May xx, 2016

98 VANADIUM ROAD
BUILDING D, 2nd FLOOR
BRIDGEVILLE, PA 15017
(412) 221-1100
(412) 257-6103 (FAX)
http://www.se-env.com

West Virginia Dept. of Environmental Protection
Division of Air Quality – Permitting Section
601 57th Street, SE
Charleston, WV 25304

RE: Application for NSR Construction Permit
Dopey Well Pad Production Facility
Jay-Bee Oil & Gas, Inc.
Tyler County, West Virginia

To Whom It May Concern:

On behalf of our client, Jay-Bee Oil & Gas, we are pleased to submit one hard copy and two electronic copies of the Application for an NSR Construction Permit for its Dopey Well Pad Production Facility in Tyler County. This application is being submitted as an individual permit application rather than a G70-B general permit registration as the facility will be contiguous and aggregated with the Icon Midstream Dopey Dehydration Facility (application being submitted separately). As such, the Dopey Well Pad Production Facility is not eligible for registration under the G70-B general permit.

A fee in the amount of $2,000 ($1,000 Permit Fee + $1,000 NSPS Fee) was determined to be applicable. A check, payable to WVDEP – Division of Air Quality for this amount is included herein.

If there are any questions or concerns regarding this application, please contact me at 412/221-1100, x 202 or rdhonau@se-env.com and we will provide any needed clarification or additional information immediately.

Sincerely,

SE TECHNOLOGIES, LLC

Roger A. Dhonau, PE, QEP
Principal

Enclosures
Cc: Jay-Bee Oil & Gas, Inc. – Shane Dowell

JAY-BEE OIL & GAS, Inc.

APPLICATION FOR
NSR CONSTRUCTION PERMIT

Dopey Well Pad Production Facility
Tyler County, West Virginia

98 Vanadium Road
Bridgeville, PA 15017
(412) 221-1100

APPLICATION FOR NSR (45CSR13)
CONSTRUCTION PERMIT

Jay-Bee Oil & Gas, Inc.

Dopey Dehydration Facility

Tyler County, West Virginia

Table of Contents

SECTION I

Application Form

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☒ **CONSTRUCTION** ☐ **MODIFICATION** ☐ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☐ **CLASS II ADMINISTRATIVE UPDATE** ☐ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☐ **MINOR MODIFICATION**
☐ **SIGNIFICANT MODIFICATION**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
Jay-Bee Oil & Gas, Inc.

2. Federal Employer ID No. ***(FEIN):***
55-073-8862

3. Name of facility *(if different from above):*
Dopey Well Pad Production Facility

4. The applicant is the:
☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**

5A. Applicant's mailing address:
3570 Shields Hill Rd
Cairo, WV 26337

5B. Facility's present physical address:
Off Indian Creek Road
Middlebourne in Tyler County

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☒ **YES** ☐ **NO**

- If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**
- If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation: **N/A**

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☒ **YES** ☐ **NO**

- If **YES,** please explain: **Applicant has a lease agreement with the land owner for installation of the Well Pad and associated equipment.**
- If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): **Natural Gas Well Pad Production Facility**

10. North American Industry Classification System **(NAICS)** code for the facility:
211111

11A. DAQ Plant ID No. (for existing facilities only):

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

12A.

- For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B**.

From Middlebourne, proceed southeast on State Route 18 (Main Street) out of town. Proceed approximately 5.8 miles to the junction with CR 1/3 (Indian Creek Road) on the left. From WV 18 and Indian Creek (CR13) intersection, take Indian Creek Rd east for 4.4 miles. Turn right onto lease road, follow north for 0.2 miles to well pad entrance.

12.B. New site address (if applicable):	12C. Nearest city or town: **Middlebourne**	12D. County: **Tyler**
12.E. UTM Northing (KM): **4,365.41**	12F. UTM Easting (KM): **519.57**	12G. UTM Zone: **17**

13. Briefly describe the proposed change(s) at the facility:
Natural gas production and separation of liquids.

14A. Provide the date of anticipated installation or change: **July 15 2016** – If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen:	14B. Date of anticipated Start-Up if a permit is granted: **July 30 2016**

14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
Hours Per Day 24 Days Per Week 7 Weeks Per Year 52

16. Is demolition or physical renovation at an existing facility involved? ☐ **YES** ☒ **NO**

17**. Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18**. Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known).* A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known).* Provide this information as **Attachment D.**

Section II. Additional attachments and supporting documents.

19. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

20. Include a **Table of Contents** as the first page of your application package.

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance***) **.**

– Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**

– Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**

– For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below:

☒ Bulk Liquid Transfer Operations	☒ Haul Road Emissions	☐ Quarry
☐ Chemical Processes	☐ Hot Mix Asphalt Plant	☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Concrete Batch Plant	☐ Incinerator	☒ Storage Tanks
☐ Grey Iron and Steel Foundry	☐ Indirect Heat Exchanger	
☐ General Emission Unit, specify		

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

☐ Absorption Systems	☐ Baghouse	☐ Flare
☐ Adsorption Systems	☐ Condenser	☐ Mechanical Collector
☐ Afterburner	☐ Electrostatic Precipitator	☐ Wet Collecting System

☒ Other Collectors, specify Enclosed Combustion Device (Vapor Combustion Unit)

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M.**

30. Provide all **Supporting Emissions Calculations** as **Attachment N,** or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**

➢ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and ***Example Legal Advertisement*** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33**. Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☐ **YES** ☒ **NO**

➢ If **YES,** identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's ***"Precautionary Notice – Claims of Confidentiality"*** guidance found in the ***General Instructions*** as **Attachment Q.**

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below:

☐ Authority of Corporation or Other Business Entity	☐ Authority of Partnership
☐ Authority of Governmental Agency	☐ Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R.**

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☒ **Responsible Official** / ☐ **Authorized Representative,** hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE _____ *(Please use blue ink)* DATE: 5-13-2016 *(Please use blue ink)*

35B. Printed name of signee: **Shane Dowell**		35C. Title: **Office Manager**
35D. E-mail: **sdowell@jaybeeoil.com**	36E. Phone: **304/628-3111**	36F. FAX:
36A. Printed name of contact person (if different from above):		36B. Title:
36C. E-mail:	36D. Phone:	36E. FAX:

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

- ☒ Attachment A: Business Certificate
- ☒ Attachment B: Map(s)
- ☒ Attachment C: Installation and Start Up Schedule
- ☒ Attachment D: Regulatory Discussion
- ☒ Attachment E: Plot Plan
- ☒ Attachment F: Detailed Process Flow Diagram(s)
- ☒ Attachment G: Process Description
- ☐ Attachment H: Material Safety Data Sheets (MSDS)
- ☒ Attachment I: Emission Units Table
- ☒ Attachment J: Emission Points Data Summary Sheet
- ☒ Attachment K: Fugitive Emissions Data Summary Sheet
- ☒ Attachment L: Emissions Unit Data Sheet(s)
- ☒ Attachment M: Air Pollution Control Device Sheet(s)
- ☒ Attachment N: Supporting Emissions Calculations
- ☒ Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans
- ☒ Attachment P: Public Notice
- ☐ Attachment Q: Business Confidential Claims
- ☐ Attachment R: Authority Forms
- ☐ Attachment S: Title V Permit Revision Information
- ☒ Application Fee

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

- ☐ *Forward 1 copy of the application to the Title V Permitting Group and:*
- ☐ *For Title V Administrative Amendments:*
  - ☐ *NSR permit writer should notify Title V permit writer of draft permit,*
- ☐ *For Title V Minor Modifications:*
  - ☐ *Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,*
  - ☐ *NSR permit writer should notify Title V permit writer of draft permit.*
- ☐ *For Title V Significant Modifications processed in parallel with NSR Permit revision:*
  - ☐ *NSR permit writer should notify a Title V permit writer of draft permit,*
  - ☐ *Public notice should reference both 45CSR13 and Title V permits,*
  - ☐ *EPA has 45 day review period of a draft permit.*

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

SECTION II

Attachments

ATTACHMENT A

Business Certificate

Attachment A

Attached Current WV Business Certificate

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION
CERTIFICATE

ISSUED TO:
JAY-BEE OIL & GAS INC
RR 1 BOX 5
CAIRO, WV 26337-9701

BUSINESS REGISTRATION ACCOUNT NUMBER: **1043-4424**

This certificate is issued on: 06/11/2010

This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with W.Va. Code s. 11-12.

The person or organization identified on this certificate is registered to conduct business in the State of West Virginia at the location above.

This certificate is not transferrable and must be displayed at the location for which issued.

This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked, or cancelled by the Tax Commissioner.

Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them.
CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.

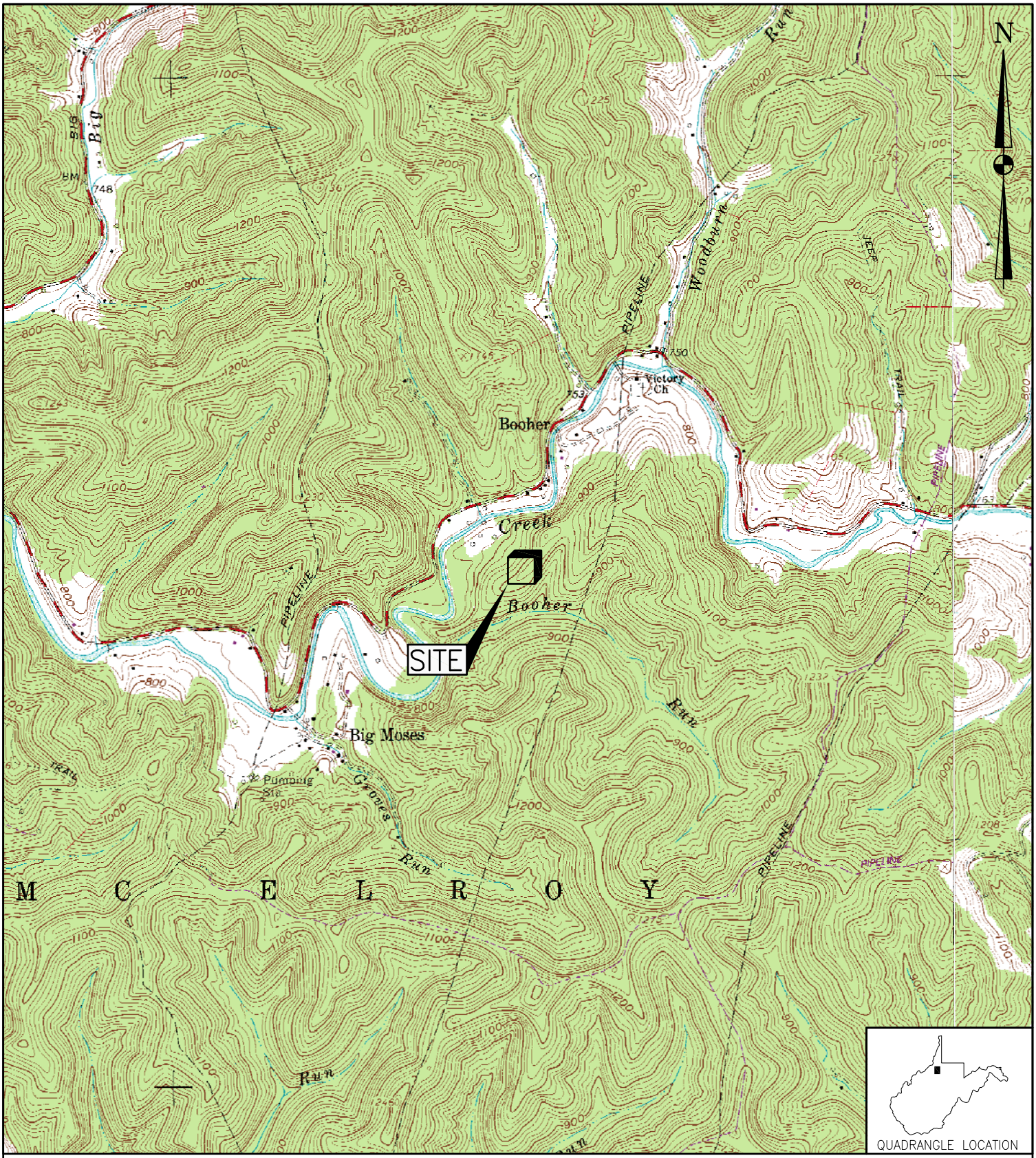
atl.006 v.1
L1388190464

SCANNED

JUN 24 2010

ATTACHMENT B

Area Map



REFERENCE: USGS 7.5' QUADRANGLE MAP OF: SHIRLEY, WEST VIRGINIA; DATED 1961, PHOTOREVISED 1989

DRAWN BY	DJF
DATE	5/10/16
CHECKED BY	RAD
SET JOB NO.	214054-17
SET DWG FILE	DOPEYm01.dwg
DRAWING SCALE	1"=2000'

TECHNOLOGIES
98 Vanadium Road Bridgeville, PA 15017 (412) 221-1100

JAY-BEE OIL & GAS, INC.

DOPEY WELL PRODUCTION FACILITY
TYLER COUNTY, WEST VIRGINIA
SITE LOCATION MAP

DRAWING NO.	REV.
FIGURE 1	0

Plot: env045 05/10/2016 11:04 G:\JAY-BEE OIL&GAS\214054\DOPEYODOPEYm01.dwg

ATTACHMENT C

Installation and Start-Up Schedule

Jay-Bee Oil & Gas, Inc.
Dopey Well Pad Production Facility
Attachment C – Installation and Start-Up Schedule

The Facility is currently beginning top-hole drilling. It is anticipated that the equipment associated with this permit will be installed upon completion of drilling and prior to well completion. It is anticipated that this will be in July or August 2016.

ATTACHMENT D

Regulatory Discussion

Dopey Well Pad Production Facility
Attachment D
Regulatory Analysis

Both State and Federal environmental regulations governing air emissions apply to the Dopey Well Pad Production Facility. The West Virginia Department of Environmental Protection (WVDEP) has been delegated the authority to implement certain federal air quality requirements for the state. Air quality regulations that potentially affect the modification are discussed herein.

1.1 PSD and NSR

The Facility is a minor source with respect to Prevention of Significant Deterioration (PSD) regulations as it does not have the potential to emit more than the annual emission thresholds of any PSD regulated pollutant with the voluntary restrictions (e.g., catalytic converter on the engine and control of tank emissions).

The Facility is within an area designated as attainment for all criteria pollutants. Consequently, the Facility is not subject to the New Source Review (NSR) regulations. Consequently, NSR requirements are not applicable to this project.

1.2 Title V Operating Permit Program

West Virginia has incorporated provisions of the federal Title V operating permit program. Thresholds for inclusion under the Title V program are 10 tpy of any single Hazardous Air Pollutant (HAP) or 25 tons of any combination of HAP and/or 100 tpy of all other regulated pollutants. Additionally, facilities regulated under certain New Source Performance Standards (NSPS) require facilities to have Title V permits. Maximum potential HAP and Criteria Pollutants from the proposed facility, alone and in conjunction with the aggregated Icon Midstream facility (see Section 1.3) are below thses thresholds. Additionally, none of the applicable NSPS mandate a Title V permit. Hence, such a permit is not required for this facility.

1.3 Aggregation

Source aggregation determinations are typically made based on the following criteria:

- Whether the facilities are under common control,
- Whether the facilities belong to the same Major Group (i.e. the first two digit code) as described in the Standard Industrial Classification Manual, 1972, as amended by the 1977 Supplement;
- Whether the facilities are located on one or more contiguous or adjacent properties; and the distance between all pollutant emitting activities,
- Whether the facilities can operate independently

Only if all criteria are met does a permitting authority aggregate the facilities into a single source.

This new Jay-Bee Oil & Gas facility will receive and manage raw natural gas and associated produced fluids from the on-site wells. After separation of the liquids, the gas will be routed to an adjoining Icon Midstream dehydration facility where water vapor is removed from the gas and it is injected into gathering lines for transportation.

The Dopey Well Pad Production Facility and the receiving Icon Midstream Dopey Dehydration Facility are under the same general SIC Code. While they are under separate ownership, they may, from time to time have a sharing of staff. The Icon Midstream Dopey Dehydration Facility supports operation of the Dopey Well Pad and only exists as a support for gas coming from this well pad. Therefore, emissions from the Dopey Dehydration Facility should be aggregated with Jay-Bee's Dopey Well Pad to determine major source status.

The closest Jay-Bee facility to the Dopey Well Pad Production Facility is its Doc Well Pad Production Facility. Again, this under the same SIC code and may, from time to time, have a sharing of staff. However, these two well pads are approximately 4100 feet (0.78 miles) apart. Additionally, they are not on contiguous or adjacent parcels. Lastly, there is no interconnection or interdependency between these two facilities. Gas from one well pad does not flow to the other. Accordingly, the operation of one well pad is not dependent upon the operation of the other. Thus, given the lack of dependency and the distance of separation, emissions from these two well pads should not be aggregated.

1.4 New Source Performance Standards

New Source Performance Standards (NSPS) regulations promulgated under 40 CFR 60 require new and reconstructed facilities to control emissions to the level achievable by Best-Available Control Technology (BACT). Specific NSPS requirements potentially applicable to the Dopey Well Pad Production Facility are as follows:

- 40 CFR 60, Subpart Dc—Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units
- 40 CFR 60, Subpart JJJJ – Stationary Spark Ignition Internal Combustion Engines
- 40 CFR 60, Subpart OOOO - Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution

1.4.1 Subpart Dc

This subpart limits SO2 and PM emissions from boilers and heaters fired by various fuels. While the primary thrust of this set of regulations it to control SOx and PM emissions from coal and

oil-fired boilers and heaters, natural gas fired units are also covered under this rule. The Gas Processing Units have heat inputs that are well below the threshold of coverage for this rule (10 MMBTU/Hr). Thus, this rule does not apply.

1.4.2 Subpart JJJJ

This subpart governs emissions from new stationary spark ignition internal combustion engines (SI ICE) manufactured after July 1, 2007. The driver for the Vapor Recovery Unit is an SI ICE unit manufactured after this date. Accordingly, this rule applies to this engine. More specifically, 60.4233(d) stipulates that non-emergency natural gas-fired rich burn engines 25-100 HP must comply with the emission standards of 40 CFR 1048.101(c). According to this rule, only NOx and CO limitations are set for engines of this size and fueled by natural gas. Thus, NOx must be less than 3.8 g/kW-hr and CO must be less than 6.5 g/kW-hr. Given that 1 kW equals 1.341 HP, this is equivalent to 2.8 g/bhp-hr for NOx and 4.8 g/bhp-hr for CO. The controlled engine emissions will meet this standard.

1.4.3 Subpart OOOO

This subpart governs emissions from a broad spectrum of operations in the oil and natural gas industries, including operations at natural gas well pads. The potentially applicable sections of this rule sets restrictions, recordkeeping and reporting requirements on emissions from storage vessels with potential VOC emissions greater than 6 tpy, fugitive emissions, reciprocating compressors and pneumatic controllers. This rule applies to the Dopey Well Pad Production Facility.

One of the key components to this rule [40 CFR 60.5390(b)] applicable to the Dopey Well Pad Production Facility is the requirement that all pneumatic controllers located between the well head and a processing plant must have a bleed rate of less than 6 scfh. All pneumatic controllers installed at Dopey Well Pad Production Facility meet these criteria.

Lastly, this rule also stipulates that storage vessels with VOC emissions equal to or greater than 6 tpy must control those emissions by 95% by October 15, 2013. The condensate tanks at Dopey have an estimated *uncontrolled* VOC emission rate well in excess of this threshold. As described in 40 CFR 60.5365(e), *the determination may take into account requirements under a legally and practically enforceable limit in an operating permit or other requirement established under a Federal, State, local or tribal authority.* The control systems proposed in this application will reduce VOC emissions from the tanks described above to rates below the 6 tpy limit per tank and operation of these controls will become part of the permit. Thus, the tanks at this facility will not be regulated under 40 CFR 60, Subpart OOOO.

1.5 National Emission Standards for Hazardous Air Pollutants

National Emission Standards for Hazardous Air Pollutants (NESHAPs) promulgated under 40 CFR 63 regulate the emission of Hazardous Air Pollutants (HAPs) from certain industrial

processes. In general, these rules apply to major sources of HAPs with a major source being defined as having the potential to emit more than 10 tpy of any individual HAP or 25 tpy of total HAPs. Emissions standards under these rules have been established as the Maximum Achievable Control Technology (MACT) for each source category. The following NESHAP source category standards are potentially applicable to the planned Dopey Well Pad Production Facility:

- 40 CFR 63, Subpart ZZZZ – NESHAP from Stationary Reciprocating Internal Combustion Engines
- 40 CFR 63, Subpart JJJJJJ – NESHAP for Industrial, Commercial and Institutional Boilers and Process Heaters

1.5.1 Subpart ZZZZ

This Subpart governs emissions from a stationary reciprocating internal combustion engine (RICE) located both at major and area source of HAPs. The Facility is not a major source of HAPs, but is considered an area source of HAPs. Hence, this rule is potentially applicable to the Facility. In accordance with 40 CFR 63.6590(a)(2)(iii), the single engine at the Dopey Well Pad Production Facility is not considered an Existing Stationary RICE. Rather, it is considered a "new" engine. Thus, the engine meets the requirements of this rule by meeting the requirements of NSPS, Subpart JJJJ.

1.5.2 Subpart JJJJJJ

This Subpart applies to industrial, commercial, or institutional boilers located at an area source of HAPs. This Facility contains natural gas-fired line heaters; therefore it is not subject to this Subpart per 40 CFR 63.11195(e).

1.6 Chemical Accident Prevention

Subparts B-D of 40 CFR 68 present the requirements for the assessment and subsequent preparation of a Risk Management Plan (RMP) for a facility that stores more than a threshold quantity of a regulated substance listed in 40 CFR 68.130. If a facility stores, handles or processes one or more regulated substances in an amount greater than its corresponding threshold, the facility must prepare and implement an RMP. The Dopey Well Pad Production Facility potentially stores more than 10,000 lbs of a flammable mixture containing several of the substances listed in Table 3 in 40 CFR 68.130. However, an RMP is not required as this facility qualifies for the exclusion provided for remote oil and gas production facilities (40 CFR 68.115).

1.7 West Virginia State Requirements

1.7.1 45 CSR 2

The purpose of 45CSR2 is to control smoke and particulate matter emissions from fuel burning units. The Facility is subject to the opacity requirement of 45 CSR 2. Emissions from the Facility cannot exceed 10% over any six minute period.

1.7.2 45 CSR 4

This regulation prohibits the emission of objectionable odors. Jay-Bee Oil & Gas is obligated to run the station in a manner that does not produce objectionable odors.

1.7.3 45 CSR 6

This rule establishes emission standards for particulate matter and other requirements for incineration of refuse not subject to or specifically exempted from federal regulation. The Enclosed Combustor falls under Section 4.1 of this rule. PM emissions from the Enclosed Combustor must remain below the allowable limit calculated under this rule.

The Enclosed Combustor must also meet the visible emissions requirements of this rule limiting visible emissions to 20% opacity.

1.7.4 45 CSR 10

This regulation limits emissions of sulfur oxides. As the sulfur content of the Inlet Gas contains no measurable sulfur, emissions of sulfur oxides is negligible. Thus, while parts of this rule are applicable to the Facility, no actions are required on the part of Jay-Bee Oil & Gas to attain compliance. The various non-engine combustion units have a design heat input less than 10 MMBTU/Hr and are therefore exempt from the requirements of this rule.

1.7.5 45 CSR 13

The state regulations applicable to the permitting of the proposed construction are in Title 45 Series 13 of the Code of State Regulations. The proposed Dopey Well Pad Production Facility has the potential to emit several regulated pollutants in excess of the thresholds that define a Stationary Source.

When taking into consideration the voluntary limit to operate the engines equipped with catalysts only when the catalytic converters are properly functioning, the Facility's potential to emit is less than the thresholds that would classify the Facility as a major source under 45 CSR 14.

1.7.6 45 CSR 16

This series of regulations is an incorporation, by reference, of the New Source Performance Standards codified under 40 CFR 60. As discussed under the federal regulations, the Dopey Well Pad Production Facility is subject to the emission limitations, monitoring, testing and recordkeeping of Subpart JJJJ. The Facility is also subject to Subpart OOOO.

1.7.7 45 CSR 30

The state regulations applicable to Title V operating permits are in Title 45 Series 30. The Dopey Well Pad Production Facility, as noted above, does not have the potential to emit any regulated pollutant above the threshold that would define it as a major source. Additionally, although the Facility is subject to certain New Source Performance Standards, the NSPS applicable to this

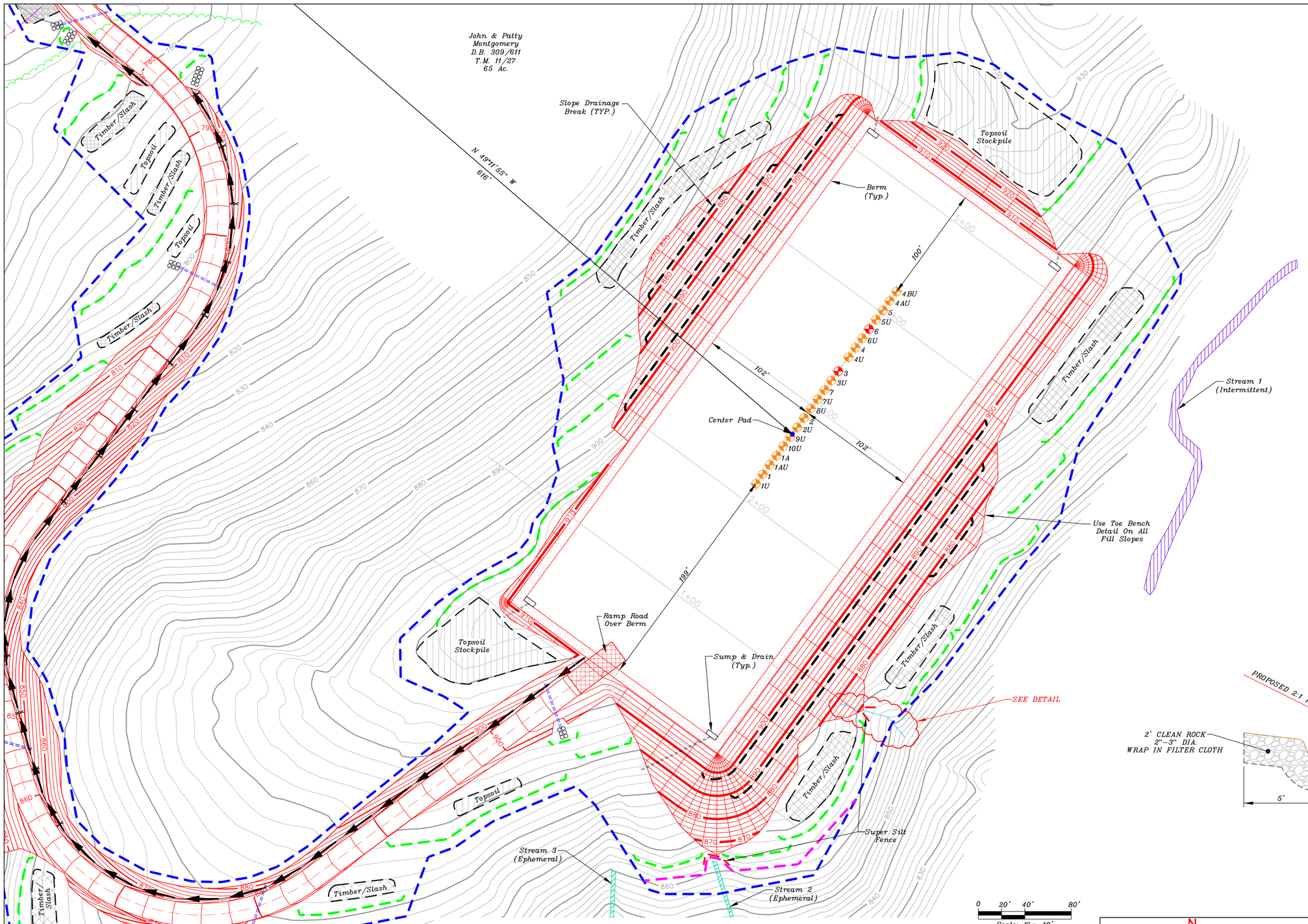
facility do not trigger the need to submit a Title V application and obtain a Title V permit. Hence this rule is not applicable.

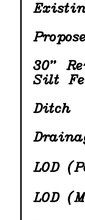
1.7.8 Other Applicable Requirements

Through Series 34, WVDEP has adopted the National Emission Standards for Hazardous Air Pollutants for Source Categories. Both of these topics have been addressed above.

ATTACHMENT E

Plot Plan





LEGEND

- Existing
- Proposed
- 30" Reinforced Silt Fence
- Ditch
- Drainage Feature
- LOD (Permit)
- LOD (Modified)
- Property Line
- Right of Way
- Slope Drainage Break
- Overhead Electric

Notes:
1. No water wells were found within 250' of the well location. One dwelling was found within 616' of the center of the well pad, as shown also on Sheet 6.

2. Stack all marketable timber on the property from which it was cut.

John & Patty
Montgomery
D.B. 309/611
T.M. 11/27
65 Ac.

FRENCH DRAIN DETAIL

NOTE: ALL DRILL PITS & SUMPS SHALL BE LINED WITH HDPE LINER HAVING A MINIMUM THICKNESS OF 60 MILLS.

PAD LIMIT OF DISTURBANCE (LOD): 6.50± ACRES

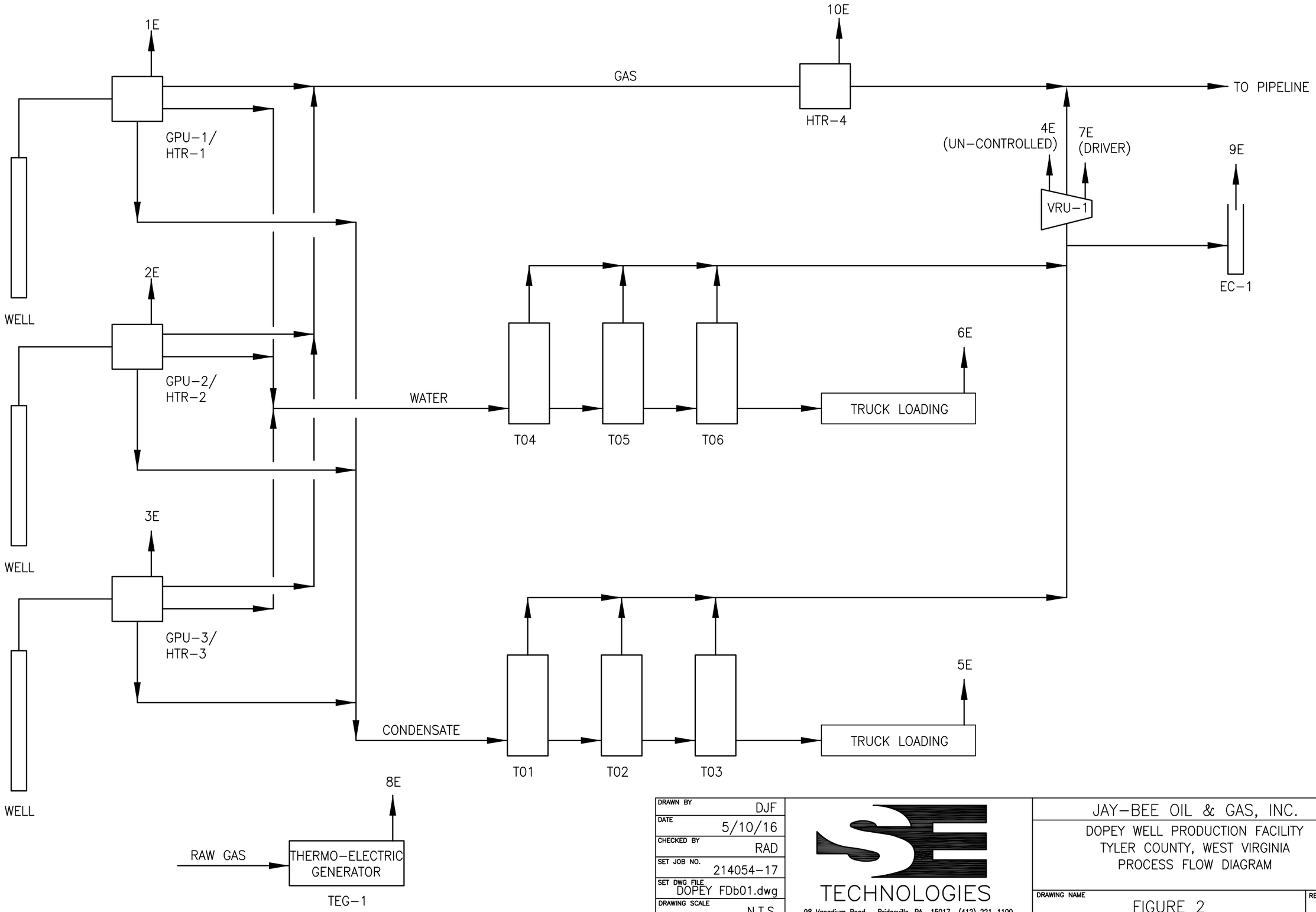
DLF.
Dennis L. Fisher, RPE
PO Box 281
Philippi, WV 26416
Cell: 304-677-4129
E-Mail: Fisher.Engineering@gmx.com

Jackson Surveying Inc.
677 W. Main St.
Clarksburg, Wv 26301
304-623-5851

Proposed Pad Plan
Sheet 7 of 13
DOPEY SITE PLAN
Modification

ATTACHMENT F

Process Flow Diagram



DRAWN BY	DJF
DATE	5/10/16
CHECKED BY	RAD
SET JOB NO.	214054-17
SET DWG FILE	DOPEY FDb01.dwg
DRAWING SCALE	N.T.S.

TECHNOLOGIES
98 Vanadium Road Bridgeville, PA 15017 (412) 221-1100

JAY-BEE OIL & GAS, INC.

DOPEY WELL PRODUCTION FACILITY
TYLER COUNTY, WEST VIRGINIA
PROCESS FLOW DIAGRAM

DRAWING NAME: FIGURE 2

REV.: 0

ATTACHMENT G

Process Description

Jay-Bee Oil & Gas, Incorporated
Dopey Well Pad Production Facility
Attachment G
Process Description

At this facility, Natural gas and Produced Fluids (condensate and water) will be received from three wells and passed through Gas Processing Units (one per well) to avoid ice formation during subsequent pressure drops. These materials will then pass through a three-way separator where gas, condensate and water are separated. The gas will be routed to the adjacent Icon Midstream Big Moses Dehydration Facility (proposed separately) and then injected into a gathering pipeline owned and operated by others.

Both Condensate and Produced Water will be accumulated in six 210 BBL tanks (three for Condensate and three for Produced Water), pending truck transportation by others. The Condensate will be transported to a regional processing facility and the Produced Water a regional disposal facility. Flash, working and breathing losses from these tanks will be routed to a Vapor Recovery Unit (VRU) with the captured vapors routed back to the raw gas discharge line. An enclosed combustor will be utilized as a backup control device for times when the VRU is not available (estimated max of 200 hours per year) and if a large slug of condensate production generates flash gas in excess of the capacity of the VRU.

A capture and control efficiency of 95% is being claimed for the VRU and 98% for the combustor.

A Process Flow Diagram depicting these features is provided in Attachment D.

Lastly, Jay-Bee is seeking approval for installation of a Thermo-electric generator to meet the minor electric demands for various monitoring and data tracking equipment.

There are no gas-fired compressor engines, other than a single engine for the vapor recovery unit (VRU). Additionally, no dehydration units are proposed for this facility at this time.

All gas fired equipment (GPUs) use natural gas produced at the site as fuel.

40 CFR 60, Subpart OOOO requires that VOC emissions from each "storage vessel affected facility" installed after April 12, 2013 (GROUP 2) must be controlled by at least 95% by April 15, 2014 when the VOC uncontrolled emissions exceed 6 tpy. As described in 40 CFR 60.5365(e), *the determination may take into account requirements under a legally and practically enforceable limit in an operating permit or other requirement established under a Federal, State, local or tribal authority.* The control systems proposed in this application will reduce VOC emissions from the tanks described above to rates below the 6 tpy limit per tank and operation of these controls will become part of the permit. Thus, the tanks at this facility will not be regulated under 40 CFR 60, Subpart OOOO.

ATTACHMENT I

Emission Units Table

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
HTR-1	1E	Gas Processing Unit	Upon Receipt of Permit	1.5 MMBTU/Hr	NEW	None
HTR-2	2E	Gas Processing Unit	Upon Receipt of Permit	1.5 MMBTU/Hr	NEW	None
HTR-3	3E	Gas Processing Unit	Upon Receipt of Permit	2.0 MMBTU/Hr	NEW	None
T01	4E	Condensate Tank	Upon Receipt of Permit	210 BBL	NEW	VRU-1/EC-1
T02	4E	Condensate Tank	Upon Receipt of Permit	210 BBL	NEW	VRU-1/EC-1
T03	4E	Condensate Tank	Upon Receipt of Permit	210 BBL	NEW	VRU-1/EC-1
T04	4E	Produce Water Tank	Upon Receipt of Permit	210 BBL	NEW	VRU-1/EC-1
T05	4E	Produced Water Tank	Upon Receipt of Permit	210 BBL	NEW	VRU-1/EC-1
T06	4E	Produced Water Tank	Upon Receipt of Permit	210 BBL	NEW	VRU-1/EC-1
TL-1	5E	Condensate Truck Loading	Upon Receipt of Permit	30,000 BBL/yr	NEW	None
TL-2	6E	Produced Water Truck Loading	Upon Receipt of Permit	63,600 BBL/yr	NEW	None
CE-1	7E	VRU Driver	Upon Receipt of Permit	84 Hp	NEW	1C
TEG-1	8E	Thermoelectric Generator	Upon Receipt of Permit	4.4 KW/Hr	NEW	None
EC-1	9E	Enclosed Combustor	Upon Receipt of Permit	10.0 MMBTU/Hr	NEW	N/A
HTR-4	10-E	Line Heater	Upon Receipt of Permit	0.5 MMBTU/Hr	NEW	None

[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
[2] For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

ATTACHMENT J

Emission Points Data Summary Sheet

ATTACHMENT J
Emission Points Data Summary Sheet
New Equipment Only

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
1E	Upward Vertical Stack	HTR-1	Gas Processing Unit		None	C	8760	NO_x	0.15	0.66	0.15	0.66	Gas	EE	
								CO	0.13	0.55	0.13	0.55	Gas	EE	
								VOC	0.01	0.04	0.01	0.04	Gas	EE	
								SO_2	<0.01	<0.01	<0.01	<0.01	Gas	EE	
								PM/PM10	0.011	0.05	0.011	0.05	Solid	EE	
								Formaldehyde	<0.01	<0.01	<0.01	<0.01	Gas	EE	
								CO2e	181.2	794	181.2	794	Gas	EE	
2E	Upward Vertical Stack	HTR-2	Gas Processing Unit		None	C	8760	NO_x	0.15	0.66	0.15	0.66	Gas	EE	
								CO	0.13	0.55	0.13	0.55	Gas	EE	
								VOC	0.01	0.04	0.01	0.04	Gas	EE	
								SO_2	<0.01	<0.01	<0.01	<0.01	Gas	EE	
								PM/PM10	0.011	0.05	0.011	0.05	Solid	EE	
								Formaldehyde	<0.01	<0.01	<0.01	<0.01	Gas	EE	
								CO2e	181.2	794	181.2	794	Gas	EE	

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term [2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
3E	Upward Vertical Vent	HTR-3	Gas Processing Unit		None	C	8760	NO_x	0.20	0.88	0.20	0.88	Gas	EE	
								CO	0.17	0.74	0.17	0.74	Gas	EE	
								VOC	0.01	0.05	0.01	0.05	Gas	EE	
								SO_2	<0.01	<0.01	<0.01	<0.01	Gas	EE	
								PM/PM10	0.015	0.07	0.015	0.07	Solid	EE	
								Formaldehyde	<0.01	<0.01	<0.01	<0.01	Gas	EE	
								CO2e	241.6	1,058	241.6	1,058	Gas	EE	
4E	Upward Vertical Vent	T01 T02 T03 T04 T05 T06	Cond. Tanks + Water Tank Un-captured emissions	VRU-1 **(4E)** EC-1 **(9E)**	Vapor Recovery Unit / Enclosed Combustor	C	8760	NO_x			0.03	0.09	Gas	EE	
								CO			1.61	0.34	Gas	EE	
								VOC			2.92	0.58	Gas	EE	
								SO_2			<0.01	<0.01	Gas	EE	
								PM/PM10			0.02	0.01	Solid	EE	
								Formaldehyde			<0.01	<0.01	Gas	EE	
								CO2e			559.4	144	Gas	EE	

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
5E + 6E	Upward Vertical Vent	TL-1 TL-2	Cond. Tanks + Water Tank Truck Loading		None	S	1360 (4 hr per day, 340 days per year)	NO_x					Gas	EE	
								CO					Gas	EE	
								VOC	27.90	2.31	27.90	2.31	Gas	EE	
								SO_2					Gas	EE	
								PM/PM10					Solid	EE	
								Formaldehyde					Gas	EE	
								CO2e					Gas	EE	
7E	Upward Vertical Vent	CE-1		1C	NSCR	C	8760	NO_x	2.11	9	0.19	0.81	Gas	EE	
								CO	2.64	11.57	0.37	1.62	Gas	EE	
								VOC	0.05	0.21	0.04	0.18	Gas	EE	
								SO_2	<0.01	<0.01	<0.01	<0.01	Gas	EE	
								PM/PM10	0.013	0.06	0.013	0.06	Solid	EE	
								Formaldehyde	0.017	0.07	0.015	0.07	Gas	EE	
								CO2e	89.4	391	89.4	391	Gas	EE	

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m[4])
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
8E	Upward Vertical Vent	TEG-1	Thermo-Electric Generator		None	C	8760	NO_x	<0.01	0.01	<0.01	0.01	Gas	EE	
								CO	<0.01	<0.01	<0.01	<0.01	Gas	EE	
								VOC	<0.01	<0.01	<0.01	<0.01	Gas	EE	
								SO_2	<0.01	<0.01	<0.01	<0.01	Gas	EE	
								PM/PM10	<0.01	<0.01	<0.01	<0.01	Solid	EE	
								Formaldehyde	<0.01	<0.01	<0.01	<0.01	Gas	EE	
								CO2e	1.6	7	1.6	7	Gas	EE	
10E	Upward Vertical Vent	HTR-4	Line Heater		N/A	C	8760	NO_x	0.05	0.22	0.05	0.22	Gas	EE	
								CO	0.04	0.18	0.04	0.18	Gas	EE	
								VOC	<0.01	0.01	<0.01	0.01	Gas	EE	
								SO_2	<0.01	<0.01	<0.01	<0.01	Gas	EE	
								PM/PM10	<0.01	0.02	<0.01	0.02	Solid	EE	
								Formaldehyde	<0.01	<0.01	<0.01	<0.01	Gas	EE	
								CO2e	60.4	265	60.4	265	Gas	EE	

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that un-captured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g., un-captured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

1. Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.
2. Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (i.e., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).
3. List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, etc. **DO NOT LIST** CO_2, H_2, H_2O, N_2, O_2, and Noble Gases.
4. Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g., 5 lb VOC/20 minute batch).
5. Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g., 5 lb VOC/20 minute batch).
6. Indicate method used to determine emission rate as follows:
   MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

ATTACHMENT J

Emission Points Data Summary Sheet
New Equipment

Table 2: Release Parameter Data								
Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (^{o}F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
1E	0.5	1050	Est 200	Est 10	750	8		
2E	0.5	1050	Est 200	Est 10	750	8		
3E	0.25	1050	Est 200	Est 10	750	8		
4E								
5E	0.33	Ambient	Est 300	Est 10	750	12		
6E	0.33	Ambient	Est. 300	Est 10	750	12		
7E	0.5	1050	Est. 300	Est 15	750	12		
8E	0.2	800	Est. 10	Est 5	750	6		
9E	0.5	1100	Est. 400	Est 20	750	10		

[1] Give at operating conditions. Include inerts.
[2] Release height of emissions above ground level.

ATTACHMENT K

Fugitive Emissions Data Summary Sheet

Jay-Bee Oil & Gas, Inc.
Dopey Well Pad Production Facility
Attachment K
Fugitive Emissions Data

Equipment Fugitive Emissions

As noted in the process description, Jay Bee plans to install various equipment at its Dopey Well Pad Production Facility. This equipment will contain a variety of piping containing natural gas and separated liquids under pressure. During the normal course of operation minor leaks from valves, pressure release devices and various fittings associated with this piping may occur. A potential emission rate of 0.76 tpy of VOCs and 23.1 tpy CO_2e has been estimated.

Estimates of these emissions are included in the calculations (Attachment N) and summarized on the form included in this section. These calculations are based on emission factors accepted by the American Petroleum Institute and EPA.

Pigging Emission Estimates

There will be no pigging operations in association with this planned facility.

Facility Blowdown Emission Estimates

There will be one gas compressor at this facility, utilized as a Vapor Recovery Unit (VRU). This device will require blowdowns to allow for routine maintenance. The volume of natural gas released per blowdown event from this unit and associated inlet separator and piping is estimated at 64.4 cubic feet at STP (see attached calculations from vendor). There will be a maximum of 16 blow downs per year for this VRU. Thus, there is a potential for 1030 cubic feet of gas emitted from blowdowns per year.

The blowdown gas composition is best represented by the condensate flash gas, its primary constituent. The specific gravity of this gas at STP is 1.387 (see the Hydrocarbon Liquid Flashed Report in the calculations). With the density of air at STP being 0.0806 pounds per cubic foot, the mass of gas released per year is 115 pounds (1030 cf x 0.0806 x 1.387). As the percentage of VOCs in the gas (by weight) is 70.17 percent (again see the Hydrocarbon Liquid Flashed Report in the calculations), the VOC (non-methane/non-ethane) emissions from blowdown operations are estimated at approximately 80.8 lbs or 0.04 tons per year. HAPs (almost exclusively n-hexane) are estimated to be 2.30 percent of the mass of the blowdown emissions or 2.6 lb/yr (115 x 0.023) or <0.01 tpy. The methane concentration in this gas is 9.93% (by weight). Therefore, methane emissions will be 11.4 pounds per year. Using a GHG factor of 25, methane emissions from blowdowns in CO_{2e} will be 0.14 tons CO_2e (11.4 x 25[GHG factor] /2000).

Storage Tank and Haul Road Fugitive Emissions

Produced Fluids (water and condensate) received by this facility will be accumulated in six 400-BBL tanks (three condensate and three water) prior to off-site shipment. Emissions from these tanks were determined by using flash gas measurements from pressurized condensate produced at an area Jay-Bee well pad and working/breathing losses via AP-42 methods using condensate vapor data from this same condensate. Uncontrolled emission from these tanks were determined to be 640.2 tons per year of VOCs. These vapors are routed to the VRU a minimum efficiency of 95%. Emission calculations, including times when the VRU is not available are presented in Attachment I.

Emissions from these sources are summarized in the following fugitive emissions form and the calculations are included in the emissions summary in Attachment N.

FUGITIVE EMISSIONS DATA SUMMARY SHEET

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS
1.) Will there be haul road activities? ☒ Yes ☐ No ☒ If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.) Will there be Storage Piles? ☐ Yes ☒ No ☐ If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.) Will there be Liquid Loading/Unloading Operations? ☒ Yes ☐ No ☒ If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
5.) Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)? ☒ Yes ☐ No ☒ If YES, complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.
6.) Will there be General Clean-up VOC Operations? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.) Will there be any other activities that generate fugitive emissions? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.
If you answered “NO” to all of the items above, it is not necessary to complete the following table, “Fugitive Emissions Summary.”

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS [1]	Maximum Potential Uncontrolled Emissions [2]		Maximum Potential Controlled Emissions [3]		Est. Method Used [4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads						
Unpaved Haul Roads	PM	16.53	3.43	16.53	3.43	EE
Loading/Unloading Operations	VOCs	27.9	2.31	27.9	2.31	EE
	Total HAPs	1.37	0.11	1.37	0.11	EE
Equipment Leaks	VOCs	Does Not Apply	0.76	Does Not Apply	0.76	EE
	CO2e	Does Not Apply	23.1	Does Not Apply	23.1	EE
Blowdowns	VOCs	N/A	0.04	N/A	0.04	EE
	Total HAPs	N/A	<0.01	N/A	<0.01	EE
Other:						

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. DO NOT LIST H_2, H_2O, N_2, O_2, and Noble Gases.

[2] Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[3] Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[4] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

G5.9C VRC2, 3 Stage (Note: assumed ideal gas behavior and used OD for volume calc)

ENTER the following Values:

Suction Pressure, psig	1	Suction Temperature, F	80
Discharge Pressure, psig	300	Discharge Temperature, F	130

Cylinders	Bore, in	Stroke, in	Rod Diameter, in	Pocket Clearance, in^3	Total Cylinder Volume, in^3	Temperature, R	Pressure, psig	Calculated Moles
1st Stage Cylinder	6.50	3.00	1.125	0.00	97	539	100	0.001
2nd Stage Cylinder	2.25	3.00	1.125	0.00	9	739	199	0.000
3rd Stage Cylinder	4.00	3.00	1.125	0.00	35	739	300	0.001
Scrubbers/Suction & Discharge Drums	**OD, in**	**Height, in**	**Total Scrubber Volume, in^3**			**Temperature, R**	**Pressure, psig**	**Calculated Moles**
1st Stage Scrubber	12.00	60.00	6786			539	1	0.011
2nd Stage Scrubber	8.00	48.00	2413			589	100	0.025
3rd Stage Scrubber	8.00	48.00	2413			589	199	0.047
Cooler Section	**No. of Tubes**	**OD, in**	**Length, in**	**Total Tube Volume, in^3**		**Temperature, R**	**Pressure, psig**	**Calculated Moles**
1st Stage Cooler Section	23	0.63	96	677		739	100	0.006
2nd Stage Cooler Section	20	0.63	96	589		739	199	0.009
3rd Stage Cooler Section	24	0.63	96	707		739	300	0.016
Piping	**OD, in**	**Length, in**	**Total Piping Volume, in^3**			**Temperature, R**	**Pressure, psig**	**Calculated Moles**
1st Stage Piping	4.00	200	2513			739	100	0.021
2nd Stage Piping	3.00	57	403			739	199	0.006
3rd Stage Piping	2.00	330	1037			739	300	0.024
Bypass	0.00	0	0			589	300	0.000

Total Estimated Moles of Gas Discharged to Atmosphere per Blowdown =	0.17
Total Estimated Volume of Blowdown Gas, ft^3 @ STP (68F, 14.7 psia) =	64.4

ATTACHMENT L

Emissions Unit Data Sheets

NATURAL GAS WELL AFFECTED FACILITY DATA SHEET

Complete this data sheet if you are the owner or operator of a gas well affected facility for which construction, modification, or reconstruction commenced after August 23, 2011. This form must be completed for natural gas well affected facilities regardless of when flowback operations occur (or have occurred).

Please provide the API number(s) for each NG well at this facility:	
047-095-02239	
047-095-02240	
047-095-02311	

Note: This is the same API well number(s) provided in the well completion notification and as provided to the WVDEP, Office of Oil and Gas for the well permit. The API number may be provided on the application without the state code (047).

Every oil and gas well permitted in West Virginia since 1929 has been issued an API (American Petroleum Institute) number. This API is used by agencies to identify and track oil and gas wells.

The API number has the following format: 047-001-00001

Where,
047 = State code. The state code for WV is 047.
001 = County Code. County codes are odd numbers, beginning with 001 (Barbour) and continuing to 109 (Wyoming).
00001= Well number. Each well will have a unique well number.

NATURAL GAS FIRED BOILER/LINE HEATER DATA SHEET

Source ID #[1]	Status[2]	Design Heat Input (mmBtu/hr)[3]	Hours of Operation (hrs/yr)[4]	Fuel Heating Value (Btu/scf)[5]	
GPU-1	NEW	1.5 MMBTU/Hr	8760	1263 BTU/scf (HHV)	
GPU-2	NEW	1.5 MMBTU/Hr	8760	1263 BTU/scf (HHV)	
GPU-3	NEW	2.0 MMBTU/Hr	8760	1263 BTU/scf (HHV)	
Line Heater	NEW	0.5 MMBTU/Hr	8760	1263 BTU/scf (HHV)	

1. Enter the appropriate Source Identification Numbers (Source ID #) for each boiler or line heater located at the compressor station. Boilers should be designated BLR-1, BLR-2, BLR-3, etc. Heaters or Line Heaters should be designated HTR-1, HTR-2, HTR-3, etc. Enter glycol dehydration unit Reboiler Vent data on the *Glycol Dehydration Unit Data Sheet*.
2. Enter the Status for each boiler or line heater using the following:

   EXIST Existing Equipment NEW Installation of New Equipment
   REM Equipment Removed
3. Enter boiler or line heater design heat input in mmBtu/hr.
4. Enter the annual hours of operation in hours/year for each boiler or line heater.
5. Enter the fuel heating value in Btu/standard cubic foot.

STORAGE TANK DATA SHEET

Source ID #[1]	Status[2]	Content[3]	Volume[4]	Dia[5]	Throughput[6]	Orientation[7]	Liquid Height[8]
T01	NEW	Condensate	210 BBL	10.0	453,600 gallons/yr	VERT	10 feet
T02	NEW	Condensate	210 BBL	10.0	453,600 gallons/yr	VERT	10 feet
T03	NEW	Condensate	210 BBL	10.0	453,600 gallons/yr	VERT	10 feet
T04	NEW	Produced Water	210 BBL	10.0	924,000 gallons/yr	VERT	10 feet
T05	NEW	Produced Water	210 BBL	10.0	924,000 gallons/yr	VERT	10 feet
T05	NEW	Produced Water	210 BBL	10.0	924,000 gallons/yr	VERT	10 feet

1. Enter the appropriate Source Identification Numbers (Source ID #) for each storage tank located at the compressor station. Tanks should be designated T01, T02, T03, etc.
2. Enter storage tank Status using the following:

   EXIST Existing Equipment NEW Installation of New Equipment
   REM Equipment Removed
3. Enter storage tank content such as condensate, pipeline liquids, glycol (DEG or TEG), lube oil, etc.
4. Enter storage tank volume in gallons.
5. Enter storage tank diameter in feet.
6. Enter storage tank throughput in gallons per year.
7. Enter storage tank orientation using the following:

   VERT Vertical Tank HORZ Horizontal Tank
8. Enter storage tank average liquid height in feet.

NATURAL GAS COMPRESSOR/GENERATOR ENGINE DATA SHEET

Source Identification Number[1]		CE-1					
Engine Manufacturer and Model		Cummins G5.9					
Manufacturer's Rated bhp/rpm		84 @ 1800					
Source Status[2]		**NS**					
Date Installed/Modified/Removed[3]		Upon Receipt of Permit					
Engine Manufactured/Reconstruction Date[4]		After 3/1/2013					
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart JJJJ? (Yes or No)[5]		No					
Engine, Fuel and Combustion Data	Engine Type[6]	RB4S					
	APCD Type[7]	NSCR					
	Fuel Type[8]	RG					
	H_2S (gr/100 scf)	<1					
	Operating bhp/rpm	84 @ 1800					
	BSFC (Btu/bhp-hr)	7914					
	Fuel throughput (ft^3/hr)	526.4					
	Fuel throughput ($MMft^3$/yr)	4.62					
	Operation (hrs/yr)	8760					
Reference[9]	Potential Emissions[10]	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
AP	NO_X	0.19	0.81				
AP	CO	0.37	1.62				
AP	VOC	0.04	0.18				
AP	SO_2	<0.001	<0.01				
AP	PM_{10}	0.013	0.06				
AP	Formaldehyde	0.015	0.06				
AP	Total HAPs	0.022	0.10				
AP	CO2e	89	391				

1. Enter the appropriate Source Identification Number for each natural gas-fueled reciprocating internal combustion compressor/generator engine located at the compressor station. Multiple compressor engines should be designated CE-1, CE-2, CE-3 etc. Generator engines should be designated GE-1, GE-2, GE-3 etc. If more than three (3) engines exist, please use additional sheets.

2. Enter the Source Status using the following codes:

NS	Construction of New Source (installation)	ES	Existing Source
MS	Modification of Existing Source	RS	Removal of Source

3. Enter the date (or anticipated date) of the engine's installation (construction of source), modification or removal.

4. Enter the date that the engine was manufactured, modified or reconstructed.

5. Is the engine a certified stationary spark ignition internal combustion engine according to 40CFR60 Subpart JJJJ. If so, the engine and control device must be operated and maintained in accordance with the manufacturer's emission-related written instructions. You must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required. If the certified engine is not operated and maintained in accordance with the manufacturer's emission-related written instructions, the engine will be considered a non-certified engine and you must demonstrate compliance according to 40CFR§60.4243a(2)(i) through (iii), as appropriate.

   Provide a manufacturer's data sheet for all engines being registered.

6. Enter the Engine Type designation(s) using the following codes:

LB2S	Lean Burn Two Stroke	RB4S	Rich Burn Four Stroke
LB4S	Lean Burn Four Stroke		

7. Enter the Air Pollution Control Device (APCD) type designation(s) using the following codes:

A/F	Air/Fuel Ratio	IR	Ignition Retard
HEIS	High Energy Ignition System	SIPC	Screw-in Precombustion Chambers
PSC	Prestratified Charge	LEC	Low Emission Combustion
NSCR	Rich Burn & Non-Selective Catalytic Reduction	SCR	Lean Burn & Selective Catalytic Reduction

8. Enter the Fuel Type using the following codes:

PQ	Pipeline Quality Natural Gas	RG	Raw Natural Gas

9. Enter the Potential Emissions Data Reference designation using the following codes. Attach all referenced data to this *Compressor/Generator Data Sheet(s)*.

MD	Manufacturer's Data	AP	AP-42	
GR	GRI-HAPCalc™	OT	Other _____	(please list)

10. Enter each engine's Potential to Emit (PTE) for the listed regulated pollutants in pounds per hour and tons per year. PTE shall be calculated at manufacturer's rated brake horsepower and may reflect reduction efficiencies of listed Air Pollution Control Devices. Emergency generator engines may use 500 hours of operation when calculating PTE. PTE data from this data sheet shall be incorporated in the *Emissions Summary Sheet*.

STORAGE VESSEL EMISSION UNIT DATA SHEET

Provide the following information for each new or modified bulk liquid storage tank.

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name **Dopey Tank Farm**	2. Tank Name **T01-T03**
3. Emission Unit ID number **N/A Vapors to combustors, emission point 4E**	4. Emission Point ID number **4E**
5. Date Installed or Modified *(for existing tanks)* **Pending Permit Approval**	6. Type of change: ☒ New construction ☐ New stored material ☐ Other
7A. Description of Tank Modification *(if applicable)*	
7B. Will more than one material be stored in this tank? *If so, a separate form must be completed for each material.* ☐ Yes ☒ No	
7C. Provide any limitations on source operation affecting emissions. (production variation, etc.) **A maximum of 32,400 BBL per year throughput for Tanks T01 through T03 combined.**	

II. TANK INFORMATION (required)

8. Design Capacity *(specify barrels or gallons).* Use the internal cross-sectional area multiplied by internal height. **210 BBL**	
9A. Tank Internal Diameter (ft.) **10**	9B. Tank Internal Height (ft.)**15**
10A. Maximum Liquid Height (ft.)**14**	10B. Average Liquid Height (ft.) **8**
11A. Maximum Vapor Space Height (ft.) **14.5**	11B. Average Vapor Space Height (ft.) **7**
12. Nominal Capacity *(specify barrels or gallons)*. This is also known as "working volume. **190 BBL**	
13A. Maximum annual throughput (gal/yr) **453,600 (each)**	13B. Maximum daily throughput (gal/day) **1500**
14. Number of tank turnovers per year **57 (max)**	15. Maximum tank fill rate (gal/min) **30**
16. Tank fill method ☐ Submerged ☐ Splash ☒ Bottom Loading	
17. Is the tank system a variable vapor space system? ☐ Yes ☒ No If yes, (A) What is the volume expansion capacity of the system (gal)? (B) What are the number of transfers into the system per year?	
18. Type of tank (check all that apply): ☒ Fixed Roof __X_ vertical ___ horizontal ___ flat roof ___ cone roof ___ dome roof ___ other (describe) ☐ External Floating Roof ___ pontoon roof ___ double deck roof ☐ Domed External (or Covered) Floating Roof ☐ Internal Floating Roof ___ vertical column support ___ self-supporting ☐ Variable Vapor Space ___ lifter roof ___ diaphragm ☐ Pressurized ___ spherical ___ cylindrical ☐ Underground ☐ Other (describe)	

III. TANK CONSTRUCTION AND OPERATION INFORMATION *(check which one applies)*

☒ Refer to enclosed TANKS Summary Sheets
☐ Refer to the responses to items 19 – 26 in section VII

IV. SITE INFORMATION *(check which one applies)*

☒ Refer to enclosed TANKS Summary Sheets
☐ Refer to the responses to items 27 – 33 in section VII

V. LIQUID INFORMATION *(check which one applies)*

☒ Refer to enclosed TANKS Summary Sheets
☐ Refer to the responses to items 34 – 39 in section VII

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply):

☐ Does Not Apply
☐ Carbon Adsorption[1]
☒ Vent to Vapor Combustion Device[1] (vapor combustors, flares, thermal oxidizers)
☐ Condenser[1]
☐ Other[1] (describe)
☐ Rupture Disc (psig)
☐ Inert Gas Blanket of _____
☐ Conservation Vent (psig
Vacuum Setting Pressure Setting
☐ Emergency Relief Valve (psig)

[1] Complete appropriate Air Pollution Control Device Sheet

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name and CAS No.	Flashing Loss		Breathing Loss		Working Loss		Total Emissions Loss		Estimation Method[1]
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
VOCs	67.97	297.7	0.05	0.22	0.19	0.85	68.21	298.8	Flash Measurements
(Un-controlled)									+EPA Tanks For W+B
									Tank Emissions
									Controlled 95%+

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

Remember to attach emissions calculations, including TANKS Summary Sheets and other modeling summary sheets if applicable.

SECTION VII (required if did not provide TANKS Summary Sheets)

TANK CONSTRUCTION AND OPERATION INFORMATION

19. Tank Shell Construction:
☒ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)

20A. Shell Color: **Blue**	20B. Roof Color: **Blue**	20C. Year Last Painted: **2015**

21. Shell Condition (if metal and unlined):
☒ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable

22A. Is the tank heated? ☐ Yes ☒ No	22B. If yes, operating temperature:	22C. If yes, how is heat provided to tank?

23. Operating Pressure Range (psig): **Less than 0.3 psig**

24. Is the tank a **Vertical Fixed Roof Tank**? ☒ Yes ☐No	24A. If yes, for dome roof provide radius (ft): **N/A**	24B. If yes, for cone roof, provide slop (ft/ft) **N/A**

25. Complete item 25 for **Floating Roof Tanks** ☐ Does not apply ☒

25A. Year Internal Floaters Installed:

25B. Primary Seal Type *(check one):* ☐ Metallic (mechanical) shoe seal ☐ Liquid mounted resilient seal ☐ Vapor mounted resilient seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a secondary seal? ☐ Yes ☐No

25D. If yes, how is the secondary seal mounted? *(check one)* ☐ Shoe ☐ Rim ☐ Other (describe):			
25E. Is the floating roof equipped with a weather shield? ☐ Yes ☐ No			
25F. Describe deck fittings:			
26. Complete the following section for **Internal Floating Roof Tanks** ☒ Does not apply			
26A. Deck Type: ☐ Bolted ☐ Welded		26B. For bolted decks, provide deck construction:	
26C. Deck seam. Continuous sheet construction: ☐ 5 ft. wide ☐ 6 ft. wide ☐ 7 ft. wide ☐ 5 x 7.5 ft. wide ☐ 5 x 12 ft. wide ☐ other (describe)			
26D. Deck seam length (ft.):	26E. Area of deck (ft^2):	26F. For column supported tanks, # of columns:	26G. For column supported tanks, diameter of column:
SITE INFORMATION:			
27. Provide the city and state on which the data in this section are based:			
28. Daily Avg. Ambient Temperature (°F):		29. Annual Avg. Maximum Temperature (°F):	
30. Annual Avg. Minimum Temperature (°F):		31. Avg. Wind Speed (mph):	
32. Annual Avg. Solar Insulation Factor (BTU/ft^2-day):		33. Atmospheric Pressure (psia):	
LIQUID INFORMATION:			
34. Avg. daily temperature range of bulk liquid (°F): **60**	34A. Minimum (°F): **50**	34B. Maximum (°F**): 70**	
35. Avg. operating pressure range of tank (psig): **0-0.3 psig**	35A. Minimum (psig): **0 psig**	35B. Maximum (psig): **0.3 psig**	
36A. Minimum liquid surface temperature (°F):		36B. Corresponding vapor pressure (psia):	
37A. Avg. liquid surface temperature (°F):		37B. Corresponding vapor pressure (psia):	
38A. Maximum liquid surface temperature (°F):		38B. Corresponding vapor pressure (psia):	
39. Provide the following for each liquid or gas to be stored in the tank. Add additional pages if necessary.			
39A. Material name and composition:	**Condensate**		
39B. CAS number:	N/A		
39C. Liquid density (lb/gal):	**6.20**		
39D. Liquid molecular weight (lb/lb-mole):	**81.3**		
39E. Vapor molecular weight (lb/lb-mole):	**39.56**		
39F. Maximum true vapor pressure (psia):			
39G. Maxim Reid vapor pressure (psia):	**5.28**		
39H. Months Storage per year. From: To:	**Continuous**		

STORAGE VESSEL EMISSION UNIT DATA SHEET

Provide the following information for each new or modified bulk liquid storage tank.

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name **Dopey Tank Farm**	2. Tank Name **T04-T06**
3. Emission Unit ID number **N/A Vapors to combustors, emission point 4E**	4. Emission Point ID number **4E**
5. Date Installed or Modified *(for existing tanks)* **Pending Permit Approval**	6. Type of change: ☐ New construction ☐ New stored material ☒ Other
7A. Description of Tank Modification *(if applicable)*	
7B. Will more than one material be stored in this tank? *If so, a separate form must be completed for each material.* ☐ Yes ☒ No	
7C. Provide any limitations on source operation affecting emissions. (production variation, etc.) **A maximum of 43,200 BBL per year throughput for Tanks T03 and T04 combined.**	

II. TANK INFORMATION (required)

8. Design Capacity *(specify barrels or gallons).* Use the internal cross-sectional area multiplied by internal height. **210 BBL**	
9A. Tank Internal Diameter (ft.) **10**	9B. Tank Internal Height (ft.)**15**
10A. Maximum Liquid Height (ft.)**14**	10B. Average Liquid Height (ft.) **8**
11A. Maximum Vapor Space Height (ft.) **14.5**	11B. Average Vapor Space Height (ft.) **7**
12. Nominal Capacity *(specify barrels or gallons)*. This is also known as "working volume. **190 BBL**	
13A. Maximum annual throughput (gal/yr) **924,000 (each)**	13B. Maximum daily throughput (gal/day) **5,000 (each)**
14. Number of tank turnovers per year **116 (max)**	15. Maximum tank fill rate (gal/min) **50**
16. Tank fill method ☐ Submerged ☐ Splash ☒ Bottom Loading	
17. Is the tank system a variable vapor space system? ☐ Yes ☒ No If yes, (A) What is the volume expansion capacity of the system (gal)? (B) What are the number of transfers into the system per year?	
18. Type of tank (check all that apply): ☒ Fixed Roof __X_ vertical ___ horizontal ___ flat roof ___ cone roof ___ dome roof ___ other (describe) ☐ External Floating Roof ___ pontoon roof ___ double deck roof ☐ Domed External (or Covered) Floating Roof ☐ Internal Floating Roof ___ vertical column support ___ self-supporting ☐ Variable Vapor Space ___ lifter roof ___ diaphragm ☐ Pressurized ___ spherical ___ cylindrical ☐ Underground ☐ Other (describe)	

III. TANK CONSTRUCTION AND OPERATION INFORMATION *(check which one applies)*

☐ Refer to enclosed TANKS Summary Sheets
☒ Refer to the responses to items 19 – 26 in section VII

IV. SITE INFORMATION *(check which one applies)*

☐ Refer to enclosed TANKS Summary Sheets
☒ Refer to the responses to items 27 – 33 in section VII

V. LIQUID INFORMATION *(check which one applies)*

☐ Refer to enclosed TANKS Summary Sheets
☒ Refer to the responses to items 34 – 39 in section VII

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply):

☐ Does Not Apply
☐ Carbon Adsorption[1]
☒ Vent to Vapor Combustion Device[1] (vapor combustors, flares, thermal oxidizers)
☐ Condenser[1]
☐ Other[1] (describe)
☐ Rupture Disc (psig)
☐ Inert Gas Blanket of _____
☐ Conservation Vent (psig
Vacuum Setting Pressure Setting
☐ Emergency Relief Valve (psig)

[1] Complete appropriate Air Pollution Control Device Sheet

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name and CAS No.	Flashing Loss		Breathing Loss		Working Loss		Total Emissions Loss		Estimation Method[1]
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
VOCs	2.92	12.77	N/A	N/A	N/A	N/A	2.92	12.77	W&B losses from
(Un-controlled)									Water tanks is
									negligible.
Tanks T04-T06 Combined									Tanks Emissions
Emissions									Controlled 95%+

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

Remember to attach emissions calculations, including TANKS Summary Sheets and other modeling summary sheets if applicable.

SECTION VII (required if did not provide TANKS Summary Sheets)

TANK CONSTRUCTION AND OPERATION INFORMATION

19. Tank Shell Construction:
☒ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)

20A. Shell Color: **Blue**	20B. Roof Color: **Blue**	20C. Year Last Painted: **2016**

21. Shell Condition (if metal and unlined):
☒ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable

22A. Is the tank heated? ☐ Yes ☒ No	22B. If yes, operating temperature:	22C. If yes, how is heat provided to tank?

23. Operating Pressure Range (psig): **Less than 0.3 psig**

24. Is the tank a **Vertical Fixed Roof Tank**? ☒ Yes ☐ No	24A. If yes, for dome roof provide radius (ft): **N/A**	24B. If yes, for cone roof, provide slop (ft/ft) **N/A**

25. Complete item 25 for **Floating Roof Tanks** ☐ Does not apply ☒

25A. Year Internal Floaters Installed:

25B. Primary Seal Type *(check one):* ☐ Metallic (mechanical) shoe seal ☐ Liquid mounted resilient seal ☐ Vapor mounted resilient seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a secondary seal? ☐ Yes ☐ No

25D. If yes, how is the secondary seal mounted? *(check one)* ☐ Shoe ☐ Rim ☐ Other (describe):

25E. Is the floating roof equipped with a weather shield? ☐ Yes ☐ No			
25F. Describe deck fittings:			
26. Complete the following section for **Internal Floating Roof Tanks** ☒ Does not apply			
26A. Deck Type: ☐ Bolted ☐ Welded		26B. For bolted decks, provide deck construction:	
26C. Deck seam. Continuous sheet construction: ☐ 5 ft. wide ☐ 6 ft. wide ☐ 7 ft. wide ☐ 5 x 7.5 ft. wide ☐ 5 x 12 ft. wide ☐ other (describe)			
26D. Deck seam length (ft.):	26E. Area of deck (ft^2):	26F. For column supported tanks, # of columns:	26G. For column supported tanks, diameter of column:
SITE INFORMATION: Items 27-33 N/A for Water Tank			
27. Provide the city and state on which the data in this section are based:			
28. Daily Avg. Ambient Temperature (°F):		29. Annual Avg. Maximum Temperature (°F):	
30. Annual Avg. Minimum Temperature (°F):		31. Avg. Wind Speed (mph):	
32. Annual Avg. Solar Insulation Factor (BTU/ft^2-day):		33. Atmospheric Pressure (psia):	
LIQUID INFORMATION:			
34. Avg. daily temperature range of bulk liquid (°F): **60**	34A. Minimum (°F): **50**	34B. Maximum (°F): **70**	
35. Avg. operating pressure range of tank (psig): **0-0.3 psig**	35A. Minimum (psig): **0 psig**	35B. Maximum (psig): **0.3 psig**	
36A. Minimum liquid surface temperature (°F):		36B. Corresponding vapor pressure (psia):	
37A. Avg. liquid surface temperature (°F):		37B. Corresponding vapor pressure (psia):	
38A. Maximum liquid surface temperature (°F):		38B. Corresponding vapor pressure (psia):	
39. Provide the following for each liquid or gas to be stored in the tank. Add additional pages if necessary.			
39A. Material name and composition:	**Produced Water**		
39B. CAS number:	**N/A**		
39C. Liquid density (lb/gal):	**8.347**		
39D. Liquid molecular weight (lb/lb-mole):	**18.04**		
39E. Vapor molecular weight (lb/lb-mole):	**30.68**		
39F. Maximum true vapor pressure (psia):			
39G. Maxim Reid vapor pressure (psia):			
39H. Months Storage per year. From: To:	**Continuous**		

Attachment L
EMISSIONS UNIT DATA SHEET
BULK LIQUID TRANSFER OPERATIONS

Furnish the following information for each new or modified bulk liquid transfer area or loading rack, as shown on the *Equipment List Form* and other parts of this application. This form is to be used for bulk liquid transfer operations such as to and from drums, marine vessels, rail tank cars, and tank trucks.

Identification Number (as assigned on *Equipment List Form*):	
1. Loading Area Name: **Tank Un-Loading Area**	
2. Type of cargo vessels accommodated at this rack or transfer point (check as many as apply): ☐ Drums ☐ Marine Vessels ☐Rail Tank Cars ☒ Tank Trucks	
3. Loading Rack or Transfer Point Data:	
Number of pumps	1 (on truck)
Number of liquids loaded	2
Maximum number of marine vessels, tank trucks, tank cars, and/or drums loading at one time	1
4. Does ballasting of marine vessels occur at this loading area? ☐ Yes ☐ No ☒ Does not apply	
5. Describe cleaning location, compounds and procedure for cargo vessels using this transfer point: **None**	
6. Are cargo vessels pressure tested for leaks at this or any other location? ☐ Yes ☒ No If YES, describe:	

7. Projected Maximum Operating Schedule (for rack or transfer point as a whole):

Maximum	Jan. - Mar.	Apr. - June	July - Sept.	Oct. - Dec.
hours/day	**3**	**3**	**3**	**3**

8. Bulk Liquid Data *(add pages as necessary):*

Pump ID No.	**N/A**	**N/A**				
Liquid Name	**Condensate**	**Produced Water**				
Max. daily throughput (1000 gal/day)	**8.4**	**7.5**				
Max. annual throughput (1000 gal/yr)	**1,360.8**	**2,772**				
Max. Fill Rate (gal/min)	**190**	**120**				
Average Fill Time (min/loading)	**45**	**45**				
Max. Bulk Liquid Temperature (^{o}F)	**70**	**70**				
True Vapor Pressure [2]	**3.1 psia**	**N/A**				
Cargo Vessel Condition [3]	**U**	**U**				
Control Equipment or Method [4]	**None**	**None**				
Minimum control efficiency (%)	**N/A**	**N/A**				

Maximum Emission Rate	Loading (lb/hr) VOC	**27.8**	**0.11**				
	Annual (lb/yr) VOC	**4,505**	**112**				
Estimation Method [5]		**AP-42**	**N/A**				

[1] BF = Bottom Fill SP = Splash Fill SUB = Submerged Fill

[2] At maximum bulk liquid temperature

[3] B = Ballasted Vessel, C = Cleaned, U = Uncleaned (dedicated service), O = other (describe)

[4] List as many as apply (complete and submit appropriate *Air Pollution Control Device Sheets*):CA = Carbon Adsorption LOA = Lean Oil AdsorptionCO = Condensation SC = Scrubber (Absorption)CRA = Compressor-Refrigeration-Absorption TO = Thermal Oxidation or Incineration
CRC = Compression-Refrigeration-Condensation VB = Dedicated Vapor Balance (closed system)
O = other (descibe)

[5] EPA = EPA Emission Factor as stated in AP-42
MB = Material Balance
TM = Test Measurement based upon test data submittal
O = other (describe)

9. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**

Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
Truck load-outs per month and volume of liquid removed each load-out	Truck load-outs per month and volume of liquid removed each load-out
REPORTING	TESTING
Truck load-outs per month and volume of liquid removed each load-out	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty **N/A**

ATTACHMENT M
Air Pollution Control Device Sheets

MIRATECH Emissions Control Equipment Specification Summary

Proposal Number: TJ-14-0081 Rev(1)

Engine Data

Number of Engines:	1
Application:	Gas Compression
Engine Manufacturer:	Cummins
Model Number:	G 5.9
Power Output:	84 bhp
Lubrication Oil:	0.6 wt% sulfated ash or less
Type of Fuel:	Natural Gas
Exhaust Flow Rate:	430 acfm (cfm)
Exhaust Temperature:	1,078°F

System Details

Housing Model Number:	VXC-1408-04-HSG
Element Model Number:	VX-RE-08XC
Number of Catalyst Layers:	1
Number of Spare Catalyst Layers:	1
System Pressure Loss:	3.0 inches of WC (Fresh)
Sound Attenuation:	28-32 dBA insertion loss
Exhaust Temperature Limits:	750 – 1250°F (catalyst inlet); 1350°F (catalyst outlet)

NSCR Housing & Catalyst Details

Model Number:	VXC-1408-04-XC1
Material:	Carbon Steel
Approximate Diameter:	14 inches
Inlet Pipe Size & Connection:	4 inch FF Flange, 150# ANSI standard bolt pattern
Outlet Pipe Size & Connection:	4 inch FF Flange, 150# ANSI standard bolt pattern
Overall Length:	53 inches
Weight Without Catalyst:	152 lbs
Weight Including Catalyst:	162 lbs
Instrumentation Ports:	1 inlet/1 outlet (1/2" NPT)

Emission Requirements

Exhaust Gases	Engine Outputs (g/ bhp-hr)	Reduction (%)	Warranted Converter Outputs (g/ bhp-hr)	Requested Emissions Targets
NOx	11.41	91%	1.00	1.00 g/bhp-hr
CO	14.64	86%	2.00	2.00 g/bhp-hr
NMNEHC	0.22	0%	0.70	0.70 g/bhp-hr
CH_2O	0.08	0%	1.00	1.00 g/bhp-hr
Oxygen	0.5%			

MIRATECH warrants the performance of the converter, as stated above, per the MIRATECH General Terms and Conditions of Sale.

USA COMPRESSION

USA Compression Partners, LLC

Unit Information Sheet

Date: May 27, 2014
Unit #: 6041
Customer: To Be Determined

To:

Lease Location: To Be Determined

Please find the below information for the USA Compression unit number listed above:

Package Information	
Compressor Manufacturer:	Arrow
Compressor Model:	VRC2
Compressor Serial Number:	12095
Compressor Cylinders:	6.5" x 4.0" x 2.25"
Driver Manufacturer:	Cummins
Driver Model:	G5.9
Rated HP & Speed	84 HP @ 1800 RPM
Driver Type:	4-stroke Rich Burn
Engine Serial Number:	73364060
Engine Manufacturing Date:	3/19/2012
Engine Catalyst Model:	VXC-1408-04-HSG
Engine Catalyst Element:	VX-RE-08XC
Engine AFR Model:	AFR-1RD-10-TK2
Engine Stack Height:	9' 5"
Engine Stack Diameter:	4"
Operating Information	
Suction Pressure:	N/A psig
Discharge Pressure:	N/A psig
Design Capacity:	N/A MSCFD
Gas Specific Gravity:	N/A

Emission Output informtion included in the attached catalyst specification sheet.

Engine Performance Data

Cummins Inc

Columbus, Indiana 47202-3005
http://www.cummins.com

Industrial

G5.9

FR 9961

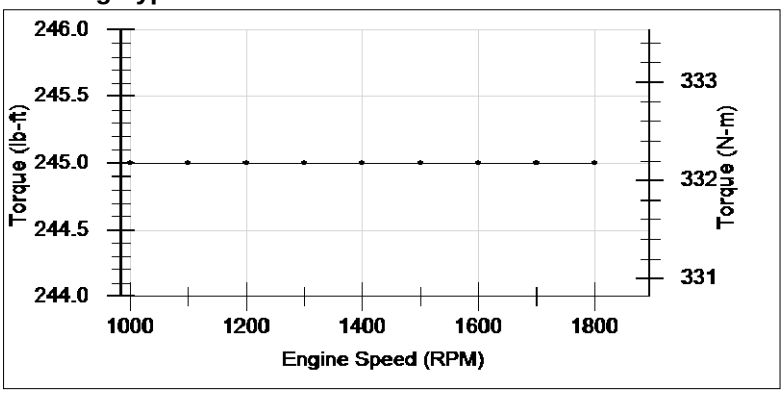
84 BHP (63 kW) @ 1800 RPM
245 lb-ft (332 N-m) @ 1800 RPM

Configuration	CPL Code	Revision
D491010CX02	**8655**	**12-May-2011**

Compression Ratio: **10.5:1**
Fuel System: **Field Gas, Dry Processed Nat Gas**
Emission Certification: **Non-certified**
Displacement: **359 in3 (5.9 L)**
Aspiration: **Naturally Aspirated**

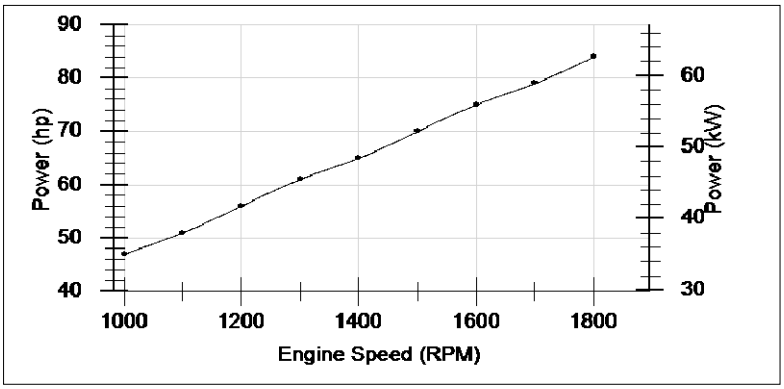
All data is based on the engine operating with fuel system, water pump, and 7 in H2O (1.74 kPa) inlet air restriction with 3.5 in (89 mm) inner diameter, and with 1 in Hg (3 kPa) exhaust restriction with 3 in (76 mm) inner diameter; not included are alternator, fan, optional equipment and driven components. Coolant flows and heat rejection data based on coolants as 50% ethylene glycol/50% water. All data is subject to change without notice.

Rating Type: Continuous/WMR



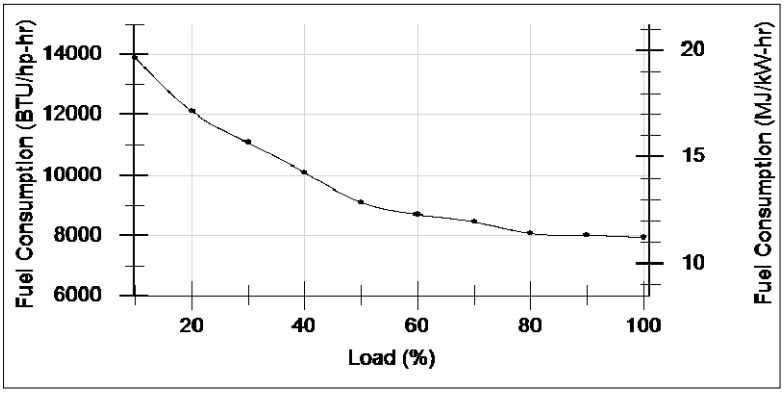
Torque Output

RPM	lb-ft	N-m
1,000	245	332
1,100	245	332
1,200	245	332
1,300	245	332
1,400	245	332
1,500	245	332
1,600	245	332
1,700	245	332
1,800	245	332



Power Output

RPM	hp	kW
1,000	47	35
1,100	51	38
1,200	56	42
1,300	61	45
1,400	65	48
1,500	70	52
1,600	75	56
1,700	79	59
1,800	84	63



Fuel Consumption @ 1,800 RPM

hp	kW	% Load	BTU/hp-hr	MJ/kW-hr
84	63	100	7,914	11.2
76	57	90	7,987	11.3
67	50	80	8,056	11.4
59	44	70	8,452	11.96
50	37	60	8,689	12.29
42	31	50	9,094	12.87
34	25	40	10,083	14.27
25	19	30	11,069	15.66
17	13	20	12,116	17.14
8	6	10	13,889	19.65

Data represents gross engine capabilities obtained and corrected in accordance with SAE J1995 using dry processed natural gas fuel with 905 BTU per standard cubic foot lower heating value. Deration may be required due to altitude, temperature and type of fuel. Consult Cummins Customer Engineering for operation above this altitude.

STATUS FOR CURVES AND DATA: Limited-(measured data)
TOLERANCE: Within +/- 5 %

CHIEF ENGINEER:
Alfred S Weber

Bold entries revised after 1-Mar-2010

Intake Air System

Maximum allowable air temperature rise over ambient at Intake Manifold (Naturally Aspirated Engines) or Turbo Compressor inlet (Turbo-charged Engines): (This parameter impacts emissions, LAT and/or altitude capability)	15 delta deg F	8.3 delta deg C

Cooling System

Maximum coolant temperature for engine protection controls	215 deg F	102 deg C
Maximum coolant operating temperature at engine outlet (max. top tank temp):	212 deg F	100 deg C

Exhaust System

Maximum exhaust back pressure:	2 in-Hg	7 kPa
Recommended exhaust piping size (inner diameter):	3 in	76 mm

Lubrication System

Nominal operating oil pressure		
@ minimum low idle	10 psi	69 kPa
@ maximum rated speed	50 psi	345 kPa
Minimum engine oil pressure for engine protection devices		
@ minimum low idle	10 psi	69 kPa

Fuel System

Maximum fuel inlet pressure:	1 psi	5 kPa

Performance Data

Engine low idle speed:	900 RPM
Maximum low idle speed:	1,800 RPM
Minimum low idle speed:	800 RPM
Engine high idle speed	1,800 RPM
Governor break speed:	
Maximum torque available at closed throttle low idle speed:	50 lb-ft 68 N-m

	100% Load		75% Load		50% Load	
Engine Speed	1,800 RPM		1,800 RPM		1,800 RPM	
Output Power	84 hp	63 kW	63 hp	47 kW	42 hp	31 kW
Torque	245 lb-ft	332 N-m	184 lb-ft	249 N-m	123 lb-ft	167 N-m
Intake Manifold Pressure	-1 in-Hg	-3 kPa	-5 in-Hg	-17 kPa	-9 in-Hg	-30 kPa
Inlet Air Flow	121 ft3/min	57 L/s	101 ft3/min	48 L/s	82 ft3/min	39 L/s
Exhaust Gas Flow	430 ft3/min	203 L/s	360 ft3/min	170 L/s	292 ft3/min	138 L/s
Exhaust Gas Temperature	1,078 deg F	581 deg C	999 deg F	537 deg C	902 deg F	483 deg C
Heat Rejection to Coolant	3,824 BTU/min	67 kW	3,244 BTU/min	57 kW	2,596 BTU/min	46 kW
Heat Rejection to Ambient	1,194 BTU/min	21 kW	784 BTU/min	14 kW	613 BTU/min	11 kW
Heat Rejection to Exhaust	2,523 BTU/min	44 kW	1,916 BTU/min	34 kW	1,371 BTU/min	24 kW
Fuel Consumption	7,914 BTU/hp-hr	11 MJ/kW-hr	8,214 BTU/hp-hr	12 MJ/kW-hr	9,094 BTU/hp-hr	13 MJ/kW-hr
Air Fuel Ratio (dry)	16.52 vol/vol		16.51 vol/vol		16.52 vol/vol	
Ignition timing (BTDC)	26 deg	26 deg	26 deg	26 deg	26 deg	26 deg
Total Hydrocarbons	1.48 g/hp-hr		1.3 g/hp-hr		1.62 g/hp-hr	
VOC ppm w/o Catalyst						
VOC ppm with Catalyst						
NOx	11.41 g/hp-hr	15.3 g/kW-hr	13.7 g/hp-hr	18.37 g/kW-hr	12.85 g/hp-hr	17.23 g/kW-hr
NOx ppm w/o Catalyst						
NOx ppm with Catalyst						
CO	14.64 g/hp-hr	19.63 g/kW-hr	0.82 g/hp-hr	1.1 g/kW-hr	1.38 g/hp-hr	1.85 g/kW-hr
CO ppm w/o Catalyst						
CO ppm with Catalyst						
CO2	449 g/hp-hr	602 g/kW-hr	489 g/hp-hr	656 g/kW-hr	540 g/hp-hr	724 g/kW-hr
O2	0.45 %		1.66 %		3.67 %	

Bold entries revised after 1-Mar-2010

Cranking System (Cold Starting Capability)

Unaided Cold Start:	
Minimum cranking speed	250 RPM
Cold starting aids available	Block Heater, Oil Pan Heater
Maximum parasitic load at 10 deg F @	

Noise Emissions

Top	89.9 dBa
Right Side	90.1 dBa
Left Side	89.8 dBa
Front	90.5 dBa
Exhaust noise emissions	103.1 dBa

Estimated Free Field Sound Pressure Level at 3.28ft (1m) and Full-Load Governed Speed
(Excludes Noise from Intake, Exhaust, Cooling System and Driven Components)

Aftercooler Heat Rejection - Heat Load on Aftercooler
BTU/min (kW)

Ambient Temp deg F (deg C)

Altitude ft (m)	**120 (49)**	**110 (43)**	**100 (38)**	**90 (32)**	**80 (27)**	**70 (21)**
0 (0)	(.0)	(.0)	(.0)	(.0)	(.0)	(.0)
1000 (305)	(.0)	(.0)	(.0)	(.0)	(.0)	(.0)
2000 (610)	(.0)	(.0)	(.0)	(.0)	(.0)	(.0)
3000 (914)	(.0)	(.0)	(.0)	(.0)	(.0)	(.0)
4000 (1219)	(.0)	(.0)	(.0)	(.0)	(.0)	(.0)
5000 (1524)	(.0)	(.0)	(.0)	(.0)	(.0)	(.0)
6000 (1829)	(.0)	(.0)	(.0)	(.0)	(.0)	(.0)
7000 (2134)	(.0)	(.0)	(.0)	(.0)	(.0)	(.0)
8000 (2438)	(.0)	(.0)	(.0)	(.0)	(.0)	(.0)
9000 (2743)	(.0)	(.0)	(.0)	(.0)	(.0)	(.0)
10000 (3048)	(.0)	(.0)	(.0)	(.0)	(.0)	(.0)

End of Report

Bold entries revised after 1-Mar-2010

Gas/Site Analysis & Engine Selection/Derate

Cummins Stationary Natural Gas Engines

Date: 4/10/2014

Industrial	NG
G5.9	**84 HP (63 kW) @1800 RPM & 10.5:1 Compression Ratio**
Available FR Number(s) From Selection: FR9936, FR9961	**Catalyst Fuel Rating**
	Industrial Continuous

Engine (as entered by user)		
Application:	Industrial	
Fuel Type:	NG	
Engine:	G5.9	
Fuel Rating:	Catalyst	
Compression Ratio:	10.5:1	
RPM:	1800	
HP (Natural Gas):	84 HP (63 kW)	
HP (Propane):	NA HP (NA kW)	
Site (as entered by user)		
Ambient Air Temperature:	90° F	
Relative Humidity:	30%	
Altitude:	1200 ft	
Cooling Fan Load:	8 HP	
Generator Efficiency:	93%	
Vapor Pressure (Calculated from Site Conditions Entered):	0.427 inHg	
Dew Point (Calculated from Site Conditions Entered):	54.4° F	
Dry Barometer (Calculated from Site Conditions Entered):	28.22 inHg	
Derate (Natural Gas)		
Advertised NG Rating:	84 HP (63 kW)	
Engine Derate Due to Site Altitude and Temperature:	2%	
Engine Derate Due to Gas Composition:		
Derate Due to Low BTU Fuel:	0%	⚠ **The sample percentage for "Name Sample" is 99.991%. Results are based on the input sample normalized to 100%.**
Derate Due to Methane Number:	0%	
Total Power Available (%) After All Applicable Derates:	98% of rated	
Total Site Derate due to Altitude, Temperature, and Gas Composition:	2 HP (1 kW)	
Total Available Horsepower from Selected Engine Running on Specified Fuel Composition at Specified Site (includes 8 HP reduction for for cooling fan load):	74 HP (55 kW)	
Derate (Propane)		
Advertised Propane Rating:	NA HP (NA kW)	
Engine Derate Due to Site Altitude and Temperature:	NA%	
Total Power Available (%) After All Applicable Derates:	NA% of rated	
Total Site Derate due to Altitude and Temperature:	NA HP (NA kW)	
Total Available Horsepower from Selected Engine Running on Propane at Specified Site (includes 8 HP reduction for for cooling fan load):	NA HP (NA kW)	

Intake Manifold Requirements for Turbocharged Engines

Maximum Allowed Intake Manifold Temperature for Selected Engine is na °F with a Maximum Aftercooler Water Inlet (CAC air inlet) of na °F based on FR9936

Factory Set Points	**Factory Supplied**	**Recommended**
Engine Speed Target:	1800 rpm	⚠ **NOTICE: A Change to Ignition Timing Is Recommended Due to Methane Number of Fuel**
Spark Plug Gap:	0.020 in	
Excess Oxygen Target-PV:	na %O2	
Propane Engine Timing Target:	na °BTDC	
Propane Gas over air Press at Carb Low:	na inH2O	
Propane Gas Press at Sec Reg Target:	na inH2O	
Excess Oxygen Target-NG:	0.45% O_2	
Natural Gas Engine Timing Target:	**Factory: 26 °BTDC**	**Recommended Timing: 25 ° BTDC**
Natural Gas over air Press at Carb Target:	5 inH2O	
Natural Gas Press at Sec Reg Target:	15 inH2O	

FR9936 Created/Revised On: 4/30/2013. Data Files Updated On: 12/12/2013

Gas Sample Analysis			
			The sample percentage for "Name Sample" is 99.991%. Results are based on the input sample normalized to 100%.
Sample Name: Name Sample			
Gas Compound:		**Volume Fraction % (User Input)**	**Mass Fraction % (Calculated)**
Methane:		77.09	59.36
Ethane:		14.83	21.41
Propane:		4.97	10.51
i-Butane:		0.62	1.72
n-Butane:		1.21	3.38
i-Pentane:		0.27	0.92
n-Pentane:		0.26	0.91
n-Hexane:		0.15	0.62
n-Heptane:		0.04	0.2
n-Octane:		0.02	0.09
n-Nonane:		0	0
n-Decane:		0	0.02
Hydrogen:		0	0
Hydrogen Sulfide (H_2S):		0 ppm	0 ppm
Carbon Dioxide:		0.15	0.32
Carbon Monoxide:		0	0
Nitrogen:		0.39	0.53
Oxygen:		0	0
Total Percent: (Sample Input Percentage: 99.991%)		**Normalized Percentage: 100%**	
Performance Parameters:		**Standard Units**	**Metric Units**
Lower Heating Value (LHV): Standard Conditions (60F/14.696psia)	by volume	1140.6 Btu/scf	42.5 MJ/scm
	by mass	20776 Btu/lbm	48.326 MJ/kg
Higher Heating Value (HHV): Standard Conditions (60F/14.696psia)	by volume	1257.5 Btu/scf	46.85 MJ/scm
	by mass	22906 Btu/lbm	53.280 MJ/kg
Methane Number:		56.1	56.1
Specific Gravity (SG):		0.7193	0.7193
Wobbe Index :	LHV/$\sqrt{SG}$	1345 Btu/scf	50.11 MJ/scm
	HV/$\sqrt{SG}$	1483 Btu/scf	55.24 MJ/scm
Molecular Weight:		20.83 g/mol	20.83 g/mol
Specific Heat (Cp):		0.473 BTU/lbm-R	1.979 kJ/kg-K
Specific Heat Ratio (Cp/Cv):		1.253	1.253
Ideal Gas Density:		0.0549 lbm/ft3	0.8788 kg/m3 std
H/C Ratio:		3.492	3.492
Gas Constant (R_{GAS}):		95.3 BTU/lbm-°R	399.1 kJ/kg-°K
Stoich Air Fuel Ratio (Dry):		16.54	16.54
Fuel Flow Data			
BTU/HP-HR:		7914	
Maximum Fuel Flow (SCFH):		583	
Maximum Fuel Flow Calculation is Based on 100% Continuous Rating of 84 HP at 1800 RPM and 10.5:1 Compression Ratio from FR9936			
Gas Regulator Details			
The Industrial G5.9 uses a Maxitrol Regulator			Notes:

FR Differences for Selected Engine

Description of FR Differences for Selected Engine

	FR9936	FR9961
Exhaust Manifold	Dry	Wet
Exhaust Stack Temp High	1300	1220

Gas Analysis Tool
References & Standards

Date: 4/10/2014

Tool Revision Date: 3/27/2014

Performance Parameters:		Reference Standard or Document	
		Standard Units	**Metric Units**
Lower Heating Value (LHV): Standard Conditions	by volume	ASTM D 3588-91 @ 60F/14.696psia	ASTM D 3588-91 @ 15.5C/101.3kPa
	by mass	ASTM D 3588-91 @ 60F/14.696psia	ASTM D 3588-91 @ 15.5C/101.3kPa
Lower Heating Value (LHV): Normal Conditions	by volume	ASTM D 3588-91 @ 32F/14.696psia	ASTM D 3588-91 @ 0C/101.3kPa
Higher Heating Value (HHV): Standard Conditions	by volume	ASTM D 3588-91 @ 60F/14.696psia	ASTM D 3588-91 @ 15.5C/101.3kPa
	by mass	ASTM D 3588-91 @ 60F/14.696psia	ASTM D 3588-91 @ 15.5C/101.3kPa
Higher Heating Value (HHV): Normal Conditions	by volume	ASTM D 3588-91 @ 32F/14.696psia	ASTM D 3588-91 @ 0C/101.3kPa
Methane Number:		Cummins Methane Number	Cummins Methane Number
Specific Gravity (SG) (Ideal Rel. Density):		–	–
Wobbe Index :	LHV/√ SG	Ideal gas @ 60F/14.696psia	Ideal gas @ 15.5C/101.3kPa
	HV/√ SG	Ideal gas @ 60F/14.696psia	Ideal gas @ 15.5C/101.3kPa
Molecular Weight:		–	–
Specific Heat (Cp):		@ 60F/14.696psia	@ 15.5C/101.3kPa
Specific Heat Ratio (Cp/Cv):		@ 60F/14.696psia	@ 15.5C/101.3kPa
Ideal Gas Density:		ASTM D 3588-91 @ 60F/14.696psia	ASTM D 3588-91 @ 15.5C/101.3kPa
H/C Ratio:		–	–
Gas Constant (R_{GAS}):		@ 60F/14.696psia	@ 15.5C/101.3kPa
Stoich Air Fuel Ratio (Dry):		–	–

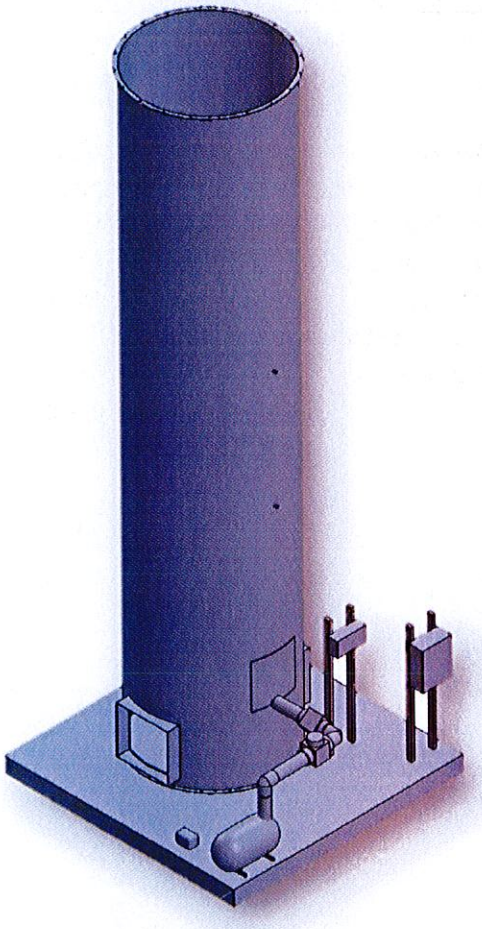
Conversion Factors			
		Standard Units	**Metric Units**
Notes			

HY-BON/EDI
Vent Gas Management

2404 Commerce Dr.
Midland, TX 79703
432-697-2292
hy-bon.com

100 Ayers Blvd.
Belpre, OH 45714
740-401-4000
ediplungerlift.com

With the fairly recent publication of the NSPS OOOO emission standard, all storage tank facilities constructed on or after August 23, 2011 will be allowed to emit 6 Tons or less of VOC's per year. This regulation not only forces companies to monitor and control their emissions, but it also forces the *means* of emission monitoring and controlling to be more reliable and exact. In response to such a stringent protocol, HY-BON Engineering Company is pleased to offer the **CH10.0** enclosed Vapor Combustor Unit (VCU). Built upon a foundation of 60+ years' experience with tank vapors, the VCU is the solution for reducing residual tank vapor emissions when a Vapor Recovery Unit (VRU) is not sufficient or a viable option.



GENERAL PROPERTIES	
TYPE	Enclosed Tank Battery Flare
AMBIENT TEMPERATURE	-20 °F to +100 °F
PILOT FUEL REQUIREMENTS	Propane or Site Gas @5psi of natural gas = 13.3 SCFM @5psi of propane = 12.5 SCFM
BURNER SIZE	10.0 million BTU/hr
INLET PRESSURE REQUIRMENTS	Minimum 0.5 oz/in^2 (~1.0 inches w.c.)
TURN DOWN RATIO	5:1
DESTRUCTION EFFICIENCY	99.99% DRE
MECHANICAL PROPERTIES	
DESIGN WIND SPEED	100 MPH
AMBIENT TEMPERATURE	-20 °F to +120 °F
ELECTRICAL AREA CLASSIFICATION	General Area Classification (Non-Hazardous)
ELEVATION	up to 3,000ft ASL
PROCESS PROPERTIES	
SMOKELESS CAPACITY	100%
OPERATING TEMPERATURE	800 °F to 2000 °F (1500 °F Nominal)
UTILITIES	
PILOT GAS	Process Gas
ELECTRICITY	1 Phase, 60 Hz, 120V/10A
SOLAR PANEL OPTION AVAILABLE	YES

- EPA 40 CFR 60, Quad O Compliant
- Completely Enclosed Combustion
- 99.99% Destruction Efficiency
- Fully Automated System
- Output Operational Data via Thumb Drive
- Capable of SCADA Integration

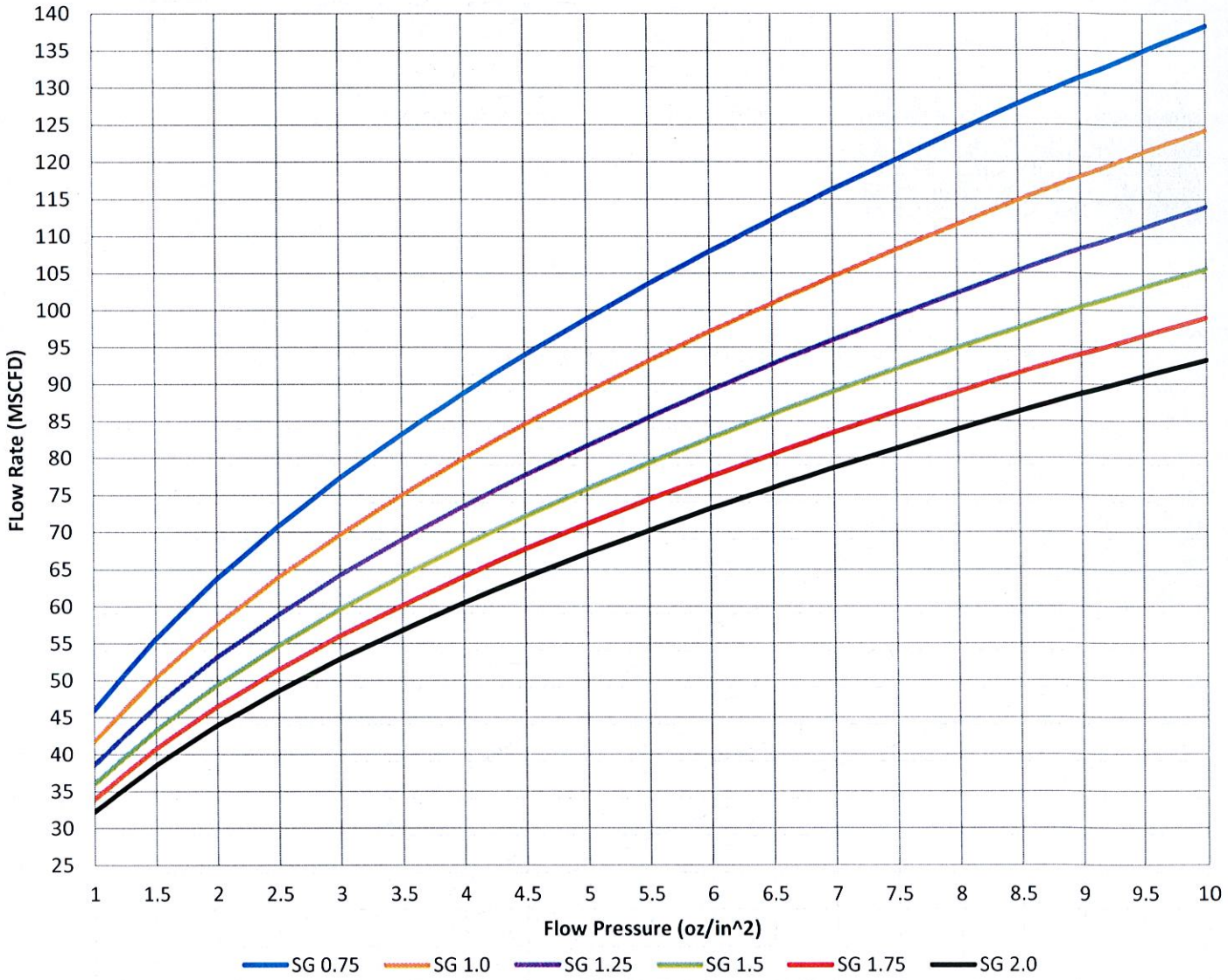
Revision #3: 09/04/2015

HY-BON/EDI
Vent Gas Management

2404 Commerce Dr.
Midland, TX 79703
432-697-2292
hy-bon.com

100 Ayers Blvd.
Belpre, OH 45714
740-401-4000
ediplungerlift.com

CH10.0: Flow Rate vs Flow Pressure with Corresponding Specific Gravity



Model 5120 Thermoelectric Generators

Global Thermoelectric's Model 5120 Thermoelectric Generator contains no moving parts. It is a reliable, low maintenance source of DC electrical power for any application where regular utilities are unavailable or unreliable.

Power Specifiations

Power Rating at 20°C
120 Watts at 6.7 Volts
108 Watts at 12 Volts
108 Watts at 24 Volts
108 Watts at 48 Volts

Electrical

Adjustment:	6.7V	up to 11 Volts
	12 V	12 -18 Volts
	24 V	24 - 30 Volts
	48 V	48 - 60 Volts

Reverse current protection included.

Output: Terminal block which accepts up to 8 AWG wire. Opening for 3/4" conduit in the base of the cabinet.

Fuel

Natural Gas:	8.8 m^3/day (311 ft^3/day) of Std. 1000 BTU/SCF (37.7 MJ/SM^3) gas
Propane:	11.4 l/day (3.0 US gal/day)
Max. Supply Pressure:	1724 kPa (250 psi)
Min. Supply Pressure:	103 kPa (15 psi)
Fuel Connection:	1/4" MNPT

Environmental

Ambient Operation Temperature: Max. 55°C (130°F) Min. -55°C (-67°F)
Operating Conditions: Unsheltered operation

Materials of Construction

Cabinet:	304 SS
Cooling Type:	Natural Convection
Thermopile:	Hermetically Sealed Lead Tin-Telluride (PbSnTe)
Burner:	Meeker Type/Inconel 600
Fuel System:	Brass, Aluminum & SS

Standard Features

- Automatic Spark Ignition (SI)
- Fuel Filter
- Low Voltage Alarm Contacts (VSR)
- Volt & Amp Meter

Optional Features

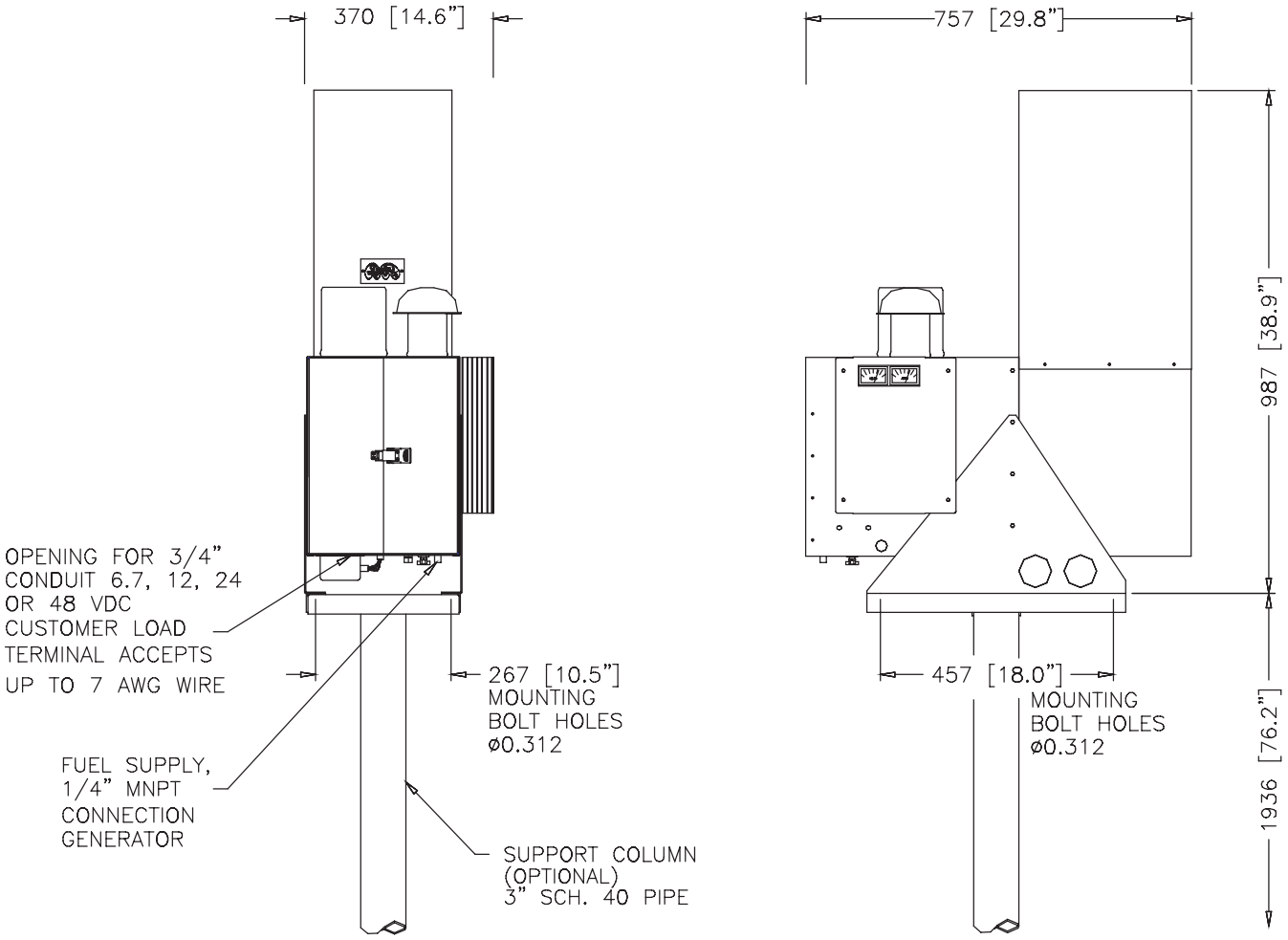
- Cathodic Protection Interface
- Pole Mount or bench stand
- Automatic Fuel Shut-off (SO)
- Corrosive Environmental Fuel System
- Flame Arrestor

Note: Specifications shown are for standard configurations. Global Thermoelectric's Applications Engineering Department is available to design custom voltages, fuel supply systems and non-standard operating temperatures.

Global Thermoelectric

Power where you need it.

Typical Installation



NOTES:
1. GENERATOR WEIGHT: 60 kg [132 lb].
2. DIMENSIONS IN mm [INCHES].

Global Thermoelectric

Power where you need it.

Corporate Office
#9, 3700 - 78 Avenue SE
Calgary, Alberta T2C 2L8
CANADA
Phone: (403) 236-5556
Fax: (403) 236-5575

US Sales
P.O. Box 38624
Houston, TX 77238
Phone: (281) 445-1515
Fax: (281) 445-6060
Toll Free: 1 800 848-4113

ATTACHMENT N

Supporting Emissions Calculations

Jay-Bee Oil & Gas, Inc.

Dopey Well Pad Production Facility
Tyler County, WV

Source	Description	NOx lb/hr	CO lb/hr	CO2e lb/hr	VOC lb/hr	SO2 lb/hr	PM lb/hr	n-Hexane lb/hr	Toluene lb/hr	formaldehyde lb/hr	Total HAPs lb/hr
CE-1	VRU Compressor [4]	0.19	0.37	89.4	0.04	0.000	0.013	0.000		0.015	0.022
HTR-1	GPU #1	0.15	0.13	181.2	0.01	0.001	0.011	0.003		0.000	0.003
HTR-2	GPU #2	0.15	0.13	181.2	0.01	0.001	0.011	0.003		0.000	0.003
HTR-3	GPU #3	0.20	0.17	241.6	0.01	0.001	0.015	0.004		0.000	0.004
HTR-4	Line Heater	0.05	0.04	60.4	0.00	0.000	0.004	0.001		0.000	0.001
TEG-1	Thermoelectric Generator	0.00	0.00	1.6	0.00	0.000	0.000	0.000		0.000	0.000
---	Blowdowns [1]			N/A	N/A						
T01-T06	Condensate Tanks + Water Tanks [2]			30.5	7.31			0.21	0.010		0.24
EC-1	Condensate Tanks + Water Tanks [4]	0.30	1.61	528.9	2.92	0.000	0.015			0.000	0.00
TL-1 + TL-2	Truck Loading [3]				27.90						1.37
---	Truck Traffic Fugitive Dust						16.53				
---	Fittings Fugitive Emissions			5.3	0.17						
Total		1.04	2.45	1,320	38.38	0.00	16.60	0.22	0.01	0.02	1.65

Source		NOx tpy	CO tpy	CO2e tpy	VOC tpy	SO2 tpy	PM tpy	n-Hexane tpy	Toluene tpy	formaldehyde tpy	Total HAPs tpy
CE-1	VRU Compressor	0.81	1.62	391	0.18	0.002	0.06	0.00		0.065	0.10
HTR-1	GPU #1	0.66	0.55	794	0.04	0.004	0.05	0.01		0.000	0.01
HTR-2	GPU #2	0.66	0.55	794	0.04	0.004	0.05	0.01		0.000	0.01
HTR-3	GPU #3	0.88	0.74	1,058	0.05	0.005	0.07	0.02		0.001	0.02
HTR-4	Line Heater	0.22	0.18	265	0.01	0.001	0.02	0.00		0.000	0.00
TEG-1	Thermoelectric Generator	0.01	0.00	7	0.00	0.000	0.00	0.00		0.000	0.00
---	Blowdowns [1]			0.1	0.04						0.01
T01-T06	Condensate Tanks + Water Tanks [2]			131	31.27			0.88	0.04		1.05
EC-1	Condensate Tanks + Water Tanks [4]	0.09	0.34	144	0.58	0.00	0.01	0.00	0.000	0.000	0.00
TL-1 + TL-2	Truck Loading [3]				2.31						0.11
---	Truck Traffic Fugitive Dust						3.47				
---	Fittings Fugitive Emissions			23	0.76						
Total		3.32	3.99	3,605	35.27	0.02	3.72	0.92	0.040	0.07	1.31
Contiguous Icon Midstream, LLC Dopey Dehydration Facility Emissions (tpy)		1.11	5.04	1,933	8.89	0.00	0.15	0.20	0.92	0.00	2.20
Aggregated Emissons (tpy)		4.43	9.04	5,538	44.16	0.02	3.87	1.12	0.96	0.07	3.51

[1] Blowdown Calculations in Fugitive Emissions (Attachment K).

[2] Condensate and water tank emissions are currently controlled by a VRU at 95% with a Combustor as backup, controlling at 98%. This line represents the 5% Un-captured/Control associated with the VRU

[3] Truck loading is un-controlled.

[4] Condensate and water tank emissions are alternately controlled by an Enclosed Combustor at 98%. The entries for VOC, n-hexane, HAPs and CO2e represents emissions of organics based on a 98% capture and control efficiency.

Jay-Bee Oil &Gas ,LLC
ENGINE EMISSIONS

Dopey Well Pad Production Facility
Tyler County, WV

Controlled Emission Rates

Source CE-1
Flash Gas Compressor

Engine Data:

Engine Manufacturer	Cummins	
Engine Model	G5.9	
Type (Rich-burn or Low Emission)	Rich Burn	
Aspiration (Natural or Turbocharged)	Natural	
Manufacturer Rating	84	hp
Speed at Above Rating	1,800	rpm
Configeration (In-line or Vee)	In-line	
Number of Cylinders	6	
Engine Bore	4.020	inches
Engine Stroke	4.720	inches
Engine Displacement	359	cu. in.
Engine BMEP	103	psi
Fuel Consumption (HHV)	7,914	Btu/bhp-hr

Emission Rates:	g/bhp-hr	lb/hr	tons/year	g/hr	lb/day	AP-42 4strokerich lb/mmbtu	Comment
Oxides of Nitrogen, NOx	1.000	0.19	0.81	84	4.44		
Carbon Monoxide CO	2.000	0.37	1.62	168	8.89		453.59 grams = 1 pound
VOC (NMNEHC)	0.220	0.04	0.18	18	0.98		2,000 pounds = 1 ton
CO2	449	83	364	37,716	1,996		
CO2e		89	391				
Total Annual Hours of Operation	**8,760**						
SO2		0.0004	0.0017			0.0006	
PM2.5		0.0063	0.0277			0.0095	
PM (Condensable)		0.0066	0.0289			0.00991	
CH_4		0.1262	0.5529			0.0022	Factor From 40 CFR 98, Table C-2
N_2O		0.0115	0.0503			0.0002	Factor From 40 CFR 98, Table C-2
acrolein		0.0017	0.0077			0.00263	
acetaldehyde		0.0019	0.0081			0.00279	
formaldehyde	0.080	0.0148	0.0649				Per Mfg.
benzene		0.0011	0.0046			0.00158	
toluene		0.0004	0.0016			0.000558	
ethylbenzene		2E-05	0.0001			2.48E-05	
xylene s		0.0001	0.0006			0.000195	
methanol		0.002	0.0089			0.00306	
total HAPs		0.022	0.0964				

Exhaust Parameters:

Exhaust Gas Temperature	1,078	deg. F
Exhaust Gas Mass Flow Rate		lb/hr
Exhaust Gas Mass Flow Rate	430	acfm
Exhaust Stack Height	96	inches
	8.00	feet
Exhaust Stack Inside Diameter	4	inches
	0.333	feet
Exhaust Stack Velocity	82.1	ft/sec
	4,927.4	ft/min

Jay-Bee Oil &Gas ,LLC

Dopey Well Pad Production Facility
Tyler County, WV

Potential Emission Rates

Source HTR-1

Burner Duty Rating	1500.0	Mbtu/hr
Burner Efficiency	98.0	%
Gas Heat Content (HHV)	1263.0	Btu/scf
Total Gas Consumption	29,086.0	scfd
H2S Concentration	0.000	Mole %
Hours of Operation	8760	

NOx	0.1501	lbs/hr	0.657	TPY
CO	0.1261	lbs/hr	0.552	TPY
CO2	180.1	lbs/hr	788.7	TPY
CO2e	181	lbs/hr	794	tpy
VOC	0.0083	lbs/hr	0.036	TPY
SO2	0.0009	lbs/hr	0.004	TPY
H2S	0.0000	lbs/hr	0.000	TPY
PM10	0.0114	lbs/hr	0.050	TPY
CHOH	0.0001	lbs/hr	0.000	TPY
Benzene	0.0000	lbs/hr	0.000	TPY
N-Hexane	0.0027	lbs/hr	0.012	TPY
Toluene	0.0000	lbs/hr	0.000	TPY
Total HAPs	0.0028	lbs/hr	0.012	TPY

AP-42 Factors Used

NOx	**100**	**Lbs/MMCF**	
CO	**84**	**Lbs/MMCF**	
CO_2	**120,000**	**Lbs/MMCF**	Global Warming Potential = 1
VOC	**5.5**	**Lbs/MMCF**	
PM	**7.6**	**Lbs/MMCF**	
SO_2	**0.6**	**Lbs/MMCF**	
CH_4	**2.3**	**Lbs/MMCF**	Global Warming Potential = 25
N_2O	**2.2**	**Lbs/MMCF**	Global Warming Potential =298
HCOH	**0.075**	**Lbs/MMCF**	
Benzene	**0.0021**	**Lbs/MMCF**	
n-Hexane	**1.8**	**Lbs/MMCF**	
Toluene	**0.0034**	**Lbs/MMCF**	

Jay-Bee Oil &Gas ,LLC

Dopey Well Pad Production Facility
Tyler County, WV

Potential Emission Rates

Source HTR-2

Burner Duty Rating	1500.0	Mbtu/hr
Burner Efficiency	98.0	%
Gas Heat Content (HHV)	1263.0	Btu/scf
Total Gas Consumption	29,086.0	scfd
H2S Concentration	0.000	Mole %
Hours of Operation	8760	

NOx	0.1501	lbs/hr	0.657	TPY
CO	0.1261	lbs/hr	0.552	TPY
CO2	180.1	lbs/hr	788.7	TPY
CO2e	181	lbs/hr	794	tpy
VOC	0.0083	lbs/hr	0.036	TPY
SO2	0.0009	lbs/hr	0.004	TPY
H2S	0.0000	lbs/hr	0.000	TPY
PM10	0.0114	lbs/hr	0.050	TPY
CHOH	0.0001	lbs/hr	0.000	TPY
Benzene	0.0000	lbs/hr	0.000	TPY
N-Hexane	0.0027	lbs/hr	0.012	TPY
Toluene	0.0000	lbs/hr	0.000	TPY
Total HAPs	0.0028	lbs/hr	0.012	TPY

AP-42 Factors Used

NOx	**100**	**Lbs/MMCF**	
CO	**84**	**Lbs/MMCF**	
CO_2	**120,000**	**Lbs/MMCF**	Global Warming Potential = 1
VOC	**5.5**	**Lbs/MMCF**	
PM	**7.6**	**Lbs/MMCF**	
SO_2	**0.6**	**Lbs/MMCF**	
CH_4	**2.3**	**Lbs/MMCF**	Global Warming Potential = 25
N_2O	**2.2**	**Lbs/MMCF**	Global Warming Potential =298
HCOH	**0.075**	**Lbs/MMCF**	
Benzene	**0.0021**	**Lbs/MMCF**	
n-Hexane	**1.8**	**Lbs/MMCF**	
Toluene	**0.0034**	**Lbs/MMCF**	

Jay-Bee Oil &Gas ,LLC

Dopey Well Pad Production Facility
Tyler County, WV

Potential Emission Rates

Source HTR-3

Burner Duty Rating	2,000.0	Mbtu/hr
Burner Efficiency	98.0	%
Gas Heat Content (HHV)	1263.0	Btu/scf
Total Gas Consumption	38,781.3	scfd
H2S Concentration	0.000	Mole %
Hours of Operation	8760	

NOx	0.2001	lbs/hr	0.876	TPY
CO	0.1681	lbs/hr	0.736	TPY
CO2	240.1	lbs/hr	1051.6	TPY
CO2e	242	lbs/hr	1,058	tpy
VOC	0.0110	lbs/hr	0.048	TPY
SO2	0.0012	lbs/hr	0.005	TPY
H2S	0.0000	lbs/hr	0.000	TPY
PM10	0.0152	lbs/hr	0.067	TPY
CHOH	0.0002	lbs/hr	0.001	TPY
Benzene	0.0000	lbs/hr	0.000	TPY
N-Hexane	0.0036	lbs/hr	0.016	TPY
Toluene	0.0000	lbs/hr	0.000	TPY
Total HAPs	0.0038	lbs/hr	0.016	TPY

AP-42 Factors Used

NOx	**100**	**Lbs/MMCF**	
CO	**84**	**Lbs/MMCF**	
CO_2	**120,000**	**Lbs/MMCF**	Global Warming Potential = 1
VOC	**5.5**	**Lbs/MMCF**	
PM	**7.6**	**Lbs/MMCF**	
SO_2	**0.6**	**Lbs/MMCF**	
CH_4	**2.3**	**Lbs/MMCF**	Global Warming Potential = 25
N_2O	**2.2**	**Lbs/MMCF**	Global Warming Potential =298
HCOH	**0.075**	**Lbs/MMCF**	
Benzene	**0.0021**	**Lbs/MMCF**	
n-Hexane	**1.8**	**Lbs/MMCF**	
Toluene	**0.0034**	**Lbs/MMCF**	

Jay-Bee Oil &Gas ,LLC

Dopey Well Pad Production Facility
Tyler County, WV

Potential Emission Rates

Source HTR-4
(Line Heater)

Burner Duty Rating	500.0	Mbtu/hr
Burner Efficiency	98.0	%
Gas Heat Content (HHV)	1263.0	Btu/scf
Total Gas Consumption	9,695.3	scfd
H2S Concentration	0.000	Mole %
Hours of Operation	8760	

NOx	0.0500	lbs/hr	0.219	TPY
CO	0.0420	lbs/hr	0.184	TPY
CO2	60.0	lbs/hr	262.9	TPY
CO2e	60	lbs/hr	265	tpy
VOC	0.0028	lbs/hr	0.012	TPY
SO2	0.0003	lbs/hr	0.001	TPY
H2S	0.0000	lbs/hr	0.000	TPY
PM10	0.0038	lbs/hr	0.017	TPY
CHOH	0.0000	lbs/hr	0.000	TPY
Benzene	0.0000	lbs/hr	0.000	TPY
N-Hexane	0.0009	lbs/hr	0.004	TPY
Toluene	0.0000	lbs/hr	0.000	TPY
Total HAPs	0.0009	lbs/hr	0.004	TPY

AP-42 Factors Used

NOx	**100**	**Lbs/MMCF**	
CO	**84**	**Lbs/MMCF**	
CO_2	**120,000**	**Lbs/MMCF**	Global Warming Potential = 1
VOC	**5.5**	**Lbs/MMCF**	
PM	**7.6**	**Lbs/MMCF**	
SO_2	**0.6**	**Lbs/MMCF**	
CH_4	**2.3**	**Lbs/MMCF**	Global Warming Potential = 25
N_2O	**2.2**	**Lbs/MMCF**	Global Warming Potential =298
HCOH	**0.075**	**Lbs/MMCF**	
Benzene	**0.0021**	**Lbs/MMCF**	
n-Hexane	**1.8**	**Lbs/MMCF**	
Toluene	**0.0034**	**Lbs/MMCF**	

Jay-Bee Oil &Gas ,LLC

Dopey Well Pad Production Facility
Tyler County, WV

Potential Emission Rates

Source TEG-1

Burner Duty Rating	13.0	Mbtu/hr
Burner Efficiency	98.0	%
Gas Heat Content (HHV)	1263.0	Btu/scf
Total Gas Consumption	252.1	scfd
H2S Concentration	0.000	Mole %
Hours of Operation	8760	

NOx	0.0013	lbs/hr	0.006	TPY
CO	0.0011	lbs/hr	0.005	TPY
CO2	1.6	lbs/hr	6.8	TPY
CO2e	2	lbs/hr	7	tpy
VOC	0.0001	lbs/hr	0.000	TPY
SO2	0.0000	lbs/hr	0.000	TPY
H2S	0.0000	lbs/hr	0.000	TPY
PM10	0.0001	lbs/hr	0.000	TPY
CHOH	0.0000	lbs/hr	0.000	TPY
Benzene	0.0000	lbs/hr	0.000	TPY
N-Hexane	0.0000	lbs/hr	0.000	TPY
Toluene	0.0000	lbs/hr	0.000	TPY
Total HAPs	0.0000	lbs/hr	0.000	TPY

AP-42 Factors Used

NOx	**100**	**Lbs/MMCF**	
CO	**84**	**Lbs/MMCF**	
CO_2	**120,000**	**Lbs/MMCF**	Global Warming Potential = 1
VOC	**5.5**	**Lbs/MMCF**	
PM	**7.6**	**Lbs/MMCF**	
SO_2	**0.6**	**Lbs/MMCF**	
CH_4	**2.3**	**Lbs/MMCF**	Global Warming Potential = 25
N_2O	**2.2**	**Lbs/MMCF**	Global Warming Potential =298
HCOH	**0.075**	**Lbs/MMCF**	
Benzene	**0.0021**	**Lbs/MMCF**	
n-Hexane	**1.8**	**Lbs/MMCF**	
Toluene	**0.0034**	**Lbs/MMCF**	

Jay-Bee Oil &Gas ,LLC

Dopey Well Pad Production Facility
Tyler County, WV

otential Emission Rate

Enclosed Combustor Pilot

Burner Duty Rating	80.0	Mbtu/hr
Burner Efficiency	99.0	%
Gas Heat Content (HHV)	1263.0	Btu/scf
Total Gas Consumption	1535.6	scfd
H2S Concentration	0.000	Mole %
Hours of Operation	8760	

NOx	0.0079	lbs/hr	0.035	TPY
CO	0.0067	lbs/hr	0.029	TPY
CO2	9.5	lbs/hr	41.6	TPY
CO2e	10	lbs/hr	42	TPY
VOC	0.0004	lbs/hr	0.002	TPY
SO2	0.0000	lbs/hr	0.000	TPY
H2S	0.0000	lbs/hr	0.000	TPY
PM10	0.0006	lbs/hr	0.003	TPY
CHOH	0.0000	lbs/hr	0.000	TPY
Benzene	0.0000	lbs/hr	0.000	TPY
N-Hexane	0.0001	lbs/hr	0.001	TPY
Toluene	0.0000	lbs/hr	0.000	TPY
Total HAPs	0.0001	lbs/hr	0.001	TPY

AP-42 Factors Used (Tables 1.4.1-1.4.3)

NOx	**100**	**Lbs/MMCF**	
CO	**84**	**Lbs/MMCF**	
CO_2	**120,000**	**Lbs/MMCF**	Global Warming Potential = 1
VOC	**5.5**	**Lbs/MMCF**	
PM	**7.6**	**Lbs/MMCF**	
SO_2	**0.6**	**Lbs/MMCF**	
CH_4	**2.3**	**Lbs/MMCF**	Global Warming Potential = 25
N_2O	**2.2**	**Lbs/MMCF**	Global Warming Potential =298
HCOH	**0.075**	**Lbs/MMCF**	
Benzene	**0.0021**	**Lbs/MMCF**	
n-Hexane	**1.8**	**Lbs/MMCF**	
Toluene	**0.0034**	**Lbs/MMCF**	

Jay-Bee Oil &Gas ,LLC

Dopey Well Pad Production Facility
Tyler County, WV

Potential Emission Rates

Source EC-1

Enclosed Vapor Combustor - Control of Tank Emissions

Destruction Efficiency	98.0	%		
Gas Heat Content (HHV)	2276.6	Btu/scf		
Max Flow to T-E	0.046	MMSCFD	0.746	MMCF/Yr
Max BTUs to Flare	4.345	MMBTU/Hr	1,698	MMBTU/Yr

NOx	0.30	lbs/hr	0.06	tpy
CO	1.61	lbs/hr	0.31	tpy
CO2	507.83	lbs/hr	99.3	tpy
CO2e	519.29	lb/hr	101.9	tpy
VOC	2.92	lb/hr	0.58	tpy
CH4	0.49	lbs/hr	0.1000	tpy
N2O	0.0010	lbs/hr	0.0002	tpy
PM	0.0145	lb/hr	0.0028	tpy
CHOH	0.0001	lb/hr	0.0000	tpy
Benzene	0.0000	lb/hr	0.0000	tpy
n-Hexane	0.0034	lb/hr	0.0007	tpy
Toluene	0.0000	lb/hr	0.0000	tpy
Total HAP	0.0036	lb/hr	0.0007	tpy

Notes: VOC, Total HAP, N-Hexane and CH4 emissions are taken from the Condensate and Produced Water Tank Emissions sheet in the Calculations Section.

Factors Used

AP-42 Table 13.5-1	**NOx**	**0.068**	**Lbs/MMBTU**
AP-42 Table 13.5-1	**CO**	**0.37**	**Lbs/MMBTU**
40 CFR 98 Table C-1	**CO2**	**116.89**	**Lbs/MMBTU**
40 CFR 98 Table C-2	**CH4**	**0.0022**	**Lbs/MMBTU**
40 CFR 98 Table C-2	**N2O**	**0.00022**	**Lbs/MMBTU**
AP-42 Table 1.4-2	**PM**	**7.6**	**lb/MMSCF**
AP-42 Table 1.4-3	**Benzene**	**0.0021**	**lb/MMSCF**
AP-42 Table 1.4-3	**Toluene**	**0.0034**	**lb/MMSCF**
AP-42 Table 1.4-3	**Hexane**	**1.8**	**lb/MMSCF**
AP-42 Table 1.4-3	**CHOH**	**0.075**	**lb/MMSCF**

Jay-Bee Oil & Gas, Inc.
GAS ANALYSIS INFORMATION

Dopey Well Pad Production Facility
Tyler County, WV

Condensate Tank Flash Vapor Composition Information:

	Fuel Gas mole %	Fuel M.W. lb/lb-mole	Fuel S.G.	Fuel Wt. %	LHV, dry Btu/scf	HHV, dry Btu/scf	AFR vol/vol	VOC NM / NE	Z Factor	GPM
Nitrogen, N2	0.032	0.009	0.000	0.022			-		0.0003	
Carbon Dioxide, CO2	0.093	0.041	0.001	0.103			-		0.0009	
Hydrogen Sulfide, H2S	0.000	0.000	0.000	0.000	0.0	0.0	0.000		0.0000	
Helium, He	-	-	-	-			-		-	
Oxygen, O2	-	-	-	-			-		-	
Methane, CH4	21.006	3.370	0.116	8.458	191.0	212.2	2.002		0.2096	
Ethane, C2H6	26.977	8.112	0.280	20.358	436.7	477.4	4.500		0.2676	7.176
Propane	25.650	11.311	0.391	28.386	593.8	645.4	6.110	28.386	0.2520	7.030
Iso-Butane	5.272	3.064	0.106	7.690	158.2	171.4	1.633	7.690	0.0512	1.715
Normal Butane	11.899	6.916	0.239	17.357	358.3	388.2	3.685	17.357	0.1150	3.731
Iso Pentane	3.281	2.367	0.082	5.941	121.4	131.3	1.250	5.941	0.0328	1.195
Normal Pentane	3.198	2.307	0.080	5.791	118.5	128.2	1.219	5.791	0.0320	1.152
Hexane	1.776	1.531	0.053	3.841	78.2	84.5	0.804	3.841	0.0175	0.726
Heptane	0.816	0.818	0.028	2.052	41.6	44.9	0.428	2.052	0.0081	0.374
	100.000	39.846	1.376		2,097.7	2,283.4	21.630	71.059	0.9872	23.100

Gas Density (STP) = 0.111

Ideal Gross (HHV)	2,283.4
Ideal Gross (sat'd)	2,244.3
GPM	-
Real Gross (HHV)	2,313.1
Real Net (LHV)	2,124.9

Jay-Bee Oil & Gas, Inc.
GAS ANALYSIS INFORMATION

Dopey Well Pad Production Facility
Tyler County, WV

Water Tank Flash Vapor Composition Information:

	Fuel Gas mole %	Fuel M.W. lb/lb-mole	Fuel S.G.	Fuel Wt. %	LHV, dry Btu/scf	HHV, dry Btu/scf	AFR vol/vol	VOC NM / NE	Z Factor	GPM
Nitrogen, N2	0.575	0.161	0.006	0.652			-		0.0057	
Carbon Dioxide, CO2	1.602	0.705	0.024	2.855			-		0.0160	
Hydrogen Sulfide, H2S	0.000	0.000	0.000	0.000	0.0	0.0	0.000		0.0000	
Helium, He	-	-	-	-			-		-	
Oxygen, O2	-	-	-	-			-		-	
Methane, CH4	74.187	11.902	0.411	48.188	674.7	749.3	7.070		0.7404	
Ethane, C2H6	9.798	2.946	0.102	11.929	158.6	173.4	1.634		0.0972	2.606
Propane	4.384	1.933	0.067	7.827	101.5	110.3	1.044	7.827	0.0431	1.202
Iso-Butane	1.841	1.070	0.037	4.332	55.2	59.9	0.570	4.332	0.0179	0.599
Normal Butane	2.043	1.187	0.041	4.808	61.5	66.6	0.633	4.808	0.0197	0.641
Iso Pentane	1.305	0.942	0.033	3.812	48.3	52.2	0.497	3.812	0.0131	0.475
Normal Pentane	0.928	0.670	0.023	2.711	34.4	37.2	0.354	2.711	0.0093	0.334
Hexane	1.149	0.990	0.034	4.009	50.6	54.6	0.520	4.009	0.0114	0.470
Heptane	2.188	2.192	0.076	8.877	111.6	120.4	1.147	8.877	0.0218	1.004
	100.000	24.699	0.853		1,296.4	1,424.0	13.469	36.376	0.9954	7.331

Gas Density (STP) = 0.069

Ideal Gross (HHV)	1,424.0
Ideal Gross (sat'd)	1,399.9
GPM	-
Real Gross (HHV)	1,430.5
Real Net (LHV)	1,302.3

Jay-Bee Oil & Gas, Inc.
GAS ANALYSIS INFORMATION

Dopey Well Pad Production Facility
Tyler County, WV

Inlet Gas Composition Information:

	Fuel Gas mole %	Fuel M.W. lb/lb-mole	Fuel S.G.	Fuel Wt. %	LHV, dry Btu/scf	HHV, dry Btu/scf	AFR vol/vol	VOC NM / NE	Z Factor	GPM
Nitrogen, N2	0.394	0.110	0.004	0.530			-		0.0039	
Carbon Dioxide, CO2	0.151	0.066	0.002	0.319			-		0.0015	
Hydrogen Sulfide, H2S	0.000	0.000	0.000	0.000	0.0	0.0	0.000		0.0000	
Helium, He	-	-	-	-			-		-	
Oxygen, O2	-	-	-	-			-		-	
Methane, CH4	77.080	12.366	0.427	59.350	701.0	778.5	7.346		0.7693	
Ethane, C2H6	14.832	4.460	0.154	21.406	240.1	262.5	2.474		0.1471	3.945
Propane	4.967	2.190	0.076	10.512	115.0	125.0	1.183	10.512	0.0488	1.361
Iso-Butane	0.616	0.358	0.012	1.718	18.5	20.0	0.191	1.718	0.0060	0.200
Normal Butane	1.210	0.703	0.024	3.375	36.4	39.5	0.375	3.375	0.0117	0.379
Iso Pentane	0.266	0.192	0.007	0.921	9.8	10.6	0.101	0.921	0.0027	0.097
Normal Pentane	0.262	0.189	0.007	0.907	9.7	10.5	0.100	0.907	0.0026	0.094
Hexane	0.158	0.136	0.005	0.654	7.0	7.5	0.072	0.654	0.0016	0.065
Heptane	0.064	0.064	0.002	0.308	3.3	3.5	0.034	0.308	0.0006	0.029
	100.000	20.836	0.719		1,140.7	1,257.6	11.875	18.396	0.9958	6.172

Gas Density (STP) = 0.058

Ideal Gross (HHV)	1,257.6
Ideal Gross (sat'd)	1,236.5
GPM	-
Real Gross (HHV)	1,263.0
Real Net (LHV)	1,145.6

Jay-Bee Oil & Gas, Inc.
FUGITIVE EMISSIONS

Dopey Well Pad Production Facility
Tyler County, WV

Fugitive VOC Emissions

Volatile Organic Compounds, NMNEHC from gas analysis:	18.40	weight percent
Methane from gas analysis:	59.35	weight percent
Carbon Dioxide from gas analysis:	0.32	weight percent
Gas Density	0.0580	lb/scf

Emission Source:	Number	Oil & Gas Production*	VOC %	VOC, lb/hr	VOC TPY	CO2 lb/Hr	CO2 TPY	CH4 lb/hr	CH4 TPY	CO2e
Valves:										
Gas/Vapor:	16	0.02700 scf/hr	18.4	0.005	0.020	0.000	0.000	0.015	0.0651	1.628
Light Liquid:	36	0.05000 scf/hr	100.0	0.104	0.457					0.000
Heavy Liquid (Oil):	-	0.00050 scf/hr	100.0	0.000	0.000					0.000
Low Bleed Pneumatic	3	1.39000 scf/hr	18.4	0.044	0.195	0.144	0.629	0.144	0.6285	16.342
Relief Valves:	18	0.04000 scf/hr	18.4	0.008	0.034	0.000	0.001	0.025	0.1085	2.714
Open-ended Lines, gas:	3	0.06100 sfc/hr	18.4	0.002	0.009					0.000
Open-ended Lines, liquid:	-	0.05000 lb/hr	100.0	0.000	0.000					0.000
Pump Seals:										
Gas:	-	0.00529 lb/hr	18.4	0.000	0.000	0.000	0.000	0.000	0.0000	0.000
Light Liquid:	-	0.02866 lb/hr	100.0	0.000	0.000					0.000
Heavy Liquid (Oil):	-	0.00133 lb/hr	100.0	0.000	0.000					0.000
Compressor Seals, Gas:	1	0.01940 lb/hr	18.4	0.004	0.016	0.000	0.000	0.001	0.0029	0.073
Connectors:										
Gas:	16	0.00300 scf/hr	18.4	0.001	0.002	0.000	0.000	0.002	0.0072	0.181
Light Liquid:	6	0.00700 scf/hr	100.0	0.042	0.184					0.000
Heavy Liquid (Oil):	-	0.00030 scf/hr	100.0	0.000	0.000					0.000
Flanges:										
Gas:	38	0.00086 lb/hr	18.4	0.006	0.026	0.000	0.000	0.019	0.0850	2.124
Light Liquid:	18	0.00300 scf/hr	100.0	0.003	0.014					0.000
Heavy Liquid:		0.0009 scf/hr	100.0	0.000	0.000					0.000

Fugitive Calculations:

	lb/hr	t/y
VOC	**0.174**	**0.761**
CH4	**0.061**	**0.269**
CO2	**0.000**	**0.002**
CO2e	**5.265**	**23.06**

Notes: *Factors are from 40 CFR 98, Table W-1A (scf/hr), where available. Remaining are API (lb/hr)

Jay-Bee Oil & Gas, Inc.
GAS DATA INFORMATION

Specific Graivity of Air, @ 29.92 in. Hg and 60 -F, 28.963
One mole of gas occupies, @ 14.696 psia & 32 -I 359.2 cu ft. per lb-mole
One mole of gas occupies, @ 14.696 psia & 60 -I 379.64 cu ft. per lb-mole

Hydrogen Sulfide (H2S) conversion chart:

0 grains H2S/100 scf	=	0.00000 mole % H2S
		0.0 ppmv H2S
0 mole % H2S	=	0 grains H2S/100 scf
		0.0 ppmv H2S
0 ppmv H2S	=	0.000 grains H2S/100 scf
		0.00000 mole % H2S

Ideal Gas at 14.696 psia and 60°F

		MW lb/mol	Specific Gravity	Lb per Cu Ft	Cu Ft per Lb	LHV, dry Btu/scf	HHV, dry Btu/scf	LHV Btu/lb	HHV Btu/lb	cu ft of air / 1 cu ft of gas	Z factor
Nitrogen	N2	28.013	0.9672	0.0738	13.552	0	0	0	0	0	0.9997
Carbon Dioxide	CO2	44.010	1.5196	0.1159	8.626	0	0	0	0	0	0.9964
Hydrogen Sulfide	H2S	34.076	1.1766	0.0898	11.141	587	637	6,545	7,100	7.15	0.9846
Water	H20	18.000	0.6215	0.0474	21.091	0	0	0	0	0	1.0006
Oxygen	O2	31.999	1.1048	0.0843	11.864	0	0	0	0	0	0.9992
Methane	CH4	16.043	0.5539	0.0423	23.664	909.4	1,010.0	21,520	23,879	9.53	0.9980
Ethane	C2H6	30.070	1.0382	0.0792	12.625	1,618.7	1,769.6	20,432	22,320	16.68	0.9919
Propane	C3H8	44.097	1.5226	0.1162	8.609	2,314.9	2,516.1	19,944	21,661	23.82	0.9825
Iso-Butane	C4H10	58.124	2.0069	0.1531	6.532	3,000.4	3,251.9	19,629	21,257	30.97	0.9711
Normal Butane	C4H10	58.124	2.0069	0.1531	6.532	3,010.8	3,262.3	19,680	21,308	30.97	0.9667
Iso Pentane	C5H12	72.151	2.4912	0.1901	5.262	3,699.0	4,000.9	19,478	21,052	38.11	1.0000
Normal Pentane	C5H12	72.151	2.4912	0.1901	5.262	3,706.9	4,008.9	19,517	21,091	38.11	1.0000
Hexane	C6H14	86.178	2.9755	0.2270	4.405	4,403.8	4,755.9	19,403	20,940	45.26	0.9879
Heptane	C7H16	100.205	3.4598	0.2639	3.789	5,100.0	5,502.5	22,000	23,000	52.41	0.9947

Real Gas at 14.696 psia and 60°F

		MW lb/mol	Specific Gravity	Lb per Cu Ft	Cu Ft per Lb	LHV, dry Btu/scf	HHV, dry Btu/scf	LHV Btu/lb	HHV Btu/lb	cu ft of air / 1 cu ft of gas	Gal/Mole
Nitrogen	N2	28.013	0.9672	0.0738	13.552	0	0	0	0	0	4.1513
Carbon Dioxide	CO2	44.010	1.5196	0.1159	8.626	0	0	0	0	0	6.4532
Hydrogen Sulfide	H2S	34.076	1.1766	0.0898	11.141	621	672	6,545	7,100	7.15	5.1005
Water	H2O	18.000	0.6215	0.0474	21.091						3.8376
Oxygen	O2	31.999	1.1048	0.0843	11.864	0	0	0	0	0	3.3605
Methane	CH4	16.043	0.5539	0.0423	23.664	911	1,012	21,520	23,879	9.53	6.4172
Ethane	C2H6	30.070	1.0382	0.0792	12.625	1,631	1,783	20,432	22,320	16.68	10.126
Propane	C3H8	44.097	1.5226	0.1162	8.609	2,353	3,354	19,944	21,661	23.82	10.433
Iso-Butane	C4H10	58.124	2.0069	0.1531	6.532	3,101	3,369	19,629	21,257	30.97	12.386
Normal Butane	C4H10	58.124	2.0069	0.1531	6.532	3,094	3,370	19,680	21,308	30.97	11.937
Iso Pentane	C5H12	72.151	2.4912	0.1901	5.262	3,709	4,001	19,478	21,052	38.11	13.86
Normal Pentane	C5H12	72.151	2.4912	0.1901	5.262	3,698	4,009	19,517	21,091	38.11	13.713
Hexane	C6H14	86.178	2.9755	0.2270	4.405	4,404	4,756	19,403	20,940	45.26	15.566
Heptane	C7H16	100.205	3.4598	0.2639	3.789	5,101	5,503	22,000	23,000	52.41	17.468

Jay-Bee Oil & Gas - Dopey

Flash Emission Calculations - Produced Water

Using Gas-Water Ratio Method

Un-Controlled

Site specific data			
Gas-Water-ratio	=	5	scf/bbl Using GOW from comparable well pad
Throughput	=	66,000	bbl/yr
Stock tank gas molecular weight	=	39.56	g/mole

Conversions			
1 lb	=	453.6	g
1 mole	=	22.4	L
1 scf	=	28.32	L
1 ton	=	2000	lb

Equations

$$E_{TOT} = Q\frac{(bbl)}{(yr)} \times R\frac{(scf)}{(bbl)} \times \frac{28.32(L)}{1(scf)} \times \frac{1(mole)}{22.4(L)} \times MW\frac{(g)}{(mole)} \times \frac{1(lb)}{453.6(g)}) \times \frac{1(ton)}{2000(lb)}$$

E_{TOT} = Total stock tank flash emissions (TPY)
R = Measured gas-oil ratio (scf/bbl)
Q = Throughput (bbl/yr)
MW = Stock tank gas molecular weight (g/mole)

$$E_{spec} = E_{TOT} \times X_{spec}$$

E_{spec} = Flash emission from constituent
X_{spec} = Weight fraction of constituent in stock tank gas

Flash Emissions

Constituent	TPY	
Total	18.1933	E_{TOT}
VOC	**12.7661**	Sum of C3+
Nitrogen	4.55E-03	
Carbon Dioxide	2.86E-02	
Methane	1.81E+00	
Ethane	3.59E+00	
Propane	4.72E+00	
Isobutane	1.28E+00	
n-Butane	2.93E+00	
2,2 Dimethylpropane	3.58E-02	
Isopentane	1.00E+00	
n-Pentane	1.05E+00	
2,2 Dimethylbutane	3.80E-02	
Cyclopentane	0.00E+00	
2,3 Dimethylbutane	5.51E-02	
2 Methylpentane	2.93E-01	
3 Methylpentane	1.75E-01	
n-Hexane	3.82E-01	HAP
Methylcyclopentane	2.78E-02	
Benzene	6.55E-03	HAP
Cyclohexane	3.95E-02	
2-Methylhexane	8.48E-02	
3-Methylhexane	8.33E-02	
2,2,4 Trimethylpentane	0.00E+00	
Other C7's	7.93E-02	
n-Heptane	1.23E-01	
Methylcyclohexane	7.62E-02	
Toluene	1.49E-02	HAP
Other C8's	1.25E-01	
n-Octane	4.15E-02	
Ethylbenzene	9.10E-04	HAP
M & P Xylenes	1.07E-02	HAP
O-Xylene	1.46E-03	HAP
Other C9's	5.17E-02	
n-Nonane	1.24E-02	
Other C10's	1.95E-02	
n-Decane	2.55E-03	
Undecanes (11)	2.73E-03	

Jay-Bee Oil & Gas, Incorporated
Dopey Well Pad Production Facility
VRU Un-Captured/Un-Controlled Emissions
and
Loading to Combustor

As noted in the Project Overview, vapors released during the drop in pressure on the condensate and produced water as they are routed to the atmospheric pressure storage tanks (flash gas) and subsequent working and breathing losses during storage of condensate in these tanks will controlled a Vapor Recover Unit (VRU), with an Enclosed Combustor as backup for times when the VRU is down for repair or maintenance or if there is a slug of condensate generating more flash gas than the VRU can handle.

Based on actual flash liberation tests on both condensate tanks and produced water tanks at nearby well pads and working/breathing losses modeled by EPA's TANKS 4.0, loading to the VRU or combustor (when the VRU is down) is projected as follows:

Condensate Flash Gas	893.1	tpy	203.90 lb/hr
Produced Water Flash Gas	18.2	tpy	4.16 lb/hr
Working/Breathing Losses	3.2	tpy	0.73 lb/hr
Total	**914.5**	**tpy**	**208.79 lb/hr**

All waste gases are hard piped to the combustor or VRU. Additionally, the combustor is warranted by the manufacturer to have 99%+ destruction efficiency. However, for permitting purposes, an overall 98% reduction in VOC emissions from un-controlled emissions is claimed when routed to the combustor and 95% control when routed to the VRU.

VRU

As discussed below, it is assumed that the VRU will be down 200 hours per year. Thus, uncaptured/controlled emissions from gases managed through the VRU will be 5% of the hourly loading over 8560 hours per year. As VOCs represents approximately 70% of the total mass loading, VOC emissions are estimated at 7.31 lb/Hr [208.79 x 70% x 0.05] or 31.27 tpy.

HAPs represent approximately 3.4% of the mass loading to the VRU. Thus, un-captured/controlled HAP emissions from the VRU are estimated at 0.24 lb/hr [208.79 x 2.3% x 0.05] or 1.03 tpy.

n-Hexane is the largest component of the total HAPs, representing approximately 85.6% of the total HAP loading to the VRU. Thus, potential uncaptured/controlled n-Hexane emissions are

estimated at 0.21 lb/Hr [0.24 x .856] or or 0.88 tpy. The next largest HAP constituent is Toluene which as potential emissions of 0.008 lb/hr or 0.04 tpy. No other HAP has potential emissions greater than 0.01 tpy.

Methane comprises approximately 11.7% of the maximum loading (weight) of the combined gas stream to the VRU or 24.43 lb/Hr. At a 5% uncaptured/controlled, methane emissions from the VRU control system is potentially 1.22 lb/hr or 5.22 tpy. With a GHG factor of 25, this equates to CO2e emissions of 30.5 lb/hr and 130.5 tpy.

Combustor

As shown in the emissions calculation spreadsheet, the density and heat content of the produced water flash gas and the condensate flash gas are as follows. It is assumed that working/breathing losses from the condensate tanks is the same as the flash gas from these tanks.

Condensate Flash Gas	Gas Density: 0.110 lb/scf	HHV: 2290 BTU/scf
Produced Water Flash Gas	Gas Density: 0.085 lb/scf	HHV: 1747 BTU/scf

Using this data, the heat loading to the combustor is determined as follows:

Condensate Flash Gas and Working Breathing Losses:
204.63 lb/hr÷0.11 lb/scf = 1860 scf/hr and 4.26 MMBTU/Hr

Produced Water Flash Gas:
4.16 lb/hr÷0.085 lb/scf = 49 scf/hr and 0.086 MMBTU/Hr

The total heat loading to the combustor (4.35 MMBTU/Hr) is well within the 10.0 MMBTU/Hr capacity of the combustor and capable of managing flash gas from any slugs of condensate that may enter the system.

The overall flow to the combustor is 1909 scf/hr (45,816 scf/day) at 2277 BTU/scf. Mass loading to the combustor is 208.8
Lb/Hr.

As noted in the Project Overview, it is anticipated that the VRU will be un-available for a maximum of 200 hours per year. Thus, annual flow to the combustor (excluding any loading due to condensate slugs generating un-anticipated excess flash gas) is 0.382 MMSCF/yr. To accommodate any overloads to the VRU, this number has been doubled to 0.764 MMSCF/yr within this application.

VOC Emissions

VOC content of this combined vapor stream is approximately 70%. With a 98% capture and control efficiency of all VOCs going to the combustor, hourly VOC emissions are 2.92 lb/hr [208.81 lb/Hr x 0.70 x 0.02] or 0.58 tpy (based on a doubling of the anticipated 200 hours per year as described above). This hourly and annual VOC emission rate has been entered into the preceding emissions spreadsheet.

HAP Emissions

As noted above, HAPs represent approximately 2.3% of the VOC in gas going to the combustor. Thus, based on the VOC emissions calculated above, anticipated HAP emissions are 0.10 lb/hr [208.81 Lb/Hr x 0.023 x 0.02] and 0.02 tpy. Again, this hourly and annual VOC emission rate has been entered into the preceding emissions spreadsheet

GHG Emissions

As noted above, the maximum loading to the combustor is estimated at 208.81 lb/hr. Methane represents approximately 11.7% (weight) of the combined gas stream to the combustor or 24.43 lb/Hr. At a 2% incomplete combustion, non-combusted methane is 0.49 lb/hr or 0.10 tpy. These amounts are presented in the combustor calculation sheet in lieu of the AP-42 emission factors which are not appropriate for a gas stream of this composition.

Jay-Bee Oil & Gas - Dopey

Flash Emission Calculations

Using Gas-Oil Ratio Method

Un-Controlled

Site specific data			
Gas-Oil-ratio	=	500	scf/bbl Using Actual GOR from RPT-8
Throughput	=	32,400	bbl/yr
Stock tank gas molecular weight	=	39.56	g/mole

Conversions			
1 lb	=	453.6	g
1 mole	=	22.4	L
1 scf	=	28.32	L
1 ton	=	2000	lb

Equations

$$E_{TOT} = Q\frac{(bbl)}{(yr)} \times R\frac{(scf)}{(bbl)} \times \frac{28.32(L)}{1(scf)} \times \frac{1(mole)}{22.4(L)} \times MW\frac{(g)}{(mole)} \times \frac{1(lb)}{453.6(g)}) \times \frac{1(ton)}{2000(lb)}$$

E_{TOT} = Total stock tank flash emissions (TPY)
R = Measured gas-oil ratio (scf/bbl)
Q = Throughput (bbl/yr)
MW = Stock tank gas molecular weight (g/mole)

$$E_{spec} = E_{TOT} \times X_{spec}$$

E_{spec} = Flash emission from constituent
X_{spec} = Weight fraction of constituent in stock tank gas

Flash Emissions

Constituent	TPY	
Total	893.1276	E_{TOT}
VOC	**626.6987**	Sum of C3+
Nitrogen	2.23E-01	
Carbon Dioxide	1.40E+00	
Methane	8.87E+01	
Ethane	1.76E+02	
Propane	2.31E+02	
Isobutane	6.26E+01	
n-Butane	1.44E+02	
2,2 Dimethylpropane	1.76E+00	
Isopentane	4.93E+01	
n-Pentane	5.17E+01	
2,2 Dimethylbutane	1.87E+00	
Cyclopentane	0.00E+00	
2,3 Dimethylbutane	2.71E+00	
2 Methylpentane	1.44E+01	
3 Methylpentane	8.58E+00	
n-Hexane	1.88E+01	HAP
Methylcyclopentane	1.37E+00	
Benzene	3.22E-01	HAP
Cyclohexane	1.94E+00	
2-Methylhexane	4.16E+00	
3-Methylhexane	4.09E+00	
2,2,4 Trimethylpentane	0.00E+00	
Other C7's	3.89E+00	
n-Heptane	6.02E+00	
Methylcyclohexane	3.74E+00	
Toluene	7.32E-01	HAP
Other C8's	6.12E+00	
n-Octane	2.04E+00	
Ethylbenzene	4.47E-02	HAP
M & P Xylenes	5.27E-01	HAP
O-Xylene	7.15E-02	HAP
Other C9's	2.54E+00	
n-Nonane	6.07E-01	
Other C10's	9.56E-01	
n-Decane	1.25E-01	
Undecanes (11)	1.34E-01	

April 24, 2014

FESCO, Ltd.
1100 Fesco Avenue - Alice, Texas 78332

For: Jay-Bee Oil & Gas, Inc.
1720 Route 22 East
Union, New Jersey 07083

Date Sampled: 04/07/14

Date Analyzed: 04/21/14

Sample: RPT 8-1

Job Number: J42794

FLASH LIBERATION OF HYDROCARBON LIQUID		
	Separator HC Liquid	**Stock Tank**
Pressure, psig	340	0
Temperature, °F	65	70
Gas Oil Ratio (1)	------	500
Gas Specific Gravity (2)	------	1.387
Separator Volume Factor (3)	1.2987	1.000

STOCK TANK FLUID PROPERTIES	
Shrinkage Recovery Factor (4)	0.7700
Oil API Gravity at 60 °F	70.79
Reid Vapor Pressure, psi (5)	5.28

Quality Control Check			
	Sampling Conditions	**Test Samples**	
Cylinder No.	------	W-2408*	W-2423
Pressure, psig	340	299	297
Temperature, °F	65	66	66

(1) - Scf of flashed vapor per barrel of stock tank oil
(2) - Air = 1.000
(3) - Separator volume / Stock tank volume
(4) - Fraction of first stage separator liquid
(5) - Absolute pressure at 100 deg F
Analyst: M. G.
* Sample used for flash study
Base Conditions: 14.85 PSI & 60 °F

Certified: FESCO, Ltd. - Alice, Texas

David Dannhaus 361-661-7015

April 23, 2014

FESCO, Ltd.
1100 Fesco Ave. - Alice, Texas 78332

For: Jay-Bee Oil & Gas, Inc.
1720 Route 22 East
Union, New Jersey 07083

Sample: RPT 8-1
Gas Evolved from Hydrocarbon Liquid Flashed
From 340 psig & 65 °F to 0 psig & 70 °F

Date Sampled: 04/07/14 Job Number: 42794.001

CHROMATOGRAPH EXTENDED ANALYSIS - SUMMATION REPORT - GPA 2286

COMPONENT	MOL%	GPM
Hydrogen Sulfide*	< 0.001	
Nitrogen	0.036	
Carbon Dioxide	0.141	
Methane	24.485	
Ethane	25.943	6.993
Propane	23.253	6.457
Isobutane	4.773	1.574
n-Butane	10.980	3.489
2-2 Dimethylpropane	0.108	0.042
Isopentane	3.027	1.116
n-Pentane	3.175	1.160
Hexanes	2.378	0.988
Heptanes Plus	1.701	0.761
Totals	100.000	22.579

Computed Real Characteristics Of Heptanes Plus:

Specific Gravity	3.599	(Air=1)
Molecular Weight	102.69	
Gross Heating Value	5488	BTU/CF

Computed Real Characteristics Of Total Sample:

Specific Gravity	1.387	(Air=1)
Compressibility (Z)	0.9850	
Molecular Weight	39.56	
Gross Heating Value		
Dry Basis	2321	BTU/CF
Saturated Basis	2282	BTU/CF

*Hydrogen Sulfide tested in laboratory by: Stained Tube Method (GPA 2377)
Results: <0.013 Gr/100 CF, <0.2 PPMV or <0.001 Mol %

Base Conditions: 14.850 PSI & 60 Deg F

Certified: FESCO, Ltd. - Alice, Texas

Analyst: MR
Processor: AL
Cylinder ID: ST# 20

David Dannhaus 361-661-7015

CHROMATOGRAPH EXTENDED ANALYSIS
TOTAL REPORT - GPA 2286

COMPONENT	MOL %	GPM	WT %
Hydrogen Sulfide*	< 0.001		< 0.001
Nitrogen	0.036		0.025
Carbon Dioxide	0.141		0.157
Methane	24.485		9.930
Ethane	25.943	6.993	19.719
Propane	23.253	6.457	25.920
Isobutane	4.773	1.574	7.013
n-Butane	10.980	3.489	16.132
2,2 Dimethylpropane	0.108	0.042	0.197
Isopentane	3.027	1.116	5.521
n-Pentane	3.175	1.160	5.791
2,2 Dimethylbutane	0.096	0.040	0.209
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.139	0.057	0.303
2 Methylpentane	0.738	0.309	1.608
3 Methylpentane	0.441	0.181	0.961
n-Hexane	0.964	0.400	2.100
Methylcyclopentane	0.072	0.025	0.153
Benzene	0.018	0.005	0.036
Cyclohexane	0.102	0.035	0.217
2-Methylhexane	0.184	0.086	0.466
3-Methylhexane	0.181	0.083	0.458
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C7's	0.174	0.076	0.436
n-Heptane	0.266	0.124	0.674
Methylcyclohexane	0.169	0.068	0.419
Toluene	0.035	0.012	0.082
Other C8's	0.246	0.115	0.685
n-Octane	0.079	0.041	0.228
Ethylbenzene	0.002	0.001	0.005
M & P Xylenes	0.022	0.009	0.059
O-Xylene	0.003	0.001	0.008
Other C9's	0.089	0.046	0.284
n-Nonane	0.021	0.012	0.068
Other C10's	0.030	0.018	0.107
n-Decane	0.004	0.002	0.014
Undecanes (11)	0.004	0.002	0.015
Totals	100.000	22.579	100.000

Computed Real Characteristics Of Total Sample:

Specific Gravity	1.387	(Air=1)
Compressibility (Z)	0.9850	
Molecular Weight	39.56	
Gross Heating Value		
Dry Basis	2321	BTU/CF
Saturated Basis	2282	BTU/CF

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

Identification

User Identification:	Dopey Condensate
City:	Huntington
State:	West Virginia
Company:	Jay-Bee Oil & Gas
Type of Tank:	Vertical Fixed Roof Tank
Description:	210 BBL Condensate Tanks - Emissions from a Single Tank

Tank Dimensions

Shell Height (ft):	15.00
Diameter (ft):	10.00
Liquid Height (ft) :	14.00
Avg. Liquid Height (ft):	10.00
Volume (gallons):	8,225.29
Turnovers:	51.06
Net Throughput(gal/yr):	453,600.00
Is Tank Heated (y/n):	N

Paint Characteristics

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

Roof Characteristics

Type:	Cone
Height (ft)	0.25
Slope (ft/ft) (Cone Roof)	0.04

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Huntington, West Virginia (Avg Atmospheric Pressure = 14.33 psia)

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

Dopey Condensate - Vertical Fixed Roof Tank
Huntington, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 6)	All	61.42	53.10	69.74	57.09	3.0220	2.5373	3.5797	69.0000			92.00	Option 4: RVP=6, ASTM Slope=3

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Dopey Condensate - Vertical Fixed Roof Tank
Huntington, West Virginia

Annual Emission Calcaulations	
Standing Losses (lb):	451.6638
Vapor Space Volume (cu ft):	399.2441
Vapor Density (lb/cu ft):	0.0373
Vapor Space Expansion Factor:	0.1508
Vented Vapor Saturation Factor:	0.5512
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	399.2441
Tank Diameter (ft):	10.0000
Vapor Space Outage (ft):	5.0833
Tank Shell Height (ft):	15.0000
Average Liquid Height (ft):	10.0000
Roof Outage (ft):	0.0833
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.0833
Roof Height (ft):	0.2500
Roof Slope (ft/ft):	0.0400
Shell Radius (ft):	5.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0373
Vapor Molecular Weight (lb/lb-mole):	69.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.0220
Daily Avg. Liquid Surface Temp. (deg. R):	521.0866
Daily Average Ambient Temp. (deg. F):	54.8458
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	516.7558
Tank Paint Solar Absorptance (Shell):	0.5400
Tank Paint Solar Absorptance (Roof):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,246.2101
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.1508
Daily Vapor Temperature Range (deg. R):	33.2847
Daily Vapor Pressure Range (psia):	1.0425
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.0220
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	2.5373
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	3.5797
Daily Avg. Liquid Surface Temp. (deg R):	521.0866
Daily Min. Liquid Surface Temp. (deg R):	512.7654
Daily Max. Liquid Surface Temp. (deg R):	529.4077
Daily Ambient Temp. Range (deg. R):	20.0583
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.5512
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	3.0220
Vapor Space Outage (ft):	5.0833

Working Losses (lb):	1,698.4482
Vapor Molecular Weight (lb/lb-mole):	69.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.0220
Annual Net Throughput (gal/yr.):	453,600.0000
Annual Turnovers:	51.0620
Turnover Factor:	0.7542
Maximum Liquid Volume (gal):	8,225.2880
Maximum Liquid Height (ft):	14.0000
Tank Diameter (ft):	10.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	2,150.1120

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

Emissions Report for: Annual

Dopey Condensate - Vertical Fixed Roof Tank
Huntington, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 6)	1,698.45	451.66	2,150.11

x 3 Tanks = 6450 lb/yr or 3.23 tpy

Jay-Bee Oil & Gas - Dopey

Flash Emission Calculations - Produced Water

Using Gas-Water Ratio Method

Un-Controlled

Site specific data

Gas-Water-ratio	=	5	scf/bbl Using GOW from comparable well pad
Throughput	=	66,000	bbl/yr
Stock tank gas molecular weight	=	39.56	g/mole

Conversions

1 lb	=	453.6	g
1 mole	=	22.4	L
1 scf	=	28.32	L
1 ton	=	2000	lb

Equations

$$E_{TOT} = Q\frac{(bbl)}{(yr)} \times R\frac{(scf)}{(bbl)} \times \frac{28.32(L)}{1(scf)} \times \frac{1(mole)}{22.4(L)} \times MW\frac{(g)}{(mole)} \times \frac{1(lb)}{453.6(g)}) \times \frac{1(ton)}{2000(lb)}$$

E_{TOT} = Total stock tank flash emissions (TPY)

R = Measured gas-oil ratio (scf/bbl)

Q = Throughput (bbl/yr)

MW = Stock tank gas molecular weight (g/mole)

$$E_{spec} = E_{TOT} \times X_{spec}$$

E_{spec} = Flash emission from constituent

X_{spec} = Weight fraction of constituent in stock tank gas

Flash Emissions

Constituent	TPY	
Total	18.1933	E_{TOT}
VOC	**12.7661**	Sum of C3+
Nitrogen	4.55E-03	
Carbon Dioxide	2.86E-02	
Methane	1.81E+00	
Ethane	3.59E+00	
Propane	4.72E+00	
Isobutane	1.28E+00	
n-Butane	2.93E+00	
2,2 Dimethylpropane	3.58E-02	
Isopentane	1.00E+00	
n-Pentane	1.05E+00	
2,2 Dimethylbutane	3.80E-02	
Cyclopentane	0.00E+00	
2,3 Dimethylbutane	5.51E-02	
2 Methylpentane	2.93E-01	
3 Methylpentane	1.75E-01	
n-Hexane	3.82E-01	HAP
Methylcyclopentane	2.78E-02	
Benzene	6.55E-03	HAP
Cyclohexane	3.95E-02	
2-Methylhexane	8.48E-02	
3-Methylhexane	8.33E-02	
2,2,4 Trimethylpentane	0.00E+00	
Other C7's	7.93E-02	
n-Heptane	1.23E-01	
Methylcyclohexane	7.62E-02	
Toluene	1.49E-02	HAP
Other C8's	1.25E-01	
n-Octane	4.15E-02	
Ethylbenzene	9.10E-04	HAP
M & P Xylenes	1.07E-02	HAP
O-Xylene	1.46E-03	HAP
Other C9's	5.17E-02	
n-Nonane	1.24E-02	
Other C10's	1.95E-02	
n-Decane	2.55E-03	
Undecanes (11)	2.73E-03	

September 2, 2015

FESCO, Ltd.
1100 Fesco Avenue - Alice, Texas 78332

For: SE Technologies, LLC
Building D, Second Floor
98 Vanadium Road
Bridgeville, Pennsylvania 15017-3061

Date Sampled: 08/12/15

Date Analyzed: 08/22/15

Job Number: [redacted]

Sample: [redacted] Well B1 2H

FLASH LIBERATION OF SEPARATOR WATER		
	Separator	**Stock Tank**
Pressure, psig	540	0
Temperature, °F	78	70
Gas Water Ratio (1)	------	4.06
Gas Specific Gravity (2)	------	1.069

(1) - Scf of water saturated vapor per barrel of stock tank water
(2) - Air = 1.000
(3) - Separator volume / Stock tank volume
Analyst: T.G.

Piston No. : WF# 235

Base Conditions: 14.65 PSI & 60 °F

Certified: FESCO, Ltd. Alice, Texas

David Dannhaus 361-661-7015

August 27, 2015

FESCO, Ltd.
1100 Fesco Ave. - Alice, Texas 78332

For: SE Technologies, LLC
Building D, Second Floor
98 Vanadium Road
Bridgeville, Pennsylvania 15017-3061

Sample: [redacted] Well B1 2H
Gas Liberated from Separator Water
From 540 psig & 78 °F to 0 psig & 70 °F

Date Sampled: 08/12/15 Job Number: [redacted]

CHROMATOGRAPH EXTENDED ANALYSIS - SUMMATION REPORT - GPA 2286

COMPONENT	MOL%	GPM
Hydrogen Sulfide*	< 0.001	
Nitrogen	1.821	
Carbon Dioxide	1.049	
Methane	56.602	
Ethane	16.424	4.367
Propane	8.000	2.191
Isobutane	1.516	0.493
n-Butane	4.274	1.340
2-2 Dimethylpropane	0.054	0.020
Isopentane	1.730	0.629
n-Pentane	2.405	0.867
Hexanes	2.953	1.209
Heptanes Plus	3.172	1.397
Totals	100.000	12.514

Computed Real Characteristics Of Heptanes Plus:

Specific Gravity	3.549	(Air=1)
Molecular Weight	101.90	
Gross Heating Value	5380	BTU/CF

Computed Real Characteristics Of Total Sample:

Specific Gravity	1.069	(Air=1)
Compressibility (Z)	0.9914	
Molecular Weight	30.68	
Gross Heating Value		
Dry Basis	1741	BTU/CF
Saturated Basis	1712	BTU/CF

*Hydrogen Sulfide tested in laboratory by: Stained Tube Method (GPA 2377)
Results: <0.013 Gr/100 CF, <0.2 PPMV or <0.001 Mol %

Base Conditions: 14.650 PSI & 60 Deg F

Sampled By: (16) Gonzalez
Analyst: MR
Processor: OA
Cylinder ID: WF# 10S

Certified: FESCO, Ltd. Alice, Texas
David Dannhaus 361-661-7015

CHROMATOGRAPH EXTENDED ANALYSIS
TOTAL REPORT - GPA 2286

COMPONENT	MOL %	GPM	WT %
Hydrogen Sulfide*	< 0.001		< 0.001
Nitrogen	1.821		1.663
Carbon Dioxide	1.049		1.505
Methane	56.602		29.592
Ethane	16.424	4.367	16.095
Propane	8.000	2.191	11.497
Isobutane	1.516	0.493	2.872
n-Butane	4.274	1.340	8.096
2,2 Dimethylpropane	0.054	0.020	0.127
Isopentane	1.730	0.629	4.069
n-Pentane	2.405	0.867	5.655
2,2 Dimethylbutane	0.075	0.031	0.211
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.145	0.059	0.407
2 Methylpentane	0.807	0.333	2.268
3 Methylpentane	0.520	0.211	1.461
n-Hexane	1.405	0.575	3.947
Methylcyclopentane	0.134	0.046	0.368
Benzene	0.028	0.008	0.072
Cyclohexane	0.185	0.063	0.507
2-Methylhexane	0.337	0.156	1.102
3-Methylhexane	0.351	0.159	1.145
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C7's	0.326	0.141	1.054
n-Heptane	0.588	0.270	1.921
Methylcyclohexane	0.318	0.127	1.018
Toluene	0.053	0.018	0.158
Other C8's	0.486	0.225	1.747
n-Octane	0.147	0.075	0.548
Ethylbenzene	0.003	0.001	0.011
M & P Xylenes	0.026	0.010	0.090
O-Xylene	0.003	0.001	0.010
Other C9's	0.129	0.065	0.530
n-Nonane	0.024	0.013	0.099
Other C10's	0.025	0.015	0.116
n-Decane	0.004	0.003	0.020
Undecanes (11)	0.004	0.002	0.019
Totals	100.000	12.514	100.000

Computed Real Characteristics Of Total Sample:

Specific Gravity	1.069	(Air=1)
Compressibility (Z)	0.9914	
Molecular Weight	30.68	
Gross Heating Value		
Dry Basis	1741	BTU/CF
Saturated Basis	1712	BTU/CF

Condensate
Truck Loading Lost Emissions Per AP-42

Per AP-42, Chapter 5.2.2.1.1, the uncontrolled loading loss emission factor L_L can be estimated as follows:

$$L_L = 12.46[SPM/T]$$

Where:

L_L = uncontrolled loading loss in pounds per 1000 gallons of liquid loaded
S= saturation factor (0.6)
P=true vapor pressure of liquid loaded: 3.6 psia (per AP-42 conversion of RVP to TVP)
M= Molecular weight of vapor in lb/lb-mole 64.35 (see attached breathing vapor analysis report)
T= temperature of bulk liquid loaded in deg R or 460+deg F (60 Deg F)

Thus, $L_L = 12.46[0.6 \times 3.6 \times 64.35]/[460+60]$
$L_L = 3.33$ lb/1000 gallons loaded

Based on sample data of breathing vapor (attached), these emissions are 99.4% VOCs. It is assumed that vapor composition from truck loading is the same as that from the tank breathing vapors.

Given a maximum loading of 200 BBL (8,400 gallons) a day, uncontrolled VOC emissions are estimated at 27.8 lb of VOC per day [8,4 x 3.33 x 0.994]. With all daily loading taking place within 1 hour, the average hourly un-controlled emission rate is therefore also estimated at 27.8 lb/hr VOCs. Emissions from truck loading are un-controlled.

Maximum annual throughput is 1,360,800 gallons (32,400 barrels) per year. Thus, un-captured/un-controlled VOC emissions are conservatively estimated at 4505 pounds per year [1361 x 3.33 x .994] or 2.25 tons per year.

Based on the attached analysis of a representative tank's breathing emissions, HAPs represent 4.9 percent of the emissions. Thus, daily HAPs emissions equal 1.37 lb/hr [8.40 x 3.33 x 0.049]. Annual maximum HAPs emissions are estimated at 222.1 lb/yr [1361 x 3.33 x 0.049] or 0.11 tpy.

.

Produced Water
Truck Loading Lost Emissions Per AP-42

Per AP-42, Chapter 5.2.2.1.1, the uncontrolled loading loss emission factor L_L can be estimated as follows:

$$L_L = 12.46[SPM/T]$$

Where:

L_L = uncontrolled loading loss in pounds per 1000 gallons of liquid loaded
S= saturation factor (0.6)
P= true vapor pressure of liquid loaded: 0.3 psia (water at 60 Deg. F)
M= Molecular weight of vapor in lb/lb-mole 24.78 (flash gas of comparable water sample)
T= temperature of bulk liquid loaded in deg R or 460+deg F (60 Deg F)

Thus, $L_L = 12.46[0.6 \times 0.3 \times 24.78]/[460+60]$
$L_L = 0.11$ lb/1000 gallons loaded

Based on sample data of breathing vapor (attached), these emissions are 36.59% VOCs. It is assumed that vapor composition from truck loading is the same as that from the tank breathing vapors.

Given a maximum loading of 240 BBL (10,080 gallons) a day, uncontrolled VOC emissions are estimated at 0.42 lb of VOC per day [10.08 x 0.11 x .366]. With all daily loading taking place within 4 hours, the average hourly un-controlled emission rate is estimated at 0.11 lb/hr VOCs. Emissions from truck loading are un-controlled.

Maximum annual throughput is 2,772,000 gallons (66,000 barrels) per year. Thus, un-captured/un-controlled VOC emissions are conservatively estimated at 111.6 pounds per year [2,772 x 0.11 x .366] or 0.06 tons per year.

.

Attachment N
FUGITIVE EMISSIONS FROM UNPAVED HAULROADS

UNPAVED HAULROADS (including all equipment traffic involved in process, haul trucks, endloaders, etc.)

		PM	PM-10
k =	Particle size multiplier	0.80	0.36
s =	Silt content of road surface material (%)	10	3
p =	Number of days per year with precipitation >0.01 in.	157	157

Item Number	Description	Number of Wheels	Mean Vehicle Weight (tons)	Mean Vehicle Speed (mph)	Miles per Trip	Maximum Trips per Hour	Maximum Trips per Year	Control Device ID Number	Control Efficiency (%)
1	Produced Water Tanker Truck	18	27	10	0.78	1	550	None	0
2	Condensate Tanker Truck	18	27	10	0.78	1	162	None	0
3									
4									
5									
6									
7									
8									

Source: *AP-42 Fifth Edition – 13.2.2 Unpaved Roads*

$E = k \times 5.9 \times (s \div 12) \times (S \div 30) \times (W \div 3)^{0.7} \times (w \div 4)^{0.5} \times ((365 - p) \div 365) =$ lb/Vehicle Mile Traveled (VMT)

Where:

		PM	PM-10
k =	Particle size multiplier	0.80	0.36
s =	Silt content of road surface material (%)	10	3
S =	Mean vehicle speed (mph)	10	10
W =	Mean vehicle weight (tons)	27	27
w =	Mean number of wheels per vehicle	18	18
p =	Number of days per year with precipitation >0.01 in.	157	157

For lb/hr: [lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] = lb/hr

For TPY: [lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] × [Ton ÷ 2000 lb] = Tons/year

SUMMARY OF UNPAVED HAULROAD EMISSIONS

Item No.	PM				PM-10			
	Uncontrolled		Controlled		Uncontrolled		Controlled	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
1	11.02	3.03	11.02	3.03	1.49	0.41	1.49	0.41
2	5.51	0.44	5.51	0.44	0.74	0.06	0.74	0.06
3								
4								
5								
6								
7								
8								
TOTALS	16.53	3.47	16.53	3.47	1.56	0.47	1.56	0.47

FUGITIVE EMISSIONS FROM PAVED HAULROADS

INDUSTRIAL PAVED HAULROADS (including all equipment traffic involved in process, haul trucks, endloaders, etc.)

I =	Industrial augmentation factor (dimensionless)	
n =	Number of traffic lanes	
s =	Surface material silt content (%)	
L =	Surface dust loading (lb/mile)	

Item Number	Description	Mean Vehicle Weight (tons)	Miles per Trip	Maximum Trips per Hour	Maximum Trips per Year	Control Device ID Number	Control Efficiency (%)
1	None						
2							
3							
4							
5							
6							
7							
8							

Source: *AP-42 Fifth Edition – 11.2.6 Industrial Paved Roads*

$E = 0.077 \times I \times (4 \div n) \times (s \div 10) \times (L \div 1000) \times (W \div 3)^{0.7}$ = lb/Vehicle Mile Traveled (VMT)

Where:

I =	Industrial augmentation factor (dimensionless)	
n =	Number of traffic lanes	
s =	Surface meterial silt content (%)	
L =	Surface dust loading (lb/mile)	
W =	Average vehicle weight (tons)	

For lb/hr: [lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] = lb/hr

For TPY: [lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] × [Ton ÷ 2000 lb] = Tons/year

SUMMARY OF PAVED HAULROAD EMISSIONS

Item No.	Uncontrolled		Controlled	
	lb/hr	TPY	lb/hr	TPY
1				
2				
3				
4				
5				
6				
7				
8				
TOTALS				

ATTACHMENT O

Monitoring, Recordkeeping, Reporting and Testing Plan

ATTACHMENT O

JAY-BEE OIL & GAS, Inc.

Dopey Well Pad Production Facility

Monitoring, Recordkeeping, Reporting and Testing Plan

I. Monitoring

Engines

Jay-Bee Oil & Gas (Jay-Bee) will monitor and record engine hours of operation on a daily basis. Additionally, Jay-Bee will monitor the amount of gas managed by the facility on a daily basis as well as gas consumed in operating the VRU compressor engine on a monthly basis. Together, this information will allow the company to determine emissions for the engine, utilizing the catalyst manufacturer's warranted emission factors.

The air to fuel ratio will be monitored on a monthly basis to ensure proper operation of the catalytic converters. Additionally, the catalytic converters will be inspected and maintained in accordance with the manufacturer's specifications.

Condensate and Produced Water Tanks

Jay-Bee will monitor and record the volume of produced water and condensate being loading out on a monthly basis.

Heaters

Lastly, gas consumption to the GPUs and line heater will be monitored and recorded on a monthly basis.

II. Recordkeeping

Jay-Bee will maintain accurate operating records of the VRU, combustor and tanks for each calendar year. Records will include monthly fuel consumption (facility-wide), hours of operation for the engine and the amount of gas managed by the facility. These records will be signed and dated by an authorized representative.

All inspections, preventive maintenance, failures, duration of failure events, replacements and/or repair of catalytic converters will be recorded, signed and dated by an authorized representative.

All inspections, maintenance, failures, replacements and/or repair of valves and non-welded connections will be recorded, signed and dated by an authorized representative.

All records will be kept either on site or at the nearest office location for a period of at least five (5) years.

III. Testing

No testing is planned for this facility, unless specifically requested by the Department. The sole compressor engine is rated at 84 Hp and does not require testing under Subpart JJJJ [40 CFR 60.4243 (a)(2)(i)].

IV. Reporting

Jay-Bee will submit certified emission statements on an annual basis in accordance with WVDEP, Division of Air Quality requirements.

ATTACHMENT P

Public Notice

Affidavit Notice Will Be Submitted Upon Receipt

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that Jay-Bee Oil & Gas, Inc. has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for an NSR Construction Permit for its Dopey Well Pad Production Facility located off of Indian Creek Road near Alma, WV in Tyler County., West Virginia. The latitude and longitude coordinates are: Lat.39.43806, Long. -80.77255.

The applicant estimates the potential to discharge the following regulated air pollutants:

3.32 tons of Nitrogen Oxides per year
3.99 tons of Carbon Monoxide per year
35.27 tons of Volatile Organics per year
0.02 tons of Sulfur Dioxide per year
3.72 tons of Particulate Matter per year
0.92 tons of n-Hexane
0.04 tons of Toluene
0.07 tons of Formaldehyde
3,605 tons of CO_{2e} per year

Startup of the facility is anticipated to take place on or about the 15th day of July, 2016. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.

Dated this the **(Day)** day of **(Month)**, **(Year)**.

By: Mr. Shane Dowell
Office Manager
Jay-Bee Oil & Gas, Inc.