

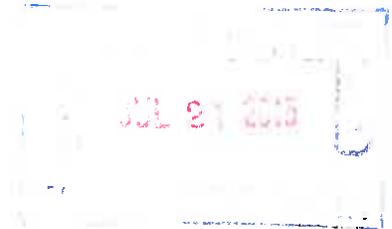
July 17, 2015

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



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

**RE: Application for Class II Administrative Update  
RTP-5 Well Pad  
Registration G70-A054  
Facility ID No. 95-00041  
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 three copies of the Application for a Class II Administrative Update to the G70-A General Permit Registration for its RTP-5 Well Pad in Tyler County. This Update is for replacement of the VRU control system for the tank emissions with an enclosed combustor and installation of a Thermoelectric Generator. No other changes are being requested at this time.

An application fee in the amount of \$300 (\$300 Class II Administrative Update Fee) was determined to be applicable. A check, payable to WVDEP – Division of Air Quality in the amount of \$300 is included in the pocket in the application with the original signature.

If there are any questions or concerns regarding this application, please contact me at 412/221-1100, x 1628 or [rdhonau@se-env.com](mailto:rdhonau@se-env.com) and we will provide any needed clarification or additional information immediately.

Sincerely,

**SE TECHNOLOGIES, LLC**

A handwritten signature in black ink that reads 'Roger A. Dhonau'.

Roger A. Dhonau, PE, QEP  
Principal

Enclosures

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

**APPLICATION FOR  
CLASS II ADMINISTRATIVE UPDATE**

**Jay-Bee Oil & Gas, Inc.**

**RTP-5 Well Pad**

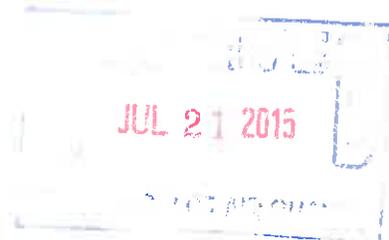
**Tyler County, West Virginia**

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**SECTION I**

**Application Form**



WEST VIRGINIA  
 DEPARTMENT OF ENVIRONMENTAL PROTECTION  
 DIVISION OF AIR QUALITY  
 601 57<sup>th</sup> Street, SE  
 Charleston, WV 25304  
 Phone: (304) 926-0475 • www.dep.wv.gov/daq

**APPLICATION FOR GENERAL PERMIT REGISTRATION**  
 CONSTRUCT, MODIFY, RELOCATE OR ADMINISTRATIVELY UPDATE  
 A STATIONARY SOURCE OF AIR POLLUTANTS

- CONSTRUCTION     MODIFICATION     RELOCATION     CLASS I ADMINISTRATIVE UPDATE  
 CLASS II ADMINISTRATIVE UPDATE

**CHECK WHICH TYPE OF GENERAL PERMIT REGISTRATION YOU ARE APPLYING FOR:**

- |   |   |
|---|---|
| <input type="checkbox"/> <b>G10-D</b> – Coal Preparation and Handling                                   | <input type="checkbox"/> <b>G40-C</b> – Nonmetallic Minerals Processing                             |
| <input type="checkbox"/> <b>G20-B</b> – Hot Mix Asphalt   | <input type="checkbox"/> <b>G50-B</b> – Concrete Batch  |
| <input type="checkbox"/> <b>G30-D</b> – Natural Gas Compressor Stations                                 | <input type="checkbox"/> <b>G60-C</b> – Class II Emergency Generator                                |
| <input type="checkbox"/> <b>G33-A</b> – Spark Ignition Internal Combustion Engines                      | <input type="checkbox"/> <b>G65-C</b> – Class I Emergency Generator                                 |
| <input type="checkbox"/> <b>G35-A</b> – Natural Gas Compressor Stations (Flare/Glycol Dehydration Unit) | <input checked="" type="checkbox"/> <b>G70-A</b> – Class II Oil and Natural Gas Production Facility |

**SECTION I. GENERAL INFORMATION**

1. Name of applicant (as registered with the WV Secretary of State's Office): <b>Jay-Bee Oil &amp; Gas, Inc.</b>		2. Federal Employer ID No. (FEIN): <b>55-073-8862</b>	
3. Applicant's mailing address: <b>3570 Shields Hill Rd Cairo, WV 26337</b>		4. Applicant's physical address: <b>3570 Shields Hill Rd Cairo, WV 26337</b>	
5. If Applicant is a subsidiary corporation, please provide the name of parent corporation. <b>N/A</b>			
<b>WV BUSINESS REGISTRATION.</b> Is the applicant a resident of the State of West Virginia? <input checked="" type="checkbox"/> YES <input type="checkbox"/> 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 <b>Attachment A</b> . IF NO, provide a copy of the Certificate of Authority / Authority of LLC / Registration (one page) including any name change amendments or other Business Certificate as <b>Attachment A</b> .			

**SECTION II. FACILITY INFORMATION**

7. Type of plant or facility (stationary source) to be constructed, modified, relocated or administratively updated (e.g., coal preparation plant, primary crusher, etc.): <b>Natural Gas Well Pad Production Facility</b>	8a. Standard Industrial Classification Classification (SIC) code: <b>1311</b>	AND	8b. North American Industry System (NAICS) code: <b>211111</b>
9. DAQ Plant ID No. (for existing facilities only): <b>095-00041</b>	10. List all current 45CSR13 and other General Permit numbers associated with this process (for existing facilities only): <b>G70-A054</b>		

**A: PRIMARY OPERATING SITE INFORMATION**

11A. Facility name of primary operating site: <b>RPT-5 Well Pad</b> <hr/> <hr/>	12A. Address of primary operating site: Mailing: <b>None</b> _____ Physical: _____ <hr/> <hr/>	
13A. Does the applicant own, lease, have an option to buy, or otherwise have control of the proposed site? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO → IF YES, please explain: <b>Applicant has a lease agreement with the land owner for installation of the Well Pad and associated equipment</b> <hr/> → IF NO, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.		
14A → For <b>Modifications or Administrative Updates</b> 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 <b>MAP as Attachment F</b> . <hr/> <b>From Intersection of WV18 and CR 13 (Indian Creek Rd.), follow CR 13 east for 0.9 miles to CR 40 (Big Run Rd) Turn left Onto CR40 (north) proceed 2 miles. Lease road entrance is on the left. Proceed on lease road 1.5 miles to well pad.</b> <hr/>		
15A. Nearest city or town:  <b>Alma, WV</b>	16A. County:  <b>Tyler</b>	17A. UTM Coordinates: Northing (KM): <u>4369.7175</u> Easting (KM): <u>517.7837</u> Zone: <u>17</u>
18A. Briefly describe the proposed new operation or change (s) to the facility: <b>Natural gas production and separation of liquids.</b>		19A. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits): Latitude: <u>39.47687</u> Longitude: <u>-80.79323</u>

**B: 1<sup>ST</sup> ALTERNATE OPERATING SITE INFORMATION (only available for G20, G40, & G50 General Permits)**

11B. Name of 1 <sup>st</sup> alternate operating site: <hr/> <hr/>	12B. Address of 1 <sup>st</sup> alternate operating site: Mailing: _____ Physical: _____ <hr/> <hr/>	
13B. Does the applicant own, lease, have an option to buy, or otherwise have control of the proposed site? <input type="checkbox"/> YES <input type="checkbox"/> NO → IF YES, please explain: _____ <hr/> → IF NO, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.		

14B. → For **Modifications or Administrative Updates** 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 F**.

\_\_\_\_\_

\_\_\_\_\_

15B. Nearest city or town:	16B. County:	17B. UTM Coordinates: Northing (KM): _____ Easting (KM): _____ Zone: _____
18B. Briefly describe the proposed new operation or change (s) to the facility:		19B. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits): Latitude: _____ Longitude: _____

**C: 2<sup>ND</sup> ALTERNATE OPERATING SITE INFORMATION (only available for G20, G40, & G50 General Permits):**

11C. Name of 2 <sup>nd</sup> alternate operating site: _____	12C. Address of 2 <sup>nd</sup> alternate operating site: Mailing: _____ Physical: _____
13C. Does the applicant own, lease, have an option to buy, or otherwise have control of the proposed site? <input type="checkbox"/> YES <input type="checkbox"/> NO	
→ IF YES, please explain: _____	
→ IF NO, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE. _____	
14C. → For <b>Modifications or Administrative Updates</b> at an existing facility, please provide directions to the present location of the facility from the nearest state road;	
→ For <b>Construction or Relocation</b> permits, please provide directions to the proposed new site location from the nearest state road. Include a <b>MAP as Attachment F</b> .	
_____	
_____	

15C. Nearest city or town:	16C. County:	17C. UTM Coordinates: Northing (KM): _____ Easting (KM): _____ Zone: _____
18C. Briefly describe the proposed new operation or change (s) to the facility:		19C. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits): Latitude: _____ Longitude: _____

<p>20. Provide the date of anticipated installation or change:</p> <p><u>8 / 15 / 15</u></p> <p>If this is an <b>After-The-Fact</b> permit application, provide the date upon which the proposed change did happen: :</p> <p>____ / ____ / ____</p>	<p>21. Date of anticipated Start-up if registration is granted:</p> <p><u>8/ 20 / 15</u></p>
<p>22. Provide maximum projected <b>Operating Schedule</b> of activity/activities outlined in this application if other than 8760 hours/year. (Note: anything other than 24/7/52 may result in a restriction to the facility's operation).</p> <p>Hours per day <u>24</u> Days per week <u>7</u> Weeks per year <u>52</u> Percentage of operation <u>100</u></p>	

**SECTION III. ATTACHMENTS AND SUPPORTING DOCUMENTS**

<p>23. Include a check payable to WVDEP – Division of Air Quality with the appropriate <b>application fee</b> (per 45CSR22 and 45CSR13).</p>
<p>24. Include a <b>Table of Contents</b> as the first page of your application package.</p>
<p>All of the required forms and additional information can be found under the Permitting Section (General Permits) of DAQ's website, or requested by phone.</p>
<p>25. Please check all attachments included with this permit application. Please refer to the appropriate reference document for an explanation of the attachments listed below.</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> ATTACHMENT A : CURRENT BUSINESS CERTIFICATE</li> <li><input checked="" type="checkbox"/> ATTACHMENT B: PROCESS DESCRIPTION</li> <li><input checked="" type="checkbox"/> ATTACHMENT C: DESCRIPTION OF FUGITIVE EMISSIONS</li> <li><input checked="" type="checkbox"/> ATTACHMENT D: PROCESS FLOW DIAGRAM</li> <li><input checked="" type="checkbox"/> ATTACHMENT E: PLOT PLAN</li> <li><input checked="" type="checkbox"/> ATTACHMENT F: AREA MAP</li> <li><input checked="" type="checkbox"/> ATTACHMENT G: EQUIPMENT DATA SHEETS AND REGISTRATION SECTION APPLICABILITY FORM</li> <li><input checked="" type="checkbox"/> ATTACHMENT H: AIR POLLUTION CONTROL DEVICE SHEETS</li> <li><input checked="" type="checkbox"/> ATTACHMENT I: EMISSIONS CALCULATIONS</li> <li><input checked="" type="checkbox"/> ATTACHMENT J: CLASS I LEGAL ADVERTISEMENT</li> <li><input type="checkbox"/> ATTACHMENT K: ELECTRONIC SUBMITTAL</li> <li><input checked="" type="checkbox"/> ATTACHMENT L: GENERAL PERMIT MODIFICATION APPLICATION FEE</li> <li><input type="checkbox"/> ATTACHMENT M: SITING CRITERIA WAIVER</li> <li><input type="checkbox"/> ATTACHMENT N: MATERIAL SAFETY DATA SHEETS (MSDS)</li> <li><input checked="" type="checkbox"/> ATTACHMENT O: EMISSIONS SUMMARY SHEETS</li> <li><input checked="" type="checkbox"/> OTHER SUPPORTING DOCUMENTATION NOT DESCRIBED ABOVE (Equipment Drawings, Aggregation Discussion, etc.)</li> </ul> <p>Please mail an original and two copies of the complete General Permit Registration Application with the signature(s) to the DAQ Permitting Section, at the address shown on the front page of this application. Please DO NOT fax permit applications. For questions regarding applications or West Virginia Air Pollution Rules and Regulations, please refer to the website shown on the front page of the application or call the phone number also provided on the front page of the application.</p>

SECTION IV. CERTIFICATION OF INFORMATION

This General Permit Registration Application shall be signed below by a Responsible Official. A Responsible Official is a President, Vice President, Secretary, Treasurer, General Partner, General Manager, a member of a Board of Directors, or Owner, depending on business structure. A business may certify an Authorized Representative who shall have authority to bind the Corporation, Partnership, Limited Liability Company, Association, Joint Venture or Sole Proprietorship. Required records of daily throughput, hours of operation and maintenance, general correspondence, Emission Inventory, Certified Emission Statement, compliance certifications and all required notifications must be signed by a Responsible Official or an Authorized Representative. If a business wishes to certify an Authorized Representative, the official agreement below shall be checked off and the appropriate names and signatures entered. Any administratively incomplete or improperly signed or unsigned Registration Application will be returned to the applicant.

FOR A CORPORATION (domestic or foreign)

I certify that I am a President, Vice President, Secretary, Treasurer or in charge of a principal business function of the corporation

FOR A PARTNERSHIP

I certify that I am a General Partner

FOR A LIMITED LIABILITY COMPANY

I certify that I am a General Partner or General Manager

FOR AN ASSOCIATION

I certify that I am the President or a member of the Board of Directors

FOR A JOINT VENTURE

I certify that I am the President, General Partner or General Manager

FOR A SOLE PROPRIETORSHIP

I certify that I am the Owner and Proprietor

I hereby certify that (please print or type) \_\_\_\_\_ is an Authorized Representative and in that capacity shall represent the interest of the business (e.g., Corporation, Partnership, Limited Liability Company, Association Joint Venture or Sole Proprietorship) and may obligate and legally bind the business. If the business changes its Authorized Representative, a Responsible Official shall notify the Director of the Office of Air Quality immediately, and/or,

I hereby certify that all information contained in this General Permit Registration Application and any supporting documents appended hereto is, to the best of my knowledge, true, accurate and complete, and that all reasonable efforts have been made to provide the most comprehensive information possible

Signature \_\_\_\_\_

(please use blue ink)



Responsible Official

7-15-15

Date

Name & Title Shane Dowell, Office Manager

(please print or type)

Signature \_\_\_\_\_

(please use blue ink)

Authorized Representative (if applicable)

Date

Applicant's Name \_\_\_\_\_

Phone & Fax

304/628-3119

Phone

304/628-3119

Fax

Email

sdowell@jaybeeoil.com

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**ATTACHMENT A**

**Business Registration**

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: **08/11/2010**

This certificate is issued by:  
**The West Virginia State Tax Commissioner  
In accordance with W.Va. Code § 1-1-2**

The person or persons mentioned on this certificate are authorized  
to conduct business in the State of West Virginia at the location(s) above.

This certificate is not transferrable and shall be displayed in the location for which issued.

This certificate shall be maintained until cessation of the business for which the certificate of registration  
was granted or until it is suspended, revoked or annulled by the Tax Commission.

Change in name or change of location shall require 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 carry a copy of  
this certificate displayed at every job site within West Virginia.

aL008 v.1  
L1369190484

SCANNED  
JUN 14 10

08/11/2010 10:14 AM  
JAY-BEE OIL & GAS INC

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**ATTACHMENT B**

**Process Description**

**Jay-Bee Oil & Gas, Incorporated**  
**RTP-5 Well Pad**  
**Attachment B**  
**Process Description**

Jay-Bee Oil & Gas currently operates its RTP-5 Well Pad under General Permit registration number G70-A054. The following describes the current operations and the desired changes.

Natural gas and Produced Fluids (condensate and water) are currently received from three wells on this well pad and passed through Gas Processing Units or GPUs (one per well) to avoid ice and methane hydrate formation during subsequent pressure drops. The gas is then routed to a gathering pipeline owned and operated by others. There is no compression or dehydration of the gas prior to injection into this pipeline.

The Produced Fluids are accumulated in six 210 BBL tanks, three water and three condensate tanks while pending truck transportation by others. The Condensate is transported to a regional processing facility and the Produced Water a regional disposal facility. Flash, working and breathing losses from these tanks are currently routed to a Vapor Recovery Unit (VRU) with the captured vapors routed back to the raw gas discharge line.

The volume of condensate and water produced by these wells has dropped significantly since the initial operations began. Thus, the volume of vapor produced by the storage tanks is also much less than during initial operations. As a result, it is no longer cost effective to control these emissions via the VRU. Jay-Bee Oil & Gas is seeking approval to replace the VRU with an enclosed combustor. The reduced production of these fluids also significantly reduces the potential tank truck traffic for the facility.

Additionally, Jay-Bee is seeking approval for installation of a Thermo-electric generator.

The proposed change to the tank emissions control methodology will actually control the tank emissions to a greater degree than the VRU. This, combined with the absence of emissions from the VRU driver engine and reduced truck traffic will actually reduce overall emissions. **However, the presence of a permanent combustor warrants these changes being processed through a Class II Administrative Update rather than a Class I update.**

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

## 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 <sup>1</sup>	Emission Point ID <sup>2</sup>	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type <sup>3</sup> and Date of Change	Control Device <sup>4</sup>
1S	GPU1	Gas Processing Unit	2013	1.5 MMBTU/Hr	EXIST	None
2S	GPU2	Gas Processing Unit	2013	1.5 MMBTU/Hr	EXIST	None
3S	GPU3	Gas Processing Unit	2013	1.5 MMBTU/Hr	EXIST	None
4S	TLU1	Condensate Truck Loading	2013	1,700,000 Gal /Yr	EXIST	None
5S	VRU1	VRU Compressor Engine Cummins 5.9	2013	84 Hp	REM	NSCR
6S	EC-1	Produced Water Tank	2014	210 BBL	EXIST	EC-1
7S	EC-1	Produced Water Tank	2014	210 BBL	EXIST	EC-1
8S	EC-1	Produced Water Tank	2014	210 BBL	EXIST	EC-1
9S	EC-1	Condensate Tank	2014	210 BBL	EXIST	EC-1
10S	EC-1	Condensate Tank	2014	210 BBL	EXIST	EC-1
11S	EC-1	Condensate Tank	2014	210 BBL	EXIST	EC-1
		Enclosed Combustor	2015	2.38 MMBTU/Hr	NEW	N/A
12S	TEG-1	Thermoelectric Generator	2015	4.4 KW/Hr	NEW	None
---	---	Fugitive VOC Emissions – Fittings and Connections	2014	N/A	EXIST	None
---	---	Haul Roads	2015	1 Trucks per day max.	EXIST	None

<sup>1</sup> For Emission Units (or Sources) use the following numbering system: 1S, 2S, 3S,... or other appropriate designation.

<sup>2</sup> For Emission Points use the following numbering system: 1E, 2E, 3E, ... or other appropriate designation.

<sup>3</sup> New, modification, removal

<sup>4</sup> For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

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**ATTACHMENT C**

**Fugitive Emissions**

**Jay-Bee Oil & Gas, Inc.**  
**RPT5 Well Pad Production Facility**  
**Attachment C**  
**Fugitive Emissions Data**

**Equipment Fugitive Emissions**

In addition to point source emissions, there are various fugitive emission sources at this facility. The 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. The number of valves, flanges, etc. reflects the equipment changes described in Attachment B. A potential emission rate of 0.77 tpy of VOCs and 2.9 tpy CO<sub>2</sub>e 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 no gas compressors at this facility. Hence, there will be no corresponding blowdown emissions.

**Storage Tank and Haul Road Fugitive Emissions**

Produced Fluids (water and condensate) received by this facility will be accumulated in six tanks (three condensate and three water) prior to off-site shipment. Emissions from these tanks were determined as described in the tank emissions discussion in Attachment I. Considering both flash as well as working and breathing losses, uncontrolled emissions from these tanks were determined to be 163.2 tons per year of VOCs. These vapors will be routed to the VCU with a minimum destruction efficiency of 98%. Thus, controlled VOC emissions from the tanks will be 3.26 tons per year. Emission calculations for the VCU are presented in calculation spreadsheet also found earlier in Attachment I.

Haul Road Emissions are generated during the movement of trucks in and out of the facility to removed accumulated condensate and produced water.. As noted in the Project Description, truck traffic is expected to be greatly reduced from what was originally permitted due to a lower production of these fluids. The calculation spreadsheet is provided in Attachment I and summarized in the following summary sheet.

## 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 <sup>1</sup> Chemical Name/CAS <sup>1</sup>	Maximum Potential Uncontrolled Emissions <sup>2</sup>		Maximum Potential Controlled Emissions <sup>3</sup>		Est. Method Used <sup>4</sup>
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads						
Unpaved Haul Roads	PM	14.65	2.01	14.65	2.01	EE
Loading/Unloading Operations	VOCs	2.3	1.08	2.3	1.08	EE
	Total HAPs	0.24	0.09	0.24	0.09	EE
Equipment Leaks	VOCs	Does Not Apply	0.77	Does Not Apply	0.77	EE
	Total HAPs	Does Not Apply	0.01	Does Not Apply	0.01	EE
Blowdowns	VOCs					EE
	Total HAPs					EE
Other:						

<sup>1</sup> List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS<sub>2</sub>, VOCs, H<sub>2</sub>S, Inorganics, Lead, Organics, O<sub>3</sub>, NO, NO<sub>2</sub>, SO<sub>2</sub>, SO<sub>3</sub>, all applicable Greenhouse Gases (including CO<sub>2</sub> and methane), etc. DO NOT LIST H<sub>2</sub>, H<sub>2</sub>O, N<sub>2</sub>, O<sub>2</sub>, and Noble Gases.

<sup>2</sup> 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).

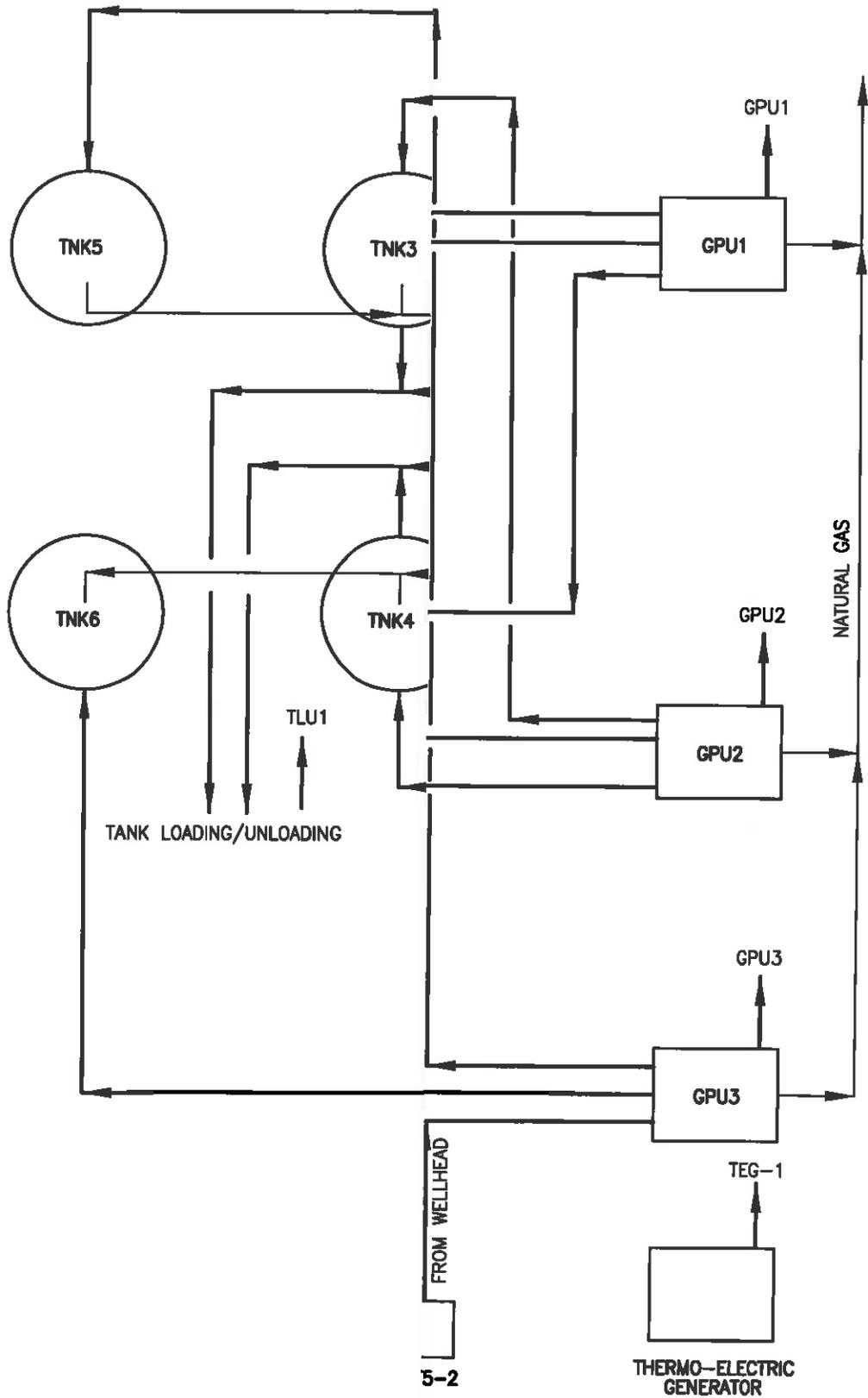
<sup>3</sup> Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

<sup>4</sup> 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).

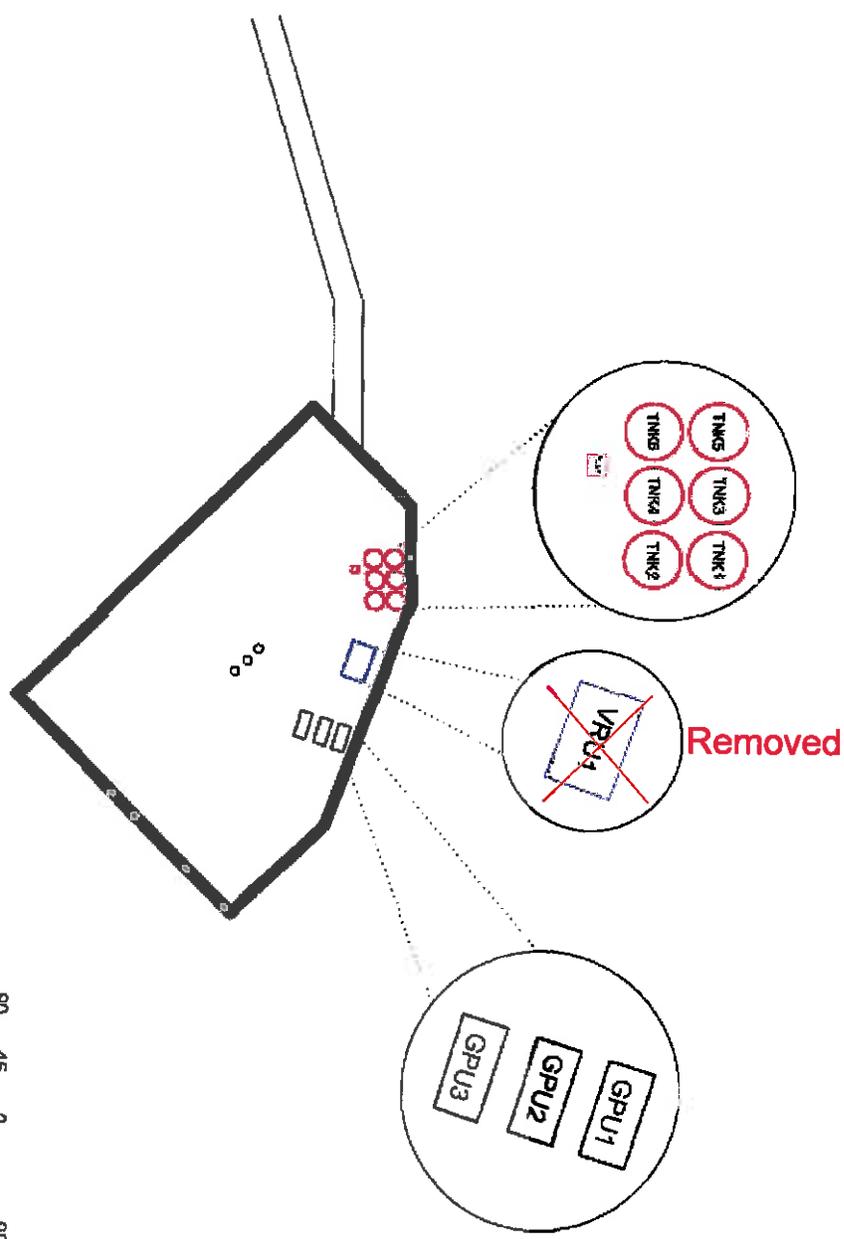
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**ATTACHMENT D**

**Process Flow Diagram**



JAY-BEE OIL & GAS, INC.	
RPT5 COMPRESSOR STATION TYLER COUNTY, WEST VIRGINIA PROCESS FLOW DIAGRAM	
DRAWING NAME	FIGURE 2
REV.	0



JAY-BEE OIL & GAS, INC  
 3570 SHIELDS HILL RD  
 CAIRO, WV 26337

**RPT5 AIR QUALITY SITE LAYOUT**

JUNE 2, 2014



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**ATTACHMENT F**

**Area Map**

Attachment F

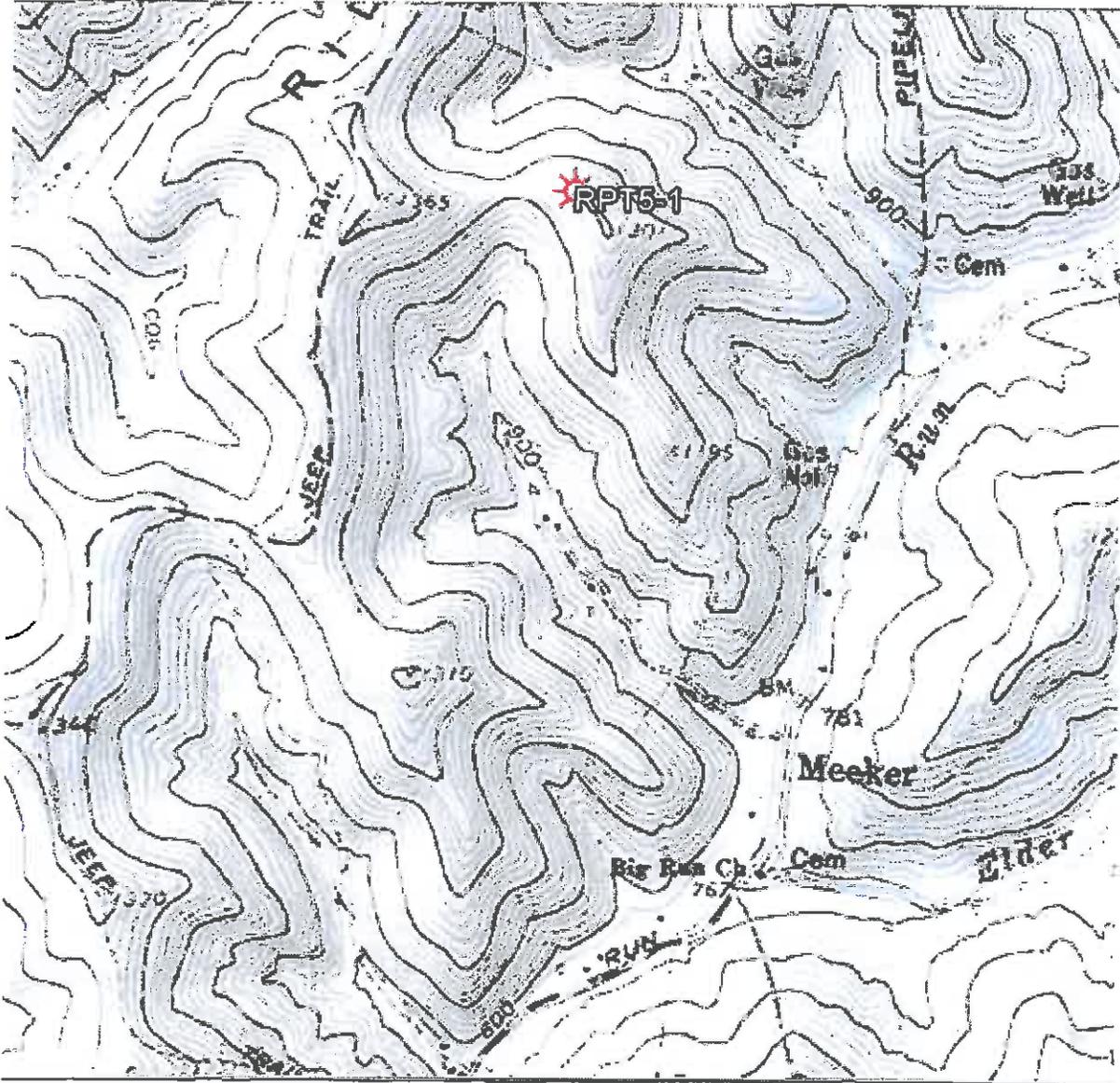
Map of Area

Northing - 4,369,717

Easting - 517,783

Zone 17





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**ATTACHMENT G**

**Equipment Data Sheets and  
Registration Section Applicability Form**

**General Permit G70-A Registration  
Section Applicability Form**

General Permit G70-A was developed to allow qualified applicants to seek registration for a variety of sources. These sources include natural gas well affected facilities, storage tanks, natural gas-fired compressor engines (RICE), natural gas producing units, natural gas-fired in-line heaters, pneumatic controllers, heater treaters, tank truck loading, glycol dehydration units, completion combustion devices, flares, enclosed combustion devices, and vapor recovery systems. All registered facilities will be subject to Sections 1.0, 2.0, 3.0, and 4.0.

General Permit G70-A allows the registrant to choose which sections of the permit they are seeking registration under. Therefore, please mark which additional sections that you are applying for registration under. If the applicant is seeking registration under multiple sections, please select all that apply. Please keep in mind, that if this registration is approved, the issued registration will state which sections will apply to your affected facility.

Section 5	Natural Gas Well Affected Facility	<input checked="" type="checkbox"/>
Section 6	Storage Vessels*	<input checked="" type="checkbox"/>
Section 7	Gas Producing Units, In-Line Heaters, Heater Treaters, and Glycol Dehydration Reboilers	<input checked="" type="checkbox"/>
Section 8	Pneumatic Controllers Affected Facility(NSPS, Subpart OOOO)	<input type="checkbox"/>
Section 9	<i>Reserved</i>	<input type="checkbox"/>
Section 10	Natural gas-fired Compressor Engine(s) (RICE)**	<input type="checkbox"/>
Section 11	Tank Truck Loading Facility ***	<input checked="" type="checkbox"/>
Section 12	Standards of Performance for Storage Vessel Affected Facilities (NSPS, Subpart OOOO)	<input type="checkbox"/>
Section 13	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (NSPS, Subpart JJJJ)	<input type="checkbox"/>
Section 14	Control Devices not subject to NSPS, Subpart OOOO	<input checked="" type="checkbox"/>
Section 15	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (40CFR63, Subpart ZZZZ)	<input type="checkbox"/>
Section 16	Glycol Dehydration Units	<input type="checkbox"/>
Section 17	Dehydration Units With Exemption from NESHAP Standard, Subpart HH § 63.764(d) (40CFR63, Subpart HH)	<input type="checkbox"/>
Section 18	Dehydration Units Subject to NESHAP Standard, Subpart HH and Not Located Within an UA/UC (40CFR63, Subpart HH)	<input type="checkbox"/>
Section 19	Dehydration Units Subject to NESHAP Standard, Subpart HH and Located Within an UA/UC (40CFR63, Subpart HH)	<input type="checkbox"/>

\* Applicants that are subject to Section 6 may also be subject to Section 12 if the applicant is subject to the NSPS, Subpart OOOO control requirements or the applicable control device requirements of Section 14.

\*\* Applicants that are subject to Section 10 may also be subject to the applicable RICE requirements of Section 13 and/or Section 15.

\*\*\* Applicants that are subject to Section 11 may also be subject to control device requirements of Section 14.

## NATURAL GAS FIRED FUEL BURNING UNITS EMISSION DATA SHEET

Complete the information on this data for each Gas Producing Unit(s), Heater Treater(s), and in-line heater(s) at the production pad. Reboiler information should be entered on the Glycol Dehydration Emission Unit Data Sheet.

Emission Unit ID # <sup>1</sup>	Emission Point ID# <sup>2</sup>	Emission Unit Description (Manufacturer / Model #)	Year Installed/ Modified	Type <sup>3</sup> and Date of Change	Control Device <sup>4</sup>	Design Heat Input (mmBtu/hr) <sup>5</sup>	Fuel Heating Value (Btu/scf) <sup>6</sup>
1S	GPU-1	Gas Processing Unit	2014	EXIST	None	1.5 MMBTU/Hr	1269
2S	GPU-2	Gas Processing Unit	2014	EXIST	None	1.5 MMBTU/Hr	1269
3S	GPU-3	Gas Processing Unit	2015	EXIST	None	1.5 MMBTU/Hr	1269
12S	TEG-1	Thermoelectric Generator	2015	NEW	None	0.013 MMBTU/Hr	1269

- <sup>1</sup> Enter the appropriate Emission Unit (or Sources) identification numbers for each fuel burning unit located at the production pad. Gas Producing Unit Burners should be designated GPU-1, GPU-2, etc. Heater Treaters should be designated HT-1, HT-2, etc. Heaters or Line Heaters should be designated LH-1, LH-2, etc. For sources, use 1S, 2S, 3S... or other appropriate designation. Enter glycol dehydration unit Reboiler Vent data on the *Glycol Dehydration Unit Data Sheet*.
- <sup>2</sup> Enter the appropriate Emission Point identification numbers for each fuel burning unit located at the production pad. Gas Producing Unit Burners should be designated GPU-1, GPU-2, etc. Heater Treaters should be designated HT-1, HT-2, etc. Heaters or Line Heaters should be designated LH-1, LH-2, etc. For emission points, use 1E, 2E, 3E... or other appropriate designation.
- <sup>3</sup> New, modification, removal
- <sup>4</sup> Complete appropriate air pollution control device sheet for any control device.
- <sup>5</sup> Enter design heat input capacity in mmBtu/hr.
- <sup>6</sup> Enter the fuel heating value in Btu/standard cubic foot.(HHV)

## NATURAL GAS-FIRED COMPRESSOR ENGINE (RICE) EMISSION UNIT DATA SHEET

Emission Unit (Source) ID No. <sup>1</sup>		5S					
Emission Point ID No. <sup>2</sup>		VRU1					
Engine Manufacturer and Model		Cummins G5.9					
Manufacturer's Rated bhp/rpm		84 @ 1800					
Source Status <sup>3</sup>		RS					
Date Installed/Modified/Removed <sup>4</sup>		5/08/2014					
Engine Manufactured/Reconstruction Date <sup>5</sup>		3/2012					
Is this engine subject to 40CFR60, Subpart JJJJ?		Yes					
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60, Subpart JJJJ? (Yes or No) <sup>6</sup>		No					
Is this engine subject to 40CFR63, Subpart ZZZZ? (yes or no)		No					
Engine, Fuel and Combustion Data	Engine Type <sup>7</sup>	RB4S					
	APCD Type <sup>8</sup>	NSCR					
	Fuel Type <sup>9</sup>	RG					
	H <sub>2</sub> S (gr/100 scf)	<1					
	Operating bhp/rpm	84 @ 1800					
	BSFC (Btu/bhp-hr)	7914					
	Fuel throughput (ft <sup>3</sup> /hr)	583					
	Fuel throughput (MMft <sup>3</sup> /yr)	5.1					
Operation (hrs/yr)	8760						
Reference <sup>10</sup>	Potential Emissions <sup>11</sup>	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
MD	NO <sub>x</sub>	0.19	0.83				
MD	CO	0.38	1.66				
MD	VOC	0.27	1.2				
AP	SO <sub>2</sub>	<0.001	<0.01				
AP	PM <sub>10</sub>	0.006	0.028				
MD	Formaldehyde	0.014	0.065				
MD	CO <sub>2e</sub>	83.2	364.2				
MRR <sup>12</sup>	Monitoring:	Engine Hours					
	Recordkeeping:	Engine Hours retained for 5 years					
	Proposed Reporting	Calculated Emissions					

Instructions for completing the Engine Emission Unit Data Sheet:

- 3 Enter the appropriate Emission Unit (Source) identification number for each natural gas-fueled reciprocating internal combustion compressor/generator engine located at the production pad. Multiple compressor engines should be designated CE-1S, CE-2S, etc. or other appropriate designation. Generator engines should be designated GE-1S, GE-2S, etc. or other appropriate designation. If more than three (3) engines exist, please use additional sheets.
- 2 For Emission Points, use the following numbering system: 1E, 2E, etc. or other appropriate designation.
- 1 Enter the Source Status using the following codes: NS = Construction of New Source (installation); ES = Existing Source; MS = Modification of Existing Source; and RS = Removal of Source
- 4 Enter the date (or anticipated date) of the engine's installation (construction of source), modification or removal.
- 5 Enter the date that the engine was manufactured, modified or reconstructed.
- 6 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 and a manufacturer's EPA certification of conformity sheet.**
- 7 Enter the Engine Type designation(s) using the following codes: LB2S = Lean Burn Two Stroke, RB4S = Rich Burn Four Stroke, and LB4S = Lean Burn Four Stroke.
- 8 Enter the Air Pollution Control Device (APCD) type designation(s) using the following codes: NSCR = Rich Burn & Non-Selective Catalytic Reduction, PSC = Rich Burn & Prestratified Charge, SCR = Lean Burn & Selective Catalytic Reduction, or CAT = Lean Burn Catalytic Oxidation
- 9 Enter the Fuel Type using the following codes: PQ = Pipeline Quality Natural Gas, or RG = Raw Natural Gas
- 10 Enter the Potential Emissions Data Reference designation using the following codes. Attach all referenced data to this Compressor/Generator Data Sheet(s). Codes: MD = Manufacturer's Data, AP = AP-42 Factors, GR = GRI-HAPCalc™, or OT = Other \_\_\_\_\_ (please list)
- 11 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 as Attachment O*.
- 12 Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the operation of this engine operation and associated air pollution control device. Include operating ranges and maintenance procedures required by the manufacturer to maintain the warranty.

## TANK TRUCK LOADING EMISSION UNIT DATA SHEET

*Furnish the following information for each new or modified bulk liquid transfer area or loading rack at the natural gas production pad. This form is to be used for bulk liquid transfer operations to tank trucks.*

1. Emission Unit ID: <b>4S</b>	2. Emission Point ID: <b>TLU1</b>	3. Year Installed/ Modified: <b>2014</b>		
4. Emission Unit Description: <b>Condensate and Water Truck Loading Area</b>				
5. Loading Area Data:				
5A. Number of pumps: <b>Pumps are on the trucks. None at the loading area.</b>	5B. Number of liquids loaded: <b>2</b>	5C. Maximum number of tank trucks loading at one time: <b>2</b>		
6. Describe cleaning location, compounds and procedure for tank trucks:  <b>Contracted Liquids Hauler. No cleaning takes place at this facility.</b>				
7. Are tank trucks pressure tested for leaks at this or any other location? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If YES, describe:				
8. Projected Maximum Operating Schedule (for rack or transfer point as a whole):				
Maximum	Jan. - Mar.	Apr. - June	July - Sept.	Oct. - Dec.
hours/day	<b>24</b>	<b>24</b>	<b>24</b>	<b>24</b>
days/week	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>

9. Bulk Liquid Data <i>(add pages as necessary)</i> :			
Liquid Name	Condensate	Produced Water	
Max. daily throughput (1000 gal/day)	<b>7.5</b>	<b>7.5</b>	
Max. annual throughput (1000 gal/yr)	<b>582.5</b>	<b>766.5</b>	
Loading Method <sup>1</sup>	<b>SUB</b>	<b>SP</b>	
Max. Fill Rate (gal/min)	<b>50</b>	<b>50</b>	
Average Fill Time (min/loading)	<b>120</b>	<b>120</b>	
Max. Bulk Liquid Temperature (°F)	<b>60</b>	<b>60</b>	
True Vapor Pressure <sup>2</sup>	<b>3.3</b>	<b>N/A</b>	
Cargo Vessel Condition <sup>3</sup>	<b>U</b>	<b>U</b>	
Control Equipment or Method <sup>4</sup>	<b>None</b>	<b>None</b>	
Minimum collection efficiency (%)	<b>N/A</b>	<b>N/A</b>	
Minimum control efficiency (%)	<b>N/A</b>	<b>N/A</b>	
<i>* Continued on next page</i>			

Maximum Emission Rate	Loading (lb/hr)	2.3 lb/hr VOC	N/A	
	Annual (ton/yr)	1.08 tons VOC	N/A	
Estimation Method <sup>5</sup>				
Notes:				
<sup>1</sup> BF = Bottom Fill    SP = Splash Fill    SUB = Submerged Fill				
<sup>2</sup> At maximum bulk liquid temperature				
<sup>3</sup> B = Ballasted Vessel, C = Cleaned, U = Uncleaned (dedicated service), O = other (describe)				
<sup>4</sup> List as many as apply (complete and submit appropriate <i>Air Pollution Control Device Sheets as Attachment "H"</i> ): CA = Carbon Adsorption VB = Dedicated Vapor Balance (closed system) ECD = Enclosed Combustion Device F = Flare TO = Thermal Oxidation or Incineration				
<sup>5</sup> EPA = EPA Emission Factor as stated in AP-42 MB = Material Balance TM = Test Measurement based upon test data submittal O = other (describe)				

<b>10. Proposed Monitoring, Recordkeeping, Reporting, and Testing</b>	
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.	
<p><b>MONITORING</b> 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.</p> <p><b>Volume, date and time of each loading event.</b> <b>Daily inspection of the valve system.</b></p>	<p><b>RECORDKEEPING</b> Please describe the proposed recordkeeping that will accompany the monitoring.</p> <p>Jay-Bee has load/withdrawal monitoring capabilities via SCAA/ Well Tenders will complete the annual inspection of the wells, which will include unloading station. Trucking employees will also have the daily inspection reports which include equipment review.</p>
<p><b>REPORTING</b> Please describe the proposed frequency of reporting of the recordkeeping.</p> <p><b>Annual reporting of monthly condensate loadout.</b></p>	<p><b>TESTING</b> Please describe any proposed emissions testing for this process equipment/air pollution control device.</p> <p>None</p>
<b>11. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty:</b>	
<b>Valve system is built and maintained by Jay-Bee.</b>	

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**ATTACHMENT H**

**Air Pollution Control Device Sheets**

## AIR POLLUTION CONTROL DEVICE Vapor Combustion Control Device Sheet

*Complete this vapor combustion control device sheet for each enclosed combustion device, flare, thermal oxidizer, or completion combustion device that is located at the natural gas production pad for the purpose of thermally destructing waste gas to control emissions of regulated pollutants to the atmosphere.*

<b>IMPORTANT: READ THE INSTRUCTIONS ACCOMPANYING THIS FORM BEFORE COMPLETING.</b>			
<b>General Information</b>			
1. Control Device ID#: <b>EC-1</b>		2. Installation Date: Upon receipt of Permit <input checked="" type="checkbox"/> New	
3. Maximum Rated Total Flow Capacity: <b>22,100 scfd</b>	4. Maximum Design Heat Input: <b>2.38 MMBtu/hr</b>	5. Design Heat Content: No limit. Only limit on total BTU/hr	
<b>Control Device Information</b>			
6. Select the type of vapor combustion control device being used: <input checked="" type="checkbox"/> Enclosed Combustion Device  <input type="checkbox"/> Elevated Flare <input type="checkbox"/> Ground Flare <input type="checkbox"/> Thermal Oxidizer <input type="checkbox"/> Completion Combustion Device			
7. Manufacturer: <b>Hy-Bon Engineering, Inc.</b> Model No. <b>Abutec 20</b>		8. Hours of operation per year: <b>8760 Potential.</b>	
9. List the emission units whose emissions are controlled by this vapor combustion control device: (Emission Point ID#: <b>6e-7e</b> )			
10. Emission Unit ID#	Emission Source Description:	Emission Unit ID#	Emission Source Description:
<b>9S (Tank 1)</b>	<b>Condensate Tank</b>	<b>6S (Tank 2)</b>	<b>Produced Water Tank</b>
<b>10S (Tank 3)</b>	<b>Condensate Tank</b>	<b>7S (Tank 4)</b>	<b>Produced Water Tank</b>
<b>11S (Tank 5)</b>	<b>Condensate Tank</b>	<b>8S (Tank 6)</b>	<b>Produced Water Tank</b>
<i>If this vapor combustor controls emissions from more than six emission units, please attach additional pages.</i>			
11. Assist Type		12. Flare Height	13. Tip Diameter
<input type="checkbox"/> Steam - <input type="checkbox"/> Air - <input type="checkbox"/> Pressure - <input checked="" type="checkbox"/> Non -		<b>11 ft</b>	<b>0.25 ft</b>
14. Was the design per §60.18? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
<b>Waste Gas Information</b>			
15. Maximum waste gas flow rate (scfm):	16. Heat value of waste gas stream (BTU/ft3)	17. Temperature of the emissions stream (°F)	18. Exit Velocity of the emissions stream (ft/s)
<b>9.5</b>	<b>1200-2170</b>	<b>1400-2100</b>	<b>78.4 (at max flow)</b>
19. Provide an attachment with the characteristics of the waste gas stream to be burned. See Calculations (Condensate Tank Vapor Combustion and Water Tank Vapor Combustion) in Attachment I - Calculations			

Pilot Information				
20. Type/Grade of pilot fuel:	21. Number of pilot lights:	22. Fuel flow rate to pilot flame per pilot (scf/hr):	23. Heat input per pilot (BTU/hr):	24. Will automatic re-ignition be used?
Natural Gas	1	63	80,000	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
25. If automatic re-ignition will be used, describe the method: The unit will try to reignite up to 25 times. After that it will go into manual mode which means someone will need to come out and start it up again.				
26. Describe the method of controlling flame: Ignition module located in the combustor control panel				
27. Is pilot flame equipped with a monitor to detect the presence of the flame?  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		28. If yes, what type? <input checked="" type="checkbox"/> Thermocouple <input type="checkbox"/> Infra-Red <input type="checkbox"/> Ultra Violet <input type="checkbox"/> Camera with monitoring control room <input type="checkbox"/> Other, describe:		

29. Pollutant(s) Controlled	30. % Capture Efficiency	31. Manufacturer's Guaranteed Control Efficiency (%)
Tank VOCs	>99 (hard piped)	99
32. Has the control device been tested by the manufacturer and certified? Yes		
33. Describe all operating ranges and maintenance procedures required by the manufacturer to maintain warranty: Combustor burner, pilot, and air inlet arrestor must be checked for foreign debris (dust, sand, etc.) and cleaned at least quarterly.		
34. Additional Information Attached? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		
<i>Please attach a copy of manufacturer's data sheet.</i> <i>Please attach a copy of manufacturer's drawing.</i> <i>Please attach a copy of the manufacturer's performance testing.</i>		

**If any of the requested information is not available, please contact the manufacturer.**

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**ATTACHMENT I**

**Emissions Calculations**

Jay-Bee Oil & Gas, Inc.

RTP-5 Well Pad  
Tyler County County, WV

Source	Description	NOx lb/hr	CO lb/hr	CO2e lb/hr	VOC lb/hr	SO2 lb/hr	PM-10 lb/hr	n-Hexane lb/Hr	Formaldehyde lb/hr	Total HAPs lb/hr
VRU-1	VRU Compressor <b>REMOVED</b>	0.00	0.00	0.0	0.00	0.000	0.000	0.000	0.000	0.000
GPU-1	GPU #1	0.12	0.10	181.0	0.01	0.001	0.009	0.002	0.000	0.002
GPU-2	GPU #2	0.12	0.10	181.0	0.01	0.001	0.009	0.002	0.000	0.002
GPU-3	GPU #3	0.12	0.10	181.0	0.01	0.001	0.009	0.002	0.000	0.002
TEG-1	Thermoelectric Generator (NEW)	0.001	0.001	1.570	0.000	0.000	0.000	0.000	0.000	0.000
---	Blowdowns <sup>1</sup>			N/A	N/A					
T01-T02	Produced Water Tanks <sup>2</sup>									
T03-T04	Condensate Tanks <sup>2</sup>			0.0	0.00			0.000		0.00
EC-1	Combustor + Pilot	0.17	0.89	289.4	37.30		0.005	0.005		0.15
TLU-1	Condensate Truck Loading <sup>3</sup>			10.0	2.30			1.190		0.240
---	Truck Traffic Fugitive Dust						2.00			
---	Fittings Fugitive Emissions			0.7	0.18					
<b>Total</b>		<b>0.53</b>	<b>1.19</b>	<b>845</b>	<b>39.80</b>	<b>0.00</b>	<b>2.03</b>	<b>1.20</b>	<b>0.00</b>	<b>0.40</b>

Source	Description	NOx tpy	CO tpy	CO2e tpy	VOC tpy	SO2 tpy	PM-10 tpy	n-Hexane TPY	Formaldehyde tpy	Total HAPs tpy
VRU-1	VRU Compressor <b>REMOVED</b>	0.00	0.00	0	0.00	0.000	0.00	0.00	0.00	0.00
GPU-1	GPU #1	0.53	0.45	793	0.03	0.003	0.04	0.01	0.00	0.01
GPU-2	GPU #2	0.53	0.45	793	0.03	0.003	0.04	0.01	0.00	0.01
GPU-3	GPU #3	0.53	0.45	793	0.03	0.003	0.04	0.01	0.00	0.01
TEG-1	Thermoelectric Generator (NEW)	0.01	0.00	6.88	0.00	0.00	0.00	0.00	0.00	0.00
---	Blowdowns <sup>1</sup>			0	0.00					
T1, T3 and T5	Produced Water Tanks <sup>2</sup>			0	0.00					
T2, T4 and T6	Condensate Tanks <sup>2</sup>			0	0.00			0.00		0.00
EC-1	Combustor +Pilot	0.40	2.02	677	6.99		0.02	0.04	0.00	0.04
TLU-1	Condensate Truck Loading <sup>3</sup>			1	1.08			0.01		0.09
---	Truck Traffic Fugitive Dust						0.27			
---	Fittings Fugitive Emissions			3	0.77					
<b>Total</b>		<b>2.00</b>	<b>3.36</b>	<b>3,066</b>	<b>8.93</b>	<b>0.01</b>	<b>0.41</b>	<b>0.08</b>	<b>0.00</b>	<b>0.16</b>
	<b>Currently Permitted</b>	<b>2.42</b>	<b>2.99</b>	<b>2,850</b>	<b>30.14</b>	<b>0.01</b>	<b>1.22</b>	<b>0.18</b>	<b>0.07</b>	<b>0.89</b>
	<b>Change in Emissions</b>	<b>-0.42</b>	<b>0.37</b>	<b>216</b>	<b>-21.21</b>	<b>0.00</b>	<b>-0.81</b>	<b>-0.10</b>	<b>-0.07</b>	<b>-0.73</b>

<sup>1</sup> No Blowdowns with removal of VRU

<sup>2</sup> Condensate and water tank emissions will be controlled by a VCU at 98% .  
Emissions are presented under the VCU.

**Jay-Bee Oil & Gas ,LLC**  
ENGINE EMISSIONS

RTP-5 Well Pad  
Tyler County County, WV

Controlled Emission Rates

**Source VRU1**  
**Vapor Recovery Compressor Engine**

**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  
Configuration (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 4stroke/rich lb/mmbtu
Oxides of Nitrogen, NOx	1.020	0.19	0.83	86	4.53	
Carbon Monoxide CO	2.050	0.38	1.66	172	9.11	
VOC (NMNEHC)	1.4800	0.27	1.20	124	6.58	
CO2	449	83	364	37,716	1,996	
CO2e		89	391			
<b>Total Annual Hours of Operation</b>	<b>8,760</b>					
SO2		0.0004	0.0017			0.0006
PM2.5		0.0063	0.0277			0.0095
PM (Condensable)		0.0066	0.0289			0.00981
CH4		0.1262	0.5529			0.0022 Factor From 40 CFR 98, Table C-2
N2O		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			
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			

Comment  
453.59 grams = 1 pound  
2,000 pounds = 1 ton

Per Mfg.

**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**

**RTP-5 Well Pad  
Tyler County County, WV**

**Potential Emission Rates**

**GPU-1**

Burner Duty Rating	1500.0 Mbtu/hr
Burner Efficiency	98.0 %
Gas Heat Content (HHV)	1263.0 Btu/scf
Total Gas Consumption	29086.0 scfd
H2S Concentration	0.000 Mole %
Hours of Operation	8760

NOx	0.1212	lbs/hr	0.531	TPY
CO	0.1018	lbs/hr	0.446	TPY
CO2	145.4	lbs/hr	637.0	TPY
CO2e	181	lbs/hr	793	tpy
VOC	0.0067	lbs/hr	0.029	TPY
SO2	0.0007	lbs/hr	0.003	TPY
H2S	0.0000	lbs/hr	0.000	TPY
PM10	0.0092	lbs/hr	0.040	TPY
CHOH	0.0001	lbs/hr	0.000	TPY
Benzene	0.0000	lbs/hr	0.000	TPY
N-Hexane	0.0022	lbs/hr	0.010	TPY
Toluene	0.0000	lbs/hr	0.000	TPY
Total HAPs	0.0023	lbs/hr	0.010	TPY

**AP-42 Factors Used**

NOx	100 Lbs/MMCF
CO	84 Lbs/MMCF
CO <sub>2</sub>	120,000 Lbs/MMCF
VOC	5.5 Lbs/MMCF
PM	7.6 Lbs/MMCF
SO <sub>2</sub>	0.6 Lbs/MMCF
CH <sub>4</sub>	2.3 Lbs/MMCF
N <sub>2</sub> O	2.2 Lbs/MMCF
HCOH	0.075 Lbs/MMCF
Benzene	0.0021 Lbs/MMCF
n-Hexane	1.8 Lbs/MMCF
Toluene	0.0034 Lbs/MMCF

**Global Warming Potential = 1**

**Global Warming Potential = 25**

**Global Warming Potential = 310**

**Jay-Bee Oil & Gas, LLC**

**RTP-5 Well Pad  
Tyler County County, WV**

**Potential Emission Rates**

**Source GPU-2**

Burner Duty Rating	1500.0 Mbtu/hr
Burner Efficiency	98.0 %
Gas Heat Content (HHV)	1263.0 Btu/scf
Total Gas Consumption	29086.0 scfd
H2S Concentration	0.000 Mole %
Hours of Operation	8760

NOx	0.1212	lbs/hr	0.531	TPY
CO	0.1018	lbs/hr	0.446	TPY
CO2	145.4	lbs/hr	637.0	TPY
CO2e	181	lbs/hr	793	tpy
VOC	0.0067	lbs/hr	0.029	TPY
SO2	0.0007	lbs/hr	0.003	TPY
H2S	0.0000	lbs/hr	0.000	TPY
PM10	0.0092	lbs/hr	0.040	TPY
CHOH	0.0001	lbs/hr	0.000	TPY
Benzene	0.0000	lbs/hr	0.000	TPY
N-Hexane	0.0022	lbs/hr	0.010	TPY
Toluene	0.0000	lbs/hr	0.000	TPY
Total HAPs	0.0023	lbs/hr	0.010	TPY

**AP-42 Factors Used**

NOx	100 Lbs/MMCF	
CO	84 Lbs/MMCF	
CO <sub>2</sub>	120,000 Lbs/MMCF	Global Warming Potential = 1
VOC	5.5 Lbs/MMCF	
PM	7.6 Lbs/MMCF	
SO <sub>2</sub>	0.6 Lbs/MMCF	
CH <sub>4</sub>	2.3 Lbs/MMCF	Global Warming Potential = 25
N <sub>2</sub> O	2.2 Lbs/MMCF	Global Warming Potential = 310
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**

**RTP-5 Well Pad  
Tyler County County, WV**

**Potential Emission Rates**

**Source GPU-3**

Burner Duty Rating	1500.0 Mbtu/hr
Burner Efficiency	98.0 %
Gas Heat Content (HHV)	1263.0 Btu/scf
Total Gas Consumption	29086.0 scfd
H2S Concentration	0.000 Mole %
Hours of Operation	8760

NOx	0.1212	lbs/hr	0.531	TPY
CO	0.1018	lbs/hr	0.446	TPY
CO2	145.4	lbs/hr	637.0	TPY
CO2e	181	lbs/hr	793	tpy
VOC	0.0067	lbs/hr	0.029	TPY
SO2	0.0007	lbs/hr	0.003	TPY
H2S	0.0000	lbs/hr	0.000	TPY
PM10	0.0092	lbs/hr	0.040	TPY
CHOH	0.0001	lbs/hr	0.000	TPY
Benzene	0.0000	lbs/hr	0.000	TPY
N-Hexane	0.0022	lbs/hr	0.010	TPY
Toluene	0.0000	lbs/hr	0.000	TPY
Total HAPs	0.0023	lbs/hr	0.010	TPY

**AP-42 Factors Used**

NOx	100 Lbs/MMCF	
CO	84 Lbs/MMCF	
CO <sub>2</sub>	120,000 Lbs/MMCF	Global Warming Potential = 1
VOC	5.5 Lbs/MMCF	
PM	7.6 Lbs/MMCF	
SO <sub>2</sub>	0.6 Lbs/MMCF	
CH <sub>4</sub>	2.3 Lbs/MMCF	Global Warming Potential = 25
N <sub>2</sub> O	2.2 Lbs/MMCF	Global Warming Potential = 310
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**

**RTP-5 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<sub>2</sub>                120,000 Lbs/MMCF  
 VOC                5.5 Lbs/MMCF  
 PM                  7.6 Lbs/MMCF  
 SO<sub>2</sub>                0.6 Lbs/MMCF  
 CH<sub>4</sub>                2.3 Lbs/MMCF  
 N<sub>2</sub>O                2.2 Lbs/MMCF  
 HCOH              0.075 Lbs/MMCF  
 Benzene            0.0021 Lbs/MMCF  
 n-Hexane          1.8 Lbs/MMCF  
 Toluene            0.0034 Lbs/MMCF

**Global Warming Potential = 1**

**Global Warming Potential = 25**

**Global Warming Potential = 310**

**RTP-5 Well Pad Production Facility  
Tyler County, WV**

**Potential Emission Rate**

**Enclosed Combustor Pilot**

Burner Duty Rating 80.0 Mbtu/hr  
 Burner Efficiency 99.0 %  
 Gas Heat Content (HHV) 1257.6 Btu/scf  
 Total Gas Consumption 1542.1 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-Hezane	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<sub>2</sub> 120,000 Lbs/MMCF  
 VOC 5.5 Lbs/MMCF  
 PM 7.6 Lbs/MMCF  
 SO<sub>2</sub> 0.6 Lbs/MMCF  
 CH<sub>4</sub> 2.3 Lbs/MMCF  
 N<sub>2</sub>O 2.2 Lbs/MMCF  
 HCOH 0.075 Lbs/MMCF  
 Benzene 0.0021 Lbs/MMCF  
 n-Hexane 1.8 Lbs/MMCF  
 Toluene 0.0034 Lbs/MMCF

Global Warming Potential = 1

Global Warming Potential = 25

Global Warming Potential =310

Potential Emission Rates

Source EC-1

Enclosed Vapor Combustor - Control of Tank Emissions

Destruction Efficiency	98.0 %	
Gas Heat Content (HHV)	2170.4 Btu/scf	
Max Flow to T-E	0.014 MMSCFD	4.964 MMCF/Yr
Max BTUs to Flare	2.38 MMBTU/Hr	10,775 MMBTU/Yr

NOx	0.16	lbs/hr	0.37	tpy
CO	0.88	lbs/hr	1.99	tpy
CO2	278	lbs/hr	629.7	tpy
CO2e	280	lb/hr	634.7	tpy
VOC	37.30	lb/hr	6.99	tpy
CH4	0.03	lbs/hr	0.1800	tpy
N2O	0.0005	lbs/hr	0.0012	tpy
PM	0.0043	lb/hr	0.0189	tpy
Benzene	0.0000	lb/hr	0.0000	tpy
CHOH	0.0000	lb/hr	0.0002	tpy
n-Hexane	0.0050	lb/hr	0.0400	tpy
Toluene	0.0000	lb/hr	0.0000	tpy
Total HAP	0.7900	lb/hr	0.1500	tpy

- Notes:
1. VOC, Total HAP, N-Hexane and CH4 emissions are taken from the Condensate Tank Emissions sheet in the Calculations Section, based on 200 hrs per year of combustor down time.
  2. Listed Hourly VOC and total HAP emissions are for when Combustor is down (highest potential emission rate).
  3. Max Hourly rates are based on combustor flow capacity (2.38 MMBTU/Hr). Annual emissions are based on annual potential vapor loading from the tanks.

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.**  
FUGITIVE EMISSIONS

RTP-5 Well Pad  
Tyler County 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
<b>Valves:</b>										
Gas/Vapor:	6	0.02700 scf/hr	18.4	0.002	0.008	0.000	0.000	0.006	0.0244	0.611
Light Liquid:	13	0.05000 scf/hr	100.0	0.038	0.165					0.000
Heavy Liquid (Oil):	-	0.00050 scf/hr	100.0	0.000	0.000					0.000
Low Bleed Pneumatic	-	1.39000 scf/hr	18.4	0.000	0.000	0.000	0.000	0.000	0.0000	0.000
<b>Relief Valves:</b>	10	0.04000 scf/hr	18.4	0.004	0.019	0.000	0.000	0.014	0.0603	1.508
<b>Open-ended Lines, gas:</b>	3	0.06100 scf/hr	18.4	0.002	0.009					0.000
<b>Open-ended Lines, liquid:</b>	2	0.05000 lb/hr	100.0	0.100	0.438					0.000
<b>Pump Seals:</b>										0.000
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
<b>Compressor Seals, Gas:</b>	-	0.01940 lb/hr	18.4	0.000	0.000	0.000	0.000	0.000	0.0000	0.000
<b>Connectors:</b>										0.000
Gas:	12	0.00300 scf/hr	18.4	0.000	0.002	0.000	0.000	0.001	0.0054	0.136
Light Liquid:	4	0.00700 scf/hr	100.0	0.028	0.123					0.000
Heavy Liquid (Oil):	-	0.00030 scf/hr	100.0	0.000	0.000					0.000
<b>Flanges:</b>										0.000
Gas:	12	0.00086 lb/hr	18.4	0.002	0.008	0.000	0.000	0.006	0.0268	0.671
Light Liquid:	0	0.00300 scf/hr	100.0	0.000	0.000					0.000
Heavy Liquid:		0.0009 scf/hr	100.0	0.000	0.000					0.000

<b>Fugitive Calculations:</b>		
	lb/hr	t/y
VOC	0.176	0.771
CH4	0.027	0.117
CO2	0.000	0.001
CO2e	0.668	2.92

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 ANALYSIS INFORMATION**

RTP-5 Well Pad  
 Tyler County 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.**  
**GAS ANALYSIS INFORMATION**

RTP-5 Well Pad  
 Tyler County County, WV

**Condensate Tank 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	0.038	0.011	0.000	0.028			-		0.0004	
Carbon Dioxide, CO2	0.086	0.038	0.001	0.101			-		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	24.079	3.863	0.133	10.379	219.0	243.2	2.295		0.2403	
Ethane, C2H6	27.436	8.250	0.285	22.166	444.1	485.5	4.576		0.2721	7.298
Propane	29.019	12.796	0.442	34.380	671.8	730.1	6.912	34.380	0.2851	7.953
Iso-Butane	4.641	2.697	0.093	7.247	139.2	150.9	1.437	7.247	0.0451	1.510
Normal Butane	9.281	5.394	0.186	14.493	279.4	302.8	2.874	14.493	0.0897	2.910
Iso Pentane	1.975	1.425	0.049	3.828	73.1	79.0	0.753	3.828	0.0197	0.719
Normal Pentane	1.920	1.386	0.048	3.722	71.2	77.0	0.732	3.722	0.0192	0.692
Hexane	1.201	1.035	0.036	2.780	52.9	57.1	0.543	2.780	0.0119	0.491
Heptane	0.325	0.326	0.011	0.875	16.6	17.9	0.170	0.875	0.0032	0.149
	100.000	37.220	1.285		1,967.2	2,143.5	20.293	67.326	0.9876	21.723

**Gas Density (STP) = 0.104**

Ideal Gross (HHV)	2,143.5
Ideal Gross (sat'd)	2,106.9
GPM	-
Real Gross (HHV)	2,170.4
Real Net (LHV)	1,991.8

Gas Data

GAS DATA INFORMATION

Specific Gravity of Air, @ 29.92 in. Hg and 60 -F, 28.9625  
 One mole of gas occupies, @ 14.696 psia & 32 -F, 359.2 cu ft. per lb-mole  
 One mole of gas occupies, @ 14.696 psia & 60 -F, 379.64 cu ft. per lb-mole

Hydrogen Sulfide (H2S) conversion chart:

Q grains H2S/100 scf	=	0.00000 mole % H2S
		0.0 ppmv H2S
Q mole % H2S	=	Q grains H2S/100 scf
		0.0 ppmv H2S
Q 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	H2O	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

16.3227  
17.468

## FUGITIVE EMISSIONS FROM UNPAVED HAULROADS

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

		PM	PM-10
<b>k =</b>	Particle size multiplier	0.80	0.36
<b>s =</b>	Silt content of road surface material (%)	10	3
<b>p =</b>	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	20	10	1.5	1	325	None	0
2	Condensate Tanker Truck	10	16	10	1.5	1	200	None	0
3									
4									
5									
6									
7									
8									

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

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

Where:

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

For lb/hr:  $[\text{lb} + \text{VMT}] \times [\text{VMT} + \text{trip}] \times [\text{Trips} + \text{Hour}] = \text{lb/hr}$

For TPY:  $[\text{lb} + \text{VMT}] \times [\text{VMT} + \text{trip}] \times [\text{Trips} + \text{Hour}] \times [\text{Ton} + 2000 \text{ lb}] = \text{Tons/year}$

### 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	8.90	1.44	8.90	1.44	1.2	0.19	1.2	0.19
2	5.75	0.57	5.75	0.57	0.80	0.08	0.80	0.08
3								
4								
5								
6								
7								
8								
<b>TOTALS</b>	<b>14.65</b>	<b>2.01</b>	<b>14.65</b>	<b>2.01</b>	<b>2.00</b>	<b>0.27</b>	<b>2.00</b>	<b>0.27</b>

### FUGITIVE EMISSIONS FROM PAVED HAULROADS

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

<b>I =</b>	Industrial augmentation factor (dimensionless)	
<b>n =</b>	Number of traffic lanes	
<b>s =</b>	Surface material silt content (%)	
<b>L =</b>	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

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

Where:

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

For lb/hr:  $[\text{lb} \div \text{VMT}] \times [\text{VMT} \div \text{trip}] \times [\text{Trips} \div \text{Hour}] = \text{lb/hr}$

For TPY:  $[\text{lb} \div \text{VMT}] \times [\text{VMT} \div \text{trip}] \times [\text{Trips} \div \text{Hour}] \times [\text{Ton} \div 2000 \text{ lb}] = \text{Tons/year}$

#### SUMMARY OF PAVED HAULROAD EMISSIONS

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

## 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:

$$L_L = 12.46[\text{SPM}/T]$$

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: 3.3 psia (condensate)

M= Molecular weight of vapor in lb/lb-mole 81.3

T= temperature of bulk liquid loaded in deg R or 460+deg F (60 Deg F)

Thus,  $L_L = 12.46[0.6 \times 3.3 \times 81.3]/[460+60]$

$L_L = 3.88$  lb/1000 gallons loaded

Based on sample data of breathing vapor (attached), these emissions are 95.6% VOCs, 10.08% HAPs and 1.38 % Methane, utilizing the tank vapors as a surrogate for truck loading vapor emissions.

Given a maximum loading of 7,500 gallons a day, uncontrolled VOC emissions are estimated at 27.8 lb of VOC per day  $[7.5 \times 3.88 \times .956]$ . Total HAP emissions are estimated at 2.93 lb per day  $[7.5 \times 3.88 \times 0.1008]$ . CO<sub>2e</sub> emissions from methane are estimated at 10.0 pounds per day  $[7.5 \times 3.88 \times 0.0138 \times 25]$ . There is no control on tank truck loading. With all daily loading taking place within 12 hours each day, the uncaptured hourly VOC emission rate is conservatively estimated at 2.3 lb/ hour  $[27.8/12]$  total HAPs emissions at 0.24 lb/hr and CO<sub>2e</sub> at 0.83 lb/hr.

Maximum annual throughput is 582,500 gallons per year. Thus, un-captured/un-controlled VOC emissions are conservatively estimated at 2160.7 pounds per year  $[582.5 \times 3.11 \times .956]$  or 1.08 tons per year. Total HAP emissions are calculated at 182.6 pounds per year  $[582.5 \times 3.11 \times 0.1008]$  or 0.09 tpy. CO<sub>2e</sub> annual emissions are estimated at 625 pounds per year  $[582.5 \times 3.11 \times 0.0138 \times 25]$  or 0.3 tpy

There are no significant VOC or HAP emissions anticipated from the loading of produced water.

**Jay-Bee Oil & Gas, Incorporated**  
**RTP-5 Production Facility**  
**Condensate and Produced Water Tank Emissions**

Utilizing E&P Tanks, un-controlled VOC and HAP emissions (flash and working/breathing) from the condensate accumulation tanks were determined to be 169.91 tpy and 3.42 tpy respectively for the maximum annual throughput of 38 BBL/Day or 13,900 BBL/Yr of condensate. Using measured Gas to Water ratio at similar nearby Jay-Bee Wells, flash emissions from the 50 BBL/Day or 18,250 BBL/Yr of produced water were projected to be 1.33 tpy of VOCs and 0.02 tpy of HAPs. Thus, total uncontrolled tank emissions are projected to be 163.24 tpy of VOCs and 3.44 tpy of HAPs.

Methane will also be emitted at a maximum rate of 26.2 tpy from the condensate and 3.0 tpy from the produced water. Using the GHG factor of 25 for Methane, the CO<sub>2e</sub> uncontrolled emission rate is 29.2 x 25 or 730 tpy of CO<sub>2e</sub>

Organic emissions will be controlled at a minimum of 98% via an enclosed combustor. Actual control efficiency is anticipated to be higher, but only 98% is conservatively claimed. Thus, when in operation, VOC emissions will be controlled to 0.75 pounds per hour and 3.26 tpy. HAPs will be controlled to 0.016 pounds per hour and 0.07 tpy.

Loading to the combustor will be a combination of the flash gas and working/breathing losses or 257.58 tpy [252.1 tpy condensate gas + 5.48 tpy produced water flash gas]. As shown in the calculation spreadsheet, the anticipated composition of this tank vapor has a density of 0.104 lb/scf. Thus, 13.57 MSCFD and 4.95 MMSCF/yr [257.58x2000/0.104] are routed to the combustor. As this gas is estimated to have a HHV of 2170 BTU/scf, maximum heat loading to the combustor is estimated at 01.23 MMBTU/hr and 10,775 MMBTU/yr. This is well below the capacity of the combustor (2.38 MMBTU/Hr). Emissions from the combustor are shown in the combustor worksheet.

For permitting purposes, it is conservatively assumed that the combustor will be out of service 200 hours per year. Thus, during those 200 hours VOCs and HAPs will be emitted at 37.3 lb/hr [163.24 x 2000/8760] and 0.79 lb/hr [3.44 x 2000/8760] respectively. Total emissions during that down time will be an additional 3.73 tons of VOC and 0.08 tons of HAPs. Thus, total controlled VOCs will be 6.99 tpy [3.26 tpy +3.73 tpy] and HAPs will be 0.15 [0.07tpy + 0.08 tpy]

```

*****
* Project Setup Information *
*****
Project File           : C:\Rogers_Files\Misc\Jay-Bee Oil & Gas\RPT-5\2015 Permit Update - Cond Tank.ept3
Flowsheet Selection   : Oil Tank with Separator
Calculation Method    : RVP Distillation
Control Efficiency    : 98.00%
Known Separator Stream : Low Pressure Oil
Entering Air Composition : No
Component Group       : C10+

Filed Name            : Jay-Bee O&G
Well Name             : RTP5 Condensate Separator and Tanks
Date                  : 2015.03.13
    
```

```

*****
* Data Input *
*****
Separator Pressure (psia) : 354.70
Separator Temperature (F) : 65.0
C10+ SG                   : 0.78
C10+ MW(lb/lbmol)        : 153.30
    
```

-- Low Pressure Oil -----

No.	Component	Mole%	Wt%
1	H2S	0.0000	0.0000
2	O2	0.0000	0.0000
3	CO2	0.0250	0.0134
4	N2	0.0110	0.0037
5	C1	7.0149	1.3662
6	C2	7.9949	2.9191
7	C3	9.0719	4.8578
8	i-C4	2.6540	1.8730
9	n-C4	7.6659	5.4099
10	i-C5	4.3350	3.7978
11	n-C5	5.7989	5.0802
12	C6	6.8459	7.1621
13	C7	13.2659	16.1401
14	C8	12.6969	17.6108
15	C9	4.9350	7.6868
16	C10+	8.6649	16.1290
17	Benzene	0.1130	0.1072
18	Toluene	0.6130	0.6857
19	E-Benzene	0.5340	0.6884
20	Xylenes	1.4360	1.8512
21	n-C6	6.3239	6.6175
22	224Trimethylp	0.0000	0.0000

-- Sales Oil -----

```

Production Rate (bbl/day) : 38.00
Days of Annual Operation  : 365
API Gravity                : 71.19
Raid Vapor Pressure (psia) : 9.33
Ambient Pressure (psia)   : 14.70
Ambient Temperature (F)   : 60.0
    
```

```

*****
* Calculation Results *
*****
    
```

-- Emission Summary -----

```

Uncontrolled   Controlled
ton            ton
    
```

Total HAPs	3.4180	0.0684
Total HC	252.0850	5.0417
VOCs, C2+	225.8830	4.5177
VOCs, C3+	169.9130	3.3983
CO2	0.2560	
CH4	26.2020	

Uncontrolled Recovery Information:

Vapor (mscfd):	14.0900
HC Vapor (mscfd):	14.0700
CO2 (mscfd):	0.0100
CH4 (mscfd):	3.3900
GOR (SCF/STB):	370.7895

-- Emission Composition

NoComponent	Uncontrolled ton	Controlled ton
1 H2S	0.0000	0.0000
2 O2	0.0000	0.0000
3 CO2	0.2560	0.2560
4 N2	0.0720	0.0720
5 C1	26.2020	0.5240
6 C2	55.9700	1.1194
7 C3	86.8190	1.7364
8 i-C4	18.2970	0.3659
9 n-C4	36.5940	0.7319
10 i-C5	9.6670	0.1933
11 n-C5	9.4000	0.1880
12 C6	3.5950	0.0719
13 Benzene	0.0450	0.0009
14 Toluene	0.0710	0.0014
15 E-Benzene	0.0210	0.0004
16 Xylenes	0.0450	0.0009
17 n-C6	3.2370	0.0647
18 224Trimethylp	0.0000	0.0000
19 Pseudo Comp1	1.4360	0.0287
20 Pseudo Comp2	0.5810	0.0116
21 Pseudo Comp3	0.0800	0.0016
22 Pseudo Comp4	0.0240	0.0005
23 Pseudo Comp5	0.0030	0.0001
24 Total	252.4150	5.0483

-- Stream Data

NoComponent	MW lb/lbmol	LP Oil mole %	Flash Oil mole %	Sales Oil mole %	Flash Gas mole %	W&S Gas mole %	Total Emission mole %
1 H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2 O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3 CO2	44.01	0.0250	0.0019	0.0000	0.1042	0.0228	0.0858
4 N2	28.01	0.0110	0.0001	0.0000	0.0485	0.0008	0.0378
5 C1	16.04	7.0149	0.1938	0.0000	30.4194	2.2859	24.0788
6 C2	30.07	7.9949	1.5326	0.0026	30.1683	18.0459	27.4363
7 C3	44.10	9.0719	5.0642	0.8719	22.8232	50.3130	29.0188
8 i-C4	58.12	2.6540	2.3367	1.8373	3.7427	7.7263	4.6405
9 n-C4	58.12	7.6659	7.6041	7.0021	7.8781	14.1012	9.2806
10 i-C5	72.15	4.3350	5.0841	5.3052	1.7647	2.6972	1.9749
11 n-C5	72.15	5.7989	6.9889	7.3934	1.7157	2.6235	1.9203
12 C6	84.00	6.8459	8.6790	9.4009	0.5561	0.8875	0.6308
13 Benzene	78.11	0.1130	0.1437	0.1559	0.0075	0.0120	0.0085
14 Toluene	92.14	0.6130	0.7888	0.8603	0.0097	0.0169	0.0113
15 E-Benzene	106.17	0.5340	0.6889	0.7523	0.0024	0.0045	0.0029
16 Xylenes	106.17	1.4360	1.8530	2.0238	0.0052	0.0097	0.0062
17 n-C6	86.18	6.3239	8.0242	8.6960	0.4899	0.7726	0.5536
18 224Trimethylp	114.24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
19 Pseudo Comp1	96.00	13.2659	17.0777	18.6289	0.1870	0.3354	0.2204
20 Pseudo Comp2	107.00	12.6969	16.3778	17.8837	0.0671	0.1245	0.0800
21 Pseudo Comp3	121.00	4.9350	6.3709	6.9598	0.0080	0.0156	0.0097
22 Pseudo Comp4	134.00	3.6474	4.7098	5.1458	0.0021	0.0043	0.0026

23 Pseudo Comp5	166.81	5.0175	6.4797	7.0800	0.0002	0.0004	0.0002
MW (lb/lbmol):		LP Oil	Flash Oil	Sales Oil	Flash Gas	W&S Gas	Total Emission
Stream Mole Ratio:		80.35	93.71	98.08	34.52	46.45	37.21
Stream Weight Ratio:		1.0000	0.7743	0.7087	0.2257	0.0657	0.2913
Total Emission (ton):		80.35	72.56	69.51	7.79	3.05	10.84
Heating Value (BTU/scf):					181.394	71.019	252.413
Gas Gravity (Gas/Air):					1996.81	2636.99	2141.09
Bubble Pt. @100F (psia):		297.56	32.33	9.94	1.19	1.60	1.28
RVP @100F (psia):		94.94	21.74	9.30			
Spec. Gravity @100F:		0.66	0.69	0.70			

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

**Identification**  
 User Identification: Jay Bee RTP-5  
 City: Huntington  
 State: West Virginia  
 Company: Jay-Bee Oil & Gas  
 Type of Tank: Vertical Fixed Roof Tank  
 Description: Condensate Tank W&B Emissions

**Tank Dimensions**  
 Shell Height (ft): 15.00  
 Diameter (ft): 10.00  
 Liquid Height (ft) : 15.00  
 Avg. Liquid Height (ft): 7.50  
 Volume (gallons): 8,812.81  
 Turnovers: 22.00  
 Net Throughput(gal/yr): 193,881.79  
 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) 0.30  
 Slope (ft/ft) (Cone Roof) 0.06

**Breather Vent Settings**  
 Vacuum Settings (psig): -0.03  
 Pressure Settings (psig) 0.03

**Meteorological 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**

**Jay Bee RTP-5 - Vertical Fixed Roof Tank**  
**Huntington, West Virginia**

Mixture/Component	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
	Month	Avg.	Min.		Max.	Avg.	Min.					
Gasoline (RVP=15.0)	All	61.42	53.10	69.74	57.09	8.3617	7.1698	9.7046	60.0000		92.00	Option 4: RVP=15, ASTM Slope=3

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

**Jay Bee RTP-5 - Vertical Fixed Roof Tank**  
**Huntington, West Virginia**

<b>Annual Emission Calculations</b>	
Spending Losses (lb):	2,142.7379
Vapor Space Volume (cu ft):	396.9026
Vapor Density (lb/cu ft):	0.0897
Vapor Space Expansion Factor:	0.4788
Vented Vapor Saturation Factor:	0.2289
<b>Tank Vapor Space Volume:</b>	
Vapor Space Volume (cu ft):	596.9026
Tank Diameter (ft):	10.0000
Vapor Space Outside (ft):	7.6000
Tank Shell Height (ft):	15.0000
Average Liquid Height (ft):	7.5000
Roof Ouage (ft):	0.1000
<b>Roof Ouage (Cone Roof)</b>	
Roof Ouage (ft):	0.1000
Roof Height (ft):	0.3000
Roof Slope (ft/ft):	0.0900
Shell Radius (ft):	5.0000
<b>Vapor Density</b>	
Vapor Density (lb/cu ft):	0.0897
Vapor Molecular Weight (lb/lb-mole):	60.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	8.3617
Daily Avg. Liquid Surface Temp. (deg. R):	521.0966
Daily Average Ambient Temp. (deg. F):	54.8458
Ideal Gas Constant R (psia cu ft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	516.7569
Tank Paint Solar Absorbance (Shell):	0.5400
Tank Paint Solar Absorbance (Roof):	0.5400
Daily Total Solar Insulation Factor (btus/sqft day):	1,246.2101
<b>Vapor Space Expansion Factor</b>	
Vapor Space Expansion Factor:	0.4788
Daily Vapor Temperature Range (deg. R):	33.2847
Daily Vapor Pressure Range (psia):	2.5349
Breather Vent Press. Settling Range (psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	8.3617
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	7.1698
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	9.7046
Daily Avg. Liquid Surface Temp. (deg R):	521.0966
Daily Min. Liquid Surface Temp. (deg R):	512.7654
Daily Max. Liquid Surface Temp. (deg R):	528.4077
Daily Ambient Temp. Range (deg. R):	20.0563
<b>Vented Vapor Saturation Factor</b>	
Vented Vapor Saturation Factor:	0.2289
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	8.3617
Vapor Space Ouage (ft):	7.9000

Working Losses (lb):  
Vapor Molecular Weight (lb/lb-mole): 60.0000  
Vapor Pressure at Daily Average Liquid Surface Temperature (psia): 8.3517  
Annual Net Throughput (gall/yr.): 153,851.7965  
Annual Turnovers: 22.0000  
Turnover Factor: 1.0000  
Maximum Liquid Volume (gal): 8,812.8098  
Maximum Liquid Height (ft): 15.0000  
Tank Diameter (ft): 10.0000  
Working Loss Product Factor: 1.0000

Total Losses (lb): 4,458.7039

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

**Emissions Report for: Annual**

**Jay Bee RTP-5 - Vertical Fixed Roof Tank**  
**Huntington, West Virginia**

Components	Losses(lbs)		Total Emissions
	Working Loss	Breathing Loss	
Gasoline (RVP 15.0)	2,315.97	2,142.74	4,458.70

## Flash Emissions

Constituent	TPY
<b>Total</b>	<b>14.4634</b>
<b>VOC</b>	<b>2.6633</b>
Nitrogen	7.67E-02
Carbon Dioxide	4.61E-02
Methane	8.58E+00
Ethane	3.10E+00
Propane	1.52E+00
Isobutane	2.48E-01
n-Butane	4.88E-01
2,2 Dimethylpropane	0.00E+00
Isopentane	1.33E-01
n-Pentane	1.31E-01
2,2 Dimethylbutane	0.00E+00
Cyclopentane	0.00E+00
2,3 Dimethylbutane	5.44E-02
2 Methylpentane	0.00E+00
3 Methylpentane	0.00E+00
n-Hexane	3.46E-02
Methylcyclopentane	0.00E+00
Benzene	5.79E-04
Cyclohexane	3.33E-03
2-Methylhexane	0.00E+00
3-Methylhexane	0.00E+00
2,2,4 Trimethylpentane	0.00E+00
Other C7's	2.17E-02
n-Heptane	8.10E-03
Methylcyclohexane	0.00E+00
Toluene	1.16E-03
Other C8's	1.16E-02
n-Octane	1.74E-03
Ethylbenzene	0.00E+00
M & P Xylenes	0.00E+00
O-Xylene	0.00E+00
Other C9's	0.00E+00
n-Nonane	0.00E+00
Other C10's	5.06E-03
n-Decane	0.00E+00
Undecanes (11)	0.00E+00

$E_{TOT}$   
Sum of C3+

Jay-Bee O&G RTP5 Produced Water Flash Emissions

## Flash Emission Calculations

Using Gas-Water Ratio Method

### Site specific data

Estimated Gas-water-ratio	=	7.50 scf/bbl
Throughput	=	13,900.0 bbl/yr
Stock tank gas molecular weight	=	37.74 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

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**ATTACHMENT J**

**Class I Legal Advertisement**

**To Be Provided Upon Receipt  
of Affidavit**

**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 a Class II Administrative Update to its G70-A General Permit Registration for its RPT-5 Well Pad off of County Route 40 near Alma in Tyler County, West Virginia. (Lat. 39.47687, Long. -80.79323)

The applicant estimates the following reduction in potential emissions of Regulated Air Pollutants will be:

- 0.42 tons of Nitrogen Oxides per year
- 2.78 tons of Carbon Monoxide per year
- 0.08 tons of Particulate Matter per year
- 21.21 tons of Volatile Organics per year
- 0.73 tons of Hazardous Air Pollutants

The applicant estimates the following increases in potential emissions of Regulated Air Pollutants will be:

- 0.37 tons of Particulate Matter per year
- 216 tons of Greenhouse Gases per year

Startup of operational modifications is planned to begin on or about the 15th day of August 2015. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57<sup>th</sup> 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 1227, during normal business hours.

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

By: Mr. Shane Dowell – Office Manager  
Jay Bee Oil & Gas, Inc.  
3570 Shields Hill Rd.  
Cairo, WV 26337

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**ATTACHMENT O**

**Emissions Summary Sheets**

**G70-A EMISSIONS SUMMARY SHEET**

Emission Point ID No.	Emission Point Type	Emission Unit Vented Through This Point		Air Pollution Control Device		All Regulated Pollutants - Chemical Name/CAS <sup>2</sup> (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions <sup>3</sup>		Maximum Potential Controlled Emissions <sup>4</sup>		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used <sup>5</sup>
		ID No.	Source	ID No.	Device Type		lb/hr	ton/yr	lb/hr	ton/yr		
GPU1	Upward Vertical Stack	1S	GPU	None		NOx	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
						PM	0.01	0.05	0.01	0.05	Solid	EE
						HCOH	<0.01	<0.01	<0.01	<0.01	Gas	EE
						Total HAPs	<0.01	0.01	<0.01	0.01	Gas	EE
						CO2e	181.2	794	181.2	794	Gas	EE
GPU2	Upward Vertical Stack	2S	GPU	None		NOx	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
						PM	0.01	0.05	0.01	0.05	Solid	EE
						HCOH	<0.01	<0.01	<0.01	<0.01	Gas	EE
						Total HAPs	<0.01	0.01	<0.01	0.01	Gas	EE
						CO2e	181.2	794	181.2	794	Gas	EE
GPU3	Upward Vertical Stack	3S	GPU	None		NOx	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
						PM	0.01	0.05	0.01	0.05	Solid	EE
						HCOH	<0.01	<0.01	<0.01	<0.01	Gas	EE
						Total HAPs	<0.01	0.01	<0.01	0.01	Gas	EE
						CO2e	181.2	794	181.2	794	Gas	EE
EC1	Upward Vertical Stack	12S	Tank Emissions	None		NOx			0.17	0.40	Gas	EE
						CO			0.89	2.02	Gas	EE
						VOC			37.3	6.99	Gas	EE
						PM			<0.01	0.02	Solid	EE
						HCOH					Gas	EE
						Total HAPs			0.78	3.44	Gas	EE
						CO2e			166.7	730	Gas	EE

TLU1	Truck Vent	4S	Truck Loading	None		NOx CO VOC PM HCOH Total HAPs CO2e	2.30	1.08	2.30	1.08	Gas Gas Gas Solid Gas Gas Gas	EE EE EE EE EE EE EE
TEG-1	Upward Vertical Stack	12S	Thermoelectric Generators	None		NOx CO VOC PM HCOH Total HAPs CO2e	0.7 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 1.57	1	0.7	1	Gas Gas Gas Solid Gas Gas Gas	EE EE EE EE EE EE EE
---	Fugitive	N/A	Haul Roads	None		NOx CO VOC PM HCOH Total HAPs CO2e	2.0	0.27	2.0	0.27	Gas Gas Gas Solid Gas Gas Gas	EE EE EE EE EE EE EE

The EMISSION SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured 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 EMISSIONS 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). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

<sup>1</sup> Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

<sup>2</sup> List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS<sub>2</sub>, VOCs, H<sub>2</sub>S, Inorganics, Lead, Organics, O<sub>3</sub>, NO, NO<sub>2</sub>, SO<sub>2</sub>, SO<sub>3</sub>, all applicable Greenhouse Gases (including CO<sub>2</sub> and methane), etc. DO NOT LIST H<sub>2</sub>, H<sub>2</sub>O, N<sub>2</sub>, O<sub>2</sub>, and Noble Gases

<sup>3</sup> 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).

<sup>4</sup> 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).<sup>4C</sup>

<sup>5</sup> Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; M = modeling; O = other (specify).

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**ATTACHMENT P**

**Other Supporting Documentation**

## 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 Specifications

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 <sup>3</sup> /day (311 ft <sup>3</sup> /day) of Std. 1000 BTU/SCF (37.7 MJ/SM <sup>3</sup> ) 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

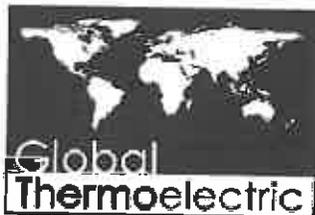
### Standard Features

- 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

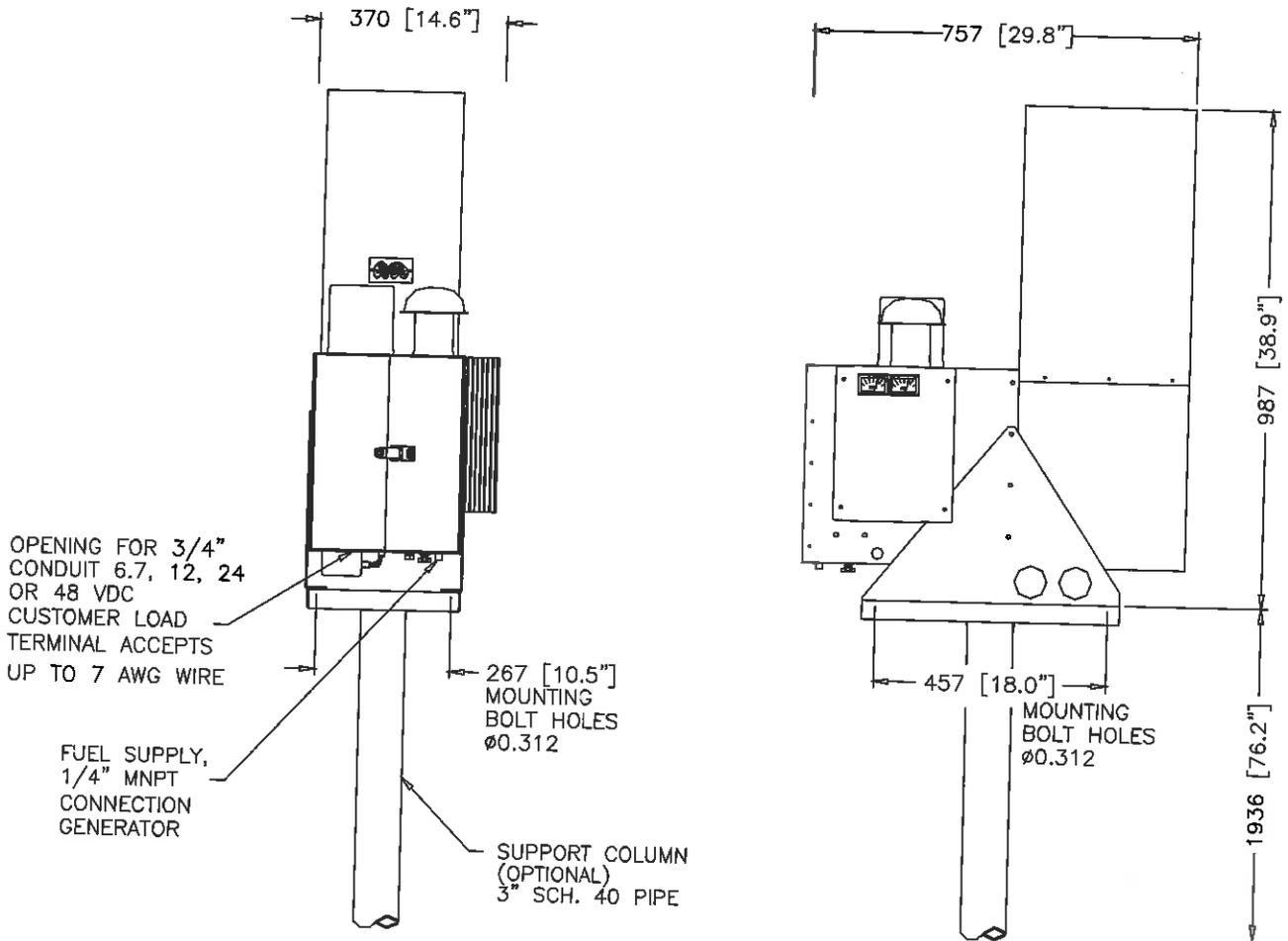
Note: Specifications shown are for standard configurations. Global Thermoelectric's Applications Engineering Department is available to design custom voltages, fuel supply systems and non-standard operating temperatures.



**Power where you need it.**

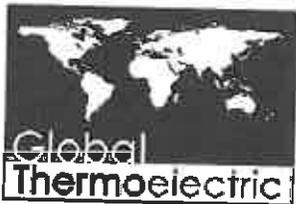


# Typical Installation



**NOTES:**

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



Power where you need it.

**Corporate Office**  
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 Calgary, Alberta T2C 2L8  
 CANADA  
 Phone: (403) 236-5556  
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 P.O. Box 38624  
 Houston, TX 77238  
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 Fax: (281) 445-6060  
 Toll Free: 1 800 848-4113

Model 5120 Thermoelectric Generator