Crude Oil Storage Tank(s) Emissions Inventory

Section 01 - Administrative Information

Facility AIRs ID:	09CY1360.XP	017-0254-002	
	Cheyenne	NWAU #3	Point

Section 02 - Equipment Description Details

Detailed Emissions Unit Description: **Braukmann Farms C Tank Battery**

Emission Control Device Description: **Install of Cimarron CEI_1_24 Combustor**

Requested Overall VOC & HAP Control Efficiency %: **95.0**

Section 03 - Processing Rate Information for Emissions Estimates

Primary Emissions - Storage Tank(s)

Actual Throughput = **5605.0** Barrels (bbl) per year

Requested Permit Limit Throughput = **6000.0** Barrels (bbl) per year Requested Monthly Throughput = 509.6 Barrels (bbl) per month

Potential to Emit (PTE) Throughput = **6500.0** Barrels (bbl) per year

Secondary Emissions - Combustion Device(s)

Heat content of waste gas = **2300.0** Btu/scf

Volume of waste gas emitted per BBL of liquids produced = **23.0** scf/bbl

Actual heat content of waste gas routed to combustion device = 296.5 MMBTU per year

Requested heat content of waste gas routed to combustion device = 317.4 MMBTU per year

Potential to Emit (PTE) heat content of waste gas routed to combustion device = 343.9 MMBTU per year

Control Device

Pilot Fuel Use Rate:	scfh	0.0 MMscf/yr
Pilot Fuel Gas Heating Value:	Btu/scf	0.0 MMBTU/yr

Section 04 - Emissions Factors & Methodologies

Will this storage tank emit flash emissions? **Yes**

Emission Factors	Crude Oil Tank		
Pollutant	Uncontrolled (lb/bbl) (Crude Oil Throughput)	Controlled (lb/bbl) (Crude Oil Throughput)	Emission Factor Source
VOC	1.2035	0.0602	Site Specific E.F. (includes flash)
Benzene	0.0114	0.0006	Site Specific E.F. (includes flash)
Toluene	0.0057	0.0003	Site Specific E.F. (includes flash)
Ethylbenzene	0.0004	0.0000	Site Specific E.F. (includes flash)
Xylene	0.0029	0.0001	Site Specific E.F. (includes flash)
n-Hexane	0.1399	0.0070	Site Specific E.F. (includes flash)
224 TMP	0.0096	0.0005	Site Specific E.F. (includes flash)
Pollutant	Control Device Uncontrolled (lb/MMBtu) (Waste Heat Combusted)	Uncontrolled (lb/bbl) (Crude Oil Throughput)	Emission Factor Source
PM10	0.0075	0.0004	AP-42 Table 1.4-2 (PM10/PM2.5)
PM2.5	0.0075	0.0004	AP-42 Table 1.4-2 (PM10/PM2.5)
NOx	0.0980	0.0052	AP-42 Table 1.4-1 (NOx)
CO	0.0824	0.0044	AP-42 Table 1.4-1 (CO)
Pollutant	Pilot Light Emissions Uncontrolled (lb/MMBtu) (Waste Heat Combusted)	Uncontrolled (lb/MMscf) (Pilot Gas Throughput)	Emission Factor Source
PM10	0.0075	0.0000	AP-42 Table 1.4-2 (PM10/PM2.5)
PM2.5	0.0075	0.0000	AP-42 Table 1.4-2 (PM10/PM2.5)
NOx	0.0980	0.0000	AP-42 Table 1.4-1 (NOx)
CO	0.0824	0.0000	AP-42 Table 1.4-1 (CO)

Crude Oil Storage Tank(s) Emissions Inventory

Section 05 - Emissions Inventory

Criteria Pollutants	Potential to Emit Uncontrolled (tons/year)	Actual Emissions Uncontrolled (tons/year)	Actual Emissions Controlled (tons/year)	Requested Permit Limits Uncontrolled (tons/year)	Requested Permit Limits Controlled (tons/year)	Requested Monthly Limits Controlled (lbs/month)
VOC	3.9	3.4	0.2	3.6	0.2	30.7
PM10	0.0	0.0	0.0	0.0	0.0	0.2
PM2.5	0.0	0.0	0.0	0.0	0.0	0.2
NOx	0.0	0.0	0.0	0.0	0.0	2.6
CO	0.0	0.0	0.0	0.0	0.0	2.2

Hazardous Air Pollutants	Potential to Emit Uncontrolled (lbs/year)	Actual Emissions Uncontrolled (lbs/year)	Actual Emissions Controlled (lbs/year)	Requested Permit Limits Uncontrolled (lbs/year)	Requested Permit Limits Controlled (lbs/year)
Benzene	74.2	64.0	3.2	68.5	3.4
Toluene	37.1	31.9	1.6	34.2	1.7
Ethylbenzene	2.3	2.0	0.1	2.1	0.1
Xylene	18.5	16.0	0.8	17.1	0.9
n-Hexane	909.2	784.0	39.2	839.2	42.0
224 TMP	62.6	54.0	2.7	57.8	2.9

Section 06 - Regulatory Summary Analysis

Regulation 3, Parts A,B	Facility attainment-area status has not been established yet
Regulation 7, Section XVII.B, C.1, C.3	Not enough information
Regulation 7, Section XVII.C.2	Not enough information
Regulation 6, Part A, NSPS Subpart Kb	Not enough information
Regulation 6, Part A, NSPS Subpart OOOO	Not enough information
NSPS Subpart OOOOa	Not enough information
Regulation 8, Part E, MACT Subpart HH	Not enough information

(See regulatory applicability worksheet for detailed analysis)

Section 07 - Initial and Periodic Sampling and Testing Requirements

Does the company use the state default emissions factors to estimate emissions? **Yes** CO & Nox
If yes, are the uncontrolled actual or requested emissions estimated to be greater than or equal to 20 tons VOC per year? **No**
If yes, the permit will contain an "Initial Compliance" testing requirement to develop a site specific emissions factor based on guidelines in PS Memo 14-03

Does the company use a site specific emissions factor to estimate emissions? **Yes**

If yes and if there are flash emissions, are the emissions factors based on a pressurized liquid sample of crude oil drawn at the facility being permitted? **Yes**
If no, the permit will contain an "Initial Compliance" testing requirement to develop a site specific emissions factor based on guidelines in PS Memo 14-03.

Does the company request a control device efficiency greater than 95% for a flare or combustion device? **No**
If yes, the permit will contain and initial compliance test condition to demonstrate the destruction efficiency of the combustion device based on inlet and outlet concentration sampling

Section 08 - Technical Analysis Notes

Section 09 - Inventory SCC Coding and Emissions Factors

AIRS Point #	Process #	SCC Code	Pollutant	Uncontrolled Emissions Factor	Control %	Units
0	01		PM10	0.01	0	lb/1,000 gallons crude oil throughput
			PM2.5	0.01	0	lb/1,000 gallons crude oil throughput
			NOx	0.12	0	lb/1,000 gallons crude oil throughput
			VOC	23.7	95	lb/1,000 gallons crude oil throughput
			CO	0.10	0	lb/1,000 gallons crude oil throughput
			Benzene	0.27	95	lb/1,000 gallons crude oil throughput
			Toluene	0.14	95	lb/1,000 gallons crude oil throughput
			Ethylbenzene	0.01	95	lb/1,000 gallons crude oil throughput
			Xylene	0.07	95	lb/1,000 gallons crude oil throughput
			n-Hexane	3.33	95	lb/1,000 gallons crude oil throughput
			224 TMP	0.23	95	lb/1,000 gallons crude oil throughput

City : Denver, CO
Min Ambient Temperature (F) : 37.2
Max Ambient Temperature (F) : 64.5
Total Solar Insolation (F) : 1501.00
Ambient Pressure (psia) : 12.63
Ambient Temperature (F) : 140.0

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* Calculation Results *
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-- Emission Summary ---------- 5604.99 lbs/bbl

	Uncontrolled ton	Controlled ton
Total HAPs	0.4760	0.0238
Total HC	3.3730	0.1687
VOCs, C2+	3.2990	0.1649
VOCs, C3+	3.1080	0.1554
CO2	0.0800	
CH4	0.0750	

1.2035 VOC lbs/bbl

Uncontrolled Recovery Information:
Vapor(mscfd): 0.1202
HC Vapor(mscfd): 0.1159
CO2(mscfd): 0.0000
CH4(mscfd): 0.0100
GOR(SCF/STB): 7.8326

-- Emission Composition ----------

NoComponent	Uncontrolled ton	Controlled ton
1 H2S	0.0000	0.0000
2 O2	0.0000	0.0000
3 CO2	0.0800	0.0800
4 N2	0.0080	0.0080
5 C1	0.0750	0.0037
6 C2	0.1910	0.0095
7 C3	0.5280	0.0264
8 i-C4	0.1180	0.0059
9 n-C4	0.4090	0.0204
10 i-C5	0.1070	0.0054
11 n-C5	0.2340	0.0117
12 C6	0.6810	0.0340
13 Benzene	0.0320	0.0016
14 Toluene	0.0160	0.0008
15 E-Benzene	0.0010	0.0000
16 Xylenes	0.0080	0.0004
17 n-C6	0.3920	0.0196
18 224Trimethylp	0.0270	0.0014
19 Pseudo Comp1	0.3770	0.0189
20 Pseudo Comp2	0.1520	0.0076
21 Pseudo Comp3	0.0180	0.0009
22 Pseudo Comp4	0.0080	0.0004
23 Pseudo Comp5	0.0000	0.0000
24 Total	3.4620	0.1731

0.02654 CO2 lbs/bbl
0.011418 lbs benzene lbs/bbl
0.00570 Toluene lbs/bbl
0.000356 E-Benzene lbs/bbl
0.00285 Xylenes lbs/bbl
0.13957 N-C6 lbs/bbl
0.009634 224 TriMethyl lbs/bbl

-- Stream Data ----------

NoComponent	MW lb/lbmol	LP Oil mole %	Flash Oil mole %	Sales Oil mole %	Flash Gas mole %	W&S Gas mole %	Total Emission mole %
1 H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2 O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3 CO2	44.01	0.0580	0.0354	0.0051	4.6108	0.9083	3.1454
4 N2	28.01	0.0050	0.0010	0.0000	0.8091	0.0002	0.4889
5 C1	16.04	0.1170	0.0515	0.0000	13.3283	0.0001	8.0531
6 C2	30.07	0.2800	0.2184	0.0895	12.7113	8.3178	10.9724
7 C3	44.10	1.0440	0.9550	0.7069	19.0016	23.2881	20.6982

8	i-C4	58.12	0.3380	0.3248	0.2851	3.0006	4.2663	3.5016
9	n-C4	58.12	1.5690	1.5257	1.3942	10.3139	14.9285	12.1403
10	i-C5	72.15	0.7338	0.7266	0.7041	2.1772	3.1780	2.5733
11	n-C5	72.15	2.0220	2.0084	1.9650	4.7608	6.8664	5.5942
12	C6	84.00	13.8594	13.8675	13.8647	12.2209	16.7020	13.9945
13	Benzene	78.11	0.8054	0.8064	0.8076	0.6097	0.8296	0.6967
14	Toluene	92.14	1.0366	1.0404	1.0488	0.2732	0.3439	0.3011
15	E-Benzene	106.17	0.1882	0.1890	0.1910	0.0198	0.0232	0.0211
16	Xylenes	106.17	1.3842	1.3904	1.4046	0.1294	0.1500	0.1375
17	n-C6	86.18	7.8437	7.8486	7.8480	6.8555	9.3601	7.8468
18	224Trimethylp	114.23	1.0306	1.0339	1.0411	0.3602	0.4699	0.4036
19	Pseudo Comp1	96.00	20.8748	20.9473	21.1113	6.2644	7.5827	6.7862
20	Pseudo Comp2	113.17	22.3261	22.4258	22.6551	2.2222	2.4611	2.3167
21	Pseudo Comp3	134.00	7.7923	7.8297	7.9157	0.2326	0.2337	0.2330
22	Pseudo Comp4	152.68	8.9340	8.9778	9.0781	0.0948	0.0876	0.0919
23	Pseudo Comp5	207.17	7.7579	7.7963	7.8842	0.0038	0.0027	0.0033

	LP Oil	Flash Oil	Sales Oil	Flash Gas	W&S Gas	Total Emission
MW (lb/lbmol):	111.98	112.26	112.69	55.80	65.87	59.79
Stream Mole Ratio:	1.0000	0.9951	0.9918	0.0049	0.0032	0.0082
Stream Weight Ratio:	111.98	111.70	111.77	0.28	0.21	0.49
Total Emission (ton):				1.952	1.509	3.462
Heating Value (BTU/scf):				2970.84	3598.63	3219.31
Gas Gravity (Gas/Air):				1.93	2.27	2.06
Bubble Pt. @100F (psia):	11.15	7.94	4.64			
RVP @100F (psia):	41.04	36.71	28.36			
Spec. Gravity @100F:	0.70	0.70	0.70			

INSTALLATION OF COMBUSTOR - CLEARVIEW.

E&P TANK V2011 Calculation Report -- Developed by DBR Technology Center through API. 2021.02.09

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* Project Setup Information *
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Project File : E:\APEN.Emissions Tracking\ef Modeling.Analyticals\Model files\Braukmann Farms C.ept
Flowsheet Selection : Oil Tank with Separator
Calculation Method : AP42
Control Efficiency : 95.00%
Known Separator Stream : Low Pressure Oil
Entering Air Composition : No
Component Group : C10+

Filed Name : Mull Drilling Company
Well Name : Braukmann Farms C
Date : 2014.09.08

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* Data Input *
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Separator Pressure (psia) : 56.00
Separator Temperature (F) : 140.0
C10+ SG : 0.78
C10+ MW(lb/lbmol) : 164.47

-- Low Pressure Oil ----------

No.	Component	Mole%	Wt%
1	H2S	0.0000	0.0000
2	O2	0.0000	0.0000
3	CO2	0.0580	0.0222
4	N2	0.0050	0.0012
5	C1	0.1170	0.0163
6	C2	0.2800	0.0733
7	C3	1.0440	0.4007
8	i-C4	0.3380	0.1710
9	n-C4	1.5690	0.7937
10	i-C5	0.7338	0.4608
11	n-C5	2.0220	1.2698
12	C6	13.8594	10.3937
13	C7	20.8748	18.2057
14	C8	12.4886	12.4169
15	C9	9.8375	10.9841
16	C10+	24.4841	35.0502
17	Benzene	0.8054	0.5476
18	Toluene	1.0366	0.8312
19	E-Benzene	0.1882	0.1739
20	Xylenes	1.3842	1.2792
21	n-C6	7.8437	5.8836
22	224Trimethylp	1.0306	1.0248

-- Sales Oil ----------
Production Rate (bbl/day) : 15.35
Days of Annual Operation : 365
API Gravity : 37.36
Reid Vapor Pressure (psia) : 3.60
Bulk Temperature : 113.0

-- Tank and Shell Data ----------
Diameter (ft) : 12.00
Shell Height (ft) : 20.00
Cone Roof Slope : 0.06
Average Liquid Height (ft) : 10.00
Vent Pressure Range (psia) : 0.25
Solar Absorbance : 0.68

-- Meteorological Data ----------