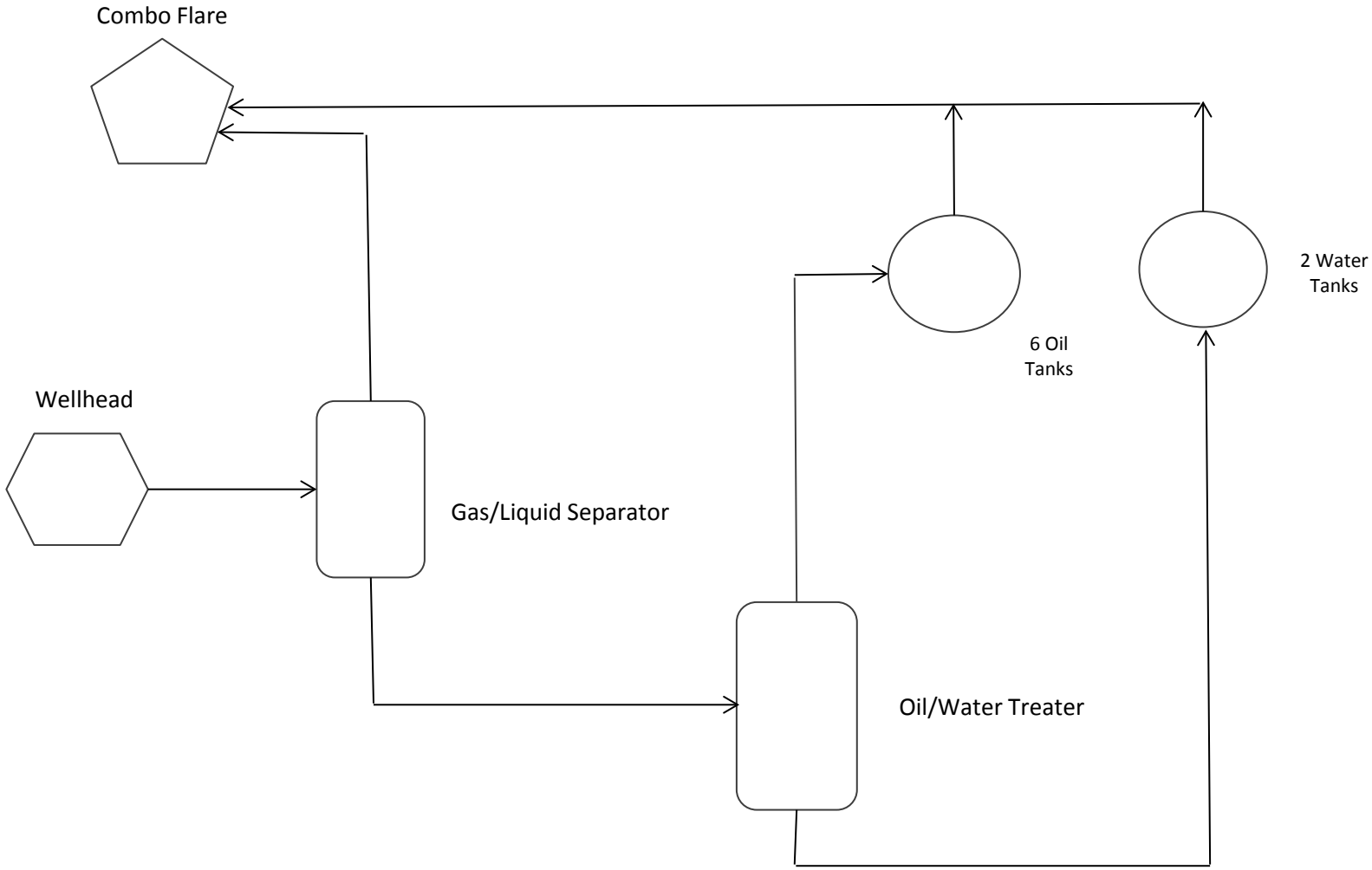
Elmo 21-16-14-1CH
Process Description

Fluids from the well are produced to a two-phase gas/liquid separator. Liquids route to an Oil/Water treater to separate oil and water. The oil is dumped into six, 400 barrel oil tanks. The water is dumped to two, 400 barrel water tanks. Emissions from the tanks are controlled with an elevated flare.

This is a low GOR oil well. Associated gas production is minimal and is used primarily onsite as lease gas to run the treater heater. Any residual gas is controlled with an elevated flare.

Elmo 21-16-14-1CH



Elmo 21-16-14-1CH Oil Tanks Flash & Working/Breathing Emissions

From Trimeric emission package 11/18/2014

Pollutant	Uncontrolled Emissions (tpy)	Controlled Emissions (tpy)
VOCs	12.51	0.2502
Total HAPs	0.41	0.0082

Elmo 21-16-14-1CH
Flash (WinSim Design II) plus EPA Tanks for Working/Breathing Losses

	VOC
VOC EF, lb/bbl	0.27

$EF\ (lb/bbl) = (Emissions(lb/hr)\ \times 24hr/day)/ Production(bbl/day)$

Emissions, tpy	12.51
Emissions, lb/hr	2.86
Projected Production, bbl/day	252.13
Projected Production, bbl/yr	92,027

Emissions (lb/hr) = Flashing Losses (lb/hr) + Working and Breathing Losses for Each Tank (lb/hr)

Elmo 21-16-14-1CH
WinSim Design II Flashing Losses

	VOC
VOC EF, lb/bbl	0.00

Emissions, tpy	0.00
Emissions, lb/hr	0.00
Projected Production, bbl/day	252.13
Projected Production, bbl/yr	92,027

Emissions (tpy) = VOC Flashing Losses Total from Bottom of p. 8

Elmo 21-16-14-1CH
EPA Tanks Working & Breathing Losses (Tank 1 with one-sixth of total capacity)

	VOC
VOC EF, lb/bbl	0.27

Emissions, tpy	2.09
Emissions, lb/hr	0.48
Projected Production, bbl/day	42.02
Projected Production, bbl/yr	15,338

$Emissions\ (lb/hr) = Total\ Emissions\ (lbs/yr)\ from\ EPA\ Tanks\ output\ on\ p.\ 11\ converted\ to\ lb/hr$

Assume all 6 tanks have identical Working and Breathing Losses
Total Working and Breathing Losses for all 6 Tanks:

Elmo 21-16-14-1CH
EPA Tanks Working & Breathing Losses

	VOC
VOC EF, lb/bbl	0.27

Emissions, tpy	12.51
Emissions, lb/hr	2.86
Projected Production, bbl/day	252.13
Projected Production, bbl/yr	92,027

Number of tanks	-	6	
Size of tanks	bbl	400	
API Gravity	-	33.8	*API Gravity from p. 19*
Specific Gravity	-	0.86	$Specific\ Gravity = 141.5/((API\ Gravity + 131.5))$

Total Projected Production	**92,027**	bbl/year	
	27,593,970	lb/year	*See Note 1*
Projected Production per tank	15,338	bbl/year-tank	
	644,189	gal/year-tank	

Note 1:

$$Projected\ Production\ (lb/yr) = Production(bbl/yr) \times 42 gal/bbl \times (8.34\ lb\ H2O)/gal \times Specific\ Gravity$$

Elmo 21-16-14-1CH
Flash (WinSim Design II) plus EPA Tanks for Working/Breathing Losses

	BTEX
BTEX EF, lb/bbl	0.0012

EF (lb/bbl) = (Emissions(lb/hr) ×24hr/day)/Production(bbl/day)

Emissions, tpy	0.057
Emissions, lb/hr	0.013
Projected Production, bbl/day	252.13
Projected Production, bbl/yr	92,027

Emissions (lb/hr) = Flashing Losses (lb/hr) + Working and Breathing Losses for Each Tank (lb/hr)

Elmo 21-16-14-1CH
WinSim Design II Flashing Losses

	BTEX
BTEX EF, lb/bbl	0.0000

Emissions, tpy	0.000
Emissions, lb/hr	0.000
Projected Production, bbl/day	252.13
Projected Production, bbl/yr	92,027

Emissions (tpy) = BTEX flow (lb/hr) in the flash gas (Stream 2) on p. 7-8 × Projected Actual Annual oil production (lb/yr) on p. 8 ÷ Feed Basis oil production (Stream 3, lb/hr) on p. 8 Converted to tpy

BTEX = Benzene, Toluene, Ethylbenzene, Xylenes

Elmo 21-16-14-1CH
EPA Tanks Working & Breathing Losses

(Tank 1 with one-sixth of total capacity)

	BTEX
BTEX EF, lb/bbl	0.0012

Emissions, tpy	0.010
Emissions, lb/hr	0.002
Projected Production, bbl/day	42.02
Projected Production, bbl/yr	15,338

Emissions (lb/hr)= Total Emissions (lbs/yr) from EPA Tanks output on p. 11 converted to lb/hr

Assume all 6 tanks have identical Working and Breathing Losses
Total Working and Breathing Losses for all 6 Tanks:

Elmo 21-16-14-1CH
EPA Tanks Working & Breathing Losses

	BTEX
BTEX EF, lb/bbl	0.0012

Emissions, tpy	0.057
Emissions, lb/hr	0.013
Projected Production, bbl/day	252.13
Projected Production, bbl/yr	92,027

Elmo 21-16-14-1CH
Flash (WinSim Design II) plus EPA Tanks for Working/Breathing Losses

	HAP
HAP EF, lb/bbl	0.009

EF (lb/bbl) = (Emissions(lb/hr) ×24hr/day)/Production(bbl/day)

Emissions (lb/hr) = Flashing Losses (lb/hr) + Working and Breathing Losses for Each Tank (lb/hr)

Emissions, tpy	0.41
Emissions, lb/hr	0.09
Projected Production, bbl/day	252.13
Projected Production, bbl/yr	92,027

Elmo 21-16-14-1CH
WinSim Design II Flashing Losses

	HAP
HAP EF, lb/bbl	0.000

Emissions, tpy	0.00
Emissions, lb/hr	0.00
Projected Production, bbl/day	252.13
Projected Production, bbl/yr	92,027

Emissions (tpy) = HAP flow (lb/hr) in the flash gas (Stream 2) on p. 7-8 × Projected Actual Annual oil production (lb/yr) on p. 8 ÷ Feed Basis oil production (Stream 3,lb/hr) on p. 8 Converted to tpy

HAP= BTEX, n-Hexane, 2,2,4-Trimethylpentane

Elmo 21-16-14-1CH
EPA Tanks Working & Breathing Losses

(Tank 1 with one-sixth of total capacity)

	HAP
HAP EF, lb/bbl	0.009

Emissions, tpy	0.07
Emissions, lb/hr	0.02
Projected Production, bbl/day	42.02
Projected Production, bbl/yr	15,338

Emissions (lb/hr)= Total Emissions (lbs/yr) from EPA Tanks output on p. 11 converted to lb/hr

Assume all 6 tanks have identical Working and Breathing Losses
Total Working and Breathing Losses for all 6 Tanks:

Elmo 21-16-14-1CH
EPA Tanks Working & Breathing Losses

	HAP
HAP EF, lb/bbl	0.009

Emissions, tpy	0.41
Emissions, lb/hr	0.09
Projected Production, bbl/day	252.13
Projected Production, bbl/yr	92,027

WinSim inputs are shown in bold italics and have a box around them.

STREAM SUMMARY

Stream Number		1	2	3
Stream Name		Feed	0 psig vapor	0 psig liquid
Thermo Method Option		GLOBAL	GLOBAL	GLOBAL
Vapor Fraction		0	1	0
Temperature	F	*73*	*45.6*	*45.6*
Pressure	psia	*16.76*	*11.76*	*11.76*
Enthalpy	Btu/hr	-13573.7868		-14920.1033
Entropy	Btu/hr/R	-14.0958		-16.6860
Vapor Density	lb/ft3			
Liquid 1 Density	lb/ft3	42.3820		42.9030
Liquid 1 Specific Gravity	60F@STP	0.7191		0.7191
Vapor Cp	Btu/lbmol/R			
Vapor Cv	Btu/lbmol/R			
Liquid 1 Cp	Btu/lbmol/R	58.2536		56.4326
Vapor Viscosity	cP			
Liquid 1 Viscosity	cP	0.5099		0.5355
Vapor Thermal Conductivity	Btu/hr/ft/R			
Liquid 1 Thermal Conductivity	Btu/hr/ft/R	0.0654		0.0647
Vapor Flowrate	MMSCF/day@STP			
Liquid 1 Flowrate	bbl/day@STP	9.5308		9.5308
Liquid 2 Flowrate				
Molecular Weight		116.6970		116.6970
Molar Flowrate	lbmol/hr	0.8569		0.8569
Mass Flowrate	lb/hr	*100.0000*		100.0000
Note: All Liquid 1 Phase calculations exclude Free Water				
Molar Flowrate By Component				
49 : CARBON DIOXIDE	lbmol/hr	0.0002		0.0002
46 : NITROGEN	lbmol/hr	0.0000		0.0000
1021 : METHANOL	lbmol/hr	0.0000		0.0000
2 : METHANE	lbmol/hr	0.0013		0.0013
3 : ETHANE	lbmol/hr	0.0020		0.0020
4 : PROPANE	lbmol/hr	0.0094		0.0094
5 : I-BUTANE	lbmol/hr	0.0026		0.0026
6 : N-BUTANE	lbmol/hr	0.0147		0.0147
7 : I-PENTANE	lbmol/hr	0.0075		0.0075
8 : N-PENTANE	lbmol/hr	0.0111		0.0111
36 : CYCLOPENTANE	lbmol/hr	0.0103		0.0103
10 : N-HEXANE	lbmol/hr	0.0425		0.0425
38 : CYCLOHEXANE	lbmol/hr	0.0187		0.0187
1159 : ISOHEXANE	lbmol/hr	0.0846		0.0846
11 : N-HEPTANE	lbmol/hr	0.1127		0.1127
39 : METHYLCYCLOHEXAN	lbmol/hr	0.0360		0.0360
82 : 2,2,4-TRIMETHYLP	lbmol/hr	0.0098		0.0098
40 : BENZENE	lbmol/hr	0.0068		0.0068
41 : TOLUENE	lbmol/hr	0.0169		0.0169
45 : ETHYL BENZENE	lbmol/hr	0.0014		0.0014
42 : O-XYLENE	lbmol/hr	0.0059		0.0059
12 : N-OCTANE	lbmol/hr	0.1010		0.1010
13 : N-NONANE	lbmol/hr	0.1098		0.1098
44 : P-XYLENE	lbmol/hr	0.0033		0.0033
43 : M-XYLENE	lbmol/hr	0.0035		0.0035
15 : N-UNDECANE	lbmol/hr	0.2112		0.2112
16 : N-DODECANE	lbmol/hr	0.0337		0.0337
Total	lbmol/hr	0.8569		0.8569

Output for Stream 2 is blank because WinSim predicts no flash gas is formed

Stream Number		1	2	3
Stream Name		Feed	0 psig vapor	0 psig liquid
Molar Composition By Component				
49 : CARBON DIOXIDE	molar %	0.0180		0.0180
46 : NITROGEN	molar %	0.0000		0.0000
1021 : METHANOL	molar %	0.0014		0.0014
2 : METHANE	molar %	0.1521		0.1521
3 : ETHANE	molar %	0.2370		0.2370
4 : PROPANE	molar %	1.1010		1.1010
5 : I-BUTANE	molar %	0.3090		0.3090
6 : N-BUTANE	molar %	1.7150		1.7150
7 : I-PENTANE	molar %	0.8760		0.8760
8 : N-PENTANE	molar %	1.2910		1.2910
36 : CYCLOPENTANE	molar %	1.2017		1.2017
10 : N-HEXANE	molar %	4.9564		4.9564
38 : CYCLOHEXANE	molar %	2.1817		2.1817
1159 : ISOHEXANE	molar %	9.8703		9.8703
11 : N-HEPTANE	molar %	13.1467		13.1467
39 : METHYLCYCLOHEXAN	molar %	4.2063		4.2063
82 : 2,2,4-TRIMETHYLP	molar %	1.1468		1.1468
40 : BENZENE	molar %	0.7897		0.7897
41 : TOLUENE	molar %	1.9733		1.9733
45 : ETHYL BENZENE	molar %	0.1643		0.1643
42 : O-XYLENE	molar %	0.6941		0.6941
12 : N-OCTANE	molar %	11.7874		11.7874
13 : N-NONANE	molar %	12.8190		12.8190
44 : P-XYLENE	molar %	0.3840		0.3840
43 : M-XYLENE	molar %	0.4037		0.4037
15 : N-UNDECANE	molar %	24.6433		24.6433
16 : N-DODECANE	molar %	3.9307		3.9307
Total	molar %	100		100
Mass Flowrate By Component				
49 : CARBON DIOXIDE	lb/hr	0.0068		0.0068
46 : NITROGEN	lb/hr	0.0000		0.0000
1021 : METHANOL	lb/hr	0.0004		0.0004
2 : METHANE	lb/hr	0.0209		0.0209
3 : ETHANE	lb/hr	0.0611		0.0611
4 : PROPANE	lb/hr	0.4160		0.4160
5 : I-BUTANE	lb/hr	0.1539		0.1539
6 : N-BUTANE	lb/hr	0.8541		0.8541
7 : I-PENTANE	lb/hr	0.5416		0.5416
8 : N-PENTANE	lb/hr	0.7981		0.7981
36 : CYCLOPENTANE	lb/hr	0.7222		0.7222
10 : N-HEXANE	lb/hr	3.6599		3.6599
38 : CYCLOHEXANE	lb/hr	1.5733		1.5733
1159 : ISOHEXANE	lb/hr	7.2885		7.2885
11 : N-HEPTANE	lb/hr	11.2880		11.2880
39 : METHYLCYCLOHEXAN	lb/hr	3.5389		3.5389
82 : 2,2,4-TRIMETHYLP	lb/hr	1.1225		1.1225
40 : BENZENE	lb/hr	0.5286		0.5286
41 : TOLUENE	lb/hr	1.5580		1.5580
45 : ETHYL BENZENE	lb/hr	0.1495		0.1495
42 : O-XYLENE	lb/hr	0.6314		0.6314
12 : N-OCTANE	lb/hr	11.5376		11.5376
13 : N-NONANE	lb/hr	14.0882		14.0882

Stream Number		1	2	3
Stream Name		Feed	0 psig vapor	0 psig liquid
44 : P-XYLENE	lb/hr	0.3494		0.3494
43 : M-XYLENE	lb/hr	0.3672		0.3672
15 : N-UNDECANE	lb/hr	33.0068		33.0068
16 : N-DODECANE	lb/hr	5.7372		5.7372
Total	lb/hr	100.0000		100.0000
Mass Composition By Component				
49 : CARBON DIOXIDE	mass %	0.0068		0.0068
46 : NITROGEN	mass %	0.0000		0.0000
1021 : METHANOL	mass %	0.0004		0.0004
2 : METHANE	mass %	0.0209		0.0209
3 : ETHANE	mass %	0.0611		0.0611
4 : PROPANE	mass %	0.4160		0.4160
5 : I-BUTANE	mass %	0.1539		0.1539
6 : N-BUTANE	mass %	0.8541		0.8541
7 : I-PENTANE	mass %	0.5416		0.5416
8 : N-PENTANE	mass %	0.7981		0.7981
36 : CYCLOPENTANE	mass %	0.7222		0.7222
10 : N-HEXANE	mass %	3.6599		3.6599
38 : CYCLOHEXANE	mass %	1.5733		1.5733
1159 : ISOHEXANE	mass %	7.2885		7.2885
11 : N-HEPTANE	mass %	11.2880		11.2880
39 : METHYLCYCLOHEXAN	mass %	3.5389		3.5389
82 : 2,2,4-TRIMETHYLP	mass %	1.1225		1.1225
40 : BENZENE	mass %	0.5286		0.5286
41 : TOLUENE	mass %	1.5580		1.5580
45 : ETHYL BENZENE	mass %	0.1495		0.1495
42 : O-XYLENE	mass %	0.6314		0.6314
12 : N-OCTANE	mass %	11.5376		11.5376
13 : N-NONANE	mass %	14.0882		14.0882
44 : P-XYLENE	mass %	0.3494		0.3494
43 : M-XYLENE	mass %	0.3672		0.3672
15 : N-UNDECANE	mass %	33.0068		33.0068
16 : N-DODECANE	mass %	5.7372		5.7372
Total	mass %	100		100
VOC Emissions in Flash Gas				
100 lb/h Feed Basis (Simulation)				
Oil Projected Production	lb/hr		100.0000	*(Stream 3 Total Flow)*
Total VOC	lb/hr		0.0000	*(Stream 2 VOC)*
(Total VOC is the sum of the flash gas (Stream 2) component flowrates of propane and heavier, includes Methanol)				
Scaled to Actual Annual Oil Projected Production				
Annual oil projected production		bbl/year	92,027	*(from p. 3)*
		lb/yr	27,593,970	*(from p. 3)*
			lb/yr	tpy
Total VOC			0	0.00

$$Total\ VOC = (WinSim\ Feed\ Basis\ Total\ VOC \times Scaled\ Annual\ Oil\ Production(lb/yr)) / (Sim\ Feed\ Basis\ Oil\ Production)$$

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

Identification		
User Identification:	Elmo 21-16-14-1CH	
City:	Cheyenne	
State:	Wyoming	
Company:	Cirque Resources	
Type of Tank:	Vertical Fixed Roof Tank	
Description:		
Tank Dimensions		
Shell Height (ft):		20.00
Diameter (ft):		12.00
Liquid Height (ft) :		19.00
Avg. Liquid Height (ft):		9.50
Volume (gallons):		16,074.56
Turnovers:		40.08
Net Throughput(gal/yr):		644,189.00
Is Tank Heated (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	Gray/Light	
Shell Condition	Good	
Roof Color/Shade:	Gray/Light	
Roof Condition:	Good	
Roof Characteristics		
Type:	Dome	
Height (ft)		0.00
Radius (ft) (Dome Roof)		0.00
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

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

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

Elmo 21-16-14-1CH - Vertical Fixed Roof Tank
Cheyenne, Wyoming

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 7)	All	52.84	43.08	62.60	47.84	3.0054	2.4401	3.6730	68.0000			92.00	Option 4: RVP=7, ASTM Slope=3
2,2,4-Trimethylpentane (isooctane)						0.4829	0.3585	0.6417	114.2300	0.0097	0.0021	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						0.9542	0.7163	1.2545	78.1100	0.0053	0.0023	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.0842	0.0587	0.1187	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						1.5831	1.2100	2.0463	86.1700	0.0368	0.0262	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Toluene						0.2631	0.1907	0.3578	92.1300	0.0157	0.0019	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						3.1901	3.1647	3.1649	67.4892	0.9175	0.9671	91.95	
Xylene (-m)						0.0699	0.0486	0.0990	106.1700	0.0037	0.0001	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Xylene (-o)						0.0547	0.0377	0.0780	106.1700	0.0063	0.0002	106.17	Option 2: A=6.998, B=1474.679, C=213.69
Xylene (-p)						0.0756	0.0528	0.1064	106.1700	0.0035	0.0001	106.17	Option 2: A=7.02063, B=1474.403, C=217.773

Gasoline RVP is next highest RVP choice in EPA Tanks relative to RVP of oil sample on p. 19

Liquid Mass Fraction of BTEX and HAP components are input in EPA Tanks based on mass composition of simulated oil stream (Stream 3) on p. 8. If WinSim predicts no flash gas (Stream 2), use the wt% concentrations provided on p. 13.

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

Emissions Report for: Annual

Elmo 21-16-14-1CH - Vertical Fixed Roof Tank
Cheyenne, Wyoming

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 7)	2,868.96	1,301.99	4,170.95
Hexane (-n)	75.16	34.11	109.27
2,2,4-Trimethylpentane (isooctane)	6.05	2.74	8.79
Benzene	6.54	2.97	9.51
Toluene	5.32	2.41	7.73
Ethylbenzene	0.16	0.07	0.24
Xylene (-m)	0.33	0.15	0.48
Xylene (-o)	0.45	0.20	0.65
Xylene (-p)	0.34	0.16	0.50
Unidentified Components	2,774.60	1,259.17	4,033.77

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

MAIN PAGE

PROJECT NO. :	201409086	ANALYSIS NO. :	01
COMPANY NAME :	CIRQUE RESOURCES	ANALYSIS DATE:	SEPTEMBER 16, 2014
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 15, 2014
PRODUCER :		CYLINDER NO. :	5041
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	OIL TREATER 16:20 ELMO 21-16-14-1CH		EMPACT
FIELD DATA		SAMPLE TEMP. :	73
SAMPLE PRES. :	<5#	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE; WELL SHUT-IN FOR SCHEDULED MAINTENANCE		

COMPONENT	MOLE %	MASS %	VOL %
ALCOHOLS	0.0014	0.0009	0.0009
NITROGEN (AIR)	0.0000	0.0000	0.0000
CARBON DIOXIDE	0.0180	0.0068	0.0062
METHANE	0.1520	0.0210	0.0524
ETHANE	0.2370	0.0614	0.1290
PROPANE	1.1010	0.4180	0.6170
I-BUTANE	0.3090	0.1546	0.2055
N-BUTANE	1.7150	0.8581	1.0995
I-PENTANE	0.8761	0.5441	0.6519
N-PENTANE	1.2910	0.8019	0.9508
HEXANES PLUS	94.2995	97.1332	96.2868
TOTALS	100.0000	100.0000	100.0000

BTEX COMPONENTS	**MOLE%**	**MASS%**
BENZENE	0.7897	0.5310
TOLUENE	1.9733	1.5653
ETHYLBENZENE	0.1643	0.1502
XYLENE	1.4818	1.3544
TOTAL BTEX	4.4091	3.6009

(CALC: GPA STD 2145-94 & TP-17 @14.696 & 60 F)

	TOTAL SAMPLE	**C6+ FRACTION**	
Specific Gravity (H2O=1) =	0.7491	0.7555	60/60
API Gravity =	57.39	55.79	60/60
Molecular Weight =	116.16	120.283	
Absolute Density =	6.25	6.29	LBS/GAL
Heating Value Liq. Idl Gas=	127307	128148	BTU/GAL
Vapor/Liquid =	20.54	20.00	CUFT/GAL
Vapor Pressure =	14.52	1.51	PSIA @100 F

**(DETAILED HYDROCARBON ANALYSIS/NJ 1993) ; ASTM D6730*

NOTE: Sample Temp., Sample Press. and Component Mole % from this page are used as inputs in the WinSim flash model. Speciated xylenes are found on page 16. Average Molecular Weight of Decanes plus on this page is used to speciate decanes plus hydrocarbons.

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

E & P TANK / GLYCALC INFORMATION

PROJECT NO. :	201409086	ANALYSIS NO. :	01
COMPANY NAME :	CIRQUE RESOURCES	ANALYSIS DATE:	SEPTEMBER 16, 2014
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 15, 2014
PRODUCER :		CYLINDER NO. :	5041
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	OIL TREATER 16:20 ELMO 21-16-14-1CH		EMPACT
FIELD DATA		SAMPLE TEMP. :	73
SAMPLE PRES. :	<5#	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE; WELL SHUT-IN FOR SCHEDULED MAINTENANCE		

COMPONENT	Mole %		Wt %		LV %	
CARBON DIOXIDE	0.0180		0.0068		0.0062	
NITROGEN (AIR)	0.0000		0.0000		0.0000	
METHANE	0.1520		0.0210		0.0524	
ETHANE	0.2370		0.0614		0.1290	
PROPANE	1.1010		0.4180		0.6170	
I-BUTANE	0.3090		0.1546		0.2055	
N-BUTANE	1.7150		0.8581		1.0995	
I-PENTANE	0.8761		0.5441		0.6519	
N-PENTANE	1.2910		0.8019		0.9508	
CYCLOPENTANE (N-C5)	1.2017		0.7255		0.7142	
N-HEXANE	4.9564		3.6761		4.1451	
CYCLOHEXANE (OTHER C6)	2.1817		1.5807		1.5098	
OTHER HEXANES	9.8703		7.2417		7.7160	
OTHER HEPTANES	13.1467		11.2390		11.7211	
METHYLCYCLOHEXANE (OTHER C7)	4.2063		3.5556		3.4345	
2,2,4 TRIMETHYLPENTANE	1.1468		0.9694		0.9628	
BENZENE	0.7897		0.5310		0.4501	
TOLUENE	1.9733		1.5653		1.3398	
ETHYLBENZENE	0.1643		0.1502		0.1285	
XYLENES	1.4818		1.3544		1.1572	
OTHER OCTANES	11.7874		11.6425		11.7863	
OCTANES PLUS	----	55.9734	----	67.0183	----	65.2562
NONANES	12.8191		13.9788		13.7902	
DECANES PLUS	28.5740		38.9230		37.4312	
SUB TOTAL	99.9986		99.9991		99.9991	
ALCOHOLS	0.0014		0.0009		0.0009	
TOTAL	100.0000		100.0000		100.0000	

API Gravity	=	**57.39**	60/60
Vapor Pressure	=	**14.52**	PSIA & 100 F
Average Molecular Weight of Decanes plus	=	**158.23**	
Average Specific Gravity of Decanes plus	=	**0.7790**	

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

BY CARBON NUMBER

PROJECT NO. :	201409086	ANALYSIS NO. :	01
COMPANY NAME :	CIRQUE RESOURCES	ANALYSIS DATE:	SEPTEMBER 16, 2014
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 15, 2014
PRODUCER :		CYLINDER NO. :	5041
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	OIL TREATER 16:20		EMPACT
	ELMO 21-16-14-1CH		
FIELD DATA		SAMPLE TEMP. :	73
SAMPLE PRES. :	<5#	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE; WELL SHUT-IN FOR SCHEDULED MAINTENANCE		

COMPONENT / CARBON NUMBER		MOLE%	MASS %	VOLUME %
ALCOHOLS		0.0014	0.0009	0.0009
NITROGEN		0.0000	0.0000	0.0000
CARBON DIOXIDE		0.0180	0.0068	0.0062
	C1	0.1520	0.0210	0.0524
	C2	0.2370	0.0614	0.1290
	C3	1.1010	0.4180	0.6170
	C4	2.0240	1.0127	1.3050
	C5	3.3688	2.0715	2.3169
	C6	17.7981	13.0295	13.8210
	C7	19.3263	16.3599	16.4954
	C8	14.5803	14.1165	14.0348
	C9	12.8191	13.9788	13.7902
	C10	10.9452	12.8767	12.4156
	C11	6.4739	8.2627	7.7680
	C12	3.5679	4.9067	4.7254
	C13	2.8467	4.3782	4.2511
	C14	2.3676	4.0436	3.9641
	C15	1.7109	3.1287	3.0319
	C16	0.4874	0.9502	0.9149
	C17	0.0687	0.1423	0.1366
	C18	0.0869	0.1904	0.1822
	C19	0.0188	0.0435	0.0414
	C20	0.0000	0.0000	0.0000
	C21	0.0000	0.0000	0.0000
	C22	0.0000	0.0000	0.0000
	C23	0.0000	0.0000	0.0000
	C24	0.0000	0.0000	0.0000
	C25	0.0000	0.0000	0.0000
	C26	0.0000	0.0000	0.0000
	C27	0.0000	0.0000	0.0000
	C28	0.0000	0.0000	0.0000
	C29	0.0000	0.0000	0.0000
	C30+	0.0000	0.0000	0.0000
	Total	100.0000	100.0000	100.0000

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201409086	ANALYSIS NO. :	01
COMPANY NAME :	CIRQUE RESOURCES	ANALYSIS DATE:	SEPTEMBER 16, 2014
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 15, 2014
PRODUCER :		CYLINDER NO. :	5041
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	OIL TREATER 16:20		EMPACT
	ELMO 21-16-14-1CH		
FIELD DATA		SAMPLE TEMP. :	73
SAMPLE PRES. :	<5#	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT	PIANO #	MOLE %	MASS %	VOL %
Nitrogen	NHC	0.0000	0.0000	0.0000
Carbon Dioxide	NHC	0.0180	0.0068	0.0062
Methane	P1	0.1520	0.0210	0.0524
Ethane	P2	0.2370	0.0614	0.1290
Propane	P3	1.1010	0.4180	0.6170
i-Butane	I4	0.3090	0.1546	0.2055
n-Butane	P4	1.7150	0.8581	1.0995
2,2-Dimethylpropane	I5	0.0041	0.0025	0.0031
i-Pentane	I5	0.8720	0.5416	0.6488
n-Pentane	P5	1.2910	0.8019	0.9508
t-Butanol	X4	0.0014	0.0009	0.0009
2,2-Dimethylbutane	I6	0.0314	0.0233	0.0267
Cyclopentane	N5	1.2017	0.7255	0.7142
2,3-Dimethylbutane	I6	0.3354	0.2488	0.2791
2-Methylpentane	I6	2.8295	2.0992	2.3882
3-Methylpentane	I6	2.0094	1.4908	1.6677
n-Hexane	P6	4.9564	3.6761	4.1451
2,2-Dimethylpentane	I7	0.0169	0.0146	0.0160
Methylcyclopentane	N6	4.6646	3.3796	3.3543
2,4-Dimethylpentane	I7	0.2246	0.1937	0.2143
2,2,3-Trimethylbutane	I7	0.0540	0.0466	0.0502
Benzene	A6	0.7897	0.5310	0.4501
3,3-Dimethylpentane	I7	0.0090	0.0078	0.0084
Cyclohexane	N6	2.1817	1.5807	1.5098
2-Methylhexane	I7	0.9210	0.7945	0.8713
2,3-Dimethylpentane	I7	0.5868	0.5062	0.5393
1,1-Dimethylcyclopentane	N7	0.4914	0.4154	0.4094
3-Methylhexane	I7	1.5832	1.3657	1.4752
1c,3-Dimethylcyclopentane	N7	1.2665	1.0706	1.0689
1t,3-Dimethylcyclopentane	N7	1.1468	0.9694	0.9628
3-Ethylpentane	I7	0.1589	0.1371	0.1457
1t,2-Dimethylcyclopentane	N7	2.2887	1.9346	1.9146
2,2,4-Trimethylpentane	I8	0.1163	0.1144	0.1224
n-Heptane	P7	3.5234	3.0393	3.3046
1c,2-Dimethylcyclopentane	N7	0.2184	0.1846	0.1778
Methylcyclohexane	N7	4.2063	3.5556	3.4345
2,2-Dimethylhexane	I8	0.8742	0.8597	0.9189
Ethylcyclopentane	N7	0.4571	0.3864	0.3750
2,5-Dimethylhexane	I8	0.0917	0.0902	0.0967
2,2,3-Trimethylpentane	I8	0.0395	0.0388	0.0403
2,4-Dimethylhexane	I8	0.1593	0.1567	0.1671
1c,2t,4-Trimethylcyclopentane	N8	0.5159	0.4984	0.4856

3,3-Dimethylhexane	I8	0.0575	0.0565	0.0592
2,3,4-Trimethylpentane	I8	0.1305	0.1283	0.1326
2,3,3-Trimethylpentane	I8	0.0038	0.0037	0.0038
Toluene	A7	1.9733	1.5653	1.3398
2,3-Dimethylhexane	I8	0.2854	0.2807	0.2933
2-Methyl-3-ethylpentane	I8	0.1169	0.1150	0.1189
1,1,2-Trimethylcyclopentane	N8	0.0436	0.0421	0.0405
2-Methylheptane	I8	1.2436	1.2229	1.3007
4-Methylheptane	I8	0.2668	0.2624	0.2723
3-Methyl-3-ethylpentane	I8	0.1684	0.1656	0.1694
3,4-Dimethylhexane	I8	0.1013	0.0996	0.1029
1c,2c,4-Trimethylcyclopentane	N8	0.0513	0.0496	0.0478
1c,3-Dimethylcyclohexane	N8	0.0397	0.0384	0.0373
3-Methylheptane	I8	0.4103	0.4035	0.4255
1c,2t,3-Trimethylcyclopentane	N8	1.2099	1.1688	1.1286
3-Ethylhexane	I8	0.2348	0.2309	0.2409
1t,4-Dimethylcyclohexane	N8	0.6219	0.6008	0.5861
1,1-Dimethylcyclohexane	N8	0.1419	0.1371	0.1306
3c-Ethylmethylcyclopentane	N8	0.0073	0.0071	0.0069
3t-Ethylmethylcyclopentane	N8	0.2083	0.2012	0.1952
2t-Ethylmethylcyclopentane	N8	0.1719	0.1661	0.1607
1,1-Methylethylcyclopentane	N8	0.5808	0.5611	0.5346
2,2,4-Trimethylhexane	I9	0.0747	0.0825	0.0858
1t,2-Dimethylcyclohexane	N8	0.7712	0.7450	0.7145
1t,3-Dimethylcyclohexane	N8	0.0026	0.0025	0.0024
UnknownC7s	U7	0.2000	0.1725	0.1876
n-Octane	P8	1.9840	1.9510	2.0652
1c,4-Dimethylcyclohexane	N8	0.7791	0.7526	0.7153
i-Propylcyclopentane	I8	0.0768	0.0742	0.0711
2,4,4-Trimethylhexane	I9	0.0286	0.0316	0.0326
2,2,3,4-Tetramethylpentane	I9	0.0207	0.0229	0.0237
2,3,4-Trimethylhexane	I9	0.0262	0.0289	0.0298
1c,2-Dimethylcyclohexane	N8	0.1482	0.1432	0.1338
2,3,5-Trimethylhexane	I9	0.1481	0.1635	0.1685
2,2-Dimethylheptane	I9	0.0189	0.0209	0.0219
1,1,4-Trimethylcyclohexane	N9	0.9758	1.0605	1.0223
2,2,3-Trimethylhexane	I9	0.3819	0.4217	0.4302
2,4-Dimethylheptane	I9	0.0288	0.0318	0.0331
4,4-Dimethylheptane	I9	0.0694	0.0766	0.0797
Ethylcyclohexane	N8	0.6141	0.5932	0.5604
n-Propylcyclopentane	N8	0.2174	0.2100	0.2012
1c,3c,5-Trimethylcyclohexane	N9	0.0450	0.0489	0.0471
2,5-Dimethylheptane	I9	0.0892	0.0985	0.1022
3,3-Dimethylheptane	I9	0.1139	0.1258	0.1306
3,5-Dimethylheptane	I9	0.0647	0.0714	0.0741
2,6-Dimethylheptane	I9	0.0688	0.0760	0.0797
1,1,3-Trimethylcyclohexane	N9	0.2024	0.2200	0.2121
Ethylbenzene	A8	0.1643	0.1502	0.1285
1c,2t,4t-Trimethylcyclohexane	N9	0.6413	0.6970	0.6591
2,3-Dimethylheptane	I9	0.9567	1.0563	1.0825
1,3-Dimethylbenzene (m-Xylene)	A8	0.4036	0.3689	0.3175
1,4-Dimethylbenzene (p-Xylene)	A8	0.3841	0.3511	0.3032
3,4-Dimethylheptane	I9	0.0935	0.1032	0.1050
3,4-Dimethylheptane (2)	I9	0.1890	0.2087	0.2123
4-Ethylheptane	I9	0.0429	0.0474	0.0493
4-Methyloctane	I9	0.2457	0.2713	0.2801
2-Methyloctane	I9	0.2769	0.3057	0.3187
1c,2t,4c-Trimethylcyclohexane	I9	0.0972	0.1073	0.1100
3-Ethylheptane	I9	0.0603	0.0666	0.0682
3-Methyloctane	I9	0.4197	0.4634	0.4783
3,3-Diethylpentane	I9	0.0894	0.0987	0.0973
1c,2t,3-Trimethylcyclohexane	N9	0.0914	0.0993	0.0939
1,1,2-Trimethylcyclohexane	N9	0.0653	0.0710	0.0671
1,2-Dimethylbenzene (o-Xylene)	A8	0.6941	0.6344	0.5365
i-Butylcyclopentane	N9	0.3075	0.3342	0.3185
UnknownC8s	U8	0.4480	0.4406	0.4664
n-Nonane	P9	1.5676	1.7309	1.7944
1,1-Methylethylcyclohexane	N9	0.6198	0.6844	0.7117
i-Propylbenzene	A9	0.4392	0.4544	0.3916
i-Propylcyclohexane	N9	0.1365	0.1483	0.1376
2,2-Dimethyloctane	I10	0.0630	0.0772	0.0777
2,4-Dimethyloctane	I10	0.0870	0.1066	0.1073
2,6-Dimethyloctane	I10	0.0167	0.0205	0.0213
2,5-Dimethyloctane	I10	0.0641	0.0785	0.0790

n-Butylcyclopentane	N9	0.2201	0.2658	0.2476
3,3-Dimethyloctane	I10	0.0984	0.1205	0.1213
n-Propylbenzene	A9	0.4440	0.4594	0.3959
3,6-Dimethyloctane	I10	0.2301	0.2819	0.2837
3-Methyl-5-ethylheptane	I10	0.4219	0.4658	0.4776
1,3-Methylethylbenzene	A9	0.2948	0.3050	0.2607
1,4-Methylethylbenzene	A9	0.2902	0.3003	0.2567
1,3,5-Trimethylbenzene	A9	0.1126	0.1165	0.1003
2,3-Dimethyloctane	I10	0.0548	0.0671	0.0675
5-Methylnonane	I10	0.1781	0.2181	0.2215
1,2-Methylethylbenzene	A9	0.3215	0.3327	0.2828
2-Methylnonane	I10	0.2108	0.2582	0.2645
3-Ethyloctane	I10	0.0615	0.0753	0.0758
3-Methylnonane	I10	0.2293	0.2809	0.2850
1,2,4-Trimethylbenzene	A9	0.0501	0.0518	0.0440
t-Butylbenzene	A10	0.6210	0.7176	0.6168
i-Butylcyclohexane	N10	0.2400	0.2898	0.2657
1t-Methyl-2-n-propylcyclohexane	I10	0.0540	0.0596	0.0611
i-Butylbenzene	A10	0.0468	0.0541	0.0472
sec-Butylbenzene	A10	0.0418	0.0483	0.0417
UnknownC9s	U9	2.1014	2.3203	2.4055
n-Decane	P10	1.2676	1.5526	1.5825
1,2,3-Trimethylbenzene	A9	0.2874	0.2974	0.2477
1,3-Methyl-i-propylbenzene	A10	0.1000	0.1035	0.0880
1,4-Methyl-i-propylbenzene	A10	0.1474	0.1525	0.1297
Sec-Butylcyclohexane	N10	0.4062	0.4905	0.4492
1,2-Methyl-i-propylbenzene	A10	0.1979	0.2287	0.1943
3-Ethylnonane	I10	0.0517	0.0633	0.0648
1,3-Diethylbenzene	A10	0.1739	0.2009	0.1731
1,3-Methyl-n-propylbenzene	A10	0.0470	0.0543	0.0470
1,4-Diethylbenzene	A10	0.1753	0.2026	0.1750
1,4-Methyl-n-propylbenzene	A10	0.0465	0.0537	0.0466
n-Butylbenzene	A10	0.0581	0.0671	0.0580
1,3-Dimethyl-5-ethylbenzene	A10	0.1781	0.2058	0.1772
1,2-Diethylbenzene	A10	0.0561	0.0648	0.0549
1,2-Methyl-n-propylbenzene	A10	0.1238	0.1430	0.1219
1,4-Dimethyl-2-ethylbenzene	A10	0.1164	0.1345	0.1142
1,3-Dimethyl-4-ethylbenzene	A10	0.0638	0.0737	0.0626
1,2-Dimethyl-4-ethylbenzene	A10	0.2015	0.2328	0.1982
1,3-Dimethyl-2-ethylbenzene	A10	0.1707	0.1972	0.1649
1t,2c,4-Trimethylcyclopentane	A10	0.7850	0.7583	0.7548
1,2-Dimethyl-3-ethylbenzene	A10	0.1292	0.1493	0.1246
1,2-Ethyl-i-propylbenzene	A10	0.0815	0.0942	0.0800
1,4-Methyl-t-butylbenzene	A11	0.2228	0.2574	0.2186
UnknownC10s	U10	3.2376	3.9656	4.0420
n-Undecane	P11	1.2462	1.6770	1.6856
1,4-Ethyl-i-propylbenzene	A11	0.0915	0.1057	0.0898
1,2,4,5-Tetramethylbenzene	A11	0.1574	0.1819	0.1529
1,2-Methyl-n-butylbenzene	A11	0.1039	0.1201	0.1020
1,2,3,5-Tetramethylbenzene	A11	0.1997	0.2308	0.1931
1,2-Methyl-t-butylbenzene	A11	0.1226	0.1417	0.1204
5-Methylindan	A11	0.0258	0.0378	0.0376
4-Methylindan	A11	0.0173	0.0254	0.0253
1,2-Ethyl-n-propylbenzene	A11	0.1817	0.2100	0.1784
2-Methylindan	A11	0.1087	0.1594	0.1585
1,3-Methyl-n-butylbenzene	A11	0.1439	0.1663	0.1412
1,3-Di-i-propylbenzene	A11	0.1284	0.1484	0.1260
sec-Pentylbenzene	A11	0.1520	0.1756	0.1491
n-Pentylbenzene	A11	0.0374	0.0477	0.0414
1t-M-2-(4MP)cyclopentane	P12	0.1056	0.1549	0.1540
1,2-Di-n-propylbenzene	A11	0.1363	0.1575	0.1338
1,4-Di-i-propylbenzene	A11	0.2322	0.2683	0.2279
Tetrahydronaphthalene	A10	0.1668	0.1927	0.1637
t-Decahydronaphthalene	A10	0.1186	0.1370	0.1164
Naphthalene	A10	0.1252	0.1381	0.1173
1-t-Butyl-3,5-dimethylbenzene	A12	0.0454	0.0525	0.0446
1,4-Ethyl-t-butylbenzene	A11	0.1826	0.2110	0.1792
UnknownC11s	U11	2.3734	3.1938	3.2102
n-Dodecane	P12	1.1096	1.6272	1.6176
1,3-Di-n-propylbenzene	A12	0.1049	0.1212	0.1029
1,3,5-Triethylbenzene	A12	0.0684	0.0708	0.0609
1,2,4-Triethylbenzene	A12	0.4858	0.5027	0.4272
1,4-Methyl-n-pentylbenzene	A12	0.0891	0.1030	0.0875
n-Hexylbenzene	A12	0.1722	0.2406	0.2089

1,2,3,4,5-Pentamethylbenzene	A13	0.3241	0.3745	0.3181
2-Methylnaphthalene	A11	0.3538	0.4331	0.3679
1-Methylnaphthalene	A11	0.2563	0.3138	0.2291
UnknownC12s	U12	1.3869	2.0338	2.0218
n-Tridecane	P13	0.9812	1.5573	1.5298
UnknownC13s	U13	1.5414	2.4464	2.4032
n-Tetradecane	P14	0.8370	1.4295	1.4014
UnknownC14s	U14	1.5306	2.6141	2.5627
n-Pentadecane	P15	0.3444	0.6298	0.6103
UnknownC15s	U15	1.3665	2.4989	2.4216
n-Hexadecane	P16	0.0280	0.0546	0.0526
UnknownC16s	U16	0.4594	0.8956	0.8623
n-Heptadecane	P17	0.0322	0.0667	0.0640
UnknownC17s	U17	0.0365	0.0756	0.0726
n-Octadecane	P18	0.0359	0.0787	0.0753
UnknownC18s	U18	0.0510	0.1117	0.1069
UnknownC19s	U19	0.0188	0.0435	0.0414
TOTAL		100.0000	100.0000	100.0000

CRUDE OIL ASSAY

PROJECT NO. :	201409086	ANALYSIS NO. :	02
COMPANY NAME :	CIRQUE RESOURCES	ANALYSIS DATE:	SEPTEMBER 16, 2014
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 15, 2014
PRODUCER :		CYLINDER NO. :	1L GLASS JAR
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	PRODUCTION TANK 16:25 ELMO 21-16-14-1CH		EMPACT
FIELD DATA		SAMPLE TEMP. :	73
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; WELL SHUT-IN FOR SCHEDULED MAINTENANCE		

SPECIFICATION	TEST METHOD	UNITS	RESULTS
API GRAVITY		API 60/60	33.8
RVP @100 DEG F	D323	PSIG	7.0
TOTAL SULFUR	D2622	WT %	N/A
TOTAL CHLORIDE	D4929	ug/g	N/A
ORGANIC CHLORIDE	D4929	ug/g	N/A
FLASH POINT	D93	° F	N/A
HEATING VALUE	D4809	BTU/ LB	N/A
VISUAL APPEARANCE			BLACK
BS&W	D96		
Crude Oil		VOL %	N/A
Water		VOL %	N/A
Emulsion		VOL %	N/A
Sediment		VOL %	N/A
DISTILLATION:	D86		
INITIAL POINT		DEG F	N/A
50%		DEG F	N/A
90%		DEG F	N/A
END POINT		DEG F	N/A
DISTILLATION: @TEMP	D445		
Average Centipoise 20°C			N/A
Average Centipoise 30°C			N/A
Average Centipoise 80°C			N/A
Kinetic Viscosity 20°C		cSt (mm2/s)	N/A
Kinetic Viscosity 30°C		cSt (mm2/s)	N/A
Kinetic Viscosity 80°C		cSt (mm2/s)	N/A

ND: NOT DETECTED
N/A: NO TEST PREFORMED FOR THIS PARAMETER

EMPACT Analytical Systems Inc. 365 S Main St Brighton, CO 80601 303-637-0150

Elmo 21-16-14-1CH
Associated Gas

Source Description Uncontrolled portion of associated gas

273 mcfd produced Based on 1st 30-days production

TotalBleed rate (cfh)	11,375	MW gas	28.8
Potential operating time	8,760 hr/yr	VOC wt fraction	49%
		HAP wt fraction	1.3%

Potential Emissions

Pollutant	Bleed Rate (cfh)	Hours per year	Estimated Uncontrolled Emissions (lb/hr)	Estimated Uncontrolled Emissions (tpy)	Controlled (tpy)
VOC	11,375	8,760	425.575	1864.02	37.28
HAPs	11,375	8,760	10.923	47.84	0.96

Notes

MW and VOC wt fraction based on 11/12/14 analysis of gas from the well

GAS TESTING AND MEASUREMENT
PETROLEUM LABORATORY
PHYSICAL TEST
GAS SURVEY

GAS PRODUCTION SURVEYS
BACK PRESSURE TESTS
ELECTRONIC VOLUMES
CHART INTEGRATION

THURMOND-McGLOTHLIN, INC.

THE NATURAL GAS MEASUREMENT COMPANY
309 North American Road Unit 13
Cheyenne, WY 82007
307-632-2298 OFFICE

FRACTION ANALYSIS:

COMPONENTS		MOL %	GPM 14.73
CARBON DIOXIDE	CO2	2.6639	
NITROGEN	N2	1.1168	
METHANE	C1	63.7791	
ETHANE	C2	9.7321	2.6104
PROPANE	C3	11.1161	3.0715
iso-BUTANE	IC4	1.3217	0.4338
n-BUTANE	NC4	5.0849	1.6078
iso-PENTANE	IC5	1.2301	0.4512
n-PENTANE	NC5	1.4421	0.5243
HEXANE +	NC6+	2.5132	1.0999
OXYGEN	O2	0.0000	
HYDROGEN SULFIDE:	H2S	0.0000	
	TOTAL	100.0000	

GASOLINE CONTENT @ 60F

ETHANE & HEAVIER	9.7989
PROPANE & HEAVIER	7.1885
BUTANE & HEAVIER	4.1170
PENTANE & HEAVIER	2.0754

GROSS HEATING VALUE
BTU @ 60F IDEAL 14.73

DRY	1554.0864
WET	1528.0965

SPECIFIC GRAVITY Z = 0.9938

REAL 0.9564

*Based on GPA 2145 & 2172

DATE RUN: 11/12/2014

COMPANY: Cirque
LEASE: Elmo
STATION: 134C
PILOT:
PRESSURE: 35.00 PSIG
TEMPERATURE: 103.00 F
CYLINDER: 28
ANALYSIS BY: Dakota Messenger
SECURED BY: Shane Rogers
DATE SAMPLED: 10/30/2014
RUN NUMBER: WY6890N Data1L280
SAMPLE TYPE: S

REMARKS:

H2S: 0.00 PPM
H20: lb/mmcf
RESULTS TO: Cirque

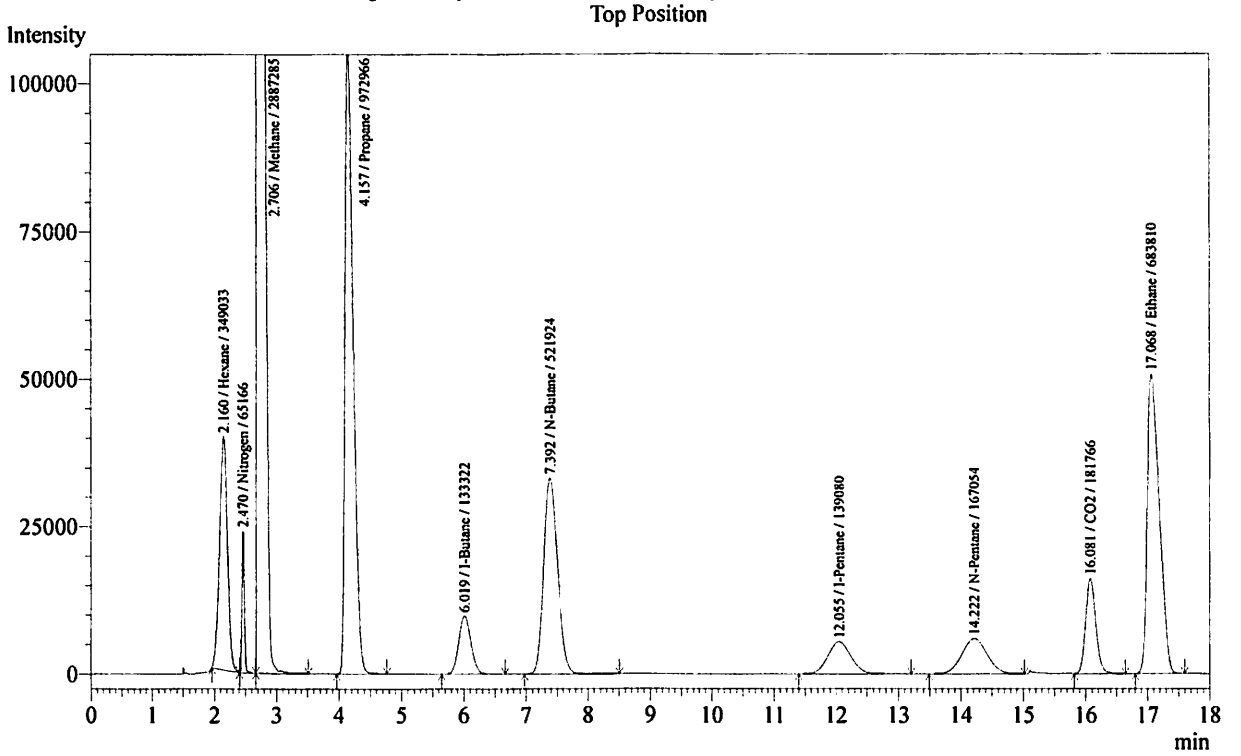
Natural Gas is one of our Most Valuable and Profitable Properties. Careful Conservation and Expert Handling will Pay Abundant Dividends.

Sample Information

Analysis Date & Time	: 11/12/2014 8:32:34 AM
User Name	: Admin
Vial#	: 1
Sample Name	: Cirque
Sample ID	: Elmo
Data Name	: C:\GCsolution\Data\Project1\Data1L280.gcd
Original Data Name	: C:\GCsolution\Data\Project1\Data1L280.gcd
Baseline Data Name	:
Method Name	: C:\GCsolution\Data\Project1\AGILENT GCM 01-30-2014.gcm
Report Name	: C:\GCsolution\Data\Project1\GC-2014AT-Nat-gas-repro.gcr
Barcode	:

$EndIf$

Chromatogram Cirque C:\GCsolution\Data\Project1\Data1L280.gcd - Channel 1
Top Position



Peak Table - Channel 1

Peak#	Ret.Time	Name	Conc.	Units	Area
1	2.160	Hexane	2.5399	%	349033
2	2.470	Nitrogen	1.1287	%	65166
3	2.706	Methane	64.4580	%	2887285
4	4.157	Propane	11.2344	%	972966
5	6.019	I-Butane	1.3358	%	133322
6	7.392	N-Butane	5.1390	%	521924
7	12.055	I-Pentane	1.2432	%	139080
8	14.222	N-Pentane	1.4574	%	167054
9	16.081	CO2	2.6923	%	181766
10	17.068	Ethane	9.8357	%	683810
Total			101.0647		6101406

Elmo 21-16-14-1CH
Flare

Source ID Number	Flare HP		
Equipment ID			
Source Description	High pressure flare for combustion of associated gas		
Equipment Usage			
Equipment Make		Potential operation	8,760 hr/yr
Equipment Model			
Serial Number			
Date in Service			
Equipment Configuration			
Emission Controls			

Fuel Heating Value	1528.1	Btu/scf
Heat Duty	20.890	MMBtu/hr
Gas flow	0.0137	MMscf/hr

Permit Status

Potential Emissions

Pollutant	Emission Factor (lb/MMscf)		Heat Duty (MMBtu/hr)	Hrs of Operation (hrs/yr)	Estimated Emissions (lb/hr)	(tpy)	Source of Emission Factor
NOx	0.14	lb/MMBtu	20.89	8760	2.92	12.81	WDEQ 3/10 Guidance Appendix B
CO	0.035	lb/MMBtu	20.89	8760	0.73	3.20	WDEQ 3/10 Guidance Appendix B
VOC*	5.5	lb/MMscf		8760	0.08	0.33	AP-42, Chapter 1.4
SOx	0.6	lb/MMscf		8760	0.008	0.04	AP-42, Chapter 1.4
PM10	7.6	lb/MMscf		8760	0.10	0.46	AP-42, Chapter 1.4

*VOC value only includes combustion emissions.
The 2% remaining uncontrolled portions of the feed streams are shown under the respective sources.

Estimating burner duty based upon streams to be controlled.
then applying a factor of 1.2

	Well Gas	Pilot*	Total
Btu/scf	1,528	1,528	
mcfd	273.0	0.4	273.4
Btu/d	417,170,345	638,133	417,808,478
MMBtu/h	17.38	0.03	17.41

* assume heat content same as well gas

Elmo 21-16-14-1CH
Flare

Source ID Number	Flare LP				
Equipment ID					
Source Description	Low pressure flare for combustion of tank emissons				
Equipment Usage					
Equipment Make			Potential operation	8,760	hr/yr
Equipment Model					
Serial Number					
Date in Service					
Equipment Configuration					
Emission Controls					

Flash gas heating value	1528.1	Btu/scf
Heat Duty	0.029	MMBtu/hr
Gas flow	0.00002	MMscf/hr

Permit Status

Potential Emissions

Pollutant	Emission Factor		Heat Duty (MMBtu/hr)	Hrs of Operation (hrs/yr)	Estimated Emissions (lb/hr)	(tpy)	Source of Emission Factor
	(lb/MMscf)						
NOx	0.14	lb/MMBtu	0.029	8760	0.004	0.018	WDEQ 3/10 Guidance Appendix B
CO	0.035	lb/MMBtu	0.029	8760	0.001	0.004	WDEQ 3/10 Guidance Appendix B
VOC*	5.5	lb/MMscf		8760	0.0001	0.0005	AP-42, Chapter 1.4
SOx	0.6	lb/MMscf		8760	0.00001	0.00005	AP-42, Chapter 1.4
PM10	7.6	lb/MMscf		8760	0.0001	0.001	AP-42, Chapter 1.4

*VOC value only includes combustion emissions.
The 2% remaining uncontrolled portions of the feed streams are shown under the respective sources.

Estimating burner duty based upon streams to be controlled.
then applying a factor of 1.2

	Tank Gas *	Pilot**	Total
Btu/scf	1,528	0	
mcfd ***	0.4	0.0	0.4
Btu/d	584,719	0	584,719
MMBtu/h	0.02	0.00	0.02

*no flash so assume heat content same as well gas
** Pilot included with flare associated gas
*** mcfd = 379.5 scf/lb-mole * total gas (lb/yr) / MW (lb/lb-mole)/365 days/yr/1000 scf/Mscf

Elmo 21-16-14-1CH
Heater Detail Sheet

Source ID Number	Treater heater					
Equipment ID						
Source Description	Heaters					
Equipment Usage						
Equipment Make		Potential operation	8760	hr/yr		
Equipment Model						
Serial Number						
Date in Service		Potential fuel usage	5.73	MMscf/yr	6.54E-04	MMscf/hr
Equipment Configuration		Each tank				
Emission Controls						

Fuel Heating Value	1528.1	Btu/scf	# of Heaters	1
Heat Rate	1.000	MMBtu/hr		

Permit Status

Potential Emissions

Pollutant	Emission Factor (lb/MMscf)	Hrs of Operation (hrs/yr)	Estimated Emissions Each burner (lb/hr)	(tpy)	All burners (tpy)	Source of Emission Factor
NOx	100	8760	0.07	0.29	0.29	AP-42, Chapter 1.4
CO	84	8760	0.05	0.24	0.24	AP-42, Chapter 1.4
VOC	5.5	8760	0.004	0.02	0.02	AP-42, Chapter 1.4
SOx	0.6	8760	0.0004	0.002	0.00	AP-42, Chapter 1.4
PM10	7.6	8760	0.005	0.02	0.02	AP-42, Chapter 1.4

Truck Loading Emissions

Elmo 21-16-14-1CH

Total Throughput = 3,863,160 gallons

Production: **252** bbl/day

S=	**0.60**		saturation factor
P=	**2.3**	psia	true vapor pressure @50 deg F for unheated tanks
M=	**50**	lb/lb-mol	molecular weight of vapors
T=	**510**	°R	temperature where °R = °F + 460
L_L=	1.69	lb/1000 gallons	Loading Losses

Total Loss= 3.26 tons VOC

controlled NA tons VOC

L_L= 12.46*S*P*M/T lb/1000 gallons

AP-42 Tables

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

Cargo Carrier	Mode Of Operation	S Factor
Tank trucks and rail tank cars	Submerged loading of a clean cargo tank	0.50
	Submerged loading: dedicated normal service	0.60
	Submerged loading: dedicated vapor balance service	1.00
	Splash loading of a clean cargo tank	1.45
	Splash loading: dedicated normal service	1.45
	Splash loading: dedicated vapor balance service	1.00

Table 7.1-2. PROPERTIES (MV, PVA, WL) OF SELECTED PETROLEUM LIQUIDS

Petroleum Liquid	vapor molecular wieght at 60 °F (lb/lb-mole)	condensate vapor density at 60 °F (lb/gal)	liquid density at 60 °F (lb/gal)	true vapor pressure (psi) at various temperatures in °F						
				40	50	60	70	80	90	100
	"M"			"P"						
Gasoline RVP 7	68.0	5.6		2.3	2.9	3.5	4.3	5.2	6.2	7.4
Crude Oil RVP 5	50	4.5	7.1	1.8	2.3	2.8	3.4	4	4.8	5.7

Elmo 21-16-14-1CH Gas Analysis

MW and VOC wt fraction based on 11/12/14 analysis of gas from the well
Heat content: 1528 Btu/scf

COMPONENTS	Measured MOLE%	MW	Measured Avg. MW	Weight %	Wt. % VOC			
HELIUM	0.00	4	0.00	0.00%				
HYDROGEN	0.00	2	0.00	0.00%				
OXYGEN/ARGON	0.00	31.98	0.00	0.00%				
NITROGEN	1.12	28.02	0.31	1.09%				
CO2	2.66	44.01	1.17	4.07%				
METHANE	63.78	16.04	10.23	35.47%				
ETHANE	9.73	30.07	2.93	10.15%				
PROPANE	11.12	44.10	4.90	17.00%	17.00%			
ISOBUTANE	1.32	58.12	0.77	2.66%	2.66%			
N-BUTANE	5.08	58.12	2.96	10.25%	10.25%			
ISOPENTANE	1.23	72.15	0.89	3.08%	3.08%			
N-PENTANE	1.44	72.15	1.04	3.61%	3.61%			
HEXANES+	2.51	145.00	3.64	12.64%	12.64%			
TOTAL	100.00							
	Calculated MW		28.84	VOC	49.2%			
	Measured SG		0.994	HAP	1.3%	HAP wt% assumed to be		
	Calculated SG		0.994			one tenth of C6+ wt%		

(MW of Hexanes+ is changed to make calculated and measured SG agree)

Fugitive Emission Factors **Elmo 21-16-14-1CH**

Total Facilities: 1

THC Leak Emission Factor (lb/day/component):

Component	Gas	Heavy Oil (≤20° API)	Light Oil (>20° API)	H_2O/Cond[2]
Connector	0.011	0.000400	0.0110	0.00580
Flanges	0.021	0.000021	0.0058	0.00015
Open Ended Lines	0.110	0.007400	0.0740	0.01300
Pump Seals	0.130		0.6900	0.00130
Valves	0.240	0.000440	0.1300	0.00520
Other[1]	0.470	0.001700	0.4000	0.74000

[1] Other includes compressor seals, pressure relief valves, dump level arms, polished rod pumps, thief hatches and miscellaneous components.

[2] Applies to streams with a water content between 50% and 99%.

Total Component Counts: *All component counts are estimated*

Component	Gas	Heavy Oil (≤20° API)	Light Oil (>20° API)	H_2O/Cond[2]
Connector	20	0	20	10
Flanges	1	0	1	0
Open Ended Lines	1	0	1	1
Pump Seals	0	0	0	0
Valves	5	0	5	2
Other[1]	1	0	1	1

Average Component Counts:

Component	Gas	Heavy Oil (≤20° API)	Light Oil (>20° API)	H_2O/Cond[2]
Connector	20	0	20	10
Flanges	1	0	1	0
Open Ended Lines	1	0	1	1
Pump Seals	0	0	0	0
Valves	5	0	5	2
Other[1]	1	0	1	1

	Gas	Heavy Oil (≤20° API)	Light Oil (>20° API)	H_2O/Cond[2]
THC Leak Factor (lb/day/site)	2.02	0.00	1.35	0.82
Percent VOCs	49%	0	100%	1%
Percent HAPs	1.3%	0	7%	0
VOC Leak Factor (total lb/day)	0.99	0.00	1.35	0.01
HAP Leak Factor (total lb/day)	0.03	0.00	0.10	0.00

2.35	VOC Fugitives per Day	(lb/day)
0.12	HAP Fugitives per Day	(lb/day)
0.43	VOC Fugitives per Year	(tpy)
0.02	HAP Fugitives per Year	(tpy)

Elmo 21-16-14-1CH
Pneumatic Devices

Source Description: Pneumatic Controllers

	Count*	Bleed Rate (cfd)	Typical Usage
Low Bleed	1	0.048	temperature, pressure, liquid level controllers
High Bleed	0		

TotalBleed rate (cfh)	0.002		MW gas	28.8
Potential operating time	8760	hr/yr	VOC wt fraction	49%
			HAP wt fraction	1.3%

Potential Emissions

Pollutant	Bleed Rate (cfh)	Hours per year	Estimated Emissions (lb/hr)	Estimated Emissions (tpy)	Notes
VOC	0.002	8760	7.48E-05	3.28E-04	
HAPs	0.002	8760	1.92E-06	8.41E-06	

Notes

MW and VOC wt fraction based on 11/12/14 analysis of gas from the well

WinSim inputs are shown in bold italics and have a box around them.

STREAM SUMMARY

Stream Number		1	2	3		
Stream Name		Feed	0 psig vapor	0 psig liquid		
Thermo Method Option		GLOBAL	GLOBAL	GLOBAL		
Vapor Fraction		0	1	0		
Temperature	F	*73*	*45.6*	*45.6*		
Pressure	psia	*16.76*	*11.76*	*11.76*		
Enthalpy	Btu/hr	-13573.7868		-14920.1033		
Entropy	Btu/hr/R	-14.0958		-16.6860		
Vapor Density	lb/ft3					
Liquid 1 Density	lb/ft3	42.3820		42.9030		
Liquid 1 Specific Gravity	60F@STP	0.7191		0.7191		
Vapor Cp	Btu/lbmol/R					
Vapor Cv	Btu/lbmol/R					
Liquid 1 Cp	Btu/lbmol/R	58.2536		56.4326		
Vapor Viscosity	cP					
Liquid 1 Viscosity	cP	0.5099		0.5355		
Vapor Thermal Conductivity	Btu/hr/ft/R					
Liquid 1 Thermal Conductivity	Btu/hr/ft/R	0.0654		0.0647		
Vapor Flowrate	MMSCF/day@STP					
Liquid 1 Flowrate	bbl/day@STP	9.5308		9.5308		
Liquid 2 Flowrate						
Molecular Weight		116.6970		116.6970		
Molar Flowrate	lbmol/hr	0.8569		0.8569		
Mass Flowrate	lb/hr	*100.0000*		100.0000		
Note: All Liquid 1 Phase calculations exclude Free Water						
Mass Composition By Component						
49 : CARBON DIOXIDE	mass %	0.0068		0.0068		
46 : NITROGEN	mass %	0.0000		0.0000		
1021 : METHANOL	mass %	0.0004		0.0004	VOC Wt%	99.9109
2 : METHANE	mass %	0.0209		0.0209	HAP Wt%	7.2443
3 : ETHANE	mass %	0.0611		0.0611		
4 : PROPANE	mass %	0.4160		0.4160		
5 : I-BUTANE	mass %	0.1539		0.1539		
6 : N-BUTANE	mass %	0.8541		0.8541		
7 : I-PENTANE	mass %	0.5416		0.5416		
8 : N-PENTANE	mass %	0.7981		0.7981		
36 : CYCLOPENTANE	mass %	0.7222		0.7222		
10 : N-HEXANE	mass %	3.6599		3.6599		
38 : CYCLOHEXANE	mass %	1.5733		1.5733		
1159 : ISOHEXANE	mass %	7.2885		7.2885		
11 : N-HEPTANE	mass %	11.2880		11.2880		
39 : METHYLCYCLOHEXAN	mass %	3.5389		3.5389		
82 : 2,2,4-TRIMETHYLP	mass %	1.1225		1.1225		
40 : BENZENE	mass %	0.5286		0.5286		
41 : TOLUENE	mass %	1.5580		1.5580		
45 : ETHYL BENZENE	mass %	0.1495		0.1495		
42 : O-XYLENE	mass %	0.6314		0.6314		
12 : N-OCTANE	mass %	11.5376		11.5376		
13 : N-NONANE	mass %	14.0882		14.0882		
44 : P-XYLENE	mass %	0.3494		0.3494		
43 : M-XYLENE	mass %	0.3672		0.3672		
15 : N-UNDECANE	mass %	33.0068		33.0068		
16 : N-DODECANE	mass %	5.7372		5.7372		
Total	mass %	100		100		

Total VOC= (WinSim Feed Basis Total VOC×Scaled Annual Oil Production(lb/yr))
/(Sim Feed Basis Oil Production)

Wind River
Environmental Group LLC

January 28, 2015

NSR Program Manager
Attn: O&G Production Facilities/Heather Bleile
Wyoming Department of Environmental Quality
Air Quality Division
Herschler Building, 2-E
122 West 25th Street
Cheyenne, WY 82002

SUBJECT: Permit Application for Elmo 21-16-14-1CH, IMPACT Forms A0000308

To Whom It May Concern:

On behalf of Cirque Resources LP, we are re-submitting an application for equipment associated with a new well site located in Laramie County, Elmo 21-16-14-1CH using the IMPACT system forms. This application was originally submitted in November 2014.

Thank you for your assistance. Should there be any questions, please contact Bill Lloyd, Cirque Resources LP, at 475 17th Street, Suite 1600, Denver, Colorado 80202, by phone at (303) 226-9500, or by e-mail at blloyd@cirqueresources.com. Alternately, you may contact me by phone at (303) 520-4861 or by e-mail at johnclouse@windriverenvironmental.com or johnclouse@comcast.net.

Regards,

John Clouse
Wind River Environmental Group LLC

Enclosure

Revised 11/3/2014

Department of Environmental Quality Air Quality Division

Permit Application Form

Is this a revision to an existing application?

Yes X No

Previous Application #: A0000308

Date of Application: 1/26/2015

COMPANY INFORMATION:

Company Name: Cirque Resources LP

Address: 475 17th Street, Suite 1600

City: Denver State: Colorado Zip Code: 80202

Country: USA Phone Number: 303-226-9500

FACILITY INFORMATION:

Facility Name: Elmo 21-16-14-1CH

New Facility or Existing Facility: New

Facility Description: Oil well

Facility Class: Synthetic Minor Operating Status: Operating

Facility Type: Production Site

For Oil & Gas Production Sites ONLY:

First Date of Production (FDOP)/Date of Modification: **7/12/2014**

Does production at this facility contain H2S?* No

If yes, contact the Division.

API Number(s): 49-021-21129

NAICS Code: 2111 Oil and Gas Extraction

FACILITY LOCATION:

***Enter the facility location in either the latitude/longitude area or section/township/range area. Both are not required.**

Physical Address:

City: Zip Code:

State: WY County:

OR

Latitude: 41.24711 Longitude: -104.6668 County: Laramie

Quarter Quarter: Quarter:

Section: Township: Range:

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

CONTACT INFORMATION:

***Note that an Environmental AND NSR Permitting Contact is required for your application to be deemed complete by the agency.**

Title: Mr. First Name: William

Last Name: Lloyd

Company Name: Cirque Resources LP

Job Title: Senior VP Operations

Address: 475 17th Street, Suite 1600

City: Denver State: Colorado

Zip Code: 80202

Primary Phone No.: 303-226-9500 E-mail: blloyd@cirqueresources.com

Mobile Phone No.: Fax No.: 303-226-9595

Contact Type: Environmental contact Start Date: Ongoing

Revised 11/3/2014

Additional Contact Type (if needed): NSR Permitting contact

Title: Mr. First Name: John

Last Name: Clouse

Company Name: Wind River Environmental Group LLC

Job Title: Principal

Address: 12081 W. Alameda Parkway #415

City: Lakewood State: Colorado

Zip Code: 80228

Primary Phone No.: 303-520-4861 E-mail: johnclouse@comcast.net

Mobile Phone No.: 303-520-4861 Fax No.: 303-374-2518

Contact Type: NSR Permitting contact Start Date: Ongoing

FACILITY APPLICATION INFORMATION:

General Info:

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

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

Federal Rules Applicability - Facility Level:

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

Modeling Section:

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

Required Attachments:

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

I, William B. Lloyd (Responsible Official (Printed Name)) Senior VP Operations (Title)

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

Signature: (ink) Date: 01.28.15

Specific Emission Unit Attributes:

Fugitives

Company Equipment ID: Fugitives

Company Equipment Description: Fugitive VOC emissions

Operating Status: Operating

Initial Construction Commencement Date: 7/12/2014

Initial Operation Commencement Date: 7/12/2014

Most Recent Construction/ Modification Commencement Date: 7/12/2014

Most Recent Operation Commencement Date: 7/12/2014

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

Reason: Construction (Greenfield/New Facility)

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

Type of Fugitive Emission: Fugitive Leaks at O&G

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

3-10-888-11

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

Hours/day: 24

Hours/year: 8760

Control Equipment: No

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

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

☐ Yes ☑ No

Pollutant: _____

Proposed BACT: _____

*If yes, attach BACT Analysis with this application.

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

☐ Yes ☑ No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

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

NSPS Subpart: _____

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

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

Part 61 NESHAP Subpart: _____

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

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

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): Not Affected

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

Non-Attainment New Source Review: Not Affected

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

Specific Emission Unit Attributes:

Loading/Unloading/Dump

Company Equipment ID: Truck Loading
Company Equipment Description: Truck Loading Crude Oil

Operating Status: Operating
Initial Construction Commencement Date: 7/12/2014
Initial Operation Commencement Date: 7/12/2014
Most Recent Construction/ Modification Commencement Date: 7/12/2014

Most Recent Operation Commencement Date: 7/12/2014

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

Reason: Construction (Greenfield/New Facility)

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

Type of Material: Liquid
Material Description: Crude oil

Maximum Annual Throughput:	92,027	Units:	barrels/yr
Maximum Hourly Throughput:	10.5	Units:	barrels/hr

Detailed Description of Loading/Unloading/Dump Source:
Submerged loading: dedicated normal service, not heated

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

4-06-001-32

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

Hours/day: 24
Hours/year: 8760

Control Equipment: No

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

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

☐ Yes ☑ No

Pollutant: _____

Proposed BACT: _____

*If yes, attach BACT Analysis with this application.

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

☐ Yes ☑ No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

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

NSPS Subpart: _____

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

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

Part 61 NESHAP Subpart: _____

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

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

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): Not Affected

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

Non-Attainment New Source Review: Not Affected

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

Specific Emission Unit Attributes:

Pneumatic Equipment (Pumps and Controllers)

Company Equipment ID: Pneumatics
Company Equipment Description: Pneumatic controller

Operating Status: Operating
Initial Construction Commencement Date: 7/12/2014
Initial Operation Commencement Date: 7/12/2014
Most Recent Construction/ Modification Commencement Date: 7/12/2014

Most Recent Operation Commencement Date: 7/12/2014

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

Reason: Construction (Greenfield/New Facility)

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

Type of Equipment: Controller
Motive Force: Field Gas
VOC Content (%): 49.2
HAP Content (%): 1.3

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

3-01-001-07

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

Hours/day: 24
Hours/year: 8760

Control Equipment: No

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

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

☐ Yes ☑ No

Pollutant: _____

Proposed BACT: _____

*If yes, attach BACT Analysis with this application.

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

☐ Yes ☑ No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

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

NSPS Subpart: _____

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

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

Part 61 NESHAP Subpart: _____

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

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

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): Not Affected

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

Non-Attainment New Source Review: Not Affected

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

Specific Emission Unit Attributes:

Separator/Treater

Company Equipment ID: Associated gas venting

Company Equipment Description: Associated gas venting

Operating Status: Operating

Initial Construction Commencement Date: 7/12/2014

Initial Operation Commencement Date: 7/12/2014

Most Recent Construction/ Modification Commencement Date: 7/12/2014

Most Recent Operation Commencement Date: 7/12/2014

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

Reason: Construction (Greenfield/New Facility)

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

Type of Vessel: 2-Phase Separator

Is Vessel Heated? No

Operating Temperature (F): ambient

Operating Pressure (psig): 75-80

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

3-10-001-29

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

Hours/day: 24

Hours/year: 8760

Control Equipment: Yes

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

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

☐ Yes ☑ No

Pollutant: _____

Proposed BACT: _____

*If yes, attach BACT Analysis with this application.

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

☐ Yes ☑ No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

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

NSPS Subpart: _____

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

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

Part 61 NESHAP Subpart: _____

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

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

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): Not Affected

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

Non-Attainment New Source Review: Not Affected

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

Specific Emission Unit Attributes:

Heater/Chiller

Company Equipment ID: Treater heater
Company Equipment Description: 1.0 MMBtu/hr heater

Operating Status: Operating
Initial Construction Commencement Date: 7/12/2014
Initial Operation Commencement Date: 7/12/2014
Most Recent Construction/ Modification 7/12/2014
Most Recent Operation Commencement 7/12/2014

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

Reason: Construction (Greenfield/New Facility)

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

Firing Type: Direct
Heat Input Rating: 1 Units: MMBtu/hr
Primary Fuel Type: Field Gas
Secondary Fuel Type:
Heat Content of Fuel: 1528 Units: BTU/scf
Fuel Sulfur Content: Negligible Units:

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

3-10-004-04

Potential Operating Schedule: Provide the operating schedule for this emission unit.
Hours/day: 24
Hours/year: 8760

Control Equipment: No
If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?
☐ Yes ☑ No
Pollutant:
Proposed BACT:
*If yes, attach BACT Analysis with this application.

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

☐ Yes ☑ No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

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

NSPS Subpart: _____

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

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

Part 61 NESHAP Subpart: _____

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

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

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): Not Affected

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

Non-Attainment New Source Review: Not Affected

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

Specific Emission Unit Attributes:

Separator/Treater

Company Equipment ID: Treater

Company Equipment Description: Treater - liquid/liquid separation, produced water and oil are routed to tanks. Treater does not emit.

Operating Status: Operating

Initial Construction Commencement Date: 7/12/2014

Initial Operation Commencement Date: 7/12/2014

Most Recent Construction/ Modification Commencement Date: 7/12/2014

Most Recent Operation Commencement Date: 7/12/2014

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

Reason: Construction (Greenfield/New Facility)

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

Type of Vessel: Heater-Treater

Is Vessel Heated? Yes

Operating Temperature (F): unknown

Operating Pressure (psig): 20-30

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

3-10-001-07

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

Hours/day: 24

Hours/year: 8760

Control Equipment: No

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

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

☐ Yes ☑ No

Pollutant: _____

Proposed BACT: _____

*If yes, attach BACT Analysis with this application.

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

☐ Yes ☑ No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

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

NSPS Subpart: _____

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

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

Part 61 NESHAP Subpart: _____

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

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

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): Not Affected

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

Non-Attainment New Source Review: Not Affected

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

Specific Emission Unit Attributes:

Storage Tank/Silo

Company Equipment ID: Oil tank 1
Company Equipment Description: 400 bbl oil tank

Operating Status: Operating
Initial Construction Commencement Date: 4/21/2014
Initial Operation Commencement Date: 7/12/2014
Most Recent Construction/ Modification Commencement Date: 4/21/2014

Most Recent Operation Commencement Date: 7/12/2014

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

Reason: Construction (Greenfield/New Facility)

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

Material Type: Liquid
Description of Material Stored: Crude oil

Capacity: 400 Units: barrels
Maximum Throughput: 252 Units: barrels/day
Maximum Hourly Throughput: 10.50 Units: barrels/hr
Operating Pressure (psig): Atmospheric
Vapor Pressure of Material Stored (psig): 2.3 psia
Is Tank Heated?: No

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

4-04-003-12

Potential Operating Schedule: Provide the operating schedule for this emission unit.
Hours/day: 24
Hours/year: 8760

Control Equipment: Yes

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

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

☐ Yes ☑ No

Pollutant: VOC/HAPs

Proposed BACT: Presumptive BACT

*If yes, attach BACT Analysis with this application.

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

☐ Yes ☑ No

Pollutant:

Proposed LAER:

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

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

NSPS Subpart:

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

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

Part 61 NESHAP Subpart:

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

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

Part 63 NESHAP Subpart:

Prevention of Significant Deterioration (PSD): Not Affected

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

Non-Attainment New Source Review: Not Affected

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

Specific Emission Unit Attributes:

Storage Tank/Silo

Company Equipment ID: Oil tank 2
Company Equipment Description: 400 bbl oil tank

Operating Status: Operating
Initial Construction Commencement Date: 4/1/2014
Initial Operation Commencement Date: 7/12/2014
Most Recent Construction/ Modification Commencement Date: 4/1/2014

Most Recent Operation Commencement Date: 7/12/2014

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

Reason: Construction (Greenfield/New Facility)

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

Material Type: Liquid
Description of Material Stored: Crude oil

Capacity: 400 Units: barrels
Maximum Throughput: 252 Units: barrels/day
Maximum Hourly Throughput: 10.50 Units: barrels/hr
Operating Pressure (psig): Atmospheric
Vapor Pressure of Material Stored (psig): 2.3 psia
Is Tank Heated?: No

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

4-04-003-12

Potential Operating Schedule: Provide the operating schedule for this emission unit.
Hours/day: 24
Hours/year: 8760

Control Equipment: Yes

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

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

☐ Yes ☑ No

Pollutant: VOC/HAPs

Proposed BACT: Presumptive BACT

*If yes, attach BACT Analysis with this application.

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

☐ Yes ☑ No

Pollutant:

Proposed LAER:

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

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

NSPS Subpart:

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

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

Part 61 NESHAP Subpart:

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

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

Part 63 NESHAP Subpart:

Prevention of Significant Deterioration (PSD): Not Affected

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

Non-Attainment New Source Review: Not Affected

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

Specific Emission Unit Attributes:

Storage Tank/Silo

Company Equipment ID: Oil tank 3
Company Equipment Description: 400 bbl oil tank

Operating Status: Operating
Initial Construction Commencement Date: 4/8/2014
Initial Operation Commencement Date: 7/12/2014
Most Recent Construction/ Modification Commencement Date: 4/8/2014

Most Recent Operation Commencement Date: 7/12/2014

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

Reason: Construction (Greenfield/New Facility)

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

Material Type: Liquid
Description of Material Stored: Crude oil

Capacity: 400 Units: barrels
Maximum Throughput: 252 Units: barrels/day
Maximum Hourly Throughput: 10.50 Units: barrels/hr
Operating Pressure (psig): Atmospheric
Vapor Pressure of Material Stored (psig): 2.3 psia
Is Tank Heated?: No

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

4-04-003-12

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

Hours/day: 24
Hours/year: 8760

Control Equipment: Yes

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

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

☐ Yes ☑ No

Pollutant: VOC/HAPs

Proposed BACT: Presumptive BACT

*If yes, attach BACT Analysis with this application.

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

☐ Yes ☑ No

Pollutant:

Proposed LAER:

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

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

NSPS Subpart:

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

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

Part 61 NESHAP Subpart:

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

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

Part 63 NESHAP Subpart:

Prevention of Significant Deterioration (PSD): Not Affected

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

Non-Attainment New Source Review: Not Affected

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

Specific Emission Unit Attributes:

Storage Tank/Silo

Company Equipment ID: Oil tank 4
Company Equipment Description: 400 bbl oil tank

Operating Status: Operating
Initial Construction Commencement Date: 4/8/2014
Initial Operation Commencement Date: 7/12/2014
Most Recent Construction/ Modification Commencement Date: 4/8/2014

Most Recent Operation Commencement Date: 7/12/2014

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

Reason: Construction (Greenfield/New Facility)

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

Material Type: Liquid
Description of Material Stored: Crude oil

Capacity: 400 Units: barrels
Maximum Throughput: 252 Units: barrels/day
Maximum Hourly Throughput: 10.50 Units: barrels/hr
Operating Pressure (psig): Atmospheric
Vapor Pressure of Material Stored (psig): 2.3 psia
Is Tank Heated?: No

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

4-04-003-12

Potential Operating Schedule: Provide the operating schedule for this emission unit.
Hours/day: 24
Hours/year: 8760

Control Equipment: Yes

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

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

☐ Yes ☑ No

Pollutant: VOC/HAPs

Proposed BACT: Presumptive BACT

*If yes, attach BACT Analysis with this application.

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

☐ Yes ☑ No

Pollutant:

Proposed LAER:

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

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

NSPS Subpart:

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

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

Part 61 NESHAP Subpart:

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

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

Part 63 NESHAP Subpart:

Prevention of Significant Deterioration (PSD): Not Affected

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

Non-Attainment New Source Review: Not Affected

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

Specific Emission Unit Attributes:

Storage Tank/Silo

Company Equipment ID: Oil tank 5
Company Equipment Description: 400 bbl oil tank

Operating Status: Operating
Initial Construction Commencement Date: 4/2/2014
Initial Operation Commencement Date: 7/12/2014
Most Recent Construction/ Modification Commencement Date: 4/2/2014

Most Recent Operation Commencement Date: 7/12/2014

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

Reason: Construction (Greenfield/New Facility)

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

Material Type: Liquid
Description of Material Stored: Crude oil

Capacity: 400 Units: barrels
Maximum Throughput: 252 Units: barrels/day
Maximum Hourly Throughput: 10.50 Units: barrels/hr
Operating Pressure (psig): Atmospheric
Vapor Pressure of Material Stored (psig): 2.3 psia
Is Tank Heated?: No

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

4-04-003-12

Potential Operating Schedule: Provide the operating schedule for this emission unit.
Hours/day: 24
Hours/year: 8760

Control Equipment: Yes

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

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

☐ Yes ☑ No

Pollutant: VOC/HAPs

Proposed BACT: Presumptive BACT

*If yes, attach BACT Analysis with this application.

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

☐ Yes ☑ No

Pollutant:

Proposed LAER:

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

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

NSPS Subpart:

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

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

Part 61 NESHAP Subpart:

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

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

Part 63 NESHAP Subpart:

Prevention of Significant Deterioration (PSD): Not Affected

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

Non-Attainment New Source Review: Not Affected

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

Specific Emission Unit Attributes:

Storage Tank/Silo

Company Equipment ID: Oil tank 6
Company Equipment Description: 400 bbl oil tank

Operating Status: Operating
Initial Construction Commencement Date: 4/21/2014
Initial Operation Commencement Date: 7/12/2014
Most Recent Construction/ Modification Commencement Date: 4/21/2014

Most Recent Operation Commencement Date: 7/12/2014

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

Reason: Construction (Greenfield/New Facility)

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

Material Type: Liquid
Description of Material Stored: Crude oil

Capacity: 400 Units: barrels
Maximum Throughput: 252 Units: barrels/day
Maximum Hourly Throughput: 10.50 Units: barrels/hr
Operating Pressure (psig): Atmospheric
Vapor Pressure of Material Stored (psig): 2.3 psia
Is Tank Heated?: No

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

4-04-003-12

Potential Operating Schedule: Provide the operating schedule for this emission unit.
Hours/day: 24
Hours/year: 8760

Control Equipment: Yes

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

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

☐ Yes ☑ No

Pollutant: VOC/HAPs

Proposed BACT: Presumptive BACT

*If yes, attach BACT Analysis with this application.

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

☐ Yes ☑ No

Pollutant:

Proposed LAER:

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

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

NSPS Subpart:

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

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

Part 61 NESHAP Subpart:

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

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

Part 63 NESHAP Subpart:

Prevention of Significant Deterioration (PSD): Not Affected

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

Non-Attainment New Source Review: Not Affected

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

Specific Emission Unit Attributes:

Storage Tank/Silo

Company Equipment ID: Produced water tank 1
Company Equipment Description: 400 bbl produced water tank

Operating Status: Operating
Initial Construction Commencement Date: 3/28/2014
Initial Operation Commencement Date: 7/12/2014
Most Recent Construction/ Modification Commencement Date: 3/28/2014

Most Recent Operation Commencement Date: 7/12/2014

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

Reason: Construction (Greenfield/New Facility)

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

Material Type: Liquid
Description of Material Stored: Produced water

Capacity: 400 Units: barrels
Maximum Throughput: 487 Units: barrels/day
Maximum Hourly Throughput: 20.29 Units: barrels/hr
Operating Pressure (psig): Atmospheric
Vapor Pressure of Material Stored (psig): unknown (water)
Is Tank Heated?: No

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

4-04-003-15

Potential Operating Schedule: Provide the operating schedule for this emission unit.
Hours/day: 24
Hours/year: 8760

Control Equipment: Yes

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

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

☐ Yes ☑ No

Pollutant: VOC/HAPs

Proposed BACT: Presumptive BACT

*If yes, attach BACT Analysis with this application.

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

☐ Yes ☑ No

Pollutant:

Proposed LAER:

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

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

NSPS Subpart:

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

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

Part 61 NESHAP Subpart:

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

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

Part 63 NESHAP Subpart:

Prevention of Significant Deterioration (PSD): Not Affected

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

Non-Attainment New Source Review: Not Affected

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

Specific Emission Unit Attributes:

Storage Tank/Silo

Company Equipment ID: Produced water tank 2
Company Equipment Description: 400 bbl produced water tank

Operating Status: Operating
Initial Construction Commencement Date: 4/1/2014
Initial Operation Commencement Date: 7/12/2014
Most Recent Construction/ Modification Commencement Date: 4/1/2014

Most Recent Operation Commencement Date: 7/12/2014

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

Reason: Construction (Greenfield/New Facility)

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

Material Type: Liquid
Description of Material Stored: Produced water

Capacity: 400 Units: barrels
Maximum Throughput: 487 Units: barrels/day
Maximum Hourly Throughput: 20.29 Units: barrels/hr
Operating Pressure (psig): Atmospheric
Vapor Pressure of Material Stored (psig): unknown (water)
Is Tank Heated?: No

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

4-04-003-15

Potential Operating Schedule: Provide the operating schedule for this emission unit.
Hours/day: 24
Hours/year: 8760

Control Equipment: Yes

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

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

☐ Yes ☑ No

Pollutant: VOC/HAPs

Proposed BACT: Presumptive BACT

*If yes, attach BACT Analysis with this application.

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

☐ Yes ☑ No

Pollutant:

Proposed LAER:

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

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

NSPS Subpart:

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

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

Part 61 NESHAP Subpart:

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

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

Part 63 NESHAP Subpart:

Prevention of Significant Deterioration (PSD): Not Affected

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

Non-Attainment New Source Review: Not Affected

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

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Criteria Pollutants:							
1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)	0			0.1	0.46	AP-42
2.)	PM #10 microns in diameter (PE/PM10)	0			0.1	0.46	AP-42
3.)	PM #2.5 microns in diameter (PE/PM2.5)	0			0.1	0.46	AP-42
4.)	Sulfur dioxide (SO2)	0			0.008	0.04	AP-42
5.)	Nitrogen Oxides (NOx)	0			2.92	12.81	Other
6.)	Carbon monoxide (CO)	0			0.73	3.2	Other
7.)	Volatile organic compounds (VOC)	1864.02			8.6	37.61	Other
8.)	Lead (Pb)	0			0	0	
9.)	Total Hazardous Air Pollutants (HAPs)	47.84			0.22	0.96	Other
10.)	Fluoride (F)	0			0	0	
11.)	Hydrogen Sulfide (H2S)	0			0	0	
12.)	Mercury (Hg)	0			0	0	
13.)	Total Reduced Sulfur (TRS)	0			0	0	
14.)	Sulfuric Acid Mist (SAM)	0			0	0	

Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminents

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)	Total HAPs	47.84			0.22	0.96	Other
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Greenhouse Gases (GHGs)

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Criteria Pollutants:							
1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)	0			1.67E-05	0.000167	AP-42
2.)	PM #10 microns in diameter (PE/PM10)	0			1.67E-05	0.000167	AP-42
3.)	PM #2.5 microns in diameter (PE/PM2.5)	0			1.67E-05	0.000167	AP-42
4.)	Sulfur dioxide (SO2)	0			1.67E-06	8.33E-06	AP-42
5.)	Nitrogen Oxides (NOx)	0			0.000667	0.003	Other
6.)	Carbon monoxide (CO)	0			0.000167	0.000667	Other
7.)	Volatile organic compounds (VOC)	2.1			0.01	0.04	Other
8.)	Lead (Pb)	0			0	0	
9.)	Total Hazardous Air Pollutants (HAPs)	0.068			0.0003	0.001	Other
10.)	Fluoride (F)	0			0	0	
11.)	Hydrogen Sulfide (H2S)	0			0	0	
12.)	Mercury (Hg)	0			0	0	
13.)	Total Reduced Sulfur (TRS)	0			0	0	
14.)	Sulfuric Acid Mist (SAM)	0			0	0	

Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminents

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)	Total HAPs	0.068			0.0003	0.001	Other
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Greenhouse Gases (GHGs)

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Criteria Pollutants:							
1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)	0			1.67E-05	0.000167	AP-42
2.)	PM #10 microns in diameter (PE/PM10)	0			1.67E-05	0.000167	AP-42
3.)	PM #2.5 microns in diameter (PE/PM2.5)	0			1.67E-05	0.000167	AP-42
4.)	Sulfur dioxide (SO2)	0			1.67E-06	8.33E-06	AP-42
5.)	Nitrogen Oxides (NOx)	0			0.000667	0.003	Other
6.)	Carbon monoxide (CO)	0			0.000167	0.000667	Other
7.)	Volatile organic compounds (VOC)	2.1			0.01	0.04	Other
8.)	Lead (Pb)	0			0	0	
9.)	Total Hazardous Air Pollutants (HAPs)	0.068			0.0003	0.001	Other
10.)	Fluoride (F)	0			0	0	
11.)	Hydrogen Sulfide (H2S)	0			0	0	
12.)	Mercury (Hg)	0			0	0	
13.)	Total Reduced Sulfur (TRS)	0			0	0	
14.)	Sulfuric Acid Mist (SAM)	0			0	0	

Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminents

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)	Total HAPs	0.068			0.0003	0.001	Other
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Greenhouse Gases (GHGs)

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Criteria Pollutants:							
1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)	0			1.67E-05	0.000167	AP-42
2.)	PM #10 microns in diameter (PE/PM10)	0			1.67E-05	0.000167	AP-42
3.)	PM #2.5 microns in diameter (PE/PM2.5)	0			1.67E-05	0.000167	AP-42
4.)	Sulfur dioxide (SO2)	0			1.67E-06	8.33E-06	AP-42
5.)	Nitrogen Oxides (NOx)	0			0.000667	0.003	Other
6.)	Carbon monoxide (CO)	0			0.000167	0.000667	Other
7.)	Volatile organic compounds (VOC)	2.1			0.01	0.04	Other
8.)	Lead (Pb)	0			0	0	
9.)	Total Hazardous Air Pollutants (HAPs)	0.068			0.0003	0.001	Other
10.)	Fluoride (F)	0			0	0	
11.)	Hydrogen Sulfide (H2S)	0			0	0	
12.)	Mercury (Hg)	0			0	0	
13.)	Total Reduced Sulfur (TRS)	0			0	0	
14.)	Sulfuric Acid Mist (SAM)	0			0	0	

Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminents

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)	Total HAPs	0.068			0.0003	0.001	Other
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Greenhouse Gases (GHGs)

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Criteria Pollutants:							
1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)	0			1.67E-05	0.000167	AP-42
2.)	PM #10 microns in diameter (PE/PM10)	0			1.67E-05	0.000167	AP-42
3.)	PM #2.5 microns in diameter (PE/PM2.5)	0			1.67E-05	0.000167	AP-42
4.)	Sulfur dioxide (SO2)	0			1.67E-06	8.33E-06	AP-42
5.)	Nitrogen Oxides (NOx)	0			0.000667	0.003	Other
6.)	Carbon monoxide (CO)	0			0.000167	0.000667	Other
7.)	Volatile organic compounds (VOC)	2.1			0.01	0.04	Other
8.)	Lead (Pb)	0			0	0	
9.)	Total Hazardous Air Pollutants (HAPs)	0.068			0.0003	0.001	Other
10.)	Fluoride (F)	0			0	0	
11.)	Hydrogen Sulfide (H2S)	0			0	0	
12.)	Mercury (Hg)	0			0	0	
13.)	Total Reduced Sulfur (TRS)	0			0	0	
14.)	Sulfuric Acid Mist (SAM)	0			0	0	

Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminents

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)	Total HAPs	0.068			0.0003	0.001	Other
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Greenhouse Gases (GHGs)

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Criteria Pollutants:							
1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)	0			1.67E-05	0.000167	AP-42
2.)	PM #10 microns in diameter (PE/PM10)	0			1.67E-05	0.000167	AP-42
3.)	PM #2.5 microns in diameter (PE/PM2.5)	0			1.67E-05	0.000167	AP-42
4.)	Sulfur dioxide (SO2)	0			1.67E-06	8.33E-06	AP-42
5.)	Nitrogen Oxides (NOx)	0			0.000667	0.003	Other
6.)	Carbon monoxide (CO)	0			0.000167	0.000667	Other
7.)	Volatile organic compounds (VOC)	2.1			0.01	0.04	Other
8.)	Lead (Pb)	0			0	0	
9.)	Total Hazardous Air Pollutants (HAPs)	0.068			0.0003	0.001	Other
10.)	Fluoride (F)	0			0	0	
11.)	Hydrogen Sulfide (H2S)	0			0	0	
12.)	Mercury (Hg)	0			0	0	
13.)	Total Reduced Sulfur (TRS)	0			0	0	
14.)	Sulfuric Acid Mist (SAM)	0			0	0	

Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminents

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)	Total HAPs	0.068			0.0003	0.001	Other
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Greenhouse Gases (GHGs)

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Criteria Pollutants:							
1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)	0			1.67E-05	0.000167	AP-42
2.)	PM #10 microns in diameter (PE/PM10)	0			1.67E-05	0.000167	AP-42
3.)	PM #2.5 microns in diameter (PE/PM2.5)	0			1.67E-05	0.000167	AP-42
4.)	Sulfur dioxide (SO2)	0			1.67E-06	8.33E-06	AP-42
5.)	Nitrogen Oxides (NOx)	0			0.000667	0.003	Other
6.)	Carbon monoxide (CO)	0			0.000167	0.000667	Other
7.)	Volatile organic compounds (VOC)	2.1			0.01	0.04	Other
8.)	Lead (Pb)	0			0	0	
9.)	Total Hazardous Air Pollutants (HAPs)	0.068			0.0003	0.001	Other
10.)	Fluoride (F)	0			0	0	
11.)	Hydrogen Sulfide (H2S)	0			0	0	
12.)	Mercury (Hg)	0			0	0	
13.)	Total Reduced Sulfur (TRS)	0			0	0	
14.)	Sulfuric Acid Mist (SAM)	0			0	0	

Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminents

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)	Total HAPs	0.068			0.0003	0.001	Other
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Greenhouse Gases (GHGs)

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Criteria Pollutants:							
1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)	0			0	0	
2.)	PM #10 microns in diameter (PE/PM10)	0			0	0	
3.)	PM #2.5 microns in diameter (PE/PM2.5)	0			0	0	
4.)	Sulfur dioxide (SO2)	0			0	0	
5.)	Nitrogen Oxides (NOx)	0			0	0	
6.)	Carbon monoxide (CO)	0			0	0	
7.)	Volatile organic compounds (VOC)	0.43			0.10	0.43	Other
8.)	Lead (Pb)	0			0	0	
9.)	Total Hazardous Air Pollutants (HAPs)	0.02			0.005	0.02	Other
10.)	Fluoride (F)	0			0	0	
11.)	Hydrogen Sulfide (H2S)	0			0	0	
12.)	Mercury (Hg)	0			0	0	
13.)	Total Reduced Sulfur (TRS)	0			0	0	
14.)	Sulfuric Acid Mist (SAM)	0			0	0	

Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminents

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)	Total HAPs	0.02			0.005	0.020	Other
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Greenhouse Gases (GHGs)

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Criteria Pollutants:							
1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)	0			0	0	
2.)	PM #10 microns in diameter (PE/PM10)	0			0	0	
3.)	PM #2.5 microns in diameter (PE/PM2.5)	0			0	0	
4.)	Sulfur dioxide (SO2)	0			0	0	
5.)	Nitrogen Oxides (NOx)	0			0	0	
6.)	Carbon monoxide (CO)	0			0	0	
7.)	Volatile organic compounds (VOC)	3.28E-04			7.48E-05	3.28E-04	Manufacturer Data
8.)	Lead (Pb)	0			0	0	
9.)	Total Hazardous Air Pollutants (HAPs)	8.41E-06			1.92E-06	8.41E-06	Manufacturer Data
10.)	Fluoride (F)	0			0	0	
11.)	Hydrogen Sulfide (H2S)	0			0	0	
12.)	Mercury (Hg)	0			0	0	
13.)	Total Reduced Sulfur (TRS)	0			0	0	
14.)	Sulfuric Acid Mist (SAM)	0			0	0	

Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminents

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)	Total HAPs	8.41E-06			1.92E-06	8.41E-06	Manufacturer Data
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Greenhouse Gases (GHGs)

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Criteria Pollutants:							
1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)	0			0	0	
2.)	PM #10 microns in diameter (PE/PM10)	0			0	0	
3.)	PM #2.5 microns in diameter (PE/PM2.5)	0			0	0	
4.)	Sulfur dioxide (SO2)	0			0	0	
5.)	Nitrogen Oxides (NOx)	0			0	0	
6.)	Carbon monoxide (CO)	0			0	0	
7.)	Volatile organic compounds (VOC)	3.26			0.74	3.26	AP-42
8.)	Lead (Pb)	0			0	0	
9.)	Total Hazardous Air Pollutants (HAPs)	negligible			0	0	
10.)	Fluoride (F)	0			0	0	
11.)	Hydrogen Sulfide (H2S)	0			0	0	
12.)	Mercury (Hg)	0			0	0	
13.)	Total Reduced Sulfur (TRS)	0			0	0	
14.)	Sulfuric Acid Mist (SAM)	0			0	0	

Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminents

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Greenhouse Gases (GHGs)

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Criteria Pollutants:							
1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)	0.02			0.005	0.02	AP-42
2.)	PM #10 microns in diameter (PE/PM10)	0.02			0.005	0.02	AP-42
3.)	PM #2.5 microns in diameter (PE/PM2.5)	0.02			0.005	0.02	AP-42
4.)	Sulfur dioxide (SO2)	0.002			0.0004	0.002	AP-42
5.)	Nitrogen Oxides (NOx)	0.29			0.07	0.29	AP-42
6.)	Carbon monoxide (CO)	0.24			0.05	0.24	AP-42
7.)	Volatile organic compounds (VOC)	0.02			0.004	0.02	AP-42
8.)	Lead (Pb)	0			0	0	
9.)	Total Hazardous Air Pollutants (HAPs)	Negligible			0	0	
10.)	Fluoride (F)	0			0	0	
11.)	Hydrogen Sulfide (H2S)	0			0	0	
12.)	Mercury (Hg)	0			0	0	
13.)	Total Reduced Sulfur (TRS)	0			0	0	
14.)	Sulfuric Acid Mist (SAM)	0			0	0	

Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminents

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Greenhouse Gases (GHGs)

			Efficiency Standards				
		Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
Pollutants:							
1.)							
2.)							
3.)							
4.)							
5.)							
6.)							
7.)							
8.)							

Revised 11/3/2014

Control Equipment:

Flare/Combustor

Manufacturer:	Steffes	Date Installed:	7/16/2014
Model Name and Number:	SHP-6 high pressure, SVG-3 low pressure	Company Control Equipment ID:	Combo flare

Company Control Equipment Description: Combination high/low pressure elevated flare

Pollutant(s) Controlled:

☐ CO	☐ NOx	☐ Pb	☐ SO2	☑ VOC	☐ PM						
☐ PM (FIL)	☐ PM Condensible	☐ PM 10 (FIL)	☐ PM 2.5 (FIL)	☐ PM 10	☐ PM 2.5						
☑ Other (organic HAPs)											

NOTE: The following fields require numeric values unless otherwise denoted with an asterisk*

Maximum Design Capacity (MMSCF/hr):	0.05025		
Minimum Design Capacity (MMSCF/hr):			
Design Control Efficiency (%):	>98	Capture Efficiency (%):	
Operating Control Efficiency (%):			
Flare Type:*	Elevated- Open	**Elevated Flare Type:***	Non-Assisted
Ignition Device:*	Yes	**Flame Presence Sensor:***	Yes
Inlet Gas Temp (F):		**Flame Presence Type:***	Thermocouple
Gas Flow Rate (acfm):		Outlet Gas Temp (F):	

☑ This is the only control equipment on this air contaminant source

If not, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel

List all other emission units that are also vented to this control equipment:* Associated gas, oil and water tanks

List all release point IDs associated with this control equipment:*

Release Point Information:

Complete the table below for ***each*** release point. Please include release point information for each emission unit. Multiple attachments may be necessary. A release point is a point at which emissions from an emission unit are released into the ambient (outside)air. List each individual release point on a separate pair of lines (release point ID and description). ***For longitude and latitude, use NAD 83/WGS84 datum and 5 digits after the decimal (i.e. 41.12345, -107.56789)***

Stack Release Point Information		
Company Release Point ID:	Release Point Type:	Vertical
Combo Flare - High Pressure Tip	Release Point Latitude:	41.24711
	Release Point Longitude:	-104.6668
Company Release Point Description:	Base Elevation (ft):	5987
Combo high pressure elevated flare for control of associated gas and oil/water tank emissions	Stack Height (ft):	20
	Stack Diameter (ft):	0.51
	Exit Gas Velocity (ft/s):	<400
	Exit Gas Temp (F):	
	Exit Gas Flow Rate (acfm):	763 scfm
Company Release Point ID:	Release Point Type:	Vertical
Combo Flare - Low Pressure Tip	Release Point Latitude:	41.24711
	Release Point Longitude:	-104.6668
Company Release Point Description:	Base Elevation (ft):	5987
Combo low pressure elevated flare for control of oil/water tank emission	Stack Height (ft):	0.26
	Stack Diameter (ft):	<400
	Exit Gas Velocity (ft/s):	
	Exit Gas Temp (F):	
	Exit Gas Flow Rate (acfm):	74 scfm
Company Release Point ID:	Release Point Type:	Vertical
Heater	Release Point Latitude:	41.24711
	Release Point Longitude:	-104.6668
Company Release Point Description:	Base Elevation (ft):	5987
1.0 MMBtu/hr associated with treater	Stack Height (ft):	
	Stack Diameter (ft):	
	Exit Gas Velocity (ft/s):	
	Exit Gas Temp (F):	
	Exit Gas Flow Rate (acfm):	
Company Release Point ID:	Release Point Type:	
	Release Point Latitude:	
	Release Point Longitude:	
Company Release Point Description:	Base Elevation (ft):	
	Stack Height (ft):	
	Stack Diameter (ft):	
	Exit Gas Velocity (ft/s):	
	Exit Gas Temp (F):	
	Exit Gas Flow Rate (acfm):	

Complete the table below for each fugitive (area, volume, line) release point. List each individual release point on a separate line.

Fugitive Release Point Information		
Company Release Point ID:	Release Point Latitude:	41.24711
Fugitives	Release Point Longitude:	-104.6668
	Release Height (ft):	varies
Company Release Point Description:		
Equipment leaks		
Company Release Point ID:	Release Point Latitude:	41.24711
Truck loading	Release Point Longitude:	-104.6668
	Release Height (ft):	unknown
Company Release Point Description:		
Fugitive emissions from truck loading		
Company Release Point ID:	Release Point Latitude:	41.24711
Pneumatic controller	Release Point Longitude:	-104.6668
	Release Height (ft):	unknown
Company Release Point Description:		
Pneumatic controller emissions		
Company Release Point ID:	Release Point Latitude:	
	Release Point Longitude:	
	Release Height (ft):	
Company Release Point Description:		

Wind River
Environmental Group LLC

November 24, 2014

NSR Program Manager/Attn: O&G Production Facilities
Wyoming Department of Environmental Quality
Air Quality Division
Herschler Building, 2-E
122 West 25th Street
Cheyenne, WY 82002

SUBJECT: Permit Application for Elmo 21-16-14-1CH

To Whom It May Concern:

On behalf of Cirque Resources LP, we are submitting an application for equipment associated with a new well site located in Laramie County, Elmo 21-16-14-1CH.

Based on the characteristics of the oil and process modeling using WinSim Design II, no flash emissions are expected from the oil storage tanks at Elmo 21-16-14-1CH. Working and breathing losses have been calculated using TANKS 4.09d for this site.

Thank you for your assistance. Should there be any questions, please contact Bill Lloyd, Cirque Resources LP, at 475 17th Street, Suite 1600, Denver, Colorado 80202, by phone at (303) 226-9500, or by e-mail at blloyd@cirqueresources.com. Alternately, you may contact me by phone at (303) 520-4861 or by e-mail at johnclouse@windriverenvironmental.com, or johnclouse@comcast.net.

Regards,

John Clouse
Wind River Environmental Group LLC

Enclosure

STATE OF WYOMING

Department of Environmental Quality - Air Quality Division

Oil & Gas Production Facilities

Checklist for Complete Application

INDUSTRY		DEQ-AQD
X	Company Name/Contact Information	
X	Well/Facility Name and API #	
X	Legal Locations	
X	Existing Permit/Waiver #'s	
X	List of Equipment Onsite	
X	Plot Plan	
X	Process Description	
X	Current Production Rates	
X	Gas/Condensate Analyses	
X	All Pertinent Dates (date of first production, control installation date)	
X	Emission Models (Input/Output)	
X	Other Calculations (heaters, pneumatic equipment, truck loading, etc.)	
X	All Applicable Application Forms	
X	DEQ Application Cover Sheet	
X	~~Facility~~ Location Specify: STATEWIDE CDA JPAD	
SCENARIO 1 SCENARIO 2 X	Dehydration Unit Presumptive BACT check appropriate box	SCENARIO 1 SCENARIO 2 NA

Form AQD-OG00

Completeness Checklist March 2010

STATE OF WYOMING

Department of Environmental Quality - Air Quality Division

Oil & Gas Production Facilities C6 S2 Permit Application

Company Name: Cirque Resources LP

Facility Name: Elmo 21-16-14-1CH

To Be Completed by WDEQ-AQD

Reviewer

Copy to

Cynthia

D.E.

File:

Form AQD-OG0

Application March 2010

STATE OF WYOMING
Department of Environmental Quality - Air Quality Division
Oil and Gas Production Facilities C6 S2 Permit Application
Application Cover Sheet

submit (1) one signed original copy AND (1) one electronic copy of the application OR (3) paper copies, one w/ original signature

Company Name: Cirque Resources LP

Facility Name: Elmo 21-16-14-1CH

API Number: 49-021-21129

For more than one well, list additional wells & associated API numbers on Form AQD-OG8.

OFFICIAL CONTACT PERSON

Name: Bill Lloyd Title: Senior VP Operations

Address: 475 17th Street, Suite 1600, Denver, CO 80202

Telephone: (303) 226-9500 Fax: (303) 226-9595 E-mail: blloyd@cirqueresources.com

LOCATION

County: Laramie

Legal Description: 1/4 1/4 SESW Section 21 T 15N R 65W

Latitude: 41.247107 Longitude: -104.666803

FACILITY INFORMATION

Type of Facility: Single Well X PAD ____ Central Tank Battery ____

Type of Application: New Construction X Modified Facility ____

First Date of Production 7/12/2014 Date of Modification ____

Producing Field Name: Wildcat

Producing Formation(s): Codell Sand

Existing Air Quality Permit / Waiver Numbers: None

Pending Air Quality Permit Application Numbers: None

I, William B. Lloyd, Senior Vice President Operations
Responsible Official **Title**

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

Signature: *Signature Required* Date: 11.24.14

FORM AQD-OG1

Application Coversheet March 2010

STATE OF WYOMING
Department of Environmental Quality - Air Quality Division
Oil and Gas Production Facilities C6 S2 Permit Application

Equipment List

Company Name	Cirque Resources LP
Facility Name	Elmo 21-16-14-1CH

List all production equipment at the site including all pressurized vessels with the potential for flash emissions, all hydrocarbon liquids and produced water storage tanks, all dehydration units, all pneumatic pumps, all natural gas-fired burners and heaters and all emission control equipment and devices. Pressurized vessels with the potential for flash emissions are all vessels that vent vapors to the atmosphere during times other than upset or emergency conditions (water knockouts, 2-phase and 3-phase separators, heater treaters, gun barrels, scrubber pots, etc). Provide design ratings for dehys (MMCFD), process heaters, burners and pilots (MMBtu/hr, SCFH). Provide size of production & water storage tanks (BPD). For dehydration units indicate if the unit includes a glycol flash separator and/or reboiler still vent condenser. For emission control combustors/flares indicate design rating (MMBtu/hr, SCFD) and combustor/flare height (ft). Provide pneumatic pump motive gas useage (SCFH).

If more space is required, continue on page 2 of this sheet.

PROVIDE INSTALLATION DATES OF ALL EMISSION CONTROL EQUIPMENT & MONITORING DEVICES/SYSTEMS !!!

6, 400 bbl oil tanks
2, 400 bbl water tanks
1 Steffes elevated flare with 1 high pressure flare for associated gas, operational on or before 7/12/2014, with temperature monitoring system and event recorder
1 Steffes elevated flare with 1 low pressure flare for oil and water tank emissions, operational on or before 7/12/2014, with temperature monitoring system and event recorder
1 2-phase separator with no burner
1 heater-treater with 1.0 MMBtu/hr heater
1 pneumatic controller (low bleed: 0.002 scf/hr)

Example:

1 2-phase high pressure separator (unheated)

1 3-phase low pressure separator w/ 0.5 MMBtu/hr heater

2 0.5 MMBtu/hr line heaters

1 5 MMCFD TEG dehydration unit w/ 0.5 MMBtu/hr reboiler heater, glycol flash separator(0.5 MMBtu/hr heater) and overheads condenser

2 400-bbl condensate tanks

1 400-bbl produced water tank

1 30-ft enclosed combustor (3.0 MMBtu/hr, 5 MCFD) for flashing & reboiler vent/glycol flash separator emissions control installed 1/1/2007

STATE OF WYOMING

Department of Environmental Quality - Air Quality Division
Oil and Gas Production Facilities C6 S2 Permit Application

Storage Tanks, Pressurized Vessels & Pneumatic Pumps

Use as many copies of this form as necessary to include all tanks, vessels and pumps.

Company Name Cirque Resources LP

Facility Name Elmo 21-16-14-1CH

STORAGE TANKS

Below, list all atmospheric tanks used to store liquids transferred from an upstream vessel or wellhead. Upstream vessels include separators, treaters, flash tanks, FWKOs, gun barrels, tanks, etc. If more than one tank of the same size is used for the same purpose, receiving fluids from the same upstream vessel, those tanks may be combined on one line.

E X A M P L E S				
2-400	condensate	100	2-phase separator	600
1-1000	produced water, skim oil	1000 water, 5 oil	treater	30
1-300	bad oil tank	5 oil	run tank	atmospheric
size (bbl)	use (condensate / oil / H_2O)	total throughput (bpd)	upstream vessel	upstream vessel pressure (psig)
6-400	Oil	252	Treater	20-30
2-400	Water	487	Treater	20-30

PRESSURIZED VESSELS List each vessel separately.

Pressurized vessels include FWKO's, heater-treaters, separators (2-phase & 3-phase), gas boots, gun barrels, flash tanks, etc…

E X A M P L E S			
HP 2-phase separator	600	well	1000
LP 3-phase separator	300	HP separator	600
3-phase heater treater	30	well	40
vessel	operating pressure (psig)	upstream vessel	upstream vessel pressure (psig)
Separator	75-80	Well	300-400
Treater	20-30	Separator	75-80

What is the API gravity of the SALES oil or condensate at this facility? 33.8

Does this facility handle sour oil / gas? YES ____ NO **X**

EMISSION CONTROL DEVICES & SYSTEMS for FLASH VAPORS & PRESSURE VESSEL PROCESS STREAMS

Identify each emission control system or device and the date(s) of installation for each.

E X A M P L E: 30-foot ACME smokeless combustor for tank vapor emissions control, installed 1/1/2008

One elevated high pressure flare for associated gas from separator, operational on or before 7/12/2014
One elevated low pressure flare for oil and water tank emissions, operational on or before 7/12/2014

Combustion Device Emission Controls (if applicable)

Date of Installation: Both elevated flares were installed on or before 7/12/2014

Manufacturer: Steffes, Combo flare, high pressure model SHP-6, Low pressure model SVG-3 with continuous pilot

Smokeless Design? Yes X No ____

Excess Oxygen (%): ____

VOC Destruction Effeciency (%): >98

HAP Destruction Efficiency (%): ____

Maximum Design Throughput (SCFD): 1,206,000

Minimum Design throughput (SCFD): ____

Actual Waste Gas Volume (SCFD): ____

Waste Gas Heat Content (Btu/SCF): ____

Burner Rating (MMBtu/hr): ____

Ignition System: Pilot X Electric Spark X Other ____

Continuous Pilot? Yes X No ____

Pilot Gas Volume (SCFM): 0.29

Is the Combustion Device Monitored? Yes X No ____ How? Thermocouple system monitors pilot and reignites if it goes out. Time and date of event are recorded.

PNEUMATIC PUMPS

Describe each pneumatic pump using natural gas as the motive gas. Indicate where motive gas is vented (atmosphere or other).

E X A M P L E: 50 SCFH Acme brand heat trace circulation pump operated w/ produced gas, vented to gas collection system.

None

STATE OF WYOMING

Department of Environmental Quality - Air Quality Division
Oil and Gas Production Facilities C6 S2 Permit Application

EMISSION SUMMARY

Company Name Cirque Resources LP

Facility Name Elmo 21-16-14-1CH

This form must be completed for each emission source at the facility. A list of the emission sources which must be considered is found in Appendix B of the C6 S2 O&G Production Facilities Permitting Guidance.

UNCONTROLLED EMISSIONS (Tons Per Year)

These are the total uncontrolled, potential emissions from each source.

EMISSION SOURCE (i.e., tank, natural gas-fired heater, reboiler still vent, glycol flash separator, pneumatic pump, separator gas vent, water knockout vent, etc.)	VOCs	Total HAPs	NO_X	CO	SO_2	H_2S
Associated Gas Flaring	1864.02	47.84	--	--	--	--
Oil tanks	12.51	0.41	--	--	--	--
Heaters	0.02	Negligible	0.29	0.24	0.002	--
Fugitives	0.43	0.02	--	--	--	--
Truck loading	3.26	Negligible	--	--	--	--
Pneumatic devices	3.28E-04	8.41E-06	--	--	--	--
						--

CONTROLLED EMISSIONS (Tons Per Year)

These are the total emissions from each source. Include controlled emissions from each controlled source and uncontrolled emissions from each source which does not require control, such as process equipment burners.

EMISSION SOURCE	VOCs	Total HAPs	NO_X	CO	SO_2	H_2S
Associated Gas Flaring	37.61	0.96	12.81	3.20	0.04	--
Oil tanks	0.25	0.008	0.02	0.004	0.00005	--
Heaters	0.02	Negligible	0.29	0.24	0.002	--
Fugitives	0.43	0.02	--	--	--	--
Truck loading	3.26	Negligible	--	--	--	--
Pneumatic devices	3.28E-04	8.41E-06	--	--	--	--
						--

HAZARDOUS AIR POLLUTANT SUMMARY (Tons Per Year)

Complete this section for each emissions source if TOTAL HAPs from that source are 9 TPY or greater.

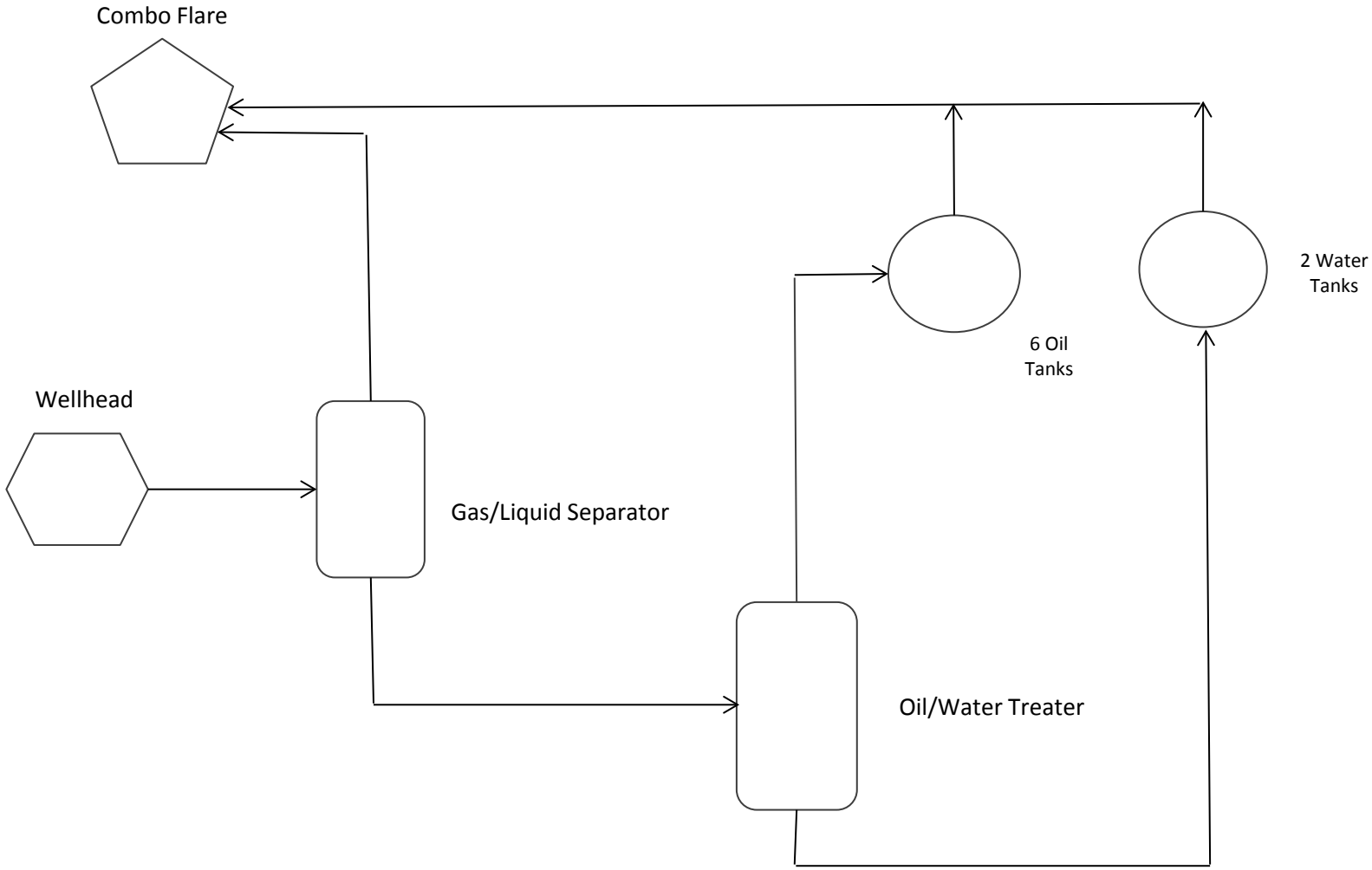
SOURCE	Benzene	Toluene	Ethyl-Benzene	Xylenes	Other

Elmo 21-16-14-1CH
Process Description

Fluids from the well are produced to a two-phase gas/liquid separator. Liquids route to an Oil/Water treater to separate oil and water. The oil is dumped into six, 400 barrel oil tanks. The water is dumped to two, 400 barrel water tanks. Emissions from the tanks are controlled with an elevated flare.

This is a low GOR oil well. Associated gas production is minimal and is used primarily onsite as lease gas to run the treater heater. Any residual gas is controlled with an elevated flare.

Elmo 21-16-14-1CH



Elmo 21-16-14-1CH Oil Tanks Flash & Working/Breathing Emissions

From Trimeric emission package 11/18/2014

Pollutant	Uncontrolled Emissions (tpy)	Controlled Emissions (tpy)
VOCs	12.51	0.2502
Total HAPs	0.41	0.0082

Elmo 21-16-14-1CH
Flash (WinSim Design II) plus EPA Tanks for Working/Breathing Losses

	VOC
VOC EF, lb/bbl	0.27

$EF\ (lb/bbl) = (Emissions(lb/hr)\ \times 24hr/day)/ Production(bbl/day)$

Emissions, tpy	12.51
Emissions, lb/hr	2.86
Projected Production, bbl/day	252.13
Projected Production, bbl/yr	92,027

Emissions (lb/hr) = Flashing Losses (lb/hr) + Working and Breathing Losses for Each Tank (lb/hr)

Elmo 21-16-14-1CH
WinSim Design II Flashing Losses

	VOC
VOC EF, lb/bbl	0.00

Emissions, tpy	0.00
Emissions, lb/hr	0.00
Projected Production, bbl/day	252.13
Projected Production, bbl/yr	92,027

Emissions (tpy) = VOC Flashing Losses Total from Bottom of p. 8

Elmo 21-16-14-1CH
EPA Tanks Working & Breathing Losses (Tank 1 with one-sixth of total capacity)

	VOC
VOC EF, lb/bbl	0.27

Emissions, tpy	2.09
Emissions, lb/hr	0.48
Projected Production, bbl/day	42.02
Projected Production, bbl/yr	15,338

$Emissions\ (lb/hr) = Total\ Emissions\ (lbs/yr)\ from\ EPA\ Tanks\ output\ on\ p.\ 11\ converted\ to\ lb/hr$

Assume all 6 tanks have identical Working and Breathing Losses
Total Working and Breathing Losses for all 6 Tanks:

Elmo 21-16-14-1CH
EPA Tanks Working & Breathing Losses

	VOC
VOC EF, lb/bbl	0.27

Emissions, tpy	12.51
Emissions, lb/hr	2.86
Projected Production, bbl/day	252.13
Projected Production, bbl/yr	92,027

Number of tanks	-	6	
Size of tanks	bbl	400	
API Gravity	-	33.8	*API Gravity from p. 19*
Specific Gravity	-	0.86	$Specific\ Gravity = 141.5/((API\ Gravity + 131.5))$

Total Projected Production	**92,027**	bbl/year	
	27,593,970	lb/year	*See Note 1*
Projected Production per tank	15,338	bbl/year-tank	
	644,189	gal/year-tank	

Note 1:

$$Projected\ Production\ (lb/yr) = Production(bbl/yr) \times 42 gal/bbl \times (8.34\ lb\ H2O)/gal \times Specific\ Gravity$$

Elmo 21-16-14-1CH
Flash (WinSim Design II) plus EPA Tanks for Working/Breathing Losses

	BTEX
BTEX EF, lb/bbl	0.0012

EF (lb/bbl) = (Emissions(lb/hr) ×24hr/day)/Production(bbl/day)

Emissions, tpy	0.057
Emissions, lb/hr	0.013
Projected Production, bbl/day	252.13
Projected Production, bbl/yr	92,027

Emissions (lb/hr) = Flashing Losses (lb/hr) + Working and Breathing Losses for Each Tank (lb/hr)

Elmo 21-16-14-1CH
WinSim Design II Flashing Losses

	BTEX
BTEX EF, lb/bbl	0.0000

Emissions, tpy	0.000
Emissions, lb/hr	0.000
Projected Production, bbl/day	252.13
Projected Production, bbl/yr	92,027

Emissions (tpy) = BTEX flow (lb/hr) in the flash gas (Stream 2) on p. 7-8 × Projected Actual Annual oil production (lb/yr) on p. 8 ÷ Feed Basis oil production (Stream 3, lb/hr) on p. 8 Converted to tpy

BTEX = Benzene, Toluene, Ethylbenzene, Xylenes

Elmo 21-16-14-1CH
EPA Tanks Working & Breathing Losses

(Tank 1 with one-sixth of total capacity)

	BTEX
BTEX EF, lb/bbl	0.0012

Emissions, tpy	0.010
Emissions, lb/hr	0.002
Projected Production, bbl/day	42.02
Projected Production, bbl/yr	15,338

Emissions (lb/hr)= Total Emissions (lbs/yr) from EPA Tanks output on p. 11 converted to lb/hr

Assume all 6 tanks have identical Working and Breathing Losses
Total Working and Breathing Losses for all 6 Tanks:

Elmo 21-16-14-1CH
EPA Tanks Working & Breathing Losses

	BTEX
BTEX EF, lb/bbl	0.0012

Emissions, tpy	0.057
Emissions, lb/hr	0.013
Projected Production, bbl/day	252.13
Projected Production, bbl/yr	92,027

Elmo 21-16-14-1CH
Flash (WinSim Design II) plus EPA Tanks for Working/Breathing Losses

	HAP
HAP EF, lb/bbl	0.009

EF (lb/bbl) = (Emissions(lb/hr) ×24hr/day)/Production(bbl/day)

Emissions (lb/hr) = Flashing Losses (lb/hr) + Working and Breathing Losses for Each Tank (lb/hr)

Emissions, tpy	0.41
Emissions, lb/hr	0.09
Projected Production, bbl/day	252.13
Projected Production, bbl/yr	92,027

Elmo 21-16-14-1CH
WinSim Design II Flashing Losses

	HAP
HAP EF, lb/bbl	0.000

Emissions, tpy	0.00
Emissions, lb/hr	0.00
Projected Production, bbl/day	252.13
Projected Production, bbl/yr	92,027

Emissions (tpy) = HAP flow (lb/hr) in the flash gas (Stream 2) on p. 7-8 × Projected Actual Annual oil production (lb/yr) on p. 8 ÷ Feed Basis oil production (Stream 3,lb/hr) on p. 8 Converted to tpy

HAP= BTEX, n-Hexane, 2,2,4-Trimethylpentane

Elmo 21-16-14-1CH
EPA Tanks Working & Breathing Losses

(Tank 1 with one-sixth of total capacity)

	HAP
HAP EF, lb/bbl	0.009

Emissions, tpy	0.07
Emissions, lb/hr	0.02
Projected Production, bbl/day	42.02
Projected Production, bbl/yr	15,338

Emissions (lb/hr)= Total Emissions (lbs/yr) from EPA Tanks output on p. 11 converted to lb/hr

Assume all 6 tanks have identical Working and Breathing Losses
Total Working and Breathing Losses for all 6 Tanks:

Elmo 21-16-14-1CH
EPA Tanks Working & Breathing Losses

	HAP
HAP EF, lb/bbl	0.009

Emissions, tpy	0.41
Emissions, lb/hr	0.09
Projected Production, bbl/day	252.13
Projected Production, bbl/yr	92,027

WinSim inputs are shown in bold italics and have a box around them.

STREAM SUMMARY

Stream Number		1	2	3
Stream Name		Feed	0 psig vapor	0 psig liquid
Thermo Method Option		GLOBAL	GLOBAL	GLOBAL
Vapor Fraction		0	1	0
Temperature	F	*73*	*45.6*	*45.6*
Pressure	psia	*16.76*	*11.76*	*11.76*
Enthalpy	Btu/hr	-13573.7868		-14920.1033
Entropy	Btu/hr/R	-14.0958		-16.6860
Vapor Density	lb/ft3			
Liquid 1 Density	lb/ft3	42.3820		42.9030
Liquid 1 Specific Gravity	60F@STP	0.7191		0.7191
Vapor Cp	Btu/lbmol/R			
Vapor Cv	Btu/lbmol/R			
Liquid 1 Cp	Btu/lbmol/R	58.2536		56.4326
Vapor Viscosity	cP			
Liquid 1 Viscosity	cP	0.5099		0.5355
Vapor Thermal Conductivity	Btu/hr/ft/R			
Liquid 1 Thermal Conductivity	Btu/hr/ft/R	0.0654		0.0647
Vapor Flowrate	MMSCF/day@STP			
Liquid 1 Flowrate	bbl/day@STP	9.5308		9.5308
Liquid 2 Flowrate				
Molecular Weight		116.6970		116.6970
Molar Flowrate	lbmol/hr	0.8569		0.8569
Mass Flowrate	lb/hr	*100.0000*		100.0000
Note: All Liquid 1 Phase calculations exclude Free Water				
Molar Flowrate By Component				
49 : CARBON DIOXIDE	lbmol/hr	0.0002		0.0002
46 : NITROGEN	lbmol/hr	0.0000		0.0000
1021 : METHANOL	lbmol/hr	0.0000		0.0000
2 : METHANE	lbmol/hr	0.0013		0.0013
3 : ETHANE	lbmol/hr	0.0020		0.0020
4 : PROPANE	lbmol/hr	0.0094		0.0094
5 : I-BUTANE	lbmol/hr	0.0026		0.0026
6 : N-BUTANE	lbmol/hr	0.0147		0.0147
7 : I-PENTANE	lbmol/hr	0.0075		0.0075
8 : N-PENTANE	lbmol/hr	0.0111		0.0111
36 : CYCLOPENTANE	lbmol/hr	0.0103		0.0103
10 : N-HEXANE	lbmol/hr	0.0425		0.0425
38 : CYCLOHEXANE	lbmol/hr	0.0187		0.0187
1159 : ISOHEXANE	lbmol/hr	0.0846		0.0846
11 : N-HEPTANE	lbmol/hr	0.1127		0.1127
39 : METHYLCYCLOHEXAN	lbmol/hr	0.0360		0.0360
82 : 2,2,4-TRIMETHYLP	lbmol/hr	0.0098		0.0098
40 : BENZENE	lbmol/hr	0.0068		0.0068
41 : TOLUENE	lbmol/hr	0.0169		0.0169
45 : ETHYL BENZENE	lbmol/hr	0.0014		0.0014
42 : O-XYLENE	lbmol/hr	0.0059		0.0059
12 : N-OCTANE	lbmol/hr	0.1010		0.1010
13 : N-NONANE	lbmol/hr	0.1098		0.1098
44 : P-XYLENE	lbmol/hr	0.0033		0.0033
43 : M-XYLENE	lbmol/hr	0.0035		0.0035
15 : N-UNDECANE	lbmol/hr	0.2112		0.2112
16 : N-DODECANE	lbmol/hr	0.0337		0.0337
Total	lbmol/hr	0.8569		0.8569

Output for Stream 2 is blank because WinSim predicts no flash gas is formed

Stream Number		1	2	3
Stream Name		Feed	0 psig vapor	0 psig liquid
Molar Composition By Component				
49 : CARBON DIOXIDE	molar %	0.0180		0.0180
46 : NITROGEN	molar %	0.0000		0.0000
1021 : METHANOL	molar %	0.0014		0.0014
2 : METHANE	molar %	0.1521		0.1521
3 : ETHANE	molar %	0.2370		0.2370
4 : PROPANE	molar %	1.1010		1.1010
5 : I-BUTANE	molar %	0.3090		0.3090
6 : N-BUTANE	molar %	1.7150		1.7150
7 : I-PENTANE	molar %	0.8760		0.8760
8 : N-PENTANE	molar %	1.2910		1.2910
36 : CYCLOPENTANE	molar %	1.2017		1.2017
10 : N-HEXANE	molar %	4.9564		4.9564
38 : CYCLOHEXANE	molar %	2.1817		2.1817
1159 : ISOHEXANE	molar %	9.8703		9.8703
11 : N-HEPTANE	molar %	13.1467		13.1467
39 : METHYLCYCLOHEXAN	molar %	4.2063		4.2063
82 : 2,2,4-TRIMETHYLP	molar %	1.1468		1.1468
40 : BENZENE	molar %	0.7897		0.7897
41 : TOLUENE	molar %	1.9733		1.9733
45 : ETHYL BENZENE	molar %	0.1643		0.1643
42 : O-XYLENE	molar %	0.6941		0.6941
12 : N-OCTANE	molar %	11.7874		11.7874
13 : N-NONANE	molar %	12.8190		12.8190
44 : P-XYLENE	molar %	0.3840		0.3840
43 : M-XYLENE	molar %	0.4037		0.4037
15 : N-UNDECANE	molar %	24.6433		24.6433
16 : N-DODECANE	molar %	3.9307		3.9307
Total	molar %	100		100
Mass Flowrate By Component				
49 : CARBON DIOXIDE	lb/hr	0.0068		0.0068
46 : NITROGEN	lb/hr	0.0000		0.0000
1021 : METHANOL	lb/hr	0.0004		0.0004
2 : METHANE	lb/hr	0.0209		0.0209
3 : ETHANE	lb/hr	0.0611		0.0611
4 : PROPANE	lb/hr	0.4160		0.4160
5 : I-BUTANE	lb/hr	0.1539		0.1539
6 : N-BUTANE	lb/hr	0.8541		0.8541
7 : I-PENTANE	lb/hr	0.5416		0.5416
8 : N-PENTANE	lb/hr	0.7981		0.7981
36 : CYCLOPENTANE	lb/hr	0.7222		0.7222
10 : N-HEXANE	lb/hr	3.6599		3.6599
38 : CYCLOHEXANE	lb/hr	1.5733		1.5733
1159 : ISOHEXANE	lb/hr	7.2885		7.2885
11 : N-HEPTANE	lb/hr	11.2880		11.2880
39 : METHYLCYCLOHEXAN	lb/hr	3.5389		3.5389
82 : 2,2,4-TRIMETHYLP	lb/hr	1.1225		1.1225
40 : BENZENE	lb/hr	0.5286		0.5286
41 : TOLUENE	lb/hr	1.5580		1.5580
45 : ETHYL BENZENE	lb/hr	0.1495		0.1495
42 : O-XYLENE	lb/hr	0.6314		0.6314
12 : N-OCTANE	lb/hr	11.5376		11.5376
13 : N-NONANE	lb/hr	14.0882		14.0882

Stream Number		1	2	3
Stream Name		Feed	0 psig vapor	0 psig liquid
44 : P-XYLENE	lb/hr	0.3494		0.3494
43 : M-XYLENE	lb/hr	0.3672		0.3672
15 : N-UNDECANE	lb/hr	33.0068		33.0068
16 : N-DODECANE	lb/hr	5.7372		5.7372
Total	lb/hr	100.0000		100.0000
Mass Composition By Component				
49 : CARBON DIOXIDE	mass %	0.0068		0.0068
46 : NITROGEN	mass %	0.0000		0.0000
1021 : METHANOL	mass %	0.0004		0.0004
2 : METHANE	mass %	0.0209		0.0209
3 : ETHANE	mass %	0.0611		0.0611
4 : PROPANE	mass %	0.4160		0.4160
5 : I-BUTANE	mass %	0.1539		0.1539
6 : N-BUTANE	mass %	0.8541		0.8541
7 : I-PENTANE	mass %	0.5416		0.5416
8 : N-PENTANE	mass %	0.7981		0.7981
36 : CYCLOPENTANE	mass %	0.7222		0.7222
10 : N-HEXANE	mass %	3.6599		3.6599
38 : CYCLOHEXANE	mass %	1.5733		1.5733
1159 : ISOHEXANE	mass %	7.2885		7.2885
11 : N-HEPTANE	mass %	11.2880		11.2880
39 : METHYLCYCLOHEXAN	mass %	3.5389		3.5389
82 : 2,2,4-TRIMETHYLP	mass %	1.1225		1.1225
40 : BENZENE	mass %	0.5286		0.5286
41 : TOLUENE	mass %	1.5580		1.5580
45 : ETHYL BENZENE	mass %	0.1495		0.1495
42 : O-XYLENE	mass %	0.6314		0.6314
12 : N-OCTANE	mass %	11.5376		11.5376
13 : N-NONANE	mass %	14.0882		14.0882
44 : P-XYLENE	mass %	0.3494		0.3494
43 : M-XYLENE	mass %	0.3672		0.3672
15 : N-UNDECANE	mass %	33.0068		33.0068
16 : N-DODECANE	mass %	5.7372		5.7372
Total	mass %	100		100
VOC Emissions in Flash Gas				
100 lb/h Feed Basis (Simulation)				
Oil Projected Production	lb/hr		100.0000	*(Stream 3 Total Flow)*
Total VOC	lb/hr		0.0000	*(Stream 2 VOC)*
(Total VOC is the sum of the flash gas (Stream 2) component flowrates of propane and heavier, includes Methanol)				
Scaled to Actual Annual Oil Projected Production				
Annual oil projected production		bbl/year	92,027	*(from p. 3)*
		lb/yr	27,593,970	*(from p. 3)*
			lb/yr	tpy
Total VOC			0	0.00

$$Total\ VOC = (WinSim\ Feed\ Basis\ Total\ VOC \times Scaled\ Annual\ Oil\ Production(lb/yr)) / (Sim\ Feed\ Basis\ Oil\ Production)$$

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

Identification		
User Identification:	Elmo 21-16-14-1CH	
City:	Cheyenne	
State:	Wyoming	
Company:	Cirque Resources	
Type of Tank:	Vertical Fixed Roof Tank	
Description:		
Tank Dimensions		
Shell Height (ft):		20.00
Diameter (ft):		12.00
Liquid Height (ft) :		19.00
Avg. Liquid Height (ft):		9.50
Volume (gallons):		16,074.56
Turnovers:		40.08
Net Throughput(gal/yr):		644,189.00
Is Tank Heated (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	Gray/Light	
Shell Condition	Good	
Roof Color/Shade:	Gray/Light	
Roof Condition:	Good	
Roof Characteristics		
Type:	Dome	
Height (ft)		0.00
Radius (ft) (Dome Roof)		0.00
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

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

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

Elmo 21-16-14-1CH - Vertical Fixed Roof Tank
Cheyenne, Wyoming

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 7)	All	52.84	43.08	62.60	47.84	3.0054	2.4401	3.6730	68.0000			92.00	Option 4: RVP=7, ASTM Slope=3
2,2,4-Trimethylpentane (isooctane)						0.4829	0.3585	0.6417	114.2300	0.0097	0.0021	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						0.9542	0.7163	1.2545	78.1100	0.0053	0.0023	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.0842	0.0587	0.1187	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						1.5831	1.2100	2.0463	86.1700	0.0368	0.0262	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Toluene						0.2631	0.1907	0.3578	92.1300	0.0157	0.0019	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						3.1901	3.1647	3.1649	67.4892	0.9175	0.9671	91.95	
Xylene (-m)						0.0699	0.0486	0.0990	106.1700	0.0037	0.0001	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Xylene (-o)						0.0547	0.0377	0.0780	106.1700	0.0063	0.0002	106.17	Option 2: A=6.998, B=1474.679, C=213.69
Xylene (-p)						0.0756	0.0528	0.1064	106.1700	0.0035	0.0001	106.17	Option 2: A=7.02063, B=1474.403, C=217.773

Gasoline RVP is next highest RVP choice in EPA Tanks relative to RVP of oil sample on p. 19

Liquid Mass Fraction of BTEX and HAP components are input in EPA Tanks based on mass composition of simulated oil stream (Stream 3) on p. 8. If WinSim predicts no flash gas (Stream 2), use the wt% concentrations provided on p. 13.

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

Emissions Report for: Annual

Elmo 21-16-14-1CH - Vertical Fixed Roof Tank
Cheyenne, Wyoming

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 7)	2,868.96	1,301.99	4,170.95
Hexane (-n)	75.16	34.11	109.27
2,2,4-Trimethylpentane (isooctane)	6.05	2.74	8.79
Benzene	6.54	2.97	9.51
Toluene	5.32	2.41	7.73
Ethylbenzene	0.16	0.07	0.24
Xylene (-m)	0.33	0.15	0.48
Xylene (-o)	0.45	0.20	0.65
Xylene (-p)	0.34	0.16	0.50
Unidentified Components	2,774.60	1,259.17	4,033.77

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

MAIN PAGE

PROJECT NO. :	201409086	ANALYSIS NO. :	01
COMPANY NAME :	CIRQUE RESOURCES	ANALYSIS DATE:	SEPTEMBER 16, 2014
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 15, 2014
PRODUCER :		CYLINDER NO. :	5041
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	OIL TREATER 16:20 ELMO 21-16-14-1CH		EMPACT
FIELD DATA		SAMPLE TEMP. :	73
SAMPLE PRES. :	<5#	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE; WELL SHUT-IN FOR SCHEDULED MAINTENANCE		

COMPONENT	MOLE %	MASS %	VOL %
ALCOHOLS	0.0014	0.0009	0.0009
NITROGEN (AIR)	0.0000	0.0000	0.0000
CARBON DIOXIDE	0.0180	0.0068	0.0062
METHANE	0.1520	0.0210	0.0524
ETHANE	0.2370	0.0614	0.1290
PROPANE	1.1010	0.4180	0.6170
I-BUTANE	0.3090	0.1546	0.2055
N-BUTANE	1.7150	0.8581	1.0995
I-PENTANE	0.8761	0.5441	0.6519
N-PENTANE	1.2910	0.8019	0.9508
HEXANES PLUS	94.2995	97.1332	96.2868
TOTALS	100.0000	100.0000	100.0000

BTEX COMPONENTS	**MOLE%**	**MASS%**
BENZENE	0.7897	0.5310
TOLUENE	1.9733	1.5653
ETHYLBENZENE	0.1643	0.1502
XYLENE	1.4818	1.3544
TOTAL BTEX	4.4091	3.6009

(CALC: GPA STD 2145-94 & TP-17 @14.696 & 60 F)

	TOTAL SAMPLE	**C6+ FRACTION**	
Specific Gravity (H2O=1) =	0.7491	0.7555	60/60
API Gravity =	57.39	55.79	60/60
Molecular Weight =	116.16	120.283	
Absolute Density =	6.25	6.29	LBS/GAL
Heating Value Liq. Idl Gas=	127307	128148	BTU/GAL
Vapor/Liquid =	20.54	20.00	CUFT/GAL
Vapor Pressure =	14.52	1.51	PSIA @100 F

**(DETAILED HYDROCARBON ANALYSIS/NJ 1993) ; ASTM D6730*

NOTE: Sample Temp., Sample Press. and Component Mole % from this page are used as inputs in the WinSim flash model. Speciated xylenes are found on page 16. Average Molecular Weight of Decanes plus on this page is used to speciate decanes plus hydrocarbons.

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

E & P TANK / GLYCALC INFORMATION

PROJECT NO. :	201409086	ANALYSIS NO. :	01
COMPANY NAME :	CIRQUE RESOURCES	ANALYSIS DATE:	SEPTEMBER 16, 2014
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 15, 2014
PRODUCER :		CYLINDER NO. :	5041
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	OIL TREATER 16:20 ELMO 21-16-14-1CH		EMPACT
FIELD DATA		SAMPLE TEMP. :	73
SAMPLE PRES. :	<5#	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE; WELL SHUT-IN FOR SCHEDULED MAINTENANCE		

COMPONENT	Mole %		Wt %		LV %	
CARBON DIOXIDE	0.0180		0.0068		0.0062	
NITROGEN (AIR)	0.0000		0.0000		0.0000	
METHANE	0.1520		0.0210		0.0524	
ETHANE	0.2370		0.0614		0.1290	
PROPANE	1.1010		0.4180		0.6170	
I-BUTANE	0.3090		0.1546		0.2055	
N-BUTANE	1.7150		0.8581		1.0995	
I-PENTANE	0.8761		0.5441		0.6519	
N-PENTANE	1.2910		0.8019		0.9508	
CYCLOPENTANE (N-C5)	1.2017		0.7255		0.7142	
N-HEXANE	4.9564		3.6761		4.1451	
CYCLOHEXANE (OTHER C6)	2.1817		1.5807		1.5098	
OTHER HEXANES	9.8703		7.2417		7.7160	
OTHER HEPTANES	13.1467		11.2390		11.7211	
METHYLCYCLOHEXANE (OTHER C7)	4.2063		3.5556		3.4345	
2,2,4 TRIMETHYLPENTANE	1.1468		0.9694		0.9628	
BENZENE	0.7897		0.5310		0.4501	
TOLUENE	1.9733		1.5653		1.3398	
ETHYLBENZENE	0.1643		0.1502		0.1285	
XYLENES	1.4818		1.3544		1.1572	
OTHER OCTANES	11.7874		11.6425		11.7863	
OCTANES PLUS	----	55.9734	----	67.0183	----	65.2562
NONANES	12.8191		13.9788		13.7902	
DECANES PLUS	28.5740		38.9230		37.4312	
SUB TOTAL	99.9986		99.9991		99.9991	
ALCOHOLS	0.0014		0.0009		0.0009	
TOTAL	100.0000		100.0000		100.0000	

API Gravity	=	**57.39**	60/60
Vapor Pressure	=	**14.52**	PSIA & 100 F
Average Molecular Weight of Decanes plus	=	**158.23**	
Average Specific Gravity of Decanes plus	=	**0.7790**	

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

BY CARBON NUMBER

PROJECT NO. :	201409086	ANALYSIS NO. :	01
COMPANY NAME :	CIRQUE RESOURCES	ANALYSIS DATE:	SEPTEMBER 16, 2014
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 15, 2014
PRODUCER :		CYLINDER NO. :	5041
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	OIL TREATER 16:20		EMPACT
	ELMO 21-16-14-1CH		
FIELD DATA		SAMPLE TEMP. :	73
SAMPLE PRES. :	<5#	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE; WELL SHUT-IN FOR SCHEDULED MAINTENANCE		

COMPONENT / CARBON NUMBER		MOLE%	MASS %	VOLUME %
ALCOHOLS		0.0014	0.0009	0.0009
NITROGEN		0.0000	0.0000	0.0000
CARBON DIOXIDE		0.0180	0.0068	0.0062
	C1	0.1520	0.0210	0.0524
	C2	0.2370	0.0614	0.1290
	C3	1.1010	0.4180	0.6170
	C4	2.0240	1.0127	1.3050
	C5	3.3688	2.0715	2.3169
	C6	17.7981	13.0295	13.8210
	C7	19.3263	16.3599	16.4954
	C8	14.5803	14.1165	14.0348
	C9	12.8191	13.9788	13.7902
	C10	10.9452	12.8767	12.4156
	C11	6.4739	8.2627	7.7680
	C12	3.5679	4.9067	4.7254
	C13	2.8467	4.3782	4.2511
	C14	2.3676	4.0436	3.9641
	C15	1.7109	3.1287	3.0319
	C16	0.4874	0.9502	0.9149
	C17	0.0687	0.1423	0.1366
	C18	0.0869	0.1904	0.1822
	C19	0.0188	0.0435	0.0414
	C20	0.0000	0.0000	0.0000
	C21	0.0000	0.0000	0.0000
	C22	0.0000	0.0000	0.0000
	C23	0.0000	0.0000	0.0000
	C24	0.0000	0.0000	0.0000
	C25	0.0000	0.0000	0.0000
	C26	0.0000	0.0000	0.0000
	C27	0.0000	0.0000	0.0000
	C28	0.0000	0.0000	0.0000
	C29	0.0000	0.0000	0.0000
	C30+	0.0000	0.0000	0.0000
	Total	100.0000	100.0000	100.0000

EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201409086	ANALYSIS NO. :	01
COMPANY NAME :	CIRQUE RESOURCES	ANALYSIS DATE:	SEPTEMBER 16, 2014
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 15, 2014
PRODUCER :		CYLINDER NO. :	5041
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	OIL TREATER 16:20		EMPACT
	ELMO 21-16-14-1CH		
FIELD DATA		SAMPLE TEMP. :	73
SAMPLE PRES. :	<5#	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE		

COMPONENT	PIANO #	MOLE %	MASS %	VOL %
Nitrogen	NHC	0.0000	0.0000	0.0000
Carbon Dioxide	NHC	0.0180	0.0068	0.0062
Methane	P1	0.1520	0.0210	0.0524
Ethane	P2	0.2370	0.0614	0.1290
Propane	P3	1.1010	0.4180	0.6170
i-Butane	I4	0.3090	0.1546	0.2055
n-Butane	P4	1.7150	0.8581	1.0995
2,2-Dimethylpropane	I5	0.0041	0.0025	0.0031
i-Pentane	I5	0.8720	0.5416	0.6488
n-Pentane	P5	1.2910	0.8019	0.9508
t-Butanol	X4	0.0014	0.0009	0.0009
2,2-Dimethylbutane	I6	0.0314	0.0233	0.0267
Cyclopentane	N5	1.2017	0.7255	0.7142
2,3-Dimethylbutane	I6	0.3354	0.2488	0.2791
2-Methylpentane	I6	2.8295	2.0992	2.3882
3-Methylpentane	I6	2.0094	1.4908	1.6677
n-Hexane	P6	4.9564	3.6761	4.1451
2,2-Dimethylpentane	I7	0.0169	0.0146	0.0160
Methylcyclopentane	N6	4.6646	3.3796	3.3543
2,4-Dimethylpentane	I7	0.2246	0.1937	0.2143
2,2,3-Trimethylbutane	I7	0.0540	0.0466	0.0502
Benzene	A6	0.7897	0.5310	0.4501
3,3-Dimethylpentane	I7	0.0090	0.0078	0.0084
Cyclohexane	N6	2.1817	1.5807	1.5098
2-Methylhexane	I7	0.9210	0.7945	0.8713
2,3-Dimethylpentane	I7	0.5868	0.5062	0.5393
1,1-Dimethylcyclopentane	N7	0.4914	0.4154	0.4094
3-Methylhexane	I7	1.5832	1.3657	1.4752
1c,3-Dimethylcyclopentane	N7	1.2665	1.0706	1.0689
1t,3-Dimethylcyclopentane	N7	1.1468	0.9694	0.9628
3-Ethylpentane	I7	0.1589	0.1371	0.1457
1t,2-Dimethylcyclopentane	N7	2.2887	1.9346	1.9146
2,2,4-Trimethylpentane	I8	0.1163	0.1144	0.1224
n-Heptane	P7	3.5234	3.0393	3.3046
1c,2-Dimethylcyclopentane	N7	0.2184	0.1846	0.1778
Methylcyclohexane	N7	4.2063	3.5556	3.4345
2,2-Dimethylhexane	I8	0.8742	0.8597	0.9189
Ethylcyclopentane	N7	0.4571	0.3864	0.3750
2,5-Dimethylhexane	I8	0.0917	0.0902	0.0967
2,2,3-Trimethylpentane	I8	0.0395	0.0388	0.0403
2,4-Dimethylhexane	I8	0.1593	0.1567	0.1671
1c,2t,4-Trimethylcyclopentane	N8	0.5159	0.4984	0.4856

3,3-Dimethylhexane	I8	0.0575	0.0565	0.0592
2,3,4-Trimethylpentane	I8	0.1305	0.1283	0.1326
2,3,3-Trimethylpentane	I8	0.0038	0.0037	0.0038
Toluene	A7	1.9733	1.5653	1.3398
2,3-Dimethylhexane	I8	0.2854	0.2807	0.2933
2-Methyl-3-ethylpentane	I8	0.1169	0.1150	0.1189
1,1,2-Trimethylcyclopentane	N8	0.0436	0.0421	0.0405
2-Methylheptane	I8	1.2436	1.2229	1.3007
4-Methylheptane	I8	0.2668	0.2624	0.2723
3-Methyl-3-ethylpentane	I8	0.1684	0.1656	0.1694
3,4-Dimethylhexane	I8	0.1013	0.0996	0.1029
1c,2c,4-Trimethylcyclopentane	N8	0.0513	0.0496	0.0478
1c,3-Dimethylcyclohexane	N8	0.0397	0.0384	0.0373
3-Methylheptane	I8	0.4103	0.4035	0.4255
1c,2t,3-Trimethylcyclopentane	N8	1.2099	1.1688	1.1286
3-Ethylhexane	I8	0.2348	0.2309	0.2409
1t,4-Dimethylcyclohexane	N8	0.6219	0.6008	0.5861
1,1-Dimethylcyclohexane	N8	0.1419	0.1371	0.1306
3c-Ethylmethylcyclopentane	N8	0.0073	0.0071	0.0069
3t-Ethylmethylcyclopentane	N8	0.2083	0.2012	0.1952
2t-Ethylmethylcyclopentane	N8	0.1719	0.1661	0.1607
1,1-Methylethylcyclopentane	N8	0.5808	0.5611	0.5346
2,2,4-Trimethylhexane	I9	0.0747	0.0825	0.0858
1t,2-Dimethylcyclohexane	N8	0.7712	0.7450	0.7145
1t,3-Dimethylcyclohexane	N8	0.0026	0.0025	0.0024
UnknownC7s	U7	0.2000	0.1725	0.1876
n-Octane	P8	1.9840	1.9510	2.0652
1c,4-Dimethylcyclohexane	N8	0.7791	0.7526	0.7153
i-Propylcyclopentane	I8	0.0768	0.0742	0.0711
2,4,4-Trimethylhexane	I9	0.0286	0.0316	0.0326
2,2,3,4-Tetramethylpentane	I9	0.0207	0.0229	0.0237
2,3,4-Trimethylhexane	I9	0.0262	0.0289	0.0298
1c,2-Dimethylcyclohexane	N8	0.1482	0.1432	0.1338
2,3,5-Trimethylhexane	I9	0.1481	0.1635	0.1685
2,2-Dimethylheptane	I9	0.0189	0.0209	0.0219
1,1,4-Trimethylcyclohexane	N9	0.9758	1.0605	1.0223
2,2,3-Trimethylhexane	I9	0.3819	0.4217	0.4302
2,4-Dimethylheptane	I9	0.0288	0.0318	0.0331
4,4-Dimethylheptane	I9	0.0694	0.0766	0.0797
Ethylcyclohexane	N8	0.6141	0.5932	0.5604
n-Propylcyclopentane	N8	0.2174	0.2100	0.2012
1c,3c,5-Trimethylcyclohexane	N9	0.0450	0.0489	0.0471
2,5-Dimethylheptane	I9	0.0892	0.0985	0.1022
3,3-Dimethylheptane	I9	0.1139	0.1258	0.1306
3,5-Dimethylheptane	I9	0.0647	0.0714	0.0741
2,6-Dimethylheptane	I9	0.0688	0.0760	0.0797
1,1,3-Trimethylcyclohexane	N9	0.2024	0.2200	0.2121
Ethylbenzene	A8	0.1643	0.1502	0.1285
1c,2t,4t-Trimethylcyclohexane	N9	0.6413	0.6970	0.6591
2,3-Dimethylheptane	I9	0.9567	1.0563	1.0825
1,3-Dimethylbenzene (m-Xylene)	A8	0.4036	0.3689	0.3175
1,4-Dimethylbenzene (p-Xylene)	A8	0.3841	0.3511	0.3032
3,4-Dimethylheptane	I9	0.0935	0.1032	0.1050
3,4-Dimethylheptane (2)	I9	0.1890	0.2087	0.2123
4-Ethylheptane	I9	0.0429	0.0474	0.0493
4-Methyloctane	I9	0.2457	0.2713	0.2801
2-Methyloctane	I9	0.2769	0.3057	0.3187
1c,2t,4c-Trimethylcyclohexane	I9	0.0972	0.1073	0.1100
3-Ethylheptane	I9	0.0603	0.0666	0.0682
3-Methyloctane	I9	0.4197	0.4634	0.4783
3,3-Diethylpentane	I9	0.0894	0.0987	0.0973
1c,2t,3-Trimethylcyclohexane	N9	0.0914	0.0993	0.0939
1,1,2-Trimethylcyclohexane	N9	0.0653	0.0710	0.0671
1,2-Dimethylbenzene (o-Xylene)	A8	0.6941	0.6344	0.5365
i-Butylcyclopentane	N9	0.3075	0.3342	0.3185
UnknownC8s	U8	0.4480	0.4406	0.4664
n-Nonane	P9	1.5676	1.7309	1.7944
1,1-Methylethylcyclohexane	N9	0.6198	0.6844	0.7117
i-Propylbenzene	A9	0.4392	0.4544	0.3916
i-Propylcyclohexane	N9	0.1365	0.1483	0.1376
2,2-Dimethyloctane	I10	0.0630	0.0772	0.0777
2,4-Dimethyloctane	I10	0.0870	0.1066	0.1073
2,6-Dimethyloctane	I10	0.0167	0.0205	0.0213
2,5-Dimethyloctane	I10	0.0641	0.0785	0.0790

n-Butylcyclopentane	N9	0.2201	0.2658	0.2476
3,3-Dimethyloctane	I10	0.0984	0.1205	0.1213
n-Propylbenzene	A9	0.4440	0.4594	0.3959
3,6-Dimethyloctane	I10	0.2301	0.2819	0.2837
3-Methyl-5-ethylheptane	I10	0.4219	0.4658	0.4776
1,3-Methylethylbenzene	A9	0.2948	0.3050	0.2607
1,4-Methylethylbenzene	A9	0.2902	0.3003	0.2567
1,3,5-Trimethylbenzene	A9	0.1126	0.1165	0.1003
2,3-Dimethyloctane	I10	0.0548	0.0671	0.0675
5-Methylnonane	I10	0.1781	0.2181	0.2215
1,2-Methylethylbenzene	A9	0.3215	0.3327	0.2828
2-Methylnonane	I10	0.2108	0.2582	0.2645
3-Ethyloctane	I10	0.0615	0.0753	0.0758
3-Methylnonane	I10	0.2293	0.2809	0.2850
1,2,4-Trimethylbenzene	A9	0.0501	0.0518	0.0440
t-Butylbenzene	A10	0.6210	0.7176	0.6168
i-Butylcyclohexane	N10	0.2400	0.2898	0.2657
1t-Methyl-2-n-propylcyclohexane	I10	0.0540	0.0596	0.0611
i-Butylbenzene	A10	0.0468	0.0541	0.0472
sec-Butylbenzene	A10	0.0418	0.0483	0.0417
UnknownC9s	U9	2.1014	2.3203	2.4055
n-Decane	P10	1.2676	1.5526	1.5825
1,2,3-Trimethylbenzene	A9	0.2874	0.2974	0.2477
1,3-Methyl-i-propylbenzene	A10	0.1000	0.1035	0.0880
1,4-Methyl-i-propylbenzene	A10	0.1474	0.1525	0.1297
Sec-Butylcyclohexane	N10	0.4062	0.4905	0.4492
1,2-Methyl-i-propylbenzene	A10	0.1979	0.2287	0.1943
3-Ethylnonane	I10	0.0517	0.0633	0.0648
1,3-Diethylbenzene	A10	0.1739	0.2009	0.1731
1,3-Methyl-n-propylbenzene	A10	0.0470	0.0543	0.0470
1,4-Diethylbenzene	A10	0.1753	0.2026	0.1750
1,4-Methyl-n-propylbenzene	A10	0.0465	0.0537	0.0466
n-Butylbenzene	A10	0.0581	0.0671	0.0580
1,3-Dimethyl-5-ethylbenzene	A10	0.1781	0.2058	0.1772
1,2-Diethylbenzene	A10	0.0561	0.0648	0.0549
1,2-Methyl-n-propylbenzene	A10	0.1238	0.1430	0.1219
1,4-Dimethyl-2-ethylbenzene	A10	0.1164	0.1345	0.1142
1,3-Dimethyl-4-ethylbenzene	A10	0.0638	0.0737	0.0626
1,2-Dimethyl-4-ethylbenzene	A10	0.2015	0.2328	0.1982
1,3-Dimethyl-2-ethylbenzene	A10	0.1707	0.1972	0.1649
1t,2c,4-Trimethylcyclopentane	A10	0.7850	0.7583	0.7548
1,2-Dimethyl-3-ethylbenzene	A10	0.1292	0.1493	0.1246
1,2-Ethyl-i-propylbenzene	A10	0.0815	0.0942	0.0800
1,4-Methyl-t-butylbenzene	A11	0.2228	0.2574	0.2186
UnknownC10s	U10	3.2376	3.9656	4.0420
n-Undecane	P11	1.2462	1.6770	1.6856
1,4-Ethyl-i-propylbenzene	A11	0.0915	0.1057	0.0898
1,2,4,5-Tetramethylbenzene	A11	0.1574	0.1819	0.1529
1,2-Methyl-n-butylbenzene	A11	0.1039	0.1201	0.1020
1,2,3,5-Tetramethylbenzene	A11	0.1997	0.2308	0.1931
1,2-Methyl-t-butylbenzene	A11	0.1226	0.1417	0.1204
5-Methylindan	A11	0.0258	0.0378	0.0376
4-Methylindan	A11	0.0173	0.0254	0.0253
1,2-Ethyl-n-propylbenzene	A11	0.1817	0.2100	0.1784
2-Methylindan	A11	0.1087	0.1594	0.1585
1,3-Methyl-n-butylbenzene	A11	0.1439	0.1663	0.1412
1,3-Di-i-propylbenzene	A11	0.1284	0.1484	0.1260
sec-Pentylbenzene	A11	0.1520	0.1756	0.1491
n-Pentylbenzene	A11	0.0374	0.0477	0.0414
1t-M-2-(4MP)cyclopentane	P12	0.1056	0.1549	0.1540
1,2-Di-n-propylbenzene	A11	0.1363	0.1575	0.1338
1,4-Di-i-propylbenzene	A11	0.2322	0.2683	0.2279
Tetrahydronaphthalene	A10	0.1668	0.1927	0.1637
t-Decahydronaphthalene	A10	0.1186	0.1370	0.1164
Naphthalene	A10	0.1252	0.1381	0.1173
1-t-Butyl-3,5-dimethylbenzene	A12	0.0454	0.0525	0.0446
1,4-Ethyl-t-butylbenzene	A11	0.1826	0.2110	0.1792
UnknownC11s	U11	2.3734	3.1938	3.2102
n-Dodecane	P12	1.1096	1.6272	1.6176
1,3-Di-n-propylbenzene	A12	0.1049	0.1212	0.1029
1,3,5-Triethylbenzene	A12	0.0684	0.0708	0.0609
1,2,4-Triethylbenzene	A12	0.4858	0.5027	0.4272
1,4-Methyl-n-pentylbenzene	A12	0.0891	0.1030	0.0875
n-Hexylbenzene	A12	0.1722	0.2406	0.2089

1,2,3,4,5-Pentamethylbenzene	A13	0.3241	0.3745	0.3181
2-Methylnaphthalene	A11	0.3538	0.4331	0.3679
1-Methylnaphthalene	A11	0.2563	0.3138	0.2291
UnknownC12s	U12	1.3869	2.0338	2.0218
n-Tridecane	P13	0.9812	1.5573	1.5298
UnknownC13s	U13	1.5414	2.4464	2.4032
n-Tetradecane	P14	0.8370	1.4295	1.4014
UnknownC14s	U14	1.5306	2.6141	2.5627
n-Pentadecane	P15	0.3444	0.6298	0.6103
UnknownC15s	U15	1.3665	2.4989	2.4216
n-Hexadecane	P16	0.0280	0.0546	0.0526
UnknownC16s	U16	0.4594	0.8956	0.8623
n-Heptadecane	P17	0.0322	0.0667	0.0640
UnknownC17s	U17	0.0365	0.0756	0.0726
n-Octadecane	P18	0.0359	0.0787	0.0753
UnknownC18s	U18	0.0510	0.1117	0.1069
UnknownC19s	U19	0.0188	0.0435	0.0414
TOTAL		100.0000	100.0000	100.0000

CRUDE OIL ASSAY

PROJECT NO. :	201409086	ANALYSIS NO. :	02
COMPANY NAME :	CIRQUE RESOURCES	ANALYSIS DATE:	SEPTEMBER 16, 2014
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 15, 2014
PRODUCER :		CYLINDER NO. :	1L GLASS JAR
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	PRODUCTION TANK 16:25 ELMO 21-16-14-1CH		EMPACT
FIELD DATA		SAMPLE TEMP. :	73
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; WELL SHUT-IN FOR SCHEDULED MAINTENANCE		

SPECIFICATION	TEST METHOD	UNITS	RESULTS
API GRAVITY		API 60/60	33.8
RVP @100 DEG F	D323	PSIG	7.0
TOTAL SULFUR	D2622	WT %	N/A
TOTAL CHLORIDE	D4929	ug/g	N/A
ORGANIC CHLORIDE	D4929	ug/g	N/A
FLASH POINT	D93	° F	N/A
HEATING VALUE	D4809	BTU/ LB	N/A
VISUAL APPEARANCE			BLACK
BS&W	D96		
Crude Oil		VOL %	N/A
Water		VOL %	N/A
Emulsion		VOL %	N/A
Sediment		VOL %	N/A
DISTILLATION:	D86		
INITIAL POINT		DEG F	N/A
50%		DEG F	N/A
90%		DEG F	N/A
END POINT		DEG F	N/A
DISTILLATION: @TEMP	D445		
Average Centipoise 20°C			N/A
Average Centipoise 30°C			N/A
Average Centipoise 80°C			N/A
Kinetic Viscosity 20°C		cSt (mm2/s)	N/A
Kinetic Viscosity 30°C		cSt (mm2/s)	N/A
Kinetic Viscosity 80°C		cSt (mm2/s)	N/A

ND: NOT DETECTED
N/A: NO TEST PREFORMED FOR THIS PARAMETER

EMPACT Analytical Systems Inc. 365 S Main St Brighton, CO 80601 303-637-0150

Elmo 21-16-14-1CH
Associated Gas

Source Description Uncontrolled portion of associated gas

273 mcfd produced Based on 1st 30-days production

TotalBleed rate (cfh)	11,375	MW gas	28.8
Potential operating time	8,760 hr/yr	VOC wt fraction	49%
		HAP wt fraction	1.3%

Potential Emissions

Pollutant	Bleed Rate (cfh)	Hours per year	Estimated Uncontrolled Emissions (lb/hr)	Estimated Uncontrolled Emissions (tpy)	Controlled (tpy)
VOC	11,375	8,760	425.575	1864.02	37.28
HAPs	11,375	8,760	10.923	47.84	0.96

Notes

MW and VOC wt fraction based on 11/12/14 analysis of gas from the well

GAS TESTING AND MEASUREMENT
PETROLEUM LABORATORY
PHYSICAL TEST
GAS SURVEY

GAS PRODUCTION SURVEYS
BACK PRESSURE TESTS
ELECTRONIC VOLUMES
CHART INTEGRATION

THURMOND-McGLOTHLIN, INC.

THE NATURAL GAS MEASUREMENT COMPANY
309 North American Road Unit 13
Cheyenne, WY 82007
307-632-2298 OFFICE

FRACTION ANALYSIS:

COMPONENTS		MOL %	GPM 14.73
CARBON DIOXIDE	CO2	2.6639	
NITROGEN	N2	1.1168	
METHANE	C1	63.7791	
ETHANE	C2	9.7321	2.6104
PROPANE	C3	11.1161	3.0715
iso-BUTANE	IC4	1.3217	0.4338
n-BUTANE	NC4	5.0849	1.6078
iso-PENTANE	IC5	1.2301	0.4512
n-PENTANE	NC5	1.4421	0.5243
HEXANE +	NC6+	2.5132	1.0999
OXYGEN	O2	0.0000	
HYDROGEN SULFIDE:	H2S	0.0000	
	TOTAL	100.0000	

GASOLINE CONTENT @ 60F

ETHANE & HEAVIER	9.7989
PROPANE & HEAVIER	7.1885
BUTANE & HEAVIER	4.1170
PENTANE & HEAVIER	2.0754

GROSS HEATING VALUE
BTU @ 60F IDEAL 14.73

DRY	1554.0864
WET	1528.0965

SPECIFIC GRAVITY Z = 0.9938

REAL 0.9564

*Based on GPA 2145 & 2172

DATE RUN: 11/12/2014

COMPANY: Cirque
LEASE: Elmo
STATION: 134C
PILOT:
PRESSURE: 35.00 PSIG
TEMPERATURE: 103.00 F
CYLINDER: 28
ANALYSIS BY: Dakota Messenger
SECURED BY: Shane Rogers
DATE SAMPLED: 10/30/2014
RUN NUMBER: WY6890N Data1L280
SAMPLE TYPE: S

REMARKS:

H2S: 0.00 PPM
H20: lb/mmcf
RESULTS TO: Cirque

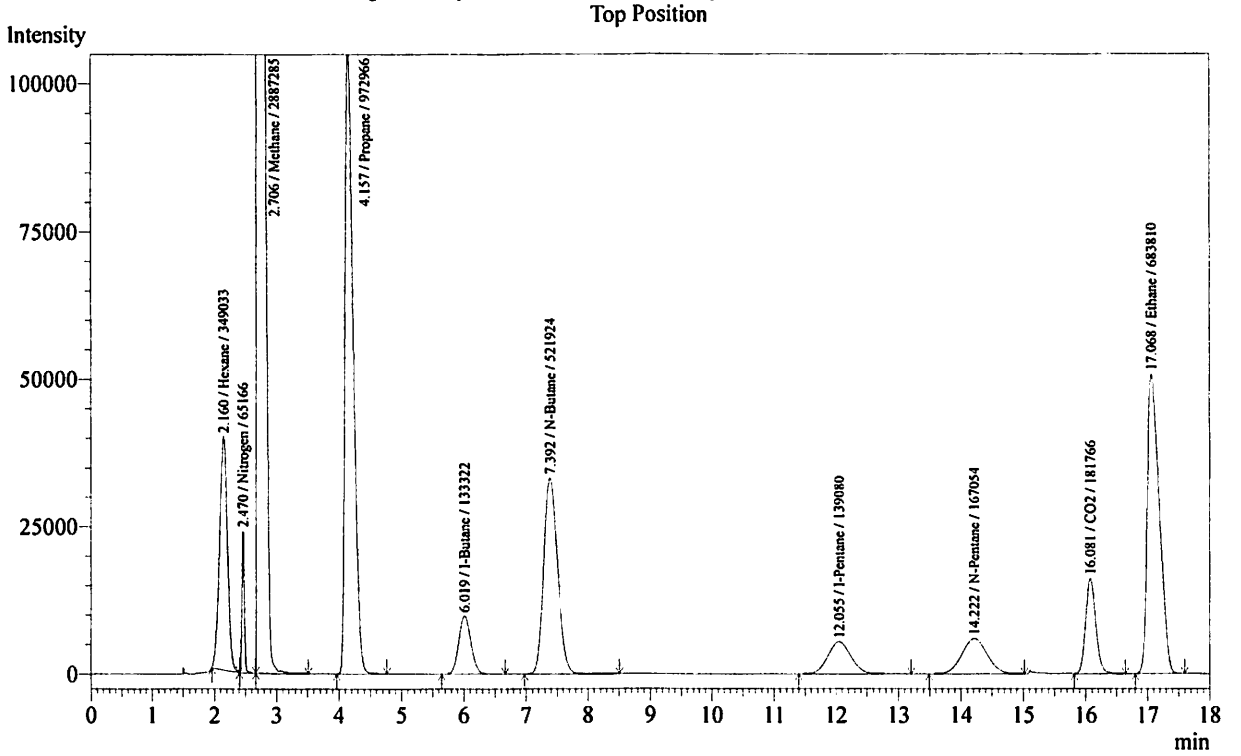
Natural Gas is one of our Most Valuable and Profitable Properties. Careful Conservation and Expert Handling will Pay Abundant Dividends.

Sample Information

Analysis Date & Time	: 11/12/2014 8:32:34 AM
User Name	: Admin
Vial#	: 1
Sample Name	: Cirque
Sample ID	: Elmo
Data Name	: C:\GCsolution\Data\Project1\Data1L280.gcd
Original Data Name	: C:\GCsolution\Data\Project1\Data1L280.gcd
Baseline Data Name	:
Method Name	: C:\GCsolution\Data\Project1\AGILENT GCM 01-30-2014.gcm
Report Name	: C:\GCsolution\Data\Project1\GC-2014AT-Nat-gas-repro.gcr
Barcode	:

$EndIf$

Chromatogram Cirque C:\GCsolution\Data\Project1\Data1L280.gcd - Channel 1
Top Position



Peak Table - Channel 1

Peak#	Ret.Time	Name	Conc.	Units	Area
1	2.160	Hexane	2.5399	%	349033
2	2.470	Nitrogen	1.1287	%	65166
3	2.706	Methane	64.4580	%	2887285
4	4.157	Propane	11.2344	%	972966
5	6.019	I-Butane	1.3358	%	133322
6	7.392	N-Butane	5.1390	%	521924
7	12.055	I-Pentane	1.2432	%	139080
8	14.222	N-Pentane	1.4574	%	167054
9	16.081	CO2	2.6923	%	181766
10	17.068	Ethane	9.8357	%	683810
Total			101.0647		6101406

Elmo 21-16-14-1CH
Flare

Source ID Number	Flare HP		
Equipment ID			
Source Description	High pressure flare for combustion of associated gas		
Equipment Usage			
Equipment Make		Potential operation	8,760 hr/yr
Equipment Model			
Serial Number			
Date in Service			
Equipment Configuration			
Emission Controls			

Fuel Heating Value	1528.1	Btu/scf
Heat Duty	20.890	MMBtu/hr
Gas flow	0.0137	MMscf/hr

Permit Status

Potential Emissions

Pollutant	Emission Factor (lb/MMscf)		Heat Duty (MMBtu/hr)	Hrs of Operation (hrs/yr)	Estimated Emissions (lb/hr)	(tpy)	Source of Emission Factor
NOx	0.14	lb/MMBtu	20.89	8760	2.92	12.81	WDEQ 3/10 Guidance Appendix B
CO	0.035	lb/MMBtu	20.89	8760	0.73	3.20	WDEQ 3/10 Guidance Appendix B
VOC*	5.5	lb/MMscf		8760	0.08	0.33	AP-42, Chapter 1.4
SOx	0.6	lb/MMscf		8760	0.008	0.04	AP-42, Chapter 1.4
PM10	7.6	lb/MMscf		8760	0.10	0.46	AP-42, Chapter 1.4

*VOC value only includes combustion emissions.
The 2% remaining uncontrolled portions of the feed streams are shown under the respective sources.

Estimating burner duty based upon streams to be controlled.
then applying a factor of 1.2

	Well Gas	Pilot*	Total
Btu/scf	1,528	1,528	
mcfd	273.0	0.4	273.4
Btu/d	417,170,345	638,133	417,808,478
MMBtu/h	17.38	0.03	17.41

* assume heat content same as well gas

Elmo 21-16-14-1CH
Flare

Source ID Number	Flare LP				
Equipment ID					
Source Description	Low pressure flare for combustion of tank emissons				
Equipment Usage					
Equipment Make			Potential operation	8,760	hr/yr
Equipment Model					
Serial Number					
Date in Service					
Equipment Configuration					
Emission Controls					

Flash gas heating value	1528.1	Btu/scf
Heat Duty	0.029	MMBtu/hr
Gas flow	0.00002	MMscf/hr

Permit Status

Potential Emissions

Pollutant	Emission Factor		Heat Duty (MMBtu/hr)	Hrs of Operation (hrs/yr)	Estimated Emissions (lb/hr)	(tpy)	Source of Emission Factor
	(lb/MMscf)						
NOx	0.14	lb/MMBtu	0.029	8760	0.004	0.018	WDEQ 3/10 Guidance Appendix B
CO	0.035	lb/MMBtu	0.029	8760	0.001	0.004	WDEQ 3/10 Guidance Appendix B
VOC*	5.5	lb/MMscf		8760	0.0001	0.0005	AP-42, Chapter 1.4
SOx	0.6	lb/MMscf		8760	0.00001	0.00005	AP-42, Chapter 1.4
PM10	7.6	lb/MMscf		8760	0.0001	0.001	AP-42, Chapter 1.4

*VOC value only includes combustion emissions.
The 2% remaining uncontrolled portions of the feed streams are shown under the respective sources.

Estimating burner duty based upon streams to be controlled.
then applying a factor of 1.2

	Tank Gas *	Pilot**	Total
Btu/scf	1,528	0	
mcfd ***	0.4	0.0	0.4
Btu/d	584,719	0	584,719
MMBtu/h	0.02	0.00	0.02

*no flash so assume heat content same as well gas
** Pilot included with flare associated gas
*** mcfd = 379.5 scf/lb-mole * total gas (lb/yr) / MW (lb/lb-mole)/365 days/yr/1000 scf/Mscf

Elmo 21-16-14-1CH
Heater Detail Sheet

Source ID Number	Treater heater					
Equipment ID						
Source Description	Heaters					
Equipment Usage						
Equipment Make		Potential operation	8760	hr/yr		
Equipment Model						
Serial Number						
Date in Service		Potential fuel usage	5.73	MMscf/yr	6.54E-04	MMscf/hr
Equipment Configuration		Each tank				
Emission Controls						

Fuel Heating Value	1528.1	Btu/scf	# of Heaters	1
Heat Rate	1.000	MMBtu/hr		

Permit Status

Potential Emissions

Pollutant	Emission Factor (lb/MMscf)	Hrs of Operation (hrs/yr)	Estimated Emissions Each burner (lb/hr)	(tpy)	All burners (tpy)	Source of Emission Factor
NOx	100	8760	0.07	0.29	0.29	AP-42, Chapter 1.4
CO	84	8760	0.05	0.24	0.24	AP-42, Chapter 1.4
VOC	5.5	8760	0.004	0.02	0.02	AP-42, Chapter 1.4
SOx	0.6	8760	0.0004	0.002	0.00	AP-42, Chapter 1.4
PM10	7.6	8760	0.005	0.02	0.02	AP-42, Chapter 1.4

Truck Loading Emissions

Elmo 21-16-14-1CH

Total Throughput = 3,863,160 gallons

Production: **252** bbl/day

S=	**0.60**		saturation factor
P=	**2.3**	psia	true vapor pressure @50 deg F for unheated tanks
M=	**50**	lb/lb-mol	molecular weight of vapors
T=	**510**	°R	temperature where °R = °F + 460
L_L=	1.69	lb/1000 gallons	Loading Losses

Total Loss= 3.26 tons VOC

controlled NA tons VOC

L_L= 12.46*S*P*M/T lb/1000 gallons

AP-42 Tables

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

Cargo Carrier	Mode Of Operation	S Factor
Tank trucks and rail tank cars	Submerged loading of a clean cargo tank	0.50
	Submerged loading: dedicated normal service	0.60
	Submerged loading: dedicated vapor balance service	1.00
	Splash loading of a clean cargo tank	1.45
	Splash loading: dedicated normal service	1.45
	Splash loading: dedicated vapor balance service	1.00

Table 7.1-2. PROPERTIES (MV, PVA, WL) OF SELECTED PETROLEUM LIQUIDS

Petroleum Liquid	vapor molecular wieght at 60 °F (lb/lb-mole)	condensate vapor density at 60 °F (lb/gal)	liquid density at 60 °F (lb/gal)	true vapor pressure (psi) at various temperatures in °F						
				40	50	60	70	80	90	100
	"M"			"P"						
Gasoline RVP 7	68.0	5.6		2.3	2.9	3.5	4.3	5.2	6.2	7.4
Crude Oil RVP 5	50	4.5	7.1	1.8	2.3	2.8	3.4	4	4.8	5.7

Elmo 21-16-14-1CH Gas Analysis

MW and VOC wt fraction based on 11/12/14 analysis of gas from the well
Heat content: 1528 Btu/scf

COMPONENTS	Measured MOLE%	MW	Measured Avg. MW	Weight %	Wt. % VOC			
HELIUM	0.00	4	0.00	0.00%				
HYDROGEN	0.00	2	0.00	0.00%				
OXYGEN/ARGON	0.00	31.98	0.00	0.00%				
NITROGEN	1.12	28.02	0.31	1.09%				
CO2	2.66	44.01	1.17	4.07%				
METHANE	63.78	16.04	10.23	35.47%				
ETHANE	9.73	30.07	2.93	10.15%				
PROPANE	11.12	44.10	4.90	17.00%	17.00%			
ISOBUTANE	1.32	58.12	0.77	2.66%	2.66%			
N-BUTANE	5.08	58.12	2.96	10.25%	10.25%			
ISOPENTANE	1.23	72.15	0.89	3.08%	3.08%			
N-PENTANE	1.44	72.15	1.04	3.61%	3.61%			
HEXANES+	2.51	145.00	3.64	12.64%	12.64%			
TOTAL	100.00							
	Calculated MW		28.84	VOC	49.2%			
	Measured SG		0.994	HAP	1.3%	HAP wt% assumed to be		
	Calculated SG		0.994			one tenth of C6+ wt%		

(MW of Hexanes+ is changed to make calculated and measured SG agree)

Fugitive Emission Factors **Elmo 21-16-14-1CH**

Total Facilities: 1

THC Leak Emission Factor (lb/day/component):

Component	Gas	Heavy Oil (≤20° API)	Light Oil (>20° API)	H_2O/Cond[2]
Connector	0.011	0.000400	0.0110	0.00580
Flanges	0.021	0.000021	0.0058	0.00015
Open Ended Lines	0.110	0.007400	0.0740	0.01300
Pump Seals	0.130		0.6900	0.00130
Valves	0.240	0.000440	0.1300	0.00520
Other[1]	0.470	0.001700	0.4000	0.74000

[1] Other includes compressor seals, pressure relief valves, dump level arms, polished rod pumps, thief hatches and miscellaneous components.

[2] Applies to streams with a water content between 50% and 99%.

Total Component Counts: *All component counts are estimated*

Component	Gas	Heavy Oil (≤20° API)	Light Oil (>20° API)	H_2O/Cond[2]
Connector	20	0	20	10
Flanges	1	0	1	0
Open Ended Lines	1	0	1	1
Pump Seals	0	0	0	0
Valves	5	0	5	2
Other[1]	1	0	1	1

Average Component Counts:

Component	Gas	Heavy Oil (≤20° API)	Light Oil (>20° API)	H_2O/Cond[2]
Connector	20	0	20	10
Flanges	1	0	1	0
Open Ended Lines	1	0	1	1
Pump Seals	0	0	0	0
Valves	5	0	5	2
Other[1]	1	0	1	1

	Gas	Heavy Oil (≤20° API)	Light Oil (>20° API)	H_2O/Cond[2]
THC Leak Factor (lb/day/site)	2.02	0.00	1.35	0.82
Percent VOCs	49%	0	100%	1%
Percent HAPs	1.3%	0	7%	0
VOC Leak Factor (total lb/day)	0.99	0.00	1.35	0.01
HAP Leak Factor (total lb/day)	0.03	0.00	0.10	0.00

2.35	VOC Fugitives per Day	(lb/day)
0.12	HAP Fugitives per Day	(lb/day)
0.43	VOC Fugitives per Year	(tpy)
0.02	HAP Fugitives per Year	(tpy)

Elmo 21-16-14-1CH
Pneumatic Devices

Source Description: Pneumatic Controllers

	Count*	Bleed Rate (cfd)	Typical Usage
Low Bleed	1	0.048	temperature, pressure, liquid level controllers
High Bleed	0		

TotalBleed rate (cfh)	0.002		MW gas	28.8
Potential operating time	8760	hr/yr	VOC wt fraction	49%
			HAP wt fraction	1.3%

Potential Emissions

Pollutant	Bleed Rate (cfh)	Hours per year	Estimated Emissions (lb/hr)	Estimated Emissions (tpy)	Notes
VOC	0.002	8760	7.48E-05	3.28E-04	
HAPs	0.002	8760	1.92E-06	8.41E-06	

Notes

MW and VOC wt fraction based on 11/12/14 analysis of gas from the well

WinSim inputs are shown in bold italics and have a box around them.

STREAM SUMMARY

Stream Number		1	2	3
Stream Name		Feed	0 psig vapor	0 psig liquid
Thermo Method Option		GLOBAL	GLOBAL	GLOBAL
Vapor Fraction		0	1	0
Temperature	F	*73*	*45.6*	*45.6*
Pressure	psia	*16.76*	*11.76*	*11.76*
Enthalpy	Btu/hr	-13573.7868		-14920.1033
Entropy	Btu/hr/R	-14.0958		-16.6860
Vapor Density	lb/ft3			
Liquid 1 Density	lb/ft3	42.3820		42.9030
Liquid 1 Specific Gravity	60F@STP	0.7191		0.7191
Vapor Cp	Btu/lbmol/R			
Vapor Cv	Btu/lbmol/R			
Liquid 1 Cp	Btu/lbmol/R	58.2536		56.4326
Vapor Viscosity	cP			
Liquid 1 Viscosity	cP	0.5099		0.5355
Vapor Thermal Conductivity	Btu/hr/ft/R			
Liquid 1 Thermal Conductivity	Btu/hr/ft/R	0.0654		0.0647
Vapor Flowrate	MMSCF/day@STP			
Liquid 1 Flowrate	bbl/day@STP	9.5308		9.5308
Liquid 2 Flowrate				
Molecular Weight		116.6970		116.6970
Molar Flowrate	lbmol/hr	0.8569		0.8569
Mass Flowrate	lb/hr	*100.0000*		100.0000
Note: All Liquid 1 Phase calculations exclude Free Water				
Molar Flowrate By Component				
49 : CARBON DIOXIDE	lbmol/hr	0.0002		0.0002
46 : NITROGEN	lbmol/hr	0.0000		0.0000
1021 : METHANOL	lbmol/hr	0.0000		0.0000
2 : METHANE	lbmol/hr	0.0013		0.0013
3 : ETHANE	lbmol/hr	0.0020		0.0020
4 : PROPANE	lbmol/hr	0.0094		0.0094
5 : I-BUTANE	lbmol/hr	0.0026		0.0026
6 : N-BUTANE	lbmol/hr	0.0147		0.0147
7 : I-PENTANE	lbmol/hr	0.0075		0.0075
8 : N-PENTANE	lbmol/hr	0.0111		0.0111
36 : CYCLOPENTANE	lbmol/hr	0.0103		0.0103
10 : N-HEXANE	lbmol/hr	0.0425		0.0425
38 : CYCLOHEXANE	lbmol/hr	0.0187		0.0187
1159 : ISOHEXANE	lbmol/hr	0.0846		0.0846
11 : N-HEPTANE	lbmol/hr	0.1127		0.1127
39 : METHYLCYCLOHEXAN	lbmol/hr	0.0360		0.0360
82 : 2,2,4-TRIMETHYLP	lbmol/hr	0.0098		0.0098
40 : BENZENE	lbmol/hr	0.0068		0.0068
41 : TOLUENE	lbmol/hr	0.0169		0.0169
45 : ETHYL BENZENE	lbmol/hr	0.0014		0.0014
42 : O-XYLENE	lbmol/hr	0.0059		0.0059
12 : N-OCTANE	lbmol/hr	0.1010		0.1010
13 : N-NONANE	lbmol/hr	0.1098		0.1098
44 : P-XYLENE	lbmol/hr	0.0033		0.0033
43 : M-XYLENE	lbmol/hr	0.0035		0.0035
15 : N-UNDECANE	lbmol/hr	0.2112		0.2112
16 : N-DODECANE	lbmol/hr	0.0337		0.0337
Total	lbmol/hr	0.8569		0.8569

Stream Number		1	2	3
Stream Name		Feed	0 psig vapor	0 psig liquid
Molar Composition By Component				
49 : CARBON DIOXIDE	molar %	0.0180		0.0180
46 : NITROGEN	molar %	0.0000		0.0000
1021 : METHANOL	molar %	0.0014		0.0014
2 : METHANE	molar %	0.1521		0.1521
3 : ETHANE	molar %	0.2370		0.2370
4 : PROPANE	molar %	1.1010		1.1010
5 : I-BUTANE	molar %	0.3090		0.3090
6 : N-BUTANE	molar %	1.7150		1.7150
7 : I-PENTANE	molar %	0.8760		0.8760
8 : N-PENTANE	molar %	1.2910		1.2910
36 : CYCLOPENTANE	molar %	1.2017		1.2017
10 : N-HEXANE	molar %	4.9564		4.9564
38 : CYCLOHEXANE	molar %	2.1817		2.1817
1159 : ISOHEXANE	molar %	9.8703		9.8703
11 : N-HEPTANE	molar %	13.1467		13.1467
39 : METHYLCYCLOHEXAN	molar %	4.2063		4.2063
82 : 2,2,4-TRIMETHYLP	molar %	1.1468		1.1468
40 : BENZENE	molar %	0.7897		0.7897
41 : TOLUENE	molar %	1.9733		1.9733
45 : ETHYL BENZENE	molar %	0.1643		0.1643
42 : O-XYLENE	molar %	0.6941		0.6941
12 : N-OCTANE	molar %	11.7874		11.7874
13 : N-NONANE	molar %	12.8190		12.8190
44 : P-XYLENE	molar %	0.3840		0.3840
43 : M-XYLENE	molar %	0.4037		0.4037
15 : N-UNDECANE	molar %	24.6433		24.6433
16 : N-DODECANE	molar %	3.9307		3.9307
Total	molar %	100		100
Mass Flowrate By Component				
49 : CARBON DIOXIDE	lb/hr	0.0068		0.0068
46 : NITROGEN	lb/hr	0.0000		0.0000
1021 : METHANOL	lb/hr	0.0004		0.0004
2 : METHANE	lb/hr	0.0209		0.0209
3 : ETHANE	lb/hr	0.0611		0.0611
4 : PROPANE	lb/hr	0.4160		0.4160
5 : I-BUTANE	lb/hr	0.1539		0.1539
6 : N-BUTANE	lb/hr	0.8541		0.8541
7 : I-PENTANE	lb/hr	0.5416		0.5416
8 : N-PENTANE	lb/hr	0.7981		0.7981
36 : CYCLOPENTANE	lb/hr	0.7222		0.7222
10 : N-HEXANE	lb/hr	3.6599		3.6599
38 : CYCLOHEXANE	lb/hr	1.5733		1.5733
1159 : ISOHEXANE	lb/hr	7.2885		7.2885
11 : N-HEPTANE	lb/hr	11.2880		11.2880
39 : METHYLCYCLOHEXAN	lb/hr	3.5389		3.5389
82 : 2,2,4-TRIMETHYLP	lb/hr	1.1225		1.1225
40 : BENZENE	lb/hr	0.5286		0.5286
41 : TOLUENE	lb/hr	1.5580		1.5580
45 : ETHYL BENZENE	lb/hr	0.1495		0.1495
42 : O-XYLENE	lb/hr	0.6314		0.6314
12 : N-OCTANE	lb/hr	11.5376		11.5376
13 : N-NONANE	lb/hr	14.0882		14.0882

Stream Number		1	2	3
Stream Name		Feed	0 psig vapor	0 psig liquid
44 : P-XYLENE	lb/hr	0.3494		0.3494
43 : M-XYLENE	lb/hr	0.3672		0.3672
15 : N-UNDECANE	lb/hr	33.0068		33.0068
16 : N-DODECANE	lb/hr	5.7372		5.7372
Total	lb/hr	100.0000		100.0000
Mass Composition By Component				
49 : CARBON DIOXIDE	mass %	0.0068		0.0068
46 : NITROGEN	mass %	0.0000		0.0000
1021 : METHANOL	mass %	0.0004		0.0004
2 : METHANE	mass %	0.0209		0.0209
3 : ETHANE	mass %	0.0611		0.0611
4 : PROPANE	mass %	0.4160		0.4160
5 : I-BUTANE	mass %	0.1539		0.1539
6 : N-BUTANE	mass %	0.8541		0.8541
7 : I-PENTANE	mass %	0.5416		0.5416
8 : N-PENTANE	mass %	0.7981		0.7981
36 : CYCLOPENTANE	mass %	0.7222		0.7222
10 : N-HEXANE	mass %	3.6599		3.6599
38 : CYCLOHEXANE	mass %	1.5733		1.5733
1159 : ISOHEXANE	mass %	7.2885		7.2885
11 : N-HEPTANE	mass %	11.2880		11.2880
39 : METHYLCYCLOHEXAN	mass %	3.5389		3.5389
82 : 2,2,4-TRIMETHYLP	mass %	1.1225		1.1225
40 : BENZENE	mass %	0.5286		0.5286
41 : TOLUENE	mass %	1.5580		1.5580
45 : ETHYL BENZENE	mass %	0.1495		0.1495
42 : O-XYLENE	mass %	0.6314		0.6314
12 : N-OCTANE	mass %	11.5376		11.5376
13 : N-NONANE	mass %	14.0882		14.0882
44 : P-XYLENE	mass %	0.3494		0.3494
43 : M-XYLENE	mass %	0.3672		0.3672
15 : N-UNDECANE	mass %	33.0068		33.0068
16 : N-DODECANE	mass %	5.7372		5.7372
Total	mass %	100		100
VOC Emissions in Flash Gas				
100 lb/h Feed Basis (Simulation)				
Oil Projected Production	lb/hr		100.0000	*(Stream 3 Total Flow*
Total VOC	lb/hr		0.0000	*(Stream 2 VOC)*
(Total VOC is the sum of the flash gas (Stream 2) component flowrates of propane and heavier, includes Methanc				
Scaled to Actual Annual Oil Projected Production				
Annual oil projected production		bbl/year	92,027	*(from p. 3)*
		lb/yr	27,593,970	*(from p. 3)*
			lb/yr	tpy
Total VOC			0	0.00

$$Total\ VOC = (WinSim\ Feed\ Basis\ Total\ VOC \times Scaled\ Annual\ Oil\ Production(lb/yr)) / (Sim\ Feed\ Basis\ Oil\ Production)$$