0.0000
Nickel (TAP)	0.0021000	0.0000	0.0000
Selenium (TAP)	0.0000240	0.0000	0.0000
Total TAPs		0.00	0.00
Total VOC-TAPs		0.00	0.00
Total Non VOC & Non TAP-HC		0.00	0.01
Total VOC		**0.00**	**0.01**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***4-05-SBP***

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

DATA:

Emission Source:	***Flash Gas from Brine Solution****
Approx. Pressure Drop of Brine Solution: (psig)	***1000***
Approx. Temperature of Brine Solution: (ºF)	***80***
Flash Gas Specific Gravity:	***1.4505***
Avg. Water Throughput: (BBL/Hr)	***50***
Max. Water Throughput: (BBL/Hr)	***50***
Blowdown Hours per Year:	***730***
Gas to Water Ratio: (SCF/BBL of Brine; GWR)	***10.0***
Basis of Emission Estimates:	***API Documentation & Actual Inlet Gas Analysis (Refer to supporting documentation)***
Flash Gas Analysis Report Number:	***Southern Petroleum Laboratories Report No.: 172-23110338-001A***

**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	=	**55.41**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Avg. Emissions * Ratio of Max. Water Rate to Avg. Water Rate	=	**55.41**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * Blowdown Hours/2000	=	**20.22**

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". 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 the referenced analysis.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.4749	0.2631	0.2631	0.0960
Carbon Dioxide (excluded from VOC total)	93.6476	51.8893	51.8893	18.9399
Methane (excluded from VOC total)	3.1626	1.7524	1.7524	0.6396
Ethane (excluded from VOC total)	0.4346	0.2408	0.2408	0.0879
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	0.4491	0.2488	0.2488	0.0908
Iso-Butane	0.2795	0.1549	0.1549	0.0565
N-Butane	0.4498	0.2492	0.2492	0.0910
Iso-Pentane	0.2332	0.1292	0.1292	0.0472
N-Pentane	0.2467	0.1367	0.1367	0.0499
Iso-Hexane	0.1663	0.0921	0.0921	0.0336

N-Hexane (TAP)	0.1223	0.0678	0.0678	0.0247
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0329	0.0182	0.0182	0.0067
Cyclohexane	0.0395	0.0219	0.0219	0.0080
Heptanes	0.1194	0.0662	0.0662	0.0241
Methylcyclohexane	0.0244	0.0135	0.0135	0.0049
Toluene (TAP)	0.0048	0.0027	0.0027	0.0010
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.0571	0.0316	0.0316	0.0115
Ethylbenzene (TAP)	0.0003	0.0002	0.0002	0.0001
Xylenes (TAP)	0.0025	0.0014	0.0014	0.0005
Nonanes	0.0331	0.0183	0.0183	0.0067
Decanes Plus	0.0194	0.0107	0.0107	0.0039
Total Weight Percent:	100.0000			
Total TAP Emissions		0.09	0.09	0.03
Total VOC Emissions		**1.26**	**1.26**	**0.46**
Total Non VOC & Non TAP-HC		1.99	1.99	0.73
Total Emissions		55.41	55.41	20.22

Uncontrolled VOC Emission Total (TPY)	Brine Flash Gas	=	**0.46**

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: 17a-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: ***5-05-OST-V***

EMISSION SOURCE DESCRIPTION: ***1500 BBL Wet Oil Tank-Common Vent (BBJ-118)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***8.22***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***8.22***
Average VOC Working Losses - L_W (lb/yr):	***613.812***
Average VOC Standing Losses - L_S (lb/yr):	***4,076.421***
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) * 3.7861/8760	=	**2.03**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 3.7861/8760	=	**2.03**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**8.88**

SPECIATION FACTORS:

The composition of this gas is based on an actual analysis of the vapors routed to the control flare and normalized to account for the removal of Nitrogen; refer to Southern Petroleum Laboratories Report No.: 172-24050250-002A 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)	0.0000	0.0000	0.0000	0.0000
Carbon Dioxide (excluded from VOC total)	72.5466	1.4706	1.4706	6.4414
Methane (excluded from VOC total)	0.1951	0.0040	0.0040	0.0173
Ethane (excluded from VOC total)	0.8462	0.0172	0.0172	0.0751
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	3.4822	0.0706	0.0706	0.3092
Iso-Butane	3.6364	0.0737	0.0737	0.3229
N-Butane	6.3922	0.1296	0.1296	0.5676
Iso-Pentane	3.6708	0.0744	0.0744	0.3259
N-Pentane	3.7304	0.0756	0.0756	0.3312
Iso-Hexane	2.3254	0.0471	0.0471	0.2065
N-Hexane (TAP)	1.4238	0.0289	0.0289	0.1264
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.2061	0.0042	0.0042	0.0183

Cyclohexane	0.3260	0.0066	0.0066	0.0289
Heptanes	0.8409	0.0170	0.0170	0.0747
Methylcyclohexane	0.1234	0.0025	0.0025	0.0110
Toluene (TAP)	0.0116	0.0002	0.0002	0.0010
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.1579	0.0032	0.0032	0.0140
Ethylbenzene (TAP)	0.0009	0.0000	0.0000	0.0001
Xylenes (TAP)	0.0100	0.0002	0.0002	0.0009
Nonanes	0.0641	0.0013	0.0013	0.0057
Decanes Plus	0.0100	0.0002	0.0002	0.0009
Total Weight Percent:	100.0000			
Total TAP Emissions		0.03	0.03	0.15
Total VOC Emissions		**0.54**	**0.54**	**2.35**
Total Non VOC & Non TAP-HC		0.02	0.02	0.09
Total Hydrocarbon Emissions		2.03	2.03	8.88

DATA:

Emission Source:	***Blanket Gas***
Average Annual Tank Throughput (BBLs/Yr):	***3,000***
Gross Blanket Gas Required (MSCF/Yr):	***17***
Gas from Process to Tank(s) (MSCF/Yr):	***90,942***
Calculated Volume Requirement (MSCF/Yr):	***-90,925***

**There are no emissions associated with supplied blanket gas as flash generated from the heater treater and other storage tanks should be sufficient to maintain the gas blanket as demonstrated herein.*

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Blanket Gas	=	**2.35**

DATA:

Emission Source:	***Losses When Opening Thief Hatches***
Specific Gravity of Gas:	***1.6384***
Maximum Thief Hatch Venting (Hrs/Yr) **(Under Normal/Routine Operating Conditions)**	***30***
Max. Minutes a Hatch is Opened in a Single Hour:	***5***
Maximum Hourly Emission Rate (lb/hr): **(from preceding tank emission estimates)**	***0.17***

Avg. Hourly Emissions (lb/hr)	=	Annual Total/8760 (hrs/yr)	=	**0.01**
Maximum Hourly Emissions (lb/hr)	=	Max. Emission Rate * Max. Minutes/Hr Hatch is Open	=	**0.17**
Maximum Annual Emissions (TPY)	=	Max. Hourly THC Rate * Hours/Yr Hatch is Open	=	**0.03**

EMISSION SUMMARY (based on the above referenced flare gas analysis):

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Water Vapor (excluded from VOC total)	0.0000	0.000	0.000	0.000
Nitrogen (excluded from VOC total)	0.0000	0.000	0.000	0.000

Carbon Dioxide (excluded from VOC total)	72.5466	0.005	0.123	0.022
Methane (excluded from VOC total)	0.1951	0.000	0.000	0.000
Ethane (excluded from VOC total)	0.8462	0.000	0.001	0.000
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.000	0.000	0.000
Propane	3.4822	0.000	0.006	0.001
Iso-Butane	3.6364	0.000	0.006	0.001
N-Butane	6.3922	0.000	0.011	0.002
Iso-Pentane	3.6708	0.000	0.006	0.001
N-Pentane	3.7304	0.000	0.006	0.001
Iso-Hexane	2.3254	0.000	0.004	0.001
N-Hexane (TAP)	1.4238	0.000	0.002	0.000
Methylcyclopentane	0.0000	0.000	0.000	0.000
Benzene (TAP)	0.2061	0.000	0.000	0.000
Cyclohexane	0.3260	0.000	0.001	0.000
Heptanes	0.8409	0.000	0.001	0.000
Methylcyclohexane	0.1234	0.000	0.000	0.000
Toluene (TAP)	0.0116	0.000	0.000	0.000
2,2,4-Trimethylpentane (TAP)	0.0000	0.000	0.000	0.000
Octanes	0.1579	0.000	0.000	0.000
Ethylbenzene (TAP)	0.0009	0.000	0.000	0.000
Xylenes (TAP)	0.0100	0.000	0.000	0.000
Nonanes	0.0641	0.000	0.000	0.000
Decanes Plus	0.0100	0.000	0.000	0.000
Other NM/NE HC	0.0000	0.000	0.000	0.000
Total Weight Percent:	100.0000			
Total TAP Emissions		0.00	0.00	0.00
Total VOC Emissions		**0.00**	**0.04**	**0.01**
Total Non VOC & Non TAP-HC		0.00	0.00	0.00
Total Emissions		0.01	0.17	0.03

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the dry oil tank are routed to the atmospheric control flare (EPN: 17a-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-OST-CV***

EMISSION SOURCE DESCRIPTION: ***5000 BBL Dry Oil Tank-Common Vent (ABJ-119A)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***1000***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***2000***
Average VOC Working Losses - L_W (lb/yr):	***75,076.263***
Average VOC Standing Losses - L_S (lb/yr):	***13,325.530***
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) * 3.7861/8760	=	**38.21**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 3.7861/8760	=	**70.66**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**167.35**

SPECIATION FACTORS:

The composition of this gas is based on an actual analysis of the vapors routed to the control flare and normalized to account for the removal of Nitrogen; refer to Southern Petroleum Laboratories Report No.: 172-24050250-002A 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)	0.0000	0.0000	0.0000	0.0000
Carbon Dioxide (excluded from VOC total)	72.5466	27.7186	51.2590	121.4076
Methane (excluded from VOC total)	0.1951	0.0745	0.1378	0.3265
Ethane (excluded from VOC total)	0.8462	0.3233	0.5979	1.4161
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	3.4822	1.3305	2.4604	5.8275
Iso-Butane	3.6364	1.3894	2.5694	6.0856
N-Butane	6.3922	2.4423	4.5165	10.6975
Iso-Pentane	3.6708	1.4026	2.5937	6.1432
N-Pentane	3.7304	1.4253	2.6358	6.2428
Iso-Hexane	2.3254	0.8885	1.6430	3.8916
N-Hexane (TAP)	1.4238	0.5440	1.0060	2.3827
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.2061	0.0788	0.1456	0.3449

Cyclohexane	0.3260	0.1246	0.2303	0.5455
Heptanes	0.8409	0.3213	0.5941	1.4072
Methylcyclohexane	0.1234	0.0471	0.0872	0.2065
Toluene (TAP)	0.0116	0.0044	0.0082	0.0193
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.1579	0.0603	0.1116	0.2642
Ethylbenzene (TAP)	0.0009	0.0004	0.0007	0.0016
Xylenes (TAP)	0.0100	0.0038	0.0071	0.0168
Nonanes	0.0641	0.0245	0.0453	0.1072
Decanes Plus	0.0100	0.0038	0.0071	0.0168
Total Weight Percent:	100.0000			
Total TAP Emissions		0.63	1.17	2.77
Total VOC Emissions		**10.09**	**18.66**	**44.20**
Total Non VOC & Non TAP-HC		0.40	0.74	1.74
Total Hydrocarbon Emissions		38.21	70.66	167.35

DATA:

Emission Source:	***Flash Gas from Oil***
Flash Gas Specific Gravity:	***1.6384***
Average Oil Throughput: **(BBLD)**	***1000***
Maximum Oil Throughput: **(BBLD)**	***2000***
Basis of Emission Estimates:	***Actual GOR & Actual Flare Gas Analysis***
Flash Gas Analysis Report Number:	***Southern Petroleum Laboratories Report No.: 172-24050250-002A***

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 this facility, refer to Southern Petroleum Laboratories Report No.: 23110338-002A in supporting documentation. The following table shows the actual field and laboratory conditions.

API Oil Gravity @ 60°F	**Process Conditions**		**Gas/Oil Ratio**
	Pressure (PSIG)	**Temperature (°F)**	**(SCF/BBL)**
Actual Facility & Laboratory Conditions:			
46.03	49	88	
	0	60	26.6
		GOR Estimate:	**26.60**

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Oil Rate * GOR	=	**1108.33**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**138.73**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Avg. Emissions * Ratio of Max. Oil Rate to Avg. Oil Rate	=	**277.47**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**607.64**

SPECIATION FACTORS:

Speciation of the flash gas mixture taken from the referenced laboratory results and normalized to account for the removal of Nitrogen; refer to 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)	0.0000	0.0000	0.0000	0.0000
Carbon Dioxide (excluded from VOC total)	72.5466	100.6467	201.2935	440.8205
Methane (excluded from VOC total)	0.1951	0.2706	0.5413	1.1853
Ethane (excluded from VOC total)	0.8462	1.1740	2.3480	5.1419
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	3.4822	4.8310	9.6619	21.1591
Iso-Butane	3.6364	5.0449	10.0899	22.0962
N-Butane	6.3922	8.8682	17.7364	38.8416
Iso-Pentane	3.6708	5.0927	10.1854	22.3054
N-Pentane	3.7304	5.1753	10.3506	22.6672
Iso-Hexane	2.3254	3.2261	6.4522	14.1299
N-Hexane (TAP)	1.4238	1.9752	3.9505	8.6513
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.2061	0.2860	0.5719	1.2525
Cyclohexane	0.3260	0.4523	0.9045	1.9808
Heptanes	0.8409	1.1666	2.3331	5.1095
Methylcyclohexane	0.1234	0.1712	0.3424	0.7498
Toluene (TAP)	0.0116	0.0160	0.0321	0.0702
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.1579	0.2190	0.4381	0.9593
Ethylbenzene (TAP)	0.0009	0.0013	0.0026	0.0057
Xylenes (TAP)	0.0100	0.0139	0.0279	0.0610
Nonanes	0.0641	0.0889	0.1778	0.3893
Decanes Plus	0.0100	0.0139	0.0278	0.0609
Total Weight Percent:	100.0000			
Total TAP Emissions		2.29	4.58	10.04
Total VOC Emissions		**36.64**	**73.28**	**160.49**
Total Non VOC & Non TAP-HC		1.44	2.89	6.33
Total Emissions		138.73	277.47	607.64

DATA:

Emission Source:	***Blanket Gas***
Average Annual Tank Throughput (BBLs/Yr):	***365,000***
Gross Blanket Gas Required (MSCF/Yr):	***2,049***
Gas from Process to Tank(s) (MSCF/Yr):	***47,520***
Calculated Volume Requirement (MSCF/Yr):	***-45,471***

**There are no emissions associated with supplied blanket gas as flash generated from this tank and the heater treater should be sufficient to maintain the gas blanket as demonstrated herein.*

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Oil Flash + Blanket Gas	=	**204.69**

DATA:

Emission Source:	***Losses When Opening Thief Hatches***
Specific Gravity of Gas:	***1.6384***
Maximum Thief Hatch Venting (Hrs/Yr) **(Under Normal/Routine Operating Conditions)**	***30***
Max. Minutes a Hatch is Opened in a Single Hour:	***5***
Maximum Hourly Emission Rate (lb/hr): **(from preceding tank emission estimates)**	***29.01***

Avg. Hourly Emissions (lb/hr)	=	Annual Total/8760 (hrs/yr)	=	**1.19**
Maximum Hourly Emissions (lb/hr)	=	Max. Emission Rate * Max. Minutes/Hr Hatch is Open	=	**29.01**
Maximum Annual Emissions (TPY)	=	Max. Hourly THC Rate * Hours/Yr Hatch is Open	=	**5.22**

EMISSION SUMMARY (based on the above referenced flare gas analysis):

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Water Vapor (excluded from VOC total)	0.0000	0.000	0.000	0.000
Nitrogen (excluded from VOC total)	0.0000	0.000	0.000	0.000
Carbon Dioxide (excluded from VOC total)	72.5466	0.865	21.046	3.788
Methane (excluded from VOC total)	0.1951	0.002	0.057	0.010
Ethane (excluded from VOC total)	0.8462	0.010	0.245	0.044
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.000	0.000	0.000
Propane	3.4822	0.042	1.010	0.182
Iso-Butane	3.6364	0.043	1.055	0.190
N-Butane	6.3922	0.076	1.854	0.334
Iso-Pentane	3.6708	0.044	1.065	0.192
N-Pentane	3.7304	0.044	1.082	0.195
Iso-Hexane	2.3254	0.028	0.675	0.121
N-Hexane (TAP)	1.4238	0.017	0.413	0.074
Methylcyclopentane	0.0000	0.000	0.000	0.000
Benzene (TAP)	0.2061	0.002	0.060	0.011
Cyclohexane	0.3260	0.004	0.095	0.017
Heptanes	0.8409	0.010	0.244	0.044

Methylcyclohexane	0.1234	0.001	0.036	0.006
Toluene (TAP)	0.0116	0.000	0.003	0.001
2,2,4-Trimethylpentane (TAP)	0.0000	0.000	0.000	0.000
Octanes	0.1579	0.002	0.046	0.008
Ethylbenzene (TAP)	0.0009	0.000	0.000	0.000
Xylenes (TAP)	0.0100	0.000	0.003	0.001
Nonanes	0.0641	0.001	0.019	0.003
Decanes Plus	0.0100	0.000	0.003	0.001
Other NM/NE HC	0.0000	0.000	0.000	0.000
Total Weight Percent:	100.0000			
Total TAP Emissions		0.02	0.48	0.09
Total VOC Emissions		**0.31**	**7.66**	**1.38**
Total Non VOC & Non TAP-HC		0.01	0.30	0.05
Total Emissions		1.19	29.01	5.22

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the dry oil tank are routed to the atmospheric control flare (EPN: 17a-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

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

EMISSION SOURCE DESCRIPTION: ***5000 BBL 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})**	***1000***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***2000***
Average VOC Working Losses - L_W (lb/yr):	***75,076.263***
Average VOC Standing Losses - L_S (lb/yr):	***13,325.530***
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) * 3.7861/8760	=	**38.21**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 3.7861/8760	=	**70.66**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**167.35**

SPECIATION FACTORS:

The composition of this gas is based on an actual analysis of the vapors routed to the control flare and normalized to account for the removal of Nitrogen; refer to Southern Petroleum Laboratories Report No.: 172-24050250-002A 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)	0.0000	0.0000	0.0000	0.0000
Carbon Dioxide (excluded from VOC total)	72.5466	27.7186	51.2590	121.4076
Methane (excluded from VOC total)	0.1951	0.0745	0.1378	0.3265
Ethane (excluded from VOC total)	0.8462	0.3233	0.5979	1.4161
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	3.4822	1.3305	2.4604	5.8275
Iso-Butane	3.6364	1.3894	2.5694	6.0856
N-Butane	6.3922	2.4423	4.5165	10.6975
Iso-Pentane	3.6708	1.4026	2.5937	6.1432
N-Pentane	3.7304	1.4253	2.6358	6.2428
Iso-Hexane	2.3254	0.8885	1.6430	3.8916
N-Hexane (TAP)	1.4238	0.5440	1.0060	2.3827
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.2061	0.0788	0.1456	0.3449

Cyclohexane	0.3260	0.1246	0.2303	0.5455
Heptanes	0.8409	0.3213	0.5941	1.4072
Methylcyclohexane	0.1234	0.0471	0.0872	0.2065
Toluene (TAP)	0.0116	0.0044	0.0082	0.0193
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.1579	0.0603	0.1116	0.2642
Ethylbenzene (TAP)	0.0009	0.0004	0.0007	0.0016
Xylenes (TAP)	0.0100	0.0038	0.0071	0.0168
Nonanes	0.0641	0.0245	0.0453	0.1072
Decanes Plus	0.0100	0.0038	0.0071	0.0168
Total Weight Percent:	100.0000			
Total TAP Emissions		0.63	1.17	2.77
Total VOC Emissions		**10.09**	**18.66**	**44.20**
Total Non VOC & Non TAP-HC		0.40	0.74	1.74
Total Hydrocarbon Emissions		38.21	70.66	167.35

DATA:

Emission Source:	***Flash Gas from Oil***
Flash Gas Specific Gravity:	***1.6384***
Average Oil Throughput: **(BBLD)**	***1000***
Maximum Oil Throughput: **(BBLD)**	***2000***
Basis of Emission Estimates:	***Actual GOR & Actual Flare Gas Analysis***
Flash Gas Analysis Report Number:	***Southern Petroleum Laboratories Report No.: 172-24050250-002A***

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 this facility, refer to Southern Petroleum Laboratories Report No.: 23110338-002A in supporting documentation. The following table shows the actual field and laboratory conditions.

API Oil Gravity @ 60°F	**Process Conditions**		**Gas/Oil Ratio**
	Pressure (PSIG)	**Temperature (°F)**	**(SCF/BBL)**
Actual Facility & Laboratory Conditions:			
46.03	49	88	
	0	60	26.6
		GOR Estimate:	**26.60**

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Oil Rate * GOR	=	**1108.33**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**138.73**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Avg. Emissions * Ratio of Max. Oil Rate to Avg. Oil Rate	=	**277.47**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**607.64**

SPECIATION FACTORS:

Speciation of the flash gas mixture taken from the referenced laboratory results and normalized to account for the removal of Nitrogen; refer to 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)	0.0000	0.0000	0.0000	0.0000
Carbon Dioxide (excluded from VOC total)	72.5466	100.6467	201.2935	440.8205
Methane (excluded from VOC total)	0.1951	0.2706	0.5413	1.1853
Ethane (excluded from VOC total)	0.8462	1.1740	2.3480	5.1419
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	3.4822	4.8310	9.6619	21.1591
Iso-Butane	3.6364	5.0449	10.0899	22.0962
N-Butane	6.3922	8.8682	17.7364	38.8416
Iso-Pentane	3.6708	5.0927	10.1854	22.3054
N-Pentane	3.7304	5.1753	10.3506	22.6672
Iso-Hexane	2.3254	3.2261	6.4522	14.1299
N-Hexane (TAP)	1.4238	1.9752	3.9505	8.6513
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.2061	0.2860	0.5719	1.2525
Cyclohexane	0.3260	0.4523	0.9045	1.9808
Heptanes	0.8409	1.1666	2.3331	5.1095
Methylcyclohexane	0.1234	0.1712	0.3424	0.7498
Toluene (TAP)	0.0116	0.0160	0.0321	0.0702
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.1579	0.2190	0.4381	0.9593
Ethylbenzene (TAP)	0.0009	0.0013	0.0026	0.0057
Xylenes (TAP)	0.0100	0.0139	0.0279	0.0610
Nonanes	0.0641	0.0889	0.1778	0.3893
Decanes Plus	0.0100	0.0139	0.0278	0.0609
Total Weight Percent:	100.0000			
Total TAP Emissions		2.29	4.58	10.04
Total VOC Emissions		**36.64**	**73.28**	**160.49**
Total Non VOC & Non TAP-HC		1.44	2.89	6.33
Total Emissions		138.73	277.47	607.64

DATA:

Emission Source:	***Blanket Gas***
Average Annual Tank Throughput (BBLs/Yr):	***365,000***
Gross Blanket Gas Required (MSCF/Yr):	***2,049***
Gas from Process to Tank(s) (MSCF/Yr):	***47,520***
Calculated Volume Requirement (MSCF/Yr):	***-45,471***

**There are no emissions associated with supplied blanket gas as flash generated from this tank and the heater treater should be sufficient to maintain the gas blanket as demonstrated herein.*

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Oil Flash + Blanket Gas	=	**204.69**

DATA:

Emission Source:	***Losses When Opening Thief Hatches***
Specific Gravity of Gas:	***1.6384***
Maximum Thief Hatch Venting (Hrs/Yr) **(Under Normal/Routine Operating Conditions)**	***30***
Max. Minutes a Hatch is Opened in a Single Hour:	***5***
Maximum Hourly Emission Rate (lb/hr): **(from preceding tank emission estimates)**	***29.01***

Avg. Hourly Emissions (lb/hr)	=	Annual Total/8760 (hrs/yr)	=	**1.19**
Maximum Hourly Emissions (lb/hr)	=	Max. Emission Rate * Max. Minutes/Hr Hatch is Open	=	**29.01**
Maximum Annual Emissions (TPY)	=	Max. Hourly THC Rate * Hours/Yr Hatch is Open	=	**5.22**

EMISSION SUMMARY (based on the above referenced flare gas analysis):

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Water Vapor (excluded from VOC total)	0.0000	0.000	0.000	0.000
Nitrogen (excluded from VOC total)	0.0000	0.000	0.000	0.000
Carbon Dioxide (excluded from VOC total)	72.5466	0.865	21.046	3.788
Methane (excluded from VOC total)	0.1951	0.002	0.057	0.010
Ethane (excluded from VOC total)	0.8462	0.010	0.245	0.044
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.000	0.000	0.000
Propane	3.4822	0.042	1.010	0.182
Iso-Butane	3.6364	0.043	1.055	0.190
N-Butane	6.3922	0.076	1.854	0.334
Iso-Pentane	3.6708	0.044	1.065	0.192
N-Pentane	3.7304	0.044	1.082	0.195
Iso-Hexane	2.3254	0.028	0.675	0.121
N-Hexane (TAP)	1.4238	0.017	0.413	0.074
Methylcyclopentane	0.0000	0.000	0.000	0.000
Benzene (TAP)	0.2061	0.002	0.060	0.011
Cyclohexane	0.3260	0.004	0.095	0.017
Heptanes	0.8409	0.010	0.244	0.044

Methylcyclohexane	0.1234	0.001	0.036	0.006
Toluene (TAP)	0.0116	0.000	0.003	0.001
2,2,4-Trimethylpentane (TAP)	0.0000	0.000	0.000	0.000
Octanes	0.1579	0.002	0.046	0.008
Ethylbenzene (TAP)	0.0009	0.000	0.000	0.000
Xylenes (TAP)	0.0100	0.000	0.003	0.001
Nonanes	0.0641	0.001	0.019	0.003
Decanes Plus	0.0100	0.000	0.003	0.001
Other NM/NE HC	0.0000	0.000	0.000	0.000
Total Weight Percent:	100.0000			
Total TAP Emissions		0.02	0.48	0.09
Total VOC Emissions		**0.31**	**7.66**	**1.38**
Total Non VOC & Non TAP-HC		0.01	0.30	0.05
Total Emissions		1.19	29.01	5.22

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: 17a-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

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

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

DATA:

Emission Source:	***Crude Oil/Water Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***7.5***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***7.5***
Average Daily Water Throughput: **(Annual Average; BBLD - Q_{avg})**	***7500***
Maximum Daily Water Throughput: **(BBLD - Q_{max})**	***7500***
Average VOC Working Losses - L_W (lb/yr):	***13,588.098***
Average VOC Standing Losses - L_S (lb/yr):	***169.609***
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) * 10.7833/8760	=	**16.94**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 10.7833/8760	=	**16.94**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**74.18**

SPECIATION FACTORS:

The composition of this gas is based on an actual analysis of the vapors routed to the control flare and normalized to account for the removal of Nitrogen; refer to Southern Petroleum Laboratories Report No.: 172-24050250-001A 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)	0.0000	0.0000	0.0000	0.0000
Carbon Dioxide (excluded from VOC total)	72.5466	12.2860	12.2860	53.8126
Methane (excluded from VOC total)	0.1951	0.0330	0.0330	0.1447
Ethane (excluded from VOC total)	0.8462	0.1433	0.1433	0.6277
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	3.4822	0.5897	0.5897	2.5830
Iso-Butane	3.6364	0.6158	0.6158	2.6974
N-Butane	6.3922	1.0825	1.0825	4.7415
Iso-Pentane	3.6708	0.6217	0.6217	2.7229
N-Pentane	3.7304	0.6318	0.6318	2.7671
Iso-Hexane	2.3254	0.3938	0.3938	1.7249

N-Hexane (TAP)	1.4238	0.2411	0.2411	1.0561
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.2061	0.0349	0.0349	0.1529
Cyclohexane	0.3260	0.0552	0.0552	0.2418
Heptanes	0.8409	0.1424	0.1424	0.6237
Methylcyclohexane	0.1234	0.0209	0.0209	0.0915
Toluene (TAP)	0.0116	0.0020	0.0020	0.0086
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.1579	0.0267	0.0267	0.1171
Ethylbenzene (TAP)	0.0009	0.0002	0.0002	0.0007
Xylenes (TAP)	0.0100	0.0017	0.0017	0.0075
Nonanes	0.0641	0.0109	0.0109	0.0475
Decanes Plus	0.0100	0.0017	0.0017	0.0074
Total Weight Percent:	100.0000			
Total TAP Emissions		0.28	0.28	1.23
Total VOC Emissions		**4.47**	**4.47**	**19.59**
Total Non VOC & Non TAP-HC		0.18	0.18	0.77
Total Hydrocarbon Emissions		16.94	16.94	74.18

DATA:

Emission Source:	***Flash Gas from Oil***
Flash Gas Specific Gravity:	***1.6384***
Average Oil Throughput: **(BBLD)**	***7.5***
Maximum Oil Throughput: **(BBLD)**	***7.5***
Basis of Emission Estimates:	***Actual GOR & Actual Flare Gas Analysis***
Flash Gas Analysis Report Number:	***Southern Petroleum Laboratories Report No.: 172-24050250-002A***

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 this facility, refer to Southern Petroleum Laboratories Report No.: 23110338-002A in supporting documentation. The following table shows the actual field and laboratory conditions.

API Oil Gravity @ 60°F	**Process Conditions**		**Gas/Oil Ratio**
	Pressure (PSIG)	**Temperature (°F)**	**(SCF/BBL)**
Actual Facility & Laboratory Conditions:			
46.03	49	88	
	0	60	26.6
		GOR Estimate:	**26.60**

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Oil Rate * GOR	=	**8.31**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**1.04**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Avg. Emissions * Ratio of Max. Oil Rate to Avg. Oil Rate	=	**1.04**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**4.56**

SPECIATION FACTORS:

Speciation of the flash gas mixture taken from the referenced laboratory results and normalized to account for the removal of Nitrogen; refer to 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)	0.0000	0.0000	0.0000	0.0000
Carbon Dioxide (excluded from VOC total)	72.5466	0.7546	0.7546	3.3046
Methane (excluded from VOC total)	0.1951	0.0020	0.0020	0.0089
Ethane (excluded from VOC total)	0.8462	0.0088	0.0088	0.0385
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	3.4822	0.0362	0.0362	0.1586
Iso-Butane	3.6364	0.0378	0.0378	0.1656
N-Butane	6.3922	0.0665	0.0665	0.2912
Iso-Pentane	3.6708	0.0382	0.0382	0.1672
N-Pentane	3.7304	0.0388	0.0388	0.1699
Iso-Hexane	2.3254	0.0242	0.0242	0.1059
N-Hexane (TAP)	1.4238	0.0148	0.0148	0.0649
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.2061	0.0021	0.0021	0.0094
Cyclohexane	0.3260	0.0034	0.0034	0.0148
Heptanes	0.8409	0.0087	0.0087	0.0383
Methylcyclohexane	0.1234	0.0013	0.0013	0.0056
Toluene (TAP)	0.0116	0.0001	0.0001	0.0005
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.1579	0.0016	0.0016	0.0072
Ethylbenzene (TAP)	0.0009	0.0000	0.0000	0.0000
Xylenes (TAP)	0.0100	0.0001	0.0001	0.0005
Nonanes	0.0641	0.0007	0.0007	0.0029
Decanes Plus	0.0100	0.0001	0.0001	0.0005
Total Weight Percent:	100.0000			
Total TAP Emissions		0.02	0.02	0.08
Total VOC Emissions		**0.27**	**0.27**	**1.20**
Total Non VOC & Non TAP-HC		0.01	0.01	0.05
Total Emissions		1.04	1.04	4.56

DATA:

Emission Source:	***Flash Gas from Brine Solution***
Approx. Pressure Drop of Brine Solution: (psig)	***35***
Approx. Temperature of Brine Solution: (ºF)	***140***
Flash Gas Specific Gravity:	***1.6384***
Avg. Water Throughput: (BBLD)	***7500***
Max. Water Throughput: (BBLD)	***7500***
Gas to Water Ratio: (SCF/BBL of Brine; GWR)	***0.4***
Basis of Emission Estimates:	***API Documentation & Actual Flare Gas Analysis (Refer to supporting documentation)***
Flash Gas Analysis Report Number:	***Southern Petroleum Laboratories Report No.: 172-24050250-002A***

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Brine Rate * GWR	=	**125.00**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**15.65**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Avg. Emissions * Ratio of Max. Water Rate to Avg. Water Rate	=	**15.65**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**68.55**

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". 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 the referenced analysis and normalized to account for the removal of Nitrogen.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Carbon Dioxide (excluded from VOC total)	72.5466	11.3512	11.3512	49.7285
Methane (excluded from VOC total)	0.1951	0.0305	0.0305	0.1337
Ethane (excluded from VOC total)	0.8462	0.1324	0.1324	0.5801
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	3.4822	0.5448	0.5448	2.3869
Iso-Butane	3.6364	0.5690	0.5690	2.4926
N-Butane	6.3922	1.0002	1.0002	4.3817
Iso-Pentane	3.6708	0.5744	0.5744	2.5162
N-Pentane	3.7304	0.5837	0.5837	2.5571
Iso-Hexane	2.3254	0.3638	0.3638	1.5940
N-Hexane (TAP)	1.4238	0.2228	0.2228	0.9759
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.2061	0.0323	0.0323	0.1413
Cyclohexane	0.3260	0.0510	0.0510	0.2235
Heptanes	0.8409	0.1316	0.1316	0.5764
Methylcyclohexane	0.1234	0.0193	0.0193	0.0846

Toluene (TAP)	0.0116	0.0018	0.0018	0.0079
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.1579	0.0247	0.0247	0.1082
Ethylbenzene (TAP)	0.0009	0.0001	0.0001	0.0006
Xylenes (TAP)	0.0100	0.0016	0.0016	0.0069
Nonanes	0.0641	0.0100	0.0100	0.0439
Decanes Plus	0.0100	0.0016	0.0016	0.0069
Total Weight Percent:	100.0000			
Total TAP Emissions		0.26	0.26	1.13
Total VOC Emissions		**4.13**	**4.13**	**18.10**
Total Non VOC & Non TAP-HC		0.16	0.16	0.71
Total Emissions		15.65	15.65	68.55

DATA:

Emission Source:	***Blanket Gas***
Average Annual Tank Throughput (BBLs/Yr):	***2,740,238***
Gross Blanket Gas Required (MSCF/Yr):	***N/A****

**There are no emissions associated with supplied blanket gas as the skimmer tank maintains a constant level.*

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Oil Flash Gas + Brine Flash Gas + Blanket Gas	=	**38.89**

DATA:

Emission Source:	***Losses When Opening Thief Hatches***
Specific Gravity of Gas:	***1.6384***
Maximum Thief Hatch Venting (Hrs/Yr) **(Under Normal/Routine Operating Conditions)**	***30***
Max. Minutes a Hatch is Opened in a Single Hour:	***5***
Maximum Hourly Emission Rate (lb/hr): **(from preceding tank emission estimates)**	***2.80***

Avg. Hourly Emissions (lb/hr)	=	Annual Total/8760 (hrs/yr)	=	**0.11**
Maximum Hourly Emissions (lb/hr)	=	Max. Emission Rate * Max. Minutes/Hr Hatch is Open	=	**2.80**
Maximum Annual Emissions (TPY)	=	Max. Hourly THC Rate * Hours/Yr Hatch is Open	=	**0.50**

EMISSION SUMMARY (based on the above referenced flare gas analysis):

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Water Vapor (excluded from VOC total)	0.0000	0.000	0.000	0.000
Nitrogen (excluded from VOC total)	0.0000	0.000	0.000	0.000
Carbon Dioxide (excluded from VOC total)	72.5466	0.083	2.031	0.366
Methane (excluded from VOC total)	0.1951	0.000	0.005	0.001
Ethane (excluded from VOC total)	0.8462	0.001	0.024	0.004
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.000	0.000	0.000
Propane	3.4822	0.004	0.098	0.018
Iso-Butane	3.6364	0.004	0.102	0.018

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
N-Butane	6.3922	0.007	0.179	0.032
Iso-Pentane	3.6708	0.004	0.103	0.019
N-Pentane	3.7304	0.004	0.104	0.019
Iso-Hexane	2.3254	0.003	0.065	0.012
N-Hexane (TAP)	1.4238	0.002	0.040	0.007
Methylcyclopentane	0.0000	0.000	0.000	0.000
Benzene (TAP)	0.2061	0.000	0.006	0.001
Cyclohexane	0.3260	0.000	0.009	0.002
Heptanes	0.8409	0.001	0.024	0.004
Methylcyclohexane	0.1234	0.000	0.003	0.001
Toluene (TAP)	0.0116	0.000	0.000	0.000
2,2,4-Trimethylpentane (TAP)	0.0000	0.000	0.000	0.000
Octanes	0.1579	0.000	0.004	0.001
Ethylbenzene (TAP)	0.0009	0.000	0.000	0.000
Xylenes (TAP)	0.0100	0.000	0.000	0.000
Nonanes	0.0641	0.000	0.002	0.000
Decanes Plus	0.0100	0.000	0.000	0.000
Other NM/NE HC	0.0000	0.000	0.000	0.000
Total Weight Percent:	100.0000			
Total TAP Emissions		0.00	0.05	0.01
Total VOC Emissions		**0.03**	**0.74**	**0.13**
Total Non VOC & Non TAP-HC		0.00	0.03	0.01
Total Emissions		0.11	2.80	0.50

Emission Calculations

POINT SOURCE I.D. NUMBER: ***8-05-SEP***

EMISSION SOURCE DESCRIPTION: ***API Separator-Vent (ZZZ-128)***

DATA:

Emission Source:	***Crude Oil/Water Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***5.5***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***5.5***
Average Daily Water Throughput: **(Annual Average; BBLD - Q_{avg})**	***800***
Maximum Daily Water Throughput: **(BBLD - Q_{max})**	***800***
Average VOC Working Losses - L_W (lb/yr):	***696.701***
Average VOC Standing Losses - L_S (lb/yr):	***0.000***
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) * 10.7833/8760	=	**0.86**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 10.7833/8760	=	**0.86**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**3.76**

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; reference supporting documentation.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Methane (excluded from VOC total)	6.20	0.0532	0.0532	0.2329
Ethane (excluded from VOC total)	5.60	0.0480	0.0480	0.2104
Hydrogen Sulfide (excluded from VOC total)	0.00	0.0000	0.0000	0.0000
Propane	17.60	0.1509	0.1509	0.6611
Iso-Butane	1.50	0.0129	0.0129	0.0563
N-Butane	27.10	0.2324	0.2324	1.0180
Iso-Pentane	1.50	0.0129	0.0129	0.0563
N-Pentane	14.60	0.1252	0.1252	0.5484
N-Hexane (TAP)	7.90	0.0678	0.0678	0.2968
Benzene (TAP)	0.10	0.0009	0.0009	0.0038
Heptanes	9.20	0.0789	0.0789	0.3456

Octanes	6.90	0.0592	0.0592	0.2592
Other NM/NE Hydrocarbons	1.80	0.0154	0.0154	0.0676
Total Weight Percent:	100.00			
Total TAP Emissions		0.07	0.07	0.30
Total VOC Emissions		**0.76**	**0.76**	**3.31**
Total Non VOC & Non TAP-HC		0.10	0.10	0.44
Total Hydrocarbon Emissions		0.86	0.86	3.76

Uncontrolled VOC Emission Total (TPY)	Storage Vapors	=	**3.31**

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the produced water tank are routed to the atmospheric control flare (EPN: 17a-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: ***9a-05-WST-CV***

EMISSION SOURCE DESCRIPTION: ***5000 BBL Produced Water Tank-Common Vent (ABJ-129A)***

DATA:

Emission Source:	***Water Storage Vapors ('Working' & 'Standing')***
Average Daily Water Throughput: **(Annual Average; BBLD - Q_{avg})**	***7500***
Maximum Daily Water Throughput: **(BBLD - Q_{max})**	***7500***
Average VOC Working Losses - L_W (lb/yr):	***2,851.158***
Average VOC Standing Losses - L_S (lb/yr):	***376.991***
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) * 3.7861/8760	=	**1.40**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 3.7861/8760	=	**1.40**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**6.11**

SPECIATION FACTORS:

The composition of this gas is based on an actual analysis of the vapors routed to the control flare and normalized to account for the removal of Nitrogen; refer to Southern Petroleum Laboratories Report No.: 172-24050250-002A 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)	0.0000	0.0000	0.0000	0.0000
Carbon Dioxide (excluded from VOC total)	72.5466	1.0122	1.0122	4.4334
Methane (excluded from VOC total)	0.1951	0.0027	0.0027	0.0119
Ethane (excluded from VOC total)	0.8462	0.0118	0.0118	0.0517
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	3.4822	0.0486	0.0486	0.2128
Iso-Butane	3.6364	0.0507	0.0507	0.2222
N-Butane	6.3922	0.0892	0.0892	0.3906
Iso-Pentane	3.6708	0.0512	0.0512	0.2243
N-Pentane	3.7304	0.0520	0.0520	0.2280
Iso-Hexane	2.3254	0.0324	0.0324	0.1421
N-Hexane (TAP)	1.4238	0.0199	0.0199	0.0870
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.2061	0.0029	0.0029	0.0126

Cyclohexane	0.3260	0.0045	0.0045	0.0199
Heptanes	0.8409	0.0117	0.0117	0.0514
Methylcyclohexane	0.1234	0.0017	0.0017	0.0075
Toluene (TAP)	0.0116	0.0002	0.0002	0.0007
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.1579	0.0022	0.0022	0.0096
Ethylbenzene (TAP)	0.0009	0.0000	0.0000	0.0001
Xylenes (TAP)	0.0100	0.0001	0.0001	0.0006
Nonanes	0.0641	0.0009	0.0009	0.0039
Decanes Plus	0.0100	0.0001	0.0001	0.0006
Total Weight Percent:	100.0000			
Total TAP Emissions		0.02	0.02	0.10
Total VOC Emissions		**0.37**	**0.37**	**1.61**
Total Non VOC & Non TAP-HC		0.01	0.01	0.06
Total Hydrocarbon Emissions		1.40	1.40	6.11

DATA:

Emission Source:	***Blanket Gas***
Average Annual Tank Throughput (BBLs/Yr):	***2,737,500***
Gross Blanket Gas Required (MSCF/Yr):	***15,371***
Gas from Process to Tank(s) (MSCF/Yr):	***90,925***
Calculated Volume Requirement (MSCF/Yr):	***-75,554***

**There are no emissions associated with supplied blanket gas as flash generated from the heater treater and other storage tanks should be sufficient to maintain the gas blanket as demonstrated herein.*

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Blanket Gas	=	**1.61**

DATA:

Emission Source:	***Losses When Opening Thief Hatches***
Specific Gravity of Gas:	***1.6384***
Maximum Thief Hatch Venting (Hrs/Yr) **(Under Normal/Routine Operating Conditions)**	***30***
Max. Minutes a Hatch is Opened in a Single Hour:	***5***
Maximum Hourly Emission Rate (lb/hr): **(from preceding tank emission estimates)**	***0.12***

Avg. Hourly Emissions (lb/hr)	=	Annual Total/8760 (hrs/yr)	=	**0.00**
Maximum Hourly Emissions (lb/hr)	=	Max. Emission Rate * Max. Minutes/Hr Hatch is Open	=	**0.12**
Maximum Annual Emissions (TPY)	=	Max. Hourly THC Rate * Hours/Yr Hatch is Open	=	**0.02**

EMISSION SUMMARY (based on the above referenced flare gas analysis):

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Water Vapor (excluded from VOC total)	0.0000	0.000	0.000	0.000
Nitrogen (excluded from VOC total)	0.0000	0.000	0.000	0.000

Carbon Dioxide (excluded from VOC total)	72.5466	0.003	0.087	0.015
Methane (excluded from VOC total)	0.1951	0.000	0.000	0.000
Ethane (excluded from VOC total)	0.8462	0.000	0.001	0.000
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.000	0.000	0.000
Propane	3.4822	0.000	0.004	0.001
Iso-Butane	3.6364	0.000	0.004	0.001
N-Butane	6.3922	0.000	0.008	0.001
Iso-Pentane	3.6708	0.000	0.004	0.001
N-Pentane	3.7304	0.000	0.004	0.001
Iso-Hexane	2.3254	0.000	0.003	0.000
N-Hexane (TAP)	1.4238	0.000	0.002	0.000
Methylcyclopentane	0.0000	0.000	0.000	0.000
Benzene (TAP)	0.2061	0.000	0.000	0.000
Cyclohexane	0.3260	0.000	0.000	0.000
Heptanes	0.8409	0.000	0.001	0.000
Methylcyclohexane	0.1234	0.000	0.000	0.000
Toluene (TAP)	0.0116	0.000	0.000	0.000
2,2,4-Trimethylpentane (TAP)	0.0000	0.000	0.000	0.000
Octanes	0.1579	0.000	0.000	0.000
Ethylbenzene (TAP)	0.0009	0.000	0.000	0.000
Xylenes (TAP)	0.0100	0.000	0.000	0.000
Nonanes	0.0641	0.000	0.000	0.000
Decanes Plus	0.0100	0.000	0.000	0.000
Other NM/NE HC	0.0000	0.000	0.000	0.000
Total Weight Percent:	100.0000			
Total TAP Emissions		0.00	0.00	0.00
Total VOC Emissions		**0.00**	**0.03**	**0.01**
Total Non VOC & Non TAP-HC		0.00	0.00	0.00
Total Emissions		0.00	0.12	0.02

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the water disposal tank are routed to the atmospheric control flare (EPN: 17a-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: ***9c-05-WST-CV***

EMISSION SOURCE DESCRIPTION: ***400 BBL Water Disposal Tank-Common Vent (ABJ-165A)***

DATA:

Emission Source:	***Water Storage Vapors ('Working' & 'Standing')***
Average Daily Water Throughput: **(Annual Average; BBLD - Q_{avg})**	***400***
Maximum Daily Water Throughput: **(BBLD - Q_{max})**	***800***
Average VOC Working Losses - L_W (lb/yr):	***166.701***
Average VOC Standing Losses - L_S (lb/yr):	***30.355***
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) * 3.7861/8760	=	**0.09**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 3.7861/8760	=	**0.16**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**0.37**

SPECIATION FACTORS:

The composition of this gas is based on an actual analysis of the vapors routed to the control flare and normalized to account for the removal of Nitrogen; refer to Southern Petroleum Laboratories Report No.: 172-24050250-002A 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)	0.0000	0.0000	0.0000	0.0000
Carbon Dioxide (excluded from VOC total)	72.5466	0.0618	0.1141	0.2706
Methane (excluded from VOC total)	0.1951	0.0002	0.0003	0.0007
Ethane (excluded from VOC total)	0.8462	0.0007	0.0013	0.0032
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	3.4822	0.0030	0.0055	0.0130
Iso-Butane	3.6364	0.0031	0.0057	0.0136
N-Butane	6.3922	0.0054	0.0100	0.0238
Iso-Pentane	3.6708	0.0031	0.0058	0.0137
N-Pentane	3.7304	0.0032	0.0059	0.0139
Iso-Hexane	2.3254	0.0020	0.0037	0.0087
N-Hexane (TAP)	1.4238	0.0012	0.0022	0.0053
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.2061	0.0002	0.0003	0.0008

Cyclohexane	0.3260	0.0003	0.0005	0.0012
Heptanes	0.8409	0.0007	0.0013	0.0031
Methylcyclohexane	0.1234	0.0001	0.0002	0.0005
Toluene (TAP)	0.0116	0.0000	0.0000	0.0000
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.1579	0.0001	0.0002	0.0006
Ethylbenzene (TAP)	0.0009	0.0000	0.0000	0.0000
Xylenes (TAP)	0.0100	0.0000	0.0000	0.0000
Nonanes	0.0641	0.0001	0.0001	0.0002
Decanes Plus	0.0100	0.0000	0.0000	0.0000
Total Weight Percent:	100.0000			
Total TAP Emissions		0.00	0.00	0.01
Total VOC Emissions		**0.02**	**0.04**	**0.10**
Total Non VOC & Non TAP-HC		0.00	0.00	0.00
Total Hydrocarbon Emissions		0.09	0.16	0.37

DATA:

Emission Source:	***Blanket Gas***
Average Annual Tank Throughput (BBLs/Yr):	***146,000***
Gross Blanket Gas Required (MSCF/Yr):	***820***
Gas from Process to Tank(s) (MSCF/Yr):	***37,777***
Calculated Volume Requirement (MSCF/Yr):	***-36,957***

**There are no emissions associated with supplied blanket gas as flash generated from the heater treater and other storage tanks should be sufficient to maintain the gas blanket as demonstrated herein.*

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Blanket Gas	=	**0.10**

DATA:

Emission Source:	***Losses When Opening Thief Hatches***
Specific Gravity of Gas:	***1.6384***
Maximum Thief Hatch Venting (Hrs/Yr) **(Under Normal/Routine Operating Conditions)**	***30***
Max. Minutes a Hatch is Opened in a Single Hour:	***5***
Maximum Hourly Emission Rate (lb/hr): **(from preceding tank emission estimates)**	***0.01***

Avg. Hourly Emissions (lb/hr)	=	Annual Total/8760 (hrs/yr)	=	**0.00**
Maximum Hourly Emissions (lb/hr)	=	Max. Emission Rate * Max. Minutes/Hr Hatch is Open	=	**0.01**
Maximum Annual Emissions (TPY)	=	Max. Hourly THC Rate * Hours/Yr Hatch is Open	=	**0.00**

EMISSION SUMMARY (based on the above referenced flare gas analysis):				
POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Water Vapor (excluded from VOC total)	0.0000	0.000	0.000	0.000
Nitrogen (excluded from VOC total)	0.0000	0.000	0.000	0.000
Carbon Dioxide (excluded from VOC total)	72.5466	0.000	0.007	0.002
Methane (excluded from VOC total)	0.1951	0.000	0.000	0.000
Ethane (excluded from VOC total)	0.8462	0.000	0.000	0.000
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.000	0.000	0.000
Propane	3.4822	0.000	0.000	0.000
Iso-Butane	3.6364	0.000	0.000	0.000
N-Butane	6.3922	0.000	0.001	0.000
Iso-Pentane	3.6708	0.000	0.000	0.000
N-Pentane	3.7304	0.000	0.000	0.000
Iso-Hexane	2.3254	0.000	0.000	0.000
N-Hexane (TAP)	1.4238	0.000	0.000	0.000
Methylcyclopentane	0.0000	0.000	0.000	0.000
Benzene (TAP)	0.2061	0.000	0.000	0.000
Cyclohexane	0.3260	0.000	0.000	0.000
Heptanes	0.8409	0.000	0.000	0.000
Methylcyclohexane	0.1234	0.000	0.000	0.000
Toluene (TAP)	0.0116	0.000	0.000	0.000
2,2,4-Trimethylpentane (TAP)	0.0000	0.000	0.000	0.000
Octanes	0.1579	0.000	0.000	0.000
Ethylbenzene (TAP)	0.0009	0.000	0.000	0.000
Xylenes (TAP)	0.0100	0.000	0.000	0.000
Nonanes	0.0641	0.000	0.000	0.000
Decanes Plus	0.0100	0.000	0.000	0.000
Other NM/NE HC	0.0000	0.000	0.000	0.000
Total Weight Percent:	100.0000			
Total TAP Emissions		0.00	0.00	0.00
Total VOC Emissions		**0.00**	**0.00**	**0.00**
Total Non VOC & Non TAP-HC		0.00	0.00	0.00
Total Emissions		0.00	0.01	0.00

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the water disposal tank are routed to the atmospheric control flare (EPN: 17a-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: ***9d-05-WST-CV***

EMISSION SOURCE DESCRIPTION: ***400 BBL Water Disposal Tank-Common Vent (ABJ-165B)***

DATA:

Emission Source:	***Water Storage Vapors ('Working' & 'Standing')***
Average Daily Water Throughput: **(Annual Average; BBLD - Q_{avg})**	***400***
Maximum Daily Water Throughput: **(BBLD - Q_{max})**	***800***
Average VOC Working Losses - L_W (lb/yr):	***166.701***
Average VOC Standing Losses - L_S (lb/yr):	***30.355***
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) * 3.7861/8760	=	**0.09**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 3.7861/8760	=	**0.16**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**0.37**

SPECIATION FACTORS:

The composition of this gas is based on an actual analysis of the vapors routed to the control flare and normalized to account for the removal of Nitrogen; refer to Southern Petroleum Laboratories Report No.: 172-24050250-002A 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)	0.0000	0.0000	0.0000	0.0000
Carbon Dioxide (excluded from VOC total)	72.5466	0.0618	0.1141	0.2706
Methane (excluded from VOC total)	0.1951	0.0002	0.0003	0.0007
Ethane (excluded from VOC total)	0.8462	0.0007	0.0013	0.0032
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	3.4822	0.0030	0.0055	0.0130
Iso-Butane	3.6364	0.0031	0.0057	0.0136
N-Butane	6.3922	0.0054	0.0100	0.0238
Iso-Pentane	3.6708	0.0031	0.0058	0.0137
N-Pentane	3.7304	0.0032	0.0059	0.0139
Iso-Hexane	2.3254	0.0020	0.0037	0.0087
N-Hexane (TAP)	1.4238	0.0012	0.0022	0.0053
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.2061	0.0002	0.0003	0.0008

Cyclohexane	0.3260	0.0003	0.0005	0.0012
Heptanes	0.8409	0.0007	0.0013	0.0031
Methylcyclohexane	0.1234	0.0001	0.0002	0.0005
Toluene (TAP)	0.0116	0.0000	0.0000	0.0000
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.1579	0.0001	0.0002	0.0006
Ethylbenzene (TAP)	0.0009	0.0000	0.0000	0.0000
Xylenes (TAP)	0.0100	0.0000	0.0000	0.0000
Nonanes	0.0641	0.0001	0.0001	0.0002
Decanes Plus	0.0100	0.0000	0.0000	0.0000
Total Weight Percent:	100.0000			
Total TAP Emissions		0.00	0.00	0.01
Total VOC Emissions		**0.02**	**0.04**	**0.10**
Total Non VOC & Non TAP-HC		0.00	0.00	0.00
Total Hydrocarbon Emissions		0.09	0.16	0.37

DATA:

Emission Source:	***Blanket Gas***
Average Annual Tank Throughput (BBLs/Yr):	***146,000***
Gross Blanket Gas Required (MSCF/Yr):	***820***
Gas from Process to Tank(s) (MSCF/Yr):	***37,777***
Calculated Volume Requirement (MSCF/Yr):	***-36,957***

**There are no emissions associated with supplied blanket gas as flash generated from the heater treater and other storage tanks should be sufficient to maintain the gas blanket as demonstrated herein.*

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Blanket Gas	=	**0.10**

DATA:

Emission Source:	***Losses When Opening Thief Hatches***
Specific Gravity of Gas:	***1.6384***
Maximum Thief Hatch Venting (Hrs/Yr) **(Under Normal/Routine Operating Conditions)**	***30***
Max. Minutes a Hatch is Opened in a Single Hour:	***5***
Maximum Hourly Emission Rate (lb/hr): **(from preceding tank emission estimates)**	***0.01***

Avg. Hourly Emissions (lb/hr)	=	Annual Total/8760 (hrs/yr)	=	**0.00**
Maximum Hourly Emissions (lb/hr)	=	Max. Emission Rate * Max. Minutes/Hr Hatch is Open	=	**0.01**
Maximum Annual Emissions (TPY)	=	Max. Hourly THC Rate * Hours/Yr Hatch is Open	=	**0.00**

EMISSION SUMMARY (based on the above referenced flare gas analysis):				
POLLUTANT:	**Weight Percent**	**CALCULATED EMISSION RATES**		
		Average Hourly (lb/hr)	**Maximum Hourly (lb/hr)**	**Annual (TPY)**
Water Vapor (excluded from VOC total)	0.0000	0.000	0.000	0.000
Nitrogen (excluded from VOC total)	0.0000	0.000	0.000	0.000
Carbon Dioxide (excluded from VOC total)	72.5466	0.000	0.007	0.002
Methane (excluded from VOC total)	0.1951	0.000	0.000	0.000
Ethane (excluded from VOC total)	0.8462	0.000	0.000	0.000
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.000	0.000	0.000
Propane	3.4822	0.000	0.000	0.000
Iso-Butane	3.6364	0.000	0.000	0.000
N-Butane	6.3922	0.000	0.001	0.000
Iso-Pentane	3.6708	0.000	0.000	0.000
N-Pentane	3.7304	0.000	0.000	0.000
Iso-Hexane	2.3254	0.000	0.000	0.000
N-Hexane (TAP)	1.4238	0.000	0.000	0.000
Methylcyclopentane	0.0000	0.000	0.000	0.000
Benzene (TAP)	0.2061	0.000	0.000	0.000
Cyclohexane	0.3260	0.000	0.000	0.000
Heptanes	0.8409	0.000	0.000	0.000
Methylcyclohexane	0.1234	0.000	0.000	0.000
Toluene (TAP)	0.0116	0.000	0.000	0.000
2,2,4-Trimethylpentane (TAP)	0.0000	0.000	0.000	0.000
Octanes	0.1579	0.000	0.000	0.000
Ethylbenzene (TAP)	0.0009	0.000	0.000	0.000
Xylenes (TAP)	0.0100	0.000	0.000	0.000
Nonanes	0.0641	0.000	0.000	0.000
Decanes Plus	0.0100	0.000	0.000	0.000
Other NM/NE HC	0.0000	0.000	0.000	0.000
Total Weight Percent:	100.0000			
Total TAP Emissions		0.00	0.00	0.00
Total VOC Emissions		**0.00**	**0.00**	**0.00**
Total Non VOC & Non TAP-HC		0.00	0.00	0.00
Total Emissions		0.00	0.01	0.00

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the oil disposal tank are routed to the atmospheric control flare (EPN: 17a-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: ***9e-05-OST-CV***

EMISSION SOURCE DESCRIPTION: ***400 BBL Oil Disposal Tank-Common Vent (ABJ-108)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD - Q_{avg})**	***5.5***
Maximum Daily Oil Throughput: **(BBLD - Q_{max})**	***5.5***
Average VOC Working Losses - L_W (lb/yr):	***407.827***
Average VOC Standing Losses - L_S (lb/yr):	***1,212.604***
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) * 3.7861/8760	=	**0.70**
Max. Hourly Uncontrolled THC Losses (lb/hr)	= (Ls + (Lw * QMax ÷ Qavg)) * 3.7861/8760	=	**0.70**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**3.07**

SPECIATION FACTORS:

The composition of this gas is based on an actual analysis of the vapors routed to the control flare and normalized to account for the removal of Nitrogen; refer to Southern Petroleum Laboratories Report No.: 172-24050250-002A 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)	0.0000	0.0000	0.0000	0.0000
Carbon Dioxide (excluded from VOC total)	72.5466	0.5081	0.5081	2.2254
Methane (excluded from VOC total)	0.1951	0.0014	0.0014	0.0060
Ethane (excluded from VOC total)	0.8462	0.0059	0.0059	0.0260
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	3.4822	0.0244	0.0244	0.1068
Iso-Butane	3.6364	0.0255	0.0255	0.1116
N-Butane	6.3922	0.0448	0.0448	0.1961
Iso-Pentane	3.6708	0.0257	0.0257	0.1126
N-Pentane	3.7304	0.0261	0.0261	0.1144
Iso-Hexane	2.3254	0.0163	0.0163	0.0713
N-Hexane (TAP)	1.4238	0.0100	0.0100	0.0437
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.2061	0.0014	0.0014	0.0063

Cyclohexane	0.3260	0.0023	0.0023	0.0100
Heptanes	0.8409	0.0059	0.0059	0.0258
Methylcyclohexane	0.1234	0.0009	0.0009	0.0038
Toluene (TAP)	0.0116	0.0001	0.0001	0.0004
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.1579	0.0011	0.0011	0.0048
Ethylbenzene (TAP)	0.0009	0.0000	0.0000	0.0000
Xylenes (TAP)	0.0100	0.0001	0.0001	0.0003
Nonanes	0.0641	0.0004	0.0004	0.0020
Decanes Plus	0.0100	0.0001	0.0001	0.0003
Total Weight Percent:	100.0000			
Total TAP Emissions		0.01	0.01	0.05
Total VOC Emissions		**0.18**	**0.18**	**0.81**
Total Non VOC & Non TAP-HC		0.01	0.01	0.03
Total Hydrocarbon Emissions		0.70	0.70	3.07

DATA:

Emission Source:	***Blanket Gas***
Average Annual Tank Throughput (BBLs/Yr):	***2,000***
Gross Blanket Gas Required (MSCF/Yr):	***11***
Gas from Process to Tank(s) (MSCF/Yr):	***73,914***
Calculated Volume Requirement (MSCF/Yr):	***-73,903***

**There are no emissions associated with supplied blanket gas as flash generated from the heater treater and other storage tanks should be sufficient to maintain the gas blanket as demonstrated herein.*

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Blanket Gas	=	**0.81**

DATA:

Emission Source:	***Losses When Opening Thief Hatches***
Specific Gravity of Gas:	***1.6384***
Maximum Thief Hatch Venting (Hrs/Yr) **(Under Normal/Routine Operating Conditions)**	***30***
Max. Minutes a Hatch is Opened in a Single Hour:	***5***
Maximum Hourly Emission Rate (lb/hr): **(from preceding tank emission estimates)**	***0.06***

Avg. Hourly Emissions (lb/hr)	=	Annual Total/8760 (hrs/yr)	=	**0.00**
Maximum Hourly Emissions (lb/hr)	=	Max. Emission Rate * Max. Minutes/Hr Hatch is Open	=	**0.06**
Maximum Annual Emissions (TPY)	=	Max. Hourly THC Rate * Hours/Yr Hatch is Open	=	**0.01**

EMISSION SUMMARY (based on the above referenced flare gas analysis):

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Water Vapor (excluded from VOC total)	0.0000	0.000	0.000	0.000
Nitrogen (excluded from VOC total)	0.0000	0.000	0.000	0.000

Carbon Dioxide (excluded from VOC total)	72.5466	0.002	0.044	0.008
Methane (excluded from VOC total)	0.1951	0.000	0.000	0.000
Ethane (excluded from VOC total)	0.8462	0.000	0.001	0.000
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.000	0.000	0.000
Propane	3.4822	0.000	0.002	0.000
Iso-Butane	3.6364	0.000	0.002	0.000
N-Butane	6.3922	0.000	0.004	0.001
Iso-Pentane	3.6708	0.000	0.002	0.000
N-Pentane	3.7304	0.000	0.002	0.000
Iso-Hexane	2.3254	0.000	0.001	0.000
N-Hexane (TAP)	1.4238	0.000	0.001	0.000
Methylcyclopentane	0.0000	0.000	0.000	0.000
Benzene (TAP)	0.2061	0.000	0.000	0.000
Cyclohexane	0.3260	0.000	0.000	0.000
Heptanes	0.8409	0.000	0.001	0.000
Methylcyclohexane	0.1234	0.000	0.000	0.000
Toluene (TAP)	0.0116	0.000	0.000	0.000
2,2,4-Trimethylpentane (TAP)	0.0000	0.000	0.000	0.000
Octanes	0.1579	0.000	0.000	0.000
Ethylbenzene (TAP)	0.0009	0.000	0.000	0.000
Xylenes (TAP)	0.0100	0.000	0.000	0.000
Nonanes	0.0641	0.000	0.000	0.000
Decanes Plus	0.0100	0.000	0.000	0.000
Other NM/NE HC	0.0000	0.000	0.000	0.000
Total Weight Percent:	100.0000			
Total TAP Emissions		0.00	0.00	0.00
Total VOC Emissions		**0.00**	**0.02**	**0.00**
Total Non VOC & Non TAP-HC		0.00	0.00	0.00
Total Emissions		0.00	0.06	0.01

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the inhibitor oil blending tank are routed to the atmospheric control flare (EPN: 17a-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

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

EMISSION SOURCE DESCRIPTION: ***1500 BBL Chemical Blending Tank-Vent (BBJ-133A)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD/Tank - Q_{avg})**	***100***
Maximum Daily Oil Throughput: **(BBLD/Tank - Q_{max})**	***200***
Average VOC Working Losses - L_w (lb/yr):	***7,468.327***
Average VOC Standing Losses - L_S (lb/yr):	***4,073.243***
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) * 3.7861/8760	=	**4.99**
Max. Hourly Uncontrolled THC Losses (lb/hr)	=	(Ls + (Lw * QMax ÷ Qavg)) * 3.7861/8760	=	**8.22**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**21.85**

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; reference supporting documentation.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen	0.0000	0.0000	0.0000	0.0000
Carbon Dioxide	72.5466	3.6189	5.9606	15.8507
Methane (excluded from VOC total)	0.1951	0.0097	0.0160	0.0426
Ethane (excluded from VOC total)	0.8462	0.0422	0.0695	0.1849
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	3.4822	0.1737	0.2861	0.7608
Iso-Butane	3.6364	0.1814	0.2988	0.7945
N-Butane	6.3922	0.3189	0.5252	1.3966
Iso-Pentane	3.6708	0.1831	0.3016	0.8020

N-Pentane	3.7304	0.1861	0.3065	0.8151
Iso-Hexane	2.3254	0.1160	0.1911	0.5081
N-Hexane (TAP)	1.4238	0.0710	0.1170	0.3111
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.2061	0.0103	0.0169	0.0450
Cyclohexane	0.3260	0.0163	0.0268	0.0712
Heptanes	0.8409	0.0419	0.0691	0.1837
Methylcyclohexane	0.1234	0.0062	0.0101	0.0270
Toluene (TAP)	0.0116	0.0006	0.0009	0.0025
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.1579	0.0079	0.0130	0.0345
Ethylbenzene (TAP)	0.0009	0.0000	0.0001	0.0002
Xylenes (TAP)	0.0100	0.0005	0.0008	0.0022
Nonanes	0.0641	0.0032	0.0053	0.0140
Decanes Plus	0.0100	0.0005	0.0008	0.0022
Total Weight Percent:	100.000			
Total TAP Emissions		0.08	0.14	0.36
Total VOC Emissions		**1.32**	**2.17**	**5.77**
Total Non VOC & Non TAP-HC		0.05	0.09	0.23
Total Hydrocarbon Emissions		4.99	8.22	21.85

Calculated Avg. Gas Flowrate (SCFH) = 17.25

The mixing station blends chemicals in various combinations. When the word "solution" is used it is intended to indicate a mixture of various chemicals. Total material use indicated below:

Chemical Material	Specific Gravity	True Vapor Pressure (psia)	Throughput (gallons/year)
Corrosion Inhibitor	0.92	0.10	15,000.00
Paraffin Inhibitor	0.89	N/A	2,000.00
Demulsifier	0.94	N/A	750.00
Produced Oil	1.684	3.36	1,533,000
Total Throughput (gallons/year) =			1,550,750.00

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 during the mixing process and the emissions from the transfer of product to the final transport container; refer to ensuing pages for copy.

Chemical Material #1:		Corrosion Inhibitor			
CHEMICAL USAGE				**CHEMICAL THROUGHPUT**	
Gallons/Year		**Hour/Year**	**Specific Gravity**	**Hourly (lb/hr)**	**Annual (TPY)**
15,000.00		8,760	0.92	13.14	57.55
Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput Factor (lb)*	*City Factor*
170	*3*	*169*	*3*	*250,000*	*1.40*
A_1 (lb/yr) = 109.57		A_2 (lb/yr) = 1.93		A_5 (lb/yr) = 108.92	A_6 (lb/yr) = 1.93
				Total ΣTPY=	0.11

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
1,2,4-Trimethylbenzene	10.00	0.0025	0.0111
1,2,3-Trimethylbenzene	5.00	0.0013	0.0056
1,3,5-Trimethylbenzene	5.00	0.0013	0.0056
Light Aromatic Naphtha	30.00	0.0076	0.0334
Methanol (TAP)	30.00	0.0076	0.0334
Other VOCs	20.00	0.0051	0.0222
Total Weight Percent:	100.00		
Total TAP Emissions		0.01	0.03
Total VOC Emissions		**0.03**	**0.11**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.03	0.11

**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 ensuing pages 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 #2:	Paraffin Inhibitor			
CHEMICAL USAGE			**CHEMICAL THROUGHPUT**	
Gallons/Year	**Hour/Year**	**Specific Gravity**	**Hourly (lb/hr)**	**Annual (TPY)**
2,000.00	8,760	0.89	1.69	7.42

Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput (lb)*	*City Factor*
34	*1*	*34*	*1*	*50,000*	*1.40*

A_1 (lb/yr) = 14.13	A_2 (lb/yr) = 0.42	A_5 (lb/yr) = 14.13	A_6 (lb/yr) = 0.42
		Total ΣTPY=	0.01

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
1,2,4-Trimethylbenzene	10.00	0.0003	0.0015
1,2,3-Trimethylbenzene	5.00	0.0002	0.0007
1,3,5-Trimethylbenzene	5.00	0.0002	0.0007
Light Aromatic Naphtha	20.00	0.0007	0.0029
Xylenes (TAP)	50.00	0.0017	0.0073
Ethylbenzene (TAP)	10.00	0.0003	0.0015
Total Weight Percent:	100.00		
Total TAP Emissions		0.00	0.01
Total VOC Emissions		**0.00**	**0.01**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.00	0.01

**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 ensuing pages 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:		Demulsifier			
CHEMICAL USAGE				**CHEMICAL THROUGHPUT**	
Gallons/Year		**Hour/Year**	**Specific Gravity**	**Hourly (lb/hr)**	**Annual (TPY)**
750.00		8,760	0.935	0.67	2.92
Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput (lb)*	*City Factor*
34	*1*	*34*	*1*	*50,000*	*1.40*
A_1 (lb/yr) = 5.57		A_2 (lb/yr) = 0.16		A_5 (lb/yr) = 5.57	A_6 (lb/yr) = 0.16
				Total ΣTPY=	0.01

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
Aromatic Petroleum Naphtha	45.00	0.0006	0.0025
Naphthalene	10.00	0.0001	0.0006
Isopropanol	10.00	0.0001	0.0006
Dodecylbenzenesulfonic acid	25.00	0.0003	0.0014
Solvent Naptha	10.00	0.0001	0.0006
Xylenes (TAP)	2.00	0.0000	0.0001
Total Weight Percent:	102.00		
Total TAP Emissions		0.00	0.00
Total VOC Emissions		**0.00**	**0.01**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.00	0.01

**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 ensuing pages 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 #4:		Produced Oil			
CHEMICAL USAGE				**CHEMICAL THROUGHPUT**	
Gallons/Year		**Hour/Year**	**Specific Gravity**	**Hourly (lb/hr)**	**Annual (TPY)**
1,533,000		8,760	1.684	2457.80	10765.16
Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput (lb)*	*City Factor*
6794	*112*	*2253*	*111*	*10,000,000*	*1.40*
A_1 (lb/yr) = 20478.77		A_2 (lb/yr) = 337.60		A_5 (lb/yr) = 6,791.09	A_6 (lb/yr) = 334.58
				Total ΣTPY=	13.97

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
Nitrogen	0.0000	0.0000	0.0000
Carbon Dioxide	72.5466	2.3140	10.1355
Methane (excluded from VOC total)	0.1951	0.0062	0.0273
Ethane (excluded from VOC total)	0.8462	0.0270	0.1182
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000
Propane	3.4822	0.1111	0.4865

Iso-Butane	3.6364	0.1160	0.5080
N-Butane	6.3922	0.2039	0.8931
Iso-Pentane	3.6708	0.1171	0.5129
N-Pentane	3.7304	0.1190	0.5212
Iso-Hexane	2.3254	0.0742	0.3249
N-Hexane (TAP)	1.4238	0.0454	0.1989
Methylcyclopentane	0.0000	0.0000	0.0000
Benzene (TAP)	0.2061	0.0066	0.0288
Cyclohexane	0.3260	0.0104	0.0455
Heptanes	0.8409	0.0268	0.1175
Methylcyclohexane	0.1234	0.0039	0.0172
Toluene (TAP)	0.0116	0.0004	0.0016
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000
Octanes	0.1579	0.0050	0.0221
Ethylbenzene (TAP)	0.0009	0.0000	0.0001
Xylenes (TAP)	0.0100	0.0003	0.0014
Nonanes	0.0641	0.0020	0.0090
Decanes Plus	0.0100	0.0003	0.0014
Total Weight Percent:	100.000		
Total TAP Emissions		0.05	0.23
Total VOC Emissions		**0.84**	**3.69**
Total Non VOC & Non TAP-HC		0.03	0.15
Total Emissions		3.19	13.97

**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 ensuing pages 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.

DATA:

Emission Source:	***Blanket Gas***
Average Annual Tank Throughput (BBLs/Yr):	***36,500***
Gross Blanket Gas Required (MSCF/Yr):	***205***
Gas from Process to Tank(s) (MSCF/Yr):	***36,952***
Calculated Volume Requirement (MSCF/Yr):	***-36,747***

**There are no emissions associated with supplied blanket gas as flash generated from the heater treater and other storage tanks should be sufficient to maintain the gas blanket as demonstrated herein.*

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Blending Emissions + Blanket Gas	=	**9.59**

Emission Calculations

Emission calculations shown below are presented for informational purposes only as vapors from the inhibitor oil blending tank are routed to the atmospheric control flare (EPN: 17a-05-F) for combustion, except during brief intervals when thief hatches are opened for purposes of sampling, gauging, etc.

POINT SOURCE I.D. NUMBER: ***11-05-CBT-V***

EMISSION SOURCE DESCRIPTION: ***1500 BBL Chemical Blending Tank-Vent (BBJ-133B)***

DATA:

Emission Source:	***Crude Oil Storage Vapors ('Working' & 'Standing')***
Average Daily Oil Throughput: **(Annual Average; BBLD/Tank - Q_{avg})**	***100***
Maximum Daily Oil Throughput: **(BBLD/Tank - Q_{max})**	***200***
Average VOC Working Losses - L_w (lb/yr):	***7,468.327***
Average VOC Standing Losses - L_S (lb/yr):	***4,073.243***
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) * 3.7861/8760	=	**4.99**
Max. Hourly Uncontrolled THC Losses (lb/hr)	=	(Ls + (Lw * QMax ÷ Qavg)) * 3.7861/8760	=	**8.22**
Annual Potential Uncontrolled THC Losses (TPY)	=	Hourly * 8760/2000	=	**21.85**

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; reference supporting documentation.

UNCONTROLLED EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen	0.0000	0.0000	0.0000	0.0000
Carbon Dioxide	72.5466	3.6189	5.9606	15.8507
Methane (excluded from VOC total)	0.1951	0.0097	0.0160	0.0426
Ethane (excluded from VOC total)	0.8462	0.0422	0.0695	0.1849
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	3.4822	0.1737	0.2861	0.7608
Iso-Butane	3.6364	0.1814	0.2988	0.7945
N-Butane	6.3922	0.3189	0.5252	1.3966
Iso-Pentane	3.6708	0.1831	0.3016	0.8020

N-Pentane	3.7304	0.1861	0.3065	0.8151
Iso-Hexane	2.3254	0.1160	0.1911	0.5081
N-Hexane (TAP)	1.4238	0.0710	0.1170	0.3111
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.2061	0.0103	0.0169	0.0450
Cyclohexane	0.3260	0.0163	0.0268	0.0712
Heptanes	0.8409	0.0419	0.0691	0.1837
Methylcyclohexane	0.1234	0.0062	0.0101	0.0270
Toluene (TAP)	0.0116	0.0006	0.0009	0.0025
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.1579	0.0079	0.0130	0.0345
Ethylbenzene (TAP)	0.0009	0.0000	0.0001	0.0002
Xylenes (TAP)	0.0100	0.0005	0.0008	0.0022
Nonanes	0.0641	0.0032	0.0053	0.0140
Decanes Plus	0.0100	0.0005	0.0008	0.0022
Total Weight Percent:	100.000			
Total TAP Emissions		0.08	0.14	0.36
Total VOC Emissions		**1.32**	**2.17**	**5.77**
Total Non VOC & Non TAP-HC		0.05	0.09	0.23
Total Hydrocarbon Emissions		4.99	8.22	21.85

Calculated Avg. Gas Flowrate (SCFH) = 39.86

The mixing station blends chemicals in various combinations. When the word "solution" is used it is intended to indicate a mixture of various chemicals. Total material use indicated below:

Chemical Material	Specific Gravity	True Vapor Pressure (psia)	Throughput (gallons/year)
Corrosion Inhibitor	0.92	0.10	15,000.00
Paraffin Inhibitor	0.89	N/A	2,000.00
Demulsifier	0.94	N/A	750.00
Produced Oil	1.684	3.36	1,533,000
Total Throughput (gallons/year) =			1,550,750.00

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 during the mixing process and the emissions from the transfer of product to the final transport container; refer to ensuing pages for copy.

Chemical Material #1:		Corrosion Inhibitor			
CHEMICAL USAGE				**CHEMICAL THROUGHPUT**	
Gallons/Year		**Hour/Year**	**Specific Gravity**	**Hourly (lb/hr)**	**Annual (TPY)**
15,000.00		8,760	0.92	13.14	57.55
Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput Factor (lb)*	*City Factor*
170	*3*	*169*	*3*	*250,000*	*1.40*
A_1 (lb/yr) = 109.57		A_2 (lb/yr) = 1.93		A_5 (lb/yr) = 108.92	A_6 (lb/yr) = 1.93
				Total ΣTPY=	0.11

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
1,2,4-Trimethylbenzene	10.00	0.0025	0.0111
1,2,3-Trimethylbenzene	5.00	0.0013	0.0056
1,3,5-Trimethylbenzene	5.00	0.0013	0.0056
Light Aromatic Naphtha	30.00	0.0076	0.0334
Methanol (TAP)	30.00	0.0076	0.0334
Other VOCs	20.00	0.0051	0.0222
Total Weight Percent:	100.00		
Total TAP Emissions		0.01	0.03
Total VOC Emissions		**0.03**	**0.11**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.03	0.11

**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 ensuing pages 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 #2:	Paraffin Inhibitor			
CHEMICAL USAGE			**CHEMICAL THROUGHPUT**	
Gallons/Year	**Hour/Year**	**Specific Gravity**	**Hourly (lb/hr)**	**Annual (TPY)**
2,000.00	8,760	0.89	1.69	7.42

Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput (lb)*	*City Factor*
34	*1*	*34*	*1*	*50,000*	*1.40*

A_1 (lb/yr) = 14.13 A_2 (lb/yr) = 0.42 A_5 (lb/yr) = 14.13 A_6 (lb/yr) = 0.42

Total ΣTPY=	0.01

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
1,2,4-Trimethylbenzene	10.00	0.0003	0.0015
1,2,3-Trimethylbenzene	5.00	0.0002	0.0007
1,3,5-Trimethylbenzene	5.00	0.0002	0.0007
Light Aromatic Naphtha	20.00	0.0007	0.0029
Xylenes (TAP)	50.00	0.0017	0.0073
Ethylbenzene (TAP)	10.00	0.0003	0.0015
Total Weight Percent:	100.00		
Total TAP Emissions		0.00	0.01
Total VOC Emissions		**0.00**	**0.01**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.00	0.01

**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 ensuing pages 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:		Demulsifier			
CHEMICAL USAGE				**CHEMICAL THROUGHPUT**	
Gallons/Year		**Hour/Year**	**Specific Gravity**	**Hourly (lb/hr)**	**Annual (TPY)**
750.00		8,760	0.935	0.67	2.92
Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput (lb)*	*City Factor*
34	*1*	*34*	*1*	*50,000*	*1.40*
A_1 (lb/yr) = 5.57		A_2 (lb/yr) = 0.16		A_5 (lb/yr) = 5.57	A_6 (lb/yr) = 0.16
				Total ΣTPY=	0.01

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
Aromatic Petroleum Naphtha	45.00	0.0006	0.0025
Naphthalene	10.00	0.0001	0.0006
Isopropanol	10.00	0.0001	0.0006
Dodecylbenzenesulfonic acid	25.00	0.0003	0.0014
Solvent Naptha	10.00	0.0001	0.0006
Xylenes (TAP)	2.00	0.0000	0.0001
Total Weight Percent:	102.00		
Total TAP Emissions		0.00	0.00
Total VOC Emissions		**0.00**	**0.01**
Total Non VOC & Non TAP-HC		0.00	0.00
Total Emissions		0.00	0.01

**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 ensuing pages 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 #4:		Produced Oil			
CHEMICAL USAGE				**CHEMICAL THROUGHPUT**	
Gallons/Year		**Hour/Year**	**Specific Gravity**	**Hourly (lb/hr)**	**Annual (TPY)**
1,533,000		8,760	1.684	2457.80	10765.16
Emission Factors*					
A_1	A_2	A_5	A_6	*Throughput (lb)*	*City Factor*
6794	*112*	*2253*	*111*	*10,000,000*	*1.40*
A_1 (lb/yr) = 20478.77		A_2 (lb/yr) = 337.60		A_5 (lb/yr) = 6,791.09	A_6 (lb/yr) = 334.58
				Total ΣTPY=	13.97

POLLUTANT:**	**Weight Percent**	**CALCULATED EMISSION RATES**	
		Hourly (lb/hr)	**Annual (TPY)**
Nitrogen	0.0000	0.0000	0.0000
Carbon Dioxide	72.5466	2.3140	10.1355
Methane (excluded from VOC total)	0.1951	0.0062	0.0273
Ethane (excluded from VOC total)	0.8462	0.0270	0.1182
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000
Propane	3.4822	0.1111	0.4865

Iso-Butane	3.6364	0.1160	0.5080
N-Butane	6.3922	0.2039	0.8931
Iso-Pentane	3.6708	0.1171	0.5129
N-Pentane	3.7304	0.1190	0.5212
Iso-Hexane	2.3254	0.0742	0.3249
N-Hexane (TAP)	1.4238	0.0454	0.1989
Methylcyclopentane	0.0000	0.0000	0.0000
Benzene (TAP)	0.2061	0.0066	0.0288
Cyclohexane	0.3260	0.0104	0.0455
Heptanes	0.8409	0.0268	0.1175
Methylcyclohexane	0.1234	0.0039	0.0172
Toluene (TAP)	0.0116	0.0004	0.0016
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000
Octanes	0.1579	0.0050	0.0221
Ethylbenzene (TAP)	0.0009	0.0000	0.0001
Xylenes (TAP)	0.0100	0.0003	0.0014
Nonanes	0.0641	0.0020	0.0090
Decanes Plus	0.0100	0.0003	0.0014
Total Weight Percent:	100.000		
Total TAP Emissions		0.05	0.23
Total VOC Emissions		**0.84**	**3.69**
Total Non VOC & Non TAP-HC		0.03	0.15
Total Emissions		3.19	13.97

**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 ensuing pages 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.

DATA:

Emission Source:	***Blanket Gas***
Average Annual Tank Throughput (BBLs/Yr):	***36,500***
Gross Blanket Gas Required (MSCF/Yr):	***205***
Gas from Process to Tank(s) (MSCF/Yr):	***36,952***
Calculated Volume Requirement (MSCF/Yr):	***-36,747***

**There are no emissions associated with supplied blanket gas as flash generated from the heater treater and other storage tanks should be sufficient to maintain the gas blanket as demonstrated herein.*

Uncontrolled VOC Emission Total (TPY)	Storage Vapors + Blending Emissions + Blanket Gas	=	**9.59**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***13-05-ST***

EMISSION SOURCE DESCRIPTION: ***2000 Gallon Chemical Storage Tank***

DATA:

Emission Source:	***"Working" & "Standing" Losses***		
Maximum Annual Throughput: **(Gallons/Yr)**	***30,000***		
Average VOC Working Losses - L_W (lb/yr):	***153.800***		
Average VOC Standing Losses - L_S (lb/yr):	***273.848***		
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	=	**0.05**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**0.21**

For purposes of permitting and/or providing conservative emission estimates, emissions were calculated using N-Hexane as the stored material for this tank. A throughput of approximately 30,000 gallons/yr was used in the emissions model in an effort to demonstrate a conservative potential emissions estimate.

Emission Calculations

This is a sample calculation for EPNs: 14-05-ST & 15-05-ST.

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

EMISSION SOURCE DESCRIPTION: ***500 Gallon Chemical Storage Tank***

DATA:

Emission Source:	***"Working" & "Standing" Losses***		
Maximum Annual Throughput: **(Gallons/Yr/Tank)**	***4,000***		
Average VOC Working Losses - L_W (lb/yr):	***20.632***		
Average VOC Standing Losses - L_S (lb/yr):	***68.786***		
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	=	**0.01**
Annual Potential Uncontrolled THC Losses (TPY)	= Hourly * 8760/2000	=	**0.04**

For purposes of permitting and/or providing conservative emission estimates, emissions were calculated using N-Hexane as the stored material for this tank. A throughput of approximately 4,000 gallons/yr was used in the emissions model in an effort to demonstrate a conservative potential emissions estimate.

Emission Calculations

POINT SOURCE I.D. NUMBERS: ***16-05-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	108	1,743	1851	2.1E-04	2.0E-04	0.050	0.769	0.22	3.37
Flanges	128	0	128	1.1E-04	3.9E-04	0.031	0.000	0.14	0.00
Open Ends	0	63	63	1.4E-03	2.0E-03	0.000	0.278	0.00	1.22
Pumps[a]	2		2	1.3E-02	2.4E-03	0.057	N/A	0.25	N/A
Valves	66	637	703	2.5E-03	4.5E-03	0.364	6.320	1.59	27.68
"Others"[b]	0	0	0	7.5E-03	8.8E-03	0.000	0.000	0.00	0.00
TOTALS:	**304**	**2,443**	**2,747**			**0.50**	**7.37**	**2.20**	**32.26**

[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".

EMISSIONS SUMMARY:

Component	Weight Percent	Calculated Emission Rate	
		Avg. Hourly (lb/hr)	Avg. Annual (TPY)
Hydrogen Sulfide (TAP; excluded from VOC total)	0.0	0.0000	0.0000
NMEHC (expressed as VOC)	29.2	0.1466	0.6422
Benzene (TAP)	0.027	0.0001	0.0006
Ethylbenzene (TAP)	0.0170	0.0001	0.0004

Toluene (TAP)	0.075	0.0004	0.0016
Xylenes (m,p,o) (TAP)	0.036	0.0002	0.0008
	TOTAL TAP EMISSIONS:	0.00	0.00
	TOTAL VOC EMISSIONS:	**0.15**	**0.64**

GAS SERVICE SPECIATION FACTORS:

Speciation of the emission stream from components in gas service is based on an actual inlet gas analysis; refer to Southern Petroleum Laboratories Report No.: 172-23110338-001A in supporting documentation.

EMISSIONS SUMMARY:

Component	Weight Percent	Calculated Emission Rate	
		Avg. Hourly (lb/hr)	Avg. Annual (TPY)
Nitrogen (excluded from VOC total)	0.4749	0.0350	0.1532
Carbon Dioxide (excluded from VOC total)	93.6476	6.8980	30.2132
Methane (excluded from VOC total)	3.1626	0.2330	1.0203
Ethane (excluded from VOC total)	0.4346	0.0320	0.1402
Hydrogen Sulfide (TAP; excluded from VOC total)	0.0000	0.0000	0.0000
Propane	0.4491	0.0331	0.1449
Iso-Butane	0.2795	0.0206	0.0902
N-Butane	0.4498	0.0331	0.1451
Iso-Pentane	0.2332	0.0172	0.0752
N-Pentane	0.2467	0.0182	0.0796
Iso-Hexanes	0.1663	0.0122	0.0537
N-Hexane (TAP)	0.1223	0.0090	0.0395
Methylcyclopentane	0.0000	0.0000	0.0000
Benzene (TAP)	0.0329	0.0024	0.0106
Cyclohexane	0.0395	0.0029	0.0127
Heptanes	0.1194	0.0088	0.0385
Methylcyclohexane	0.0244	0.0018	0.0079
Toluene (TAP)	0.0048	0.0004	0.0015
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000
Octanes	0.0571	0.0042	0.0184
Ethylbenzene (TAP)	0.0003	0.0000	0.0001
Xylenes (TAP)	0.0025	0.0002	0.0008
Nonanes	0.0331	0.0024	0.0107
Decanes Plus	0.0194	0.0014	0.0063
TOTAL WEIGHT PERCENT:	100.0000		
	TOTAL TAP EMISSIONS:	0.01	0.05
	TOTAL VOC EMISSIONS:	**0.17**	**0.74**
	TOTAL Non-VOC & Non-TAP HC:	0.26	1.16
	TOTAL Emissions:	7.37	32.26

Facility-Wide VOC Fugitive Totals	=	**0.32 lb/hr**	**1.38 TPY**

Emission Calculations

POINT SOURCE I.D. NUMBER: ***17a-05-F***

EMISSION SOURCE DESCRIPTION: ***Atmospheric Control Flare (ZZZ-190B)***

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):	***729***
Assist Gas Feed:	***Yes***
Gas Heat of Combustion (BTU/Ft^3-typical fuel gas analysis):	***1037***
Pilot Feed (Propane):	***Yes***
Gas Heat of Combustion (BTU/Ft^3):	***2516***
Combustion Efficiency:	***98% for all other HC***

Gas Stream #1 - Storage Tank Vapors

Gas volume estimates are supported by the calculations associated with EPNs: 5-05-OST-V, 6a-05-OST-CV, 6b-05-OST-CV, 7a-05-ST-CV, 9a-05-WST-CV, 9c-05-WST-CV, 9d-05-WST-CV, 9e-05-OST-CV, 10-05-CBT-V, & 11-05-CBT-V and are outlined below:

INPUT

Maximum Gas Flowrate (scf/hr)	*Operating Time (hrs/year)*	*Burn Efficiency (%)*	*Gas Heat of Combustion (BTU/FT^3)*	*Specific Gravity of Gas*
3,209.97	*8760*	*98*	*729*	*1.6384*

CALCULATIONS

Gas Combusted (annual hourly average)	=	*gas rate (scf/hr)*	*x*	*efficiency*	*x*	*usage (hrs/yr)*
	=	*3,209.97*	*x*	*0.98*	*x*	*8,760*
	=	***27,556,950 scf/yr***		=	***3,145.77 SCF/hr***	
Heat Content (annual hourly average)	=	*gas rate (scf/yr)*	*x*	*gas heat of combustion (BTU/scf)*		
	=	*27,556,950*	*x*	*729*		
	=	***2.2933 MMBTU/Hr***				
Uncontrolled Max. Hourly Emissions (lbs/hr)	=	*gas specific gravity*	*x*	*density of air (lb/SCF)*	*x*	*Maximum Gas Rate (SCF/Hr)*
	=	*1.6384*	*x*	*0.0764*	*x*	*3,209.97*
	=	***401.81 lbs/hr***				
Uncontrolled Annual Emissions (TPY)	=	*gas specific gravity*	*x*	*density of air (tons/SCF)*	*x*	*Total Gas Rate (SCF/Yr)*
	=	*1.6384*	*x*	*0.0000382*	*x*	*28,119,337*
	=	***1,759.91 TPY***				

SPECIATION FACTORS:

Speciation of the flash gas mixture is based on an actual analysis of the vapors routed to the control flare and normalized to account for the removal of Nitrogen; refer to Southern Petroleum Laboratories Report No.: 172-24050250-002A 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)	0.0000	0.0000	0.0000	0.0000
Carbon Dioxide (excluded from VOC total)	72.5466	291.4969	291.4969	1276.7563
Methane (excluded from VOC total)	0.1951	0.0157	0.0157	0.0687
Ethane (excluded from VOC total)	0.8462	0.0680	0.0680	0.2979
Hydrogen Sulfide (TAP; excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	3.4822	0.2798	0.2798	1.2257
Iso-Butane	3.6364	0.2922	0.2922	1.2800
N-Butane	6.3922	0.5137	0.5137	2.2500
Iso-Pentane	3.6708	0.2950	0.2950	1.2921
N-Pentane	3.7304	0.2998	0.2998	1.3130
Iso-Hexanes	2.3254	0.1869	0.1869	0.8185
N-Hexane (TAP)	1.4238	0.1144	0.1144	0.5011
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.2061	0.0166	0.0166	0.0726
Cyclohexane	0.3260	0.0262	0.0262	0.1147
Heptanes	0.8409	0.0676	0.0676	0.2960
Methylcyclohexane	0.1234	0.0099	0.0099	0.0434
Toluene (TAP)	0.0116	0.0009	0.0009	0.0041
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.1579	0.0127	0.0127	0.0556
Ethylbenzene (TAP)	0.0009	0.0001	0.0001	0.0003
Xylenes (TAP)	0.0100	0.0008	0.0008	0.0035
Nonanes	0.0641	0.0051	0.0051	0.0226
Decanes Plus	0.0100	0.0008	0.0008	0.0035
Other NM/NE HC	0.0000	0.0000	0.0000	0.0000
TOTAL WEIGHT PERCENT:	100.0000			
TOTAL TAP EMISSIONS:		0.13	0.13	0.58
TOTAL VOC EMISSIONS:		**2.12**	**2.12**	**9.30**
TOTAL Non-VOC & Non-TAP HC:		0.08	0.08	0.37
TOTAL EMISSIONS:		293.70	293.70	1286.42

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

INPUT				
Maximum Gas Flowrate (scf/hr)	*Operating Time (hrs/year)*	*Burn Efficiency (%)*	*Gas Heat of Combustion (BTU/FT^3)*	*Specific Gravity of Gas*
50.00	*8760*	*98*	*1037*	*0.5925*

CALCULATIONS						
Gas Combusted (annual hourly average)	=	*gas rate (scf/hr)*	*x*	*efficiency*	*x*	*usage (hrs/yr)*
	=	*50.00*	*x*	*0.98*	*x*	*8,760*
	=	***429,240 scf/yr***		=	***49.00 SCF/hr***	
Heat Content (annual hourly average)	=	*gas rate (scf/yr)*	*x*	*gas heat of combustion (BTU/scf)*		
	=	*429,240*	*x*	*1037*		
	=	***0.0508 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*	*50.00*
	=	***2.26 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*	*438,000*
	=	***9.91 TPY***				

SPECIATION FACTORS:

Speciation of the supply gas is based on a typical fuel gas analysis; refer to McComb-Summit City Gas Gas Sample 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	0.0151	0.0151	0.0660
Carbon Dioxide (excluded from VOC total)	2.9413	0.0666	0.0666	0.2916
Methane (excluded from VOC total)	89.0707	0.0403	0.0403	0.1766
Ethane (excluded from VOC total)	4.4023	0.0020	0.0020	0.0087
Hydrogen Sulfide (TAP; excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	1.2597	0.0006	0.0006	0.0025
Iso-Butane	0.4244	0.0002	0.0002	0.0008
N-Butane	0.4075	0.0002	0.0002	0.0008
Iso-Pentane	0.2192	0.0001	0.0001	0.0004
N-Pentane	0.1264	0.0001	0.0001	0.0003
Iso-Hexanes	0.2925	0.0001	0.0001	0.0006
N-Hexane (TAP)	0.0678	0.0000	0.0000	0.0001
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0137	0.0000	0.0000	0.0000
Cyclohexane	0.0000	0.0000	0.0000	0.0000

Heptanes	0.0366	0.0000	0.0000	0.0001
Methylcyclohexane	0.0000	0.0000	0.0000	0.0000
Toluene (TAP)	0.0140	0.0000	0.0000	0.0000
2,2,4-Trimethylpentane (TAP)	0.0162	0.0000	0.0000	0.0000
Octanes Plus	0.0368	0.0000	0.0000	0.0001
Ethylbenzene (TAP)	0.0008	0.0000	0.0000	0.0000
Xylenes (TAP)	0.0041	0.0000	0.0000	0.0000
TOTAL WEIGHT PERCENT:	100.0000			
TOTAL TAP EMISSIONS:		0.00	0.00	0.00
TOTAL VOC EMISSIONS:		**0.00**	**0.00**	**0.01**
TOTAL Non-VOC & Non-TAP HC:		0.04	0.04	0.19
TOTAL EMISSIONS:		0.13	0.13	0.55

Pilot Gas (Propane) (anticipated volume needed to ensure an adequate heat content):

INPUT					
Maximum Gas Flowrate (scf/hr)	*Operating Time (hrs/year)*	*Burn Efficiency (%)*	*Gas Heat of Combustion (BTU/FT^3)*	*Specific Gravity of Gas*	
50.00	*8760*	*98*	*2516*	*1.52*	
CALCULATIONS					
Gas Combusted (annual hourly average)	=	*gas rate (scf/hr)*	*x*	*efficiency*	*x*	*usage (hrs/yr)*
	=	*50.00*	*x*	*0.98*	*x*	*8,760*
	=	***429,240***	***scf/yr***	=	***49.00***	***SCF/hr***
Heat Content (annual hourly average)	=	*gas rate (scf/yr)*	*x*	*gas heat of combustion (BTU/scf)*		
	=	*429,240*	*x*	*2516*		
	=				***0.1233***	***MMBTU/Hr***
Uncontrolled Max. Hourly Emissions (lbs/hr)	=	*gas specific gravity*	*x*	*density of air (lb/SCF)*	*x*	*Maximum Gas Rate (SCF/Hr)*
	=	*1.52*	*x*	*0.0764*	*x*	*50.00*
	=	***5.81***	***lbs/hr***			
Uncontrolled Annual Emissions (TPY)	=	*gas specific gravity*	*x*	*density of air (tons/SCF)*	*x*	*Total Gas Rate (SCF/Yr)*
	=	*1.52*	*x*	*0.0000382*	*x*	*438,000*
	=	***25.43***	***TPY***			

SPECIATION FACTORS:

Speciation of the pilot gas is based on propane.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Propane	100.0000	0.1161	0.1161	0.5086
TOTAL WEIGHT PERCENT:	100.0000			
TOTAL TAP EMISSIONS:		0.00	0.00	0.00
TOTAL VOC EMISSIONS:		**0.12**	**0.12**	**0.51**
TOTAL Non-VOC & Non-TAP HC:		0.00	0.00	0.00
TOTAL EMISSIONS:		0.12	0.12	0.51

Total of Average Hourly VOC emissions estimated for this source:	**2.24 Lbs/Hr**
Total of Maximum Hourly VOC emissions estimated for this source:	**2.24 Lbs/Hr**
Total of Maximum Annual VOC emissions estimated for this source:	**9.82 TPY**

CALCULATIONS - Selected Combustion Products

Summary of all routine streams combusted by this flare:

Gas Stream	*Annual Operating Hours*	*Average Flowrate (SCF/Hr)*	*Maximum Flowrate (SCF/Hr)*	*Average Heat Rate (MMBTU/Hr)*	*Maximum Heat Rate (MMBTU/Hr)*
1. Storage Tank Vapors	8760	3209.97	3209.97	2.2933	2.2933
Assist Gas Feed	8760	50.00	50.00	0.0508	0.0508
Pilot Feed	8760	50.00	50.00	0.1233	0.1233
Totals:		***3,309.97***	***3,309.97***	***2.47***	***2.47***

Emission factor for soot is from AP-42 "Compilation of Air Pollution Emission Factors" for an industrial burn flare stack (refer to supporting documentation for copies).

SO_2 emissions based on the composite H_2S composition of the flare gas streams assuming stoichiometric combustion.

POLLUTANT:	Emission Factor (lb/SCF)	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Soot (expressed as PM_{10})	0.000011	0.04	0.04	0.16
Soot (expressed as $PM_{2.5}$)	0.000011	0.04	0.04	0.16
SO_2	N/A	0.00	0.00	0.00

Emission factors for nitrogen oxide and carbon monoxide are from a 1983 CMA document entitled "A Report on a Flare Efficiency Study", for a non-assisted industrial burn flares. (refer to supporting documentation for copies).

POLLUTANT:	Emission Factor ($lb/10^6$ BTU)	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen Oxides	0.0641	0.16	0.16	0.69
CO	0.5496	1.36	1.36	5.95

Emission Calculations

POINT SOURCE I.D. NUMBER: ***17b-05-F***

EMISSION SOURCE DESCRIPTION: ***Atmospheric Control Flare (ZZZ-190A)***

DATA:

Emission Source:	***Unburned Hydrocarbons and Products of Combustion***
Atmospheric Gas Streams:	
Gas Stream #1:	***Heater Treater Flash Gas & Water Flash Drum Flash Gas***
Gas Heat of Combustion (BTU/Ft^3-actual flare gas analysis):	***277***
Assist Gas Feed:	***Yes***
Gas Heat of Combustion (BTU/Ft^3-typical fuel gas analysis):	***1037***
Pilot Feed (Propane):	***Yes***
Gas Heat of Combustion (BTU/Ft^3):	***2516***
Combustion Efficiency:	***98% for all other HC***

Gas Stream #1 - Heater Treater Flash Gas & Water Flash Drum Flash Gas

Gas volume estimates are supported by the calculations associated with EPNs: 20-05-HT-WG & 21-05-WFD-WG and are outlined below:

INPUT

Maximum Gas Flowrate (scf/hr)	*Operating Time (hrs/year)*	*Burn Efficiency (%)*	*Gas Heat of Combustion (BTU/FT^3)*	*Specific Gravity of Gas*
9,164.01	*8760*	*98*	*277*	*1.5280*

CALCULATIONS

Gas Combusted (annual hourly average)	=	*gas rate (scf/hr)*	*x*	*efficiency*	*x*	*usage (hrs/yr)*
	=	*9,164.01*	*x*	*0.98*	*x*	*8,760*
	=	***78,671,193 scf/yr***		=	***8,980.73 SCF/hr***	
Heat Content (annual hourly average)	=	*gas rate (scf/yr)*	*x*	*gas heat of combustion (BTU/scf)*		
	=	*78,671,193*	*x*	*277*		
	=			***2.4877 MMBTU/Hr***		
Uncontrolled Max. Hourly Emissions (lbs/hr)	=	*gas specific gravity*	*x*	*density of air (lb/SCF)*	*x*	*Maximum Gas Rate (SCF/Hr)*
	=	*1.5280*	*x*	*0.0764*	*x*	*9,164.01*
	=	***1,069.78 lbs/hr***				
Uncontrolled Annual Emissions (TPY)	=	*gas specific gravity*	*x*	*density of air (tons/SCF)*	*x*	*Total Gas Rate (SCF/Yr)*
	=	*1.5280*	*x*	*0.0000382*	*x*	*80,276,728*
	=	***4,685.65 TPY***				

SPECIATION FACTORS:

Speciation of the flash gas mixture is based on an actual analysis of the vapors routed to the control flare and normalized to account for the removal of Nitrogen; refer to Southern Petroleum Laboratories Report No.: 172-24050250-001A 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)	0.0000	0.0000	0.0000	0.0000
Carbon Dioxide (excluded from VOC total)	88.9569	951.6463	951.6463	4168.2106
Methane (excluded from VOC total)	1.0838	0.2319	0.2319	1.0157
Ethane (excluded from VOC total)	0.6856	0.1467	0.1467	0.6425
Hydrogen Sulfide (TAP; excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	1.4348	0.3070	0.3070	1.3446
Iso-Butane	1.2691	0.2715	0.2715	1.1893
N-Butane	2.0420	0.4369	0.4369	1.9136
Iso-Pentane	1.0645	0.2278	0.2278	0.9976
N-Pentane	1.0846	0.2321	0.2321	1.0164
Iso-Hexanes	0.7174	0.1535	0.1535	0.6723
N-Hexane (TAP)	0.4961	0.1061	0.1061	0.4649
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.1033	0.0221	0.0221	0.0968
Cyclohexane	0.1543	0.0330	0.0330	0.1446
Heptanes	0.4716	0.1009	0.1009	0.4419
Methylcyclohexane	0.0958	0.0205	0.0205	0.0898
Toluene (TAP)	0.0150	0.0032	0.0032	0.0140
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.1944	0.0416	0.0416	0.1822
Ethylbenzene (TAP)	0.0015	0.0003	0.0003	0.0014
Xylenes (TAP)	0.0152	0.0033	0.0033	0.0142
Nonanes	0.1022	0.0219	0.0219	0.0958
Decanes Plus	0.0119	0.0025	0.0025	0.0111
Other NM/NE HC	0.0000	0.0000	0.0000	0.0000
TOTAL WEIGHT PERCENT:	100.0000			
TOTAL TAP EMISSIONS:		0.14	0.14	0.59
TOTAL VOC EMISSIONS:		**1.98**	**1.98**	**8.69**
TOTAL Non-VOC & Non-TAP HC:		0.38	0.38	1.66
TOTAL EMISSIONS:		954.01	954.01	4178.56

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

INPUT				
Maximum Gas Flowrate (scf/hr)	*Operating Time (hrs/year)*	*Burn Efficiency (%)*	*Gas Heat of Combustion (BTU/FT^3)*	*Specific Gravity of Gas*
150.00	*8760*	*98*	*1037*	*0.5925*

CALCULATIONS						
Gas Combusted (annual hourly average)	=	*gas rate (scf/hr)*	*x*	*efficiency*	*x*	*usage (hrs/yr)*
	=	*150.00*	*x*	*0.98*	*x*	*8,760*
	=	***1,287,720 scf/yr***		=	***147.00 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*	*150.00*
	=	***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 supply gas is based on a typical fuel gas analysis; refer to McComb-Summit City Gas Gas Sample 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
Heptanes	0.0366	0.0000	0.0000	0.0002
Methylcyclohexane	0.0000	0.0000	0.0000	0.0000
Toluene (TAP)	0.0140	0.0000	0.0000	0.0001
2,2,4-Trimethylpentane (TAP)	0.0162	0.0000	0.0000	0.0001
Octanes Plus	0.0368	0.0000	0.0000	0.0002
Ethylbenzene (TAP)	0.0008	0.0000	0.0000	0.0000
Xylenes (TAP)	0.0041	0.0000	0.0000	0.0000
TOTAL WEIGHT PERCENT:	100.0000			
TOTAL TAP EMISSIONS:		0.00	0.00	0.00
TOTAL VOC EMISSIONS:		**0.00**	**0.00**	**0.02**
TOTAL Non-VOC & Non-TAP HC:		0.13	0.13	0.56
TOTAL EMISSIONS:		0.38	0.38	1.65

Pilot Gas (Propane) (anticipated volume needed to ensure an adequate heat content):

INPUT					
Maximum Gas Flowrate (scf/hr)	*Operating Time (hrs/year)*	*Burn Efficiency (%)*	*Gas Heat of Combustion (BTU/FT^3)*	*Specific Gravity of Gas*	
150.00	*8760*	*98*	*2516*	*1.52*	
CALCULATIONS					
Gas Combusted (annual hourly average)	=	*gas rate (scf/hr)*	*x*	*efficiency*	*x* *usage (hrs/yr)*
	=	*150.00*	*x*	*0.98*	*x* *8,760*
	=	***1,287,720 scf/yr***		=	***147.00 SCF/hr***
Heat Content (annual hourly average)	=	*gas rate (scf/yr)*	*x*	*gas heat of combustion (BTU/scf)*	
	=	*1,287,720*	*x*	*2516*	
	=				***0.3699 MMBTU/Hr***
Uncontrolled Max. Hourly Emissions (lbs/hr)	=	*gas specific gravity*	*x*	*density of air (lb/SCF)*	*x* *Maximum Gas Rate (SCF/Hr)*
	=	*1.52*	*x*	*0.0764*	*x* *150.00*
	=	***17.42 lbs/hr***			
Uncontrolled Annual Emissions (TPY)	=	*gas specific gravity*	*x*	*density of air (tons/SCF)*	*x* *Total Gas Rate (SCF/Yr)*
	=	*1.52*	*x*	*0.0000382*	*x* *1,314,000*
	=	***76.30 TPY***			

SPECIATION FACTORS:

Speciation of the pilot gas is based on propane.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Propane	100.0000	0.3484	0.3484	1.5259
TOTAL WEIGHT PERCENT:	100.0000			
TOTAL TAP EMISSIONS:		0.00	0.00	0.00
TOTAL VOC EMISSIONS:		**0.35**	**0.35**	**1.53**
TOTAL Non-VOC & Non-TAP HC:		0.00	0.00	0.00
TOTAL EMISSIONS:		0.35	0.35	1.53

Total of Average Hourly VOC emissions estimated for this source:	**2.33 Lbs/Hr**
Total of Maximum Hourly VOC emissions estimated for this source:	**2.33 Lbs/Hr**
Total of Maximum Annual VOC emissions estimated for this source:	**10.24 TPY**

CALCULATIONS - Selected Combustion Products

Summary of all routine streams combusted by this flare:

Gas Stream	*Annual Operating Hours*	*Average Flowrate (SCF/Hr)*	*Maximum Flowrate (SCF/Hr)*	*Average Heat Rate (MMBTU/Hr)*	*Maximum Heat Rate (MMBTU/Hr)*
1. Heater Treater Flash Gas & Water Flash Drum Flash Gas	8760	9164.01	9164.01	2.4877	2.4877
Assist Gas Feed	8760	150.00	150.00	0.1524	0.1524
Pilot Feed	8760	150.00	150.00	0.3699	0.3699
Totals:		***9,464.01***	***9,464.01***	***3.01***	***3.01***

Emission factor for soot is from AP-42 "Compilation of Air Pollution Emission Factors" for an industrial burn flare stack (refer to supporting documentation for copies).

SO_2 emissions based on the composite H_2S composition of the flare gas streams assuming stoichiometric combustion.

POLLUTANT:	Emission Factor (lb/SCF)	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Soot (expressed as PM_{10})	0.000011	0.10	0.10	0.46
Soot (expressed as $PM_{2.5}$)	0.000011	0.10	0.10	0.46
SO_2	N/A	0.00	0.00	0.00

Emission factors for nitrogen oxide and carbon monoxide are from a 1983 CMA document entitled "A Report on a Flare Efficiency Study", for a non-assisted industrial burn flares. (refer to supporting documentation for copies).

POLLUTANT:	Emission Factor ($lb/10^6$ BTU)	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen Oxides	0.0641	0.19	0.19	0.85
CO	0.5496	1.65	1.65	7.25

Emission Calculations

POINT SOURCE I.D. NUMBER: ***18-05-CB***

EMISSION SOURCE DESCRIPTION: ***Compressor Blowdowns***

DATA:

Emission Source:	***Compressor Blowdowns***
Gas Specific Gravity:	***1.4505***
Maximum Volume per Blowdown Rate (SCF): *(conservative estimate provided by operator)*	***79477***
Maximum Number of Blowdowns per Year:	***36***
Basis of Emission Estimates:	***Conservative Estimate Provided By Operator & Actual Inlet Gas Analysis (Refer to supporting documentation)***
Well Gas Analysis Report Number:	***Southern Petroleum Laboratories Report No.: 172-23110338-001A***

Total Blowdown Gas Volume (SCF/Yr)	=	Volume per Event * Number of Events	=	**2861172.00**
Avg. Hourly Uncontrolled Total Emissions (lb/hr)	=	Gas Gravity * Density of Air * Volume per Blowdown	=	**8807.50**
Max. Hourly Uncontrolled Total Emissions (lb/hr)	=	Gas Gravity * Density of Air * Volume per Blowdown	=	**8807.50**
Annual Potential Uncontrolled Total Emissions (TPY)	=	Hourly * Number of Events per Year/2000	=	**158.54**

SPECIATION FACTORS:

Speciation of the well gas relief is based on the referenced analysis.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.4749	41.8268	41.8268	0.7529
Carbon Dioxide (excluded from VOC total)	93.6476	8248.0106	8248.0106	148.4642
Methane (excluded from VOC total)	3.1626	278.5459	278.5459	5.0138
Ethane (excluded from VOC total)	0.4346	38.2774	38.2774	0.6890
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	0.4491	39.5545	39.5545	0.7120
Iso-Butane	0.2795	24.6170	24.6170	0.4431
N-Butane	0.4498	39.6161	39.6161	0.7131
Iso-Pentane	0.2332	20.5391	20.5391	0.3697
N-Pentane	0.2467	21.7281	21.7281	0.3911
Iso-Hexane	0.1663	14.6469	14.6469	0.2636
N-Hexane (TAP)	0.1223	10.7716	10.7716	0.1939
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.0329	2.8977	2.8977	0.0522
Cyclohexane	0.0395	3.4790	3.4790	0.0626
Heptanes	0.1194	10.5162	10.5162	0.1893
Methylcyclohexane	0.0244	2.1490	2.1490	0.0387

Toluene (TAP)	0.0048	0.4228	0.4228	0.0076
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.0571	5.0291	5.0291	0.0905
Ethylbenzene (TAP)	0.0003	0.0264	0.0264	0.0005
Xylenes (TAP)	0.0025	0.2202	0.2202	0.0040
Nonanes	0.0331	2.9153	2.9153	0.0525
Decanes Plus	0.0194	1.7087	1.7087	0.0308
Total Weight Percent:	100.0000			
Total TAP Emissions		14.34	14.34	0.26
Total VOC Emissions		**200.84**	**200.84**	**3.62**
Total Non VOC & Non TAP-HC		316.82	316.82	5.70
Total Emissions		8807.50	8807.50	158.54

Uncontrolled VOC Emission Total (TPY)	Compressor Blowdowns	=	**3.62**

Emission Calculations

Emission calculations shown below are presented for informational purposes only as off-gas from the heater treater is routed to the storage tanks and used as blanket gas as needed with relief routed to the LP control flare (EPN: 17b-05-F) for combustion. For purposes of permitting, all off-gas is shown as routed to the LP control flare (EPN: 17b-05-F) for combustion.

POINT SOURCE I.D. NUMBER: ***20-05-HT-WG***

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

DATA:

Emission Source:	***Heater Treater Flash Gas***
Flash Gas Specific Gravity:	***1.5280***
Maximum Oil Throughput: **(BBLD)**	***2000***
Basis of Emission Estimates:	***Representative GOR & Actual Flare Gas Analysis***
Flash Gas Analysis Report Number:	***Southern Petroleum Laboratories Report No.: 172-24050250-001A***

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 to PENCOR Report No.: 31554-5006038374 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:			
46	200	80	
	35	140	Unknown
Laboratory Conditions:			
35.7	200	86	
	39	120	75
		Prorated GOR Estimate:	**103.59**

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	=	Oil Rate * GOR	=	**8632.76**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**1007.78**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	=	Flash Gas Gravity * Density of Air * Flash Rate	=	**1007.78**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Hourly * 8760/2000	=	**4414.08**

SPECIATION FACTORS:

Speciation of the flash gas mixture taken from the referenced laboratory results and normalized to account for the removal of Nitrogen; refer to 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)	0.0000	0.0000	0.0000	0.0000
Carbon Dioxide (excluded from VOC total)	88.9569	896.4915	896.4915	3926.6271
Methane (excluded from VOC total)	1.0838	10.9224	10.9224	47.8400
Ethane (excluded from VOC total)	0.6856	6.9097	6.9097	30.2643
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	1.4348	14.4601	14.4601	63.3351
Iso-Butane	1.2691	12.7897	12.7897	56.0188
N-Butane	2.0420	20.5790	20.5790	90.1358
Iso-Pentane	1.0645	10.7276	10.7276	46.9870
N-Pentane	1.0846	10.9307	10.9307	47.8762
Iso-Hexane	0.7174	7.2295	7.2295	31.6650
N-Hexane (TAP)	0.4961	4.9993	4.9993	21.8968
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.1033	1.0408	1.0408	4.5588
Cyclohexane	0.1543	1.5546	1.5546	6.8090
Heptanes	0.4716	4.7526	4.7526	20.8163
Methylcyclohexane	0.0958	0.9659	0.9659	4.2305
Toluene (TAP)	0.0150	0.1507	0.1507	0.6600
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.1944	1.9589	1.9589	8.5800
Ethylbenzene (TAP)	0.0015	0.0153	0.0153	0.0671
Xylenes (TAP)	0.0152	0.1532	0.1532	0.6710
Nonanes	0.1022	1.0303	1.0303	4.5128
Decanes Plus	0.0119	0.1198	0.1198	0.5246
Total Weight Percent:	100.0000			
Total TAP Emissions		6.36	6.36	27.85
Total VOC Emissions		**93.46**	**93.46**	**409.34**
Total Non VOC & Non TAP-HC		17.83	17.83	78.10
Total Emissions		1007.78	1007.78	4414.08

Uncontrolled VOC Emission Total (TPY)	Heater Treater Flash Gas	=	**409.34**

Emission Calculations

Emission calculations shown below are presented for informational purposes only as off-gas from the water flash drums is routed to the LP control flare (EPN: 17b-05-F) for combustion.

POINT SOURCE I.D. NUMBER: ***21-05-WFD-WG***

EMISSION SOURCE DESCRIPTION: ***Water Flash Drum-Flash Gas***

DATA:

Emission Source:	***Water Flash Drum Flash Gas***
Approx. Pressure Drop of Brine Solution: (psig)	***165***
Approx. Temperature of Brine Solution: (^{o}F)	***72***
Flash Gas Specific Gravity:	***1.5280***
Maximum Water Throughput: (BBLD)	***7500***
Gas to Water Ratio: (SCF/BBL of Brine; GWR)	***1.7***
Basis of Emission Estimates:	***API Documentation & Actual Flare Gas Analysis (Refer to supporting documentation)***
Wet Gas Analysis Report Number:	***Southern Petroleum Laboratories Report No.: 172-24050250-001A***

Avg. Hourly Uncontrolled Flash Rate (SCF/Hr)	= Brine Rate * GWR	=	**531.25**
Avg. Hourly Uncontrolled Total Flash Emissions (lb/hr)	= Flash Gas Gravity * Density of Air * Flash Rate	=	**62.02**
Max. Hourly Uncontrolled Total Flash Emissions (lb/hr)	= Flash Gas Gravity * Density of Air * Flash Rate	=	**62.02**
Annual Potential Uncontrolled Flash Emissions (TPY)	= Hourly * 8760/2000	=	**271.65**

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". 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 the referenced analysis and normalized to account for the removal of Nitrogen.

EMISSIONS SUMMARY:

POLLUTANT:	Weight Percent	CALCULATED EMISSION RATES		
		Average Hourly (lb/hr)	Maximum Hourly (lb/hr)	Annual (TPY)
Nitrogen (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Carbon Dioxide (excluded from VOC total)	88.9569	55.1690	55.1690	241.6494
Methane (excluded from VOC total)	1.0838	0.6722	0.6722	2.9441
Ethane (excluded from VOC total)	0.6856	0.4252	0.4252	1.8625
Hydrogen Sulfide (excluded from VOC total)	0.0000	0.0000	0.0000	0.0000
Propane	1.4348	0.8899	0.8899	3.8977
Iso-Butane	1.2691	0.7871	0.7871	3.4475
N-Butane	2.0420	1.2664	1.2664	5.5471
Iso-Pentane	1.0645	0.6602	0.6602	2.8916
N-Pentane	1.0846	0.6727	0.6727	2.9464
Iso-Hexane	0.7174	0.4449	0.4449	1.9487
N-Hexane (TAP)	0.4961	0.3076	0.3076	1.3476

Methylcyclopentane	0.0000	0.0000	0.0000	0.0000
Benzene (TAP)	0.1033	0.0641	0.0641	0.2806
Cyclohexane	0.1543	0.0957	0.0957	0.4190
Heptanes	0.4716	0.2925	0.2925	1.2811
Methylcyclohexane	0.0958	0.0594	0.0594	0.2604
Toluene (TAP)	0.0150	0.0093	0.0093	0.0406
2,2,4-Trimethylpentane (TAP)	0.0000	0.0000	0.0000	0.0000
Octanes	0.1944	0.1205	0.1205	0.5280
Ethylbenzene (TAP)	0.0015	0.0009	0.0009	0.0041
Xylenes (TAP)	0.0152	0.0094	0.0094	0.0413
Nonanes	0.1022	0.0634	0.0634	0.2777
Decanes Plus	0.0119	0.0074	0.0074	0.0323
Total Weight Percent:	100.0000			
Total TAP Emissions		0.39	0.39	1.71
Total VOC Emissions		**5.75**	**5.75**	**25.19**
Total Non VOC & Non TAP-HC		1.10	1.10	4.81
Total Emissions		62.02	62.02	271.65

Uncontrolled VOC Emission Total (TPY)	Water Flash Drum Flash Gas	=	**25.19**

Emission Calculations

Relief gas accounts for any venting associated with gas surges in the low pressure compressor system.

POINT SOURCE I.D. NUMBER: ***22-10-LP-RG***

EMISSION SOURCE DESCRIPTION: ***Low Pressure Relief Gas***

DATA:

Emission Source:	***Low Pressure Relief Gas***
Flash Gas Specific Gravity:	***1.602***
Maximum Daily Gas Rate (MSCFD): **(conservative estimate provided by operator)**	***500***
Maximum Annual Gas Rate (MSCF/Yr): **(conservative estimate provided by operator)**	***5000***
Basis of Emission Estimates:	***Actual Gas Analysis***
Flash Gas Analysis Report Number:	***Southern Petroleum Laboratories Report No.: 17080192-004A***

Avg. Hourly Uncontrolled Gas Rate (SCF/Hr)	=	Max. Annual Gas Rate * 1000/8760	=	**570.78**
Avg. Hourly Uncontrolled Total Emissions (lb/hr)	=	Gas Gravity * Density of Air * Avg. Hourly Gas Rate	=	**69.86**
Max Hourly Uncontrolled Gas Rate (SCF/Hr)	=	Max. Daily Gas Rate * 1000/24	=	**20833.33**
Max. Hourly Uncontrolled Total Emissions (lb/hr)	=	Gas Gravity * Density of Air * Max. Hourly Gas Rate	=	**2549.85**
Annual Potential Uncontrolled Flash Emissions (TPY)	=	Avg. Hourly * 8760/2000	=	**305.99**

SPECIATION FACTORS:

Speciation of the flash gas mixture taken from the referenced laboratory results; refer to 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)	0.000	0.0000	0.0000	0.0000
Carbon Dioxide (excluded from VOC total)	78.367	54.7467	1998.2406	239.7927
Methane (excluded from VOC total)	0.439	0.3067	11.1938	1.3433
Ethane (excluded from VOC total)	1.884	1.3162	48.0392	5.7648
Hydrogen Sulfide (excluded from VOC total)	0.000	0.0000	0.0000	0.0000
Propane	2.897	2.0239	73.8717	8.8647
Iso-Butane	2.489	1.7388	63.4658	7.6160
N-Butane	4.534	3.1675	115.6127	13.8737
Iso-Pentane	2.295	1.6033	58.5216	7.0227
N-Pentane	2.432	1.6990	62.0149	7.4419
Iso-Hexane	1.672	1.1681	42.6360	5.1164
N-Hexane (TAP)	1.198	0.8370	30.5497	3.6660
Methylcyclopentane	0.000	0.0000	0.0000	0.0000
Benzene (TAP)	0.344	0.2404	8.7740	1.0529

Cyclohexane	0.000	0.0000	0.0000	0.0000
Heptanes	0.981	0.6854	25.0166	3.0020
Methylcyclohexane	0.000	0.0000	0.0000	0.0000
Toluene (TAP)	0.025	0.0175	0.6400	0.0768
2,2,4-Trimethylpentane (TAP)	0.002	0.0015	0.0535	0.0064
Octanes	0.334	0.2334	8.5190	1.0223
Ethylbenzene (TAP)	0.003	0.0022	0.0790	0.0095
Xylenes (TAP)	0.029	0.0203	0.7420	0.0890
Nonanes	0.072	0.0504	1.8384	0.2206
Decanes Plus	0.001	0.0008	0.0280	0.0034
Total Weight Percent:	100.000			
Total TAP Emissions		1.12	40.84	4.90
Total VOC Emissions		**13.49**	**492.36**	**59.08**
Total Non VOC & Non TAP-HC		1.62	59.23	7.11
Total Emissions		69.86	2549.84	305.99

Uncontrolled VOC Emission Total (TPY)	Low Pressure Relief Gas	=	**59.08**

Michael Watson
SECRETARY OF STATE

This is not an official certificate of good standing.

Name History

Name	Name Type
DENBURY ONSHORE, LLC	Legal

Business Information

Business Type:	Limited Liability Company
Business ID:	743899
Status:	Good Standing
Effective Date:	12/31/2003
State of Incorporation:	DE
Principal Office Address:	5851 Legacy Circle, Suite 1200 Plano, TX 75024

Registered Agent

Name

CORPORATION SERVICE COMPANY
109 Executive Drive, Suite 3
Madison, MS 39110

Officers & Directors

Name	Title
Alan Rhoades 5320 LEGACY DRIVE PLANO, TX 75024	Organizer
KATHLEEN D ASH 5851 LEGACY CIRCLE, SUITE 1200 PLANO, TX 75024	Manager
KATHLEEN A BRACCI 5851 LEGACY CIRCLE, SUITE 1200 PLANO, TX 75024	Manager
ROBERT D TRACY 5851 LEGACY CIRCLE, SUITE 1200 PLANO, TX 75024	Manager

Fuel Gas

MCComb-Summit City Gate Gas Sample1
Gulf South Pipeline Company, LP 04/08/05 07:31:19
Houston, Texas PAGE 1
CERTIFICATE OF ANALYSIS
for 03/05

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
□□&T1X□&l60F□&l6D□(8U□(s10h3T□(10U

Typical Fuel Gas Analysis

COMPONENT	mole %	MOLE FRACTION	MW	fuel weight	WT frac	Wt %	dh*	Heat Value (BTU/SCF)	Carbon Weight %	C-H ratio	
Nitrogen	0.4070	0.004	28.0134	0.11	0.0067	0.6661	0	0.00	0.0000	0	0
Hydrogen Sulfide	0.0000	0.000	34.08	0.00	0.0000	0.0000	637.1	0.00	0.0000	0	0
Carbon Dioxide	1.1440	0.011	44.01	0.50	0.0294	2.9413	0	0.00	0.1374	0	0
Methane	95.0360	0.950	16.043	15.25	0.8907	89.0707	1010	959.86	11.4045	0.25	0.23759
Ethane	2.5060	0.025	30.07	0.75	0.0440	4.4023	1770	44.35	0.6013	0.33333	0.00835325
Propane	0.4890	0.005	44.097	0.22	0.0126	1.2597	2516	12.30	0.1761	0.375	0.00183375
I-Butane	0.1250	0.001	58.123	0.07	0.0042	0.4244	3252	4.06	0.0600	0.4	0.0005
N-Butane	0.1200	0.001	58.123	0.07	0.0041	0.4075	3262	3.91	0.0576	0.4	0.00048
I-Pentane	0.0520	0.001	72.15	0.04	0.0022	0.2192	4001	2.08	0.0312	0.41667	0.000216668
N-Pentane	0.0300	0.000	72.15	0.02	0.0013	0.1264	4009	1.20	0.0180	0.41667	0.000125001
Other hexanes	0.0581	0.001	86.177	0.05	0.0029	0.2925	4750	2.76	0.0418	0.42857	0.000249014
N-hexane	0.0135	0.000	86.177	0.01	0.0007	0.0678	4756	0.64	0.0097	0.42857	5.76808E-05
heptane	0.0063	0.000	100.204	0.01	0.0004	0.0366	5503	0.34	0.0053	0.4375	2.73512E-05
iso-octane	0.0024	0.000	114.231	0.00	0.0002	0.0162	6232	0.15	0.0023	0.4444	1.07976E-05
octanes+	0.0044	0.000	144.231	0.01	0.0004	0.0368	6500	0.28	0.0052	0.4444	1.94114E-05
benzene	0.0030	0.000	78.114	0.00	0.0001	0.0137	3742	0.11	0.0022	1	0.000030121
toluene	0.0026	0.000	92.141	0.00	0.0001	0.0140	4475	0.12	0.0022	0.875	2.26931E-05
ethylbenzene	0.0001	0.000	106.167	0.00	0.0000	0.0008	5222	0.01	0.0001	0.8	1.0192E-06
xylene	0.0007	0.000	106.167	0.00	0.0000	0.0041	5209	0.03	0.0006	0.8	5.2416E-06
TOTALS	**100.0000**	**1.000**		**17.12**	**1.0000**	**100.0000**		***1032***	***12.5556***		0.249521999

		sg	**0.5903**		
hexanes+	0.0910	**VOC wt%**	**2.9197**	Carbon wt%	73.34956
		Toxic wt%	**0.1165**		

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 $1b/10^6$ 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 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION[a]

Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
CO_2[b]	120,000	A
Lead	0.0005	D
N_2O (Uncontrolled)	2.2	E
N_2O (Controlled-low-NO_X burner)	0.64	E
PM (Total)[c]	7.6	D
PM (Condensable)[c]	5.7	D
PM (Filterable)[c]	1.9	B
SO_2[d]	0.6	A
TOC	11	B
Methane	2.3	B
VOC	5.5	C

[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. 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. 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. TOC = Total Organic Compounds. VOC = Volatile Organic Compounds.

[b] Based on approximately 100% conversion of fuel carbon to CO_2. $CO_2[lb/10^6 \text{ scf}] = (3.67)(CON)(C)(D)$, where CON = fractional conversion of fuel carbon to CO_2, C = carbon content of fuel by weight (0.76), and D = density of fuel, 4.2×10^4 $lb/10^6$ scf.

[c] All PM (total, condensible, and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM_{10}, $PM_{2.5}$ or PM_1 emissions. Total PM is the sum of the filterable PM and condensible PM. Condensible PM is the particulate matter collected using EPA Method 202 (or equivalent). Filterable PM is the particulate matter collected on, or prior to, the filter of an EPA Method 5 (or equivalent) sampling train.

[d] Based on 100% conversion of fuel sulfur to SO_2. Assumes sulfur content is natural gas of 2,000 grains/10^6 scf. The SO_2 emission factor in this table can be converted to other natural gas sulfur contents by multiplying the SO_2 emission factor by the ratio of the site-specific sulfur content (grains/10^6 scf) to 2,000 grains/10^6 scf.

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 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION (Continued)

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
129-00-0	Pyrene[b, c]	5.0E-06	E
108-88-3	Toluene[b]	3.4E-03	C

[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. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. To convert from $1b/10^6$ scf to lb/MMBtu, divide by 1,020. Emission Factors preceeded with a less-than symbol are based on method detection limits.

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

[c] HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.

[d] The sum of individual organic compounds may exceed the VOC and TOC emission factors due to differences in test methods and the availability of test data for each pollutant.

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 l6. 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.

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Williston Laboratory
3111 1st Ave W
Williston, ND 58801

Certificate of Analysis

Number: 172-23110338-001A

Nov. 30, 2023

Kevin Hendricks
Denbury
202 S 4th Street West
Baker, MT 59313

Station Name: Soso EOR
Sample Point: MBD 100 HP Separator
Method: GPA 2286
Cylinder No: 82
Analyzed: 11/30/2023 08:28:40

Sampled By: Tim Keene
Sample Of: Gas Spot
Sample Date: 11/08/2023 12:00
Sample Conditions: 784 psig, @ 71 °F
PO/Ref. No: 4300204782

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.696 psia
Nitrogen	0.7086	0.4749	
Methane	8.2399	3.1626	
Carbon Dioxide	88.9411	93.6476	
Ethane	0.6041	0.4346	0.1620
Propane	0.4257	0.4491	0.1176
Iso-Butane	0.2010	0.2795	0.0660
n-Butane	0.3235	0.4498	0.1023
Iso-Pentane	0.1351	0.2332	0.0496
n-Pentane	0.1429	0.2467	0.0520
Hexanes	0.0807	0.1663	0.0333
n-Hexane	0.0593	0.1223	0.0245
Benzene	0.0176	0.0329	0.0049
Cyclohexane	0.0196	0.0395	0.0067
Heptanes	0.0498	0.1194	0.0230
Methylcyclohexane	0.0104	0.0244	0.0042
Toluene	0.0022	0.0048	0.0007
Octanes	0.0209	0.0571	0.0107
Ethylbenzene	0.0001	0.0003	0.0000
Xylenes	0.0010	0.0025	0.0004
Nonanes	0.0108	0.0331	0.0061
Decanes Plus	0.0057	0.0194	0.0035
	100.0000	100.0000	0.6675

GPM TOTAL C2+ 0.669

Calculated Physical Properties	Total	C10+
Calculated Molecular Weight	41.80	142.28
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.696 psia & 60°F		
Higher Heating Value, Real Gas Dry BTU	147.8	7742.9
Water Sat. Gas Base BTU	145.3	7607.8
Relative Density Real Gas	1.4505	4.9126
Compressibility Factor	0.9945	

Data reviewed by: Ahsenur Kara, Lab Technician 1

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

DRILLING AND PRODUCTION PRACTICE

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New York 20, N. Y.

1945

To calculate the properties of the interstitial water in the reservoir, it is observed from Table 4 that the change in formation volume of pure water at 3,000 psi, absolute, and 200 deg F (due to the solution of 15.4 cu ft per bbl of gas) is 1.0380 minus 1.0271, or 0.0059 bbl per bbl. As the solubility in the interstitial water is only 13.6 cu ft per bbl, the change in formation volume would be expected to be $\frac{13.6}{15.4}$ (0.0059), or 0.0052. Hence, the formation volume of the interstitial water is calculated to be 1.0271 plus 0.0052, or 1.0323 bbl per bbl. A similar calculation at a reservoir pressure of 2,000 psi, absolute, yields a formation volume of 1.0340 bbl per bbl—which indicates that, even though the interstitial water contains less dissolved gas at 2,000 psi, absolute, than it did at 3,000 psi, absolute, its volume is greater at the lower pressure. This result is interesting, because it is opposite to the behavior of natural-gas–crude-oil mixtures.

The compressibility of the saturated interstitial water is found from Fig. 2 by multiplying the correction factor for the gas solubility, 1.12 for a 13.6-cu-ft-per-bbl mixture, times the compressibility, 3.12 times 10^{-6}, of pure water, which gives 3.50 times 10^{-6} bbl per bbl per lb per sq in.

The use of data on the formation volumes of the saturated interstitial water, together with the data on the compressibilities, permits accurate accounting of the interstitial-water behavior for material-balance calculations when the accuracy of the other data justifies the additional refinement.

TABLE 4

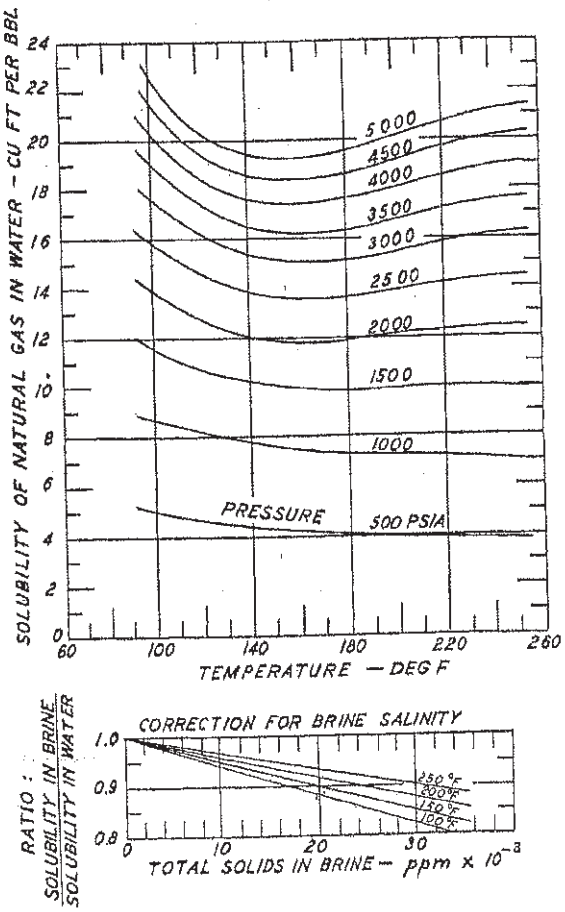
Formation Volumes of Pure Water and Mixtures of Natural Gas and Water

Saturation Pressure (PSI, Absolute)	Formation Volumes—Barrel Per Barrel			
	100 Deg F	150 Deg F	200 Deg F	250 Deg F
	Natural Gas and Water			
5,000	0.9989	1.0126	1.0301	1.0522
4,000	1.0003	1.0140	1.0316	1.0537
3,000	1.0017	1.0154	1.0330	1.0552
2,000	1.0031	1.0168	1.0345	1.0568
1,000	1.0045	1.0183	1.0361	1.0584
Pressure (PSI, Absolute)	Pure Water *			
5,000	0.9910	1.0039	1.0210	1.0418
4,000	0.9938	1.0067	1.0240	1.0452
3,000	0.9966	1.0095	1.0271	1.0487
2,000	0.9995	1.0125	1.0304	1.0523
1,000	1.0025	1.0153	1.0335	1.0560
Vapor pressure of water	1.0056	1.0187	1.0370	1.0598

* See reference No. 3.

Water production from so-called "clean" gas wells or high gas-oil-ratio (distillate) wells may be a combination of the water that exists as vapor in the reservoir gas and liquid water that is brought to the surface by mechanical entrainment in the gas. The water produced by condensation is free of salts, whereas the entrained water may contain a considerable amount of dissolved salts.

The amount of water that will be produced from a well as vapor can be determined from Table 5 and Fig. 3. For example, consider the case of a gas reservoir at 3,000 psi, absolute, and 200 deg F, in which the interstitial water has a salinity of 30,000 ppm. From Table 5 and Fig. 3, the amount of water vapor in the formation gas is shown to be 0.82 bbl per 1,000 MCF of dry gas when vaporized from pure water, or 0.82 times 0.93, which equals 0.76 bbl per 1,000 MCF for the gas in equilibrium with the saline interstitial water. If the foregoing reservoir gas is put through a trap operating at 500 psi, absolute, and 100 deg F, the amount of water which can remain as vapor in the gas at these conditions is shown in Table 5 to be 0.31 bbl per 1,000



Solubility of Natural Gas in Water.

FIG. 1

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

Tank ID	**5-05-OST-V**
Tank Description	**1500 BBL Wet Oil Tank-Common Vent (BBJ-118)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**21.50**
Vertical Height/Horizontal Length (H_S ft)	**24.10**
Roof Height (H_R ft)	**0.67**
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)	**0.2240**

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)	**3,000.00**
Annual Turnovers, N	**2.01**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**8,386.46**
vapor space outage (H_{VO} ft)	**12.774**
vapor space volume (V_V ft^3)	**4,637.59**

Major City for Meterological Data	**Meridian, MS**
Site Elevation (ft)	**400**
Atmospheric Pressure (P_A psia)	**14.485**
Table 7.1-2 Liquid	**crude oil**
*RVP**	**7.16**
*API gravity**	**46.0**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**46.0**
API gravity at 100F	**49.5**
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			

HLP engineering inc.
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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)	57.10	61.40	68.80	76.20	83.40	88.80	91.40	91.10	86.50	77.30	66.90	58.50	75.60
hourly average minimum ambient temperature (T_{AN} °F)	35.80	38.10	44.50	51.50	60.80	67.80	70.80	70.20	64.20	52.50	42.50	36.90	53.00
daily total solar insolation factor (I btu/ft^2 day)	783	1044	1380	1726	1918	1989	1945	1823	1544	1252	924	727	1421
daily average ambient temperature (T_{AA} °F)	46.45	49.75	56.65	63.85	72.10	78.30	81.10	80.65	75.35	64.90	54.70	47.70	64.30
liquid bulk temperature (T_B °F)	47.81	51.57	59.05	66.85	75.44	81.76	84.48	83.82	78.04	67.08	56.31	48.96	66.77
average vapor temperature (T_V °F)	50.40	55.02	63.61	72.56	81.78	88.33	90.91	89.85	83.14	71.22	59.36	51.37	71.47
daily ambient temperature range (ΔT_A °R)	21.30	23.30	24.30	24.70	22.60	21.00	20.60	20.90	22.30	24.80	24.40	21.60	22.60
daily vapor temperature range (ΔT_V °R)	24.80	28.90	33.02	37.31	38.07	37.77	36.98	35.78	33.52	32.09	28.66	24.51	32.30
daily average liquid surface temperature (T_{LA} °F)	49.11	53.29	61.33	69.70	78.61	85.05	87.70	86.83	80.59	69.15	57.83	50.17	69.12
daily maximum liquid surface temperature (T_{LX} °F)	55.31	60.52	69.59	79.03	88.12	94.49	96.94	95.78	88.97	77.17	65.00	56.29	77.20
daily minimum liquid surface temperature (T_{LN} °F)	42.91	46.07	53.08	60.38	69.09	75.60	78.45	77.89	72.21	61.12	50.67	44.04	61.04
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.857	4.170	4.827	5.596	6.515	7.250	7.570	7.465	6.734	5.542	4.532	3.934	5.539
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	4.327	4.757	5.584	6.562	7.623	8.442	8.775	8.616	7.728	6.359	5.153	4.407	6.362
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	3.427	3.641	4.153	4.745	5.536	6.193	6.498	6.437	5.843	4.809	3.971	3.503	4.802
daily vapor pressure range (ΔP_V)	0.9000	1.1158	1.4311	1.8164	2.0866	2.2495	2.2774	2.1791	1.8846	1.5496	1.1817	0.9037	1.5594
vapor space expansion factor (K_E)	0.1334	0.1645	0.2116	0.2748	0.3325	0.3803	0.3969	0.3759	0.3052	0.2340	0.1741	0.1337	0.2354
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	1,430	1,292	1,430	1,384	1,430	1,384	1,430	1,430	1,384	1,430	1,384	1,430	16,842
monthly turnovers (N/month) with avg = total annual	0.17	0.15	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	2.01
vented vapor saturation factor (K_S)	0.2769	0.2616	0.2343	0.2088	0.1848	0.1693	0.1633	0.1652	0.1799	0.2104	0.2458	0.2730	0.2105
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)	0.0352	0.0377	0.0430	0.0490	0.0561	0.0616	0.0641	0.0633	0.0578	0.0486	0.0407	0.0359	0.0486
standing storage losses (L_S lb/month & avg is lb/yr)	251.01	242.92	306.24	337.78	399.43	425.01	456.45	450.96	398.58	346.54	280.51	255.56	4150.99
working losses (L_W lb/month & avg is lb/yr)	37.80	36.58	46.11	50.86	60.14	64.00	68.73	67.90	60.02	52.18	42.24	38.48	625.04
total losses (L_T lb/month & avg is lb/yr)	288.80	279.50	352.35	388.64	459.58	489.01	525.19	518.86	458.59	398.72	322.75	294.05	4776.04
max hourly Q in bbl/hour	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.051	0.054	0.062	0.071	0.081	0.089	0.092	0.091	0.083	0.070	0.059	0.052	
breathing/standing loss (L_S lb/hr)	0.337	0.361	0.412	0.543	0.666	0.767	0.802	0.759	0.613	0.466	0.390	0.343	
max hourly total loss (L_T lb/hr)	0.388	0.416	0.474	0.614	0.747	0.855	0.895	0.851	0.697	0.536	0.448	0.395	

L_S sum months	L_W sum months	L_T sum months
4150.99	625.04	4776.04

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	**0.465**	**0.802**	**4,076.421**
Working Loss L_W	**0.070**	**0.092**	**613.812**
Total Loss L_T	**0.535**	**0.895**	**4,690.233**

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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Certificate of Analysis

Number: 172-24050250-002A

Williston Laboratory
3111 1st Ave W
Williston, ND 58801

Kevin Hendricks
Denbury
202 S 4th Street West
Baker, MT 59313

May 28, 2024

Station Name: Soso EOR
Sample Point: FLARE INLET GAS ZZZ-190B
Method: GPA 2286
Analyzed: 05/23/2024 10:14:40

Sampled By: Tim Keene
Sample Of: Gas Spot
Sample Date: 05/06/2024 13:50
Sample Conditions: 93 °F
PO/Ref. No: 4300204782

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.696 psia
Nitrogen	4.3684	2.6226	
Methane	0.5525	0.1900	
Carbon Dioxide	74.9010	70.6441	
Ethane	1.2787	0.8240	0.3443
Propane	3.5881	3.3908	0.9951
Iso-Butane	2.8428	3.5410	0.9365
n-Butane	4.9972	6.2246	1.5860
Iso-Pentane	2.3118	3.5746	0.8511
n-Pentane	2.3493	3.6325	0.8573
Hexanes	1.2261	2.2644	0.5072
n-Hexane	0.7507	1.3864	0.3108
Benzene	0.1199	0.2007	0.0338
Cyclohexane	0.1760	0.3174	0.0603
Heptanes	0.3813	0.8188	0.1771
Methylcyclohexane	0.0571	0.1202	0.0231
Toluene	0.0057	0.0113	0.0019
Octanes	0.0628	0.1537	0.0324
Ethylbenzene	0.0004	0.0009	0.0002
Xylenes	0.0043	0.0098	0.0017
Nonanes	0.0227	0.0624	0.0129
Decanes Plus	0.0032	0.0098	0.0020
	100.0000	100.0000	6.7337

GPM TOTAL C2+ 6.731

Calculated Physical Properties	Total	C10+
Calculated Molecular Weight	46.66	142.28
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.696 psia & 60°F		
Higher Heating Value, Real Gas Dry BTU	703.6	7742.9
Water Sat. Gas Base BTU	691.7	7607.8
Relative Density Real Gas	1.6254	4.9126
Compressibility Factor	0.9908	

Data reviewed by: Mo Milton, Laboratory Technician

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

Normalized Component Calculation

Atmospheric Control Flare Gas Analysis; Southern Petroleum Laboratories Report No.: 172-24050250-002A

COMPONENT	mole %	Normalized mole %	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	4.3684	0.0000	28.0134	0.00	0.0000	0	0
Carbon Dioxide	74.9010	78.3224	44.01	34.47	72.5466	0	0
Methane	0.5525	0.5777	16.043	0.09	0.1951	1010	6
Ethane	1.2787	1.3371	30.07	0.40	0.8462	1770	24
Hydrogen Sulfide	0.0000	0.0000	34.08	0.00	0.0000	637	0
Propane	3.5881	3.7520	44.097	1.65	3.4822	2516	94
I-Butane	2.8428	2.9727	58.123	1.73	3.6364	3252	97
N-Butane	4.9972	5.2255	58.123	3.04	6.3922	3262	170
I-Pentane	2.3118	2.4174	72.15	1.74	3.6708	4001	97
N-Pentane	2.3493	2.4566	72.15	1.77	3.7304	4009	98
Other/Iso Hexanes	1.2261	1.2821	86.177	1.10	2.3254	4750	61
N-Hexane	0.7507	0.7850	86.177	0.68	1.4238	4756	37
Methylcyclopentane	0.0000	0.0000	84.1608	0.00	0.0000	4501	0
Benzene	0.1199	0.1254	78.114	0.10	0.2061	3742	5
Cyclohexane	0.1760	0.1840	84.1608	0.15	0.3260	4482	8
Heptane	0.3813	0.3987	100.204	0.40	0.8409	5503	22
Methylcyclohexane	0.0571	0.0597	98.188	0.06	0.1234	5216	3
Toluene	0.0057	0.0060	92.141	0.01	0.0116	4475	0
Iso-Octane/224-Trimethylpentane	0.0000	0.0000	114.231	0.00	0.0000	6232	0
Octanes	0.0628	0.0657	114.231	0.08	0.1579	6249	4
Ethylbenzene	0.0004	0.0004	106.167	0.00	0.0009	5222	0
Xylenes	0.0043	0.0045	106.167	0.00	0.0100	5209	0
Nonanes	0.0227	0.0237	128.258	0.03	0.0641	6997	2
Decanes Plus	0.0032	0.0033	142.285	0.00	0.0100	7743	0
TOTALS	**100.0000**	**100.0000**	**MW=**	**47.51**	**100.0000**	**btu/scf =**	**729.010728**
				sg	**1.6384**		
				VOC wt%	**26.4121**		
				Toxic wt%	**1.6524**		

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

Tank ID	**6a-05-OST-CV**
Tank Description	**5000 BBL Dry Oil Tank-Common Vent (ABJ-119A)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**38.70**
Vertical Height/Horizontal Length (H_S ft)	**24.00**
Roof Height (H_R ft)	**1.21**
Max Liquid Height (H_{LX} ft)	**23.00**
Avg Liquid Height (H_L ft)	**11.50**
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)	**0.4031**

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)	**365,000.00**
Annual Turnovers, N	**75.74**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**27,054.51**
vapor space outage (H_{VO} ft)	**12.903**
vapor space volume (V_V ft^3)	**15,177.73**

Major City for Meterological Data	**Meridian, MS**
Site Elevation (ft)	**400**
Atmospheric Pressure (P_A psia)	**14.485**
Table 7.1-2 Liquid	**crude oil**
*RVP**	**7.16**
*API gravity**	**46.0**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**46.0**
API gravity at 100F	**49.5**
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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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	57.10	61.40	68.80	76.20	83.40	88.80	91.40	91.10	86.50	77.30	66.90	58.50	75.60
hourly average minimum ambient temperature (T_{AN} °F)	35.80	38.10	44.50	51.50	60.80	67.80	70.80	70.20	64.20	52.50	42.50	36.90	53.00
daily total solar insolation factor (I btu/ft^2 day)	783	1044	1380	1726	1918	1989	1945	1823	1544	1252	924	727	1421
daily average ambient temperature (T_{AA} °F)	46.45	49.75	56.65	63.85	72.10	78.30	81.10	80.65	75.35	64.90	54.70	47.70	64.30
liquid bulk temperature (T_B °F)	47.81	51.57	59.05	66.85	75.44	81.76	84.48	83.82	78.04	67.08	56.31	48.96	66.77
average vapor temperature (T_V °F)	50.83	55.59	64.36	73.50	82.82	89.42	91.97	90.84	83.98	71.90	59.87	51.76	72.24
daily ambient temperature range (ΔT_A °R)	21.30	23.30	24.30	24.70	22.60	21.00	20.60	20.90	22.30	24.80	24.40	21.60	22.60
daily vapor temperature range (ΔT_V °R)	24.17	28.42	33.02	37.31	38.07	37.77	36.98	35.78	33.52	31.88	27.96	23.81	32.30
daily average liquid surface temperature (T_{LA} °F)	49.32	53.58	61.71	70.18	79.13	85.59	88.23	87.33	81.01	69.49	58.09	50.36	69.51
daily maximum liquid surface temperature (T_{LX} °F)	55.36	60.68	69.96	79.50	88.65	95.03	97.47	96.28	89.39	77.46	65.08	56.32	77.58
daily minimum liquid surface temperature (T_{LN} °F)	43.28	46.47	53.45	60.85	69.61	76.15	78.98	78.39	72.63	61.52	51.10	44.41	61.43
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.872	4.192	4.860	5.642	6.572	7.315	7.636	7.526	6.782	5.575	4.553	3.949	5.577
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	4.332	4.771	5.621	6.614	7.688	8.515	8.849	8.684	7.781	6.390	5.160	4.408	6.404
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	3.452	3.669	4.182	4.786	5.587	6.250	6.556	6.491	5.886	4.843	4.003	3.528	4.836
daily vapor pressure range (ΔP_V)	0.8798	1.1019	1.4387	1.8280	2.1009	2.2651	2.2926	2.1928	1.8949	1.5468	1.1570	0.8805	1.5677
vapor space expansion factor (K_E)	0.1304	0.1624	0.2128	0.2771	0.3362	0.3852	0.4022	0.3805	0.3080	0.2339	0.1705	0.1303	0.2370
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	174,034	157,192	174,034	168,420	174,034	168,420	174,034	174,034	168,420	174,034	168,420	174,034	2,049,110
monthly turnovers (N/month) with avg = total annual	6.43	5.81	6.43	6.23	6.43	6.23	6.43	6.43	6.23	6.43	6.23	6.43	75.74
vented vapor saturation factor (K_S)	0.2741	0.2586	0.2313	0.2058	0.1820	0.1666	0.1607	0.1627	0.1774	0.2078	0.2431	0.2702	0.2077
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)	0.0353	0.0379	0.0432	0.0493	0.0564	0.0621	0.0645	0.0637	0.0581	0.0489	0.0408	0.0360	0.0489
standing storage losses (L_S lb/month & avg is lb/yr)	818.79	793.20	1001.10	1105.41	1307.76	1391.61	1494.21	1475.63	1303.15	1132.11	915.43	833.46	13571.87
working losses (L_W lb/month & avg is lb/yr)	4613.10	4468.89	5640.21	6227.91	7367.95	7840.35	8418.41	8313.71	7341.99	6378.32	5157.57	4695.73	76464.13
total losses (L_T lb/month & avg is lb/yr)	5431.89	5262.08	6641.30	7333.32	8675.71	9231.96	9912.62	9789.34	8645.15	7510.43	6073.00	5529.18	90035.99
max hourly Q in bbl/hour	233.92	233.92	233.92	233.92	233.92	233.92	233.92	233.92	233.92	233.92	233.92	233.92	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	6.200	6.650	7.581	8.650	9.903	10.889	11.315	11.174	10.197	8.573	7.163	6.311	
breathing/standing loss (L_S lb/hr)	1.101	1.180	1.346	1.779	2.184	2.519	2.637	2.494	2.008	1.522	1.271	1.120	
max hourly total loss (L_T lb/hr)	7.301	7.830	8.926	10.429	12.087	13.408	13.952	13.668	12.205	10.095	8.435	7.432	

L_S sum months	L_W sum months	L_T sum months
13571.87	76464.13	90035.99

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	**1.521**	**2.637**	**13,325.530**
Working Loss L_W	**8.570**	**11.315**	**75,076.263**
Total Loss L_T	**10.092**	**13.952**	**88,401.792**

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

SPL, Inc.
3111 1st Ave W
Williston, ND 58801
701-368-7183

Flash Liberation of Hydrocarbon Liquid Study

Client:	Denbury Resources	Sample Lab ID:	23110338-002A
Facility:	Soso EOR	Facility Well:	Not Indicated
Equipment:	Not Indicated	Sample Source:	HP Separator MBD 100
Unique Number:	Not Indicated	Analyst:	JMC
Date Sampled:	11/08/23	Date Analyzed:	11/29/23
State:	MS	Site Notes:	
County:	Not Indicated		

Flash Liberation of Hydrocarbon Liquid Conditions

	Pressure (psig)	Temperature (°F)
Separator Hydrocarbon Liquid	49.0	88.0
Stock Tank	0.0	60.0

Base Conditions

	Condition	Units/Description
Base Conditions, Pressure	14.73	psi

Flash Liberation of Hydrocarbon Liquid Results

	Result	Units/Description
Gas Oil Ratio	26.60	SCF flashed vapor/bbl stock tank oil
Gas Oil Ratio	3.103	lb flashed vapor/bbl stock tank oil
Gas Specific Gravity	1.525	Air = 1.000
Separator Volume Factor	1.036	Separator Volume/Stock tank Volume

Stock Tank Fluid Properties

	Result	Units/Description
Shrinkage Recovery Factor	0.9655	Fraction of first stage separator liquid
Oil API Gravity at 60 °F	46.03	
Specific Gravity at 60 °F	0.7970	ASTM D7777, Measured
Dry Vapor Pressure, psi	5.56	Absolute Pressure at 100°F by D5191

Cylinder Pressure Check

	Pressure (psi)	Temperature (°F)
Sample Conditions	49.0	88.0
Test Sample	37.5	74.9

Quality Control Summary

Duplicate Results		Acceptable Range
Gas Oil Ratio (% difference)	0.1	<5%
Separator Volume Factor (% difference)	0.3	<5%
Shrinkage Recovery Factor (% difference)	0.3	<5%
Cylinder Type	Piston	
Cylinder Size (cc)	500	
Cylinder Number	2500-00268	
Sample Collection Rate (mL/min)	47	<50 mL/min

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

Tank ID	**6b-05-OST-CV**
Tank Description	**5000 BBL Dry Oil Tank-Common Vent (ABJ-119B)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**38.70**
Vertical Height/Horizontal Length (H_S ft)	**24.00**
Roof Height (H_R ft)	**1.21**
Max Liquid Height (H_{LX} ft)	**23.00**
Avg Liquid Height (H_L ft)	**11.50**
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)	**0.4031**

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)	**365,000.00**
Annual Turnovers, N	**75.74**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**27,054.51**
vapor space outage (H_{VO} ft)	**12.903**
vapor space volume (V_V ft^3)	**15,177.73**

Major City for Meterological Data	**Meridian, MS**
Site Elevation (ft)	**400**
Atmospheric Pressure (P_A psia)	**14.485**
Table 7.1-2 Liquid	**crude oil**
*RVP**	**7.16**
*API gravity**	**46.0**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**46.0**
API gravity at 100F	**49.5**
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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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	57.10	61.40	68.80	76.20	83.40	88.80	91.40	91.10	86.50	77.30	66.90	58.50	75.60
hourly average minimum ambient temperature (T_{AN} °F)	35.80	38.10	44.50	51.50	60.80	67.80	70.80	70.20	64.20	52.50	42.50	36.90	53.00
daily total solar insolation factor (I btu/ft^2 day)	783	1044	1380	1726	1918	1989	1945	1823	1544	1252	924	727	1421
daily average ambient temperature (T_{AA} °F)	46.45	49.75	56.65	63.85	72.10	78.30	81.10	80.65	75.35	64.90	54.70	47.70	64.30
liquid bulk temperature (T_B °F)	47.81	51.57	59.05	66.85	75.44	81.76	84.48	83.82	78.04	67.08	56.31	48.96	66.77
average vapor temperature (T_V °F)	50.83	55.59	64.36	73.50	82.82	89.42	91.97	90.84	83.98	71.90	59.87	51.76	72.24
daily ambient temperature range (ΔT_A °R)	21.30	23.30	24.30	24.70	22.60	21.00	20.60	20.90	22.30	24.80	24.40	21.60	22.60
daily vapor temperature range (ΔT_V °R)	24.17	28.42	33.02	37.31	38.07	37.77	36.98	35.78	33.52	31.88	27.96	23.81	32.30
daily average liquid surface temperature (T_{LA} °F)	49.32	53.58	61.71	70.18	79.13	85.59	88.23	87.33	81.01	69.49	58.09	50.36	69.51
daily maximum liquid surface temperature (T_{LX} °F)	55.36	60.68	69.96	79.50	88.65	95.03	97.47	96.28	89.39	77.46	65.08	56.32	77.58
daily minimum liquid surface temperature (T_{LN} °F)	43.28	46.47	53.45	60.85	69.61	76.15	78.98	78.39	72.63	61.52	51.10	44.41	61.43
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.872	4.192	4.860	5.642	6.572	7.315	7.636	7.526	6.782	5.575	4.553	3.949	5.577
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	4.332	4.771	5.621	6.614	7.688	8.515	8.849	8.684	7.781	6.390	5.160	4.408	6.404
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	3.452	3.669	4.182	4.786	5.587	6.250	6.556	6.491	5.886	4.843	4.003	3.528	4.836
daily vapor pressure range (ΔP_V)	0.8798	1.1019	1.4387	1.8280	2.1009	2.2651	2.2926	2.1928	1.8949	1.5468	1.1570	0.8805	1.5677
vapor space expansion factor (K_E)	0.1304	0.1624	0.2128	0.2771	0.3362	0.3852	0.4022	0.3805	0.3080	0.2339	0.1705	0.1303	0.2370
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	174,034	157,192	174,034	168,420	174,034	168,420	174,034	174,034	168,420	174,034	168,420	174,034	2,049,110
monthly turnovers (N/month) with avg = total annual	6.43	5.81	6.43	6.23	6.43	6.23	6.43	6.43	6.23	6.43	6.23	6.43	75.74
vented vapor saturation factor (K_S)	0.2741	0.2586	0.2313	0.2058	0.1820	0.1666	0.1607	0.1627	0.1774	0.2078	0.2431	0.2702	0.2077
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)	0.0353	0.0379	0.0432	0.0493	0.0564	0.0621	0.0645	0.0637	0.0581	0.0489	0.0408	0.0360	0.0489
standing storage losses (L_S lb/month & avg is lb/yr)	818.79	793.20	1001.10	1105.41	1307.76	1391.61	1494.21	1475.63	1303.15	1132.11	915.43	833.46	13571.87
working losses (L_W lb/month & avg is lb/yr)	4613.10	4468.89	5640.21	6227.91	7367.95	7840.35	8418.41	8313.71	7341.99	6378.32	5157.57	4695.73	76464.13
total losses (L_T lb/month & avg is lb/yr)	5431.89	5262.08	6641.30	7333.32	8675.71	9231.96	9912.62	9789.34	8645.15	7510.43	6073.00	5529.18	90035.99
max hourly Q in bbl/hour	233.92	233.92	233.92	233.92	233.92	233.92	233.92	233.92	233.92	233.92	233.92	233.92	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	6.200	6.650	7.581	8.650	9.903	10.889	11.315	11.174	10.197	8.573	7.163	6.311	
breathing/standing loss (L_S lb/hr)	1.101	1.180	1.346	1.779	2.184	2.519	2.637	2.494	2.008	1.522	1.271	1.120	
max hourly total loss (L_T lb/hr)	7.301	7.830	8.926	10.429	12.087	13.408	13.952	13.668	12.205	10.095	8.435	7.432	

L_S sum months	L_W sum months	L_T sum months
13571.87	76464.13	90035.99

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	**1.521**	**2.637**	**13,325.530**
Working Loss L_W	**8.570**	**11.315**	**75,076.263**
Total Loss L_T	**10.092**	**13.952**	**88,401.792**

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

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

Tank ID	**7a-05-ST-CV**
Tank Description	**2000 BBL Skimmer Tank-Vent (ABM-120A)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**29.70**
Vertical Height/Horizontal Length (H_S ft)	**16.10**
Roof Height (H_R ft)	**0.93**
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)	**0.3094**

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)	**2,740,237.50**
Annual Turnovers, N	**1470.55**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**10,461.16**
vapor space outage (H_{VO} ft)	**8.859**
vapor space volume (V_V ft^3)	**6,137.70**

Major City for Meterological Data	**Meridian, MS**
Site Elevation (ft)	**400**
Atmospheric Pressure (P_A psia)	**14.485**
Table 7.1-2 Liquid	
*RVP**	**7.16**
*API gravity**	**46.0**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**46.0**
API gravity at 100F	**49.5**
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*
Crude Oil	0.100	50.000	0.04995	0.27678	10.916	4866.929	0.000
Water	99.900	18.015	17.99700	99.72322	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						
	100.000		18.047	100.000			

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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)	57.10	61.40	68.80	76.20	83.40	88.80	91.40	91.10	86.50	77.30	66.90	58.50	75.60
hourly average minimum ambient temperature (T_{AN} °F)	35.80	38.10	44.50	51.50	60.80	67.80	70.80	70.20	64.20	52.50	42.50	36.90	53.00
daily total solar insolation factor (I btu/ft^2 day)	783	1044	1380	1726	1918	1989	1945	1823	1544	1252	924	727	1421
daily average ambient temperature (T_{AA} °F)	46.45	49.75	56.65	63.85	72.10	78.30	81.10	80.65	75.35	64.90	54.70	47.70	64.30
liquid bulk temperature (T_B °F)	47.81	51.57	59.05	66.85	75.44	81.76	84.48	83.82	78.04	67.08	56.31	48.96	66.77
average vapor temperature (T_V °F)	50.92	55.71	64.53	73.71	83.05	89.66	92.21	91.06	84.17	72.05	59.98	51.85	72.41
daily ambient temperature range (ΔT_A °R)	21.30	23.30	24.30	24.70	22.60	21.00	20.60	20.90	22.30	24.80	24.40	21.60	22.60
daily vapor temperature range (ΔT_V °R)	24.03	28.42	33.02	37.31	38.07	37.77	36.98	35.78	33.52	31.88	27.81	23.66	32.30
daily average liquid surface temperature (T_{LA} °F)	49.37	53.64	61.79	70.28	79.24	85.71	88.35	87.44	81.10	69.56	58.14	50.41	69.59
daily maximum liquid surface temperature (T_{LX} °F)	55.37	60.74	70.05	79.61	88.76	95.15	97.59	96.39	89.48	77.53	65.09	56.32	77.67
daily minimum liquid surface temperature (T_{LN} °F)	43.36	46.53	53.54	60.95	69.73	76.27	79.10	78.50	72.72	61.59	51.19	44.49	61.52
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	0.177	0.208	0.278	0.372	0.501	0.617	0.670	0.651	0.532	0.363	0.244	0.184	0.363
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	0.221	0.268	0.369	0.507	0.679	0.827	0.891	0.859	0.694	0.474	0.311	0.229	0.476
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	0.142	0.160	0.207	0.270	0.365	0.454	0.499	0.489	0.404	0.276	0.190	0.148	0.275
daily vapor pressure range (ΔP_V)	0.0793	0.1079	0.1622	0.2373	0.3140	0.3732	0.3925	0.3703	0.2907	0.1980	0.1217	0.0808	0.2008
vapor space expansion factor (K_E)	0.0527	0.0629	0.0747	0.0872	0.0931	0.0962	0.0959	0.0922	0.0828	0.0743	0.0622	0.0520	0.0753
vapor molecular weight (M_V lb/lbmole)	18.71	18.66	18.58	18.50	18.44	18.39	18.38	18.38	18.42	18.51	18.61	18.70	18.51
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	1,306,560	1,180,119	1,306,560	1,264,413	1,306,560	1,264,413	1,306,560	1,306,560	1,264,413	1,306,560	1,264,413	1,306,560	15,383,693
monthly turnovers (N/month) with avg = total annual	124.90	112.81	124.90	120.87	124.90	120.87	124.90	124.90	120.87	124.90	120.87	124.90	1,470.55
vented vapor saturation factor (K_S)	0.9231	0.9112	0.8847	0.8513	0.8096	0.7755	0.7606	0.7658	0.8001	0.8544	0.8972	0.9203	0.8543
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	0.0019	0.0021	0.0020	0.0017	0.0012	0.0008	0.0006	0.0012
standing storage losses (L_S lb/month & avg is lb/yr)	7.41	7.74	11.21	14.23	19.39	22.78	25.44	24.79	19.88	14.40	9.64	7.68	184.59
working losses (L_W lb/month & avg is lb/yr)	593.81	619.74	898.28	1139.99	1553.71	1824.83	2038.16	1985.66	1592.71	1153.71	772.31	615.53	14788.43
total losses (L_T lb/month & avg is lb/yr)	601.22	627.47	909.49	1154.22	1573.10	1847.61	2063.60	2010.45	1612.59	1168.11	781.95	623.21	14973.02
max hourly Q in bbl/hour	1756.13	1756.13	1756.13	1756.13	1756.13	1756.13	1756.13	1756.13	1756.13	1756.13	1756.13	1756.13	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.798	0.922	1.207	1.583	2.088	2.534	2.739	2.669	2.212	1.551	1.073	0.827	
breathing/standing loss (L_S lb/hr)	0.010	0.012	0.016	0.023	0.031	0.037	0.039	0.037	0.028	0.019	0.013	0.010	
max hourly total loss (L_T lb/hr)	0.808	0.934	1.223	1.606	2.119	2.571	2.778	2.705	2.241	1.570	1.086	0.838	

L_S sum months	L_W sum months	L_T sum months
184.59	14788.43	14973.02

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**	**0.039**	**169.609**
Working Loss L_W	**1.551**	**2.739**	**13,588.098**
Total Loss L_T	**1.571**	**2.778**	**13,757.707**

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

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

Tank ID	**8-05-SEP**
Tank Description	**API Separator-Vent (ZZZ-128)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Horizontal**
Tank Diameter (D ft)	**20.00**
Vertical Height/Horizontal Length (H_S ft)	**40.00**
Roof Height (H_R ft)	
Max Liquid Height (H_{LX} ft)	**20.00**
Avg Liquid Height (H_L ft)	**10.00**
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)	

Tank Shell Color/Shade	**Gray - Light**
Tank Shell Paint Condition	**average**
Tank Roof Color/Shade	**Gray - Light**
Tank Roof Paint Condition	**average**
Roof Type	**horizontal tank**
Tank Insulation	**no insulation**
Tank Underground?	**yes**
Annual Throughput (Q bbl/year)	**294,007.50**
Annual Turnovers, N	**131.35**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**12,566.37**
vapor space outage (H_{VO} ft)	**7.854**
vapor space volume (V_V ft^3)	**6,283.19**

Major City for Meterological Data	**Meridian, MS**
Site Elevation (ft)	**400**
Atmospheric Pressure (P_A psia)	**14.485**
Table 7.1-2 Liquid	
*RVP**	**7.16**
*API gravity**	**46.0**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**46.0**
API gravity at 100F	**49.5**
Working Loss Product Factor (K_P)	**0.75**
working loss turnover factor K_N	**0.395**

*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*
Crude Oil	0.683	50.000	0.34140	1.87240	10.916	4866.929	0.000
Water	99.317	18.015	17.89199	98.12760	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						
	100.000		18.233	100.000			

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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)	57.10	61.40	68.80	76.20	83.40	88.80	91.40	91.10	86.50	77.30	66.90	58.50	75.60
hourly average minimum ambient temperature (T_{AN} °F)	35.80	38.10	44.50	51.50	60.80	67.80	70.80	70.20	64.20	52.50	42.50	36.90	53.00
daily total solar insolation factor (I btu/ft^2 day)	783	1044	1380	1726	1918	1989	1945	1823	1544	1252	924	727	1421
daily average ambient temperature (T_{AA} °F)	46.45	49.75	56.65	63.85	72.10	78.30	81.10	80.65	75.35	64.90	54.70	47.70	64.30
liquid bulk temperature (T_B °F)	47.81	51.57	59.05	66.85	75.44	81.76	84.48	83.82	78.04	67.08	56.31	48.96	66.77
average vapor temperature (T_V °F)	50.01	54.50	62.93	71.70	80.82	87.35	89.95	88.94	82.37	70.59	58.90	51.01	70.76
daily ambient temperature range (ΔT_A °R)	21.30	23.30	24.30	24.70	22.60	21.00	20.60	20.90	22.30	24.80	24.40	21.60	22.60
daily vapor temperature range (ΔT_V °R)	25.37	29.38	33.16	37.31	38.07	37.77	36.98	35.78	33.52	32.49	29.30	25.15	32.30
daily average liquid surface temperature (T_{LA} °F)	48.91	53.03	60.99	69.28	78.13	84.55	87.22	86.38	80.20	68.84	57.61	49.99	68.77
daily maximum liquid surface temperature (T_{LX} °F)	55.25	60.38	69.28	78.60	87.65	94.00	96.46	95.33	88.58	76.96	64.93	56.27	76.84
daily minimum liquid surface temperature (T_{LN} °F)	42.57	45.69	52.70	59.95	68.61	75.11	77.97	77.44	71.82	60.71	50.28	43.70	60.69
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	0.196	0.226	0.296	0.390	0.518	0.633	0.687	0.670	0.553	0.384	0.264	0.203	0.383
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	0.244	0.290	0.390	0.526	0.696	0.843	0.907	0.877	0.716	0.499	0.338	0.253	0.497
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	0.157	0.175	0.223	0.286	0.381	0.471	0.515	0.507	0.423	0.294	0.205	0.163	0.293
daily vapor pressure range (ΔP_V)	0.0874	0.1154	0.1664	0.2396	0.3145	0.3724	0.3916	0.3702	0.2927	0.2054	0.1325	0.0896	0.2038
vapor space expansion factor (K_E)	0.0560	0.0654	0.0754	0.0875	0.0933	0.0963	0.0960	0.0923	0.0831	0.0760	0.0660	0.0556	0.0756
vapor molecular weight (M_V lb/lbmole)	22.30	22.02	21.55	21.13	20.74	20.50	20.40	20.43	20.66	21.15	21.74	22.23	21.15
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	140,184	126,618	140,184	135,662	140,184	135,662	140,184	140,184	135,662	140,184	135,662	140,184	1,650,558
monthly turnovers (N/month) with avg = total annual	11.16	10.08	11.16	10.80	11.16	10.80	11.16	11.16	10.80	11.16	10.80	11.16	131.35
vented vapor saturation factor (K_S)	0.9246	0.9140	0.8902	0.8604	0.8227	0.7915	0.7777	0.7821	0.8129	0.8621	0.9009	0.9220	0.8624
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)	0.0008	0.0009	0.0011	0.0014	0.0019	0.0022	0.0024	0.0023	0.0020	0.0014	0.0010	0.0008	0.0014
standing storage losses (L_S lb/month & avg is lb/yr)	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
working losses (L_W lb/month & avg is lb/yr)	33.17	33.85	47.30	58.05	76.92	88.83	98.69	96.52	78.92	59.31	41.52	34.26	747.34
total losses (L_T lb/month & avg is lb/yr)	33.17	33.85	47.30	58.05	76.92	88.83	98.69	96.52	78.92	59.31	41.52	34.26	747.34
max hourly Q in bbl/hour	188.42	188.42	188.42	188.42	188.42	188.42	188.42	188.42	188.42	188.42	188.42	188.42	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.113	0.127	0.161	0.204	0.262	0.312	0.336	0.328	0.277	0.202	0.146	0.117	
breathing/standing loss (L_S lb/hr)													
max hourly total loss (L_T lb/hr)													

L_S sum months	L_W sum months	L_T sum months
0.00	747.34	747.34

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	**0.000**		**0.000**
Working Loss L_W	**0.080**	**0.336**	**696.701**
Total Loss L_T	**0.080**		**696.701**

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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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	

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

Tank ID	**9a-05-WST-CV**
Tank Description	**5000 BBL Produced Water Tank-Common Vent (ABJ-129A)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**38.70**
Vertical Height/Horizontal Length (H_S ft)	**24.00**
Roof Height (H_R ft)	**1.21**
Max Liquid Height (H_{LX} ft)	**23.00**
Avg Liquid Height (H_L ft)	**11.50**
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)	**0.4031**

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)	**2,737,500.00**
Annual Turnovers, N	**568.05**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**27,054.51**
vapor space outage (H_{VO} ft)	**12.903**
vapor space volume (V_V ft^3)	**15,177.73**

Major City for Meterological Data	**Meridian, MS**
Site Elevation (ft)	**400**
Atmospheric Pressure (P_A psia)	**14.485**
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	**0.219**

*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*
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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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	57.10	61.40	68.80	76.20	83.40	88.80	91.40	91.10	86.50	77.30	66.90	58.50	75.60
hourly average minimum ambient temperature (T_{AN} °F)	35.80	38.10	44.50	51.50	60.80	67.80	70.80	70.20	64.20	52.50	42.50	36.90	53.00
daily total solar insolation factor (I btu/ft^2 day)	783	1044	1380	1726	1918	1989	1945	1823	1544	1252	924	727	1421
daily average ambient temperature (T_{AA} °F)	46.45	49.75	56.65	63.85	72.10	78.30	81.10	80.65	75.35	64.90	54.70	47.70	64.30
liquid bulk temperature (T_B °F)	47.81	51.57	59.05	66.85	75.44	81.76	84.48	83.82	78.04	67.08	56.31	48.96	66.77
average vapor temperature (T_V °F)	50.83	55.59	64.36	73.50	82.82	89.42	91.97	90.84	83.98	71.90	59.87	51.76	72.24
daily ambient temperature range (ΔT_A °R)	21.30	23.30	24.30	24.70	22.60	21.00	20.60	20.90	22.30	24.80	24.40	21.60	22.60
daily vapor temperature range (ΔT_V °R)	24.17	28.42	33.02	37.31	38.07	37.77	36.98	35.78	33.52	31.88	27.96	23.81	32.30
daily average liquid surface temperature (T_{LA} °F)	49.32	53.58	61.71	70.18	79.13	85.59	88.23	87.33	81.01	69.49	58.09	50.36	69.51
daily maximum liquid surface temperature (T_{LX} °F)	55.36	60.68	69.96	79.50	88.65	95.03	97.47	96.28	89.39	77.46	65.08	56.32	77.58
daily minimum liquid surface temperature (T_{LN} °F)	43.28	46.47	53.45	60.85	69.61	76.15	78.98	78.39	72.63	61.52	51.10	44.41	61.43
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	0.173	0.203	0.272	0.365	0.493	0.608	0.661	0.642	0.524	0.357	0.239	0.180	0.357
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	0.217	0.262	0.363	0.499	0.670	0.817	0.880	0.848	0.685	0.467	0.306	0.224	0.468
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	0.138	0.156	0.202	0.264	0.358	0.447	0.491	0.481	0.397	0.270	0.185	0.144	0.270
daily vapor pressure range (ΔP_V)	0.0788	0.1067	0.1605	0.2350	0.3112	0.3700	0.3894	0.3674	0.2883	0.1962	0.1211	0.0804	0.1989
vapor space expansion factor (K_E)	0.0530	0.0628	0.0746	0.0871	0.0929	0.0959	0.0957	0.0919	0.0826	0.0741	0.0625	0.0523	0.0751
vapor molecular weight (M_V lb/lbmole)	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02
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	1,305,255	1,178,940	1,305,255	1,263,150	1,305,255	1,263,150	1,305,255	1,305,255	1,263,150	1,305,255	1,263,150	1,305,255	15,368,325
monthly turnovers (N/month) with avg = total annual	48.25	43.58	48.25	46.69	48.25	46.69	48.25	48.25	46.69	48.25	46.69	48.25	568.05
vented vapor saturation factor (K_S)	0.8940	0.8781	0.8431	0.8001	0.7479	0.7064	0.6888	0.6948	0.7361	0.8038	0.8594	0.8902	0.8037
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	0.0015	0.0019	0.0020	0.0020	0.0016	0.0011	0.0008	0.0006	0.0011
standing storage losses (L_S lb/month & avg is lb/yr)	16.20	16.98	24.77	31.63	43.34	51.08	57.13	55.64	44.50	32.02	21.25	16.82	411.35
working losses (L_W lb/month & avg is lb/yr)	122.54	128.39	187.37	239.18	327.76	386.28	432.04	420.81	336.56	242.15	160.72	127.18	3110.98
total losses (L_T lb/month & avg is lb/yr)	138.74	145.37	212.14	270.81	371.09	437.35	489.17	476.45	381.06	274.17	181.97	143.99	3522.33
max hourly Q in bbl/hour	1754.38	1754.38	1754.38	1754.38	1754.38	1754.38	1754.38	1754.38	1754.38	1754.38	1754.38	1754.38	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.750	0.871	1.147	1.514	2.007	2.444	2.646	2.577	2.130	1.483	1.017	0.779	
breathing/standing loss (L_S lb/hr)	0.022	0.025	0.035	0.051	0.067	0.080	0.084	0.079	0.062	0.043	0.030	0.023	
max hourly total loss (L_T lb/hr)	0.772	0.896	1.182	1.564	2.074	2.524	2.730	2.656	2.192	1.526	1.047	0.801	

L_S sum months	L_W sum months	L_T sum months
411.35	3110.98	3522.33

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	**0.043**	**0.084**	**376.991**
Working Loss L_W	**0.325**	**2.646**	**2,851.158**
Total Loss L_T	**0.369**	**2.730**	**3,228.148**

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

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

Tank ID	**9c-05-WST-CV**
Tank Description	**400 BBL Water Disposal Tank-Common Vent (ABJ-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)	**146,000.00**
Annual Turnovers, N	**381.43**
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	**Meridian, MS**
Site Elevation (ft)	**400**
Atmospheric Pressure (P_A psia)	**14.485**
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	**0.245**

*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*
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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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	57.10	61.40	68.80	76.20	83.40	88.80	91.40	91.10	86.50	77.30	66.90	58.50	75.60
hourly average minimum ambient temperature (T_{AN} °F)	35.80	38.10	44.50	51.50	60.80	67.80	70.80	70.20	64.20	52.50	42.50	36.90	53.00
daily total solar insolation factor (I btu/ft^2 day)	783	1044	1380	1726	1918	1989	1945	1823	1544	1252	924	727	1421
daily average ambient temperature (T_{AA} °F)	46.45	49.75	56.65	63.85	72.10	78.30	81.10	80.65	75.35	64.90	54.70	47.70	64.30
liquid bulk temperature (T_B °F)	47.81	51.57	59.05	66.85	75.44	81.76	84.48	83.82	78.04	67.08	56.31	48.96	66.77
average vapor temperature (T_V °F)	50.13	54.65	63.13	71.95	81.11	87.64	90.23	89.21	82.60	70.78	59.04	51.11	70.97
daily ambient temperature range (ΔT_A °R)	21.30	23.30	24.30	24.70	22.60	21.00	20.60	20.90	22.30	24.80	24.40	21.60	22.60
daily vapor temperature range (ΔT_V °R)	25.20	29.23	33.08	37.31	38.07	37.77	36.98	35.78	33.52	32.37	29.11	24.96	32.30
daily average liquid surface temperature (T_{LA} °F)	48.97	53.11	61.09	69.40	78.27	84.70	87.36	86.52	80.32	68.93	57.67	50.04	68.87
daily maximum liquid surface temperature (T_{LX} °F)	55.27	60.42	69.36	78.73	87.79	94.14	96.60	95.46	88.70	77.02	64.95	56.28	76.95
daily minimum liquid surface temperature (T_{LN} °F)	42.67	45.80	52.82	60.08	68.75	75.26	78.11	77.57	71.94	60.84	50.40	43.80	60.80
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	0.171	0.200	0.266	0.356	0.479	0.591	0.643	0.626	0.513	0.350	0.236	0.178	0.349
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	0.216	0.260	0.355	0.487	0.652	0.795	0.857	0.828	0.671	0.460	0.305	0.224	0.459
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	0.135	0.152	0.197	0.257	0.348	0.434	0.477	0.468	0.388	0.264	0.181	0.141	0.264
daily vapor pressure range (ΔP_V)	0.0813	0.1082	0.1578	0.2297	0.3036	0.3610	0.3802	0.3592	0.2827	0.1959	0.1245	0.0834	0.1952
vapor space expansion factor (K_E)	0.0552	0.0646	0.0746	0.0868	0.0924	0.0954	0.0951	0.0914	0.0823	0.0751	0.0650	0.0548	0.0749
vapor molecular weight (M_V lb/lbmole)	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02
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	69,614	62,877	69,614	67,368	69,614	67,368	69,614	69,614	67,368	69,614	67,368	69,614	819,644
monthly turnovers (N/month) with avg = total annual	32.40	29.26	32.40	31.35	32.40	31.35	32.40	32.40	31.35	32.40	31.35	32.40	381.43
vented vapor saturation factor (K_S)	0.9121	0.8990	0.8696	0.8331	0.7875	0.7504	0.7342	0.7394	0.7760	0.8353	0.8828	0.9088	0.8356
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	0.0011	0.0015	0.0018	0.0020	0.0019	0.0016	0.0011	0.0008	0.0006	0.0011
standing storage losses (L_S lb/month & avg is lb/yr)	1.31	1.37	1.99	2.54	3.47	4.09	4.58	4.46	3.58	2.58	1.72	1.37	33.07
working losses (L_W lb/month & avg is lb/yr)	7.22	7.54	10.95	13.93	19.06	22.45	25.13	24.52	19.67	14.19	9.45	7.50	181.61
total losses (L_T lb/month & avg is lb/yr)	8.53	8.91	12.95	16.46	22.52	26.54	29.71	28.98	23.25	16.77	11.18	8.86	214.68
max hourly Q in bbl/hour	93.57	93.57	93.57	93.57	93.57	93.57	93.57	93.57	93.57	93.57	93.57	93.57	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.040	0.046	0.060	0.079	0.104	0.127	0.138	0.134	0.111	0.078	0.054	0.041	
breathing/standing loss (L_S lb/hr)	0.002	0.002	0.003	0.004	0.005	0.006	0.007	0.006	0.005	0.003	0.002	0.002	
max hourly total loss (L_T lb/hr)	0.041	0.048	0.063	0.083	0.110	0.134	0.145	0.141	0.116	0.081	0.056	0.043	

L_S sum months	L_W sum months	L_T sum months
33.07	181.61	214.68

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	**0.003**	**0.007**	**30.355**
Working Loss L_W	**0.019**	**0.138**	**166.701**
Total Loss L_T	**0.022**	**0.145**	**197.056**

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

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

Tank ID	**9d-05-WST-CV**
Tank Description	**400 BBL Water Disposal Tank-Common Vent (ABJ-165B)**
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)	**146,000.00**
Annual Turnovers, N	**381.43**
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	**Meridian, MS**
Site Elevation (ft)	**400**
Atmospheric Pressure (P_A psia)	**14.485**
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	**0.245**

*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*
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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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	57.10	61.40	68.80	76.20	83.40	88.80	91.40	91.10	86.50	77.30	66.90	58.50	75.60
hourly average minimum ambient temperature (T_{AN} °F)	35.80	38.10	44.50	51.50	60.80	67.80	70.80	70.20	64.20	52.50	42.50	36.90	53.00
daily total solar insolation factor (I btu/ft^2 day)	783	1044	1380	1726	1918	1989	1945	1823	1544	1252	924	727	1421
daily average ambient temperature (T_{AA} °F)	46.45	49.75	56.65	63.85	72.10	78.30	81.10	80.65	75.35	64.90	54.70	47.70	64.30
liquid bulk temperature (T_B °F)	47.81	51.57	59.05	66.85	75.44	81.76	84.48	83.82	78.04	67.08	56.31	48.96	66.77
average vapor temperature (T_V °F)	50.13	54.65	63.13	71.95	81.11	87.64	90.23	89.21	82.60	70.78	59.04	51.11	70.97
daily ambient temperature range (ΔT_A °R)	21.30	23.30	24.30	24.70	22.60	21.00	20.60	20.90	22.30	24.80	24.40	21.60	22.60
daily vapor temperature range (ΔT_V °R)	25.20	29.23	33.08	37.31	38.07	37.77	36.98	35.78	33.52	32.37	29.11	24.96	32.30
daily average liquid surface temperature (T_{LA} °F)	48.97	53.11	61.09	69.40	78.27	84.70	87.36	86.52	80.32	68.93	57.67	50.04	68.87
daily maximum liquid surface temperature (T_{LX} °F)	55.27	60.42	69.36	78.73	87.79	94.14	96.60	95.46	88.70	77.02	64.95	56.28	76.95
daily minimum liquid surface temperature (T_{LN} °F)	42.67	45.80	52.82	60.08	68.75	75.26	78.11	77.57	71.94	60.84	50.40	43.80	60.80
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	0.171	0.200	0.266	0.356	0.479	0.591	0.643	0.626	0.513	0.350	0.236	0.178	0.349
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	0.216	0.260	0.355	0.487	0.652	0.795	0.857	0.828	0.671	0.460	0.305	0.224	0.459
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	0.135	0.152	0.197	0.257	0.348	0.434	0.477	0.468	0.388	0.264	0.181	0.141	0.264
daily vapor pressure range (ΔP_V)	0.0813	0.1082	0.1578	0.2297	0.3036	0.3610	0.3802	0.3592	0.2827	0.1959	0.1245	0.0834	0.1952
vapor space expansion factor (K_E)	0.0552	0.0646	0.0746	0.0868	0.0924	0.0954	0.0951	0.0914	0.0823	0.0751	0.0650	0.0548	0.0749
vapor molecular weight (M_V lb/lbmole)	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02
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	69,614	62,877	69,614	67,368	69,614	67,368	69,614	69,614	67,368	69,614	67,368	69,614	819,644
monthly turnovers (N/month) with avg = total annual	32.40	29.26	32.40	31.35	32.40	31.35	32.40	32.40	31.35	32.40	31.35	32.40	381.43
vented vapor saturation factor (K_S)	0.9121	0.8990	0.8696	0.8331	0.7875	0.7504	0.7342	0.7394	0.7760	0.8353	0.8828	0.9088	0.8356
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	0.0011	0.0015	0.0018	0.0020	0.0019	0.0016	0.0011	0.0008	0.0006	0.0011
standing storage losses (L_S lb/month & avg is lb/yr)	1.31	1.37	1.99	2.54	3.47	4.09	4.58	4.46	3.58	2.58	1.72	1.37	33.07
working losses (L_W lb/month & avg is lb/yr)	7.22	7.54	10.95	13.93	19.06	22.45	25.13	24.52	19.67	14.19	9.45	7.50	181.61
total losses (L_T lb/month & avg is lb/yr)	8.53	8.91	12.95	16.46	22.52	26.54	29.71	28.98	23.25	16.77	11.18	8.86	214.68
max hourly Q in bbl/hour	93.57	93.57	93.57	93.57	93.57	93.57	93.57	93.57	93.57	93.57	93.57	93.57	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.040	0.046	0.060	0.079	0.104	0.127	0.138	0.134	0.111	0.078	0.054	0.041	
breathing/standing loss (L_S lb/hr)	0.002	0.002	0.003	0.004	0.005	0.006	0.007	0.006	0.005	0.003	0.002	0.002	
max hourly total loss (L_T lb/hr)	0.041	0.048	0.063	0.083	0.110	0.134	0.145	0.141	0.116	0.081	0.056	0.043	

L_S sum months	L_W sum months	L_T sum months
33.07	181.61	214.68

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	**0.003**	**0.007**	**30.355**
Working Loss L_W	**0.019**	**0.138**	**166.701**
Total Loss L_T	**0.022**	**0.145**	**197.056**

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	**9e-05-OST-CV**
Tank Description	**400 BBL Oil Disposal 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)	**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)	**2,000.00**
Annual Turnovers, N	**5.23**
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	**Meridian, MS**
Site Elevation (ft)	**400**
Atmospheric Pressure (P_A psia)	**14.485**
Table 7.1-2 Liquid	**crude oil**
*RVP**	**7.16**
*API gravity**	**46.0**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**46.0**
API gravity at 100F	**49.5**
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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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	57.10	61.40	68.80	76.20	83.40	88.80	91.40	91.10	86.50	77.30	66.90	58.50	75.60
hourly average minimum ambient temperature (T_{AN} °F)	35.80	38.10	44.50	51.50	60.80	67.80	70.80	70.20	64.20	52.50	42.50	36.90	53.00
daily total solar insolation factor (I btu/ft^2 day)	783	1044	1380	1726	1918	1989	1945	1823	1544	1252	924	727	1421
daily average ambient temperature (T_{AA} °F)	46.45	49.75	56.65	63.85	72.10	78.30	81.10	80.65	75.35	64.90	54.70	47.70	64.30
liquid bulk temperature (T_B °F)	47.81	51.57	59.05	66.85	75.44	81.76	84.48	83.82	78.04	67.08	56.31	48.96	66.77
average vapor temperature (T_V °F)	50.13	54.65	63.13	71.95	81.11	87.64	90.23	89.21	82.60	70.78	59.04	51.11	70.97
daily ambient temperature range (ΔT_A °R)	21.30	23.30	24.30	24.70	22.60	21.00	20.60	20.90	22.30	24.80	24.40	21.60	22.60
daily vapor temperature range (ΔT_V °R)	25.20	29.23	33.08	37.31	38.07	37.77	36.98	35.78	33.52	32.37	29.11	24.96	32.30
daily average liquid surface temperature (T_{LA} °F)	48.97	53.11	61.09	69.40	78.27	84.70	87.36	86.52	80.32	68.93	57.67	50.04	68.87
daily maximum liquid surface temperature (T_{LX} °F)	55.27	60.42	69.36	78.73	87.79	94.14	96.60	95.46	88.70	77.02	64.95	56.28	76.95
daily minimum liquid surface temperature (T_{LN} °F)	42.67	45.80	52.82	60.08	68.75	75.26	78.11	77.57	71.94	60.84	50.40	43.80	60.80
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.847	4.156	4.806	5.567	6.478	7.209	7.529	7.426	6.704	5.521	4.519	3.925	5.515
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	4.325	4.749	5.562	6.529	7.582	8.396	8.729	8.573	7.694	6.343	5.149	4.405	6.335
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	3.412	3.623	4.134	4.720	5.504	6.156	6.461	6.402	5.816	4.785	3.951	3.487	4.781
daily vapor pressure range (ΔP_V)	0.9128	1.1258	1.4288	1.8090	2.0775	2.2396	2.2677	2.1704	1.8780	1.5585	1.1974	0.9185	1.5542
vapor space expansion factor (K_E)	0.1353	0.1660	0.2111	0.2734	0.3302	0.3772	0.3936	0.3730	0.3034	0.2351	0.1764	0.1359	0.2344
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	954	861	954	923	954	923	954	954	923	954	923	954	11,228
monthly turnovers (N/month) with avg = total annual	0.44	0.40	0.44	0.43	0.44	0.43	0.44	0.44	0.43	0.44	0.43	0.44	5.23
vented vapor saturation factor (K_S)	0.3158	0.2994	0.2698	0.2419	0.2151	0.1977	0.1909	0.1930	0.2094	0.2434	0.2821	0.3115	0.2436
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)	0.0352	0.0376	0.0428	0.0488	0.0558	0.0614	0.0638	0.0630	0.0576	0.0485	0.0406	0.0358	0.0484
standing storage losses (L_S lb/month & avg is lb/yr)	74.77	72.31	91.09	100.41	118.70	126.30	135.66	134.06	118.55	103.13	83.53	76.14	1234.64
working losses (L_W lb/month & avg is lb/yr)	25.15	24.32	30.64	33.77	39.92	42.48	45.63	45.09	39.87	34.68	28.09	25.61	415.24
total losses (L_T lb/month & avg is lb/yr)	99.91	96.63	121.73	134.18	158.62	168.77	181.28	179.15	158.42	137.81	111.63	101.74	1649.88
max hourly Q in bbl/hour	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.034	0.036	0.041	0.047	0.054	0.059	0.061	0.061	0.055	0.047	0.039	0.034	
breathing/standing loss (L_S lb/hr)	0.100	0.108	0.122	0.162	0.199	0.229	0.240	0.227	0.183	0.139	0.116	0.102	
max hourly total loss (L_T lb/hr)	0.134	0.144	0.164	0.208	0.252	0.288	0.301	0.288	0.239	0.186	0.155	0.137	

L_S sum months	L_W sum months	L_T sum months
1234.64	415.24	1649.88

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	**0.138**	**0.240**	**1,212.604**
Working Loss L_W	**0.047**	**0.061**	**407.827**
Total Loss L_T	**0.185**	**0.301**	**1,620.431**

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

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

Tank ID	**10-05-CBT-V**
Tank Description	**1500 BBL Chemical Blending Tank-Vent (BBJ-133A)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**
Tank Diameter (D ft)	**21.50**
Vertical Height/Horizontal Length (H_S ft)	**24.00**
Roof Height (H_R ft)	**0.67**
Max Liquid Height (H_{LX} ft)	**23.00**
Avg Liquid Height (H_L ft)	**11.50**
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)	**0.2240**

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)	**36,500.00**
Annual Turnovers, N	**24.54**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**8,350.16**
vapor space outage (H_{VO} ft)	**12.724**
vapor space volume (V_V ft^3)	**4,619.44**

Major City for Meterological Data	**Meridian, MS**
Site Elevation (ft)	**400**
Atmospheric Pressure (P_A psia)	**14.485**
Table 7.1-2 Liquid	**crude oil**
*RVP**	**7.16**
*API gravity**	**46.0**
*°F basis for gv**	**60.0**
bubble point psia	
API gravity at 60F	**46.0**
API gravity at 100F	**49.5**
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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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	57.10	61.40	68.80	76.20	83.40	88.80	91.40	91.10	86.50	77.30	66.90	58.50	75.60
hourly average minimum ambient temperature (T_{AN} °F)	35.80	38.10	44.50	51.50	60.80	67.80	70.80	70.20	64.20	52.50	42.50	36.90	53.00
daily total solar insolation factor (I btu/ft^2 day)	783	1044	1380	1726	1918	1989	1945	1823	1544	1252	924	727	1421
daily average ambient temperature (T_{AA} °F)	46.45	49.75	56.65	63.85	72.10	78.30	81.10	80.65	75.35	64.90	54.70	47.70	64.30
liquid bulk temperature (T_B °F)	47.81	51.57	59.05	66.85	75.44	81.76	84.48	83.82	78.04	67.08	56.31	48.96	66.77
average vapor temperature (T_V °F)	50.40	55.02	63.62	72.56	81.78	88.34	90.92	89.85	83.14	71.22	59.36	51.37	71.47
daily ambient temperature range (ΔT_A °R)	21.30	23.30	24.30	24.70	22.60	21.00	20.60	20.90	22.30	24.80	24.40	21.60	22.60
daily vapor temperature range (ΔT_V °R)	24.79	28.89	33.02	37.31	38.07	37.77	36.98	35.78	33.52	32.09	28.66	24.51	32.30
daily average liquid surface temperature (T_{LA} °F)	49.11	53.29	61.33	69.71	78.61	85.05	87.70	86.84	80.59	69.15	57.84	50.17	69.12
daily maximum liquid surface temperature (T_{LX} °F)	55.31	60.52	69.59	79.04	88.13	94.49	96.95	95.78	88.97	77.17	65.00	56.29	77.20
daily minimum liquid surface temperature (T_{LN} °F)	42.91	46.07	53.08	60.38	69.09	75.61	78.46	77.89	72.21	61.13	50.67	44.04	61.05
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.857	4.170	4.827	5.596	6.515	7.250	7.571	7.465	6.735	5.542	4.532	3.934	5.540
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	4.327	4.757	5.585	6.562	7.623	8.443	8.776	8.616	7.728	6.359	5.153	4.407	6.362
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	3.428	3.641	4.153	4.745	5.537	6.193	6.498	6.437	5.844	4.810	3.972	3.503	4.803
daily vapor pressure range (ΔP_V)	0.8998	1.1157	1.4312	1.8165	2.0867	2.2496	2.2775	2.1792	1.8846	1.5495	1.1815	0.9036	1.5595
vapor space expansion factor (K_E)	0.1334	0.1645	0.2116	0.2748	0.3325	0.3803	0.3970	0.3759	0.3052	0.2339	0.1741	0.1337	0.2354
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	17,403	15,719	17,403	16,842	17,403	16,842	17,403	17,403	16,842	17,403	16,842	17,403	204,911
monthly turnovers (N/month) with avg = total annual	2.08	1.88	2.08	2.02	2.08	2.02	2.08	2.08	2.02	2.08	2.02	2.08	24.54
vented vapor saturation factor (K_S)	0.2777	0.2623	0.2350	0.2095	0.1854	0.1698	0.1638	0.1657	0.1804	0.2111	0.2465	0.2737	0.2112
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)	0.0352	0.0377	0.0430	0.0490	0.0561	0.0616	0.0641	0.0633	0.0578	0.0486	0.0407	0.0359	0.0486
standing storage losses (L_S lb/month & avg is lb/yr)	250.81	242.73	306.00	337.52	399.12	424.69	456.10	450.61	398.27	346.27	280.29	255.36	4147.76
working losses (L_W lb/month & avg is lb/yr)	459.86	445.05	561.06	618.84	731.80	778.67	836.27	826.19	730.22	634.89	513.91	468.21	7604.96
total losses (L_T lb/month & avg is lb/yr)	710.66	687.78	867.06	956.36	1130.92	1203.36	1292.37	1276.80	1128.49	981.16	794.20	723.57	11752.73
max hourly Q in bbl/hour	23.39	23.39	23.39	23.39	23.39	23.39	23.39	23.39	23.39	23.39	23.39	23.39	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.618	0.662	0.754	0.860	0.984	1.081	1.124	1.110	1.014	0.853	0.714	0.629	
breathing/standing loss (L_S lb/hr)	0.337	0.361	0.411	0.543	0.665	0.766	0.802	0.759	0.613	0.465	0.389	0.343	
max hourly total loss (L_T lb/hr)	0.955	1.023	1.165	1.402	1.649	1.848	1.926	1.869	1.627	1.319	1.103	0.973	

L_S sum months	L_W sum months	L_T sum months
4147.76	7604.96	11752.73

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	**0.465**	**0.802**	**4,073.243**
Working Loss L_W	**0.853**	**1.124**	**7,468.327**
Total Loss L_T	**1.318**	**1.926**	**11,541.570**

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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United States Environmental Protection Agency

Office of Pollution Prevention and Toxics
Washington, DC 20460

March 1999
EPA 745-R-99-005

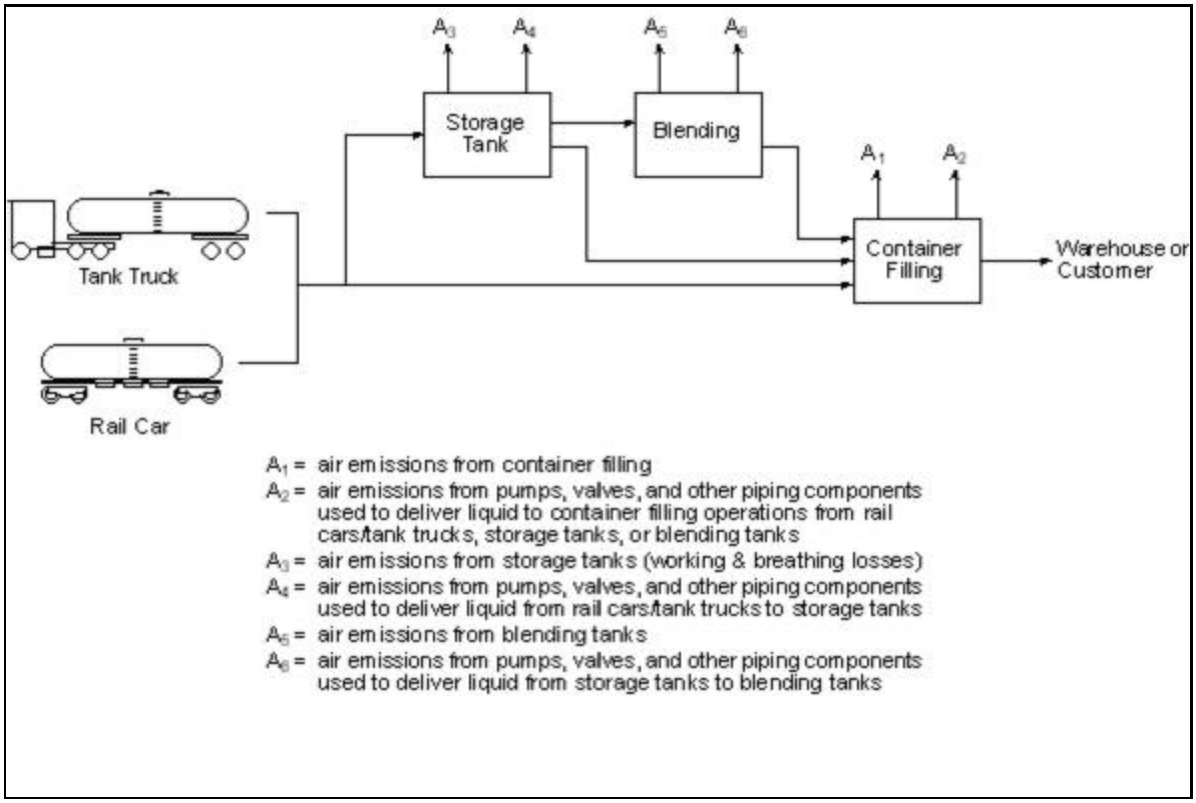
EPCRA Section 313

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

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

Toxic Chemical Release Inventory

FIGURE 1: LIQUID BULK STORAGE AND CONTAINER FILLING PROCESS



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

City	*State*	*City Factor*
Homer	AK	0.52
Birmingham	AL	1.21
Montgomery	AL	1.31
Little Rock	AR	1.21
Fort Smith	AR	1.18
Phoenix	AZ	1.67
Tucson	AZ	1.53
Bakersfield	CA	1.38
San Francisco	CA	1.02
Long Beach	CA	1.29
Los Angeles	CA	1.2
Sacramento	CA	1.21
Santa Maria	CA	1.07
Denver	CO	0.91
Grand Junction	CO	0.97
Wilmington	DE	0.93
Miami	FL	1.69
Atlanta	GA	1.17
Savannah	GA	1.34
Honolulu	HI	1.79
Des Moine	IA	0.83
Boise	ID	0.9
Chicago	IL	0.81
Springfield	IL	0.91
Indianapolis	IN	0.88
Wichita	KS	1.04
Louisville	KY	1
Baton Rouge	LA	1.4
Lake Charles	LA	1.41
New Orleans	LA	1.42
Boston	MA	0.84
Baltimore	MD	0.97
Portland	ME	0.71
Detroit	MI	0.79
Grand Rapids	MI	0.77
St. Paul	MN	0.71
St. Louis	MO	0.99
Jackson	MS	1.31
Billings	MT	0.77

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

Tank ID	**11-05-CBT-V**
Tank Description	**1500 BBL Chemical Blending Tank-Vent (BBJ-133B)**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Vertical**	*Tank Shell Color/Shade*	**Gray - Light**	*Major City for Meterological Data*	**Meridian, MS**
Tank Diameter (D ft)	**21.50**	*Tank Shell Paint Condition*	**average**	*Site Elevation (ft)*	**400**
Vertical Height/Horizontal Length (H_S ft)	**24.00**	*Tank Roof Color/Shade*	**Gray - Light**	*Atmospheric Pressure (P_A psia)*	**14.485**
Roof Height (H_R ft)	**0.67**	*Tank Roof Paint Condition*	**average**	*Table 7.1-2 Liquid*	**crude oil**
Max Liquid Height (H_{LX} ft)	**23.00**	*Roof Type*	**vertical tank with cone roof**	*RVP**	**7.16**
Avg Liquid Height (H_L ft)	**11.50**	*Tank Insulation*	**no insulation**	*API gravity**	**46.0**
Breather Vent Pressure Setting (P_{BP} psig)		*Tank Underground?*	**no**	*°F basis for gv**	**60.0**
Breather Vent Vacuum Setting (P_{BV} psig)		*Annual Throughput (Q bbl/year)*	**36,500.00**	*bubble point psia*	
actual tank pressure (P_I psig)	**0.0**	*Annual Turnovers, N*	**24.54**	*API gravity at 60F*	**46.0**
Shell Paint Solar Absorptance (S_A)	**0.58**	*Annual Hours*	**8,760**	*API gravity at 100F*	**49.5**
Roof Paint Solar Absorptance (R_A)	**0.58**	*tank max liquid volume (V_{LX} ft^3)*	**8,350.16**		
breather vent pressure range (ΔP_B psi)	**0.00**	*vapor space outage (H_{VO} ft)*	**12.724**	*Working Loss Product Factor (K_P)*	**0.75**
roof outage (H_{RO} ft)	**0.2240**	*vapor space volume (V_V ft^3)*	**4,619.44**	*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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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
hourly average maximum ambient temperature (T_{AX} °F)	57.10	61.40	68.80	76.20	83.40	88.80	91.40	91.10	86.50	77.30	66.90	58.50	75.60
hourly average minimum ambient temperature (T_{AN} °F)	35.80	38.10	44.50	51.50	60.80	67.80	70.80	70.20	64.20	52.50	42.50	36.90	53.00
daily total solar insolation factor (I btu/ft^2 day)	783	1044	1380	1726	1918	1989	1945	1823	1544	1252	924	727	1421
daily average ambient temperature (T_{AA} °F)	46.45	49.75	56.65	63.85	72.10	78.30	81.10	80.65	75.35	64.90	54.70	47.70	64.30
liquid bulk temperature (T_B °F)	47.81	51.57	59.05	66.85	75.44	81.76	84.48	83.82	78.04	67.08	56.31	48.96	66.77
average vapor temperature (T_V °F)	50.40	55.02	63.62	72.56	81.78	88.34	90.92	89.85	83.14	71.22	59.36	51.37	71.47
daily ambient temperature range (ΔT_A °R)	21.30	23.30	24.30	24.70	22.60	21.00	20.60	20.90	22.30	24.80	24.40	21.60	22.60
daily vapor temperature range (ΔT_V °R)	24.79	28.89	33.02	37.31	38.07	37.77	36.98	35.78	33.52	32.09	28.66	24.51	32.30
daily average liquid surface temperature (T_{LA} °F)	49.11	53.29	61.33	69.71	78.61	85.05	87.70	86.84	80.59	69.15	57.84	50.17	69.12
daily maximum liquid surface temperature (T_{LX} °F)	55.31	60.52	69.59	79.04	88.13	94.49	96.95	95.78	88.97	77.17	65.00	56.29	77.20
daily minimum liquid surface temperature (T_{LN} °F)	42.91	46.07	53.08	60.38	69.09	75.61	78.46	77.89	72.21	61.13	50.67	44.04	61.05
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	3.857	4.170	4.827	5.596	6.515	7.250	7.571	7.465	6.735	5.542	4.532	3.934	5.540
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	4.327	4.757	5.585	6.562	7.623	8.443	8.776	8.616	7.728	6.359	5.153	4.407	6.362
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	3.428	3.641	4.153	4.745	5.537	6.193	6.498	6.437	5.844	4.810	3.972	3.503	4.803
daily vapor pressure range (ΔP_V)	0.8998	1.1157	1.4312	1.8165	2.0867	2.2496	2.2775	2.1792	1.8846	1.5495	1.1815	0.9036	1.5595
vapor space expansion factor (K_E)	0.1334	0.1645	0.2116	0.2748	0.3325	0.3803	0.3970	0.3759	0.3052	0.2339	0.1741	0.1337	0.2354
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	17,403	15,719	17,403	16,842	17,403	16,842	17,403	17,403	16,842	17,403	16,842	17,403	204,911
monthly turnovers (N/month) with avg = total annual	2.08	1.88	2.08	2.02	2.08	2.02	2.08	2.08	2.02	2.08	2.02	2.08	24.54
vented vapor saturation factor (K_S)	0.2777	0.2623	0.2350	0.2095	0.1854	0.1698	0.1638	0.1657	0.1804	0.2111	0.2465	0.2737	0.2112
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)	0.0352	0.0377	0.0430	0.0490	0.0561	0.0616	0.0641	0.0633	0.0578	0.0486	0.0407	0.0359	0.0486
standing storage losses (L_S lb/month & avg is lb/yr)	250.81	242.73	306.00	337.52	399.12	424.69	456.10	450.61	398.27	346.27	280.29	255.36	4147.76
working losses (L_W lb/month & avg is lb/yr)	459.86	445.05	561.06	618.84	731.80	778.67	836.27	826.19	730.22	634.89	513.91	468.21	7604.96
total losses (L_T lb/month & avg is lb/yr)	710.66	687.78	867.06	956.36	1130.92	1203.36	1292.37	1276.80	1128.49	981.16	794.20	723.57	11752.73
max hourly Q in bbl/hour	23.39	23.39	23.39	23.39	23.39	23.39	23.39	23.39	23.39	23.39	23.39	23.39	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.618	0.662	0.754	0.860	0.984	1.081	1.124	1.110	1.014	0.853	0.714	0.629	
breathing/standing loss (L_S lb/hr)	0.337	0.361	0.411	0.543	0.665	0.766	0.802	0.759	0.613	0.465	0.389	0.343	
max hourly total loss (L_T lb/hr)	0.955	1.023	1.165	1.402	1.649	1.848	1.926	1.869	1.627	1.319	1.103	0.973	

L_S sum months	L_W sum months	L_T sum months
4147.76	7604.96	11752.73

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	**0.465**	**0.802**	**4,073.243**
Working Loss L_W	**0.853**	**1.124**	**7,468.327**
Total Loss L_T	**1.318**	**1.926**	**11,541.570**

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	**13-05-ST**
Tank Description	**2000 Gallon Chemical Storage Tank**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Horizontal**
Tank Diameter (D ft)	**5.90**
Vertical Height/Horizontal Length (H_S ft)	**10.00**
Roof Height (H_R ft)	
Max Liquid Height (H_{LX} ft)	**5.90**
Avg Liquid Height (H_L ft)	**2.95**
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)	**714.29**
Annual Turnovers, N	**14.67**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**273.40**
vapor space outage (H_{VO} ft)	**2.317**
vapor space volume (V_V ft^3)	**136.70**

Major City for Meterological Data	**Meridian, MS**
Site Elevation (ft)	**400**
Atmospheric Pressure (P_A psia)	**14.485**
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):

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

component	*mole%*	*MW*	*lb/mole*	*wt%*	*A*	*B*	*C*
Hexane N-	100.000	86.180	86.18000	100.00000	6.878	1171.500	224.370
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		86.180	100.000			

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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)	57.10	61.40	68.80	76.20	83.40	88.80	91.40	91.10	86.50	77.30	66.90	58.50	75.60
hourly average minimum ambient temperature (T_{AN} °F)	35.80	38.10	44.50	51.50	60.80	67.80	70.80	70.20	64.20	52.50	42.50	36.90	53.00
daily total solar insolation factor (I btu/ft^2 day)	783	1044	1380	1726	1918	1989	1945	1823	1544	1252	924	727	1421
daily average ambient temperature (T_{AA} °F)	46.45	49.75	56.65	63.85	72.10	78.30	81.10	80.65	75.35	64.90	54.70	47.70	64.30
liquid bulk temperature (T_B °F)	48.56	52.57	60.38	68.51	77.28	83.67	86.35	85.57	79.52	68.28	57.19	49.66	68.14
average vapor temperature (T_V °F)	52.14	57.33	66.68	76.39	86.03	92.75	95.23	93.89	86.57	74.00	61.41	52.98	74.62
daily ambient temperature range (ΔT_A °R)	21.30	23.30	24.30	24.70	22.60	21.00	20.60	20.90	22.30	24.80	24.40	21.60	22.60
daily vapor temperature range (ΔT_V °R)	29.05	35.10	41.85	48.36	50.34	50.50	49.43	47.44	43.40	39.90	33.71	28.53	41.40
daily average liquid surface temperature (T_{LA} °F)	50.35	54.95	63.53	72.45	81.66	88.21	90.79	89.73	83.04	71.14	59.30	51.32	71.38
daily maximum liquid surface temperature (T_{LX} °F)	57.61	63.73	73.99	84.54	94.24	100.84	103.15	101.59	93.89	81.11	67.73	58.46	81.73
daily minimum liquid surface temperature (T_{LN} °F)	43.09	46.18	53.06	60.36	69.07	75.58	78.43	77.87	72.19	61.16	50.88	44.19	61.03
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	1.479	1.674	2.094	2.620	3.271	3.809	4.040	3.944	3.379	2.536	1.878	1.518	2.552
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	1.796	2.105	2.721	3.499	4.367	5.050	5.309	5.134	4.333	3.229	2.330	1.836	3.276
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	1.209	1.318	1.591	1.930	2.409	2.828	3.029	2.989	2.603	1.971	1.500	1.247	1.964
daily vapor pressure range (ΔP_V)	0.5870	0.7867	1.1292	1.5695	1.9575	2.2215	2.2795	2.1448	1.7296	1.2582	0.8300	0.5892	1.3125
vapor space expansion factor (K_E)	0.1021	0.1296	0.1711	0.2232	0.2676	0.3003	0.3080	0.2898	0.2357	0.1805	0.1308	0.1013	0.1879
vapor molecular weight (M_V lb/lbmole)	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18
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	341	308	341	330	341	330	341	341	330	341	330	341	4,010
monthly turnovers (N/month) with avg = total annual	1.25	1.13	1.25	1.21	1.25	1.21	1.25	1.25	1.21	1.25	1.21	1.25	14.67
vented vapor saturation factor (K_S)	0.8463	0.8295	0.7954	0.7566	0.7135	0.6813	0.6684	0.6737	0.7067	0.7625	0.8126	0.8429	0.7614
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)	0.0232	0.0260	0.0320	0.0392	0.0481	0.0554	0.0585	0.0572	0.0497	0.0382	0.0289	0.0238	0.0384
standing storage losses (L_S lb/month & avg is lb/yr)	14.07	14.24	19.38	23.03	29.19	32.50	35.46	34.70	29.15	23.15	16.98	14.42	286.27
working losses (L_W lb/month & avg is lb/yr)	7.90	8.00	10.88	12.94	16.39	18.25	19.92	19.49	16.37	13.00	9.54	8.10	160.78
total losses (L_T lb/month & avg is lb/yr)	21.97	22.24	30.26	35.97	45.58	50.75	55.38	54.19	45.53	36.15	26.52	22.52	447.05
max hourly Q in bbl/hour	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.011	0.012	0.015	0.018	0.022	0.025	0.027	0.026	0.023	0.017	0.013	0.011	
breathing/standing loss (L_S lb/hr)	0.019	0.021	0.026	0.038	0.052	0.065	0.069	0.064	0.047	0.031	0.024	0.019	
max hourly total loss (L_T lb/hr)	0.030	0.033	0.041	0.056	0.074	0.090	0.095	0.090	0.070	0.049	0.037	0.030	

L_S sum months	L_W sum months	L_T sum months
286.27	160.78	447.05

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	**0.031**	**0.069**	**273.848**
Working Loss L_W	**0.018**	**0.027**	**153.800**
Total Loss L_T	**0.049**	**0.095**	**427.648**

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

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

Tank ID	**14-05-ST & 15-05-ST**
Tank Description	**500 Gallon Chemical Storage Tank**
Company Name	**Denbury Onshore, LLC**

Tank Orientation	**Horizontal**
Tank Diameter (D ft)	**4.00**
Vertical Height/Horizontal Length (H_S ft)	**5.00**
Roof Height (H_R ft)	
Max Liquid Height (H_{LX} ft)	**4.00**
Avg Liquid Height (H_L ft)	**2.00**
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)	**95.24**
Annual Turnovers, N	**8.51**
Annual Hours	**8,760**
tank max liquid volume (V_{LX} ft^3)	**62.83**
vapor space outage (H_{VO} ft)	**1.571**
vapor space volume (V_V ft^3)	**31.42**

Major City for Meterological Data	**Meridian, MS**
Site Elevation (ft)	**400**
Atmospheric Pressure (P_A psia)	**14.485**
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):

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

component	*mole%*	*MW*	*lb/mole*	*wt%*	*A*	*B*	*C*
Hexane N-	100.000	86.180	86.18000	100.00000	6.878	1171.500	224.370
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		86.180	100.000			

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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)	57.10	61.40	68.80	76.20	83.40	88.80	91.40	91.10	86.50	77.30	66.90	58.50	75.60
hourly average minimum ambient temperature (T_{AN} °F)	35.80	38.10	44.50	51.50	60.80	67.80	70.80	70.20	64.20	52.50	42.50	36.90	53.00
daily total solar insolation factor (I btu/ft^2 day)	783	1044	1380	1726	1918	1989	1945	1823	1544	1252	924	727	1421
daily average ambient temperature (T_{AA} °F)	46.45	49.75	56.65	63.85	72.10	78.30	81.10	80.65	75.35	64.90	54.70	47.70	64.30
liquid bulk temperature (T_B °F)	48.56	52.57	60.38	68.51	77.28	83.67	86.35	85.57	79.52	68.28	57.19	49.66	68.14
average vapor temperature (T_V °F)	52.46	57.76	67.24	77.10	86.82	93.56	96.03	94.64	87.20	74.51	61.79	53.28	75.21
daily ambient temperature range (ΔT_A °R)	21.30	23.30	24.30	24.70	22.60	21.00	20.60	20.90	22.30	24.80	24.40	21.60	22.60
daily vapor temperature range (ΔT_V °R)	29.00	35.10	41.85	48.36	50.34	50.50	49.43	47.44	43.40	39.90	33.71	28.37	41.40
daily average liquid surface temperature (T_{LA} °F)	50.51	55.17	63.81	72.80	82.05	88.62	91.19	90.11	83.36	71.39	59.49	51.47	71.67
daily maximum liquid surface temperature (T_{LX} °F)	57.76	63.94	74.27	84.89	94.63	101.24	103.55	101.97	94.21	81.37	67.92	58.56	82.02
daily minimum liquid surface temperature (T_{LN} °F)	43.26	46.39	53.35	60.71	69.46	75.99	78.83	78.25	72.51	61.42	51.06	44.38	61.32
vapor pressure at daily avg liq surface temp T_{LA} (P_{VA} psia)	1.485	1.683	2.109	2.643	3.301	3.845	4.077	3.978	3.404	2.553	1.887	1.524	2.570
vapor pressure at daily max liq surface temp T_{LX} (P_{VX} psia)	1.803	2.117	2.739	3.528	4.405	5.095	5.354	5.175	4.364	3.248	2.341	1.841	3.299
vapor pressure at daily min liq surface temp T_{LN} (P_{VN} psia)	1.215	1.326	1.603	1.948	2.433	2.856	3.058	3.016	2.624	1.984	1.508	1.254	1.979
daily vapor pressure range (ΔP_V)	0.5882	0.7904	1.1359	1.5806	1.9723	2.2383	2.2961	2.1595	1.7400	1.2647	0.8334	0.5877	1.3202
vapor space expansion factor (K_E)	0.1021	0.1299	0.1717	0.2243	0.2693	0.3025	0.3103	0.2918	0.2370	0.1811	0.1311	0.1008	0.1887
vapor molecular weight (M_V lb/lbmole)	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18	86.18
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	45	41	45	44	45	44	45	45	44	45	44	45	535
monthly turnovers (N/month) with avg = total annual	0.72	0.65	0.72	0.70	0.72	0.70	0.72	0.72	0.70	0.72	0.70	0.72	8.51
vented vapor saturation factor (K_S)	0.8900	0.8771	0.8506	0.8197	0.7844	0.7575	0.7466	0.7512	0.7792	0.8247	0.8642	0.8874	0.8237
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)	0.0233	0.0261	0.0321	0.0395	0.0485	0.0558	0.0589	0.0576	0.0500	0.0384	0.0291	0.0239	0.0386
standing storage losses (L_S lb/month & avg is lb/yr)	3.53	3.57	4.87	5.79	7.34	8.18	8.92	8.73	7.32	5.81	4.26	3.61	71.93
working losses (L_W lb/month & avg is lb/yr)	1.06	1.07	1.46	1.74	2.20	2.45	2.68	2.62	2.20	1.74	1.28	1.08	21.58
total losses (L_T lb/month & avg is lb/yr)	4.58	4.64	6.33	7.53	9.55	10.63	11.60	11.34	9.52	7.55	5.53	4.70	93.51
max hourly Q in bbl/hour	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	
max hourly working loss at P_{VX} & Q/hr & K_N=1 (L_W lb/hr)	0.001	0.002	0.002	0.002	0.003	0.003	0.004	0.004	0.003	0.002	0.002	0.001	
breathing/standing loss (L_S lb/hr)	0.005	0.005	0.007	0.010	0.013	0.017	0.018	0.017	0.012	0.008	0.006	0.005	
max hourly total loss (L_T lb/hr)	0.006	0.007	0.009	0.012	0.016	0.020	0.021	0.020	0.015	0.010	0.008	0.006	

L_S sum months	L_W sum months	L_T sum months
71.93	21.58	93.51

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	**0.008**	**0.018**	**68.786**
Working Loss L_W	**0.002**	**0.004**	**20.632**
Total Loss L_T	**0.010**	**0.021**	**89.418**

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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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

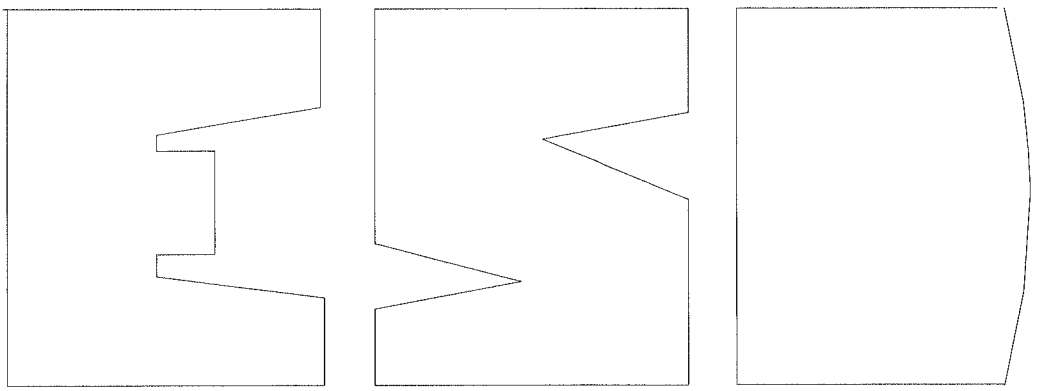

TABLE 2-4. OIL AND GAS PRODUCTION OPERATIONS AVERAGE EMISSION FACTORS (kg/hr/source)

Equipment Type	Service[a]	Emission Factor (kg/hr/source)[b]
Valves	Gas	4.5E-03
	Heavy Oil	8.4E-06
	Light Oil	2.5E-03
	Water/Oil	9.8E-05
Pump seals	Gas	2.4E-03
	Heavy Oil	NA
	Light Oil	1.3E-02
	Water/Oil	2.4E-05
Others[c]	Gas	8.8E-03
	Heavy Oil	3.2E-05
	Light Oil	7.5E-03
	Water/Oil	1.4E-02
Connectors	Gas	2.0E-04
	Heavy Oil	7.5E-06
	Light Oil	2.1E-04
	Water/Oil	1.1E-04
Flanges	Gas	3.9E-04
	Heavy Oil	3.9E-07
	Light Oil	1.1E-04
	Water/Oil	2.9E-06
Open-ended lines	Gas	2.0E-03
	Heavy Oil	1.4E-04
	Light Oil	1.4E-03
	Water/Oil	2.5E-04

[a]Water/Oil emission factors apply to water streams in oil service with a water content greater than 50%, from the point of origin to the point where the water content reaches 99%. For water streams with a water content greater than 99%, the emission rate is considered negligible.

[b]These factors are for total organic compound emission rates (including non-VOC's such as methane and ethane) and apply to light crude, heavy crude, gas plant, gas production, and off shore facilities. "NA" indicates that not enough data were available to develop the indicated emission factor.

[c]The "other" equipment type was derived from compressors, diaphrams, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, relief valves, and vents. This "other" equipment type should be applied for any equipment type other than connectors, flanges, open-ended lines, pumps, or valves.

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

	Emission Factor, lb THC/yr		
Component	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

	Fractional Composition, lb/lb THC			
Compound	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.

Weighted Average for Tank Vapors to Atmospheric Control Flare (EPN: 17a-05-F)

Total Working & Standing Losses:	**107.65**	**lb/hr**
Total Oil Flash Vapors:	**2224.97**	**SCFH**
Total Brine Flash Vapors:	**125.00**	**SCFH**
Total Stream Flowrate:	**3209.97**	**SCFH**

June 1998
RG-109

Air Permit Technical Guidance for Chemical Sources:

Flares and Vapor Oxidizers

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New Source Review Permits Division

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Flare Emission Factors

The usual flare destruction efficiencies and emission factors are provided in Table 4. The high-Btu waste streams referred to in the table have a heating value greater than 1,000 Btu/scf.

Flare Destruction Efficiencies

Claims for destruction efficiencies greater than those listed in Table 4 will be considered on a case-by-case basis. The applicant may make one of the three following demonstrations to justify the higher destruction efficiency: (1) general method, (2) 99.5 percent justification, or (3) flare stack sampling.

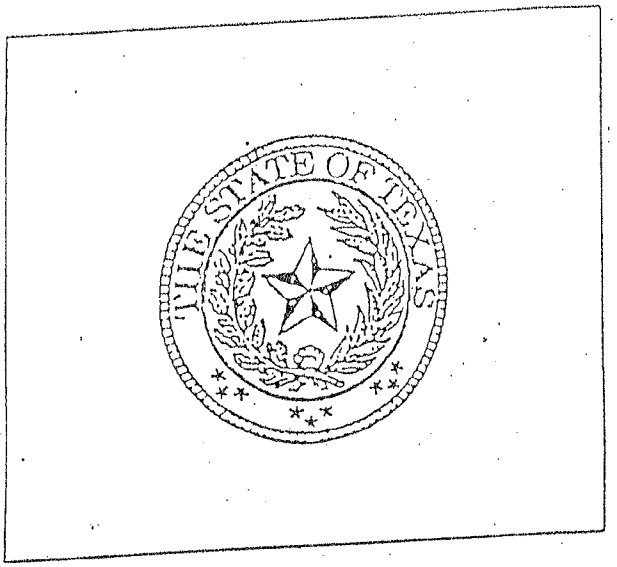
Table 4. Flare Factors

Waste Stream	Destruction/Removal Efficiency (DRE)		
VOC	98 percent (generic)		
	99 percent for compounds containing no more than 3 carbons that contain no elements other than carbon and hydrogen in addition to the following compounds: methanol, ethanol, propanol, ethylene oxide and propylene oxide		
H_2S	98 percent		
NH_3	case by case		
CO	case by case		
Air Contaminants	**Emission Factors**		
thermal NO_x	steam-assist:	high Btu	0.0485 lb/MMBtu
		low Btu	0.068 lb/MMBtu
	other:	high Btu	0.138 lb/MMBtu
		low Btu	0.0641 lb/MMBtu
fuel NO_x	NO_x is 0.5 wt percent of inlet NH_3, other fuels case by case		
CO	steam-assist:	high Btu	0.3503 lb/MMBtu
		low Btu	0.3465 lb/MMBtu
	other:	high Btu	0.2755 lb/MMBtu
		low Btu	0.5496 lb/MMBtu
PM	none, required to be smokeless		
SO_2	100 percent S in fuel to SO_2		

Technical Guidance Package for
Chemical Sources

Flare Sources

Texas Natural Resource Conservation Commission



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

Compiled by TNRCC Chemical Section Engineers
November 1994

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Post Office Box 13087
Austin, Texas 78711-3087
(512) 239-1250

greater than standard destruction efficiencies (>SDE) are claimed. The determinations shall indicate the maximum or minimum values required for flare performance at the claimed efficiency. The determinations shall be made during the testing protocols used to demonstrate >SDE.

A. Tip Velocities and Flow rates (maximum)

B. Heating Values (minimum).

4. The applicant shall install, calibrate, operate and maintain a flow meter to monitor actual stream flow rates to, and calculate tip velocities of, flares for which >SDE are claimed.

5. Records shall be maintained which indicate on a continuous basis the flow rates and heating values of the streams directed to the flares for which >SDE are claimed.

6. Flow rates of streams to flares for which >SDE are claimed shall not exceed the lesser of the indicated maxima; (1) flow rates which produce the tip velocities specified in 40 CFR 60.18, or (2) flow rates demonstrated during testing to correspond to the demonstrated flare efficiency.

7. Tip velocities of flares for which >SDE are claimed shall not exceed the lesser of the indicated maxima; (1) tip velocities specified in 40 CFR 60.18, or (2) tip velocities demonstrated during testing to correspond to the demonstrated flare efficiency.

8. Heating values of streams directed to flares for which >SDE are claimed shall be no less than the greater of the indicated minima; (1) 300 BTU/scf for streams directed to non-assisted flares and 400 BTU/scf for streams directed to assisted flares, or (2) heating values demonstrated during testing to correspond to the demonstrated flare efficiency.

9. The applicant shall provide vendor data supportive of the claimed flare efficiency.

<u>NO_x and CO Emissions</u>

The following NO_x and CO factors were derived by the Chemical Section of the New Source Review Division based on data published in the 1983 CMA document entitled, *A Report on A Flare Efficiency Study*. These factors should be used in estimating NO_x and CO emissions rather than the emission factors found in Section 11.5 of AP-42.

Table 3: Flare Factors.

Type	Waste Gas	NO, 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

Since flares do not lend themselves to conventional emission testing techniques, only a few attempts have been made to characterize flare emissions. Recent EPA tests using propylene as flare gas indicated that efficiencies of 98 percent can be achieved when burning an offgas with at least 11,200 kJ/m^3 (300 Btu/ft^3). The tests conducted on steam-assisted flares at velocities as low as 39.6 meters per minute (m/min) (130 ft/min) to 1140 m/min (3750 ft/min), and on air-assisted flares at velocities of 180 m/min (617 ft/min) to 3960 m/min (13,087 ft/min) indicated that variations in incoming gas flow rates have no effect on the combustion efficiency. Flare gases with less than 16,770 kJ/m^3 (450 Btu/ft^3) do not smoke.

Table 13.5-1 presents flare emission factors, and Table 13.5-2 presents emission composition data obtained from the EPA tests.[1] Crude propylene was used as flare gas during the tests. Methane was a major fraction of hydrocarbons in the flare emissions, and acetylene was the dominant intermediate hydrocarbon species. Many other reports on flares indicate that acetylene is always formed as a stable intermediate product. The acetylene formed in the combustion reactions may react further with hydrocarbon radicals to form polyacetylenes followed by polycyclic hydrocarbons.[2]

In flaring waste gases containing no nitrogen compounds, NO is formed either by the fixation of atmospheric nitrogen (N) with oxygen (O) or by the reaction between the hydrocarbon radicals present in the combustion products and atmospheric nitrogen, by way of the intermediate stages, HCN, CN, and OCN.[2] Sulfur compounds contained in a flare gas stream are converted to SO_2 when burned. The amount of SO_2 emitted depends directly on the quantity of sulfur in the flared gases.

Table 13.5-1 (English Units). EMISSION FACTORS FOR FLARE OPERATIONS[a]

EMISSION FACTOR RATING: B

Component	Emission Factor (lb/10^6 Btu)
Total hydrocarbons[b]	0.14
Carbon monoxide	0.37
Nitrogen oxides	0.068
Soot[c]	0 - 274

[a] Reference 1. Based on tests using crude propylene containing 80% propylene and 20% propane.
[b] Measured as methane equivalent.
[c] Soot in concentration values: nonsmoking flares, 0 micrograms per liter (μg/L); lightly smoking flares, 40 μg/L; average smoking flares, 177 μg/L; and heavily smoking flares, 274 μg/L.

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.

Certificate of Analysis

Number: 172-24050250-001A

Williston Laboratory
3111 1st Ave W
Williston, ND 58801

May 28, 2024

Kevin Hendricks
Denbury
202 S 4th Street West
Baker, MT 59313

Station Name: Soso EOR
Sample Point: FLARE INLET GAS ZZZ-190A
Method: GPA 2286
Analyzed: 05/23/2024 10:03:18

Sampled By: Tim Keene
Sample Of: Gas Spot
Sample Date: 05/06/2024 13:30
Sample Conditions: 93 °F
PO/Ref. No: 4300204782

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.696 psia
Nitrogen	5.4388	3.5086	
Methane	2.8307	1.0458	
Carbon Dioxide	84.6947	85.8356	
Ethane	0.9554	0.6616	0.2564
Propane	1.3634	1.3845	0.3770
Iso-Butane	0.9149	1.2246	0.3005
n-Butane	1.4721	1.9704	0.4658
Iso-Pentane	0.6182	1.0271	0.2269
n-Pentane	0.6299	1.0466	0.2292
Hexanes	0.3488	0.6922	0.1438
n-Hexane	0.2412	0.4787	0.0995
Benzene	0.0554	0.0997	0.0156
Cyclohexane	0.0768	0.1488	0.0262
Heptanes	0.1972	0.4550	0.0913
Methylcyclohexane	0.0409	0.0925	0.0165
Toluene	0.0068	0.0144	0.0023
Octanes	0.0713	0.1876	0.0367
Ethylbenzene	0.0006	0.0015	0.0002
Xylenes	0.0060	0.0147	0.0023
Nonanes	0.0334	0.0986	0.0189
Decanes Plus	0.0035	0.0115	0.0022
	100.0000	100.0000	2.3113

GPM TOTAL C2+ 2.311

Calculated Physical Properties	Total	C10+
Calculated Molecular Weight	43.42	142.28
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.696 psia & 60°F		
Higher Heating Value, Real Gas Dry BTU	263.4	7742.9
Water Sat. Gas Base BTU	259.0	7607.8
Relative Density Real Gas	1.5081	4.9126
Compressibility Factor	0.9938	

Data reviewed by: Mo Milton, Laboratory Technician

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

Normalized Component Calculation

LP Flare Gas Analysis; Southern Petroleum Laboratories Report No.: 172-24050250-001A

COMPONENT	mole %	Normalized mole %	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	5.4388	0.0000	28.0134	0.00	0.0000	0	0
Carbon Dioxide	84.6947	89.5660	44.01	39.42	88.9569	0	0
Methane	2.8307	2.9935	16.043	0.48	1.0838	1010	30
Ethane	0.9554	1.0104	30.07	0.30	0.6856	1770	18
Hydrogen Sulfide	0.0000	0.0000	34.08	0.00	0.0000	637	0
Propane	1.3634	1.4418	44.097	0.64	1.4348	2516	36
I-Butane	0.9149	0.9675	58.123	0.56	1.2691	3252	31
N-Butane	1.4721	1.5568	58.123	0.90	2.0420	3262	51
I-Pentane	0.6182	0.6538	72.15	0.47	1.0645	4001	26
N-Pentane	0.6299	0.6661	72.15	0.48	1.0846	4009	27
Other/Iso Hexanes	0.3488	0.3689	86.177	0.32	0.7174	4750	18
N-Hexane	0.2412	0.2551	86.177	0.22	0.4961	4756	12
Methylcyclopentane	0.0000	0.0000	84.1608	0.00	0.0000	4501	0
Benzene	0.0554	0.0586	78.114	0.05	0.1033	3742	2
Cyclohexane	0.0768	0.0812	84.1608	0.07	0.1543	4482	4
Heptane	0.1972	0.2085	100.204	0.21	0.4716	5503	11
Methylcyclohexane	0.0409	0.0433	98.188	0.04	0.0958	5216	2
Toluene	0.0068	0.0072	92.141	0.01	0.0150	4475	0
Iso-Octane/224-Trimethylpentane	0.0000	0.0000	114.231	0.00	0.0000	6232	0
Octanes	0.0713	0.0754	114.231	0.09	0.1944	6249	5
Ethylbenzene	0.0006	0.0006	106.167	0.00	0.0015	5222	0
Xylenes	0.0060	0.0063	106.167	0.01	0.0152	5209	0
Nonanes	0.0334	0.0353	128.258	0.05	0.1022	6997	2
Decanes Plus	0.0035	0.0037	142.285	0.01	0.0119	7743	0
TOTALS	**100.0000**	**100.0000**	**MW=**	**44.31**	**100.0000**	**btu/scf =**	**276.873395**
				sg	**1.5280**		
				VOC wt%	**9.2736**		
				Toxic wt%	**0.6310**		

Weighted Average for Tank Vapors to LP Control Flare (EPN: 17b-05-F)

Total Heater Treater Flash Gas Vapors:	**8632.76**	**SCFH**
Total Water Flash Drum Flash Gas Vapors:	**531.25**	**SCFH**
Total Stream Flowrate:	**9164.01**	**SCFH**

HT-FG

H.L.P. Engineering, Inc.
Engr: Mr. Thomas LaSalle

LA Environmental Laboratory Accreditation
Cert. No. 01995
Denbury Onshore, LLC
Brookhaven Field Central Facility
Lincoln County, Mississippi

Multi-Stage Separator Test

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)
200	**86**	**0.820**	**N/A**	**N/A**	**90**	**85**	0	**0.948**
39	120	0.826	0.0059	1.512	15	14	75	0.984
0	80	0.838	0.0020	1.635	0	0	15	1.000

Summary Data

Total Separator Gas-Oil Ratio	90	scf/stb
Stock Tank Oil Gravity	37.2	°API at 80 °F 35.7 @ 60°F
Separator Volume Factor	1.055	bbls@ Psat/stb
Color	Crude	

Notes:

- stb: stock tank barrel @ 80 °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 80 °F.

LP-RG

SPL
OIL AND GAS MEASUREMENT AND ANALYSIS

4790 NE Evangeline Thruway
Carencro, LA 70520
Office: 337-896-3055
Fax: 337-896-3077

CERTIFICATE OF ANALYSIS
17080192-004A

Customer:	Denbury Resources	**Report Date:**	09/08/17
Attn:	Mark Garcia		
	5320 Legacy Drive	**PO / Ref. No.:**	
	Plano, TX 75024		
Company:	Denbury Resources	**Sample Of:**	Flash Gas
Field:	Soso	**Sample Date/Time:**	8/20/17 9:15
Well:	EOR Facility Inlet Liquid	**Sample Psig & Temp:**	191 psi @ 85 °F
		Sampled By:	BA-FSC
Sample Point:	LP Sep MBD 101	**Cylinder # :**	2030-00460
Comments:	EOS Flash Gas Composition		
	Staged Flash from 727 psi @ 89°F to 0 psi @ 60°F		

	MOL %	WEIGHT %	GPM's @ 15.025
NITROGEN			
METHANE	1.259	0.439	
CO2	81.879	78.367	
ETHANE	2.880	1.884	1.104
PROPANE	3.021	2.897	1.124
I-BUTANE	1.969	2.489	0.617
N-BUTANE	3.587	4.534	1.166
I-PENTANE	1.463	2.295	0.410
N-PENTANE	1.550	2.432	0.439
I-HEXANE	0.892	1.672	0.221
N-HEXANE	0.639	1.198	0.159
2,2,4 TRIMETHYLPENTANE	0.001	0.002	0.000
BENZENE	0.203	0.344	0.074
HEPTANES	0.467	0.981	0.104
TOLUENE	0.012	0.025	0.004
OCTANES	0.137	0.334	0.027
E-BENZENE	0.001	0.003	0.000
m,o,&p-XYLENE	0.013	0.029	0.003
NONANES	0.026	0.072	0.005
DECANES PLUS	0.000	0.001	0.000
TOTALS	100.000	100.000	5.458

CALCULATED VALUES

REAL DRY BTU AT 15.025 PSIA, 60 DEG.F	561.0
REAL WET BTU AT 15.025 PSIA, 60 DEG.F	551.4
RELATIVE DENSITY	1.602
COMPRESSIBILITY FACTOR	0.99117

	C2+	C5+
GPM's @ 15.025 psia, 60 Deg.F	5.458	1.446