MOUNTAIN AIR CONSULTING, LLC

March 27, 2018

Attn: Ms. Claudia Smith
USEPA Region VIII
1595 Wynkoop Street
Denver, CO 80202-1129

Re: Minor Source Registration – Part 2 Emission and Production Information
Aurora Federal 6-28D-7-20 Well Pad

Dear Ms. Smith:

On behalf of Robert L. Bayless, Producer LLC (Bayless), Mountain Air Consulting, LLC (Mountain Air) is providing a Part 2 Registration Form (EPA Form No. 5900-391) to register a new oil and natural gas true minor source in Indian country under the requirements of 40 CFR §49.160(c)(1)(iv).

If you have any questions regarding this submittal, please feel free to contact me.

Sincerely,

Mountain Air Consulting, LLC

Joe Miller
Principal Air Quality Specialist

Cc: Ute Indian Tribe

730 17th Street, Suite 315 · Denver, CO · 80202 · (303)-524-9686 (phone)

EPA Form No. 5900-391
EPA ICR No. 1230.27
OMB Control No. 2060-0003
Approval expires 4/30/2017

United States Environmental Protection Agency
https://www.epa.gov/tribal-air/tribal-minor-new-source-review
January 4, 2017

Part 2: Submit Within 60 Days After Startup of Production -- Emission and Production Information

FEDERAL IMPLEMENTATION PLAN FOR TRUE MINOR SOURCES IN INDIAN COUNTRY IN THE OIL AND NATURAL GAS PRODUCTION AND NATURAL GAS PROCESSING SEGMENTS OF THE OIL AND NATURAL GAS SECTOR

Registration for New True Minor Oil and Natural Gas Sources and Minor Modifications at Existing True Minor Oil and Natural Gas Sources

Please submit information to:

[Reviewing Authority Address Phone]	

A. GENERAL SOURCE INFORMATION (See Instructions Below)

1. Company Name Robert L Bayless, Producer LLC		**2. Source Name** Aurora Federal 6-28D-7-20	
3. Type of Oil and Natural Gas Operation Oil production		**4. New Minor Source?** ☒ Yes ☐ No **5. True Source Modification?** ☐ Yes ☒ No	
6. NAICS Code 211111		**7. SIC Code** 1311	
8. U.S. Well ID(s) or API Number(s) [if applicable] 4304745411			
9. Area of Indian Country Northern Ute	**10. County** Uintah, UT	**11a. Latitude** 40.183528 N	**11b. Longitude** -109.675567 W

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B. CONTACT INFORMATION (See Instructions Below)

1. Owner Name Robert L Bayless, Producer LLC	Title
Mailing Address PO Box 168, Farmington, NM 87499	
Email Address Notices@rlbayless.com	
Telephone Number 505-326-2659	Facsimile Number 505-326-6911
2. Operator Name (if different from owner)	Title
Mailing Address	
Email Address	
Telephone Number	Facsimile Number
3. Source Contact John D Thomas	Title Production and Asset Manager
Mailing Address PO Box 168, Farmington, NM 87499	
Email Address jthomas@rlbayless.com	
Telephone Number 505-326-2659	Facsimile Number 505-326-6911

4. Compliance Contact	Title
John D Thomas	Production and Asset Manager
Mailing Address	
PO Box 168, Farmington, NM 87499	
Email Address	
jthomas@rlbayless.com	
Telephone Number	Facsimile Number
505-326-2659	505-326-6911

C. EMISSIONS AND OTHER SOURCE INFORMATION

Include all of the following information in the table below and as attachments to this form:

Note: The emission estimates can be based upon actual test data or, in the absence of such data, upon procedures acceptable to the Reviewing Authority. The following procedures are generally acceptable for estimating emissions from air pollution sources: (1) unit-specific emission tests; (2) mass balance calculations; (3) published, verifiable emission factors that are applicable to the unit (i.e., manufacturer specifications); (4) other engineering calculations; or (5) other procedures to estimate emissions specifically approved by the Reviewing Authority. Guidance for estimating emissions can be found at https://www.epa.gov/chief.

- ■ Narrative description of the operations.
- ■ Identification and description of any air pollution control equipment and compliance monitoring devices or activities.
- ■ Type and actual amount (annually) of each fuel that will be used.
- ■ Type of raw materials used (e.g., water for hydraulic fracturing).
- ■ Actual, annual production rates.
- ■ Actual operating schedules.
- ■ Any existing limitations on source operations affecting emissions or any work practice standards, where applicable, for all regulated New Source Review (NSR) pollutants at your source. Indicate all requirements referenced in the Federal Implementation Plan (FIP) for True Minor Sources in Indian Country in the Oil and Natural Gas Production and Natural Gas Processing Segments of the Oil and Natural Gas Sector that apply to emissions units and air pollution generating activities at the source or proposed. Include statements indicating each emissions unit that is an emissions unit potentially subject to the requirements referenced in the FIP, but does not meet the definition of an affected facility under the referenced requirement, and therefore, is not subject to those requirements.
- ■ For each emissions unit comprising the new source or modification, estimates of the total allowable (potential to emit) annual emissions at startup of production from the air pollution source for the following air pollutants: particulate matter, PM_{10}, $PM_{2.5}$, sulfur oxides ( ), nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compound (VOC), lead (Pb) and lead compounds, fluorides (gaseous and particulate), sulfuric acid mist (H_2SO_4), hydrogen sulfide (H_2S), total reduced sulfur (TRS) and reduced sulfur compounds, including all calculations for the estimates. Allowable annual emissions are defined as: emissions rate of an emissions unit calculated using the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical

or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation, or the effect it would have on emissions, is legally and practically enforceable. You must determine the potential for emissions within 30 days from the startup of production.

☒ For each emissions unit comprising the new source or modification, estimates of the total actual annual emissions during the upcoming, consecutive 12 months from the air pollution source for the following air pollutants: particulate matter (PM, PM_{10}, $PM_{2.5}$), sulfur oxides (SO_x), nitrogen oxides (NOx), carbon monoxide (CO), volatile organic compound (VOC), lead (Pb) and lead compounds, ammonia (NH_3), fluorides (gaseous and particulate), sulfuric acid mist (H_2SO_4), hydrogen sulfide (H_2S), total reduced sulfur (TRS) and reduced sulfur compounds, including all calculations for the estimates. Estimates of actual emissions must take into account equipment, operating conditions, and air pollution control measures. You should calculate an estimate of the actual annual emissions using estimated operating hours, production rates, in-place control equipment, and types of materials processed, stored, or combusted.

D. TABLE OF ESTIMATED EMISSIONS

Provide in the table below estimates of the total allowable annual emissions in tons per year (tpy) and total actual annual emissions (tpy) for the following pollutants for all emissions units comprising the new source or modification.

POLLUTANT	TOTAL ALLOWABLE ANNUAL EMISSIONS (TPY)	TOTAL ACTUAL ANNUAL EMISSIONS (TPY)
PM	0.05	0.05
PM_{10}	0.05	0.05
$PM_{2.5}$	0.05	0.05
SO_x	0.004	0.004
NO_x	0.7	0.7
CO	0.6	0.6
VOC	11.9	9.0
Pb	n/a	n/a

POLLUTANT	TOTAL ALLOWABLE ANNUAL EMISSIONS (TPY)	TOTAL ACTUAL ANNUAL EMISSIONS (TPY)
NH3	n/a	n/a
Fluorides	n/a	n/a
H_2SO_4	n/a	n/a
H_2S	n/a	n/a
TRS	n/a	n/a

Instructions for Part 2

Please answer all questions. If the item does not apply to the source and its operations write "n/a". If the answer is not known write "unknown".

A. General Source Information

1. Company Name: Provide the complete company name. For corporations, include divisions or subsidiary name, if any.
2. Source Name: Provide the source name. Please note that a source is a site, place, or location that may contain one or more air pollution emitting units.
3. Type of Operation: Indicate the generally accepted name for the oil and natural gas production or natural gas processing segment operation (e.g., oil and gas well site, tank battery, compressor station, natural gas processing plant).
4. New True Minor Source: [Per Federal Indian Country Minor New Source Review Rule, 40 CFR 49.153].
5. True Minor Source Modification: [Per Federal Indian Country Minor New Source Review Rule, 40 CFR 49.153].
6. North American Industry Classification System (NAICS): The NAICS Code for your oil and natural gas source can be found at the following link for North American Industry Classification System: http://www.census.gov/eos/www/naics/.
7. Standard Industrial Classification Code (SIC Code): Although the new NAICS code has replaced the SIC codes, much of the Clean Air Act permitting processes continue to use these codes. The SIC Code for your oil and natural gas source can be found at the following link for Standard Industrial Classification Codes: http://www.osha.gov/pls/imis/sic_manual.html.
8. U.S. Well ID or API Number: Unique well identifier as assigned by the Federal or State oil and gas regulatory agency with primacy, using the American Petroleum Institute (API) Standard for number format (pre-2014) or the Professional Petroleum Data Management (PPDM) Association US Well Number Standard (2014-present). Provide IDs for all oil and natural gas production wells associated with the facility, if applicable. May not be applicable for downstream production sources, such as compressor stations.
9. Area of Indian Country: Provide the name of the Indian reservation within which the source is operating.
10. County: Provide the County within which the source is operating.
11. Latitude & Longitude (11a. and 11b.): Provide latitude and longitude location(s) in decimal degrees, indicating the datum used in parentheses. These are GPS (global positioning system) coordinates. This information should be provided in decimal degrees with 6 digits to the right of the decimal point, indicating the datum used in parentheses (i.e., NAD 27, NAD 83, WGS 84 – WGS 84 is preferred over NAD 27).

B. Contact Information

Please provide the information requested in full.

1. Owners: List the full name (last, middle initial, first) of all owners of the source.
2. Operator: Provide the name of the operator of the source if it is different from the owner(s).
3. Source Contact: The source contact must be the local contact authorized to receive requests for data and information.
4. Compliance Contact: The compliance contact must be the local contact responsible for the source's compliance with this rule. If this is the same as the Source Contact please note this on the form.

C. Attachments

The information requested in the attachments will enable the U.S. Environmental Protection Agency (EPA) to understand the type of oil and natural gas source being registered and the nature and extent of the air pollutants to be emitted.

Disclaimers:

The public reporting and recordkeeping burden for this collection of information is estimated to average 6 hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

Information in these forms submitted in compliance with the final Federal Indian Country Minor NSR rule may be claimed as confidential. A company may assert a claim of confidentiality for information submitted by clearly marking that information as confidential. Such information shall be treated in accordance with EPA's procedures for information claimed as confidential at 40 CFR part 2, subpart B, and will only be disclosed by the means set forth in the subpart. If no claim of confidentiality accompanies the report when it is received by EPA, it may be made public without further notice to the company (40 CFR 2.203).

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C. Attachments

Narrative description of the operations.

The Aurora Federal 6-28D-7-20 well site pad is an Oil Production Facility planned to initially accommodate one producing oil well. The well produces oil, water and natural gas which is piped from the well through a three phase separator. Separated liquids are piped to storage tanks and associated gas is sold via pipeline. The oil from the storage tanks is sold via truck loadout. Engineered flares control storage tank emissions (water and oil) and treater gas if the pipeline is unavailable.

Identification and description of any air pollution control equipment and compliance monitoring devices or activities.

Air Pollution Control Equipment-

Engineered Dual-Tip flare will be used to control emissions from the oil and water storage tanks, and treater gas when pipeline is unavailable. Flares are capable of 98% DRE.

Compliance Monitoring Devices or Activities-

Audio, visual & olfactory (AVO) inspection will be conducted monthly
Low Pressure vent line pressures will be monitored by field operators via gauge. LDAR inspections will be conducted in compliance with OOOOa leak detection requirements.

Type and actual amount (annually) of each fuel that will be used.

The heater treater burner and the two (2) tank heaters are each rated at 500,000 Btu/hr and will be fired using natural gas. Annual fuel use for the three (3) heaters is estimated to be 7.0 MMScf/yr (based on 1,000 BTU/scf and 8,760 hr/yr).

Type of raw materials used

Natural gas as fuel.

Actual, annual production rates

Natural gas	13.7 MMSCF/yr (projected)
Oil	27,375 bbl/yr (projected)
Water	13,688 bbl/yr (projected)

Actual operating schedules

The Oil Production Facility is scheduled to operate 8,760 hours per year.

Any existing limitations on source operations affecting emissions or any work practice standards, where applicable, for all regulated New Source Review (NSR) pollutants at your source. Indicate all requirements referenced in the Federal Implementation Plan (FIP) for True Minor Sources in Indian Country in the Oil and Natural Gas Production and Natural Gas Processing Segments of the Oil and Natural Gas Sector that apply to emissions units and air pollution generating activities at the source or proposed. Include statements indicating each emissions unit that is an emissions unit potentially subject to the requirements referenced in the FIP, but does not meet the definition of an affected facility under the referenced requirement, and therefore, is not subject to those requirements.

§49.105(f) requires compliance with subpart OOOOa (Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification, or Reconstruction Commenced after September 18, 2015). Applicable limitations and work practice standards under subpart OOOOa include the following:

- The production tanks are required to reduce VOC emissions by 95.0% within 60 days after startup, per §60.5395a(a) and will be equipped with a control device that meets the conditions specified in §60.5412a(c) or (d), per §60.5395a(b)(1).
- The production tanks must be equipped with a cover that meets the requirements of §60.5411a(b) and is connected through a closed vent system that meets the requirements of §60.5411a(c) and (d).
- The well site affected facility must monitor all fugitive emission components in accordance with §60.5397a(a), and develop an emissions monitoring plan per §60.5397a(b).

§49.153(c) lists emissions units and activities that are exempt from the Federal Minor New Source Review Program in Indian County. Exempt units and activities at the facility include the following:

- The pump jack engine at the facility. The unit is a stationary internal combustion engine with a manufacturer's site-rated horsepower of less than 50, and is exempt per §49.153(c)(10).

For each emissions unit comprising the new source or modification, estimates of the total allowable (potential to emit) annual emissions at startup of production from the air pollution source for the following air pollutants: particulate matter, PM_{10}, $PM_{2.5}$, sulfur oxides ( ), nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compound (VOC), lead (Pb) and lead compounds, fluorides (gaseous and particulate), sulfuric acid mist (H_2SO_4), hydrogen sulfide (H_2S), total reduced sulfur (TRS) and reduced sulfur compounds, including all calculations for the estimates. Allowable annual emissions are defined as: emissions rate of an emissions unit calculated using the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation, or the effect it would have on emissions, is legally and practically enforceable. You must determine the potential for emissions within 30 days from the startup of production.

See attached

For each emissions unit comprising the new source or modification, estimates of the total actual annual emissions during the upcoming, consecutive 12 months from the air pollution source for the following air pollutants: particulate matter (PM, PM_{10}, $PM_{2.5}$), sulfur oxides (SO_x), nitrogen oxides (NOx), carbon monoxide (CO), volatile organic compound (VOC), lead (Pb) and lead compounds, ammonia (NH_3), fluorides (gaseous and particulate), sulfuric acid mist (H_2SO_4), hydrogen sulfide (H_2S), total reduced sulfur (TRS) and reduced sulfur compounds, including all calculations for the estimates. Estimates of actual emissions must take into account equipment, operating conditions, and air pollution control measures. You should calculate an estimate of the actual annual emissions using estimated operating hours, production rates, in-place control equipment, and types of materials processed, stored, or combusted.

See attached

Facility Wide Emissions Inventory Form

Company Name: Robert L Bayless Producer, LLC
Source Name: Aurora Federal 6-28D-7-20

	Potential to Emit (PTE)																
	Criteria (TPY)							HAPs (lbs/yr)									
Equipment Description	**TSP**	**PM10**	**PM2.5**	**SO2**	**NOx**	**VOC**	**CO**	**HCHO**	**Acetal**	**Acro**	**BZ**	**Tol**	**EB**	**Xyl**	**n-Hex**	**Meth**	**224-TMP**
oil tanks	-	-	-	-	-	4.2	-	-	-	-	-	-	-	-	-	-	-
water tanks	-	-	-	-	-	2.4	-	-	-	-	128	-	-	-	402	-	-
ECD	0.001	0.001	0.001	0.0001	0.03	-	0.06	-	-	-	-	-	-	-	-	-	-
oil loadout	-	-	-	-	-	5.2	-	-	-	-	-	-	-	-	-	-	-
(3) 500 MBTU/hr heaters	0.050	0.050	0.050	0.004	0.7	0.04	0.6	11	10	-	10	13	28	17	23	13	37
VOC leaks	-	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-
Total =	**0.05**	**0.05**	**0.05**	**0.004**	**0.7**	**11.9**	**0.6**	**11**	**10**	**0**	**138**	**13**	**28**	**17**	**425**	**13**	**37**
Uncontrolled Total, All HAPs (TPY) =								**0.3**									

	Projected Actual Emissions *																
	Criteria (TPY)							HAPs (lbs/yr)									
Equipment Description	**TSP**	**PM10**	**PM2.5**	**SO2**	**NOx**	**VOC**	**CO**	**HCHO**	**Acetal**	**Acro**	**BZ**	**Tol**	**EB**	**Xyl**	**n-Hex**	**Meth**	**224-TMP**
oil tanks	-	-	-	-	-	3.1	-	-	-	-	-	-	-	-	-	-	-
water tanks	-	-	-	-	-	1.8	-	-	-	-	96	-	-	-	301	-	-
ECD	0.001	0.001	0.001	0.0001	0.03	-	0.06	-	-	-	-	-	-	-	-	-	-
oil loadout	-	-	-	-	-	3.9	-	-	-	-	-	-	-	-	-	-	-
(3) 500 MBTU/hr heaters	0.050	0.050	0.050	0.004	0.7	0.04	0.6	11	10	-	10	13	28	17	23	13	37
VOC leaks	-	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-
Total =	**0.05**	**0.05**	**0.05**	**0.004**	**0.7**	**9.0**	**0.6**	**11**	**10**	**0**	**106**	**13**	**28**	**17**	**324**	**13**	**37**
Uncontrolled Total, All HAPs (TPY) =								**0.3**									

* Actual emissions for oil tanks and loadout estimated as potential emissions multiplied by the ratio of projected actual throughput (27,375 bbl/yr) to potential throughput (36,500 bbl/yr).
* Actual emissions for water tanks estimated as potential emissions multiplied by the ratio of projected actual throughput (13,688 bbl/yr) to potential throughput (18,250 bbl/yr).
* Actual emissions for remaining equipment expected to operate full time and equal potential emissions.

BZ = Benzene
Tol = Toluene
EB = Ethylbenzene
Xyl = Xylene
HCHO = Formaldehyde
224-TMP = 2,2,4-Trimethylpentane
Acetal = Acetaldehyde
Acro = Acrolein
n-Hex = n-Hexane
Meth = Methanol

Storage Tank Emission Calculatons
Robert L Bayless Producer, LLC
Aurora Federal 6-28D-7-20

Oil Tanks

Emissions from the facility's oil tanks were estimated based on the Vazquez-Beggs equation (flashing emissions) and EPA TANKS 4.09d (working and storage emissions).

Oil production	100	bbl/day
	36500	bbl/yr

Uncontrolled Emission Calculations

Flashing emissions:	14.5	ton/yr
Working & Storage emissions:	5.7	ton/yr
Total VOC emissions:	20.1	ton/yr

OOOOa Federal Enforceability

60 days operation uncontrolled	3.3	ton/yr
305 days operation 95% control	0.8	ton/yr
Potential VOC emissions:	4.2	ton/yr

Water Tank

Emissions from the facility's water tank(s) were estimated based on the emission factors provided in PS Memo 09-02.

Water production	50	bbl/day
	18250	bbl/yr

Pollutant	Uncontrolled Emissions		
	EF	PTE	
	lb/bbl	lb/yr	ton/yr
VOC	0.262	4782	2.4
benzene	0.007	128	0.1
n-hexane	0.022	402	0.2

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Loadout Emission Calculatons
Robert L Bayless Producer, LLC
Aurora Federal 6-28D-7-20

Emissions from oil loading were estimated based on the methodologies presented in AP-42 Section 5.2, *Transporation and Marketing of Petroleum Liquids* . Equation (1) of Section 5.2.2.1.1 indicates that the loading loss, L_L, of a petroleum liquid is given by:

$$L_L = 12.46\ SPM/T$$

where

S = saturation factor (see AP-42 Table 5.2-1)	0.60 [a]		
P = true vapor pressure of liquid loaded, psia	10.9	psia [b]	
M = molecular weight of vapors, lb/lb-mol	50	lb/lb-mol [c]	
T = temperature of bulk liquid loaded, degrees R	598	R [d]	
L_L = loading loss, lb/10^3 gal of liquid loaded	6.8	lb/10^3 gal of liquid loaded	
Tank throughput [e]	36,500	bbl/yr	1533000 gal/yr
Total VOC Emissions	10445	lb/yr	5.22 ton/yr
	0.29	lb/bbl	

[a] Saturation factor for submerged loading, dedicated to normal service (AP-42, Table 5.2-1).

[b] Average vapor pressure of RVP = 5 crude oil from TANKS 4.0 run.

[c] Molecular weight of W&S gas from TANKS 4.0 run.

[d] 138 F converted to degrees Rankin.

[e] Maximum expected oil throughput for facility.

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Heater Emission Calculations
Robert L Bayless Producer, LLC
Aurora Federal 6-28D-7-20

Unit	Heater
Unit Rating:	0.5 mmbtu/hr
Fuel usage [a]:	500 scf/hr
	4.38 mmscf/yr
Operating hours:	8760 hours

[a] Based on fuel heat content of: 1000 btu/scf

Emission Calculations:

Criteria Pollutant	Emission Factor	Data Source	Emissions (tons/yr)
NO_X	100 lb/mmscf	AP-42 Section 1.4, Table 1.4-1 (July 1998 revision)	0.22
CO	84 lb/mmscf	AP-42 Section 1.4, Table 1.4-1 (July 1998 revision)	0.18
PM10/PM/TSP	7.6 lb/mmscf	AP-42 Section 1.4, Table 1.4-2 (July 1998 revision)	0.02
SO2	0.6 lb/mmscf	AP-42 Section 1.4, Table 1.4-2 (July 1998 revision)	0.001
VOC	5.5 lb/mmscf	AP-42 Section 1.4, Table 1.4-2 (July 1998 revision)	0.01

Hazardous Air Pollutant (HAP)	Emission Factor [a]	Data Source	Emissions (tons/yr)
1,3-Butadiene	3.42E-04 lb/MMBtu	GRI FIELD TEST DATA	7.50E-04
2,2,4-Trimethylpentane	2.84E-03 lb/MMBtu	GRI FIELD TEST DATA	6.22E-03
2-Methylnaphthalene	1.47E-07 lb/MMBtu	GRI FIELD TEST DATA	3.22E-07
3-Methylcholanthrene	1.80E-09 lb/MMBtu	EPA	3.94E-09
7,12-Dimethylbenz(a)anthracene	1.57E-08 lb/MMBtu	EPA	3.44E-08
Acenaphthene	9.00E-08 lb/MMBtu	GRI FIELD TEST DATA	1.97E-07
Acenaphthylene	6.70E-08 lb/MMBtu	GRI FIELD TEST DATA	1.47E-07
Acetaldehyde	7.38E-04 lb/MMBtu	GRI FIELD TEST DATA	1.62E-03
Anthracene	8.70E-08 lb/MMBtu	GRI FIELD TEST DATA	1.91E-07
Benz(a)anthracene	8.70E-08 lb/MMBtu	GRI FIELD TEST DATA	1.91E-07
Benzene	7.48E-04 lb/MMBtu	GRI FIELD TEST DATA	1.64E-03
Benzo(a)pyrene	7.00E-08 lb/MMBtu	GRI FIELD TEST DATA	1.53E-07
Benzo(b)fluoranthene	1.50E-07 lb/MMBtu	GRI FIELD TEST DATA	3.29E-07
Benzo(g,h,i)perylene	2.60E-07 lb/MMBtu	GRI FIELD TEST DATA	5.69E-07
Benzo(k)fluoranthene	7.60E-07 lb/MMBtu	GRI FIELD TEST DATA	1.66E-06
Biphenyl	4.73E-07 lb/MMBtu	GRI FIELD TEST DATA	1.04E-06
Chrysene	1.17E-07 lb/MMBtu	GRI FIELD TEST DATA	2.56E-07
Dibenz(a,h)anthracene	1.03E-07 lb/MMBtu	GRI FIELD TEST DATA	2.26E-07
Ethylbenzene	2.11E-03 lb/MMBtu	GRI FIELD TEST DATA	4.63E-03
Fluoranthene	9.00E-08 lb/MMBtu	GRI FIELD TEST DATA	1.97E-07
Fluorene	8.00E-08 lb/MMBtu	GRI FIELD TEST DATA	1.75E-07
Formaldehyde	8.44E-04 lb/MMBtu	GRI FIELD TEST DATA	1.85E-03
Indeno(1,2,3-c,d)pyrene	1.20E-07 lb/MMBtu	GRI FIELD TEST DATA	2.63E-07
Lead	4.90E-07 lb/MMBtu	EPA	1.07E-06
Methanol	9.64E-04 lb/MMBtu	GRI FIELD TEST DATA	2.11E-03
Naphthalene	5.98E-07 lb/MMBtu	EPA	1.31E-06
n-Hexane	1.76E-03 lb/MMBtu	EPA	3.86E-03
Phenanthrene	6.00E-08 lb/MMBtu	GRI FIELD TEST DATA	1.31E-07
Phenol	1.07E-07 lb/MMBtu	GRI FIELD TEST DATA	2.34E-07
Pyrene	8.30E-08 lb/MMBtu	GRI FIELD TEST DATA	1.82E-07
Styrene	2.08E-03 lb/MMBtu	GRI FIELD TEST DATA	4.55E-03
Toluene	1.02E-03 lb/MMBtu	GRI FIELD TEST DATA	2.23E-03
Xylenes(m,p,o)	1.32E-03 lb/MMBtu	GRI FIELD TEST DATA	2.89E-03
TOTAL	**1.48E-02 lb/MMBtu**		0.032

[a] Uncontrolled emission factors for HAP from heaters @ 5 mmbtu/hr from GRI-HAPCalc 3.01, based on a composite of EPA's AP-42, GRI field data and GRI literature data. The highest emission factor between the data sets is listed here in order to provide a conservative estimate of HAP emissions from heaters.

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Emission Control Device (ECD) Emission Calculations
Robert L Bayless Producer, LLC
Aurora Federal 6-28D-7-20

Unit	ECD	
Throughput [a]:	0.2 mmscf/yr	
Heating Value	2000 BTU/scf	estimated
Operating hours:	8760 hours	

[a] Based on 6.1 scf/bbl (from Vasquez-Beggs) and 36,500 bbl/yr.

Emission Calculations:

Pollutant	Emission Factor	Data Source	Emissions (tons/yr)
NO_X	0.138 lb/MMBtu	TCEQ RG-360A/10 - January 2011 (high Btu > 1000 Btu/scf)	0.03
CO	0.2755 lb/MMBtu	TCEQ RG-360A/10 - January 2011 (high Btu > 1000 Btu/scf)	0.06
PM10/PM/TSP	7.6 lb/mmscf	AP-42 Section 1.4, Table 1.4-2 (July 1998 revision)	0.001
SO2	0.6 lb/mmscf	AP-42 Section 1.4, Table 1.4-2 (July 1998 revision)	0.0001
VOC	5.5 lb/mmscf	AP-42 Section 1.4, Table 1.4-2 (July 1998 revision)	0.001

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VOC EMISSIONS FROM EQUIPMENT LEAKS
SOURCES WITH LEAK DEFINITION < 10,000 ppmv (EPA-453/R-95-017, Table 2-8) *

Facility: Aurora Federal 6-28D-7-20

Equipment Type	Quantity	% VOC	Service	Uncontrolled Emissions (EPA-453/R-95-017, Table 2-8) Emission Factor (kg/hr/component)	TOC (ton/yr)	VOC (ton/yr)
Valves	72	100.0%	Gas	2.5E-05	1.74E-02	1.74E-02
	0	100.0%	Heavy Oil	8.4E-06	0.00E+00	0.00E+00
	45	100.0%	Light Oil	1.9E-05	8.26E-03	8.26E-03
	0	100.0%	Water/Oil	9.7E-06	0.00E+00	0.00E+00
Flanges	27	100.0%	Gas	5.7E-06	1.49E-03	1.49E-03
	0	100.0%	Heavy Oil	3.9E-07	0.00E+00	0.00E+00
	0	100.0%	Light Oil	2.4E-06	0.00E+00	0.00E+00
	0	100.0%	Water/Oil	2.9E-06	0.00E+00	0.00E+00
Connectors	356	100.0%	Gas	1.0E-05	3.44E-02	3.44E-02
	0	100.0%	Heavy Oil	7.5E-06	0.00E+00	0.00E+00
	183	100.0%	Light Oil	9.7E-06	1.71E-02	1.71E-02
	0	100.0%	Water/Oil	1.0E-05	0.00E+00	0.00E+00
Open-ended lines	6	100.0%	Gas	1.5E-05	8.69E-04	8.69E-04
	0	100.0%	Heavy Oil	7.2E-06	0.00E+00	0.00E+00
	0	100.0%	Light Oil	1.4E-05	0.00E+00	0.00E+00
	0	100.0%	Water/Oil	3.5E-06	0.00E+00	0.00E+00
Pump Seals	0	100.0%	Gas	3.5E-04	0.00E+00	0.00E+00
	0	100.0%	Heavy Oil	n/a	--	--
	1	100.0%	Light Oil	5.1E-04	4.93E-03	4.93E-03
	0	100.0%	Water/Oil	2.4E-05	0.00E+00	0.00E+00
Other Components	6	100.0%	Gas	1.2E-04	6.95E-03	6.95E-03
	0	100.0%	Heavy Oil	3.2E-05	0.00E+00	0.00E+00
	0	100.0%	Light Oil	1.1E-04	0.00E+00	0.00E+00
	0	100.0%	Water/Oil	5.9E-05	0.00E+00	0.00E+00
	696			**Total:**	**0.1**	**0.1**

* Estimates of facility component counts. This facility is subject to 500 ppmv leak definitions under 40 CFR 60 subpart OOOOa.

Robert L Bayless Producer, LLC
Aurora Federal 6-28D-7-20
Ajax E-42 Emission Calculations

Ajax E-42 Pump-jack Engine (2-Stroke Lean-burn)

Unit Rating: [a]	40 hp
BSFC:	9900 Btu/hp-hr
Maximum Heat Input:	0.4 mmBtu/hr
Operating Schedule:	8760 hr/yr
FHV:	1000 Btu/scf
Maximum Fuel Use:	3.5 mmscf/yr
Fuel Use Rate:	396.0 scf/hr

THIS UNIT IS EXEMPT PER §49.153(c)(10)

[a] Site rated based on a nominal elevation of 1500ft above sea level and average 65 F ambient temperature.

Emission Calculations

Pollutant	Emission Factors	Data Source	Potential Emissions (ton/yr)
NO_X	4.4 g/bhp-hr	Manufacturer	1.70
CO	3.3 g/bhp-hr	Manufacturer	1.27
VOC	0.12 lb/mmBtu	AP 42 Table 3.2-1	0.21
PM10 [b]	0.04831 lb/mmBtu	AP 42 Table 3.2-1	0.08
SO_2	5.88E-04 lb/mmBtu	AP 42 Table 3.2-1	0.001

Pollutant	Emission Factors [c]	Data Source	Potential Emissions (lb/yr)
1,1,2,2-Tetrachloroethane	6.63E-05 lb/mmBtu	EPA	0
1,1,2-Trichloroethane	5.27E-05 lb/mmBtu	EPA	0
1,3-Butadiene	8.20E-04 lb/mmBtu	EPA	3
1,3-Dichloropropene	4.38E-05 lb/mmBtu	EPA	0
2,2,4-Trimethylpentane	3.50E-03 lb/mmBtu	GRI FIELD TEST DATA	12
2-Methylnaphthalene	2.14E-05 lb/mmBtu	EPA	0
Acenaphthene	1.33E-06 lb/mmBtu	EPA	0
Acenaphthylene	3.17E-06 lb/mmBtu	EPA	0
Acetaldehyde	3.30E-02 lb/mmBtu	GRI FIELD TEST DATA	116
Acrolein	7.78E-03 lb/mmBtu	EPA	27
Anthracene	7.18E-07 lb/mmBtu	EPA	0
Benz(a)anthracene	3.36E-07 lb/mmBtu	EPA	0
Benzene	2.36E-03 lb/mmBtu	GRI FIELD TEST DATA	8
Benzo(a)pyrene	5.68E-09 lb/mmBtu	EPA	0
Benzo(b)fluoranthene	8.51E-09 lb/mmBtu	EPA	0
Benzo(e)pyrene	2.34E-08 lb/mmBtu	EPA	0
Benzo(g,h,i)perylene	2.48E-08 lb/mmBtu	EPA	0
Benzo(k)fluoranthene	4.26E-09 lb/mmBtu	EPA	0
Biphenyl	3.95E-06 lb/mmBtu	EPA	0
Carbon Tetrachloride	6.07E-05 lb/mmBtu	EPA	0
Chlorobenzene	4.44E-05 lb/mmBtu	EPA	0
Chloroform	4.71E-05 lb/mmBtu	EPA	0
Chrysene	6.72E-07 lb/mmBtu	EPA	0
Ethylbenzene	2.85E-03 lb/mmBtu	GRI FIELD TEST DATA	10
Ethylene Dibromide	7.34E-05 lb/mmBtu	EPA	0
Fluoranthene	3.94E-07 lb/mmBtu	GRI FIELD TEST DATA	0
Fluorene	1.69E-06 lb/mmBtu	EPA	0
Formaldehyde	3.00E-01 g/bhp-hr	manufacturer	232
Indeno(1,2,3-c,d)pyrene	9.93E-09 lb/mmBtu	EPA	0
Methanol	3.43E-03 lb/mmBtu	GRI FIELD TEST DATA	12
Methylene Chloride	1.47E-04 lb/mmBtu	EPA	1
Naphthalene	9.63E-05 lb/mmBtu	EPA	0
n-Hexane	2.28E-03 lb/mmBtu	GRI FIELD TEST DATA	8
PAH	1.34E-04 lb/mmBtu	EPA	0
Perylene	4.97E-09 lb/mmBtu	EPA	0
Phenanthrene	3.53E-06 lb/mmBtu	EPA	0
Phenol	4.21E-05 lb/mmBtu	EPA	0
Propanal	7.54E-04 lb/mmBtu	GRI FIELD TEST DATA	3
Pyrene	5.84E-07 lb/mmBtu	EPA	0
Styrene	2.78E-03 lb/mmBtu	GRI FIELD TEST DATA	10
Toluene	2.62E-03 lb/mmBtu	GRI FIELD TEST DATA	9
Vinyl Chloride	2.47E-05 lb/mmBtu	EPA	0
Xylenes(m,p,o)	2.91E-03 lb/mmBtu	GRI FIELD TEST DATA	10
TOTAL		--	**431**

[b] PM10 emission factor is the sum of "PM10 (filterable)" and "PM Condensable".

[c] Uncontrolled emission factors for HAP from 2-stroke, lean-burn (2SLB) engines from GRI-HAPCalc 3.01, based on a composite of EPA's AP-42, GRI field data and GRI literature data. The highest emission factor between the data sets is listed here in order to provide a conservative estimate of HAP emissions from 2SLB engines. GRI emission factors were converted from g/bhp-hr using 7,276 Btu/bhp-hr (per GRI-HAPCalc 3.01 guidance).

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Company Name: **Robert L Bayless Producer, LLC** Permit No

Facility Name: **Aurora Federal 6-28D-7-20** Date:

Volatile Organic Compound Emission Calculation for Flashing

Vasquez - Beggs Solution Gas/Oil Ratio Correlation Method

(For Estimating VOC Flashing Emissions, Using Stock Tank Gas-Oil Ratios For Crude Oil Facilities)

INPUTS:

Stock Tank API Gravity	30.7	**API**
Separator Pressure (psig)	50	**P**
Separator Temperature (°F)	160	**Ti**
Separator Gas Gravity at Initail Condition	0.8	**SGi**
Stock Tank Barrels of Oil per day (BOPD)	100	**Q**
Stock Tank Gas Molecular Weight	50	**MW**
Fraction VOC (C3+) of Stock Tank Gas	1	**VOC**
Atmospheric Pressure (psia)	12.3	**Patm**

Constraints on inputs and calculated values:

16	**>API>**	**58**	°API	ok
50	**>P+Patm>**	**5250**	**(psia)**	ok
70	**> Ti >**	**295**	**(°F)**	ok
0.56	**>SGi>**	**1.18**	**MW/28.97**	ok
None	**> Q >**	**None**	**(BOPD)**	ok
18	**>MW>**	**125**	**lb/lb-mole**	ok
0.5	**>Voc>**	**1.00**	**Fraction**	ok
20	**> Rs >**	**2070**	**(scf/STB)**	WARNING ....

SGx = Dissolved gas gravity at 100 psig = SGi [1.0+0.00005912*API*Ti*Log(Pi/114.7)]

SGx =	**0.74**

Document Notes:

Rs = (C1 * SGx * Pi^C2) exp ((C3 * API) / (Ti + 460))

Where:

Rs	Gas/Oil Ratio of liquid at pressure of interest
SGx	Dissolved gas gravity at 100 psig
Pi	Pressure of initial condition (psia)
API	API Gravity of liquid hydrocarbon at final condition
Ti	Temperature of initial condition (F)

Constants

	°API Gravity		
°APTI →	**< 30**	**>= 30**	Given °API
C1	~~0.0362~~	0.0178	**0.0178**
C2	~~1.0937~~	1.187	**1.187**
C3	~~25.724~~	23.931	**23.931**

Rs =	**6.10**	**scf/bbl**	***for P + Patm =***	***62.3***

THC = Rs * Q * MW * 1/385 scf/lb-mole * 365 D/Yr * 1 ton/2000 lb.s

THC	Total Hydrocarbon (tons/year)
Rs	Solution Gas/Oil Ratio (scf/STB)
Q	Oil Production Rate (bbl/day)
MW	Molecular Weight of Stock Tank Gas (lb/lb-mole)
385	Volume of 1 lb-mole of gas at 14.7 psia and 68 F (WAQS&R Std Cond)

THC =	**14.5**	**TPY**

VOC = THC * Frac. of C3+ in the Stock Tank Vapor

VOC =	**14.5**	**TPY**	***from "FLASHING" of oil from separator to tank press***

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

Identification

User Identification:	Aurora Federal 6-28D-7-20
City:	
State:	Utah
Company:	Robert L Bayless Producer, LLC
Type of Tank:	Vertical Fixed Roof Tank
Description:	50 bopd @ 30.7 API (1) of (2) 400 bbl tanks

Tank Dimensions

Shell Height (ft):		20.00
Diameter (ft):		12.00
Liquid Height (ft) :		18.00
Avg. Liquid Height (ft):		9.00
Volume (gallons):		15,228.53
Turnovers:		50.33
Net Throughput(gal/yr):		766,500.00
Is Tank Heated (y/n):	Y	

Paint Characteristics

Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good

Roof Characteristics

Type:	Dome	
Height (ft)		0.50
Radius (ft) (Dome Roof)		12.00

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Grand Junction, Colorado (Avg Atmospheric Pressure = 12.37 psia)

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

Aurora Federal 6-28D-7-20 - Vertical Fixed Roof Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 5)	All	138.00	138.00	138.00	138.00	10.9028	10.9028	10.9028	50.0000			207.00	Option 4: RVP=5

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

Emissions Report for: Annual

Aurora Federal 6-28D-7-20 - Vertical Fixed Roof Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Crude oil (RVP 5)	5,690.92	0.00	5,690.92

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CAMERON

AJAX

Estimated Exhaust Emissions Based On PLQNG, 1500 FASL Elevation and an average Ambient Temperature of 65 Degrees F

For Emissions Permits, please contact Ajax for emissions data based on specific site conditions

Ajax Engine Model	Emissions (Gm / Bhph)					BSFC	RPM	BHP	BMEP	Exhaust Stack						No. Of Cyl's	Bore	Stroke
	NOx	CO	HCT	NMHC	CH2O					Dia. (in.)	Height (in.)	Temp (Deg.F)	Flow (acfm)	Flow (lb/m)	Velocity (ft/m)			
EA-15	4.4	3.3	7.7	1.3	0.3	9900	900	14	49.6	4	31	500	140	5	1604	1	5	6.5
EA-22	4.4	3.3	7.7	1.3	0.3	9900	650	21	48.5	5	64	500	200	8	1467	1	6.5	8
EA-30	4.4	3.3	7.7	1.3	0.3	9900	650	29	53.1	5	80	500	250	10	1833	1	7.25	8
C-30	4.4	3.3	7.7	1.3	0.3	9400	525	29	49.2	5	101	450	260	11	1907	1	7.5	10
C-42	4.4	3.3	7.7	1.3	0.3	9900	525	40	53.6	6	137	565	380	14	1935	1	8.5	10
E-42	4.4	3.3	7.7	1.3	0.3	9900	525	40	53.6	6	137	565	380	14	1935	1	8.5	10
DP-60	4.4	1.7	4.4	1.0	0.3	9000	475	58	56.5	8	150	540	500	18	1432	1	9.5	12
DP-80	4.4	2.8	9.6	1.5	0.3	8900	400	77	57.1	10	164	470	610	24	1118	1	11.0	14
DP-81	6.6	1.1	3.8	0.9	0.3	8500	475	78	62.4	10	164	545	610	22	1118	1	10.5	12
DP-115	4.4	2.4	12.7	1.9	0.3	9000	360	110	55.0	12	190	440	880	36	1120	1	13.25	16
DP-125	5.0	2.7	12.0	1.8	0.3	8500	380	120	56.7	12	190	470	960	38	1222	1	13.25	16
DP-160	4.4	2.8	9.6	1.8	0.3	8900	400	154	57.1	10	164	470	1220	48	2237	2	11	14
DP-165	6.0	3.0	12.0	1.8	0.3	8500	380	158	58.4	13.25	260	450	1210	49	1264	1	15	16
DP-230	4.4	2.4	14.0	1.9	0.3	9000	360	221	55.0	12	190	440	1770	72	2254	2	13.25	16
DP-250	5.5	3.0	11.0	1.7	0.3	8500	380	240	56.7	12	190	460	1910	76	2432	2	13.25	16
DP-325	5.5	1.7	12.0	1.9	0.3	8400	380	312	57.5	13.25	260	450	2420	98	2527	2	15	16
DPC-60	4.4	1.7	4.4	1.0	0.3	9000	475	58	56.5	8	150	540	500	18	1432	1	9.5	12
DPC-80	4.4	2.8	8.8	1.5	0.3	8900	400	77	57.1	10	164	470	610	24	1118	1	11	14
DPC-81	6.6	1.1	3.8	0.9	0.3	8500	475	78	62.4	10	164	545	610	22	1118	1	10.5	12
DPC-105	4.4	2.8	6.6	1.2	0.3	8800	425	101	59.3	12	193	480	780	31	993	1	12	14
DPC-115	4.4	2.4	12.7	1.9	0.3	8700	360	110	55.0	12	190	440	870	36	1108	1	13.25	16
DPC-115 LE	2.0	2.2	7.7	1.3	0.3	8100	360	110	55.0	12	190	400	830	36	1057	1	13.25	16
DPC-120	5.5	1.7	4.4	1.0	0.3	9000	475	115	56.5	8	150	540	1000	37	2865	2	9.5	12
DPC-140	10.5	1.3	6.8	1.2	0.3	8200	400	134	60.3	12	190	490	1040	40	1324	1	13.25	16
DPC-140 LE	2.0	1.4	5.5	1.1	0.3	7800	400	134	60.3	12	190	450	1010	41	1286	1	13.25	16
DPC-160	4.4	2.7	8.8	1.4	0.3	8900	400	154	57.1	10	164	470	1220	48	2237	2	11	14
DPC-162	6.6	1.1	3.8	0.9	0.3	8500	475	156	62.4	10	164	545	1230	45	2255	2	10.5	12
DPC-180	6.3	1.4	14.6	2.1	0.3	8400	400	173	60.5	13.25	256	460	1290	52	1347	1	15	16
DPC-180 LE	2.0	1.1	6.6	1.2	0.3	7900	400	173	60.5	13.25	256	555	1450	53	1514	1	15	16

Site Altitude = 0 - 1500 FASL Date: December 2008

Site Fuel Composition = Pipeline Quality Natural Gas (PLQNG)

Ambient Temp For Defining Maximum Load = 100 Deg F

Ambient Temp For Defining Exhaust Emissions = 65 Deg F

NOx = Nitrogen Oxide

CO = Carbon Monoxide

HCT = Total Unburned Hydrocarbons

NMHC= Non-Methane Hydrocarbons

CH2O = Formaldehyde

FASL = Feet Above Sea Level

ACFM = Actual Cubic Feet Per Minute

BMEP = Brake Mean Effective Pressure (Psi)

BSFC = Brake Specific Fuel Consumption (Btu / Bhp-hr)

Gm / Bhph = Gram / Brake Horse Power-Hour

The above emissions and performance data is contingent on:

1.) Engine must be maintained in good working order.

2.) Engine modifications or upgrades from the original factory configuration must meet Ajax specifications and installation guidelines.

3.) Engine operating parameters must be consistent with those specified in the Ajax manual.

Fuel Composition (PLQNG):

Compound	Formula	% Volume
Nitrogen	N2	0.72
Carbon Dioxide	CO2	1.14
Methane	CH4	92.84
Ethane	C2H6	4.10
Propane	C3H8	1.20
	Total Volume % =	100.00