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Petroleum Geology • Engineering • Hydrogeology • Regulatory Permitting

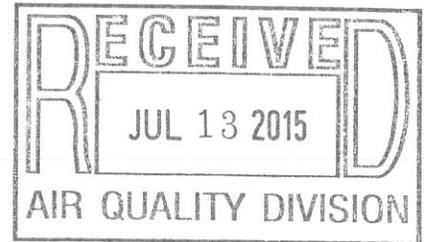
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July 10, 2015

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

RE: Peak Powder River Resources, LLC
Chapter 6 Section 2 Air Quality Permit Application
Christensen Ranch 1-23H



Dear Program Manager:

Enclosed are one hard copy and one electronic copy of the complete Air Quality Permit Application for the facility named above, prepared on behalf of our client Peak Powder River Resources, LLC. This is a new single-well facility located in Johnson County, within the "Statewide Area" defined in the Chapter 6, Section 2 Oil and Gas Production Facilities Permitting Guidance.

The First Date of Production was April 15, 2015, making this application due by July 15, 2015. The application has been prepared in accordance with the September 2013 O&G Permitting Guidance.

Please contact me if additional information or clarification is needed.

Sincerely,

Cynthia Madison
Project Engineer

Attachment
CD

Reviewer Hmb
cc: _____
Modeler _____
D.E. _____
File A0001312
IMP FID 26956



STATE OF WYOMING
Department of Environmental Quality/Air Quality Division
C6 S2 Air Quality Permit Application



Peak Powder River Resources, LLC

Christensen Ranch 1-23H

Latitude: 43.776961 Longitude: -106.075585
NW NE Section 23, Township 44N, Range 77W
Johnson County, WY

API Number 49-019-29982

ORIGINAL

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Process Description

The Christensen Ranch 1-23H is a new horizontal well producing from the Shannon Formation. It is located in Johnson County within the area specified as "Statewide" in the Chapter 6, Section 2 Oil and Gas Production Facilities Permitting Guidance (C6 S2 Guidance). It is producing from a field designated as Wildcat by the Wyoming Oil and Gas Conservation Commission

The well first produced on April 7, 2015 for one day, was shut in and did not begin producing again until April 15, 2015. For the purpose of this application, the First Date of Production (FDOP) was April 15, 2015.

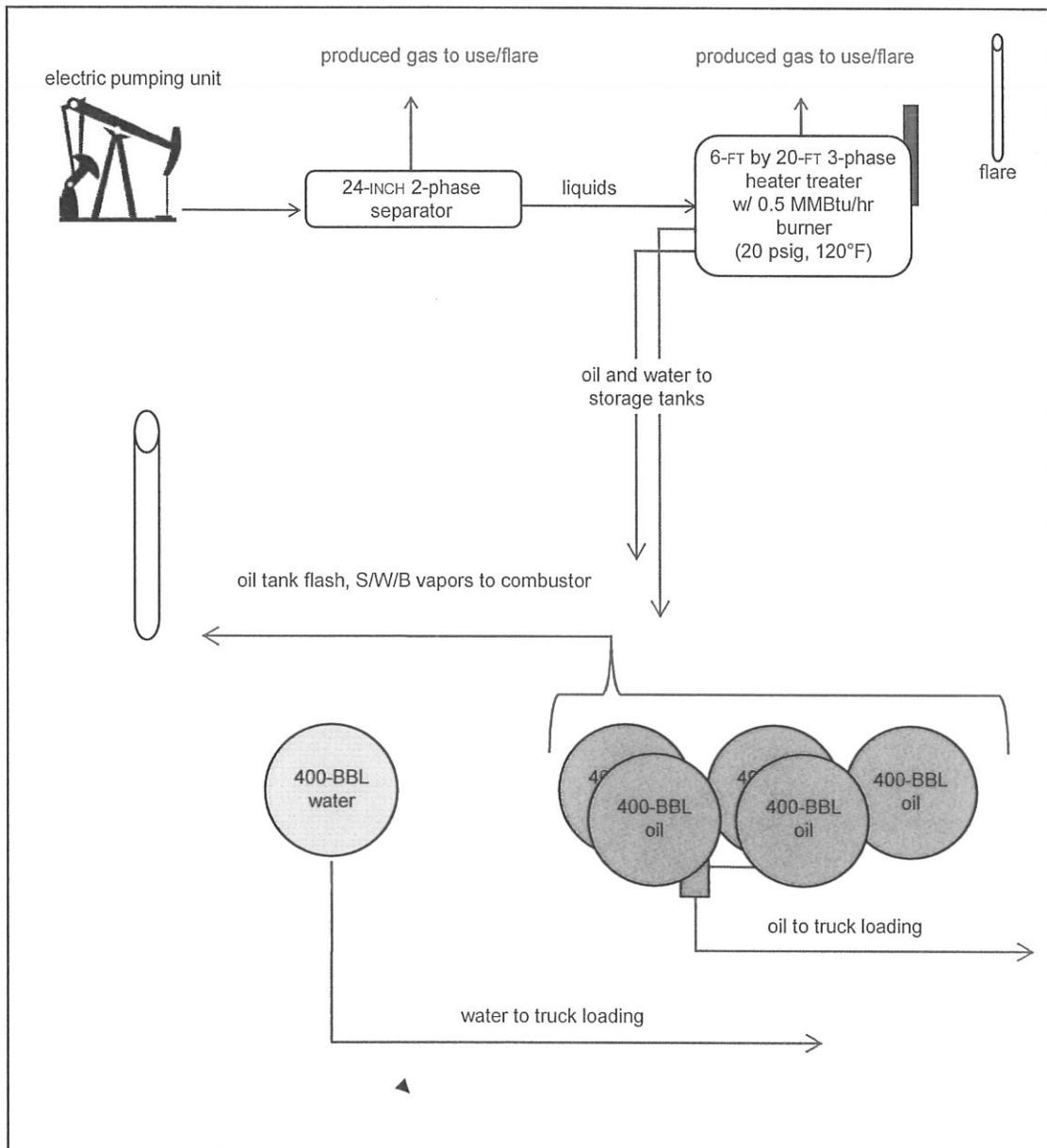
The well is produced with an electric pumping unit. Well fluids are directed into a 24-IN two-phase gas separator and then into a 6-FT by 20-FT three phase heater treater with a 0.5 million BTU per hour (MMBTU/HR) burner. Any gas separated from the liquids in the separator and treater is routed is used as fuel for the treater burner. Excess gas is routed to a 4-FT by 25-FT smokeless flare (see Pages 20-21) as no gas sales line is available. At the time of this application, the well is making minimal gas and most is used as burner fuel. Oil and water from the vessels are sent to five 400-barrel (BBL) oil tanks and one 400-BBL water tank. An electric pump is used to recycle oil and water back through production equipment when necessary. Oil tank vapors are routed to a 36-INCH by 25-FOOT LEED Fabrication combustor for at least 98% destruction of the associated volatile organic compound (VOC) and hazardous air pollutant (HAP) components in the vapors (see Pages 18-19). The by-products of combustion are carbon monoxide (CO), nitrogen oxides (NO_x) and water vapor. There are no pneumatic pumps or process controllers.

Presumptive BACT

The sources at this facility affected by the Presumptive BACT requirements in the C6 S2 Guidance are the oil tanks. Vapors from all of the oil tanks have been routed to a smokeless combustor since startup of the well and operation of the combustor is continually recorded and monitored using a SCADA type system, meeting the Presumptive BACT requirements. The combustor is designed to achieve greater than 99% destruction efficiency and is compliant with EPA NSPS 40 CFR Part 60, Subpart OOOO (see Pages 18-19). A flare used to combust excess produced gas that is not used as burner fuel and all gas produced during emergency or upset conditions is also smokeless and designed with 99% destruction efficiency (see Pages 20-21).

There are no pneumatic controllers or pumps and there are no other sources at this facility emitting ≥ 8 tons per year (TPY) of VOCs or ≥ 5 TPY of HAPs that would require a BACT analysis to be filed with this application. All Presumptive BACT requirements specified in the C6 S2 Guidance for "Statewide Area" production facilities have been met.

Process Diagram Christensen Ranch 1-23H



Emission Calculations

Flash & S/W/B

The API E&P TANK V2 model was used to estimate uncontrolled tank VOC emissions, including flash and S/W/B, of 31.6 tons per year (TPY). The model was run using the projected oil production rate of 29 BOPD (see Page 11) and an extended hydrocarbon analysis of oil sampled at the outlet of the Christensen Ranch 1-23H treater (see Pages 12-14). The model input and output is shown below.

```

*****
* Project Setup Information *
*****
Project File:          C:\E&P TANK\PEAK CHRISTENSEN RANCH 1-23H.ept
Flowsheet Selection:  Oil Tank with Separator
Calculation Method:   RVP Distillation
Control Efficiency:   0%
Known Separator Stream: Low Pressure Oil
Entering Air Composition: No
Filed Name:           Peak Powder River Resources, LLC
Well Name:            Christensen Ranch 1-23H
Well ID:              Christensen Ranch 1-23H
Permit Number:        Air Quality Permit Application
Date:                 2015.07.09

*****
* Data Input *
*****

Separator Pressure:   15.00 [psig]
Separator Temperature: 118.00 [F]
Ambient Pressure:     12.00 [psia]
Ambient Temperature: 50.00 [F]
C10+ SG:              0.7955
C10+ MW:              219.853
-- Low Pressure Oil -----
No.   Component      mol %
1     H2S             0.0000
2     O2              0.0000
3     CO2             0.0110
4     N2              0.0000
5     C1              0.4270
6     C2              1.2060
7     C3              2.9580
8     i-C4            1.6860
9     n-C4            6.1390
10    i-C5            2.4320
11    n-C5            3.0890
12    C6              2.6720
13    C7              10.7300
14    C8              14.9230
15    C9              6.6450
16    C10+           36.8070
17    Benzene         0.2540
18    Toluene         1.1340
19    E-Benzene       0.8810
20    Xylenes         4.4510
21    n-C6            3.1070
22    224Trimethylp  0.4480
    
```

-- Sales Oil -----
 Production Rate: 29 [bbl/day]
 Days of Annual Operation: 365 [days/year]
 API Gravity: 35.5
 Reid Vapor Pressure: 5.60 [psia]

 * Calculation Results *

-- Emission Summary -----

Item	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]
Total HAPs	0.420	0.096
Total HC	36.330	8.295
VOCs, C2+	35.574	8.122
VOCs, C3+	31.578	7.210

Uncontrolled Recovery Info.

Vapor	1.6200 [MSCFD]
HC Vapor	1.6200 [MSCFD]
GOR	55.86 [SCF/bbl]

-- Emission Composition -----

No	Component	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]
1	H2S	0.000	0.000
2	O2	0.000	0.000
3	CO2	0.053	0.012
4	N2	0.000	0.000
5	C1	0.755	0.172
6	C2	3.997	0.913
7	C3	13.429	3.066
8	i-C4	4.503	1.028
9	n-C4	9.647	2.203
10	i-C5	1.308	0.299
11	n-C5	1.179	0.269
12	C6	0.334	0.076
13	C7	0.485	0.111
14	C8	0.230	0.053
15	C9	0.039	0.009
16	C10+	0.000	0.000
17	Benzene	0.022	0.005
18	Toluene	0.030	0.007
19	E-Benzene	0.008	0.002
20	Xylenes	0.037	0.008
21	n-C6	0.306	0.070
22	224Trimethylp	0.019	0.004
Total		36.381	8.306

-- Stream Data -----

No.	Component	MW	LP Oil mol %	Flash Oil mol %	Sale Oil mol %	Flash Gas mol %	W&S Gas mol %	Total Emissions mol %
1	H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	CO2	44.01	0.0110	0.0059	0.0000	0.3886	0.1020	0.1556
4	N2	28.01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5	C1	16.04	0.4270	0.1154	0.0000	23.7108	1.9801	6.0386
6	C2	30.07	1.2060	0.8449	0.0008	28.1901	14.4855	17.0450
7	C3	44.10	2.9580	2.6794	0.2114	23.7779	42.5616	39.0534
8	i-C4	58.12	1.6860	1.6382	1.0583	5.2591	11.0093	9.9353
9	n-C4	58.12	6.1390	6.0431	4.9866	13.3032	23.1177	21.2847
10	i-C5	72.15	2.4320	2.4391	2.4402	1.9026	2.4216	2.3247
11	n-C5	72.15	3.0890	3.1069	3.1647	1.7509	2.1738	2.0948

12 C6	86.16	2.6720	2.7020	2.8365	0.4319	0.5285	0.5105
13 C7	100.20	10.7300	10.8665	11.4977	0.5318	0.6664	0.6412
14 C8	114.23	14.9230	5.1199	16.0383	0.2140	0.2777	0.2658
15 C9	128.28	6.6450	6.7335	7.1475	0.0303	0.0434	0.0409
16 C10+	219.85	36.8070	37.2996	39.6077	0.0001	0.0002	0.0002
17 Benzene	78.11	0.2540	0.2570	0.2706	0.0303	0.0372	0.0359
18 Toluene	92.13	1.1340	1.1487	1.2171	0.0346	0.0439	0.0422
19 E-Benzene	106.17	0.8810	0.8927	0.9473	0.0082	0.0107	0.0103
20 Xylenes	106.17	4.4510	4.5101	4.7863	0.0354	0.0467	0.0446
21 n-C6	86.18	3.1070	3.1435	3.3088	0.3831	0.4719	0.4553
22 224Trimethylp	114.24	0.4480	0.4538	0.4805	0.0174	0.0218	0.0209
MW	138.73	140.08	145.74	37.97	48.65	46.66	
Stream Mole Ratio	1.0000	0.9868	0.9293	0.0132	0.0575	0.0707	
Heating Value [BTU/SCF]				2176.60	2755.14	2647.09	
Gas Gravity [Gas/Air]				1.31	1.68	1.61	
Bubble Pt. @ 100F [psia]	33.41	21.02	6.22				
RVP @ 100F [psia]	15.73	12.86	5.62				
Spec. Gravity @ 100F	0.688	0.689	0.693				

The model predicts 1.62 MCFD of tank vapors containing **31.58 TPY VOC** and **0.42 TPY total HAP**.

The vapors are routed to a smokeless combustor for 98% destruction of the VOC and HAP components resulting in controlled tank emissions of **0.63 TPY VOC** and **0.01 TPY HAP**.

NO_x and CO emissions due to combustion of the tank vapors are calculated using the flare emission factors listed in the C6 S2 Guidance (0.14 LB NO_x/MMBTU and 0.035 LB CO/MMBTU) and the flowrate and heat content of the tank vapors from the E&P TANK model.

Waste gas volume: 1.62 MCFD (1620 SCFD, 1.125 SCFM)
 Heat content of tank vapors: 2647 BTU/SCF

0.14 LB NO_x/MMBTU (1620 SCF/DAY) (2647 BTU/SCF) (MMBTU/10⁶ BTU) (365 DAY/YR) (TON/2000 LB)
 = **0.11 TPY NO_x**

0.035 LB CO/MMBTU (1620 SCF/DAY) (2647 BTU/SCF) (MMBTU/10⁶ BTU) (365 DAY/YR) (TON/2000 LB)
 = **0.03 TPY CO**

Treater Burner

Produced gas is used as fuel for the 0.5 MMBTU/HR heater treater burner. Emissions were calculated using AP-42 emission factors (100 LB NO_x/MMCF and 84 LB CO/MMCF) and the measured heat content of the gas produced by the well (see Pages 15-16). For the purposes of this application, it is assumed the burner operates 8760 hours annually.

Produced gas heat content: 1509 BTU/SCF

0.5 MMBTU/HR (100 LB NO_x/MMCF) (1509 BTU/1020 BTU) (1 SCF/1020 BTU) (8760 HR/YR)
(TON/2000 LB) = **0.32 TPY NO_x**

0.5 MMBTU/HR (84 LB CO/MMCF) (1509 BTU/1020 BTU) (1 SCF/1020 BTU) (8760 HR/YR)
(TON/2000 LB) = **0.27 TPY CO**

Fugitives

Fugitive emissions were estimated using the typical component count for Peak's single-well production facilities, the fugitive emission factors provided in the C6 S2 Guidance and the measured weight percentages of VOC and HAP in produced gas (see Pages 15-16).

Emission Factors			
Equipment Type	Gas	Light Oil	Water/Light Oil
	LB THC/DAY/Component	LB THC/DAY/Component	LB THC/DAY/Component
Connector	0.0110	0.0110	0.0058
Flange	0.0210	0.0058	0.0002
Open Line	0.1100	0.0740	0.0130
Other	0.4700	0.4000	0.7400
Pump	0.1300	0.6900	0.0013
Valve	0.2400	0.1300	0.0052

Component Count and Service Type									
	#	LB THC/DAY	TPY	#	LB THC/DAY	TPY	#	LB THC/DAY	TPY
Connector	30	0.3300	0.0602	60	0.6600	0.1204	30	0.1740	0.0317
Flange	10	0.2100	0.0383	20	0.1160	0.0212	10	0.0020	0.0004
Open Line	0	0.0000	0.0000	0	0.0000	0.0000	0	0.0000	0.0000
Other	4	1.8800	0.3431	8	3.2000	1.1680	4	2.9600	0.5402
Pump	0	0.0000	0.0000	0	0.0000	0.0000	1	0.0013	0.0002
Valve	20	4.8000	0.8760	40	5.2000	0.9490	20	0.1040	0.0190
Subtotals			1.32			2.26			0.59

Total THC = **4.17 TPY**

produced gas: 47.06 WT% VOC and 3.33 WT% HAP
 fugitive VOC $4.17 * 47.06/100 = \mathbf{1.96 TPY}$
 fugitive HAP $4.17 * 3.33/100 = \mathbf{0.14 TPY}$

Truck Loading

Maximum annual truck loading emissions were estimated using the method described in the C6 S2 Guidance based on the projected oil production rate and the VOC/HAP content and molecular weight of tank vapors as determined by the E&P TANK Model (see Page 17).

Projected Production	29 * 365 = 10,585 BBL/YR
Saturation Factor (Submerged loading, Normal Svc.)	0.6 S
True Vapor Pressure of Oil @ T = 50°F	2.3 P
Molecular Weight of Tank Vapors	46.7044 M
Temperature (°R)	510 T
Tank Vapor VOC/HAP content (WT%)	86.81/1.16
Pounds/1000 gallons loaded:	LL = 12.46 * S * P * M/T

$$12.46 * 0.6 * 2.3 * 46.7044 / 510 = 1.57 \text{ LB/1000 GAL}$$

$$1.57 \text{ LB/1000 GAL loaded (42 GAL/BBL) (10,585 BBL/YR) (TON/2000 LB) = 0.35 TPY total losses}$$

$$0.35 \text{ TPY (86.819/100) = } \underline{\mathbf{0.30 \text{ TPY VOC}}}$$

$$0.35 \text{ TPY (1.16/100) = } \underline{\mathbf{0.00 \text{ TPY HAP}}}$$

Emission Summary

Total Estimated Uncontrolled Emissions (Tons Per Year)

EMISSION SOURCE	VOCs	total HAPs	NO _x	CO	SO ₂	H ₂ S
oil tanks	31.58	0.42				
burner			0.32	0.27		
fugitives	1.96	0.14				
truck loading	0.30	0.00				
TOTAL	33.8	0.6	0.3	0.3		

Total Estimated Controlled Emissions (Tons Per Year)

EMISSION SOURCE	VOCs	total HAPs	NO _x	CO	SO ₂	H ₂ S
oil tanks	0.63	0.01	0.11	0.03		
burner			0.32	0.27		
fugitives	1.96	0.14				
truck loading	0.30	0.00				
TOTAL	2.9	0.2	0.4	0.3		

Hazardous Air Pollutants (TPY)

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

Christensen Ranch 1-23H Production Record

Date		BOPD	BWPD
5/17/2015		20.04	107.46
5/16/2015		23.38	98
5/15/2015		22.05	100
5/14/2015		28.13	152
5/13/2015		31.99	66
5/12/2015		31.4	86
5/11/2015		30.05	80.46
5/10/2015		28.39	133.26
5/9/2015		30.06	121.57
5/8/2015		40.08	215.15
5/7/2015		36.74	196.7
5/6/2015		36.74	194.87
5/5/2015		26.72	240.18
5/4/2015		51.77	166.66
5/3/2015		35.07	121.57
5/2/2015		33.4	188.23
5/1/2015	initial 30-day average oil	50.52	171.67
4/30/2015	production	41.75	130.26
4/29/2015	= <u>48 BOPD</u>	42.17	101.59
4/28/2015		44.27	139.65
4/27/2015	projected production:	48.42	148.04
4/26/2015	48 * 0.6 = <u>29 BOPD</u>	46.77	175.83
4/25/2015		51.77	280.04
4/24/2015		60.12	182.1
4/23/2015		61.78	199.21
4/22/2015		40.08	196.76
4/21/2015		63.46	194.91
4/20/2015		56.78	97.39
4/19/2015		70.14	274.46
4/18/2015		65.13	219.86
4/17/2015		91.85	363.4
4/16/2015		119.95	476.53
4/15/2015		70.23	273.47
4/14/2015		0	90.18
4/13/2015		0	0
4/12/2015		0	0
4/11/2015		0	0
4/10/2015		0	0
4/9/2015		0	0
4/8/2015		0	0
4/7/2015		108.75	0



AMERICAN MOBILE RESEARCH, INC.

P.O. BOX 2909 (307) 235-4590 PHONE
 CASPER, WYOMING 82602 (307) 265-4489 FAX

**EXTENDED HYDROCARBON (GLYCALC) LIQUID STUDY
 CERTIFICATE OF ANALYSIS**

Company TISDALE CREEK RANCH, INC.

Lab Number CR-15660
 Date Sampled 6-22-2015

Study Number CR-2
 Date Tested 6-24-2015

Sample Identification **PEAK ENERGY - CHRISTENSEN RANCH 1-23H PRESSURIZED OIL
 STATION NO. 49-019-29982**

Sample Location JEPSON DRAW FIELD, WYOMING.

Sample Pressure 15 PSIG

Sample Temperature 118 F

Type Sample SPOT

County JOHNSON

Test Method GPA 2186

Sampling Method GPA-2174

Components	Mole %	Weight %	Liq. Vol. %
Hydrogen Sulfide	0.000	0.000	0.000
Oxygen	0.000	0.000	0.000
Carbon Dioxide	0.011	0.003	0.003
Nitrogen	0.000	0.000	0.000
Methane	0.427	0.049	0.122
Ethane	1.206	0.259	0.543
Propane	2.958	0.932	1.372
iso-Butane	1.686	0.700	0.929
n-Butane	6.139	2.550	3.258
iso-Pentane	2.432	1.254	1.497
n-Pentane	3.089	1.593	1.885
Hexanes	2.672	1.646	1.850
Heptanes	10.730	7.685	8.333
Octanes	14.923	12.184	12.869
Nonanes	6.645	6.091	6.294
Decanes+	36.807	57.838	54.262
Benzene.....	0.254	0.142	0.120
Toluene.....	1.134	0.747	0.639
Ethylbenzene.....	0.881	0.669	0.572
Xylenes.....	4.451	3.378	2.911
n-Hexane	3.107	1.914	2.151
2,2,4-Trimethylpentar	0.448	0.366	0.392
Totals.....	100.000	100.000	100.000

ADDITIONAL BETX DATA

<u>Components</u>	<u>Mole %</u>	<u>Weight %</u>	<u>Liq. Vol. %</u>
2-Methylpentane	1.910	1.177	1.322
3-Methylpentane	0.762	0.469	0.527
n-Hexane	3.107	1.914	2.151
2,2,4-Trimethylpentane	0.448	0.366	0.392
Benzene	0.254	0.142	0.120
Toluene	1.134	0.747	0.639
Ethylbenzene	0.881	0.669	0.572
m-Xylene	0.512	0.388	0.335
p-Xylene	3.182	2.415	2.081
o-Xylene	0.757	0.574	0.495

API GRAVITY AT 60/60 F, calculated	58.1
SPECIFIC GRAVITY AT 60/60 F, calculated	0.74630
RELATIVE SPECIFIC GRAVITY OF DECANES+ (C10+) FRACTION, calculated	0.79549
AVERAGE MOLECULAR WEIGHT	139.909
AVERAGE MOLECULAR WEIGHT OF DECANES+ (C10+) FRACTION, calculated	219.853
TRUE VAPOR PRESSURE AT 100 F, PSIA, calculated	42.567
AVERAGE BOILING POINT, F, calculated	306.453
CUBIC FEET OF GAS / GALLON OF LIQUID, as Ideal Gas, calculated	19.528
BTU / GALLON OF LIQUID AT 14.73 PSIA, calculated	122,911.33
LBS / GALLON OF LIQUID, calculated	6.222

NOTATION: ALL CALCULATIONS PERFORMED USING PHYSICAL CONSTANTS FROM GPA 2145-09, THE TABLES OF PHYSICAL CONSTANTS FOR HYDROCARBONS AND OTHER COMPOUNDS OF INTEREST TO THE NATURAL GAS INDUSTRY.

James A. Kane, President
 American Mobile Research, Inc.



AMERICAN MOBILE RESEARCH, INC.

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EXTENDED HYDROCARBON LIQUID STUDIES

CERTIFICATE OF ANALYSIS

Company..... TISDALE CREEK RANCH, INC.

Lab Number..... CR-15660

Study Number..... CR-3

Date Sampled..... 6-22-2015

Date Tested..... 6-24-2015

Sample Identification..... PEAK ENERGY - CHRISTENSEN RANCH 1-23H FLASHED CRUDE OIL

Sample Location..... JEPSON DRAW FIELD, WYOMING.

Sample Pressure.....N/A

Sample Temperature... N/A

Flowrate.....N/A

County..... JOHNSON

Test Method..... VARIOUS

Sample Container..... 1-QUART BOTTLE

TEST PERFORMED

RESULTS

API GRAVITY AT 60/60 F (ASTM D-287), observed	35.5
SPECIFIC GRAVITY AT 60/60 F (ASTM D-1657), calculated	0.8473
REID VAPOR PRESSURE (ASTM D-323), PSIG AT 100 F, observed	5.6
TOTAL SULFUR CONTENT (ASTM D-5453), PPMW	N/A
TRUE VAPOR PRESSURE (ASTM 2889), PSIA AT 100 F, observed	N/A
BASIC SEDIMENT AND WATER CONTENT (BSW), % BY VOLUME	N/A
COPPER STRIP CORROSION (ASTM D-130), 1 HOUR AT 100 F, observed	N/A
FREE WATER, observed	N/A

NOTATION : ALL TESTING PROVIDED ABOVE WAS PERFORMED IN ACCORDANCE TO METHODOLOGY
 OUTLINED BY THE AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM).

James A. Kane, President
 American Mobile Research, Inc.



AMERICAN MOBILE RESEARCH, INC.

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 CASPER, WYOMING 82602

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EXTENDED HYDROCARBON GAS (GLYCALC) STUDY

CERTIFICATE OF ANALYSIS

Company TISDALE CREEK RANCH, INC.

Lab Number CR-15660
 Date Sampled 6-22-2015

Study Number CR-1
 Date Tested 6-24-2015

Sample Identification **PEAK ENERGY - CHRISTENSEN RANCH 1-23H GAS**
STATION NO. 49-019-29982

Sample Location JEPSON DRAW FIELD, WYOMING.

Sample Pressure 14.0 PSIG

Sample Temperature . 96 F

Type Sample SPOT

County JOHNSON

Test Method GPA-2286

Cylinder ID AMR 551

<u>Components</u>	<u>Mole %</u>	<u>Weight %</u>	<u>Liq. Vol. %</u>
Carbon Dioxide.....	1.334	2.196	1.090
Hydrogen Sulfide.....	0.000	0.000	0.000
Nitrogen.....	1.798	1.884	0.947
Methane.....	64.950	38.979	52.699
Ethane.....	8.785	9.882	11.244
Propane.....	12.482	20.590	16.458
iso-Butane.....	1.980	4.305	3.101
n-Butane.....	4.717	10.256	7.117
iso-Pentane.....	1.180	3.185	2.065
n-Pentane.....	1.145	3.090	1.986
Cyclopentane.....	0.014	0.037	0.020
n-Hexane.....	0.259	0.835	0.510
Cyclohexane.....	0.134	0.422	0.218
Other Hexanes	0.480	1.547	0.945
Heptanes.....	0.561	2.103	1.239
Methylcyclohexane....	0.051	0.187	0.098
2,2,4-Trimethylpentar	0.016	0.068	0.040
Benzene.....	0.017	0.050	0.023
Toluene.....	0.029	0.100	0.046
Ethylbenzene.....	0.009	0.036	0.017
Xylenes.....	0.013	0.052	0.024
C8+ Heavies.....	0.046	0.197	0.113
Totals	100.000	100.000	100.000

47.059
 VOC WT%

ADDITIONAL BETX DATA

<u>Components</u>	<u>Mole %</u>	<u>Weight %</u>		<u>Liq. Vol. %</u>
Cyclopentane	0.014	0.037	} 3.334 HAP WT%	0.020
Cyclohexane	0.134	0.422		0.218
2-Methylpentane	0.343	1.106		0.675
3-Methylpentane	0.137	0.441		0.269
n-Hexane	0.259	0.835		0.510
Methylcyclohexane	0.051	0.187		0.098
2,2,4-Trimethylpentane	0.016	0.068		0.040
Benzene	0.017	0.050		0.023
Toluene	0.029	0.100		0.046
Ethylbenzene	0.009	0.036		0.017
m-Xylene	0.002	0.008		0.004
p-Xylene	0.008	0.031		0.014
o-Xylene	0.003	0.013		0.006

SPECIFIC GRAVITY AT 60/60 F, calculated.....	0.9230
TOTAL GPM (ETHANE INCLUSIVE).....	9.432
CALCULATED BTU / REAL CF AT 14.73 PSIA, dry basis.....	1535.319
CALCULATED BTU / REAL CF AT 14.73 PSIA, wet basis.....	1508.860
AVERAGE MOLECULAR WEIGHT.....	26.732
MOLAR MASS RATIO.....	0.9230
RELATIVE DENSITY (G x Z (Air) / Z), calculated.....	0.9285
IDEAL GROSS HEATING VALUE, BTU / IDEAL CF AT 14.696 PSIA, calculated..	1522.607
COMPRESSIBILITY FACTOR (Z).....	0.99400

PROPANE GPM.....	3.4300
BUTANE GPM.....	2.1296
GASOLINE GPM (PENTANE AND HEAVIER).....	1.5289

NOTATION: ALL CALCULATIONS PERFORMED USING PHYSICAL CONSTANTS FROM GPA 2145-09, THE TABLES OF PHYSICAL CONSTANTS FOR HYDROCARBONS AND OTHER COMPOUNDS OF INTEREST TO THE NATURAL GAS INDUSTRY.

James A. Kane, President
 American Mobile Research, Inc.

MOL% to WEIGHT% Conversion

Christensen Ranch 1-23H Tank Vapors
 from E&P TANK output

Mol Composition of "Total Emissions" from E&P TANK

COMPONENT	mol %	M.W.	(mol % X MW)/100	WT% of i
H2S	0	34.08	0	0
O2	0	32.00	0	0.0000
CO2	0.1556	44.01	0.0685	0.0015
N2	0	28.02	0.0000	0.0000
Methane C1	6.0386	16.04	0.9686	0.0207
Ethane C2	17.045	30.07	5.1254	0.1097
Propane C3	39.0534	44.09	17.2186	0.3687
i-Butane i-C4	9.9353	58.12	5.7744	0.1236
n-Butane n-C4	21.2847	58.12	12.3707	0.2649
i-Pentane iC5	2.3247	72.15	1.6773	0.0359
n-Pentane nC5	2.0948	72.15	1.5114	0.0324
n-Hexane n-C6	0.4553	86.17	0.3923	0.0084
Cyclohexane	0	84.16	0.0000	0.0000
other Hexanes	0.5105	85.00	0.4339	0.0093
Heptanes	0.6412	100.20	0.6425	0.0138
Methylcyclohexane	0	98.18	0.0000	0.0000
2,2,4 Trimethylpentane	0.0209	114.22	0.0239	0.0005
Benzene	0.0359	78.11	0.0280	0.0006
Toluene	0.0422	92.14	0.0389	0.0008
Ethylbenzene	0.0103	106.17	0.0109	0.0002
Xylenes	0.0446	106.17	0.0474	0.0010
C8	0.2658	120.00	0.3190	0.0068
C9	0.0409	128.26	0.0525	0.0011
C ₁₀ +	0.0002	142.29	0.0003	0.0000
hydrogen	0	1.01	0.0000	0.0000
Helium	0	4.00	0.0000	0.0000
water	0	18.02	0.0000	0.0000
	100			1.0000

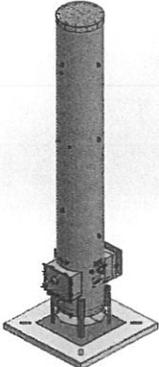
composition of tank vapors from E&P TANK MODEL

MOLECULAR WEIGHT (lb/lb-mol)= 46.7044

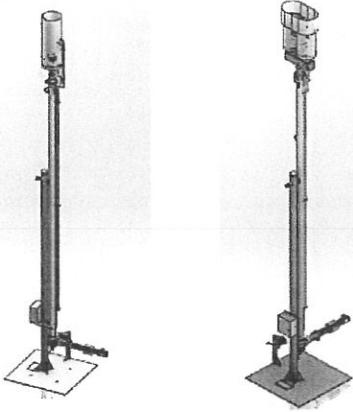
TOTAL VOCs WEIGHT PERCENT = 0.8681

TOTAL HAPs WEIGHT PERCENT = 0.0116

 <p style="text-align: center;">Environmental Control Equipment Data Sheet</p>		Item/Tag No.:		Page	1	of	3
		Project No.:		Revision:	B		
Client:		Project:		Date:	27 February 2014		
Site:		P.O. No.:	-	By:	JS		
Unit/Lease:		RFQ No.:	-	Checked:	SG		
		Ref. P&ID:	-	Approved:	MS		
		Remarks:	-	Supplier:	LEED FABRICATION		
				Model No.:	L30-0018-00		
GENERAL							
1	Design Code:			NDE:	LEED Fabrication Standards		
2	Service:			Customer Specs:	<input type="checkbox"/> Yes		
3	Description:	Standard Single Stage 36 High Efficiency Combustor			<input checked="" type="checkbox"/> No		
PROCESS DATA							
Gas Composition:		mol %		Process Conditions:			
4	Methane			Variable	Value	Units	
5	Ethane			Flow Rate	Up to 99	Mscfd	
6	Propane			Pressure	Up to 12	oz/in2	
7	I-Butane			Temperature		°F	
8	n-Butane			Molecular Weight			
9	I-Pentane			Process/Waste Stream	<input checked="" type="checkbox"/> Gas	<input type="checkbox"/> Liquid	
10	n-Pentane			Detailed Process Description / Process Notes:			
11	n-Hexane			1. Turndown 10:1. Based on an expected normal operating rate indicated above.			
12	CO2			2. DRE: 98 % operating at design conditions			
13	N2			3. Burner Pressure Drop: Min. 0.10 oz/in2			
14	Helium						
15	H2O						
16	C7						
17	C8						
18	C9						
19	C10						
20	C11+						
21	TOTAL						
Other Components:		PPMV		Available Utilities:			
22	H2S			Fuel / Pilot Gas	Min. 30psig Natural Gas / Propane 40-50 SCFH		
23	Benzene			Instrument Air	NA		
24	Toluene			Power	120 V / 60 Hz or Solar Power		
25	E-Benzene			Steam	NA		
26	Xylene			Purge Gas			
DESIGN DATA							
27	Ambient Temperatures:			Noise Performance Requirements:	Under 85 dBA		
28	Low, °F	-20		Structural Design Code:			
29	High, °F	120		Wind Design Code:	ASCE		
30	Design Conditions:	Pressure/Temperature					
31	Max. Relative Humidity, %	90		Pressure/Speed	100 mph		
32	Elevation (ASL), ft			Category			
33	Area Classification:	Class I Div 2		Seismic Design Code:			
34	Electrical Design Code:	NEC		Location			
EQUIPMENT SPECIFICATION							
35	Type:	<input type="checkbox"/> Elevated <input checked="" type="checkbox"/> Enclosed		Equipment Design:			
36		<input type="checkbox"/> Above Ground		Component	Material / Size / Rating / Other		
37		<input checked="" type="checkbox"/> Stack <input type="checkbox"/> Multiple Stack		Burner			
38		<input type="checkbox"/> Portable / Trailer		Burner Tip / Assist Gas Burner	304 SS		
39				Burner Body	Carbon Steel		
40	Smokeless By:	<input type="checkbox"/> Steam <input type="checkbox"/> Assist Air		Pilot			
41		<input type="checkbox"/> Gas Assist <input checked="" type="checkbox"/> Staging		Pilot Tip	304 SS		
42				Pilot Line(s)	Carbon Steel		
43	Stack:	<input checked="" type="checkbox"/> Self Supporting		Firebox / Stack			
44	Flare Burner:	<input type="checkbox"/> Non-Smokeless <input checked="" type="checkbox"/> Smokeless <input type="checkbox"/> Gas Assist		Shell	Carbon Steel		
45	Pilot:	<input checked="" type="checkbox"/> Intermittent <input type="checkbox"/> Continuous		Piping	Carbon Steel		
46	Pilot Air Inspirator:	<input checked="" type="checkbox"/> Local <input type="checkbox"/> Remote		Nozzles	Carbon Steel		
47	Pilot Flame Control:	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (Thermocouple)		Flanges	Carbon Steel		
48				Insulation	Blanket		
49	Pilot Ignition:	<input type="checkbox"/> Flamefront Generator <input checked="" type="checkbox"/> Inspiring Ignitor		Insulation Pins	304 SS		
50		<input type="checkbox"/> Electronic <input checked="" type="checkbox"/> Automatic <input type="checkbox"/> Manual		Refractory	NA		
51		<input type="checkbox"/> With Pilot Flame Control		Refractory Anchors	NA		
52		<input type="checkbox"/> With Auto Pilot Re-Ignition		Ladders and Platforms	NA		
53				Stack Sample Connections	Per EPA requirements		
54	Pilot Ignition Backup:	<input type="checkbox"/> Manual Specify: I.e Piezo-Electric		Sight Glass	2		
55		<input type="checkbox"/> Battery Pack		Other			

 <p style="text-align: center;">Environmental Control Equipment Data Sheet</p>		Item/Tag No.:		Page	2	of	3	
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		Project:		Date:	27 February 2014			
		P.O. No.:	-	By:	JS			
		RFQ No.:	-	Checked:	SG			
Client:		Ref. P&ID:	-	Approved:	MS			
Site:		Remarks:	-	Supplier:	LEED FABRICATION			
Unit/Lease:				Model No.:	L30-0018-00			
EQUIPMENT SPECIFICATION								
56	Flame Detection:	<input type="checkbox"/> Thermocouple	<input checked="" type="checkbox"/> Ionization Rod	Auxiliary Equipment				
57		<input type="checkbox"/> UV Scanner		Valves	NA			
58	General Configuration:			Blowers	NA			
59				Dampers	NA			
60				Inlet KO / Liquid Seal	NA			
61				Flame / Detonation Arrestor	Yes			
62				Instrumentation & Controls				
63				Solenoids / Shut-Off Valves	Check with Sales for available config.			
64				Flow Meters	NA			
65				Calorimeter	NA			
66				Pressure Switches/Transmitters	NA			
67				Thermocouples	Check with Sales for available config.			
68		Temperature Switches/Transmitters	NA					
69		BMS	Check with Sales for available config.					
70		CEMS	NA					
71		Other	NA					
72								
73								
74								
75								
FABRICATION AND INSPECTION								
76	Special requirements	<input type="checkbox"/> Skid Mounted	<input checked="" type="checkbox"/> Concrete Pad	Equipment Info				
77		<input type="checkbox"/> Other		Component	Weight / Dimensions			
78				Burner				
79	Inspection	<input checked="" type="checkbox"/> Vendor Standard		Burner Assembly				
80		<input type="checkbox"/> Other. Specify:		Stack				
81	Material Certification	<input checked="" type="checkbox"/> Vendor Standard		Stack Assembly	36" OD x 25' H			
82		<input type="checkbox"/> MTR		Pilot Tip				
83		<input type="checkbox"/> Certificate of Compliance		Pilot Line(s)				
84		<input type="checkbox"/> Other (Specify):		Stack Assembly				
85	NDE	<input checked="" type="checkbox"/> Vendor Standard		Auxiliary Equipment				
86		<input type="checkbox"/> Radiography. Specify:		Blowers				
87		<input type="checkbox"/> Ultrasonic. Specify:		Inlet KO / Liquid Seal				
88		<input type="checkbox"/> Liquid Penetrant.		Flame / Detonation Arrestor				
89		<input type="checkbox"/> Magnetic Particles.		Skid				
90		<input type="checkbox"/> PMI. Specify:		Instrumentation & Controls				
91		<input type="checkbox"/> Other. Specify:		BMS				
92	Surface Preparation	<input checked="" type="checkbox"/> Vendor Standard		Control Panel				
93		<input type="checkbox"/> Other. Specify:						
94	Paint System	<input checked="" type="checkbox"/> Vendor Standard						
95		<input type="checkbox"/> Other. Specify:						
96	Finished Color	<input checked="" type="checkbox"/> Vendor Standard						
97		<input type="checkbox"/> Other. Specify:						
98								
99								
Additional Notes:								

 <p style="text-align: center;">Environmental Control Equipment Data Sheet</p>		Item/Tag No.:	Page		1	of	3
		Project No.:	Revision:		B		
Client:		Ref. P&ID:	Date:		27 February 2014		
			By:		JS		
Site:		Remarks:	Checked:		SG		
Unit/Lease:			Approved:		MS		
			Supplier:		LEED FABRICATION		
			Model No.:		L30-0007/8-00		
GENERAL							
1	Design Code:		NDE:		LEED Fabrication Standards		
2	Service:		Customer Specs:		<input type="checkbox"/> Yes		
3	Description:		Standard Single/Dual Head Flare		<input checked="" type="checkbox"/> No		
PROCESS DATA							
Gas Composition:		mol %	Process Conditions:				
			Variable	Value	Units		
4	Methane		Flow Rate	Up to 2.75	mmscfd		
5	Ethane		Pressure		psig		
6	Propane		Temperature		°F		
7	I-Butane		Molecular Weight				
8	n-Butane		Process/Waste Stream	<input checked="" type="checkbox"/> Gas	<input type="checkbox"/> Liquid		
9	I-Pentane		Detailed Process Description / Process Notes:				
10	n-Pentane		1. Turndown 10:1. Based on an expected normal operating rate indicated above				
11	n-Hexane		2. Gas mixture heating value estimated to be 1500 BTU/SCF unless specified by customer				
12	CO2		3. Actual gas composition varies by site				
13	N2		4. EPA NSPS 40 CFR Part 60 compliant				
14	Helium		5. 98% DRE				
15	H ₂ O						
16	C7						
17	C8						
18	C9						
19	C10						
20	C11+						
21	TOTAL						
Other Components:		PPMV	Available Utilities:				
22	H2S		Fuel / Pilot Gas	Natural Gas: 50 SCFH / Propane 40 SCFH @ 5-7 psig			
23	Benzene		Instrument Air	NA			
24	Toluene		Power	120 V / 60 Hz or Solar Power			
25	E-Benzene		Steam	NA			
26	Xylene		Purge Gas	NA			
DESIGN DATA							
27	Ambient Temperatures:		Noise Performance Requirements:				
28	Low, °F	-20	Structural Design Code:				
29	High, °F	120	Wind Design Code:		ASCE		
30	Design Conditions: Pressure/Temperature						
31	Max. Relative Humidity, %	90	Pressure/Speed		100 mph		
32	Elevation (ASL), ft		Category				
33	Area Classification: Class 1 Div 2		Seismic Design Code:				
34	Electrical Design Code: NEC		Location				
EQUIPMENT SPECIFICATION							
35	Type:	<input checked="" type="checkbox"/> Elevated <input type="checkbox"/> Enclosed	Equipment Design:				
36		<input type="checkbox"/> Above Ground	Component		Material / Size / Rating / Other		
37		<input checked="" type="checkbox"/> Stack <input type="checkbox"/> Multiple Stack	Burner				
38		<input type="checkbox"/> Portable / Trailer	Burner Tip / Assist Gas Burner		304/316 SS		
39			Burner Body		Carbon Steel		
40	Smokeless By:	<input type="checkbox"/> Steam <input type="checkbox"/> Assist Air	Pilot				
41		<input type="checkbox"/> Gas Assist <input type="checkbox"/> Staging	Pilot Tip		304/316 SS		
42			Pilot Line(s)		Carbon Steel		
43	Stack:	<input checked="" type="checkbox"/> Self Supporting	Firebox / Stack				
44	Flare Burner:	<input type="checkbox"/> Non-Smokeless <input checked="" type="checkbox"/> Smokeless <input type="checkbox"/> Gas Assist	Shell		NA		
45	Pilot:	<input checked="" type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Continuous	Piping		Carbon Steel		
46	Pilot Air Inspirator:	<input checked="" type="checkbox"/> Local <input type="checkbox"/> Remote	Nozzles		Carbon Steel		
47	Pilot Flame Control:	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (Thermocouple)	Flanges		Carbon Steel		
48			Insulation		NA		
49	Pilot Ignition:	<input type="checkbox"/> Flamefront Generator <input checked="" type="checkbox"/> Inspiring Ignitor	Insulation Pins		NA		
50		<input type="checkbox"/> Electronic <input checked="" type="checkbox"/> Automatic <input type="checkbox"/> Manual	Refractory		NA		
51		<input type="checkbox"/> With Pilot Flame Control	Refractory Anchors		NA		
52		<input type="checkbox"/> With Auto Pilot Re-Ignition	Ladders and Platforms		NA		
53			Stack Sample Connections		NA		
54	Pilot Ignition Backup:	<input type="checkbox"/> Manual Specify: i.e Piezo-Electric	Sight Glass		NA		
55		<input type="checkbox"/> Battery Pack	Other				

 <p style="text-align: center;">Environmental Control Equipment Data Sheet</p>		Item/Tag No.:		Page	2	of	3	
		Project No.:		Revision:	B			
		Project:		Date:	27 February 2014			
		P.O. No.:	-	By:	JS			
Client:		Ref. P&ID:	-	Checked:	SG			
Site:		Remarks:	-	Approved:	MS			
Unit/Lease:		Supplier:	LEED FABRICATION					
		Model No.:	L30-0007/8-00					
EQUIPMENT SPECIFICATION								
56	Flame Detection:	<input type="checkbox"/> Thermocouple	<input checked="" type="checkbox"/> Ionization Rod	Auxiliary Equipment				
57		<input type="checkbox"/> UV Scanner		Valves	NA			
58	General Configuration:			Blowers	NA			
59				Dampers	NA			
60				Inlet KO / Liquid Seal	NA			
61				Flame / Detonation Arrestor	Yes			
62				Instrumentation & Controls				
63				Solenoids / Shut-Off Valves	Check with Sales for available config.			
64				Flow Meters	NA			
65				Calorimeter	NA			
66				Pressure Switches/Transmitters	NA			
67				Thermocouples	Check with Sales for available config.			
68		Temperature Switches/Transmitters	NA					
69		BMS	Check with Sales for available config.					
70		CEMS	NA					
71		Other	NA					
72								
73								
74								
75								
FABRICATION AND INSPECTION								
76	Special requirements	<input type="checkbox"/> Skid Mounted	<input checked="" type="checkbox"/> Concrete Pad	Equipment Info				
77		<input type="checkbox"/> Other		Component	Weight / Dimensions			
78				Burner				
79	Inspection	<input checked="" type="checkbox"/> Vendor Standard		Burner Assembly				
80		<input type="checkbox"/> Other. Specify:		Stack				
81	Material Certification	<input checked="" type="checkbox"/> Vendor Standard		Stack Assembly	4" OD x 25' H			
82		<input type="checkbox"/> MTR		Pilot Tip				
83		<input type="checkbox"/> Certificate of Compliance		Pilot Line(s)				
84		<input type="checkbox"/> Other (Specify):		Stack Assembly				
85	NDE	<input checked="" type="checkbox"/> Vendor Standard		Auxiliary Equipment				
86		<input type="checkbox"/> Radiography. Specify:		Blowers				
87		<input type="checkbox"/> Ultrasonic. Specify:		Inlet KO / Liquid Seal				
88		<input type="checkbox"/> Liquid Penetrant.		Flame / Detonation Arrestor				
89		<input type="checkbox"/> Magnetic Particles.		Skid				
90		<input type="checkbox"/> PMI. Specify:		Instrumentation & Controls				
91		<input type="checkbox"/> Other. Specify:		BMS				
92	Surface Preparation	<input checked="" type="checkbox"/> Vendor Standard		Control Panel				
93		<input type="checkbox"/> Other. Specify:						
94	Paint System	<input checked="" type="checkbox"/> Vendor Standard						
95		<input type="checkbox"/> Other. Specify:						
96	Finished Color	<input checked="" type="checkbox"/> Vendor Standard						
97		<input type="checkbox"/> Other. Specify:						
98								
99								
Additional Notes:								



Department of Environmental Quality Air Quality Division
Permit Application Form

Is this a revision to an existing application?
Yes _____ No X
Previous Application #: _____

Date of Application: 7/10/2015

COMPANY INFORMATION:

Company Name: Peak Powder River Resources, LLC
Address: 1910 Main Avenue
City: Durango State: Colorado Zip Code: 81301
Country: USA Phone Number: (970) 247-1500

FACILITY INFORMATION:

Facility Name: Christensen Ranch 1-23H
New Facility or Existing Facility: New
Facility Description: Single Well, Oil Production
Facility Class: Minor Operating Status: Operating
Facility Type: Production Site

For Oil & Gas Production Sites ONLY:

First Date of Production (FDOP)/Date of Modification: 4/15/2015
Does production at this facility contain H2S? No
**If yes, contact the Division.*
API Number(s): 49-019-29982

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: Johnson

OR

Latitude: 43.776961 Longitude: -106.075585
Quarter: NW Quarter: NE
Section: 23 Township: 44N Range: 77W

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: Ms. First Name: Daneka
Last Name: Ewert
Company Name: Peak Powder River Resources, LLC
Job Title: Environmental Manager
Address: 1910 Main Avenue
City: Durango State: Colorado
Zip Code: 81301
Primary Phone No.: (307) 231-0755 E-mail: Dewert@colopecs.com
Mobile Phone No.: _____ Fax No.: (970) 247-5424
Contact Type: Environmental contact Start Date: _____

Additional Contact Type (if needed): NSR Permitting contact

Title: First Name: same as above

Last Name: _____

Company Name: _____

Job Title: _____

Address: _____

City: _____ State:

Zip Code: _____

Primary Phone No.: _____ E-mail: _____

Mobile Phone No.: _____ Fax No.: _____

Contact Type: Start Date: _____

FACILITY APPLICATION INFORMATION:

General Info:

Has the facility changed location or is it a new/ greenfield facility?

Has a Land Use Planning document been included in this application?

Is the facility located in a sage grouse core area? *

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):

Non-Attainment New Source Review:

Modeling Section:

Has the Air Quality Division been contacted to determine if modeling is required?

Is a modeling analysis part of this application?

Is the proposed project subject to Prevention of Significant Deterioration (PSD) requirements?

Has the Air Quality Division been notified to schedule a pre-application meeting?

Has a modeling protocol been submitted to and approved by the Air Quality Division?

Has the Air Quality Division received a Q/D analysis to submit to the respective FLMs to determine the need for an AQRV analysis?

Required Attachments:

Facility Map	<input type="checkbox"/>	[
Process Flow Diagram	<input checked="" type="checkbox"/>	[
Modeling Analysis (if applicable)	<input type="checkbox"/>	[
Land Use Planning Document	<input type="checkbox"/>	[
Detailed Project Description	<input checked="" type="checkbox"/>	[
Emissions Calculations	<input checked="" type="checkbox"/>	[

I, Daneka Ewert Environmental Manager
 Responsible Official (Printed Name) Title

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

Signature: Cynthia Madison
 (ink)
 for Daneka Ewert

Date: July 10, 2015

ORIGINAL

Specific Emission Unit Attributes:

Separator/Treater

Company Equipment ID: Separator

Company Equipment Description: 2-phase unheated separator

Operating Status: Operating

Initial Construction Commencement Date: _____

Initial Operation Commencement Date: 4/7/2015

Most Recent Construction/ Modification
Commencement Date: _____

Most Recent Operation Commencement Date: _____

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): 80

Operating Pressure (psig): 100

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).

31000107

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

Hours/day: 24

Hours/year: 8760

Specific Emission Unit Attributes:

Separator/Treater

Company Equipment ID: Heater Treater

Company Equipment Description: 3-Phase Heater Treater

Operating Status: Operating

Initial Construction Commencement Date: _____

Initial Operation Commencement Date: 4/7/2015

Most Recent Construction/ Modification
Commencement Date: _____

Most Recent Operation Commencement Date: _____

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): 120

Operating Pressure (psig): 20

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).

31000107

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

Hours/day: 24

Hours/year: 8760

Specific Emission Unit Attributes:

Heater/Chiller

Company Equipment ID: Treater Burner
Company Equipment Description: 0.5 MMBTU/HR Treater Burner

Operating Status: Operating

Initial Construction Commencement Date: _____

Initial Operation Commencement Date: 4/7/2015

Most Recent Construction/ Modification
Commencement Date: _____

Most Recent Operation Commencement Date: _____

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:	<u>Indirect</u>	Units:	<u>MMBtu/hr</u>
Heat Input Rating:	<u>0.5</u>		
Primary Fuel Type:	<u>Field Gas</u>		
Secondary Fuel Type:	<u>N/A</u>		
Heat Content of Fuel:	<u>1509</u>	Units:	<u>BTU/scf</u>
Fuel Sulfur Content:	<u>0</u>	Units:	<u></u>

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).

31000107 30600105

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

Hours/day: 24

Hours/year: 8760

Specific Emission Unit Attributes:

Storage Tank/Silo

Company Equipment ID: Oil Tanks

Company Equipment Description: 5 400-BBL Oil Tanks

Operating Status: Operating

Initial Construction Commencement Date: _____

Initial Operation Commencement Date: 4/7/2015

Most Recent Construction/ Modification
Commencement Date: _____

Most Recent Operation Commencement Date: _____

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: 35.5 deg API crude oil

Capacity: 2000 Units: barrels

Maximum Throughput: 10,585 (projected) Units: barrels/yr

Maximum Hourly Throughput: 2 Units: barrels/hr

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).

40400312

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): Subject, but exempt

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

NSPS Subpart: 0000

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

*National Emission 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

Company Equipment Description: 400-BBL Produced Water Tank

Operating Status: Operating

Initial Construction Commencement Date: _____

Initial Operation Commencement Date: 4/7/2015

Most Recent Construction/ Modification
Commencement Date: _____

Most Recent Operation Commencement Date: _____

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: 200 Units: barrels/day

Maximum Hourly Throughput: 9 Units: barrels/hr

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).

40400315

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

Hours/day: 24

Hours/year: 8760

Specific Emission Unit Attributes:

Fugitives

Company Equipment ID: _____ Fugitives
Company Equipment Description: _____ Fugitives

Operating Status: _____ Operating

Initial Construction Commencement Date: _____

Initial Operation Commencement Date: _____ 4/7/2015

Most Recent Construction/ Modification
Commencement Date: _____

Most Recent Operation Commencement Date: _____

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).

31000101

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

Hours/day: _____ 24

Hours/year: _____ 8760

Specific Emission Unit Attributes:

Loading/Unloading/Dump

Company Equipment ID: _____ Truck Loading

Company Equipment Description: _____ Truck Loading

Operating Status: _____ Operating

Initial Construction Commencement Date: _____

Initial Operation Commencement Date: _____ 4/7/2015

Most Recent Construction/ Modification
Commencement Date: _____

Most Recent Operation Commencement Date: _____

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: _____ 10,585 (projected) _____ Units: _____ barrels/yr

Maximum Hourly Throughput: _____ 200 _____ Units: _____ barrels/hr

Detailed Description of Loading/Unloading/Dump Source: _____
Submerged loading into tanker truck, dedicated service to crude oil

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).

40600132

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

Hours/day: _____ ≈2

Hours/year: _____ 106

Control Equipment:

Flare/Combustor

Manufacturer: LEED Date Installed: 4/7/2015

Model Name and Number: L30-0011 Company Control Equipment ID: _____

Company Control Equipment Description: 36-IN by 25-FT Smokeless Combustor

Pollutant(s) Controlled:		<input type="checkbox"/> CO	<input type="checkbox"/> NOx	<input type="checkbox"/> Pb	<input type="checkbox"/> SO2	<input checked="" type="checkbox"/> VOC	<input type="checkbox"/> PM
<input type="checkbox"/> PM (FIL)	<input type="checkbox"/> PM Condensable	<input type="checkbox"/> PM 10 (FIL)	<input type="checkbox"/> PM 2.5 (FIL)	<input type="checkbox"/> PM 10	<input type="checkbox"/> PM 2.5		
<input type="checkbox"/> Other							

Design Control Efficiency (%): 99+ Capture Efficiency (%): 100

Operating Control Efficiency (%): 98

Flare Type: Enclosed Elevated Flare Type: Non-Assisted

Ignition Device: Yes Flame Presence Sensor: Yes

Inlet Gas Temp (F): 100 Flame Presence Type: Thermocouple

Gas Flow Rate (acfm): 0.0001 Outlet Gas Temp (F): 1000

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: _____

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

Oil Storage Tanks

Control Equipment:

Flare/Combustor

Manufacturer: LEED Date Installed: 4/7/2015

Model Name and Number: L30-007-00 Company Control Equipment ID: _____

Company Control Equipment Description: 4-IN by 25-FT Smokeless Flare

Pollutant(s) Controlled:		<input type="checkbox"/> CO	<input type="checkbox"/> NOx	<input type="checkbox"/> Pb	<input type="checkbox"/> SO2	<input checked="" type="checkbox"/> VOC	<input type="checkbox"/> PM
<input type="checkbox"/> PM (FIL)	<input type="checkbox"/> PM Condensable	<input type="checkbox"/> PM 10 (FIL)	<input type="checkbox"/> PM 2.5 (FIL)	<input type="checkbox"/> PM 10	<input type="checkbox"/> PM 2.5		
<input type="checkbox"/> Other							

Design Control Efficiency (%): 99+ Capture Efficiency (%): 100

Operating Control Efficiency (%): 98

Flare Type: Enclosed Elevated Flare Type: Non-Assisted

Ignition Device: Yes Flame Presence Sensor: Yes

Inlet Gas Temp (F): 100 Flame Presence Type: Thermocouple

Gas Flow Rate (acfm): 0.1 Outlet Gas Temp (F): 1000

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: Excess produced gas from separator and treater, if there is any.

List all release point IDs associated with this control equipment: excess produced gas from separator and treater

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

*EMISSIONS DETERMINATIONS ARE DESCRIBED IN THE CALCULATIONS SECTION OF THIS APPLICATION and BELOW.

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

Criteria Pollutants:

1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)						
2.)	PM #10 microns in diameter (PE/PM10)						
3.)	PM #2.5 microns in diameter (PE/PM2.5)						
4.)	Sulfur dioxide (SO2)						
5.)	Nitrogen Oxides (NOx)	0.32	0.62	lb/ton of production	0.10	0.43	*
6.)	Carbon monoxide (CO)	0.27	0.43	lb/ton of production	0.07	0.30	*
7.)	Volatile organic compounds (VOC)	33.84	4.18	lb/ton of production	0.66	2.89	*
8.)	Lead (Pb)						
9.)	Total Hazardous Air Pollutants (HAPs)	0.56	0.22	lb/ton of production	0.03	0.15	*
10.)	Fluoride (F)						
11.)	Hydrogen Sulfide (H2S)						
12.)	Mercury (Hg)						
13.)	Total Reduced Sulfur (TRS)						
14.)	Sulfuric Acid Mist (SAM)						

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

Shannon oil weighs 6.222 LB/GAL (42 GAL/BBL) = 261 LB/BBL
 Projected oil production = 10,585 BBL
 261 LB/BBL (10,585 BBL) (TON/2000 LB) = 1383 TONS oil/YR
 LB/TON of production = X TON/1383 TONS (2000 LB/TON)
 LB/HR = X TONS/8760 HR (2000 LB/TON)

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: LEED combustor	Release Point Type: <input type="text" value="Vertical"/> Release Point Latitude: <u>43.776961</u> Release Point Longitude: <u>-106.075585</u>
Company Release Point Description: vapors from 5 oil tanks routed to 36-IN by 25-FT combustor	Base Elevation (ft): <u>4888</u> Stack Height (ft): <u>25</u> Stack Diameter (ft): <u>3</u> Exit Gas Velocity (ft/s): <u>0.1</u> Exit Gas Temp (F): <u>1000</u> Exit Gas Flow Rate (acfm): <u>1.125</u>
Company Release Point ID: trtr burner	Release Point Type: <input type="text" value="Vertical"/> Release Point Latitude: <u>43.776961</u> Release Point Longitude: <u>-106.075585</u>
Company Release Point Description: fumes from the combustion of natural gas exiting the treater burner stack	Base Elevation (ft): <u>4888</u> Stack Height (ft): <u>20</u> Stack Diameter (ft): <u>0.83</u> Exit Gas Velocity (ft/s): <u>0.1</u> Exit Gas Temp (F): <u>1000</u> Exit Gas Flow Rate (acfm): <u>6.3</u>
Company Release Point ID: fugitives	Release Point Type: <input type="text" value="Horizontal"/> Release Point Latitude: <u>43.776961</u> Release Point Longitude: <u>-106.075585</u>
Company Release Point Description: multiple variable components - anywhere from ground level to 20+ feet.	Base Elevation (ft): <u>4888</u> Stack Height (ft): <u>4</u> Stack Diameter (ft): <u>0.00001</u> Exit Gas Velocity (ft/s): <u>0.01</u> Exit Gas Temp (F): <u>80</u> Exit Gas Flow Rate (acfm): <u>0.0001</u>

Company Release Point ID: truckloading	Release Point Type:	Vertical
	Release Point Latitude:	43.776961
Company Release Point Description: submerged loading, dedicated service	Release Point Longitude:	-106.075585
	Base Elevation (ft):	4888
	Stack Height (ft):	3
	Stack Diameter (ft):	0.33
	Exit Gas Velocity (ft/s):	0.01
	Exit Gas Temp (F):	70
	Exit Gas Flow Rate (acfm):	18.7

Tanks: $ACFM = (MSCF/DAY) (1000 SCF/MCF) (DAY/24 HR) (HR/60 MIN)$

Burners: $ACFM = (MMBTU/HR)(HR/60 MIN)(SCF/BTU)(10^6 BTU/MMBTU)$

Truckloading: $(200 BBL/HR)(HR/60 MIN)(5.61 CF/BBL) = 18.7 ACFM$

Company Release Point ID: Flare	Release Point Type:	Vertical
	Release Point Latitude:	43.776961
Company Release Point Description:	Release Point Longitude:	-106.075585
	Base Elevation (ft):	4888
	Stack Height (ft):	25
	Stack Diameter (ft):	0.3
	Exit Gas Velocity (ft/s):	0.1
	Exit Gas Temp (F):	1000
	Exit Gas Flow Rate (acfm):	0.1

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:	_____
	Release Point Longitude:	_____
	Release Height (ft):	_____
Company Release Point Description:		