STATE OF WYOMING

Department of Environmental Quality - Air Quality Division

Chapter 6, Section 2 Oil & Gas Production Facilities Application

for the

Jonah-Pinedale Anticline Development Area

These application forms are to be used ONLY for facilities with existing Air Quality permits issued according to the July 28, 2004 Addendum to the C6 S2 Oil and Gas Production Facilities Permitting Guidance

Please submit three (3) copies of this completed form to:
Department of Environmental Quality
Air Quality Division
Herschler Building 4-W
122 West 25th Street
Cheyenne, WY 82002

Contact Information:

Name: Ms. Cally McKee Title: Manager, Environmental & Regulatory
Address: 304 Inverness Way South, Suite 295 Englewood, CO 80112
Telephone: (303) 645-9843 Fax: (303) 708-9748 Email: cmckee@ultrapetroleum.com

Facility Information:

Company Name: Ultra Resources, Inc.
Facility Name: Boulder 5-30 Pad
Production Field Name: Pinedale Anticline
Current Air Quality Permit(s): AP-14367, April 1, 2013

PAD Location (Provide legal description including either Latitude/Longitude or UTM coordinates)

County: Sublette
Legal Description: ¼¼ Section: SENW Section: 30 T: 31N R: 108W
Coordinates: Latitude: 42.62922 Longitude: 109.76871
UTM Coordinates: Zone: Easting: Northing:

Date Permitted Facility FIRST Became Operational: 11/16/2012
Date of Modification to Facility: 8/28/2013

Date of Modification to Facility is defined as: the First Date of Production for a new well added to an existing single or PAD well facility or the date production from a new or existing well is tied into existing equipment at an existing single or PAD well facility.

Facility Emission Summary (TPY)

	VOC	HAP	NOx	CO
Emissions per AP-14367, April 1, 2013	6.2	2.2	10.5	7.7
Total Facility Emissions after Modification:	4.9	1.9	8.6	6.5

Names and API numbers for all existing wells producing to this facility

Name:	API #:
Boulder 3d1-30D (Boulder 5-30 CDP)	49-35-28562
Boulder 4a1-30D (Boulder 5-30 CDP)	49-35-28572
Boulder 4b1-30D (Boulder 5-30 CDP)	49-35-28570
Boulder 6a2-30D (Boulder 5-30 CDP)	49-35-28355
Boulder 3a1-30D (Boulder 5-30 CDP)	49-35-28568
Boulder 3c1-30D (Boulder 5-30 CDP)	49-35-28571
Boulder 5d1-30D (Boulder 5-30 CDP)	49-35-28567
Boulder 6b2-30D (Boulder 5-30 CDP)	49-35-28561
Boulder 6c1-30D (Boulder 5-30 CDP)	49-35-28566
Boulder 6d1-30D (Boulder 5-30 CDP)	49-35-28569
Boulder 5d2-30D (Boulder 5-30 CDP)	49-35-28565
Boulder 3b1-30D (Boulder 5-30 CDP)	49-35-28563
Boulder 5a2-30D (Boulder 5-30 CDP)	49-35-28609
Boulder 4d1-30D (Boulder 5-30 CDP)	49-35-28564

Name and API number for new well(s) producing to this facility

Name:	API #:

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BRIEFLY describe why this form is being submitted. (Examples - Additional production from a separate well has been added to an existing wellsite facility, or an additional well and associated production equipment has been placed at an existing single well or PAD facility, or a new PAD facility has been constructed, etc.)

Equipment updates detailed for the Boulder 5-30 Pad.
Production routed through Boulder 5-30 Pad.

Identify all EXISTING, permitted production equipment at the site owned, leased or operated by the applicant.

	Equipment Description	Site Rating (Hp, MMBtu/hr, bbl, MMSCFD, etc.)
2	4.0 MMSCFD TEG Dehydration Unit	4.0 MMSCFD
2	Kimray 4015PV Glycol Pump	0.68 gpm
2	Dehy Reboiler Heaters	0.085 MMBtu/hr
2	3-phase separator w/ separator heater	0.75 MMBtu/hr
3	25.0 MMSCFD TEG Dehydration Unit	25.0 MMSCFD
6	Kimray 21015PV Glycol Pump (Backup pumps included)	3.50 gpm
3	Dehy Reboiler Heater	0.35 MMBtu/hr
3	3-phase separator w/ separator heater	1.50 MMBtu/hr
15	Liquid level controllers (intermittent bleed)	1.75 scfh
1	J.W. William BTEX Combustion Device	30" OD
1	J.W. William BTEX Combustion Device	48" OD
3	Line Heater Secondary Burner Control	0.25 MMBtu/hr
2	Tanks (Emergency Use Only)	300 bbl
1	Bleach Pump (solar powered)	n/a

Identify all NEW production equipment at the site owned, leased or operated by the applicant

	Equipment Description	Site Rating (Hp, MMBtu/hr, bbl, MMSCFD, etc.)
1	Pneumatic Heat Trace Pump(s)	60 scfh
1	Bleach Tank(s)	500 gal

Identify production equipment which has been removed from the site

	Equipment Description	Site Rating (Hp, MMBtu/hr, bbl, MMSCFD, etc.)
1	25.0 MMSCFD TEG Dehydration Unit	25.0 MMSCFD
2	Kimray 21015PV Glycol Pump (Backup pumps included)	3.50 gpm
1	Dehy Reboiler Heater	0.35 MMBtu/hr
1	3-phase separator w/ separator heater	1.50 MMBtu/hr
3	Liquid level controllers (intermittent bleed)	1.75 scfh
3	Line Heater Secondary Burner Control	0.25 MMBtu/hr

Is there any emission source not under the applicant's control? ☐ Yes ☑ No

Identify Owner or Operator of Other's Equipment	Description of Other's Equipment

Note: Emergency Tanks previously identified as Condensate and Produced Water (emergency use only).
Ultra will refer to combustors by the base diameter rather than the exit diameter. (eg. 12" now a 16", 20" now a 24")

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BRIEFLY describe why this form is being submitted. (Examples - Additional production from a separate well has been added to an existing wellsite facility, or an additional well and associated production equipment has been placed at an existing single well or PAD facility, or a new PAD facility has been constructed, etc.)

Equipment updates detailed for the Boulder 5-30 SimOps.
Production routed through Boulder 5-30 Pad.

Identify all EXISTING, permitted production equipment at the site owned, leased or operated by the applicant.

Equipment Description		Site Rating (Hp, MMBtu/hr, bbl, MMSCFD, etc.)
14	Line Heater/Heater Treater	0.75 MMBtu/hr
3	Line Heater Secondary Burner Control	0.25 MMBtu/hr

Identify all NEW production equipment at the site owned, leased or operated by the applicant

Equipment Description	Site Rating (Hp, MMBtu/hr, bbl, MMSCFD, etc.)

Identify production equipment which has been removed from the site

Equipment Description	Site Rating (Hp, MMBtu/hr, bbl, MMSCFD, etc.)

Is there any emission source not under the applicant's control? ☐ Yes ☑ No

Identify Owner or Operator of Other's Equipment	Description of Other's Equipment

Note: Emergency Tanks previously identified as Condensate and Produced Water (emergency use only).
Ultra will refer to combustors by the base diameter rather than the exit diameter. (eg. 12" now a 16", 20" now a 24")

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Boulder 5-30 Pad

Below list current, average daily throughput based on the latest one-month of production records available, for each dehydration unit (MMCFD), each pressurized vessel with the potential for flash emissions (BPD) and each hydrocarbon liquid storage tank (BPD). A pressurized vessel with the potential for flash emissions is any vessel where hydrocarbon vapors flashed from solution are NOT routed into a gas sales or gas collection line. This does not include pressure relief valves which are ONLY used to relieve pressure during upset conditions.

Dehydration units	(MMCFD)	"Flash" vessels	(BPD)	Hydrocarbon Liquid Storage Tanks	(BPD)
4 - Dehy Units	15.4			Condensate	102.9
				Production now goes to CGF	

According to the Addendum to the C6 S2 Oil and Gas Production Facilities Permitting Guidance, approved and effective July 28, 2004, controls for emissions from all existing and new hydrocarbon liquid storage tanks and pressure vessels (flashing emissions) and existing and new dehydration units, meeting BACT requirements described in the C6 S2 Guidance, must be installed and operational upon the First Date of Production of an additional well(s) or upon the date production associated with a well(s) from a seperate location is tied into this facility. For all new and existing combustion units used for control of flashing and dehydration unit emissions, pilot flames must be continually monitored using a thermocouple and continous recording device or any other device(s) which will detect and record the presence of the pilot flames. These monitoring systems must be installed and operational upon start-up of the combustion devices.

In the space below identify and provide installation dates of controls and pilot monitoring systems installed per the paragraph above.

Control	Monitoring system	Installation Date
BTEX Combustor 48"	remote telemetry/daily check by operator	2012
BTEX Combustor 30"	remote telemetry/daily check by operator	2012

I, Ms. Cally McKee — Manager, Environmental & Regulatory

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 this facility will operate in compliance with all Wyoming Air Quality Standards and Regulation

Signature: Cally McKee **Date:** **11/1/2013**

STATE OF WYOMING

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

EMISSION SUMMARY

Company Name Ultra Resources, Inc.

Facility Name Boulder 5-30 Pad

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.

EMISSIONS (Tons Per Year)

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**
Emissions per AP-14367, April 1, 2013	6.20	2.20	10.50	7.70	0.00	0.00
Emissions as of: 9/27/2013	4.89	1.92	8.58	6.52	0.00	0.00
Emissions/Offsets=	**-1.31**	**-0.28**	**-1.92**	**-1.18**	**0.00**	**0.00**

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**

STATE OF WYOMING

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Oil and Gas Production Facilities C6 S2 Permit Application

EMISSION SUMMARY

Company Name Ultra Resources, Inc.

Facility Name Boulder 5-30 Pad

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**

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**
4.0 MMSCFD TEG Dehydration Units	0.53	0.28	0.00	0.00	0.00	0.00
25.0 MMSCFD TEG Dehydration Units	2.79	1.53	0.00	0.00	0.00	0.00
Condensate Tanks**	0.00	0.00	0.00	0.00	0.00	0.00
Tank Flare**	0.00	0.00	0.00	0.00	0.00	0.00
Dehy Combustor Flare	0.00	0.00	1.11	0.28	0.00	0.00
Process Heaters	0.41	Insig.	7.42	6.24	0.00	0.00
Pneumatic & Chemical Pumps **(controlled)**	0.02	0.001	0.04	0.01	0.00	0.00
Truck Loading**	0.00	0.00	0.00	0.00	0.00	0.00
Fugitives	0.79	0.09	0.00	0.00	0.00	0.00
Liquid Level Controllers (Intermittent-bleed)	0.36	0.021	0.00	0.00	0.00	0.00
Total	**4.89**	**1.92**	**8.58**	**6.52**	**0.00**	**0.00**

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**

Note: **** Pad connected to the CGF #2 by December 31, 2010, therefore, emissions are no longer associated with this process.**

Ultra Resources, Inc.
Total Well Production

Facility		Boulder 5-30 Pad

Production Timeframe [1]	Number of Wells	CDP Name	Oil Bbls[1]	Gas Mcf[1]	Produced Water	Days	Gas (MMSCF/day)	Oil (BPD)
September 2013	14	Boulder 5-30 CDP	3086	461124	62262	30	15.37	102.9
Totals			**3086**	**461124**	**62262**		**15**	**103**

Average Pad Production Rates - Existing Wells; no decline factor		
Gas MMSCFD	**Oil (BPD)**	**CDP**
15.4	102.9	Boulder 5-30 CDP

Average Pad Production Rates - New Wells; ~30 day production * 0.6 decline factor		
Gas MMSCFD	**Oil (BPD)**	**CDP**
0.0	0.0	

Estimated Production/Dehy Unit		
Dehys	**MMSCFD**	**CDP**
4.0	1.06	Boulder 5-30 CDP
4.0	1.06	Boulder 5-30 CDP
25.0	6.63	Boulder 5-30 CDP
25.0	6.63	Boulder 5-30 CDP

Totals		
Gas (MMSCFD)	**Oil (BPD)**	**CDP**
15.4	**102.9**	Boulder 5-30 CDP

References

[1] Gas and oil production data obtained from Ultra online database.

Ultra Resources, Inc.
Dehy Combustor Emission Calculations

Emission Assumptions

		NOx Emission Factor =	0.14	lb/MMBtu	WDEQ O&G Guidance
		CO Emission Factor =	0.035	lb/MMBtu	WDEQ O&G Guidance
Boulder 5-30 CDP	4.0 MMSCFD	Combustor Waste Gas Throughput =	135	scf/hr	[Gas Throughput based GlyCalc Model]
Boulder 5-30 CDP	25.0 MMSCFD	Combustor Waste Gas Throughput =	699	scf/hr	[Gas Throughput based GlyCalc Model]
		Combustor Pilot Gas =	30	scf/hr	[conservative estimate]
		Natural Gas Heating Value =	1050	Btu/scf	[conservative estimate]

CDP			**NOx (tpy)**	**CO (tpy)**	**Number of Dehys**	
Boulder 5-30 CDP	4.0 MMSCFD	Combustor Emissions =	0.17	0.04	2	
Boulder 5-30 CDP	25.0 MMSCFD	Combustor Emissions =	0.90	0.23	2	
		Pilot Gas Emissions =	0.04	0.01	2	**Number of BTEX Combustors**
		Total Combustor Emissions =	**1.11**	**0.28**		

Notes:

Emission factors for NOx and CO from combustors from WDEQ O&G Guidance, March 2010

Note:
**** Pad connected to the CGF #2 by December 31, 2010, therefore, emissions are no longer associated with this process.**

Ultra Resources, Inc.
Process Heater Emission Calculations

Emission Assumptions

AP-42 Emission Factors for Natural Gas Combustion:

NOx Emission Factor=	100	lb/MMscf	[AP-42, Table 1.4-1]
CO Emission Factor=	84	lb/MMscf	[AP-42, Table 1.4-1]
VOC Emission Factor=	5.5	lb/MMscf	[AP-42, Table 1.4-2]

AP-42 Emissions Factors adjusted to actual gas heating value:

Adjusted NOx Emission Factor=	104	lb/MMscf	
Adjusted CO Emission Factor=	87	lb/MMscf	
Adjusted VOC Emission Factor=	5.7	lb/MMscf	
Natural Gas Heating Value =	1061	Btu/scf	[From Gas Analyses]
Natural Gas Heating Value =	1020	Btu/scf	AP-42 average value

			Number of Units
Dehy Reboiler =	0.085	MMBtu/hr	2
Dehy Reboiler =	0.350	MMBtu/hr	2
Indirect Heater / Separator Heater =	0.75	MMBtu/hr	2
Indirect Heater / Separator Heater =	1.50	MMBtu/hr	2
Line Heater Secondary Burner Control =	0.25	MMBtu/hr	3
Indirect Heater / Line Heater =	0.75	MMBtu/hr	14

		NOx (tpy)	VOC (tpy)	CO (tpy)
0.085 MMBtu/hr	Dehy Reboiler =	**0.08**	**0.004**	**0.06**
0.350 MMBtu/hr	Dehy Reboiler =	**0.31**	**0.017**	**0.26**
0.75 MMBtu/hr	Indirect Heater / Separator Heater =	**0.67**	**0.037**	**0.56**
1.50 MMBtu/hr	Indirect Heater / Separator Heater =	**1.34**	**0.074**	**1.13**
0.25 MMBtu/hr	Line Heater Secondary Burner Control =	**0.34**	**0.018**	**0.28**
0.75 MMBtu/hr	Indirect Heater / Line Heater =	**4.69**	**0.258**	**3.94**
	Total Process Heater Emissions =	**7.42**	**0.41**	**6.24**

Ultra Resources, Inc.
Pneumatics Emissions Estimation
Calculation Details

Sandpiper pump (scfh)	60
Hours/year	8760
Motive Gas Density (lb/ft^3)	0.0478
Number of pumps	1
Gas Vented (tpy)	12.56
% VOC	8.11%
% HAPs	0.47%
Uncontrolled VOCs (tpy)	**1.02**
Uncontrolled HAPs (tpy)	**0.06**
Control Efficiency (%)	**98.0%**
Controlled VOCs (tpy)[1]	**0.02**
Controlled HAPs (tpy)[1]	**0.001**
Total VOCs (tpy)[1]	**0.02**
Total HAPs (tpy)[1]	**0.001**

Methanol Injection (scfh)	25
Hours/year	8760
Motive Gas Density (lb/ft^3)	0.0478
Number of pumps	0
Gas Vented (tpy)	0.00
% VOC	8.11%
% HAPs	0.47%
Uncontrolled VOCs (tpy)[2]	**0.00**
Uncontrolled HAPs (tpy)[2]	**0.00**
Control Efficiency (%)	**98.0%**
Controlled VOCs (tpy)[1]	**0.00**
Controlled HAPs (tpy)[1]	**0.000**

Calculations:

Pump Rate (scf/hour) * Number of Pumps / 23.8 ft^3/lb * 8760 hrs/yr / 2000 lbs-ton = Amount of gas vented (tons/yr)
%VOC was calculated from the mol % wet gas average of four wells, converted to weight percent, VOC = All C3+ components
% VOC of gas x pneumatic gas vented (tons/yr) = ton/yr of VOC emitted

Notes:
All pneumatic heat trace, heat medium, glycol circulation, and chemical pumps are routed through combustor or an equivalent device to achieve 98% destruction efficiency
[2]There is 1 additional solar powered bleach pump, no emissions

Ultra Resources, Inc.
Condensate Truck Loading

From AP-42, Chapter 5.2 - Transportation and Marketing of Petroleum Liquids

L_L = 12.46 SPM / T

Where,

L_L = Loading Loss, lb/1000 gals of liquid loaded
S = Saturation Factor
P = True Vapor Pressure of Liquid Loaded, psia
M = Molecular Weight of Vapors, lb/lb-mol
T = Temperature of Bulk Liquid Loaded, ^oR

Condensate Truck Loading Assumptions

L_L =	3.78	Loading Losses, lb/1000 gal liquid loaded
S =	0.6	submerged loading, dedicated normal service
	7.0	Reid Vapor Pressure, psia
P =	3.79	True Vapor Pressure, psia
M =	68.0	Mol Wt of Vapors, lb/lbmol
T =	510	Temp of liquid loaded, ^oR, (50 + 460) = 510 ^oR
Average Daily Loadout =	0.0	bbls/day
Annual Production =	0	bbls/year
Annual Production =	0	gals/year
Annual Production =	0	1,000 gals/year
E =	**0.00**	**TPY VOC**
E =	**0.00**	**TPY HAPs**

Notes:
**** Pad connected to the CGF #2 by December 31, 2010, therefore, emissions are no longer associated with this process.**

Ultra Resources, Inc.

Equipment Leak Emission Factors

Equipment Type	Equipment Service	Average Total HydroCarbon Emission Factors[1] (lb/component-day)	Speciated Fugitive Emission Factors (Estimated Weight Fractions)[2] VOC	$C6^+$	Benzene	Toluene	Ethylbenzene	Xylenes	Total HAP
Valves	Gas	**0.2400**	3.50E-02	3.38E-03	2.30E-04	3.90E-04	2.00E-05	1.00E-04	4.12E-03
	Heavy Oil	**0.00044**	3.00E-02	7.52E-03	9.35E-03	3.44E-03	5.10E-04	3.72E-03	2.45E-02
	Light Oil	**0.1300**	2.92E-01	2.43E-02	2.70E-04	7.50E-04	1.70E-04	3.60E-04	2.59E-02
	Water/Oil	**0.0052**	N/A	N/A	6.24E-06	1.66E-06	5.20E-08	2.08E-07	8.16E-06
Pump Seals	Gas	**0.1300**	3.50E-02	3.38E-03	2.30E-04	3.90E-04	2.00E-05	1.00E-04	4.12E-03
	Heavy Oil	**NA**	NA	NA	NA	NA	NA	NA	NA
	Light Oil	**0.6900**	2.92E-01	2.43E-02	2.70E-04	7.50E-04	1.70E-04	3.60E-04	2.59E-02
	Water/Oil	**0.0013**	N/A	N/A	1.56E-06	4.16E-07	1.30E-08	5.20E-08	2.04E-06
Others: pressure relief valves, compressors, instruments, diaphrams, drains, hatches, meters, and vents.	Gas	**0.4700**	3.50E-02	3.38E-03	2.30E-04	3.90E-04	2.00E-05	1.00E-04	4.12E-03
	Heavy Oil	**0.0017**	3.00E-02	7.52E-03	9.35E-03	3.44E-03	5.10E-04	3.72E-03	2.45E-02
	Light Oil	**0.4000**	2.92E-01	2.43E-02	2.70E-04	7.50E-04	1.70E-04	3.60E-04	2.59E-02
	Water/Oil	**0.7400**	N/A	N/A	8.88E-04	2.37E-04	7.40E-06	2.96E-05	1.16E-03
Connectors	Gas	**0.0110**	3.50E-02	3.38E-03	2.30E-04	3.90E-04	2.00E-05	1.00E-04	4.12E-03
	Heavy Oil	**0.0004**	3.00E-02	7.52E-03	9.35E-03	3.44E-03	5.10E-04	3.72E-03	2.45E-02
	Light Oil	**0.0110**	2.92E-01	2.43E-02	2.70E-04	7.50E-04	1.70E-04	3.60E-04	2.59E-02
	Water/Oil	**0.0058**	N/A	N/A	6.96E-06	1.86E-06	5.80E-08	2.32E-07	9.11E-06
Flanges	Gas	**0.0210**	3.50E-02	3.38E-03	2.30E-04	3.90E-04	2.00E-05	1.00E-04	4.12E-03
	Heavy Oil	**0.000021**	3.00E-02	7.52E-03	9.35E-03	3.44E-03	5.10E-04	3.72E-03	2.45E-02
	Light Oil	**0.0058**	2.92E-01	2.43E-02	2.70E-04	7.50E-04	1.70E-04	3.60E-04	2.59E-02
	Water/Oil	**0.00015**	N/A	N/A	1.80E-07	4.80E-08	1.50E-09	6.00E-09	2.36E-07
Open-Ended Lines	Gas	**0.1100**	3.50E-02	3.38E-03	2.30E-04	3.90E-04	2.00E-05	1.00E-04	4.12E-03
	Heavy Oil	**0.0074**	3.00E-02	7.52E-03	9.35E-03	3.44E-03	5.10E-04	3.72E-03	2.45E-02
	Light Oil	**0.0740**	2.92E-01	2.43E-02	2.70E-04	7.50E-04	1.70E-04	3.60E-04	2.59E-02
	Water/Oil	**0.0130**	N/A	N/A	1.56E-05	4.16E-06	1.30E-07	5.20E-07	2.04E-05

Ultra Resources, Inc.

Equipment Leak Emissions

Equipment Type	Equipment Service	Component Count	Total HydroCarbon Emissions lb/day	lb/mo.	ton/yr	Total VOC Emissions lb/day	lb/mo.	ton/yr	Total HAP Emissions lb/day	lb/mo.	ton/yr
Valves	Gas	**70**	16.8	511.0	3.1	0.588	17.9	0.107	0.069	2.1	0.013
	Heavy Oil										
	Light Oil	**1**	0.13	4.0	0.0	0.038	1.2	0.007	0.003	0.1	0.001
	Water/Oil	**1**	0.01	0.2	0.0	N/A			0.000	0.0	0.000
Pump Seals	Gas	**14**	1.8	55.4	0.3	0.064	1.9	0.012	0.007	0.2	0.001
	Heavy Oil										
	Light Oil										
	Water/Oil										
Others: pressure relief valves, compressors, instruments, diaphrams, drains, hatches, meters, and vents.	Gas	**140**	65.8	2001.4	12.0	2.303	70.0	0.420	0.271	8.2	0.049
	Heavy Oil										
	Light Oil	**2**	0.8	24.3	0.1	0.234	7.1	0.043	0.021	0.6	0.004
	Water/Oil	**2**	1.5	45.0	0.3	N/A			0.002	0.1	0.000
Connectors	Gas	**280**	3.1	93.7	0.6	0.108	3.3	0.020	0.013	0.4	0.002
	Heavy Oil										
	Light Oil	**210**	2.3	70.3	0.4	0.675	20.5	0.123	0.060	1.8	0.011
	Water/Oil	**210**	1.2	37.0	0.2	N/A			0.000	0.0	0.000
Flanges	Gas	**28**	0.6	17.9	0.1	0.021	0.6	0.004	0.002	0.1	0.000
	Heavy Oil										
	Light Oil	**0**	0.0	0.0	0.0	0.000	0.0	0.000	0.000	0.0	0.000
	Water/Oil	**0**	0.0	0.0	0.0	N/A			0.000	0.0	0.000
Open-Ended Lines	Gas										
	Heavy Oil										
	Light Oil	**14**	1.0	31.5	0.2	0.303	9.2	0.055	0.027	0.8	0.005
	Water/Oil	**14**	0.2	5.5	0.0				0.000	0.0	0.000
		Total	**94.0**	**2860.1**	**17.2**	**4.332**	**131.8**	**0.79**	**0.475**	**14.5**	**0.09**

Speciated Fugitive Emission Factors
(Estimated weight fractions of THC emissions in each category

Equipment Service	Speciated Fugitive Emission Factors (Estimated weight fractions of THC emissions)[2] Methane	NMHC	VOC	$C6^+$	Benzene	Toluene	Ethylbenzene	Xylenes
Gas Production	0.92	0.08	0.035	0.00338	0.00023	0.00039	0.00002	0.0001
Heavy Oil	0.942	0.058	0.03	0.00752	0.00935	0.00344	0.00051	0.00372
Light Oil	0.613	0.387	0.292	0.0243	0.00027	0.00075	0.00017	0.00036

HAP (BTEX) Fugitive Emission Speciation Factors Used for Water/Oil

Compound	Speciation Factor [3] (lb HAP/lb TOC)
Benzene	0.0012
Toluene	0.00032
Ethylbenzene	0.00001
Xylenes (m,p,o)	0.00004

Sample Calculations: TOC emissions (tpy) = [N, (Component Count)] * [THC EF per equipment type and service category, (lb/component-day)] * [365, (days in a year)] / [2000, (lbs/ton)]
VOC emissions (tpy) = [TOC emissions per equipment service, (tpy)] * [VOC Speciated Fugitive EF per equipment service, (weight fraction)]
HAP emissions (tpy) = [TOC emissions per equipment service, (tpy)] * [Sum of HAP speciated EF's per equipment service, (sum of weight fractions)]

References:

[1] EPA Protocol for Equipment Leak Emission Estimates, November 1995 (EPA-453/R-95-017). Table 2-4, Page 2-15.
[2] Oil and Gas Production Facilities, Chapter 6, section 2 Permitting Guidance, WDEQ, Air Quality Division; Fugitive Emissions Pg. 71 of 81
[3] Gas Research Institute (GRI) Technical Reference Manual for GRI-HAPCalc, Software for Estimating Emissions of Hazardous Air Pollutants and Criteria Air Pollutants from Natural Gas Industry Operations, GRI-96/0346

Ultra Resources, Inc.
Liquid Level Controllers (LLC)

Post-Modification (Intermittent-Bleed):		
Mizer Intermittent-Bleed Pilot Valve Controllers Rate:	1.75	scfh
Total Controllers:	12	LLCs
Hours of Operation/year:	8760	hours
Estimated Motive Gas Density:	0.048	lb/ft^3
Gas Vented (tpy)	4.40	
% VOC	8.11%	
% HAPs	0.47%	
VOC Emissions (tpy):	**0.36**	
HAP Emissions (tpy):	**0.021**	

GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: Boulder 5-30 Pad Facility
File Name: J:\12000\12027-006 - WY Well Air Permitting\Equip Inv Apps\Submittal -To Be Submitted\BR 5-30\GlyCalc\BR 5-30_4.0 MMSCFD_Submittal16.ddf
Date: October 23, 2013

DESCRIPTION:

Description: Boulder 5-30 CDP
4.0 MMSCFD dehy units (2)
Total of 14 wells
September 2013 Production Data

Annual Hours of Operation: 8760.0 hours/yr

WET GAS:

Temperature: 75.00 deg. F
Pressure: 400.00 psig
Wet Gas Water Content: Saturated

Component	Conc. (vol %)
Carbon Dioxide	0.5939
Nitrogen	0.1378
Methane	91.3895
Ethane	5.1507
Propane	1.5068
Isobutane	0.3480
n-Butane	0.3042
Isopentane	0.1334
n-Pentane	0.0654
Cyclopentane	0.0112
n-Hexane	0.0366
Cyclohexane	0.0354
Heptanes	0.0736
Methylcyclohexane	0.0097
2,2,4-Trimethylpentane	0.0029
Benzene	0.0119
Toluene	0.0202
Ethylbenzene	0.0004
Xylenes	0.0102
C8+ Heavies	0.0238

DRY GAS:

Flow Rate: 1.1 MMSCF/day
Water Content: 5.0 lbs. H2O/MMSCF

LEAN GLYCOL:

Glycol Type: TEG
Water Content: 1.5 wt% H2O
Flow Rate: 0.7 gpm

PUMP:

Glycol Pump Type: Gas Injection
Gas Injection Pump Volume Ratio: 0.080 acfm gas/gpm glycol

REGENERATOR OVERHEADS CONTROL DEVICE:

Control Device: Condenser
Temperature: 100.0 deg. F
Pressure: 11.3 psia

Control Device: Combustion Device
Destruction Efficiency: 98.0 %
Excess Oxygen: 20.0 %
Ambient Air Temperature: 36.0 deg. F

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Boulder 5-30 Pad Facility
File Name: J:\12000\12027-006 - WY Well Air Permitting\Equip Inv Apps\Submittal -To Be Submitted\BR 5-30\GlyCalc\BR 5-30_4.0 MMSCFD_Submittal16.ddf
Date: October 23, 2013

DESCRIPTION:

Description: Boulder 5-30 CDP
4.0 MMSCFD dehy units (2)
Total of 14 wells
September 2013 Production Data

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.0836	2.006	0.3661
Ethane	0.0122	0.293	0.0535
Propane	0.0072	0.172	0.0314
Isobutane	0.0029	0.070	0.0127
n-Butane	0.0032	0.076	0.0138
Isopentane	0.0019	0.045	0.0083
n-Pentane	0.0011	0.027	0.0050
Cyclopentane	0.0007	0.016	0.0030
n-Hexane	0.0013	0.030	0.0055
Cyclohexane	0.0045	0.108	0.0196
Heptanes	0.0051	0.123	0.0225
Methylcyclohexane	0.0016	0.038	0.0069
2,2,4-Trimethylpentane	0.0001	0.003	0.0005
Benzene	0.0083	0.198	0.0362
Toluene	0.0162	0.388	0.0708
Ethylbenzene	0.0002	0.006	0.0011
Xylenes	0.0064	0.153	0.0279
C8+ Heavies	0.0001	0.003	0.0006
Total Emissions	0.1565	3.755	0.6853
Total Hydrocarbon Emissions	0.1565	3.755	0.6853
Total VOC Emissions	0.0607	1.456	0.2657
Total HAP Emissions	0.0324	0.778	0.1419
Total BTEX Emissions	0.0310	0.745	0.1360

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	4.1800	100.320	18.3085
Ethane	0.6113	14.672	2.6776
Propane	0.3603	8.648	1.5783
Isobutane	0.1464	3.514	0.6413
n-Butane	0.1595	3.828	0.6987
Isopentane	0.0976	2.342	0.4273
n-Pentane	0.0591	1.419	0.2589
Cyclopentane	0.0359	0.861	0.1572

n-Hexane	0.0693	1.664	0.3037
Cyclohexane	0.2580	6.191	1.1299
Heptanes	0.3319	7.966	1.4538
Methylcyclohexane	0.1041	2.499	0.4560
2,2,4-Trimethylpentane	0.0071	0.170	0.0309
Benzene	0.4956	11.895	2.1709
Toluene	1.3130	31.513	5.7511
Ethylbenzene	0.0365	0.876	0.1599
Xylenes	1.0278	24.667	4.5018
C8+ Heavies	0.6944	16.665	3.0414
Total Emissions	9.9880	239.712	43.7474
Total Hydrocarbon Emissions	9.9880	239.712	43.7474
Total VOC Emissions	5.1966	124.719	22.7613
Total HAP Emissions	2.9494	70.785	12.9183
Total BTEX Emissions	2.8730	68.952	12.5837

EQUIPMENT REPORTS:

CONDENSER AND COMBUSTION DEVICE

Condenser Outlet Temperature:	100.00	deg. F
Condenser Pressure:	11.30	psia
Condenser Duty:	4.04e-002	MM BTU/hr
Hydrocarbon Recovery:	0.17	bbls/day
Produced Water:	0.13	bbls/day
Ambient Temperature:	36.00	deg. F
Excess Oxygen:	20.00	%
Combustion Efficiency:	98.00	%
Supplemental Fuel Requirement:	4.04e-002	MM BTU/hr

Component	Emitted	Destroyed
Methane	2.00%	98.00%
Ethane	2.00%	98.00%
Propane	1.99%	98.01%
Isobutane	1.98%	98.02%
n-Butane	1.98%	98.02%
Isopentane	1.93%	98.07%
n-Pentane	1.93%	98.07%
Cyclopentane	1.88%	98.12%
n-Hexane	1.81%	98.19%
Cyclohexane	1.74%	98.26%
Heptanes	1.55%	98.45%
Methylcyclohexane	1.52%	98.48%
2,2,4-Trimethylpentane	1.53%	98.47%
Benzene	1.67%	98.33%
Toluene	1.23%	98.77%
Ethylbenzene	0.67%	99.33%
Xylenes	0.62%	99.38%
C8+ Heavies	0.02%	99.98%

ABSORBER

NOTE: Because the Calculated Absorber Stages was below the minimum allowed, GRI-GLYCalc has set the number of Absorber Stages to 1.25 and has calculated a revised Dry Gas Dew Point.

Calculated Absorber Stages:	1.25	
Calculated Dry Gas Dew Point:	1.96	lbs. H2O/MMSCF
Temperature:	75.0	deg. F
Pressure:	400.0	psig
Dry Gas Flow Rate:	1.0600	MMSCF/day
Glycol Losses with Dry Gas:	0.0016	lb/hr
Wet Gas Water Content:	Saturated	
Calculated Wet Gas Water Content:	55.65	lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio:	17.17	gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	3.52%	96.48%
Carbon Dioxide	99.47%	0.53%
Nitrogen	99.97%	0.03%
Methane	99.97%	0.03%
Ethane	99.87%	0.13%
Propane	99.75%	0.25%
Isobutane	99.59%	0.41%
n-Butane	99.44%	0.56%
Isopentane	99.34%	0.66%
n-Pentane	99.14%	0.86%
Cyclopentane	96.30%	3.70%
n-Hexane	98.33%	1.67%
Cyclohexane	92.79%	7.21%
Heptanes	96.35%	3.65%
Methylcyclohexane	90.84%	9.16%
2,2,4-Trimethylpentane	98.38%	1.62%
Benzene	54.50%	45.50%
Toluene	39.74%	60.26%
Ethylbenzene	26.51%	73.49%
Xylenes	18.85%	81.15%
C8+ Heavies	85.53%	14.47%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	70.65%	29.35%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	0.38%	99.62%
n-Pentane	0.40%	99.60%
Cyclopentane	0.47%	99.53%
n-Hexane	0.44%	99.56%
Cyclohexane	3.11%	96.89%
Heptanes	0.47%	99.53%
Methylcyclohexane	3.91%	96.09%

2,2,4-Trimethylpentane	1.33%	98.67%
Benzene	4.98%	95.02%
Toluene	7.87%	92.13%
Ethylbenzene	10.37%	89.63%
Xylenes	12.87%	87.13%
C8+ Heavies	11.85%	88.15%

STREAM REPORTS:

WET GAS STREAM

Temperature: 75.00 deg. F
Pressure: 414.70 psia
Flow Rate: 4.43e+004 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.17e-001	2.46e+000
Carbon Dioxide	5.94e-001	3.05e+001
Nitrogen	1.38e-001	4.50e+000
Methane	9.14e+001	1.71e+003
Ethane	5.15e+000	1.81e+002
Propane	1.51e+000	7.75e+001
Isobutane	3.48e-001	2.36e+001
n-Butane	3.04e-001	2.06e+001
Isopentane	1.33e-001	1.12e+001
n-Pentane	6.54e-002	5.50e+000
Cyclopentane	1.12e-002	9.16e-001
n-Hexane	3.66e-002	3.68e+000
Cyclohexane	3.54e-002	3.48e+000
Heptanes	7.36e-002	8.60e+000
Methylcyclohexane	9.70e-003	1.11e+000
2,2,4-Trimethylpentane	2.90e-003	3.86e-001
Benzene	1.19e-002	1.08e+000
Toluene	2.02e-002	2.17e+000
Ethylbenzene	4.00e-004	4.95e-002
Xylenes	1.02e-002	1.26e+000
C8+ Heavies	2.38e-002	4.73e+000
Total Components	100.00	2.09e+003

DRY GAS STREAM

Temperature: 75.00 deg. F
Pressure: 414.70 psia
Flow Rate: 4.42e+004 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	4.14e-003	8.67e-002
Carbon Dioxide	5.92e-001	3.03e+001
Nitrogen	1.38e-001	4.50e+000
Methane	9.16e+001	1.71e+003
Ethane	5.16e+000	1.80e+002

Propane	1.51e+000	7.73e+001
Isobutane	3.47e-001	2.35e+001
n-Butane	3.03e-001	2.05e+001
Isopentane	1.33e-001	1.12e+001
n-Pentane	6.50e-002	5.46e+000
Cyclopentane	1.08e-002	8.82e-001
n-Hexane	3.61e-002	3.62e+000
Cyclohexane	3.29e-002	3.22e+000
Heptanes	7.11e-002	8.29e+000
Methylcyclohexane	8.83e-003	1.01e+000
2,2,4-Trimethylpentane	2.86e-003	3.80e-001
Benzene	6.50e-003	5.91e-001
Toluene	8.04e-003	8.63e-001
Ethylbenzene	1.06e-004	1.31e-002
Xylenes	1.93e-003	2.38e-001
C8+ Heavies	2.04e-002	4.04e+000
Total Components	100.00	2.09e+003

LEAN GLYCOL STREAM

Temperature: 75.00 deg. F
Flow Rate: 6.79e-001 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.84e+001	3.76e+002
Water	1.50e+000	5.73e+000
Carbon Dioxide	4.25e-012	1.63e-011
Nitrogen	3.98e-014	1.52e-013
Methane	4.85e-018	1.85e-017
Ethane	2.82e-008	1.08e-007
Propane	2.09e-009	7.97e-009
Isobutane	7.57e-010	2.89e-009
n-Butane	7.51e-010	2.87e-009
Isopentane	9.70e-005	3.71e-004
n-Pentane	6.24e-005	2.38e-004
Cyclopentane	4.46e-005	1.71e-004
n-Hexane	8.09e-005	3.09e-004
Cyclohexane	2.17e-003	8.28e-003
Heptanes	4.13e-004	1.58e-003
Methylcyclohexane	1.11e-003	4.24e-003
2,2,4-Trimethylpentane	2.49e-005	9.51e-005
Benzene	6.80e-003	2.60e-002
Toluene	2.94e-002	1.12e-001
Ethylbenzene	1.11e-003	4.23e-003
Xylenes	3.97e-002	1.52e-001
C8+ Heavies	2.44e-002	9.34e-002
Total Components	100.00	3.82e+002

RICH GLYCOL AND PUMP GAS STREAM

Temperature: 75.00 deg. F
Pressure: 414.70 psia
Flow Rate: 7.06e-001 gpm
NOTE: Stream has more than one phase.

Component	Conc.	Loading

	(wt%)	(lb/hr)
TEG	9.53e+001	3.76e+002
Water	2.06e+000	8.11e+000
Carbon Dioxide	5.76e-002	2.27e-001
Nitrogen	2.81e-003	1.11e-002
Methane	1.06e+000	4.18e+000
Ethane	1.55e-001	6.11e-001
Propane	9.13e-002	3.60e-001
Isobutane	3.71e-002	1.46e-001
n-Butane	4.04e-002	1.60e-001
Isopentane	2.48e-002	9.79e-002
n-Pentane	1.50e-002	5.94e-002
Cyclopentane	9.14e-003	3.61e-002
n-Hexane	1.76e-002	6.96e-002
Cyclohexane	6.75e-002	2.66e-001
Heptanes	8.45e-002	3.33e-001
Methylcyclohexane	2.75e-002	1.08e-001
2,2,4-Trimethylpentane	1.81e-003	7.16e-003
Benzene	1.32e-001	5.22e-001
Toluene	3.61e-001	1.43e+000
Ethylbenzene	1.03e-002	4.07e-002
Xylenes	2.99e-001	1.18e+000
C8+ Heavies	2.00e-001	7.88e-001
Total Components	100.00	3.95e+002

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 1.81e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	2.77e+001	2.38e+000
Carbon Dioxide	1.08e+000	2.27e-001
Nitrogen	8.28e-002	1.11e-002
Methane	5.45e+001	4.18e+000
Ethane	4.25e+000	6.11e-001
Propane	1.71e+000	3.60e-001
Isobutane	5.27e-001	1.46e-001
n-Butane	5.74e-001	1.60e-001
Isopentane	2.83e-001	9.76e-002
n-Pentane	1.71e-001	5.91e-002
Cyclopentane	1.07e-001	3.59e-002
n-Hexane	1.68e-001	6.93e-002
Cyclohexane	6.41e-001	2.58e-001
Heptanes	6.93e-001	3.32e-001
Methylcyclohexane	2.22e-001	1.04e-001
2,2,4-Trimethylpentane	1.29e-002	7.06e-003
Benzene	1.33e+000	4.96e-001
Toluene	2.98e+000	1.31e+000
Ethylbenzene	7.20e-002	3.65e-002
Xylenes	2.03e+000	1.03e+000
C8+ Heavies	8.53e-001	6.94e-001
Total Components	100.00	1.26e+001

CONDENSER PRODUCED WATER STREAM

Temperature: 100.00 deg. F
Flow Rate: 3.67e-003 gpm

Component	Conc. (wt%)	Loading (lb/hr)	(ppm)
Water	1.00e+002	1.83e+000	999608.
Carbon Dioxide	1.21e-003	2.23e-005	12.
Nitrogen	1.34e-006	2.46e-008	0.
Methane	1.03e-003	1.88e-005	10.
Ethane	1.81e-004	3.33e-006	2.
Propane	9.29e-005	1.71e-006	1.
Isobutane	2.10e-005	3.86e-007	0.
n-Butane	3.10e-005	5.69e-007	0.
Isopentane	1.35e-005	2.48e-007	0.
n-Pentane	8.90e-006	1.63e-007	0.
Cyclopentane	3.98e-005	7.31e-007	0.
n-Hexane	8.50e-006	1.56e-007	0.
Cyclohexane	1.84e-004	3.37e-006	2.
Heptanes	1.98e-005	3.64e-007	0.
Methylcyclohexane	3.14e-005	5.77e-007	0.
2,2,4-Trimethylpentane	2.76e-007	5.06e-009	0.
Benzene	1.06e-002	1.94e-004	106.
Toluene	1.77e-002	3.25e-004	177.
Ethylbenzene	2.09e-004	3.84e-006	2.
Xylenes	7.75e-003	1.42e-004	78.
C8+ Heavies	2.99e-007	5.49e-009	0.
Total Components	100.00	1.84e+000	1000000.

CONDENSER RECOVERED OIL STREAM

Temperature: 100.00 deg. F
Flow Rate: 5.09e-003 gpm

Component	Conc. (wt%)	Loading (lb/hr)
Water	3.41e-002	7.38e-004
Carbon Dioxide	4.22e-003	9.14e-005
Nitrogen	9.19e-005	1.99e-006
Methane	2.57e-002	5.57e-004
Ethane	2.18e-002	4.71e-004
Propane	7.27e-002	1.57e-003
Isobutane	6.08e-002	1.32e-003
n-Butane	9.11e-002	1.97e-003
Isopentane	1.54e-001	3.34e-003
n-Pentane	9.88e-002	2.14e-003
Cyclopentane	9.80e-002	2.12e-003
n-Hexane	3.04e-001	6.58e-003
Cyclohexane	1.56e+000	3.38e-002
Heptanes	3.49e+000	7.55e-002
Methylcyclohexane	1.16e+000	2.52e-002
2,2,4-Trimethylpentane	7.61e-002	1.65e-003
Benzene	3.80e+000	8.23e-002
Toluene	2.33e+001	5.04e-001
Ethylbenzene	1.12e+000	2.43e-002
Xylenes	3.28e+001	7.09e-001

C8+ Heavies	3.18e+001	6.88e-001
Total Components	100.00	2.16e+000

CONDENSER VENT STREAM

Temperature: 100.00 deg. F
Pressure: 11.30 psia
Flow Rate: 1.35e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	8.50e+000	5.46e-001
Carbon Dioxide	1.45e+000	2.27e-001
Nitrogen	1.11e-001	1.11e-002
Methane	7.30e+001	4.18e+000
Ethane	5.70e+000	6.11e-001
Propane	2.28e+000	3.59e-001
Isobutane	7.00e-001	1.45e-001
n-Butane	7.60e-001	1.58e-001
Isopentane	3.66e-001	9.42e-002
n-Pentane	2.21e-001	5.70e-002
Cyclopentane	1.35e-001	3.38e-002
n-Hexane	2.04e-001	6.28e-002
Cyclohexane	7.47e-001	2.24e-001
Heptanes	7.17e-001	2.56e-001
Methylcyclohexane	2.25e-001	7.89e-002
2,2,4-Trimethylpentane	1.33e-002	5.42e-003
Benzene	1.48e+000	4.13e-001
Toluene	2.46e+000	8.08e-001
Ethylbenzene	3.23e-002	1.22e-002
Xylenes	8.41e-001	3.18e-001
C8+ Heavies	1.12e-002	6.80e-003
Total Components	100.00	8.61e+000

COMBUSTION DEVICE OFF GAS STREAM

Temperature: 1000.00 deg. F
Pressure: 14.70 psia
Flow Rate: 2.43e+000 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Methane	8.12e+001	8.36e-002
Ethane	6.33e+000	1.22e-002
Propane	2.54e+000	7.18e-003
Isobutane	7.78e-001	2.90e-003
n-Butane	8.45e-001	3.15e-003
Isopentane	4.07e-001	1.88e-003
n-Pentane	2.46e-001	1.14e-003
Cyclopentane	1.50e-001	6.75e-004
n-Hexane	2.27e-001	1.26e-003
Cyclohexane	8.30e-001	4.48e-003
Heptanes	7.98e-001	5.13e-003
Methylcyclohexane	2.50e-001	1.58e-003
2,2,4-Trimethylpentane	1.48e-002	1.08e-004
Benzene	1.65e+000	8.26e-003
Toluene	2.73e+000	1.62e-002

Ethylbenzene	3.59e-002	2.45e-004
Xylenes	9.35e-001	6.37e-003
C8+ Heavies	1.24e-002	1.36e-004
Total Components	100.00	1.56e-001

ANNUAL AIR-COOLED CONDENSER PERFORMANCE:

ANNUAL AIR-COOLED CONDENSER PERFORMANCE

Nearest Site for Air Temperature Data: Rock Springs, WY

Ambient Air Dry Bulb Temperature (deg. F)	Frequency (%)	Condenser Outlet Temperature (deg. F)
<=50	62.28	<=90
51-55	7.96	91-95
56-60	7.20	96-100
61-65	6.61	101-105
66-70	5.47	106-110
71-75	4.33	111-115
76-80	3.31	116-120
81-85	2.22	121-125
86-90	0.54	126-130
91-95	0.06	131-135
96-100	0.00	136-140
>100	0.00	>140

Condenser outlet temperature approach to ambient: 40.00 deg. F

Annual air-cooled condenser emissions and control efficiency:

	Uncontrolled emissions tons/year	Controlled emissions tons/year	% Control
Benzene	2.794	2.794	0.00
BTEX	19.076	19.076	0.00
Total HAP	19.413	19.413	0.00
VOC	30.093	30.093	0.00

GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: Boulder 5-30 Pad Facility
File Name: J:\12000\12027-006 - WY Well Air Permitting\Equip Inv Apps\Submittal -To Be Submitted\BR 5-30\GlyCalc\BR 5-30_25.0 MMSCFD_Submittal16.ddf
Date: October 23, 2013

DESCRIPTION:

Description: Boulder 5-30 CDP
25.0 MMSCFD dehy units (2)
Total of 14 wells
September 2013 Production Data

Annual Hours of Operation: 8760.0 hours/yr

WET GAS:

Temperature: 75.00 deg. F
Pressure: 400.00 psig
Wet Gas Water Content: Saturated

Component	Conc. (vol %)
Carbon Dioxide	0.5939
Nitrogen	0.1378
Methane	91.3895
Ethane	5.1507
Propane	1.5068
Isobutane	0.3480
n-Butane	0.3042
Isopentane	0.1334
n-Pentane	0.0654
Cyclopentane	0.0112
n-Hexane	0.0366
Cyclohexane	0.0354
Heptanes	0.0736
Methylcyclohexane	0.0097
2,2,4-Trimethylpentane	0.0029
Benzene	0.0119
Toluene	0.0202
Ethylbenzene	0.0004
Xylenes	0.0102
C8+ Heavies	0.0238

DRY GAS:

Flow Rate: 6.6 MMSCF/day
Water Content: 5.0 lbs. H2O/MMSCF

LEAN GLYCOL:

Glycol Type: TEG
Water Content: 1.5 wt% H2O
Flow Rate: 3.5 gpm

PUMP:

Glycol Pump Type: Gas Injection
Gas Injection Pump Volume Ratio: 0.080 acfm gas/gpm glycol

REGENERATOR OVERHEADS CONTROL DEVICE:

Control Device: Condenser
Temperature: 100.0 deg. F
Pressure: 11.3 psia

Control Device: Combustion Device
Destruction Efficiency: 98.0 %
Excess Oxygen: 20.0 %
Ambient Air Temperature: 36.0 deg. F

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Boulder 5-30 Pad Facility
File Name: J:\12000\12027-006 - WY Well Air Permitting\Equip Inv Apps\Submittal -To Be Submitted\BR 5-30\GlyCalc\BR 5-30_25.0 MMSCFD_Submittal16.ddf
Date: October 23, 2013

DESCRIPTION:

Description: Boulder 5-30 CDP
25.0 MMSCFD dehy units (2)
Total of 14 wells
September 2013 Production Data

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.4312	10.350	1.8888
Ethane	0.0630	1.511	0.2758
Propane	0.0370	0.888	0.1620
Isobutane	0.0149	0.359	0.0655
n-Butane	0.0162	0.389	0.0711
Isopentane	0.0097	0.232	0.0424
n-Pentane	0.0058	0.140	0.0256
Cyclopentane	0.0035	0.083	0.0151
n-Hexane	0.0064	0.153	0.0280
Cyclohexane	0.0228	0.548	0.1000
Heptanes	0.0257	0.616	0.1124
Methylcyclohexane	0.0079	0.190	0.0347
2,2,4-Trimethylpentane	0.0005	0.013	0.0024
Benzene	0.0445	1.068	0.1948
Toluene	0.0871	2.091	0.3815
Ethylbenzene	0.0013	0.031	0.0057
Xylenes	0.0343	0.823	0.1501
C8+ Heavies	0.0006	0.015	0.0027
Total Emissions	0.8125	19.499	3.5586
Total Hydrocarbon Emissions	0.8125	19.499	3.5586
Total VOC Emissions	0.3183	7.638	1.3940
Total HAP Emissions	0.1741	4.178	0.7625
Total BTEX Emissions	0.1672	4.012	0.7322

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	21.5653	517.567	94.4560
Ethane	3.1510	75.624	13.8013
Propane	1.8589	44.614	8.1420
Isobutane	0.7550	18.121	3.3071
n-Butane	0.8226	19.743	3.6031
Isopentane	0.5033	12.079	2.2045
n-Pentane	0.3047	7.312	1.3345
Cyclopentane	0.1852	4.446	0.8114

n-Hexane	0.3575	8.581	1.5660
Cyclohexane	1.3359	32.061	5.8512
Heptanes	1.7131	41.115	7.5035
Methylcyclohexane	0.5404	12.971	2.3672
2,2,4-Trimethylpentane	0.0364	0.874	0.1595
Benzene	2.7409	65.781	12.0049
Toluene	7.4808	179.540	32.7661
Ethylbenzene	0.2141	5.139	0.9379
Xylenes	6.1361	147.266	26.8761
C8+ Heavies	3.6376	87.303	15.9329
Total Emissions	53.3391	1280.138	233.6251
Total Hydrocarbon Emissions	53.3391	1280.138	233.6251
Total VOC Emissions	28.6228	686.947	125.3678
Total HAP Emissions	16.9659	407.181	74.3106
Total BTEX Emissions	16.5719	397.726	72.5851

EQUIPMENT REPORTS:

CONDENSER AND COMBUSTION DEVICE

Condenser Outlet Temperature:	100.00	deg. F
Condenser Pressure:	11.30	psia
Condenser Duty:	2.09e-001	MM BTU/hr
Hydrocarbon Recovery:	1.02	bbls/day
Produced Water:	0.83	bbls/day
Ambient Temperature:	36.00	deg. F
Excess Oxygen:	20.00	%
Combustion Efficiency:	98.00	%
Supplemental Fuel Requirement:	2.09e-001	MM BTU/hr

Component	Emitted	Destroyed
Methane	2.00%	98.00%
Ethane	2.00%	98.00%
Propane	1.99%	98.01%
Isobutane	1.98%	98.02%
n-Butane	1.97%	98.03%
Isopentane	1.92%	98.08%
n-Pentane	1.92%	98.08%
Cyclopentane	1.87%	98.13%
n-Hexane	1.79%	98.21%
Cyclohexane	1.71%	98.29%
Heptanes	1.50%	98.50%
Methylcyclohexane	1.47%	98.53%
2,2,4-Trimethylpentane	1.49%	98.51%
Benzene	1.62%	98.38%
Toluene	1.16%	98.84%
Ethylbenzene	0.61%	99.39%
Xylenes	0.56%	99.44%
C8+ Heavies	0.02%	99.98%

ABSORBER

NOTE: Because the Calculated Absorber Stages was below the minimum allowed, GRI-GLYCalc has set the number of Absorber Stages to 1.25 and has calculated a revised Dry Gas Dew Point.

Calculated Absorber Stages:	1.25	
Calculated Dry Gas Dew Point:	2.03	lbs. H2O/MMSCF
Temperature:	75.0	deg. F
Pressure:	400.0	psig
Dry Gas Flow Rate:	6.6300	MMSCF/day
Glycol Losses with Dry Gas:	0.0099	lb/hr
Wet Gas Water Content:	Saturated	
Calculated Wet Gas Water Content:	55.65	lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio:	14.15	gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	3.64%	96.36%
Carbon Dioxide	99.56%	0.44%
Nitrogen	99.97%	0.03%
Methane	99.97%	0.03%
Ethane	99.90%	0.10%
Propane	99.79%	0.21%
Isobutane	99.66%	0.34%
n-Butane	99.54%	0.46%
Isopentane	99.46%	0.54%
n-Pentane	99.29%	0.71%
Cyclopentane	96.94%	3.06%
n-Hexane	98.62%	1.38%
Cyclohexane	94.03%	5.97%
Heptanes	96.99%	3.01%
Methylcyclohexane	92.40%	7.60%
2,2,4-Trimethylpentane	98.67%	1.33%
Benzene	59.76%	40.24%
Toluene	45.08%	54.92%
Ethylbenzene	31.06%	68.94%
Xylenes	22.51%	77.49%
C8+ Heavies	87.88%	12.12%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	66.49%	33.51%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	0.38%	99.62%
n-Pentane	0.40%	99.60%
Cyclopentane	0.47%	99.53%
n-Hexane	0.44%	99.56%
Cyclohexane	3.11%	96.89%
Heptanes	0.47%	99.53%
Methylcyclohexane	3.91%	96.09%

2,2,4-Trimethylpentane	1.33%	98.67%
Benzene	4.98%	95.02%
Toluene	7.88%	92.12%
Ethylbenzene	10.38%	89.62%
Xylenes	12.88%	87.12%
C8+ Heavies	11.86%	88.14%

STREAM REPORTS:

WET GAS STREAM

Temperature: 75.00 deg. F
Pressure: 414.70 psia
Flow Rate: 2.77e+005 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.17e-001	1.54e+001
Carbon Dioxide	5.94e-001	1.91e+002
Nitrogen	1.38e-001	2.82e+001
Methane	9.14e+001	1.07e+004
Ethane	5.15e+000	1.13e+003
Propane	1.51e+000	4.85e+002
Isobutane	3.48e-001	1.48e+002
n-Butane	3.04e-001	1.29e+002
Isopentane	1.33e-001	7.02e+001
n-Pentane	6.54e-002	3.44e+001
Cyclopentane	1.12e-002	5.73e+000
n-Hexane	3.66e-002	2.30e+001
Cyclohexane	3.54e-002	2.17e+001
Heptanes	7.36e-002	5.38e+001
Methylcyclohexane	9.70e-003	6.95e+000
2,2,4-Trimethylpentane	2.90e-003	2.42e+000
Benzene	1.19e-002	6.78e+000
Toluene	2.02e-002	1.36e+001
Ethylbenzene	4.00e-004	3.10e-001
Xylenes	1.02e-002	7.90e+000
C8+ Heavies	2.38e-002	2.96e+001
Total Components	100.00	1.31e+004

DRY GAS STREAM

Temperature: 75.00 deg. F
Pressure: 414.70 psia
Flow Rate: 2.76e+005 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	4.28e-003	5.61e-001
Carbon Dioxide	5.92e-001	1.90e+002
Nitrogen	1.38e-001	2.82e+001
Methane	9.16e+001	1.07e+004
Ethane	5.16e+000	1.13e+003

Propane	1.51e+000	4.84e+002
Isobutane	3.48e-001	1.47e+002
n-Butane	3.03e-001	1.28e+002
Isopentane	1.33e-001	6.98e+001
n-Pentane	6.51e-002	3.42e+001
Cyclopentane	1.09e-002	5.56e+000
n-Hexane	3.62e-002	2.27e+001
Cyclohexane	3.34e-002	2.04e+001
Heptanes	7.15e-002	5.22e+001
Methylcyclohexane	8.98e-003	6.42e+000
2,2,4-Trimethylpentane	2.87e-003	2.38e+000
Benzene	7.13e-003	4.05e+000
Toluene	9.13e-003	6.12e+000
Ethylbenzene	1.24e-004	9.62e-002
Xylenes	2.30e-003	1.78e+000
C8+ Heavies	2.10e-002	2.60e+001
Total Components	100.00	1.30e+004

LEAN GLYCOL STREAM

Temperature: 75.00 deg. F
Flow Rate: 3.49e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.84e+001	1.93e+003
Water	1.50e+000	2.95e+001
Carbon Dioxide	4.26e-012	8.37e-011
Nitrogen	3.99e-014	7.84e-013
Methane	4.86e-018	9.55e-017
Ethane	2.82e-008	5.54e-007
Propane	2.09e-009	4.11e-008
Isobutane	7.58e-010	1.49e-008
n-Butane	7.53e-010	1.48e-008
Isopentane	9.72e-005	1.91e-003
n-Pentane	6.25e-005	1.23e-003
Cyclopentane	4.48e-005	8.80e-004
n-Hexane	8.11e-005	1.59e-003
Cyclohexane	2.18e-003	4.29e-002
Heptanes	4.14e-004	8.13e-003
Methylcyclohexane	1.12e-003	2.20e-002
2,2,4-Trimethylpentane	2.49e-005	4.90e-004
Benzene	7.31e-003	1.44e-001
Toluene	3.25e-002	6.40e-001
Ethylbenzene	1.26e-003	2.48e-002
Xylenes	4.61e-002	9.07e-001
C8+ Heavies	2.49e-002	4.89e-001
Total Components	100.00	1.97e+003

RICH GLYCOL AND PUMP GAS STREAM

Temperature: 75.00 deg. F
Pressure: 414.70 psia
Flow Rate: 3.64e+000 gpm
NOTE: Stream has more than one phase.

Component	Conc.	Loading

	(wt%)	(lb/hr)
TEG	9.50e+001	1.93e+003
Water	2.18e+000	4.44e+001
Carbon Dioxide	5.75e-002	1.17e+000
Nitrogen	2.81e-003	5.72e-002
Methane	1.06e+000	2.16e+001
Ethane	1.55e-001	3.15e+000
Propane	9.13e-002	1.86e+000
Isobutane	3.71e-002	7.55e-001
n-Butane	4.04e-002	8.23e-001
Isopentane	2.48e-002	5.05e-001
n-Pentane	1.50e-002	3.06e-001
Cyclopentane	9.14e-003	1.86e-001
n-Hexane	1.76e-002	3.59e-001
Cyclohexane	6.77e-002	1.38e+000
Heptanes	8.46e-002	1.72e+000
Methylcyclohexane	2.76e-002	5.62e-001
2,2,4-Trimethylpentane	1.81e-003	3.69e-002
Benzene	1.42e-001	2.88e+000
Toluene	3.99e-001	8.12e+000
Ethylbenzene	1.17e-002	2.39e-001
Xylenes	3.46e-001	7.04e+000
C8+ Heavies	2.03e-001	4.13e+000
Total Components	100.00	2.04e+003

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 9.97e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	3.14e+001	1.49e+001
Carbon Dioxide	1.01e+000	1.17e+000
Nitrogen	7.77e-002	5.72e-002
Methane	5.12e+001	2.16e+001
Ethane	3.99e+000	3.15e+000
Propane	1.60e+000	1.86e+000
Isobutane	4.95e-001	7.55e-001
n-Butane	5.39e-001	8.23e-001
Isopentane	2.66e-001	5.03e-001
n-Pentane	1.61e-001	3.05e-001
Cyclopentane	1.01e-001	1.85e-001
n-Hexane	1.58e-001	3.58e-001
Cyclohexane	6.04e-001	1.34e+000
Heptanes	6.51e-001	1.71e+000
Methylcyclohexane	2.10e-001	5.40e-001
2,2,4-Trimethylpentane	1.21e-002	3.64e-002
Benzene	1.34e+000	2.74e+000
Toluene	3.09e+000	7.48e+000
Ethylbenzene	7.68e-002	2.14e-001
Xylenes	2.20e+000	6.14e+000
C8+ Heavies	8.13e-001	3.64e+000
Total Components	100.00	6.94e+001

CONDENSER PRODUCED WATER STREAM

Temperature: 100.00 deg. F
Flow Rate: 2.41e-002 gpm

Component	Conc. (wt%)	Loading (lb/hr)	(ppm)
Water	1.00e+002	1.20e+001	999593.
Carbon Dioxide	1.21e-003	1.46e-004	12.
Nitrogen	1.34e-006	1.61e-007	0.
Methane	1.03e-003	1.23e-004	10.
Ethane	1.81e-004	2.18e-005	2.
Propane	9.27e-005	1.12e-005	1.
Isobutane	2.10e-005	2.53e-006	0.
n-Butane	3.09e-005	3.72e-006	0.
Isopentane	1.34e-005	1.62e-006	0.
n-Pentane	8.84e-006	1.06e-006	0.
Cyclopentane	3.95e-005	4.76e-006	0.
n-Hexane	8.37e-006	1.01e-006	0.
Cyclohexane	1.81e-004	2.18e-005	2.
Heptanes	1.92e-005	2.32e-006	0.
Methylcyclohexane	3.05e-005	3.68e-006	0.
2,2,4-Trimethylpentane	2.67e-007	3.22e-008	0.
Benzene	1.10e-002	1.33e-003	110.
Toluene	1.85e-002	2.23e-003	185.
Ethylbenzene	2.15e-004	2.59e-005	2.
Xylenes	8.07e-003	9.73e-004	81.
C8+ Heavies	2.61e-007	3.15e-008	0.
Total Components	100.00	1.20e+001	1000000.

CONDENSER RECOVERED OIL STREAM

Temperature: 100.00 deg. F
Flow Rate: 2.99e-002 gpm

Component	Conc. (wt%)	Loading (lb/hr)
Water	3.53e-002	4.49e-003
Carbon Dioxide	4.23e-003	5.38e-004
Nitrogen	1.01e-004	1.28e-005
Methane	2.54e-002	3.23e-003
Ethane	2.13e-002	2.71e-003
Propane	7.19e-002	9.14e-003
Isobutane	6.02e-002	7.66e-003
n-Butane	9.01e-002	1.15e-002
Isopentane	1.53e-001	1.94e-002
n-Pentane	9.82e-002	1.25e-002
Cyclopentane	9.68e-002	1.23e-002
n-Hexane	3.00e-001	3.82e-002
Cyclohexane	1.53e+000	1.95e-001
Heptanes	3.38e+000	4.30e-001
Methylcyclohexane	1.13e+000	1.44e-001
2,2,4-Trimethylpentane	7.34e-002	9.34e-003
Benzene	4.05e+000	5.15e-001
Toluene	2.46e+001	3.12e+000
Ethylbenzene	1.17e+000	1.49e-001
Xylenes	3.48e+001	4.42e+000

C8+ Heavies	2.84e+001	3.61e+000
Total Components	100.00	1.27e+001

CONDENSER VENT STREAM

Temperature: 100.00 deg. F
Pressure: 11.30 psia
Flow Rate: 6.99e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	8.50e+000	2.82e+000
Carbon Dioxide	1.44e+000	1.17e+000
Nitrogen	1.11e-001	5.71e-002
Methane	7.29e+001	2.16e+001
Ethane	5.68e+000	3.15e+000
Propane	2.28e+000	1.85e+000
Isobutane	6.98e-001	7.47e-001
n-Butane	7.57e-001	8.11e-001
Isopentane	3.64e-001	4.84e-001
n-Pentane	2.20e-001	2.92e-001
Cyclopentane	1.34e-001	1.73e-001
n-Hexane	2.01e-001	3.19e-001
Cyclohexane	7.36e-001	1.14e+000
Heptanes	6.95e-001	1.28e+000
Methylcyclohexane	2.19e-001	3.96e-001
2,2,4-Trimethylpentane	1.29e-002	2.71e-002
Benzene	1.54e+000	2.22e+000
Toluene	2.56e+000	4.36e+000
Ethylbenzene	3.31e-002	6.48e-002
Xylenes	8.76e-001	1.71e+000
C8+ Heavies	9.79e-003	3.07e-002
Total Components	100.00	4.47e+001

COMBUSTION DEVICE OFF GAS STREAM

Temperature: 1000.00 deg. F
Pressure: 14.70 psia
Flow Rate: 1.26e+001 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Methane	8.11e+001	4.31e-001
Ethane	6.31e+000	6.30e-002
Propane	2.53e+000	3.70e-002
Isobutane	7.76e-001	1.49e-002
n-Butane	8.42e-001	1.62e-002
Isopentane	4.05e-001	9.68e-003
n-Pentane	2.44e-001	5.84e-003
Cyclopentane	1.49e-001	3.46e-003
n-Hexane	2.23e-001	6.39e-003
Cyclohexane	8.18e-001	2.28e-002
Heptanes	7.72e-001	2.57e-002
Methylcyclohexane	2.43e-001	7.92e-003
2,2,4-Trimethylpentane	1.43e-002	5.42e-004
Benzene	1.72e+000	4.45e-002
Toluene	2.85e+000	8.71e-002

Ethylbenzene	3.68e-002	1.30e-003
Xylenes	9.74e-001	3.43e-002
C8+ Heavies	1.09e-002	6.15e-004
Total Components	100.00	8.12e-001

ANNUAL AIR-COOLED CONDENSER PERFORMANCE:

ANNUAL AIR-COOLED CONDENSER PERFORMANCE

Nearest Site for Air Temperature Data: Rock Springs, WY

Ambient Air Dry Bulb Temperature (deg. F)	Frequency (%)	Condenser Outlet Temperature (deg. F)
<=50	62.28	<=90
51-55	7.96	91-95
56-60	7.20	96-100
61-65	6.61	101-105
66-70	5.47	106-110
71-75	4.33	111-115
76-80	3.31	116-120
81-85	2.22	121-125
86-90	0.54	126-130
91-95	0.06	131-135
96-100	0.00	136-140
>100	0.00	>140

Condenser outlet temperature approach to ambient: 40.00 deg. F

Annual air-cooled condenser emissions and control efficiency:

	Uncontrolled emissions tons/year	Controlled emissions tons/year	% Control
Benzene	14.814	14.814	0.00
BTEX	104.902	104.902	0.00
Total HAP	106.632	106.632	0.00
VOC	161.542	161.542	0.00

ULTRA UP PETROLEUM

March 11, 2013

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

RE: Ultra Resources, Inc. – Chapter 6, Section 2 Well Air Permit Applications
Sublette County, Wyoming

Dear WDEQ:

Ultra Resources, Inc. (Ultra) is submitting air permit applications following the Wyoming Department of Environmental Quality (WDEQ) Oil and Gas Production Facilities Chapter 6, Section 2 Permitting Guidance. In accord with the July 28, 2004, Guidance Addendum, complete new well applications or AQD Pinedale-1 forms along with the required certification checklists and offset emissions calculations are being submitted to represent complete applications for the following locations:

Production Facility / Associated Well Pads	**Reason For Well Permit Application**	**Existing Permit / Application Analysis**
Boulder 5-30 CDP / Boulder 5-30 SimOps Pad	New wells came online; equipment updates	New Well Application Submitted January 14, 2013; AP-14417
Boulder 6-29 SimOps Pad	New wells came online; equipment updates	New Well Application Submitted January 14, 2013; AP-14416
Warbonnet 5-14 Pad	New wells came online; equipment updates	MD-13542; issued 8/28/2012

The Boulder 5-30 and Boulder 6-29 SimOps well pads had new well applications submitted January 14, 2013 and the Warbonnet 5-14 has an existing permit. Therefore, AQD Pinedale-1 forms according to Chapter 6, Section 2 guidance are being submitted for these facilities.

Ultra met with the WDEQ on April 13th, 2012 regarding the handling of blow case pot (BCP) fluids at each well pad. Ultra has completed the process of implementing a system to dump BCP fluids directly into the liquid gathering system. Therefore, the BCP fluids from each of the well pad referenced above will no longer dump into the emergency tanks at each facility, eliminating the need to amend the existing permitted emissions.

There are no other liquids that are dumped to the emergency tanks other than when the liquids gathering system is down. The discharge from the scrubber pots are tied into the line that is connected to the central gathering facilities (CGFs), and vapors from the blow case pot are routed to the same enclosed combustor that is used to control the glycol dehydrator still vent column vapors.

ULTRA UP PETROLEUM

One original signed copy is enclosed, along with a CD that includes the electronic copies of the New Well Application forms or AQD Pinedale-1 forms and associated offset emissions calculations for each modified facility.

If you have any questions in regards to this application submittal, please contact me at (303) 645-9843, or Todd Rudolph of AECOM at (505) 889-4120.

Sincerely,

Cally McKee

Ms. Cally McKee
Manager, Environmental & Regulatory

Enclosure

146620

MAR 2013 RECEIVED AIR QUALITY DIVISION

Field Inspection Checklist for Application and Surveillance Form

WYDEQ

ULTRA PETROLEUM

Pad Name: BR 5-30 **Pads Associated with this Production Facility:** _____

Check box if this pad is connected to the Liquid Gathering System ☑

METHOD OF INSPECTION	Quarter Inspection Occurred
☐ Flir Camera Wind Speed_____ mph Temperature_____ ☐ LEL Meter ☒ Sensory	☑ 1st ☐ 2nd ☐ 3rd ☐ 4th

PADS NOT CONNECTED TO LIQUID GATHERING SYSTEM		
Are relief valves weighted and sealing properly to remain closed when separator dumps?	☐ yes	☐ no
Do thief hatches on tanks seal properly?	☐ yes	☐ no

ALL PADS		
Are lines properly sloped and insulated to ensure they will operate in cold weather?	☒ yes	☐ no
Are the combustors operating properly?	☒ yes	☐ no
Are all valves positioned properly so that no vapors will bypass emission control equipment?	☒ yes	☐ no

If any "NO" answers were given, describe problem and indicate corrective action.

_____

_____

_____

List below any additional comments.

_____

_____

_____

_____

_____

Was written notification sent to WYDEQ prior to inspection? Yes

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. The information submitted is to the best of my knowledge and believe, true accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and/or imprisonment.

Johnny Luster		3-11-13
name (print)	Signature of Applicant	Date

STATE OF WYOMING
Department of Environmental Quality - Air Quality Division
Chapter 6, Section 2 Oil & Gas Production Facilities Application
for the
Jonah-Pinedale Anticline Development Area

These application forms are to be used ONLY for facilities with existing Air Quality permits issued according to the July 28, 2004 Addendum to the C6 S2 Oil and Gas Production Facilities Permitting Guidance

MAR 2013
RECEIVED
AIR QUALITY
DIVISION

Please submit three (3) copies of this completed form to:
Department of Environmental Quality
Air Quality Division
Herschler Building 4-W
122 West 25th Street
Cheyenne, WY 82002

Contact Information:

Name: Ms. Cally McKee Title: Manager, Environmental & Regulatory
Address: 304 Inverness Way South, Suite 295 Englewood, CO 80112
Telephone: (303) 645-9843 Fax: (303) 708-9748 Email: cmckee@ultrapetroleum.com

Facility Information:

Company Name: Ultra Resources, Inc.
Facility Name: Boulder 5-30 Pad
Production Field Name: Pinedale Anticline
Current Air Quality Permit(s): AP-14417 (pending), Submitted Jan 31, 2013

PAD Location (Provide legal description including either Latitude/Longitude or UTM coordinates)

County: Sublette
Legal Description: ¼¼ Section: SENW Section: 30 T: 31N R: 108W
Coordinates: Latitude: 42.62922 Longitude: 109.76871
UTM Coordinates: Zone: Easting: Northing:

Date Permitted Facility FIRST Became Operational: 11/16/2012
Date of Modification to Facility: 1/12/2013

Date of Modification to Facility is defined as: the First Date of Production for a new well added to an existing single or PAD well facility or the date production from a new or existing well is tied into existing equipment at an existing single or PAD well facility.

Facility Emission Summary (TPY)

	VOC	HAP	NOx	CO
Emissions per AP-14417 (pending), Submitted Jan 31, 2013	7.7	3.4	11.0	7.5
Total Facility Emissions after Modification:	8.1	3.3	10.8	7.4

Names and API numbers for all existing wells producing to this facility

Name		API #
Boulder 3d1-30D	(Boulder 5-30 CDP)	49-35-28562
Boulder 4a1-30D	(Boulder 5-30 CDP)	49-35-28572
Boulder 4b1-30D	(Boulder 5-30 CDP)	49-35-28570
Boulder 6a2-30D	(Boulder 5-30 CDP)	49-35-28355
Boulder 3a1-30D	(Boulder 5-30 CDP)	49-35-28568
Boulder 3c1-30D	(Boulder 5-30 CDP)	49-35-28571
Boulder 5d1-30D	(Boulder 5-30 CDP)	49-35-28567
Boulder 6b2-30D	(Boulder 5-30 CDP)	49-35-28561
Boulder 6c1-30D	(Boulder 5-30 CDP)	49-35-28566
Boulder 6d1-30D	(Boulder 5-30 CDP)	49-35-28569

Name and API number for new well(s) producing to this facility

Name		API #
Boulder 5d2-30D	(Boulder 5-30 CDP)	49-35-28565
Boulder 3b1-30D	(Boulder 5-30 CDP)	49-35-28563
Boulder 5a2-30D	(Boulder 5-30 CDP)	49-35-28609
Boulder 4d1-30D	(Boulder 5-30 CDP)	49-35-28564

STATE OF WYOMING
Department of Environmental Quality - Air Quality Division
Chapter 6, Section 2 Oil & Gas Production Facilities Application
for the
Jonah-Pinedale Anticline Development Area
These application forms are to be used ONLY for facilities with existing Air Qualtiy permits issued according to the July 28, 2004 Addendum to the C6 S2 Oil and Gas Production Facilities Permitting Guidance

BRIEFLY describe why this form is being submitted. (Examples - Additional production from a separate well has been added to an existing wellsite facility, or an additional well and associated production equipment has been placed at an existing single well or PAD facility, or a new PAD facility has been constructed, etc.)

Equipment updates detailed for the Boulder 5-30 Pad.
Production routed through Boulder 5-30 Pad.

Identify all EXISTING, permitted production equipment at the site owned, leased or operated by the applicant.

	Equipment Description	Site Rating (Hp, MMBtu/hr, bbl, MMSCFD, etc.)
2	4.0 MMSCFD TEG Dehydration Unit	4.0 MMSCFD
2	Kimray 4015PV Glycol Pump	0.68 gpm
2	Dehy Reboiler Heaters	0.085 MMBtu/hr
2	3-phase separator w/ separator heater	0.75 MMBtu/hr
3	25.0 MMSCFD TEG Dehydration Unit	25.0 MMSCFD
6	Kimray 21015PV Glycol Pump (Backup pumps included)	3.50 gpm
3	Dehy Reboiler Heater	0.35 MMBtu/hr
3	3-phase separator w/ separator heater	1.50 MMBtu/hr
15	Liquid level controllers (intermittent bleed)	1.75 scfh
1	J.W. William BTEX Combustion Device	30" OD
1	J.W. William BTEX Combustion Device	48" OD
3	Line Heater Secondary Burner Control (two not in use)	0.25 MMBtu/hr
2	Tanks (Emergency Use Only)	300 bbl
1	Bleach Pump	

Identify all NEW production equipment at the site owned, leased or operated by the applicant

	Equipment Description	Site Rating (Hp, MMBtu/hr, bbl, MMSCFD, etc.)
4	Pneumatic Heat Trace Pump(s) (three not in use)	60 scfh

Identify production equipment which has been removed from the site

	Equipment Description	Site Rating (Hp, MMBtu/hr, bbl, MMSCFD, etc.)
3	Line Heater Secondary Burner Control (two not in use)	0.25 MMBtu/hr

Is there any emission source not under the applicant's control? ☐ Yes ☑ No

Identify Owner or Operator of Other's Equipment	Description of Other's Equipment

Note:
Ultra will refer to combustors by the base diameter rather than the exit diameter. (eg. 12" now a 16", 20" now a 24")

STATE OF WYOMING
Department of Environmental Quality - Air Quality Division
Chapter 6, Section 2 Oil & Gas Production Facilities Application
for the
Jonah-Pinedale Anticline Development Area
These application forms are to be used ONLY for facilities with existing Air Qualtiy permits issued according to the July 28, 2004 Addendum to the C6 S2 Oil and Gas Production Facilities Permitting Guidance

BRIEFLY describe why this form is being submitted. (Examples - Additional production from a separate well has been added to an existing wellsite facility, or an additional well and associated production equipment has been placed at an existing single well or PAD facility, or a new PAD facility has been constructed, etc.)

Equipment updates detailed for the Boulder 5-30 SimOps.
Production routed through Boulder 5-30 Pad.

Identify all EXISTING, permitted production equipment at the site owned, leased or operated by the applicant.

Equipment Description			Site Rating (Hp, MMBtu/hr, bbl, MMSCFD, etc.)
14	Line Heater/Heater Treater		0.75 MMBtu/hr
3	Line Heater Secondary Burner Control	(two not in use)	0.25 MMBtu/hr

Identify all NEW production equipment at the site owned, leased or operated by the applicant

Equipment Description		Site Rating (Hp, MMBtu/hr, bbl, MMSCFD, etc.)
3	Pneumatic Heat Trace Pump(s)	60 scfh

Identify production equipment which has been removed from the site

Equipment Description	Site Rating (Hp, MMBtu/hr, bbl, MMSCFD, etc.)

Is there any emission source not under the applicant's control? ☐ Yes ☑ No

Identify Owner or Operator of Other's Equipment	Description of Other's Equipment

Note:

STATE OF WYOMING

Department of Environmental Quality - Air Quality Division

Chapter 6, Section 2 Oil & Gas Production Facilities Application

for the

Jonah-Pinedale Anticline Development Area

These application forms are to be used ONLY for facilities with existing Air Qualtiy permits issued according to the July 28, 2004 Addendum to the C6 S2 Oil and Gas Production Facilities Permitting Guidance

Boulder 5-30 Pad

Below list current, average daily throughput based on the latest one-month of production records available, for each dehydration unit (MMCFD), each pressurized vessel with the potential for flash emissions (BPD) and each hydrocarbon liquid storage tank (BPD). A pressurized vessel with the potential for flash emissions is any vessel where hydrocarbon vapors flashed from solution are NOT routed into a gas sales or gas collection line. This does not include pressure relief valves which are ONLY used to relieve pressure during upset conditions.

Dehydration units	(MMCFD)	"Flash" vessels	(BPD)	Hydrocarbon Liquid Storage Tanks	(BPD)
5 - Dehy Units	31.0			Condensate	222.2
				Production now goes to LGS	

According to the Addendum to the C6 S2 Oil and Gas Production Facilities Permitting Guidance, approved and effective July 28, 2004, controls for emissions from all existing and new hydrocarbon liquid storage tanks and pressure vessels (flashing emissions) and existing and new dehydration units, meeting BACT requirements described in the C6 S2 Guidance, must be installed and operational upon the First Date of Production of an additional well(s) or upon the date production associated with a well(s) from a seperate location is tied into this facility. For all new and existing combustion units used for control of flashing and dehydration unit emissions, pilot flames must be continually monitored using a thermocouple and continous recording device or any other device(s) which will detect and record the presence of the pilot flames. These monitoring systems must be installed and operational upon start-up of the combustion devices.

In the space below identify and provide installation dates of controls and pilot monitoring systems installed per the paragraph above.

Control	Monitoring system	Installation Date
BTEX Combustor 30"	remote telemetry/daily check by operator	prior to 11/16/2012
BTEX Combustor 48"	remote telemetry/daily check by operator	prior to 11/16/2012

I, Ms. Cally McKee — Manager, Environmental & Regulatory

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 this facility will operate in compliance with all Wyoming Air Quality Standards and Regulation

Signature: Cally McK **Date:** 3·6·13

STATE OF WYOMING

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

EMISSION SUMMARY

Company Name Ultra Resources, Inc.

Facility Name Boulder 5-30 Pad

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

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
4.0 MMSCFD TEG Dehydration Unit(s)	0.65	0.35	0.00	0.00	0.00	0.00
25.0 MMSCFD TEG Dehydration Unit(s)	5.14	2.83	0.00	0.00	0.00	0.00
Condensate Tanks**	0.00	0.00	0.00	0.00	0.00	0.00
Tank Flare**	0.00	0.00	0.00	0.00	0.00	0.00
Dehy Combustor Flare	0.00	0.00	2.30	0.58	0.00	0.00
Process Heaters	0.45	Insig.	8.23	6.75	0.00	0.00
Pneumatic & Chemical Pumps **(controlled)**	0.13	0.006	0.27	0.07	0.00	0.00
Truck Loading**	0.00	0.00	0.00	0.00	0.00	0.00
Fugitives	1.30	0.14	0.00	0.00	0.00	0.00
Liquid Level Controllers (Intermittent-bleed)	0.40	0.019	0.00	0.00	0.00	0.00
Total	**8.07**	**3.34**	**10.80**	**7.39**	**0.00**	**0.00**

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

Note: ** This facility was connected to CGF#2 prior to the first date of production (11/16/2012) , therefore, emissions are not associated with this process.

Ultra Resources, Inc.
Total Well Production

Facility	Boulder 5-30 Pad

Month-Year [1]	CDP Name	Oil Bbls[1]	Gas Mcf[1]	Produced Water	Days	Gas (MMSCF/day)	Oil (BPD)
Jan- Feb 2013	BR 5-30 CDP	4924	670973	68088	30	22.37	164.1
Totals		**4924**	**670973**	**68088**		**22**	**164**
Month-Year [1]	**New Wells BR 5-30 CDP**	**Oil Bbls[1]**	**Gas Mcf[1]**	**Produced Water**	**Days**	**Gas (MMSCF/day)**	**Oil (BPD)**
1/12/2013 - 2/10/2013	Boulder 5d2-30D	656	116325	10918	30	3.88	21.9
1/12/2013 - 2/10/2013	Boulder 3b1-30D	1088	111314	8641	30	3.71	36.3
1/19/2013 - 2/17/2013	Boulder 5a2-30D	498	88355	8295	30	2.95	16.6
1/19/2013 - 2/17/2013	Boulder 4d1-30D	662	117378	11016	30	3.91	22.1
Totals		**345**	**77460**	**38870**		**14.4**	**96.8**

Average Pad Production Rates - Existing Wells; no decline factor		
Gas MMSCFD	**Oil (BPD)**	**CDP**
22.4	164.1	BR 5-30 CDP

Average Pad Production Rates - New Wells; ~30 day production * 0.6 decline factor		
Gas MMSCFD	**Oil (BPD)**	**CDP**
8.7	58.1	BR 5-30 CDP

Estimated Production/Dehy Unit		
Dehys	**MMSCFD**	**CDP**
4.0	1.50	BR 5-30 CDP
4.0	1.50	BR 5-30 CDP
25.0	9.35	BR 5-30 CDP
25.0	9.35	BR 5-30 CDP
25.0	9.35	BR 5-30 CDP

Totals		
Gas (MMSCFD)	**Oil (BPD)**	**CDP**
31.0	**222.2**	BR 5-30 CDP

References

[1] Gas and oil production data obtained from Ultra online database.

Ultra Resources, Inc.
Dehy Combustor Emission Calculations

Emission Assumptions

		NOx Emission Factor =	0.14 lb/MMBtu	WDEQ O&G Guidance
		CO Emission Factor =	0.035 lb/MMBtu	WDEQ O&G Guidance
BR 5-30 CDP	4.0 MMSCFD	Combustor Waste Gas Throughput =	170 scf/hr	[Gas Throughput based GlyCalc Model]
BR 5-30 CDP	25.0 MMSCFD	Combustor Waste Gas Throughput =	879 scf/hr	[Gas Throughput based GlyCalc Model]
		Combustor Pilot Gas =	300 scf/hr	[conservative estimate]
		Natural Gas Heating Value =	1050 Btu/scf	[conservative estimate]

CDP			NOx (tpy)	CO (tpy)	Number of Dehys	
BR 5-30 CDP	4.0 MMSCFD	Combustor Emissions =	0.22	0.05	2	
BR 5-30 CDP	25.0 MMSCFD	Combustor Emissions =	1.70	0.42	3	
		Pilot Gas Emissions =	0.39	0.10	2	**Number of BTEX Combustors**
		Total Combustor Emissions =	**2.30**	**0.58**		

Notes:
Emission factors for NOx and CO from combustors from WDEQ O&G Guidance, March 2010

Ultra Resources, Inc.
Combustor Emission Calculations

Emission Assumptions

NOx Emission Factor =	0.14	lb/MMBtu	WDEQ O&G Guidance
CO Emission Factor =	0.035	lb/MMBtu	WDEQ O&G Guidance
Combustor Gas Throughput =	0.0	MSCFD	[Gas Throughput from E&P Tank Model]
Combustor Pilot Gas =	300	scf/hr	[conservative estimate]
Natural Gas Heating Value =	0	Btu/scf	[Heating Value from E&P Tank Model]

	NOx (tpy)	CO (tpy)	Number of Tank Combustors
Combustor Emissions =	0.00	0.00	0
Pilot Gas Emissions =	0.00	0.00	0
Total Combustor Emissions =	**0.00**	**0.00**	**0.00**

Notes:
**Emission factors for NOx and CO from combustors from WDEQ O&G Guidance, March 2010
** This facility was connected to CGF#2 prior to the first date of production (11/16/2012) , therefore, emissions are not associated with this process.

Ultra Resources, Inc.
Process Heater Emission Calculations

Emission Assumptions

AP-42 Emission Factors for Natural Gas Combustion:

NOx Emission Factor=	94	lb/MMscf	[AP-42, Table 1.4-1; <300,000 Btu/hr]
NOx Emission Factor=	100	lb/MMscf	[AP-42, Table 1.4-1; >300,000 Btu/hr]
CO Emission Factor=	40	lb/MMscf	[AP-42, Table 1.4-1; <300,000 Btu/hr]
CO Emission Factor=	84	lb/MMscf	[AP-42, Table 1.4-1; >300,000 Btu/hr]
VOC Emission Factor=	5.5	lb/MMscf	[AP-42, Table 1.4-2]

AP-42 Emissions Factors adjusted to actual gas heating value:

Adjusted NOx Emission Factor=	98	lb/MMscf
Adjusted NOx Emission Factor=	104	lb/MMscf
Adjusted CO Emission Factor=	42	lb/MMscf
Adjusted CO Emission Factor=	87	lb/MMscf
Adjusted VOC Emission Factor=	6	lb/MMscf

Natural Gas Heating Value =	1061	Btu/scf	[from gas analyses]
Natural Gas Heating Value =	1020	Btu/scf	AP-42 average value

			Number of Units
Dehy Reboiler =	0.085	MMBtu/hr	2
Dehy Reboiler =	0.350	MMBtu/hr	3
Indirect Heater / Separator Heater =	0.75	MMBtu/hr	2
Indirect Heater / Separator Heater =	1.50	MMBtu/hr	3
Line Heater Secondary Burner Control =	0.25	MMBtu/hr	3
Indirect Heater / Line Heater =	0.75	MMBtu/hr	14

		NOx (tpy)	VOC (tpy)	CO (tpy)
0.085 MMBtu/hr	Dehy Reboiler =	**0.07**	**0.004**	**0.03**
0.350 MMBtu/hr	Dehy Reboiler =	**0.47**	**0.026**	**0.39**
0.75 MMBtu/hr	Indirect Heater / Separator Heater =	**0.67**	**0.037**	**0.56**
1.50 MMBtu/hr	Indirect Heater / Separator Heater =	**2.01**	**0.111**	**1.69**
0.25 MMBtu/hr	Line Heater Secondary Burner Control =	**0.31**	**0.018**	**0.13**
0.75 MMBtu/hr	Indirect Heater / Line Heater =	**4.69**	**0.258**	**3.94**
	Total Process Heater Emissions =	**8.23**	**0.45**	**6.75**

Ultra Resources, Inc.
Pnuemtics Emissions Estimation
Calculation Details

Sandpiper pump (scfh)	60
Hours/year	8760
Motive Gas Density (lb/ft^3)	0.042
Number of pumps	7
Gas Vented (tpy)	77.26
% VOC	8.22%
% HAPs	0.39%
Uncontrolled VOCs (tpy)	6.35
Uncontrolled HAPs (tpy)	0.30
Control Efficiency (%)	98.0%
Controlled VOCs (tpy)[1]	0.13
Controlled HAPs (tpy)[1]	0.006
Total VOCs (tpy)[1]	0.13
Total HAPs (tpy)[1]	0.006

Methanol Injection (scfh)	25
Hours/year	8760
Motive Gas Density (lb/ft^3)	0.042
Number of pumps	0
Gas Vented (tpy)	0.00
% VOC	8.22%
% HAPs	0.39%
Uncontrolled VOCs (tpy)[2]	0.00
Uncontrolled HAPs (tpy)[2]	0.00
Control Efficiency (%)	98.0%
Controlled VOCs (tpy)[1]	0.00
Controlled HAPs (tpy)[1]	0.000

Calculations:

Pump Rate (scf/hour) * Number of Pumps / 23.8 ft^3/lb * 8760 hrs/yr / 2000 lbs-ton = Amount of gas vented (tons/yr)
%VOC was calculated from the mol % wet gas average of four wells, converted to weight percent, VOC = All C3+ components
% VOC of gas x pneumatic gas vented (tons/yr) = ton/yr of VOC emitted

Notes:
[1]All pneumatic heat trace, heat medium, glycol circulation, and chemical pumps are routed through combustor or an equivalent device to achieve 98% destruction efficiency

Ultra Resources, Inc.
Pneumatic & Chemical Pump Emission Calculations

Emission Assumptions

NOx Emission Factor =	0.14	lb/MMBtu	WDEQ O&G Guidance
CO Emission Factor =	0.035	lb/MMBtu	WDEQ O&G Guidance
Pneumatic Pump Waste Gas Throughput =	420	scf/hr	[Gas Throughput based on pump rate]
Chemical Pump Waste Gas Throughput =	0	scf/hr	[Gas Throughput based on pump rate]
Combustor Pilot Gas =	300	scf/hr	[conservative estimate]
Natural Gas Heating Value =	1061	Btu/scf	

	NOx (tpy)	CO (tpy)		
Pneumatic Pump Control Emissions =	0.27	0.07		
Chemical Pump Control Emissions =	0.00	0.00		
Pilot Gas Emissions =	0.00	0.00	0	**Number of VOC Combustors**
Total Combustor Emissions =	**0.27**	**0.07**		

Notes:
Emission factors for NOx and CO from combustors from WDEQ O&G Guidance, March 2010

Ultra Resources, Inc.
Condensate Truck Loading

From AP-42, Chapter 5.2 - Transportation and Marketing of Petroleum Liquids

L_L = 12.46 SPM / T

Where,

L_L = Loading Loss, lb/1000 gals of liquid loaded
S = Saturation Factor
P = True Vapor Pressure of Liquid Loaded, psia
M = Molecular Weight of Vapors, lb/lb-mol
T = Temperature of Bulk Liquid Loaded, °R

Condensate Truck Loading Assumptions

L_L =	3.78	Loading Losses, lb/1000 gal liquid loaded
S =	0.6	submerged loading, dedicated normal service
	7.0	Reid Vapor Pressure, psia
P =	3.79	True Vapor Pressure, psia
M =	68.0	Mol Wt of Vapors, lb/lbmol
T =	510	Temp of liquid loaded, °R, (50 + 460) = 510 °R
Average Daily Loadout =	0.0	bbls/day
Annual Production =	0	bbls/year
Annual Production =	0	gals/year
Annual Production =	0	1,000 gals/year
E =	**0.00**	**TPY VOC**
E =	**0.000**	**TPY HAPs**

Notes:
**** This facility was connected to CGF#2 prior to the first date of production (11/16/2012) , therefore, emissions are not associated with this process.**

Ultra Resources, Inc.
Equipment Leak Emission Factors

Equipment Type	Equipment Service	Average Total HydroCarbon Emission Factors[1] (lb/component-day)	Speciated Fugitive Emission Factors (Estimated Weight Fractions)[2] VOC	C6+	Benzene	Toluene	Ethylbenzene	Xylenes	Total HAP
Valves	Gas	**0.2400**	3.50E-02	3.38E-03	2.30E-04	3.90E-04	2.00E-05	1.00E-04	4.12E-03
	Heavy Oil	**0.00044**	3.00E-02	7.52E-03	9.35E-03	3.44E-03	5.10E-04	3.72E-03	2.45E-02
	Light Oil	**0.1300**	2.92E-01	2.43E-02	2.70E-04	7.50E-04	1.70E-04	3.60E-04	2.59E-02
	Water/Oil	**0.0052**	N/A	N/A	6.24E-06	1.66E-06	5.20E-08	2.08E-07	8.16E-06
Pump Seals	Gas	**0.1300**	3.50E-02	3.38E-03	2.30E-04	3.90E-04	2.00E-05	1.00E-04	4.12E-03
	Heavy Oil	**NA**	NA	NA	NA	NA	NA	NA	NA
	Light Oil	**0.6900**	2.92E-01	2.43E-02	2.70E-04	7.50E-04	1.70E-04	3.60E-04	2.59E-02
	Water/Oil	**0.0013**	N/A	N/A	1.56E-06	4.16E-07	1.30E-08	5.20E-08	2.04E-06
Others: pressure relief valves, compressors, instruments, diaphrams, drains, hatches, meters, and vents.	Gas	**0.4700**	3.50E-02	3.38E-03	2.30E-04	3.90E-04	2.00E-05	1.00E-04	4.12E-03
	Heavy Oil	**0.0017**	3.00E-02	7.52E-03	9.35E-03	3.44E-03	5.10E-04	3.72E-03	2.45E-02
	Light Oil	**0.4000**	2.92E-01	2.43E-02	2.70E-04	7.50E-04	1.70E-04	3.60E-04	2.59E-02
	Water/Oil	**0.7400**	N/A	N/A	8.88E-04	2.37E-04	7.40E-06	2.96E-05	1.16E-03
Connectors	Gas	**0.0110**	3.50E-02	3.38E-03	2.30E-04	3.90E-04	2.00E-05	1.00E-04	4.12E-03
	Heavy Oil	**0.0004**	3.00E-02	7.52E-03	9.35E-03	3.44E-03	5.10E-04	3.72E-03	2.45E-02
	Light Oil	**0.0110**	2.92E-01	2.43E-02	2.70E-04	7.50E-04	1.70E-04	3.60E-04	2.59E-02
	Water/Oil	**0.0058**	N/A	N/A	6.96E-06	1.86E-06	5.80E-08	2.32E-07	9.11E-06
Flanges	Gas	**0.0210**	3.50E-02	3.38E-03	2.30E-04	3.90E-04	2.00E-05	1.00E-04	4.12E-03
	Heavy Oil	**0.000021**	3.00E-02	7.52E-03	9.35E-03	3.44E-03	5.10E-04	3.72E-03	2.45E-02
	Light Oil	**0.0058**	2.92E-01	2.43E-02	2.70E-04	7.50E-04	1.70E-04	3.60E-04	2.59E-02
	Water/Oil	**0.00015**	N/A	N/A	1.80E-07	4.80E-08	1.50E-09	6.00E-09	2.36E-07
Open-Ended Lines	Gas	**0.1100**	3.50E-02	3.38E-03	2.30E-04	3.90E-04	2.00E-05	1.00E-04	4.12E-03
	Heavy Oil	**0.0074**	3.00E-02	7.52E-03	9.35E-03	3.44E-03	5.10E-04	3.72E-03	2.45E-02
	Light Oil	**0.0740**	2.92E-01	2.43E-02	2.70E-04	7.50E-04	1.70E-04	3.60E-04	2.59E-02
	Water/Oil	**0.0130**	N/A	N/A	1.56E-05	4.16E-06	1.30E-07	5.20E-07	2.04E-05

Speciated Fugitive Emission Factors
(Estimated weight fractions of THC emissions in each category

Equipment Service	Speciated Fugitive Emission Factors (Estimated weight fractions of THC emissions)[2] Methane	NMHC	VOC	C6+	Benzene	Toluene	Ethylbenzene	Xylenes
Gas Production	0.92	0.08	0.035	0.00338	0.00023	0.00039	0.00002	0.0001
Heavy Oil	0.942	0.058	0.03	0.00752	0.00935	0.00344	0.00051	0.00372
Light Oil	0.613	0.387	0.292	0.0243	0.00027	0.00075	0.00017	0.00036

HAP (BTEX) Fugitive Emission Speciation Factors Used for Water/Oil

Compound	Speciation Factor [3] (lb HAP/lb TOC)
Benzene	0.0012
Toluene	0.00032
Ethylbenzene	0.00001
Xylenes (m,p,o)	0.00004

Sample Calculations: TOC emissions (tpy) = [N, (Component Count)] * [THC EF per equipment type and service category, (lb/component-day)] * [365, (days in a year)] / [2000, (lbs/ton)]
VOC emissions (tpy) = [TOC emissions per equipment service, (tpy)] * [VOC Speciated Fugitive EF per equipment service, (weight fraction)]
HAP emissions (tpy) = [TOC emissions per equipment service, (tpy)] * [Sum of HAP speciated EF's per equipment service, (sum of weight fractions)]

Ultra Resources, Inc.
Equipment Leak Emissions

Component Count	Total HydroCarbon Emissions lb/day	lb/mo.	ton/yr	Total VOC Emissions lb/day	lb/mo.	ton/yr	Total HAP Emissions lb/day	lb/mo.	ton/yr
70	16.8	511.0	3.1	0.588	17.9	0.107	0.069	2.1	0.013
14	1.82	55.4	0.3	0.531	16.2	0.097	0.047	1.4	0.009
14	0.07	2.2	0.0	N/A			0.000	0.0	0.000
14	1.8	55.4	0.3	0.064	1.9	0.012	0.007	0.2	0.001
140	65.8	2001.4	12.0	2.303	70.0	0.420	0.271	8.2	0.049
28	11.2	340.7	2.0	3.270	99.5	0.597	0.290	8.8	0.053
28	20.7	630.2	3.8	N/A			0.024	0.7	0.004
280	3.1	93.7	0.6	0.108	3.3	0.020	0.013	0.4	0.002
70	0.8	23.4	0.1	0.225	6.8	0.041	0.020	0.6	0.004
70	0.4	12.3	0.1	N/A			0.000	0.0	0.000
28	0.6	17.9	0.1	0.021	0.6	0.004	0.002	0.1	0.000
14	0.1	2.5	0.0	0.024	0.7	0.004	0.002	0.1	0.000
14	0.0	0.1	0.0	N/A			0.000	0.0	0.000
Total	**123.2**	**3746.1**	22.5	**7.133**	**217.0**	1.30	**0.746**	**22.7**	0.14

References:
[1] EPA Protocol for Equipment Leak Emission Estimates, November 1995 (EPA-453/R-95-017). Table 2-4, Page 2-15.
[2] Oil and Gas Production Facilities, Chapter 6, section 2 Permitting Guidance, WDEQ, Air Quality Division; Fugitive Emissions Pg. 71 of 81
[3] Gas Research Institute (GRI) Technical Reference Manual for GRI-HAPCalc, Software for Estimating Emissions of Hazardous Air Pollutants and Criteria Air Pollutants from Natural Gas Industry Operations, GRI-96/0346

Ultra Resources, Inc.
Liquid Level Controllers (LLC)

Post-Modification (Intermittent-Bleed):		
Mizer Intermittent-Bleed Pilot Valve Controllers Rate:	1.75	scfh
Total Controllers:	15	LLCs
Hours of Operation/year:	8760	hours
Estimated Motive Gas Density:	0.042	lb/ft^3
Gas Vented (tpy)	4.83	
% VOC	8.22%	
% HAPs	0.39%	
VOC Emissions (tpy):	**0.40**	
HAP Emissions (tpy):	**0.019**	

Note:
** This facility was connected to CGF#2 prior to the first date of production (11/16/2012) , therefore, emissions are not associated with this process.

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Boulder 5-30 Pad Facility
File Name: C:\Users\congdond\Documents\Ultra\Round 30\BR 5-30\GlyCalc\BR 5-30_4.0 MMSCFD Jan 2013.ddf
Date: March 03, 2013

DESCRIPTION:

Description: Boulder 5-30 CDP
4.0 MMSCFD dehy unit (2)
Total of 14 wells
Jan - Feb 2013 Production Data

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.1057	2.536	0.4629
Ethane	0.0151	0.362	0.0661
Propane	0.0085	0.205	0.0374
Isobutane	0.0033	0.080	0.0146
n-Butane	0.0036	0.086	0.0157
Isopentane	0.0021	0.050	0.0091
n-Pentane	0.0012	0.030	0.0054
Cyclopentane	0.0007	0.017	0.0030
n-Hexane	0.0013	0.031	0.0057
Cyclohexane	0.0047	0.113	0.0206
Other Hexanes	0.0032	0.078	0.0142
Heptanes	0.0052	0.126	0.0229
Methylcyclohexane	0.0016	0.039	0.0070
2,2,4-Trimethylpentane	0.0001	0.003	0.0005
Benzene	0.0095	0.228	0.0416
Toluene	0.0199	0.478	0.0872
Ethylbenzene	0.0004	0.009	0.0016
Xylenes	0.0091	0.219	0.0400
C8+ Heavies	0.0002	0.004	0.0007
Total Emissions	0.1955	4.693	0.8564
Total Hydrocarbon Emissions	0.1955	4.693	0.8564
Total VOC Emissions	0.0747	1.794	0.3274
Total HAP Emissions	0.0403	0.968	0.1766
Total BTEX Emissions	0.0389	0.934	0.1705

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	5.2846	126.831	23.1467
Ethane	0.7555	18.133	3.3093
Propane	0.4286	10.287	1.8774
Isobutane	0.1683	4.040	0.7372
n-Butane	0.1805	4.331	0.7904
Isopentane	0.1065	2.556	0.4665

n-Pentane	0.0636	1.527	0.2787
Cyclopentane	0.0362	0.869	0.1585
n-Hexane	0.0701	1.683	0.3071
Cyclohexane	0.2611	6.265	1.1434
Other Hexanes	0.1709	4.102	0.7486
Heptanes	0.3187	7.649	1.3959
Methylcyclohexane	0.0994	2.386	0.4355
2,2,4-Trimethylpentane	0.0067	0.161	0.0293
Benzene	0.5470	13.128	2.3958
Toluene	1.4645	35.147	6.4144
Ethylbenzene	0.0454	1.091	0.1990
Xylenes	1.2186	29.247	5.3376
C8+ Heavies	0.5878	14.107	2.5746
Total Emissions	11.8141	283.539	51.7459
Total Hydrocarbon Emissions	11.8141	283.539	51.7459
Total VOC Emissions	5.7739	138.575	25.2899
Total HAP Emissions	3.3523	80.456	14.6832
Total BTEX Emissions	3.2755	78.612	14.3468

EQUIPMENT REPORTS:

CONDENSER AND COMBUSTION DEVICE

Condenser Outlet Temperature:	100.00	deg. F
Condenser Pressure:	11.30	psia
Condenser Duty:	5.05e-002	MM BTU/hr
Hydrocarbon Recovery:	0.16	bbls/day
Produced Water:	0.14	bbls/day
Ambient Temperature:	36.00	deg. F
Excess Oxygen:	20.00	%
Combustion Efficiency:	98.00	%
Supplemental Fuel Requirement:	5.05e-002	MM BTU/hr

Component	Emitted	Destroyed
Methane	2.00%	98.00%
Ethane	2.00%	98.00%
Propane	1.99%	98.01%
Isobutane	1.99%	98.01%
n-Butane	1.98%	98.02%
Isopentane	1.95%	98.05%
n-Pentane	1.95%	98.05%
Cyclopentane	1.91%	98.09%
n-Hexane	1.86%	98.14%
Cyclohexane	1.80%	98.20%
Other Hexanes	1.89%	98.11%
Heptanes	1.64%	98.36%
Methylcyclohexane	1.62%	98.38%
2,2,4-Trimethylpentane	1.64%	98.36%
Benzene	1.74%	98.26%
Toluene	1.36%	98.64%
Ethylbenzene	0.81%	99.19%
Xylenes	0.75%	99.25%
C8+ Heavies	0.03%	99.97%

ABSORBER

NOTE: Because the Calculated Absorber Stages was below the minimum allowed, GRI-GLYCalc has set the number of Absorber Stages to 1.25 and has calculated a revised Dry Gas Dew Point.

Calculated Absorber Stages:	1.25	
Calculated Dry Gas Dew Point:	1.68	lbs. H2O/MMSCF
Temperature:	75.0	deg. F
Pressure:	500.0	psig
Dry Gas Flow Rate:	1.5000	MMSCF/day
Glycol Losses with Dry Gas:	0.0026	lb/hr
Wet Gas Water Content:	Saturated	
Calculated Wet Gas Water Content:	46.26	lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio:	14.62	gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	3.62%	96.38%
Carbon Dioxide	99.54%	0.46%
Nitrogen	99.97%	0.03%
Methane	99.97%	0.03%
Ethane	99.89%	0.11%
Propane	99.80%	0.20%
Isobutane	99.68%	0.32%
n-Butane	99.56%	0.44%
Isopentane	99.51%	0.49%
n-Pentane	99.35%	0.65%
Cyclopentane	97.18%	2.82%
n-Hexane	98.78%	1.22%
Cyclohexane	94.62%	5.38%
Other Hexanes	99.10%	0.90%
Heptanes	97.41%	2.59%
Methylcyclohexane	93.36%	6.64%
2,2,4-Trimethylpentane	98.87%	1.13%
Benzene	62.26%	37.74%
Toluene	48.35%	51.65%
Ethylbenzene	35.28%	64.72%
Xylenes	26.11%	73.89%
C8+ Heavies	90.97%	9.03%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	67.22%	32.78%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	0.36%	99.64%

n-Pentane	0.39%	99.61%
Cyclopentane	0.47%	99.53%
n-Hexane	0.43%	99.57%
Cyclohexane	3.09%	96.91%
Other Hexanes	0.83%	99.17%
Heptanes	0.47%	99.53%
Methylcyclohexane	3.89%	96.11%
2,2,4-Trimethylpentane	1.29%	98.71%
Benzene	4.98%	95.02%
Toluene	7.87%	92.13%
Ethylbenzene	10.37%	89.63%
Xylenes	12.87%	87.13%
C8+ Heavies	11.79%	88.21%

STREAM REPORTS:

WET GAS STREAM

Temperature: 75.00 deg. F
Pressure: 514.70 psia
Flow Rate: 6.26e+004 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	9.75e-002	2.90e+000
Carbon Dioxide	5.93e-001	4.31e+001
Nitrogen	1.38e-001	6.37e+000
Methane	9.14e+001	2.42e+003
Ethane	5.14e+000	2.55e+002
Propane	1.50e+000	1.09e+002
Isobutane	3.45e-001	3.31e+001
n-Butane	3.01e-001	2.88e+001
Isopentane	1.31e-001	1.55e+001
n-Pentane	6.37e-002	7.59e+000
Cyclopentane	1.04e-002	1.20e+000
n-Hexane	3.49e-002	4.96e+000
Cyclohexane	3.38e-002	4.69e+000
Other Hexanes	1.10e-001	1.56e+001
Heptanes	6.93e-002	1.15e+001
Methylcyclohexane	8.99e-003	1.46e+000
2,2,4-Trimethylpentane	2.70e-003	5.08e-001
Benzene	1.12e-002	1.44e+000
Toluene	1.86e-002	2.82e+000
Ethylbenzene	4.00e-004	7.00e-002
Xylenes	9.39e-003	1.64e+000
C8+ Heavies	2.27e-002	6.37e+000
Total Components	100.00	2.97e+003

DRY GAS STREAM

Temperature: 75.00 deg. F
Pressure: 514.70 psia
Flow Rate: 6.25e+004 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	3.53e-003	1.05e-001
Carbon Dioxide	5.92e-001	4.29e+001
Nitrogen	1.38e-001	6.36e+000
Methane	9.15e+001	2.42e+003
Ethane	5.14e+000	2.55e+002
Propane	1.50e+000	1.09e+002
Isobutane	3.44e-001	3.30e+001
n-Butane	3.00e-001	2.87e+001
Isopentane	1.30e-001	1.55e+001
n-Pentane	6.34e-002	7.54e+000
Cyclopentane	1.01e-002	1.17e+000
n-Hexane	3.45e-002	4.90e+000
Cyclohexane	3.20e-002	4.44e+000
Other Hexanes	1.09e-001	1.55e+001
Heptanes	6.76e-002	1.12e+001
Methylcyclohexane	8.41e-003	1.36e+000
2,2,4-Trimethylpentane	2.67e-003	5.03e-001
Benzene	6.98e-003	8.98e-001
Toluene	9.00e-003	1.37e+000
Ethylbenzene	1.41e-004	2.47e-002
Xylenes	2.46e-003	4.29e-001
C8+ Heavies	2.07e-002	5.80e+000
Total Components	100.00	2.96e+003

LEAN GLYCOL STREAM

Temperature: 75.00 deg. F
Flow Rate: 6.79e-001 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.84e+001	3.76e+002
Water	1.50e+000	5.73e+000
Carbon Dioxide	5.13e-012	1.96e-011
Nitrogen	4.98e-014	1.90e-013
Methane	5.96e-018	2.28e-017
Ethane	3.33e-008	1.27e-007
Propane	2.35e-009	8.98e-009
Isobutane	8.27e-010	3.16e-009
n-Butane	8.15e-010	3.11e-009
Isopentane	1.01e-004	3.86e-004
n-Pentane	6.47e-005	2.47e-004
Cyclopentane	4.46e-005	1.70e-004
n-Hexane	7.98e-005	3.05e-004
Cyclohexane	2.18e-003	8.33e-003
Other Hexanes	3.73e-004	1.43e-003
Heptanes	3.90e-004	1.49e-003
Methylcyclohexane	1.05e-003	4.03e-003
2,2,4-Trimethylpentane	2.28e-005	8.72e-005
Benzene	7.50e-003	2.86e-002
Toluene	3.28e-002	1.25e-001
Ethylbenzene	1.38e-003	5.26e-003
Xylenes	4.71e-002	1.80e-001
C8+ Heavies	2.06e-002	7.86e-002

Total Components	100.00	3.82e+002

RICH GLYCOL AND PUMP GAS STREAM

Temperature: 75.00 deg. F
Pressure: 514.70 psia
Flow Rate: 7.11e-001 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.47e+001	3.76e+002
Water	2.15e+000	8.53e+000
Carbon Dioxide	7.01e-002	2.78e-001
Nitrogen	3.54e-003	1.40e-002
Methane	1.33e+000	5.28e+000
Ethane	1.90e-001	7.56e-001
Propane	1.08e-001	4.29e-001
Isobutane	4.24e-002	1.68e-001
n-Butane	4.55e-002	1.80e-001
Isopentane	2.69e-002	1.07e-001
n-Pentane	1.61e-002	6.39e-002
Cyclopentane	9.16e-003	3.64e-002
n-Hexane	1.77e-002	7.04e-002
Cyclohexane	6.79e-002	2.69e-001
Other Hexanes	4.34e-002	1.72e-001
Heptanes	8.07e-002	3.20e-001
Methylcyclohexane	2.61e-002	1.03e-001
2,2,4-Trimethylpentane	1.71e-003	6.78e-003
Benzene	1.45e-001	5.76e-001
Toluene	4.00e-001	1.59e+000
Ethylbenzene	1.28e-002	5.07e-002
Xylenes	3.52e-001	1.40e+000
C8+ Heavies	1.68e-001	6.66e-001
Total Components	100.00	3.97e+002

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 2.21e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	2.66e+001	2.80e+000
Carbon Dioxide	1.08e+000	2.78e-001
Nitrogen	8.59e-002	1.40e-002
Methane	5.64e+001	5.28e+000
Ethane	4.30e+000	7.56e-001
Propane	1.67e+000	4.29e-001
Isobutane	4.96e-001	1.68e-001
n-Butane	5.32e-001	1.80e-001
Isopentane	2.53e-001	1.07e-001
n-Pentane	1.51e-001	6.36e-002
Cyclopentane	8.84e-002	3.62e-002
n-Hexane	1.39e-001	7.01e-002

Cyclohexane	5.31e-001	2.61e-001
Other Hexanes	3.40e-001	1.71e-001
Heptanes	5.45e-001	3.19e-001
Methylcyclohexane	1.73e-001	9.94e-002
2,2,4-Trimethylpentane	1.00e-002	6.69e-003
Benzene	1.20e+000	5.47e-001
Toluene	2.72e+000	1.46e+000
Ethylbenzene	7.33e-002	4.54e-002
Xylenes	1.97e+000	1.22e+000
C8+ Heavies	5.91e-001	5.88e-001
Total Components	100.00	1.49e+001

CONDENSER PRODUCED WATER STREAM

Temperature: 100.00 deg. F
Flow Rate: 4.22e-003 gpm

Component	Conc. (wt%)	Loading (lb/hr)	(ppm)
Water	1.00e+002	2.11e+000	999610.
Carbon Dioxide	1.18e-003	2.50e-005	12.
Nitrogen	1.35e-006	2.86e-008	0.
Methane	1.03e-003	2.18e-005	10.
Ethane	1.78e-004	3.77e-006	2.
Propane	8.81e-005	1.86e-006	1.
Isobutane	1.93e-005	4.07e-007	0.
n-Butane	2.80e-005	5.92e-007	0.
Isopentane	1.19e-005	2.50e-007	0.
n-Pentane	7.70e-006	1.63e-007	0.
Cyclopentane	3.25e-005	6.86e-007	0.
n-Hexane	7.02e-006	1.48e-007	0.
Cyclohexane	1.53e-004	3.23e-006	2.
Other Hexanes	1.38e-005	2.92e-007	0.
Heptanes	1.61e-005	3.40e-007	0.
Methylcyclohexane	2.55e-005	5.38e-007	0.
2,2,4-Trimethylpentane	2.22e-007	4.69e-009	0.
Benzene	9.69e-003	2.04e-004	97.
Toluene	1.74e-002	3.67e-004	174.
Ethylbenzene	2.50e-004	5.28e-006	3.
Xylenes	8.86e-003	1.87e-004	89.
C8+ Heavies	2.68e-007	5.66e-009	0.
Total Components	100.00	2.11e+000	1000000.

CONDENSER RECOVERED OIL STREAM

Temperature: 100.00 deg. F
Flow Rate: 4.79e-003 gpm

Component	Conc. (wt%)	Loading (lb/hr)
Water	3.47e-002	7.07e-004
Carbon Dioxide	4.07e-003	8.30e-005
Nitrogen	1.01e-004	2.05e-006
Methane	2.54e-002	5.18e-004
Ethane	2.07e-002	4.21e-004

Propane	6.72e-002	1.37e-003
Isobutane	5.44e-002	1.11e-003
n-Butane	8.00e-002	1.63e-003
Isopentane	1.30e-001	2.65e-003
n-Pentane	8.42e-002	1.72e-003
Cyclopentane	7.83e-002	1.60e-003
n-Hexane	2.48e-001	5.04e-003
Cyclohexane	1.27e+000	2.59e-002
Other Hexanes	4.48e-001	9.13e-003
Heptanes	2.79e+000	5.69e-002
Methylcyclohexane	9.31e-001	1.90e-002
2,2,4-Trimethylpentane	5.93e-002	1.21e-003
Benzene	3.53e+000	7.20e-002
Toluene	2.30e+001	4.68e-001
Ethylbenzene	1.33e+000	2.71e-002
Xylenes	3.74e+001	7.61e-001
C8+ Heavies	2.85e+001	5.80e-001
Total Components	100.00	2.04e+000

CONDENSER VENT STREAM

Temperature: 100.00 deg. F
Pressure: 11.30 psia
Flow Rate: 1.70e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	8.50e+000	6.86e-001
Carbon Dioxide	1.41e+000	2.78e-001
Nitrogen	1.12e-001	1.40e-002
Methane	7.35e+001	5.28e+000
Ethane	5.60e+000	7.55e-001
Propane	2.16e+000	4.27e-001
Isobutane	6.42e-001	1.67e-001
n-Butane	6.87e-001	1.79e-001
Isopentane	3.21e-001	1.04e-001
n-Pentane	1.91e-001	6.19e-002
Cyclopentane	1.10e-001	3.46e-002
n-Hexane	1.68e-001	6.51e-002
Cyclohexane	6.23e-001	2.35e-001
Other Hexanes	4.19e-001	1.62e-001
Heptanes	5.83e-001	2.62e-001
Methylcyclohexane	1.83e-001	8.04e-002
2,2,4-Trimethylpentane	1.07e-002	5.49e-003
Benzene	1.36e+000	4.75e-001
Toluene	2.41e+000	9.96e-001
Ethylbenzene	3.86e-002	1.84e-002
Xylenes	9.60e-001	4.57e-001
C8+ Heavies	1.00e-002	7.66e-003
Total Components	100.00	1.08e+001

COMBUSTION DEVICE OFF GAS STREAM

Temperature: 1000.00 deg. F
Pressure: 14.70 psia
Flow Rate: 3.06e+000 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Methane	8.17e+001	1.06e-001
Ethane	6.23e+000	1.51e-002
Propane	2.40e+000	8.55e-003
Isobutane	7.13e-001	3.34e-003
n-Butane	7.63e-001	3.58e-003
Isopentane	3.57e-001	2.08e-003
n-Pentane	2.13e-001	1.24e-003
Cyclopentane	1.22e-001	6.92e-004
n-Hexane	1.87e-001	1.30e-003
Cyclohexane	6.93e-001	4.70e-003
Other Hexanes	4.66e-001	3.24e-003
Heptanes	6.48e-001	5.24e-003
Methylcyclohexane	2.03e-001	1.61e-003
2,2,4-Trimethylpentane	1.19e-002	1.10e-004
Benzene	1.51e+000	9.50e-003
Toluene	2.68e+000	1.99e-002
Ethylbenzene	4.29e-002	3.67e-004
Xylenes	1.07e+000	9.14e-003
C8+ Heavies	1.12e-002	1.53e-004
Total Components	100.00	1.96e-001

ANNUAL AIR-COOLED CONDENSER PERFORMANCE:

ANNUAL AIR-COOLED CONDENSER PERFORMANCE

Nearest Site for Air Temperature Data: Rock Springs, WY

Ambient Air Dry Bulb Temperature (deg. F)	Frequency (%)	Condenser Outlet Temperature (deg. F)
<=50	62.28	<=90
51-55	7.96	91-95
56-60	7.20	96-100
61-65	6.61	101-105
66-70	5.47	106-110
71-75	4.33	111-115
76-80	3.31	116-120
81-85	2.22	121-125
86-90	0.54	126-130
91-95	0.06	131-135
96-100	0.00	136-140
>100	0.00	>140

Condenser outlet temperature approach to ambient: 40.00 deg. F

Annual air-cooled condenser emissions and control efficiency:

	Uncontrolled emissions tons/year	Controlled emissions tons/year	% Control
Benzene	2.509	2.509	0.00
BTEX	15.520	15.520	0.00
Total HAP	15.856	15.856	0.00
VOC	26.503	26.503	0.00

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Boulder 5-30 Pad Facility
File Name: C:\Users\congdond\Documents\Ultra\Round 30\BR 5-30\GlyCalc\BR 5-30_25.0 MMSCFD Jan 2013.ddf
Date: March 03, 2013

DESCRIPTION:

Description: BR 5-30 CDP
25.0 MMSCFD dehy units (3)
Total of 14 wells
Jan- Feb 2013 Production Data

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.5452	13.085	2.3881
Ethane	0.0778	1.868	0.3409
Propane	0.0441	1.057	0.1930
Isobutane	0.0172	0.413	0.0754
n-Butane	0.0184	0.442	0.0807
Isopentane	0.0107	0.256	0.0468
n-Pentane	0.0064	0.153	0.0278
Cyclopentane	0.0035	0.085	0.0155
n-Hexane	0.0066	0.159	0.0291
Cyclohexane	0.0240	0.575	0.1050
Other Hexanes	0.0166	0.397	0.0725
Heptanes	0.0263	0.632	0.1154
Methylcyclohexane	0.0081	0.195	0.0355
2,2,4-Trimethylpentane	0.0006	0.013	0.0024
Benzene	0.0506	1.215	0.2218
Toluene	0.1064	2.554	0.4661
Ethylbenzene	0.0019	0.046	0.0085
Xylenes	0.0489	1.174	0.2143
C8+ Heavies	0.0007	0.017	0.0030
Total Emissions	1.0141	24.338	4.4417
Total Hydrocarbon Emissions	1.0141	24.338	4.4417
Total VOC Emissions	0.3910	9.385	1.7127
Total HAP Emissions	0.2151	5.162	0.9421
Total BTEX Emissions	0.2079	4.990	0.9106

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	27.2642	654.342	119.4173
Ethane	3.8938	93.450	17.0546
Propane	2.2108	53.059	9.6832
Isobutane	0.8677	20.825	3.8005
n-Butane	0.9304	22.328	4.0749
Isopentane	0.5492	13.181	2.4055

n-Pentane	0.3278	7.868	1.4358
Cyclopentane	0.1865	4.475	0.8167
n-Hexane	0.3612	8.669	1.5820
Cyclohexane	1.3476	32.342	5.9025
Other Hexanes	0.8806	21.134	3.8569
Heptanes	1.6419	39.405	7.1914
Methylcyclohexane	0.5139	12.333	2.2509
2,2,4-Trimethylpentane	0.0345	0.827	0.1510
Benzene	2.9772	71.453	13.0401
Toluene	8.1841	196.418	35.8463
Ethylbenzene	0.2609	6.261	1.1426
Xylenes	7.1393	171.342	31.2699
C8+ Heavies	3.0514	73.233	13.3649
Total Emissions	62.6226	1502.943	274.2872
Total Hydrocarbon Emissions	62.6226	1502.943	274.2872
Total VOC Emissions	31.4647	755.152	137.8152
Total HAP Emissions	18.9571	454.970	83.0320
Total BTEX Emissions	18.5614	445.474	81.2989

EQUIPMENT REPORTS:

CONDENSER AND COMBUSTION DEVICE

Condenser Outlet Temperature:	100.00	deg. F
Condenser Pressure:	11.30	psia
Condenser Duty:	2.62e-001	MM BTU/hr
Hydrocarbon Recovery:	0.96	bbls/day
Produced Water:	0.95	bbls/day
Ambient Temperature:	36.00	deg. F
Excess Oxygen:	20.00	%
Combustion Efficiency:	98.00	%
Supplemental Fuel Requirement:	2.62e-001	MM BTU/hr

Component	Emitted	Destroyed
Methane	2.00%	98.00%
Ethane	2.00%	98.00%
Propane	1.99%	98.01%
Isobutane	1.99%	98.01%
n-Butane	1.98%	98.02%
Isopentane	1.94%	98.06%
n-Pentane	1.94%	98.06%
Cyclopentane	1.90%	98.10%
n-Hexane	1.84%	98.16%
Cyclohexane	1.78%	98.22%
Other Hexanes	1.88%	98.12%
Heptanes	1.60%	98.40%
Methylcyclohexane	1.58%	98.42%
2,2,4-Trimethylpentane	1.60%	98.40%
Benzene	1.70%	98.30%
Toluene	1.30%	98.70%
Ethylbenzene	0.74%	99.26%
Xylenes	0.69%	99.31%
C8+ Heavies	0.02%	99.98%

ABSORBER

NOTE: Because the Calculated Absorber Stages was below the minimum allowed, GRI-GLYCalc has set the number of Absorber Stages to 1.25 and has calculated a revised Dry Gas Dew Point.

Calculated Absorber Stages:	1.25	
Calculated Dry Gas Dew Point:	1.74	lbs. H2O/MMSCF
Temperature:	75.0	deg. F
Pressure:	500.0	psig
Dry Gas Flow Rate:	9.3500	MMSCF/day
Glycol Losses with Dry Gas:	0.0165	lb/hr
Wet Gas Water Content:	Saturated	
Calculated Wet Gas Water Content:	46.26	lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio:	12.09	gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	3.76%	96.24%
Carbon Dioxide	99.62%	0.38%
Nitrogen	99.98%	0.02%
Methane	99.98%	0.02%
Ethane	99.91%	0.09%
Propane	99.83%	0.17%
Isobutane	99.74%	0.26%
n-Butane	99.64%	0.36%
Isopentane	99.59%	0.41%
n-Pentane	99.46%	0.54%
Cyclopentane	97.67%	2.33%
n-Hexane	98.99%	1.01%
Cyclohexane	95.55%	4.45%
Other Hexanes	99.25%	0.75%
Heptanes	97.86%	2.14%
Methylcyclohexane	94.50%	5.50%
2,2,4-Trimethylpentane	99.07%	0.93%
Benzene	67.03%	32.97%
Toluene	53.67%	46.33%
Ethylbenzene	40.37%	59.63%
Xylenes	30.52%	69.48%
C8+ Heavies	92.48%	7.52%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	62.91%	37.09%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	0.36%	99.64%

n-Pentane	0.39%	99.61%
Cyclopentane	0.47%	99.53%
n-Hexane	0.43%	99.57%
Cyclohexane	3.09%	96.91%
Other Hexanes	0.83%	99.17%
Heptanes	0.47%	99.53%
Methylcyclohexane	3.89%	96.11%
2,2,4-Trimethylpentane	1.29%	98.71%
Benzene	4.98%	95.02%
Toluene	7.88%	92.12%
Ethylbenzene	10.38%	89.62%
Xylenes	12.88%	87.12%
C8+ Heavies	11.79%	88.21%

STREAM REPORTS:

WET GAS STREAM

Temperature: 75.00 deg. F
Pressure: 514.70 psia
Flow Rate: 3.90e+005 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	9.75e-002	1.81e+001
Carbon Dioxide	5.93e-001	2.69e+002
Nitrogen	1.38e-001	3.97e+001
Methane	9.14e+001	1.51e+004
Ethane	5.14e+000	1.59e+003
Propane	1.50e+000	6.80e+002
Isobutane	3.45e-001	2.06e+002
n-Butane	3.01e-001	1.80e+002
Isopentane	1.31e-001	9.69e+001
n-Pentane	6.37e-002	4.73e+001
Cyclopentane	1.04e-002	7.49e+000
n-Hexane	3.49e-002	3.09e+001
Cyclohexane	3.38e-002	2.92e+001
Other Hexanes	1.10e-001	9.74e+001
Heptanes	6.93e-002	7.14e+001
Methylcyclohexane	8.99e-003	9.08e+000
2,2,4-Trimethylpentane	2.70e-003	3.17e+000
Benzene	1.12e-002	8.99e+000
Toluene	1.86e-002	1.76e+001
Ethylbenzene	4.00e-004	4.36e-001
Xylenes	9.39e-003	1.03e+001
C8+ Heavies	2.27e-002	3.97e+001
Total Components	100.00	1.85e+004

DRY GAS STREAM

Temperature: 75.00 deg. F
Pressure: 514.70 psia
Flow Rate: 3.90e+005 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	3.67e-003	6.79e-001
Carbon Dioxide	5.92e-001	2.68e+002
Nitrogen	1.38e-001	3.97e+001
Methane	9.15e+001	1.51e+004
Ethane	5.15e+000	1.59e+003
Propane	1.50e+000	6.79e+002
Isobutane	3.44e-001	2.06e+002
n-Butane	3.00e-001	1.79e+002
Isopentane	1.30e-001	9.65e+001
n-Pentane	6.35e-002	4.70e+001
Cyclopentane	1.02e-002	7.32e+000
n-Hexane	3.46e-002	3.06e+001
Cyclohexane	3.23e-002	2.79e+001
Other Hexanes	1.09e-001	9.67e+001
Heptanes	6.80e-002	6.99e+001
Methylcyclohexane	8.51e-003	8.58e+000
2,2,4-Trimethylpentane	2.68e-003	3.14e+000
Benzene	7.51e-003	6.02e+000
Toluene	9.99e-003	9.45e+000
Ethylbenzene	1.62e-004	1.76e-001
Xylenes	2.87e-003	3.13e+000
C8+ Heavies	2.10e-002	3.67e+001
Total Components	100.00	1.85e+004

LEAN GLYCOL STREAM

Temperature: 75.00 deg. F
Flow Rate: 3.49e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.84e+001	1.93e+003
Water	1.50e+000	2.95e+001
Carbon Dioxide	5.13e-012	1.01e-010
Nitrogen	4.99e-014	9.80e-013
Methane	5.97e-018	1.17e-016
Ethane	3.33e-008	6.54e-007
Propane	2.36e-009	4.63e-008
Isobutane	8.28e-010	1.63e-008
n-Butane	8.16e-010	1.60e-008
Isopentane	1.01e-004	1.99e-003
n-Pentane	6.47e-005	1.27e-003
Cyclopentane	4.46e-005	8.77e-004
n-Hexane	7.98e-005	1.57e-003
Cyclohexane	2.19e-003	4.30e-002
Other Hexanes	3.73e-004	7.34e-003
Heptanes	3.91e-004	7.68e-003
Methylcyclohexane	1.06e-003	2.08e-002
2,2,4-Trimethylpentane	2.28e-005	4.49e-004
Benzene	7.93e-003	1.56e-001
Toluene	3.56e-002	7.00e-001
Ethylbenzene	1.54e-003	3.02e-002
Xylenes	5.37e-002	1.06e+000
C8+ Heavies	2.07e-002	4.08e-001

Total Components	100.00	1.97e+003

RICH GLYCOL AND PUMP GAS STREAM

Temperature: 75.00 deg. F
Pressure: 514.70 psia
Flow Rate: 3.67e+000 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.45e+001	1.93e+003
Water	2.29e+000	4.69e+001
Carbon Dioxide	7.00e-002	1.43e+000
Nitrogen	3.54e-003	7.24e-002
Methane	1.33e+000	2.73e+001
Ethane	1.90e-001	3.89e+000
Propane	1.08e-001	2.21e+000
Isobutane	4.24e-002	8.68e-001
n-Butane	4.54e-002	9.30e-001
Isopentane	2.69e-002	5.51e-001
n-Pentane	1.61e-002	3.29e-001
Cyclopentane	9.15e-003	1.87e-001
n-Hexane	1.77e-002	3.63e-001
Cyclohexane	6.79e-002	1.39e+000
Other Hexanes	4.34e-002	8.88e-001
Heptanes	8.06e-002	1.65e+000
Methylcyclohexane	2.61e-002	5.35e-001
2,2,4-Trimethylpentane	1.71e-003	3.49e-002
Benzene	1.53e-001	3.13e+000
Toluene	4.34e-001	8.88e+000
Ethylbenzene	1.42e-002	2.91e-001
Xylenes	4.00e-001	8.19e+000
C8+ Heavies	1.69e-001	3.46e+000
Total Components	100.00	2.05e+003

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 1.21e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	3.03e+001	1.74e+001
Carbon Dioxide	1.02e+000	1.43e+000
Nitrogen	8.10e-002	7.24e-002
Methane	5.32e+001	2.73e+001
Ethane	4.06e+000	3.89e+000
Propane	1.57e+000	2.21e+000
Isobutane	4.68e-001	8.68e-001
n-Butane	5.01e-001	9.30e-001
Isopentane	2.38e-001	5.49e-001
n-Pentane	1.42e-001	3.28e-001
Cyclopentane	8.33e-002	1.86e-001
n-Hexane	1.31e-001	3.61e-001

Cyclohexane	5.01e-001	1.35e+000
Other Hexanes	3.20e-001	8.81e-001
Heptanes	5.13e-001	1.64e+000
Methylcyclohexane	1.64e-001	5.14e-001
2,2,4-Trimethylpentane	9.45e-003	3.45e-002
Benzene	1.19e+000	2.98e+000
Toluene	2.78e+000	8.18e+000
Ethylbenzene	7.69e-002	2.61e-001
Xylenes	2.11e+000	7.14e+000
C8+ Heavies	5.61e-001	3.05e+000
Total Components	100.00	8.15e+001

CONDENSER PRODUCED WATER STREAM

Temperature: 100.00 deg. F
Flow Rate: 2.77e-002 gpm

Component	Conc. (wt%)	Loading (lb/hr)	(ppm)
Water	1.00e+002	1.39e+001	999598.
Carbon Dioxide	1.18e-003	1.63e-004	12.
Nitrogen	1.35e-006	1.87e-007	0.
Methane	1.03e-003	1.43e-004	10.
Ethane	1.78e-004	2.47e-005	2.
Propane	8.79e-005	1.22e-005	1.
Isobutane	1.92e-005	2.67e-006	0.
n-Butane	2.79e-005	3.87e-006	0.
Isopentane	1.18e-005	1.63e-006	0.
n-Pentane	7.65e-006	1.06e-006	0.
Cyclopentane	3.22e-005	4.46e-006	0.
n-Hexane	6.93e-006	9.60e-007	0.
Cyclohexane	1.51e-004	2.09e-005	2.
Other Hexanes	1.37e-005	1.90e-006	0.
Heptanes	1.57e-005	2.18e-006	0.
Methylcyclohexane	2.49e-005	3.45e-006	0.
2,2,4-Trimethylpentane	2.17e-007	3.00e-008	0.
Benzene	1.00e-002	1.39e-003	100.
Toluene	1.80e-002	2.49e-003	180.
Ethylbenzene	2.55e-004	3.53e-005	3.
Xylenes	9.18e-003	1.27e-003	92.
C8+ Heavies	2.33e-007	3.24e-008	0.
Total Components	100.00	1.39e+001	1000000.

CONDENSER RECOVERED OIL STREAM

Temperature: 100.00 deg. F
Flow Rate: 2.80e-002 gpm

Component	Conc. (wt%)	Loading (lb/hr)
Water	3.58e-002	4.26e-003
Carbon Dioxide	4.09e-003	4.87e-004
Nitrogen	1.10e-004	1.31e-005
Methane	2.52e-002	3.00e-003
Ethane	2.03e-002	2.42e-003

Propane	6.66e-002	7.94e-003
Isobutane	5.40e-002	6.43e-003
n-Butane	7.93e-002	9.45e-003
Isopentane	1.29e-001	1.54e-002
n-Pentane	8.42e-002	1.00e-002
Cyclopentane	7.75e-002	9.23e-003
n-Hexane	2.46e-001	2.93e-002
Cyclohexane	1.25e+000	1.49e-001
Other Hexanes	4.42e-001	5.26e-002
Heptanes	2.73e+000	3.25e-001
Methylcyclohexane	9.11e-001	1.09e-001
2,2,4-Trimethylpentane	5.77e-002	6.87e-003
Benzene	3.72e+000	4.44e-001
Toluene	2.40e+001	2.86e+000
Ethylbenzene	1.38e+000	1.64e-001
Xylenes	3.94e+001	4.69e+000
C8+ Heavies	2.53e+001	3.02e+000
Total Components	100.00	1.19e+001

CONDENSER VENT STREAM

Temperature: 100.00 deg. F
Pressure: 11.30 psia
Flow Rate: 8.79e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	8.50e+000	3.54e+000
Carbon Dioxide	1.41e+000	1.43e+000
Nitrogen	1.12e-001	7.24e-002
Methane	7.34e+001	2.73e+001
Ethane	5.59e+000	3.89e+000
Propane	2.16e+000	2.20e+000
Isobutane	6.40e-001	8.61e-001
n-Butane	6.84e-001	9.21e-001
Isopentane	3.20e-001	5.34e-001
n-Pentane	1.90e-001	3.18e-001
Cyclopentane	1.09e-001	1.77e-001
n-Hexane	1.66e-001	3.32e-001
Cyclohexane	6.15e-001	1.20e+000
Other Hexanes	4.15e-001	8.28e-001
Heptanes	5.68e-001	1.32e+000
Methylcyclohexane	1.78e-001	4.05e-001
2,2,4-Trimethylpentane	1.04e-002	2.76e-002
Benzene	1.40e+000	2.53e+000
Toluene	2.49e+000	5.32e+000
Ethylbenzene	3.93e-002	9.67e-002
Xylenes	9.95e-001	2.45e+000
C8+ Heavies	8.74e-003	3.45e-002
Total Components	100.00	5.58e+001

COMBUSTION DEVICE OFF GAS STREAM

Temperature: 1000.00 deg. F
Pressure: 14.70 psia
Flow Rate: 1.58e+001 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Methane	8.16e+001	5.45e-001
Ethane	6.21e+000	7.78e-002
Propane	2.40e+000	4.41e-002
Isobutane	7.11e-001	1.72e-002
n-Butane	7.61e-001	1.84e-002
Isopentane	3.55e-001	1.07e-002
n-Pentane	2.11e-001	6.36e-003
Cyclopentane	1.21e-001	3.54e-003
n-Hexane	1.85e-001	6.64e-003
Cyclohexane	6.83e-001	2.40e-002
Other Hexanes	4.61e-001	1.66e-002
Heptanes	6.31e-001	2.63e-002
Methylcyclohexane	1.98e-001	8.11e-003
2,2,4-Trimethylpentane	1.16e-002	5.52e-004
Benzene	1.56e+000	5.06e-002
Toluene	2.77e+000	1.06e-001
Ethylbenzene	4.37e-002	1.93e-003
Xylenes	1.11e+000	4.89e-002
C8+ Heavies	9.71e-003	6.89e-004
Total Components	100.00	1.01e+000

ANNUAL AIR-COOLED CONDENSER PERFORMANCE:

ANNUAL AIR-COOLED CONDENSER PERFORMANCE

Nearest Site for Air Temperature Data: Rock Springs, WY

Ambient Air Dry Bulb Temperature (deg. F)	Frequency (%)	Condenser Outlet Temperature (deg. F)
<=50	62.28	<=90
51-55	7.96	91-95
56-60	7.20	96-100
61-65	6.61	101-105
66-70	5.47	106-110
71-75	4.33	111-115
76-80	3.31	116-120
81-85	2.22	121-125
86-90	0.54	126-130
91-95	0.06	131-135
96-100	0.00	136-140
>100	0.00	>140

Condenser outlet temperature approach to ambient: 40.00 deg. F

Annual air-cooled condenser emissions and control efficiency:

	Uncontrolled emissions tons/year	Controlled emissions tons/year	% Control
Benzene	13.565	13.565	0.00
BTEX	87.338	87.338	0.00
Total HAP	89.073	89.073	0.00
VOC	144.004	144.004	0.00