**West Virginia** Department of Environmental Protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25 4
Phone (304) 926-0475
Fax (304) 926-0479
www.dep.wv.gov

# G70-C GENERAL PERMIT REGISTRATION APPLICATION

**PREVENTION AND CONTROL OF AIR POLLUTION IN REGARD TO THE CONSTRUCTION, MODIFICATION, RELOCATION, ADMINISTRATIVE UPDATE AND OPERATION OF NATURAL GAS PRODUCTION FACILITIES LOCATED AT THE WELL SITE**

☒CONSTRUCTION
☐MODIFICATION
☐RELOCATION
☐CLASS I ADMINISTRATIVE UPDATE
☐CLASS II ADMINISTRATIVE UPDATE

## SECTION 1. GENERAL INFORMATION

Name of Applicant (as registered with the WV Secretary of State's Office): **Northeast Natural Energy, LLC**

Federal Employer ID No. (FEIN): **27-0945493**

Applicant's Mailing Address: 48 Donley Street, Suite 601

| City: **Morgantown** | State: **WV** | ZIP Code: **26501** |
|---|---|---|

Facility Name: **Kassay Well Pad**

Operating Site Physical Address: **1003 Daybrook Road**
If none available, list road, city or town and zip of facility.

| City: **Fairview** | Zip Code: **26570** | County: **Monongalia** |
|---|---|---|

Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):
Latitude: **39.65851**
Longitude: **-80.194503**

| SIC Code: **1311**<br><br>NAICS Code: **211111** | DAQ Facility ID No. (For existing facilities) |
|---|---|

## CERTIFICATION OF INFORMATION

This G70-C 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 the 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, 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 G70-C Registration Application will be returned to the applicant. Furthermore, if the G70-C forms are not utilized, the application will be returned to the applicant. No substitution of forms is allowed.**

I hereby certify that 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 Division of Air Quality immediately.

I hereby certify that all information contained in this G70-C 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.

Responsible Official Signature: Brett Loflin
Name and Title: **Brett Loflin –Vice President Regulatory Affairs** Phone: **304/241-5782** Fax: **304/414-7061**
Email: **bloflin@nne-llc.com** Date: 9/15/16

If applicable:
Authorized Representative Signature: _____
Name and Title: Phone: Fax:
Email: Date:

If applicable:
Environmental Contact
Name and Title: **Brett Loflin** Phone: Fax:
Email: Date:

| OPERATING SITE INFORMATION |
|---|
| Briefly describe the proposed new operation and/or any change(s) to the facility: **New Natural Gas Well Pad Production Facility** |
| Directions to the facility: **From I-79, take exit 155. Merge onto CHAPLIN HILL RD/CR-19/24 N toward US-19/WV-7/STAR CITY. If traveling from the south, this will be a right. If from the north, this will be a left off the exit. After 0.8 miles, turn left at light onto US-19/WV-7. Continue on US-19/WV-7 for 1.7 miles. Turn left on WV-7 and continue on route for 13.9 miles. Turn left onto WV-218/DAYBROOK RUN RD and continue south 5.9 miles to Yank Hollow Road (SR 23/3). Turn left onto Yank Hollow Road and travel east approximately 1.25 miles to well pad entrance road on the left.** |

| ATTACHMENTS AND SUPPORTING DOCUMENTS | |
|---|---|
| **I have enclosed the following required documents:** | |
| Check payable to WVDEP – Division of Air Quality with the appropriate application fee (per 45CSR13 and 45CSR22).<br><br>☒ Check attached to front of application.<br>☐ I wish to pay by electronic transfer. Contact for payment (incl. name and email address):<br>☐ I wish to pay by credit card. Contact for payment (incl. name and email address):<br><br>☒$500 (Construction, Modification, and Relocation) ☐$300 (Class II Administrative Update)<br>☒$1,000 NSPS fee for 40 CFR60, Subpart IIII, JJJJ and/or OOOO [1]<br>☐$2,500 NESHAP fee for 40 CFR63, Subpart ZZZZ and/or HH [2]<br><br>[1] Only one NSPS fee will apply.<br>[2] Only one NESHAP fee will apply. The Subpart ZZZZ NESHAP fee will be waived for new engines that satisfy requirements by complying with NSPS, Subparts IIII and/or JJJJ.<br>*NSPS and NESHAP fees apply to new construction or if the source is being modified.* | |
| ☒ Responsible Official or Authorized Representative Signature (if applicable) | |
| ☒ Single Source Determination Form **(must be completed in its entirety)** – Attachment A | |
| ☐ Siting Criteria Waiver (if applicable) – Attachment B | ☒ Current Business Certificate – Attachment C |
| ☒ Process Flow Diagram – Attachment D | ☒ Process Description – Attachment E |
| ☒ Plot Plan – Attachment F | ☒ Area Map – Attachment G |
| ☒ G70-C Section Applicability Form – Attachment H | ☒ Emission Units/ERD Table – Attachment I |
| ☒ Fugitive Emissions Summary Sheet – Attachment J | |
| ☒ Gas Well Affected Facility Data Sheet (if applicable) – Attachment K | |
| ☒ Storage Vessel(s) Data Sheet (include gas sample data, USEPA Tanks, simulation software (e.g. ProMax, E&P Tanks, HYSYS, etc.), etc. where applicable) – Attachment L | |
| ☒ Natural Gas Fired Fuel Burning Unit(s) Data Sheet (GPUs, Heater Treaters, In-Line Heaters if applicable) – Attachment M | |
| ☒ Internal Combustion Engine Data Sheet(s) (include manufacturer performance data sheet(s) if applicable) – Attachment N | |
| ☒ Tanker Truck Loading Data Sheet (if applicable) – Attachment O | |
| ☐ Glycol Dehydration Unit Data Sheet(s) (include wet gas analysis, GRI- GLYCalc™ input and output reports and information on reboiler if applicable) – Attachment P | |
| ☐ Pneumatic Controllers Data Sheet – Attachment Q | |
| ☐ Air Pollution Control Device/Emission Reduction Device(s) Sheet(s) (include manufacturer performance data sheet(s) if applicable) – Attachment R | |
| ☒ Emission Calculations (please be specific and include all calculation methodologies used) – Attachment S | |
| ☒ Facility-wide Emission Summary Sheet(s) – Attachment T | |
| ☒ Class I Legal Advertisement – Attachment U | |
| ☒ One (1) paper copy and two (2) copies of CD or DVD with pdf copy of application and attachments | |

**All attachments must be identified by name, divided into sections, and submitted in order.**

## ATTACHMENT A - SINGLE SOURCE DETERMINATION FORM

Classifying multiple facilities as one "stationary source" under 45CSR13, 45CSR14, and 45CSR19 is based on the definition of Building, structure, facility, or installation as given in §45-14-2.13 and §45-19-2.12. The definition states:

*"Building, Structure, Facility, or Installation" means all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control). Pollutant-emitting activities are a part of the same industrial grouping if they belong to the same "Major Group" (i.e., which have the same two (2)-digit code) as described in the Standard Industrial Classification Manual, 1987 (United States Government Printing Office stock number GPO 1987 0-185-718:QL 3).*

Is there a facility owned by or associated with the natural gas industry located within one (1) mile of the proposed facility? Yes X No ☐

If Yes, please complete the questionnaire on the following page (Attachment A).

Please provide a source aggregation analysis for the proposed facility below:

This Northeast Natural Energy facility will receive and manage raw natural gas and associated produced water from the wells. After separation of the produced water, the gas will be injected into gathering lines for transportation via pipeline owned a
nd operated by others to a compressor station, owned and operated by others, where it will be compressed, dehydrated and injected into a transmission line for transportation to customers.

The Kassay Well Pad is located 1.71 miles from the nearest facility (Yost Well Pad) owned and operated by Northeast, including support facilities. These two well pads are owned and operated by the same organization, are under the same SIC code and share personnel. However the two facilities operate independent of each other. Operation of the Kassay Well Pad does not depend on operation of the Yost Well Pad and operation of Yost Well Pad does not depend on operation of the Kassay Well Pad. Most importantly, these two well pads are separated by 1.71 mile with multiple properties in between that are not under control of Northeast.

The Kassay Well Pad and the receiving compressor station (Hamilton CS) are under the same general SIC Code. <u>They are not under common ownership and will not have a sharing of staff</u>. Additionally, as the gas can also flow to other compressor stations further away, there is no dependency of the Kassay Well Pad on this compressor station. Additionally, operation of this compressor station is not dependent upon the Kassay Well Pad as it also receives gas from other well pads in addition to Kassay. Lastly, the distance between the planned Kassay Well Pad and the receiving compressor station (1.2 miles) does not rise to the definition of contiguous or adjacent. Thus, not all of the criteria for aggregation are met. Hence, emissions from the Kassay Well Pad should not be aggregated with those of Hamilton Compressor Station.

## ATTACHMENT A - SINGLE SOURCE DETERMINATION FORM

Answer each question with a detailed explanation to determine contiguous or adjacent properties which are under a common control and any support facilities. This section must be completed in its entirety.

Provide a map of contiguous or adjacent facilities (production facilities, compressor stations, dehydration facilities, etc.) which are under common control and those facilities that are not under common control but are support facilities. Please indicate the SIC code, permit number (if applicable), and the distance between facilities in question on the map.

| | |
|---|---|
| Are the facilities owned by the same parent company or a subsidiary of the parent company? Provide the owners identity and the percentage of ownership of each facility. **The two well pads are owned and operated by Northeast Natural Energy** | Yes ☒ No ☐ |
| Does an entity such as a corporation have decision making authority over the operation of a second entity through a contractual agreement or voting interest? Please explain. | Yes ☐ No ☒ |
| Is there a contract for service relationship between the two (2) companies or, a support/dependency relationship that exists between the two (2) companies? Please explain. | Yes ☐ No ☒ |
| Do the facilities share common workforces, plant managers, security forces, corporate executive officers or board executives? **NNE Well Tenders will work at both sites** | Yes ☒ No ☐ |
| Will managers or other workers frequently shuttle back and forth to be involved actively at both facilities? **NNE Well Tenders will work at both sites** | Yes ☒ No ☐ |
| Do the facilities share common payroll activities, employee benefits, health plans, retirement funds, insurance coverage, or other administrative functions? Please explain. **All workers at both sites will be NNE employees with common payroll and benefits** | Yes ☒ No ☐ |
| Does one (1) facility operation support the operation of the other facility? | Yes ☐ No ☒ |
| Is one (1) facility dependent on the other? If one (1) facility shuts down, what are the limitations on the other to pursue outside business? Please explain. | Yes ☐ No ☒ |
| Are there any financial arrangements between the two (2) entities? | Yes ☐ No ☒ |
| Are there any legal or lease agreements between the two (2) facilities? | Yes ☐ No ☒ |
| Do the facilities share products, byproducts, equipment, or other manufacturing or air pollution control device equipment? Please explain. | Yes ☐ No ☒ |
| Do all the pollutant-emitting activities at the facilities belong to the same SIC Code? Please provide the SIC Codes. **3111** | Yes ☒ No ☐ |
| Was the location of the new facility chosen primarily because of its proximity to the existing facility to integrate the operation of the two (2) facilities? Please explain. | Yes ☐ No ☒ |
| Will materials be routinely transferred between the two (2) facilities? Please explain the amount of transfer and how often the transfers take place and what percentages go to the various entities. | Yes ☐ No ☒ |
| Does the facility influence production levels or compliance with environmental regulations at other facilities? Who accepts the responsibility for compliance with air quality requirements? Please explain. | Yes ☐ No ☒ |

## ATTACHMENT C – CURRENT BUSINESS CERTIFICATE

If the applicant is a resident of West Virginia, the applicant should provide a copy of the current Business Registration Certificate issued to them from the West Virginia Secretary of State's Office. If the applicant is not a resident of the State of West Virginia, the registrant should provide a copy of the Certificate of Authority/Authority of LLC/Registration. This information is required for all sources to operate a business in West Virginia regardless of whether it is a construction, modification, or administrative update.

If you are a new business to West Virginia and have applied to the West Virginia Secretary of State's Office for a business license, please include a copy of your application.

Please note: Under the West Virginia Bureau of Employment Programs, 96CSR1, the DAQ may not grant, issue, or renew approval of any permit, general permit registration, or Certificate to Operate to any employing unit whose account is in default with the Bureau of Employment Programs Unemployment Compensation Division.

# State of West Virginia

# Certificate

***I, Natalie E. Tennant, Secretary of State of the State of West Virginia, hereby certify that***

**NORTHEAST NATURAL ENERGY LLC**

**Control Number: 99GX5**

a limited liability company, organized under the laws of the State of Delaware

has filed its "Application for Certificate of Authority" in my office according to the provisions of West Virginia Code §31B-10-1002. I hereby declare the organization to be registered as a foreign limited liability company from its effective date of October 9, 2009, until a certificate of cancellation is filed with our office.

Therefore, I hereby issue this

## CERTIFICATE OF AUTHORITY OF A FOREIGN LIMITED LIABILITY COMPANY

to the limited liability company authorizing it to transact business in West Virginia

***Given under my hand and the Great Seal of the State of West Virginia on this day of October 9, 2009***

Natalie E Tennant

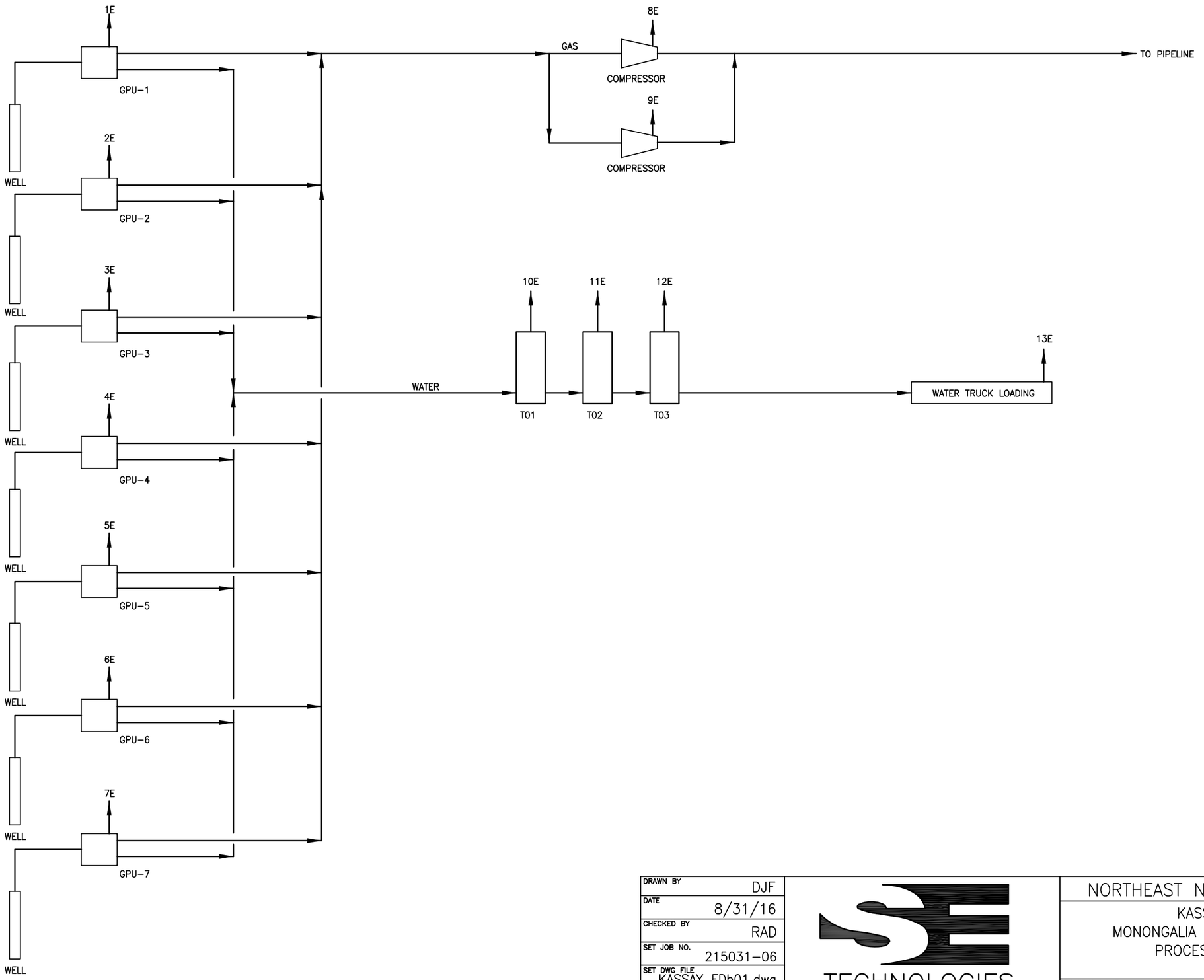
***Secretary of State***

## ATTACHMENT D – PROCESS FLOW DIAGRAM

Provide a diagram or schematic that supplements the process description of the operation. The process flow diagram must show all sources, components or facets of the operation in an understandable line sequence of operation. The process flow diagram should include the emission unit ID numbers, the pollution control device ID numbers, and the emission point ID numbers consistent with references in other attachments of the application. For a proposed modification, clearly identify the process areas, emission units, emission points, and/or control devices that will be modified, and specify the nature and extent of the modification.

Use the following guidelines to ensure a complete process flow diagram:

- The process flow diagram shall logically follow the entire process from beginning to end.
- Identify each emission source and air pollution control device with proper and consistent emission unit identification numbers, emission point identification numbers, and control device identification numbers.
- The process flow lines may appear different for clarity. For example, dotted lines may be used for vapor flow and solid lines used for liquid flow and arrows for direction of flow.
- The process flow lines may be color coded. For example: new or modified equipment may be red; old or existing equipment may be blue; different stages of preparation such as raw material may be green; and, finished product or refuse, another color.

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| DRAWN BY | DJF |
| DATE | 8/31/16 |
| CHECKED BY | RAD |
| SET JOB NO. | 215031-06 |
| SET DWG FILE | KASSAY FDb01.dwg |
| DRAWING SCALE | N.T.S. |

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

NORTHEAST NATIONAL ENERGY, LLC

KASSAY WELL PAD
MONONGALIA COUNTY, WEST VIRGINIA
PROCESS FLOW DIAGRAM

DRAWING NAME: FIGURE 2

REV. 0

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## ATTACHMENT E – PROCESS DESCRIPTION

Provide a detailed written description of the operation for which the applicant is seeking a permit. The process description is used in conjunction with the process flow diagram to provide the reviewing engineer a complete understanding of the activity at the operation. Describe in detail and order the complete process operation.

Use the following guidelines to ensure a complete Process Description:

- The process flow diagram should be prepared first and used as a guide when preparing the process description. The written description shall follow the logical order of the process flow diagram.
- All emission sources, emission points, and air pollution control devices must be included in the process description.
- When modifications are proposed, describe the modifications and the effect the changes will have on the emission sources, emission points, control devices and the potential emissions.
- Proper emission source ID numbers must be used consistently in the process description, the process flow diagram, the emissions calculations, and the emissions summary information provided.
- Include any additional information that may facilitate the reviewers understanding of the process operation.

The process description is required for all sources regardless of whether it is a construction, modification, or administrative update.

# Northeast Natural Energy, LLC
# Kassay Well Pad
# Attachment E
# Process Description

Natural gas and Produced Fluids (water) will be received from seven wells on this location at approximately 600 psi and pass through Gas Processing Units [Emission Units GPU-1 to GPU-7] to avoid ice and methane hydrate formation during subsequent pressure drops. These materials will then pass through a separator where gas and water are separated. There will be two gas-fired engines [Emission Units CE-1 and CE-2] used to drive compressors which will boost the pressure of the production gas to a pressure suitable for injection into the gathering line owned by others. No dehydration units are proposed for this facility. The compressed gas will be metered and routed to a gathering pipeline owned and operated by others.

The Produced Water will be accumulated in two 400 BBL tanks and a single 210 BBL tank [Emission Units T01 - T03], pending truck loading [Emission Unit TL-1] and transportation to facilities owned and operated by others. Produced water will be re-used at subsequent wells or disposed of at a regional disposal facility. Flash, working and breathing losses from these tanks have been determined to be nominal, based on measurements at a nearby Northeast Energy Well Pad, and will be allowed to vent to atmosphere. *There is no condensate generated at this facility*.

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

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

40 CFR 60, Subpart OOOOa requires that VOC emissions from each "storage vessel affected facility" installed after September 18, 2015 must be controlled by at least 95% within 60 days of installation when the uncontrolled VOC emissions exceed 6 tpy [ 40 CFR 60.5395a(a)(2)]. VOC emissions from the tanks described above will be well below the 6 tpy threshold to be defined as a "storage vessel affected facility". Thus, the tanks at this facility will not be regulated under 40 CFR 60, Subpart OOOOa.

## ATTACHMENT F – PLOT PLAN

Provide an accurately scaled and detailed Plot Plan showing the locations of all emission units, emission points, and air pollution control devices. Show all emission units, affected facilities, enclosures, buildings and plant entrances and exits from the nearest public road(s) as appropriate. Note height, width and length of proposed or existing buildings and structures.

A scale between 1"=10' and 1"=200' should be used with the determining factor being the level of detail necessary to show operation or plant areas, affected facilities, emission unit sources, transfer points, etc. An overall small scale plot plan (e.g., 1"=300') should be submitted in addition to larger scale plot plans for process or activity areas (e.g., 1"=50') if the plant is too large to allow adequate detail on a single plot plan. Process or activity areas may be grouped for the enlargements as long as sufficient detail is shown.

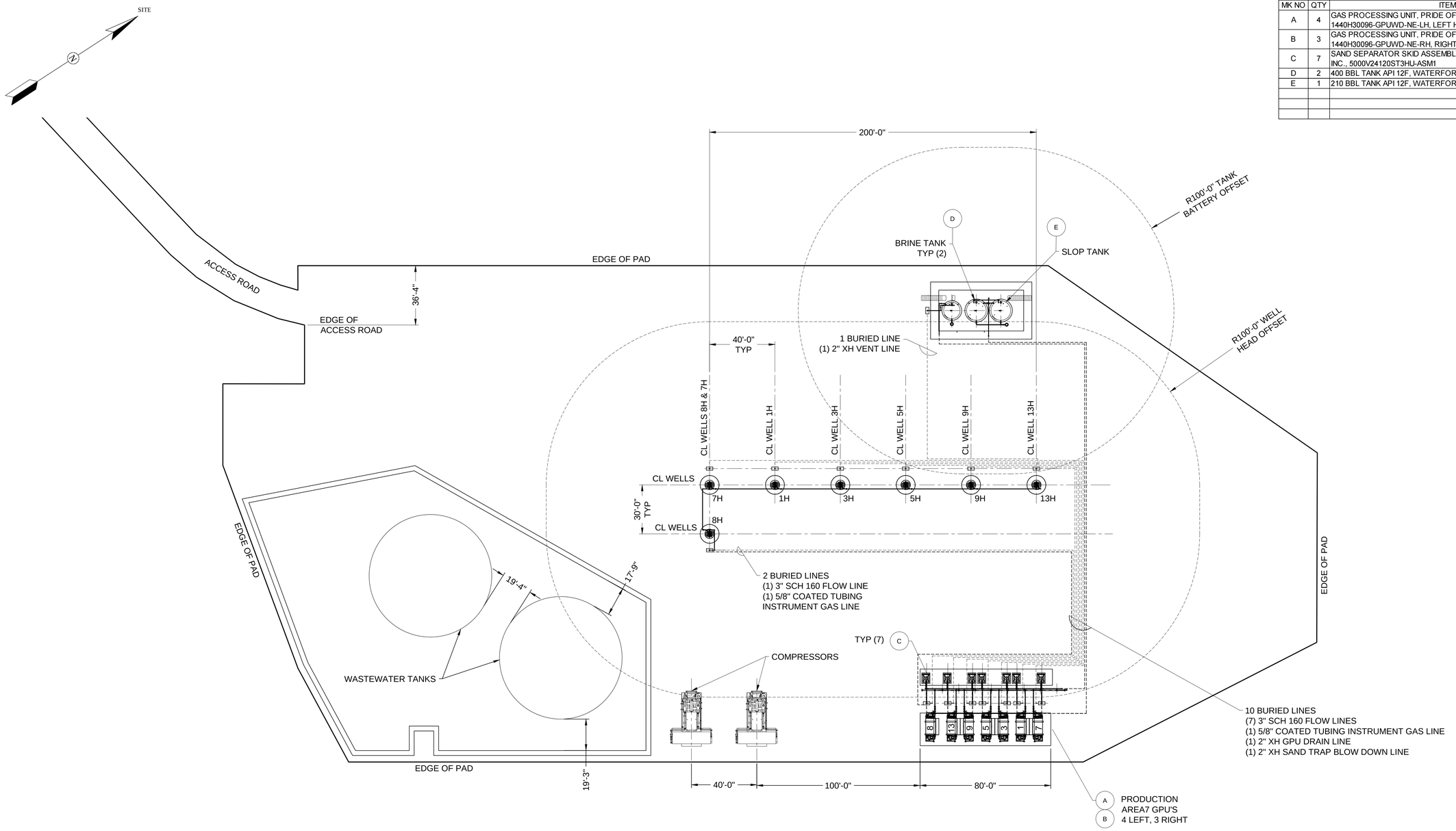
Use the following guidelines to ensure a complete Plot Plan:

- Facility name
- Company name
- Company facility ID number (for existing facilities)
- Plot scale, north arrow, date drawn, and submittal date.
- Facility boundary lines
- Base elevation
- Lat/Long reference coordinates from the area map and corresponding reference point elevation
- Location of all point sources labeled with proper and consistent source identification numbers

This information is required for all sources regardless of whether it is a construction, modification, or administrative update.

## BILL OF MATERIAL

| MK NO | QTY | ITEM DESCRIPTION | REF DRAWING |
|---|---|---|---|
| A | 4 | GAS PROCESSING UNIT, PRIDE OF THE HILLS MANUFACTURING INC., 1440H30096-GPUWD-NE-LH, LEFT HAND ASSEMBLY | GPU0075D-LH |
| B | 3 | GAS PROCESSING UNIT, PRIDE OF THE HILLS MANUFACTURING INC., 1440H30096-GPUWD-NE-RH, RIGHT HAND ASSEMBLY | GPU0075D-RH |
| C | 7 | SAND SEPARATOR SKID ASSEMBLY, PRIDE OF THE HILLS MANUFACTURING INC., 5000V24120ST3HU-ASM1 | ST0017C-ASM1 |
| D | 2 | 400 BBL TANK API 12F, WATERFORD TANK & FABRICATION, 12'Ø x 20'-0" HIGH | T400-12 |
| E | 1 | 210 BBL TANK API 12F, WATERFORD TANK & FABRICATION, 10'Ø x 15'-0" HIGH | T210-22 |




# PLAN VIEW

KASSAY WELL PAD

SCALE 1"=30'

Vavco LLC
Revised & Re-Issued for Const. / Fab.
*Issued By: Mark Hadley*
*Issued on: Jul 28, 2016 @ 12:07:45*

| REV | DESCRIPTION | DATE | BY |
|---|---|---|---|
| 4 | REMOVED FUTURE WELLS AND REVISED COMPRESSORS | 7/28/2016 | BSB |
| 3 | REISSUED FOR CONSTRUCTION | 7/21/2016 | BSB |
| 2 | REVISED LAYOUT TO SUIT LOCATIONS OF WASTE WATER TANKS | 7/19/2016 | BSB |
| 1 | REVISED TO ACCOMMODATE INSTALLATION OF WASTE WATER TANKS | 3/4/2016 | RUNQUIST |
| 0 | ISSUED FOR CONSTRUCTION | 12/21/2015 | MCCOY |

LETTERED REVISIONS (i.e., 'A', 'B' etc.) INDICATE DRAWINGS FOR REVIEW/APPROVAL. NO WORK SHALL BE DONE BASED ON THESE DRAWINGS. AFTER APPROVAL DRAWINGS SHALL MARKED AS REVISION # 0. ALL SUBSEQUENT CHANGES TO THE DRAWING SHALL BE SEQUENTIALLY NUMBERED AND LISTED HERE. AFTER APPROVAL REFERENCES TO LETTERED REVISIONS SHALL BE REMOVED.

# VAVCO LLC.

101 MAHOOD ROAD, BUTLER, PA 16001

FOR: NORTHEAST NATURAL ENERGY, LLC PROJ: KASSAY WELL PAD

SITE LAYOUT
OVERALL PLAN VIEW

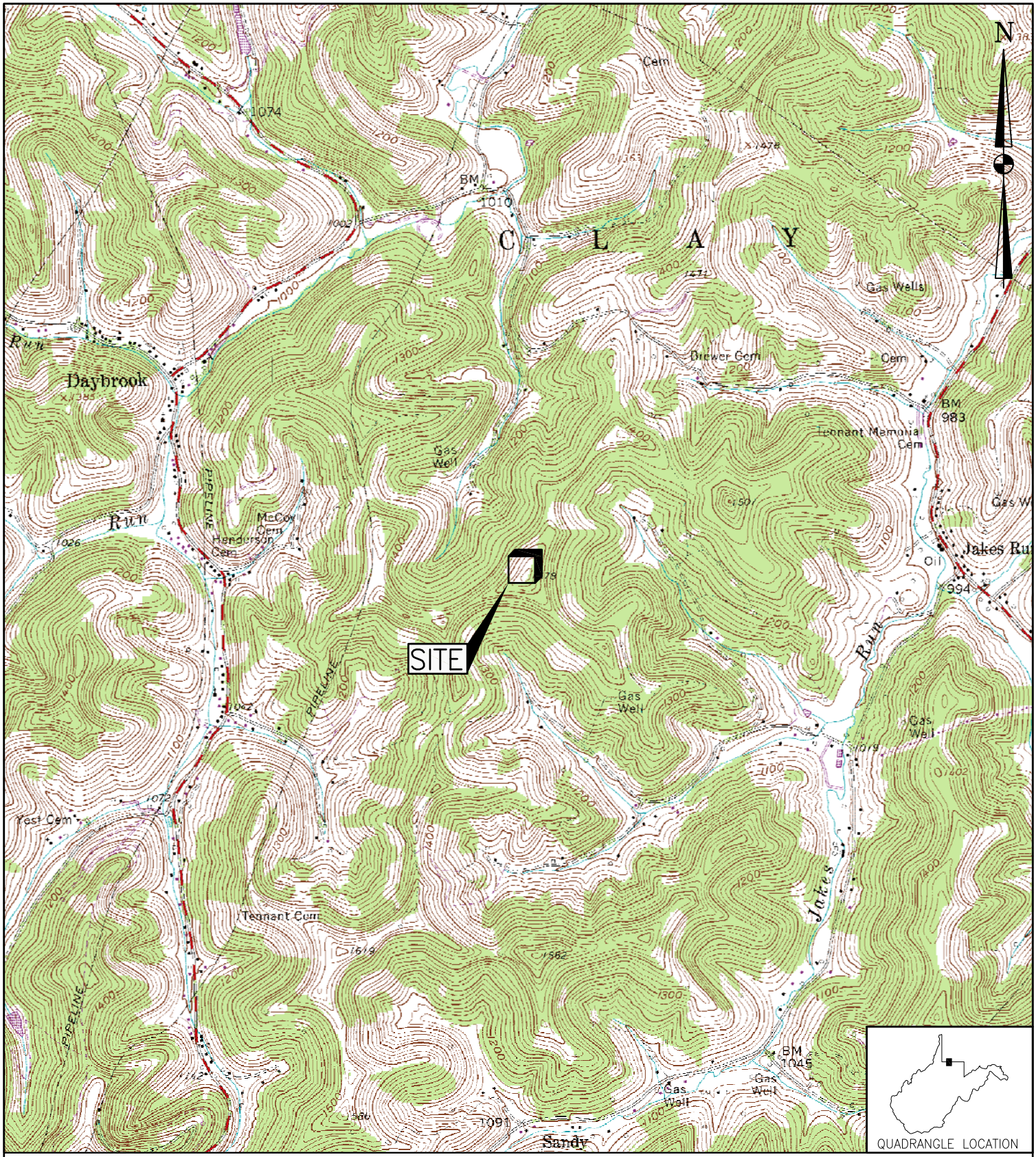
| TOWN: - | SCALE 1" = 30'-0" | DRAWN BY: RUNQUIST 3/4/2016 | CHECKED: SINKUC 3/4/2016 | ISSUED FOR: CONSTRUCTION |
|---|---|---|---|---|
| COUNTY: - | | | | |
| DR/FILE: NNE-1500-P-100.dwg | PROJ# 1500 | DWG. NO. NNE-1500-P-100 | | REV. 4 |

## ATTACHMENT G – AREA MAP

Provide an Area Map showing the current or proposed location of the operation. On this map, identify plant or operation property lines, access roads and any adjacent dwelling, business, public building, school, church, cemetery, community or institutional building or public park within a 300’ boundary circle of the collective emission units.

Please provide a 300’ boundary circle on the map surrounding the proposed emission units collectively.

This information is required for all sources regardless of whether it is a construction, modification, or administrative update.




REFERENCE: USGS 7.5' QUADRANGLE MAP OF: BLACKSVILLE, W.VA.–PA; DATED 1958, PHOTOREVISED 1976, PHOTOINSPECTED 1988.

| | |
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| DRAWN BY | DJF |
| DATE | 8/2/16 |
| CHECKED BY | RAD |
| SET JOB NO. | 215031–06 |
| SET DWG FILE | KASSAYm01.dwg |
| DRAWING SCALE | 1"=2000' |


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


# NORTHEAST NATIONAL ENERGY, LLC

KASSAY WELL PAD
MONONGALIA COUNTY, WEST VIRGINIA
SITE LOCATION MAP

| DRAWING NO. | REV. |
|---|---|
| FIGURE 1 | 0 |

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| CHECKED BY | RAD |
| SET JOB NO. | 215031-06 |
| SET DWG FILE | KASSAYm01.dwg |
| DRAWING SCALE | 1"=500' |

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NORTHEAST NATIONAL ENERGY, LLC

KASSAY WELL PAD
MONONGALIA COUNTY, WEST VIRGINIA
SITE LOCATION MAP
300' RADIUS MAP

| DRAWING NO. | REV. |
|---|---|
| FIGURE 1A | 0 |

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## ATTACHMENT H – G70-C SECTION APPLICABILITY FORM

# General Permit G70-C Registration
# Section Applicability Form

General Permit G70-C was developed to allow qualified applicants to seek registration for a variety of sources. These sources include gas well affected facilities, storage vessels, gas production units, in-line heaters, heater treaters, glycol dehydration units and associated reboilers, pneumatic controllers, centrifugal compressors, reciprocating compressors, reciprocating internal combustion engines (RICEs), tank truck loading, fugitive emissions, 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-C 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.

| GENERAL PERMIT G70-C APPLICABLE SECTIONS | |
|---|---|
| X Section 5.0 | Gas Well Affected Facility (NSPS, Subpart OOOO) |
| X Section 6.0 | Storage Vessels Containing Condensate and/or Produced Water[1] |
| ☐Section 7.0 | Storage Vessel Affected Facility (NSPS, Subpart OOOO) |
| ☐Section 8.0 | Control Devices and Emission Reduction Devices not subject to NSPS Subpart OOOO and/or NESHAP Subpart HH |
| X Section 9.0 | Small Heaters and Reboilers not subject to 40CFR60 Subpart Dc |
| ☐Section 10.0 | Pneumatic Controllers Affected Facility (NSPS, Subpart OOOO) |
| ☐Section 11.0 | Centrifugal Compressor Affected Facility (NSPS, Subpart OOOO)[2] |
| X Section 12.0 | Reciprocating Compressor Affected Facility (NSPS, Subpart OOOO)[2] |
| X Section 13.0 | Reciprocating Internal Combustion Engines, Generator Engines, Microturbines |
| X Section 14.0 | Tanker Truck Loading[3] |
| ☐Section 15.0 | Glycol Dehydration Units[4] |

*1 Applicants that are subject to Section 6 may also be subject to Section 7 if the applicant is subject to the NSPS, Subpart OOOO control requirements or the applicable control device requirements of Section 8.*

*2 Applicants that are subject to Section 11 and 12 may also be subject to the applicable RICE requirements of Section 13.*

*3 Applicants that are subject to Section 14 may also be subject to control device and emission reduction device requirements of Section 8.*

*4 Applicants that are subject to Section 15 may also be subject to the requirements of Section 9 (reboilers). Applicants that are subject to Section 15 may also be subject to control device and emission reduction device requirements of Section 8.*

## ATTACHMENT I – EMISSION UNITS / EMISSION REDUCTION DEVICES (ERD) TABLE

Include ALL emission units and air pollution control devices/ERDs that will be part of this permit application review. Do not include fugitive emission sources in this table. Deminimis storage tanks shall be listed in the Attachment L table. This information is required for all sources regardless of whether it is a construction, modification, or administrative update.

| Emission Unit ID[1] | Emission Point ID[2] | Emission Unit Description | Year Installed | Manufac. Date[3] | Design Capacity | Type[4] and Date of Change | Control Device(s)[5] | ERD(s)[6] |
|---|---|---|---|---|---|---|---|---|
| GPU-1 | 1E | Gas Processing Unit | Pending Permit | | 1.0 MMBTU/Hr | NEW | | |
| GPU-2 | 2E | Gas Processing Unit | Pending Permit | | 1.0 MMBTU/Hr | NEW | | |
| GPU-3 | 3E | Gas Processing Unit | Pending Permit | | 1.0 MMBTU/Hr | NEW | | |
| GPU-4 | 4E | Gas Processing Unit | Pending Permit | | 1.0 MMBTU/Hr | NEW | | |
| GPU-5 | 5E | Gas Processing Unit | Pending Permit | | 1.0 MMBTU/Hr | NEW | | |
| GPU-6 | 6E | Gas Processing Unit | Pending Permit | | 1.0 MMBTU/Hr | NEW | | |
| GPU-7 | 7E | Gas Processing Unit | Pending Permit | | 1.0 MMBTU/Hr | NEW | | |
| CE-1 | 8E | CAT 3516B | Pending Permit | After Jan 1, 2012 | 1380 HP | NEW | 1C | |
| CE-2 | 9E | CAT 3516B | Pending Permit | After Jan 1, 2012 | 1380 HP | NEW | 2C | |
| T01 | 10E | Produced Water Tank | Pending Permit | | 400 BBL | NEW | | |
| T02 | 11E | Produced Water Tank | Pending Permit | | 400 BBL | NEW | | |
| T03 | 12E | Produced Water Tank | Pending Permit | | 210 BBL | NEW | | |
| TL-1 | 13E | Produced Water Truck Loading | Pending Permit | | | NEW | | |

[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
[2] For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[3] When required by rule
[4] New, modification, removal, existing
[5] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.
[6] For ERDs use the following numbering system: 1D, 2D, 3D,... or other appropriate designation.

## ATTACHMENT J – FUGITIVE EMISSIONS SUMMARY SHEET

Sources of fugitive emissions may include loading operations, equipment leaks, blowdown emissions, etc.
Use extra pages for each associated source or equipment if necessary.

Source/Equipment: **Equipment Leaks and Blowdown Emissions**

| Leak Detection Method Used | ☒ Audible, visual, and olfactory (AVO) inspections | ☐ Infrared (FLIR) cameras | ☐ Other (please describe) | ☐ None required |
|---|---|---|---|---|

| Component Type | Closed Vent System | Count | Source of Leak Factors (EPA, other (specify)) | Stream type (gas, liquid, etc.) | Estimated Emissions (tpy) | | |
|---|---|---|---|---|---|---|---|
| | | | | | VOC | HAP | GHG ($CO_2e$) |
| Pumps | ☐ Yes ☒ No | 0 | EPA | ☐ Gas ☐ Liquid ☐ Both | | | |
| Valves | ☐ Yes ☒ No | 42 | EPA | ☒ Gas ☐ Liquid ☐ Both | <0.01 | <0.01 | 5.35 |
| Safety Relief Valves | ☐ Yes ☒ No | 21 | EPA | ☒ Gas ☐ Liquid ☐ Both | <0.01 | <0.01 | 3.96 |
| Open Ended Lines | ☐ Yes ☐ No | 7 | EPA | ☒ Gas ☐ Liquid ☐ Both | <0.01 | <0.01 | 0.01 |
| Sampling Connections | ☐ Yes ☒ No | 14 | TCEQ | ☒ Gas ☐ Liquid ☐ Both | 0.01 | <0.01 | 47.15 |
| Connections (Not sampling) | ☐ Yes ☒ No | 180 | EPA | ☒ Gas ☐ Liquid ☐ Both | <0.01 | <0.01 | 2.55 |
| Compressors | ☐ Yes ☒ No | 2 | API | ☒ Gas ☐ Liquid ☐ Both | <0.01 | <0.01 | 0.18 |
| Flanges | ☐ Yes ☒ No | 210 | API | ☒ Gas ☐ Liquid ☐ Both | <0.01 | <0.01 | 18.44 |
| Other[1] (Blowdowns) | ☐ Yes ☒ No | | | ☒ Gas ☐ Liquid ☐ Both | 0.01 | <0.01 | 40.4 |

[1] Other equipment types may include compressor seals, relief valves, diaphragms, drains, meters, etc.

Please provide an explanation of the sources of fugitive emissions (e.g. pigging operations, equipment blowdowns, pneumatic controllers, etc.):
**Other Equipment is compressor engine blowdowns. No pigging owned/operated by Northeast.**

Please indicate if there are any closed vent bypasses (include component):
**None**

Specify all equipment used in the closed vent system (e.g. VRU, ERD, thief hatches, tanker truck loading, etc.)**N/A**

# Northeast Natural Energy, LLC
# Kassay Well Pad
# Attachment J – Fugitive Emissions Data

**Storage Tank and Haul Road Fugitive Emissions**
Haul Road Fugitive Emissions for unpaved roads are calculated and presented in Attachment S. Potential PM emissions are estimated to be 12.66 tons per year and PM-10 to be 1.71 tons per year.

Produced Fluids generated by the on-site wells will be accumulated in a three tanks prior to off-site shipment. Emissions from these tanks were determined by using direct measurements from produced water tanks at a nearby Northeast well pad. Uncontrolled emissions from these tanks were determined to be 1.01 tons per year of VOCs and 0.20 tons per year of HAPs. There is no control on these emissions. *There is no condensate generated at this facility.*

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

**Equipment Fugitive Emissions**
As noted in the process discussion, Northeast plans to install various equipment at its Kassay Well Pad. This equipment will contain a variety of piping containing natural gas and separated liquids under pressure. During the normal course of operation minor leaks from valves, pressure release devices and various fittings associated with this piping may occur. A potential emission rate of 0.02 tpy of VOCs and 77.6 tpy $CO_2e$ has been estimated (see Attachment S).

Estimates of these emissions are included in the calculations (Attachment S) 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 under Northeast Natural Energy ownership/operation in association with this planned facility.

**Facility Blowdown Emission Estimates**
There will be two gas compressors at this facility that will require blowdowns to allow for routine maintenance. The volume of natural gas released per blowdown event from each unit and associated inlet separator and piping is approximately 1570 cubic feet of gas at STP (see attached calculations). There will be a maximum of 24 blow downs per compressor per year. Thus, there is a potential for 75,360 cubic feet of gas emitted from blowdowns per year.

The density of this gas at STP is 0.046 pounds per cubic foot (see the Inlet Gas spreadsheet in the calculations). Thus, the mass of gas released per year is 3,466 pounds (75,360 cf x 0.046). As the percentage of VOCs in the gas (by weight) is 0.48 percent (see Inlet Gas spreadsheet in the calculations), the VOC (non-methane/non-ethane) emissions from blowdown operations are estimated at approximately 16.6 lbs (3,466 x 0.0048) or 0.01 tons per year. As the methane concentration in this gas is 93.2 % (by weight), methane emissions will be 3,230 pounds (3,466 x 0.932) per year. Using a GHG factor of 25, methane emissions from blowdowns in $CO_{2e}$ will be 40.4 tons $CO_2e$ (3,230 x 25[GHG factor] /2000).

## ATTACHMENT K – GAS WELL AFFECTED FACILITY DATA SHEET

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

| API Number | Date of Flowback | Date of Well Completion | Green Completion and/or Combustion Device |
|---|---|---|---|
| 47-061-01731 | 5/15/2017 | 3/9/2017 | Gas flow to gathering line as soon as separator is functional |
| 47-061-01704 | 5/15/2017 | 3/17/2017 | Gas flow to gathering line as soon as separator is functional |
| 47-061-01694 | 5/15/2017 | 3/25/2017 | Gas flow to gathering line as soon as separator is functional |
| 47-061-01732 | 5/15/2017 | 4/2/2017 | Gas flow to gathering line as soon as separator is functional |
| 47-061-01740 | 5/15/2017 | 4/10/2017 | Gas flow to gathering line as soon as separator is functional |
| 47-061-01695 | 5/15/2017 | 4/18/2017 | Gas flow to gathering line as soon as separator is functional |
| 47-061-01689 | 5/15/2017 | 4/26/2017 | Gas flow to gathering line as soon as separator is functional |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

*Note: If future wells are planned and no API number is available please list as PLANNED. If there are existing wells that commenced construction prior to August 23, 2011, please acknowledge as existing.*

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

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

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

*Where,*

*047 = State code. The state code for WV is 047.*

*001 = County Code. County codes are odd numbers, beginning with 001 (Barbour) and continuing to 109 (Wyoming).*

*00001= Well number. Each well will have a unique well number.*

## ATTACHMENT L – STORAGE VESSEL DATA SHEET

Complete this data sheet if you are the owner or operator of a storage vessel that contains condensate and/or produced water. This form must be completed for ***each*** new or modified bulk liquid storage vessel(s) that contains condensate and/or produced water. (If you have more than one (1) identical tank (i.e. 4-400 bbl condensate tanks), then you can list all on one (1) data sheet). **Include gas sample analysis, flashing emissions, working and breathing losses, USEPA Tanks, simulation software (ProMax, E&P Tanks, HYSYS, etc.), and any other supporting documents where applicable.**

**The following information is REQUIRED:**

☒ Composition of the representative sample used for the simulation
☒ For each stream that contributes to flashing emissions:
- ☐ Temperature and pressure (inlet and outlet from separator(s))
- ☐ Simulation-predicted composition
- ☐ Molecular weight
- ☐ Flow rate

☒ Resulting flash emission factor or flashing emissions from simulation
☐ Working/breathing loss emissions from tanks and/or loading emissions if simulation is used to quantify those emissions

*Additional information may be requested if necessary.*

**GENERAL INFORMATION (REQUIRED)**

| | |
|---|---|
| 1. Bulk Storage Area Name **Kassay Tank Farm** | 2. Tank Name **T01 and T02** |
| 3. Emission Unit ID number **T01 and T02** | 4. Emission Point ID number **10E and 11E** |
| 5. Date Installed , Modified or Relocated *(for existing tanks)* **N/A**<br>Was the tank manufactured after August 23, 2011?<br>☐ Yes ☐ No | 6. Type of change:<br>☒ New construction ☐ New stored material ☐ Other<br>☐ Relocation |
| 7A. Description of Tank Modification *(if applicable)* **N/A** | |
| 7B. Will more than one material be stored in this tank? *If so, a separate form must be completed for each material.*<br>☐ Yes ☒ No | |
| 7C. Was USEPA Tanks simulation software utilized?<br>☐ Yes ☒ No<br>***If Yes, please provide the appropriate documentation and items 8-42 below are not required.*** | |

## TANK INFORMATION

| | |
|---|---|
| 8. Design Capacity *(specify barrels or gallons).* Use the internal cross-sectional area multiplied by internal height. **400 BBL** | |
| 9A. Tank Internal Diameter (ft.) **12.0** | 9B. Tank Internal Height (ft.) **20.0** |
| 10A. Maximum Liquid Height (ft.) **19.5** | 10B. Average Liquid Height (ft.) **8.0** |
| 11A. Maximum Vapor Space Height (ft.) **18.5** | 11B. Average Vapor Space Height (ft.) **12.0** |
| 12. Nominal Capacity *(specify barrels or gallons).* This is also known as "working volume". **390 BBL** | |
| 13A. Maximum annual throughput (gal/yr) **5,104,900 each** | 13B. Maximum daily throughput (gal/day) **13,990 each** |
| 14. Number of tank turnovers per year **312 each** | 15. Maximum tank fill rate (gal/min) **50** |
| 16. Tank fill method ☐ Submerged ☐ Splash ☒ Bottom Loading | |
| 17. Is the tank system a variable vapor space system? ☐ Yes ☒ No<br>If yes, (A) What is the volume expansion capacity of the system (gal)?<br>(B) What are the number of transfers into the system per year? | |
| 18. Type of tank (check all that apply):<br>☒ Fixed Roof ☐ vertical ☐ horizontal ☐ flat roof ☐ cone roof ☐ dome roof ☐ other (describe)<br><br>☐ External Floating Roof ☐ pontoon roof ☐ double deck roof<br>☐ Domed External (or Covered) Floating Roof<br>☐ Internal Floating Roof ☐ vertical column support ☐ self-supporting<br>☐ Variable Vapor Space ☐ lifter roof ☐ diaphragm<br>☐ Pressurized ☐ spherical ☐ cylindrical<br>☐ Other (describe) | |

## PRESSURE/VACUUM CONTROL DATA

19. Check as many as apply:

☒ Does Not Apply ☐ Rupture Disc (psig)

☐ Inert Gas Blanket of _____ ☐ Carbon Adsorption[1]

☐ Vent to Vapor Combustion Device[1] (vapor combustors, flares, thermal oxidizers, enclosed combustors)

☐ Conservation Vent (psig) ☐ Condenser[1]

Vacuum Setting Pressure Setting

☐ Emergency Relief Valve (psig)

Vacuum Setting Pressure Setting

☐ Thief Hatch Weighted ☐ Yes ☒ No

[1] Complete appropriate Air Pollution Control Device Sheet

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

| Material Name | Flashing Loss | | Breathing Loss | | Working Loss | | Total Emissions Loss | | Estimation Method[1] |
|---|---|---|---|---|---|---|---|---|---|
| | lb/hr | tpy | lb/hr | tpy | lb/hr | tpy | lb/hr | tpy | |
| VOC | 0.91 | 0.40 | N/A | N/A | N/A | N/A | 0.91 | 0.40 | ST |
| GHG | 122.7 | 537.6 | N/A | N/A | N/A | N/A | 122.7 | 537.6 | ST |
| HAPs | 0.018 | 0.08 | N/A | N/A | N/A | N/A | 0.018 | 0.08 | ST |

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

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

| **TANK CONSTRUCTION AND OPERATION INFORMATION** | | | |
|---|---|---|---|
| 21. Tank Shell Construction:<br>☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☒ Other (describe) **Welded** | | | |
| 21A. Shell Color: **Tan** | 21B. Roof Color: **Tan** | 21C. Year Last Painted: **2016 (NEW)** | |
| 22. Shell Condition (if metal and unlined):<br>☒ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable | | | |
| 22A. Is the tank heated? ☐ Yes ☒ No | 22B. If yes, operating temperature: | 22C. If yes, how is heat provided to tank? | |
| 23. Operating Pressure Range (psig): **Less than 0.3 psig**<br>**Must be listed for tanks using VRUs with closed vent system.** | | | |
| 24. Is the tank a **Vertical Fixed Roof Tank**?<br>☒ Yes ☐ No | 24A. If yes, for dome roof provide radius (ft): | 24B. If yes, for cone roof, provide slop (ft/ft): **0.06** | |
| 25. Complete item 25 for **Floating Roof Tanks** ☐ Does not apply ☒ | | | |
| 25A. Year Internal Floaters Installed: | | | |
| 25B. Primary Seal Type *(check one):* ☐ Metallic (mechanical) shoe seal ☐ Liquid mounted resilient seal<br>☐ Vapor mounted resilient seal ☐ Other (describe): | | | |
| 25C. Is the Floating Roof equipped with a secondary seal? ☐ Yes ☐ No | | | |
| 25D. If yes, how is the secondary seal mounted? *(check one)* ☐ Shoe ☐ Rim ☐ Other (describe): | | | |
| 25E. Is the floating roof equipped with a weather shield? ☐ Yes ☐ No | | | |
| 25F. Describe deck fittings: | | | |
| 26. Complete the following section for **Internal Floating Roof Tanks** ☒ Does not apply | | | |
| 26A. Deck Type: ☐ Bolted ☐ Welded | 26B. For bolted decks, provide deck construction: | | |
| 26C. Deck seam. Continuous sheet construction:<br>☐ 5 ft. wide ☐ 6 ft. wide ☐ 7 ft. wide ☐ 5 x 7.5 ft. wide ☐ 5 x 12 ft. wide ☐ other (describe) | | | |
| 26D. Deck seam length (ft.): | 26E. Area of deck ($ft^2$): | 26F. For column supported tanks, # of columns: | 26G. For column supported tanks, diameter of column: |
| 27. Closed Vent System with VRU? ☐ Yes ☒ No | | | |
| 28. Closed Vent System with Enclosed Combustor? ☐ Yes ☒ No | | | |
| **SITE INFORMATION** | | | |
| 29. Provide the city and state on which the data in this section are based: | | | |
| 30. Daily Avg. Ambient Temperature (°F): | 31. Annual Avg. Maximum Temperature (°F): | | |
| 32. Annual Avg. Minimum Temperature (°F): | 33. Avg. Wind Speed (mph): | | |
| 34. Annual Avg. Solar Insulation Factor (BTU/$ft^2$-day): | 35. Atmospheric Pressure (psia): | | |
| **LIQUID INFORMATION** | | | |
| 36. Avg. daily temperature range of bulk liquid (°F):**60-75** | 36A. Minimum (°F): **50** | 36B. Maximum (°F): **85** | |
| 37. Avg. operating pressure range of tank (psig): **0-0.3 psig** | 37A. Minimum (psig): **0 psig** | 37B. Maximum (psig): **0.3 psig** | |
| 38A. Minimum liquid surface temperature (°F): | 38B. Corresponding vapor pressure (psia): | | |
| 39A. Avg. liquid surface temperature (°F): | 39B. Corresponding vapor pressure (psia): | | |
| 40A. Maximum liquid surface temperature (°F): | 40B. Corresponding vapor pressure (psia): | | |
| 41. Provide the following for each liquid or gas to be stored in the tank. Add additional pages if necessary. | | | |
| 41A. Material name and composition: | Produced Water | | |
| 41B. CAS number: | N/A | | |
| 41C. Liquid density (lb/gal): | **8.8** | | |
| 41D. Liquid molecular weight (lb/lb-mole): | **18.2** | | |
| 41E. Vapor molecular weight (lb/lb-mole): | **17.68** | | |
| 41F. Maximum true vapor pressure (psia): | | | |
| 41G. Maximum Reid vapor pressure (psia): | | | |
| 41H. Months Storage per year.<br>From: To: | **Continuous** | | |
| 42. Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations. | **670** | | |

## ATTACHMENT L – STORAGE VESSEL DATA SHEET

Complete this data sheet if you are the owner or operator of a storage vessel that contains condensate and/or produced water. This form must be completed for ***each*** new or modified bulk liquid storage vessel(s) that contains condensate and/or produced water. (If you have more than one (1) identical tank (i.e. 4-400 bbl condensate tanks), then you can list all on one (1) data sheet). **Include gas sample analysis, flashing emissions, working and breathing losses, USEPA Tanks, simulation software (ProMax, E&P Tanks, HYSYS, etc.), and any other supporting documents where applicable.**

**The following information is REQUIRED:**

☒ Composition of the representative sample used for the simulation
☒ For each stream that contributes to flashing emissions:
- ☐ Temperature and pressure (inlet and outlet from separator(s))
- ☐ Simulation-predicted composition
- ☐ Molecular weight
- ☐ Flow rate

☒ Resulting flash emission factor or flashing emissions from simulation
☐ Working/breathing loss emissions from tanks and/or loading emissions if simulation is used to quantify those emissions

*Additional information may be requested if necessary.*

**GENERAL INFORMATION (REQUIRED)**

| | |
|---|---|
| 1. Bulk Storage Area Name **Kassay Tank Farm** | 2. Tank Name **T03** |
| 3. Emission Unit ID number **T03** | 4. Emission Point ID number **10E and 11E** |
| 5. Date Installed , Modified or Relocated *(for existing tanks)* **N/A**<br>Was the tank manufactured after August 23, 2011?<br>☐ Yes ☐ No | 6. Type of change:<br>☒ New construction ☐ New stored material ☐ Other<br>☐ Relocation |
| 7A. Description of Tank Modification *(if applicable)* **N/A** | |
| 7B. Will more than one material be stored in this tank? *If so, a separate form must be completed for each material.*<br>☐ Yes ☒ No | |
| 7C. Was USEPA Tanks simulation software utilized?<br>☐ Yes ☒ No<br>***If Yes, please provide the appropriate documentation and items 8-42 below are not required.*** | |

## TANK INFORMATION

| | |
|---|---|
| 8. Design Capacity *(specify barrels or gallons).* Use the internal cross-sectional area multiplied by internal height. **210 BBL** | |
| 9A. Tank Internal Diameter (ft.) **10.0** | 9B. Tank Internal Height (ft.) **15.0** |
| 10A. Maximum Liquid Height (ft.) **14.5** | 10B. Average Liquid Height (ft.) **7.0** |
| 11A. Maximum Vapor Space Height (ft.) **14** | 11B. Average Vapor Space Height (ft.) **8.0** |
| 12. Nominal Capacity *(specify barrels or gallons).* This is also known as "working volume". **200 BBL** | |
| 13A. Maximum annual throughput (gal/yr) **2,667,400** | 13B. Maximum daily throughput (gal/day) **7310** |
| 14. Number of tank turnovers per year **318** | 15. Maximum tank fill rate (gal/min) **50** |
| 16. Tank fill method ☐ Submerged ☐ Splash ☒ Bottom Loading | |
| 17. Is the tank system a variable vapor space system? ☐ Yes ☒ No<br>If yes, (A) What is the volume expansion capacity of the system (gal)?<br>(B) What are the number of transfers into the system per year? | |
| 18. Type of tank (check all that apply):<br>☒ Fixed Roof ☐ vertical ☐ horizontal ☐ flat roof ☐ cone roof ☐ dome roof ☐ other (describe)<br><br>☐ External Floating Roof ☐ pontoon roof ☐ double deck roof<br>☐ Domed External (or Covered) Floating Roof<br>☐ Internal Floating Roof ☐ vertical column support ☐ self-supporting<br>☐ Variable Vapor Space ☐ lifter roof ☐ diaphragm<br>☐ Pressurized ☐ spherical ☐ cylindrical<br>☐ Other (describe) | |

## PRESSURE/VACUUM CONTROL DATA

19. Check as many as apply:

☒ Does Not Apply ☐ Rupture Disc (psig)

☐ Inert Gas Blanket of _____ ☐ Carbon Adsorption[1]

☐ Vent to Vapor Combustion Device[1] (vapor combustors, flares, thermal oxidizers, enclosed combustors)

☐ Conservation Vent (psig) ☐ Condenser[1]

Vacuum Setting Pressure Setting

☐ Emergency Relief Valve (psig)

Vacuum Setting Pressure Setting

☐ Thief Hatch Weighted ☐ Yes ☒ No

[1] Complete appropriate Air Pollution Control Device Sheet

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

| Material Name | Flashing Loss | | Breathing Loss | | Working Loss | | Total Emissions Loss | | Estimation Method[1] |
|---|---|---|---|---|---|---|---|---|---|
| | lb/hr | tpy | lb/hr | tpy | lb/hr | tpy | lb/hr | tpy | |
| **VOC** | 0.048 | 0.21 | N/A | N/A | N/A | N/A | 0.048 | 0.21 | ST |
| **GHG** | 64.5 | 282.3 | N/A | N/A | N/A | N/A | 64.5 | 282.3 | ST |
| **HAPs** | 0.009 | 0.04 | N/A | N/A | N/A | N/A | 0.009 | 0.04 | ST |

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

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

| **TANK CONSTRUCTION AND OPERATION INFORMATION** | | | |
|---|---|---|---|
| 21. Tank Shell Construction:<br>☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☒ Other (describe) **Welded** | | | |
| 21A. Shell Color: **Tan** | 21B. Roof Color: **Tan** | 21C. Year Last Painted: **2016 (NEW)** | |
| 22. Shell Condition (if metal and unlined):<br>☒ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable | | | |
| 22A. Is the tank heated? ☐ Yes ☒ No | 22B. If yes, operating temperature: | 22C. If yes, how is heat provided to tank? | |
| 23. Operating Pressure Range (psig): **Less than 0.3 psig**<br>**Must be listed for tanks using VRUs with closed vent system.** | | | |
| 24. Is the tank a **Vertical Fixed Roof Tank**?<br>☒ Yes ☐ No | 24A. If yes, for dome roof provide radius (ft): | 24B. If yes, for cone roof, provide slop (ft/ft): **0.06** | |
| 25. Complete item 25 for **Floating Roof Tanks** ☐ Does not apply ☒ | | | |
| 25A. Year Internal Floaters Installed: | | | |
| 25B. Primary Seal Type *(check one):* ☐ Metallic (mechanical) shoe seal ☐ Liquid mounted resilient seal<br>☐ Vapor mounted resilient seal ☐ Other (describe): | | | |
| 25C. Is the Floating Roof equipped with a secondary seal? ☐ Yes ☐ No | | | |
| 25D. If yes, how is the secondary seal mounted? *(check one)* ☐ Shoe ☐ Rim ☐ Other (describe): | | | |
| 25E. Is the floating roof equipped with a weather shield? ☐ Yes ☐ No | | | |
| 25F. Describe deck fittings: | | | |
| 26. Complete the following section for **Internal Floating Roof Tanks** ☒ Does not apply | | | |
| 26A. Deck Type: ☐ Bolted ☐ Welded | 26B. For bolted decks, provide deck construction: | | |
| 26C. Deck seam. Continuous sheet construction:<br>☐ 5 ft. wide ☐ 6 ft. wide ☐ 7 ft. wide ☐ 5 x 7.5 ft. wide ☐ 5 x 12 ft. wide ☐ other (describe) | | | |
| 26D. Deck seam length (ft.): | 26E. Area of deck ($ft^2$): | 26F. For column supported tanks, # of columns: | 26G. For column supported tanks, diameter of column: |
| 27. Closed Vent System with VRU? ☐ Yes ☒ No | | | |
| 28. Closed Vent System with Enclosed Combustor? ☐ Yes ☒ No | | | |
| **SITE INFORMATION** | | | |
| 29. Provide the city and state on which the data in this section are based: | | | |
| 30. Daily Avg. Ambient Temperature (°F): | 31. Annual Avg. Maximum Temperature (°F): | | |
| 32. Annual Avg. Minimum Temperature (°F): | 33. Avg. Wind Speed (mph): | | |
| 34. Annual Avg. Solar Insulation Factor (BTU/$ft^2$-day): | 35. Atmospheric Pressure (psia): | | |
| **LIQUID INFORMATION** | | | |
| 36. Avg. daily temperature range of bulk liquid (°F):**60-75** | 36A. Minimum (°F): **50** | 36B. Maximum (°F): **85** | |
| 37. Avg. operating pressure range of tank (psig): **0-0.3 psig** | 37A. Minimum (psig): **0 psig** | 37B. Maximum (psig): **0.3 psig** | |
| 38A. Minimum liquid surface temperature (°F): | 38B. Corresponding vapor pressure (psia): | | |
| 39A. Avg. liquid surface temperature (°F): | 39B. Corresponding vapor pressure (psia): | | |
| 40A. Maximum liquid surface temperature (°F): | 40B. Corresponding vapor pressure (psia): | | |
| 41. Provide the following for each liquid or gas to be stored in the tank. Add additional pages if necessary. | | | |
| 41A. Material name and composition: | Produced Water | | |
| 41B. CAS number: | N/A | | |
| 41C. Liquid density (lb/gal): | **8.8** | | |
| 41D. Liquid molecular weight (lb/lb-mole): | **18.2** | | |
| 41E. Vapor molecular weight (lb/lb-mole): | **17.68** | | |
| 41F. Maximum true vapor pressure (psia): | | | |
| 41G. Maximum Reid vapor pressure (psia): | | | |
| 41H. Months Storage per year.<br>From: To: | **Continuous** | | |
| 42. Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations. | **670** | | |

# STORAGE TANK DATA TABLE

## List all deminimis storage tanks (i.e. lube oil, glycol, diesel etc.)

| Source ID #[1] | Status[2] | Content[3] | Volume[4] |
|---|---|---|---|
| T04 | NEW | Engine Lube Oil | 500 |
| T05 | NEW | Compressor Oil | 500 |
| T06 | NEW | Coolant Surge Tank | 30 |
| T07 | NEW | Engine Lube Oil | 500 |
| T08 | NEW | Compressor Oil | 500 |
| T09 | NEW | Coolant Surge Tank | 30 |
| | | | |
| | | | |
| | | | |
| | | | |
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| | | | |
| | | | |

1. Enter the appropriate Source Identification Numbers (Source ID #) for each storage tank located at the compressor station. Tanks should be designated T01, T02, T03, etc.
2. Enter storage tank Status using the following:
   - EXIST Existing Equipment
   - NEW Installation of New Equipment
   - REM Equipment Removed
3. Enter storage tank content such as condensate, pipeline liquids, glycol (DEG or TEG), lube oil, diesel, mercaptan etc.
4. Enter the maximum design storage tank volume in gallons.

## ATTACHMENT M – SMALL HEATERS AND REBOILERS NOT SUBJECT TO 40CFR60 SUBPART DC
## DATA SHEET

Complete this data sheet for each small heater and reboiler not subject to 40CFR60 Subpart Dc at the facility. ***The Maximum Design Heat Input (MDHI) must be less than 10 MMBTU/hr.***

| Emission Unit ID#[1] | Emission Point ID#[2] | Emission Unit Description (manufacturer, model #) | Year Installed/ Modified | Type[3] and Date of Change | Maximum Design Heat Input (MMBTU/hr)[4] | Fuel Heating Value (BTU/scf)[5] |
|---|---|---|---|---|---|---|
| GPU-1 | 1E | Pride of the Hills | 2017 | NEW | 1.0 | 1032 |
| GPU-2 | 2E | Pride of the Hills | 2017 | NEW | 1.0 | 1032 |
| GPU-3 | 3E | Pride of the Hills | 2017 | NEW | 1.0 | 1032 |
| GPU-4 | 4E | Pride of the Hills | 2017 | NEW | 1.0 | 1032 |
| GPU-5 | 5E | Pride of the Hills | 2017 | NEW | 1.0 | 1032 |
| GPU-6 | 6E | Pride of the Hills | 2017 | NEW | 1.0 | 1032 |
| GPU-7 | 7E | Pride of the Hills | 2017 | NEW | 1.0 | 1032 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

[1] Enter the appropriate Emission Unit (or Source) identification number 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.

[2] 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.

[3] New, modification, removal

[4] Enter design heat input capacity in MMBtu/hr.

[5] Enter the fuel heating value in BTU/standard cubic foot.

## ATTACHMENT N – INTERNAL COMBUSTION ENGINE DATA SHEET

Complete this data sheet for each internal combustion engine at the facility. Include manufacturer performance data sheet(s) or any other supporting document if applicable. Use extra pages if necessary. *Generator(s) and microturbine generator(s) shall also use this form.*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Emission Unit ID#[1] | | CE-1 | | CE-2 | | | |
| Engine Manufacturer/Model | | CAT 3516B | | CAT 3516B | | | |
| Manufacturers Rated bhp/rpm | | 1380/1400 | | 1380/1400 | | | |
| Source Status[2] | | NEW | | NEW | | | |
| Date Installed/ Modified/Removed/Relocated[3] | | January 2017 | | January 2017 | | | |
| Engine Manufactured /Reconstruction Date[4] | | After 1/1/2012 | | After 1/1/2012 | | | |
| Check all applicable Federal Rules for the engine (include EPA Certificate of Conformity if applicable)[5] | | ☒40CFR60 Subpart JJJJ<br>☐JJJJ Certified?<br>☐40CFR60 Subpart IIII<br>☐IIII Certified?<br>☐40CFR63 Subpart ZZZZ<br>☐ NESHAP ZZZZ/ NSPS JJJJ Window<br>☐ NESHAP ZZZZ Remote Sources | | ☒40CFR60 Subpart JJJJ<br>☐JJJJ Certified?<br>☐40CFR60 Subpart IIII<br>☐IIII Certified?<br>☐40CFR63 Subpart ZZZZ<br>☐ NESHAP ZZZZ/ NSPS JJJJ Window<br>☐ NESHAP ZZZZ Remote Sources | | ☐40CFR60 Subpart JJJJ<br>☐JJJJ Certified?<br>☐40CFR60 Subpart IIII<br>☐IIII Certified?<br>☐40CFR63 Subpart ZZZZ<br>☐ NESHAP ZZZZ/ NSPS JJJJ Window<br>☐ NESHAP ZZZZ Remote Sources | |
| Engine Type[6] | | 4SLB | | 4SLB | | | |
| APCD Type[7] | | A/F + OxCat | | A/F + OxCat | | | |
| Fuel Type[8] | | RG | | RG | | | |
| $H_2S$ (gr/100 scf) | | <1 | | <1 | | | |
| Operating bhp/rpm | | 1380/1400 | | 1380/1400 | | | |
| BSFC (BTU/bhp-hr) | | 8255 | | 8255 | | | |
| Hourly Fuel Throughput | | 11,028 $ft^3$/hr<br>gal/hr | | 11028 $ft^3$/hr<br>gal/hr | | $ft^3$/hr<br>gal/hr | |
| Annual Fuel Throughput (Must use 8,760 hrs/yr unless emergency generator) | | 96.61 $MMft^3$/yr<br>gal/yr | | 96.61 $MMft^3$/yr<br>gal/yr | | $MMft^3$/yr<br>gal/yr | |
| Fuel Usage or Hours of Operation Metered | | Yes ☒ No ☐ | | Yes ☒ No ☐ | | Yes ☐ No ☐ | |
| **Calculation Methodology[9]** | **Pollutant[10]** | **Hourly PTE (lb/hr)[11]** | **Annual PTE (tons/year)[11]** | **Hourly PTE (lb/hr)[11]** | **Annual PTE (tons/year)[11]** | **Hourly PTE (lb/hr)[11]** | **Annual PTE (tons/year)[11]** |
| MD | $NO_x$ | 1.52 | 6.66 | 1.52 | 6.66 | | |
| MD | CO | 0.52 | 2.27 | 0.52 | 2.27 | | |
| MD | VOC | 0.76 | 3.33 | 0.76 | 3.33 | | |
| AP-42 | $SO_2$ | <0.01 | 0.03 | <0.01 | 0.03 | | |
| AP-42 | $PM_{10}$ | 0.11 | 0.50 | 0.11 | 0.50 | | |
| MD | Formaldehyde | 0.14 | 0.63 | 0.14 | 0.63 | | |
| AP-42 | Total HAPs | 0.30 | 1.33 | 0.30 | 1.33 | | |
| MD | GHG ($CO_2e$) | 1748 | 7655 | 1748 | 7655 | | |

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

2 Enter the Source Status using the following codes:

| | | | |
|---|---|---|---|
| NS | Construction of New Source (installation) | ES | Existing Source |
| MS | Modification of Existing Source | RS | Relocated Source |
| REM | Removal of Source | | |

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

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

5 Is the engine a certified stationary spark ignition internal combustion engine according to 40CFR60 Subpart IIII/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 as appropriate.

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

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

| | | | |
|---|---|---|---|
| 2SLB | Two Stroke Lean Burn | 4SRB | Four Stroke Rich Burn |
| 4SLB | Four Stroke Lean Burn | | |

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

| | | | |
|---|---|---|---|
| A/F | Air/Fuel Ratio | IR | Ignition Retard |
| HEIS | High Energy Ignition System | SIPC | Screw-in Pre-combustion Chambers |
| PSC | Pre-stratified Charge | LEC | Low Emission Combustion |
| NSCR | Rich Burn & Non-Selective Catalytic Reduction | OxCat | Oxidation Catalyst |
| SCR | Lean Burn & Selective Catalytic Reduction | | |

8 Enter the Fuel Type using the following codes:

| | | | | | |
|---|---|---|---|---|---|
| PQ | Pipeline Quality Natural Gas | RG | Raw Natural Gas /Production Gas | D | Diesel |

9 Enter the Potential Emissions Data Reference designation using the following codes. Attach all reference data used.

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

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

11 PTE for engines shall be calculated from manufacturer's data unless unavailable.

## Engine Air Pollution Control Device
## (Emission Unit ID# C1 and C2, use extra pages as necessary)

Air Pollution Control Device Manufacturer's Data Sheet included?
Yes ☒ No ☐

☐ NSCR ☐ SCR ☒ Oxidation Catalyst

Provide details of process control used for proper mixing/control of reducing agent with gas stream: **N/A**

| | |
|---|---|
| Manufacturer: **DCL** | Model #: **DC65-14** |
| Design Operating Temperature: **992 °F** | Design gas volume: **9200 scfm** |
| Service life of catalyst: **8000 hours** | Provide manufacturer data? ☒Yes ☐ No |
| Volume of gas handled: **9103 acfm at 994 °F** | Operating temperature range for NSCR/Ox Cat: **From 900 °F to 1200 °F** |
| Reducing agent used, if any: **N/A** | Ammonia slip (ppm): **N/A** |

Pressure drop against catalyst bed (delta P): **3.4** inches of $H_2O$

Provide description of warning/alarm system that protects unit when operation is not meeting design conditions:

There is no warning/alarm system. However, the engine will shut down if the catalyst inlet temperature exceeds 1200 Deg. F.

Is temperature and pressure drop of catalyst required to be monitored per 40CFR63 Subpart ZZZZ?
☐ Yes ☒ No

How often is catalyst recommended or required to be replaced (hours of operation)?

How often is performance test required?
☒ Initial
☐ Annual
☒ Every 8,760 hours of operation
☐ Field Testing Required
☐ No performance test required. If so, why (please list any maintenance required and the applicable sections in NSPS/GACT,

USA COMPRESSION

# USA Compression Unit TBD Caterpillar G3516BLE Engine Emissions

| | | | | | |
|---|---|---|---|---|---|
| Date of Manufacture | TBD | Engine Serial Number | TBD | Date Modified/Reconstructed | Not Any |
| Driver Rated HP | 1380 | Rated Speed in RPM | 1400 | Combustion Type | Spark Ignited 4 Stroke |
| Number of Cylinders | 16 | Compression Ratio | 8:1 | Combustion Setting | Ultra Lean Burn |
| Total Displacement ($in^3$) | 4211 | Fuel Delivery Method | Carburetor | Combustion Air Treatment | T.C./Aftercooled |

**Raw Engine Emissions (Customer Supplied Fuel Gas with H2S < 10 PPM)**

*Fuel Consumption* *7443 LHV BTU/bhp-hr or 8250 HHV BTU/bhp-hr*
*Altitude* *1200 ft*
*Maximum Air Inlet Temp* *90 F*

| | g/bhp-hr [1] | lb/MMBTU [2] | lb/hr | TPY |
|---|---|---|---|---|
| Nitrogen Oxides (NOx) | 0.5 | | 1.52 | 6.66 |
| Carbon Monoxide (CO) | 2.43 | | 7.39 | 32.38 |
| Volatile Organic Compounds (VOC or NMNEHC excluding CH2O) | 0.48 | | 1.46 | 6.40 |
| Formaldehyde (CH2O) | 0.43 | | 1.31 | 5.73 |
| Particulate Matter (PM) Filterable+Condensable | | 9.99E-03 | 1.14E-01 | 4.98E-01 |
| Sulfur Dioxide (SO2) | | 5.88E-04 | 6.69E-03 | 2.93E-02 |

| | g/bhp-hr [1] | lb/hr | Metric Tonne/yr |
|---|---|---|---|
| Carbon Dioxide (CO2) | 473 | 1439 | 5717 |
| Methane (CH4) | 4.05 | 12.32 | 48.95 |

[1] g/bhp-hr are based on Caterpillar Specifications (GERP) Customer Supplied fuel gas, 1200 ft elevation, and 90 F Max Air Inlet Temperature.
Note that g/bhp-hr values are based on 100% Load Operation. It is recommended to add a safety margin to CO, VOC, and Formaldehyde to account for variations in fuel gas composition and load.
[2] Emission Factor obtained from EPA's AP-42, Fifth Edition, Volume I, Chapter 3: Stationary Internal Combution Sources (Section 3.2 Natural Gas-Fired Reciprocating Engines, Table 3.2-2).

**Catalytic Converter Emissions**

*Catalytic Converter Make amd Model:* *DCL DC64L2-16*
*Element Type:* *Oxidation*
*Number of Elements in Housing:* *2*
*Air/Fuel Ratio Control* *Caterpillar ADEM3, NOx Feedback*

| | % Reduction | **lb/hr** | **TPY** |
|---|---|---|---|
| Nitrogen Oxides (NOx) | 0 | **1.52** | **6.66** |
| Carbon Monoxide (CO) | 93 | **0.52** | **2.27** |
| Volatile Organic Compounds (VOC or NMNEHC excluding CH2O) | 48 | **0.76** | **3.33** |
| Formaldehyde (CH2O) | 89 | **0.14** | **0.63** |
| Particulate Matter (PM) | 0 | **1.14E-01** | **4.98E-01** |
| Sulfur Dioxide (SO2) | 0 | **6.69E-03** | **2.93E-02** |

| | % Reduction | **lb/hr** | **Metric Tonne/yr** |
|---|---|---|---|
| Carbon Dioxide (CO2) | 0 | **1439** | **5717** |
| Methane (CH4) | 0 | **12.32** | **48.95** |

DCL America Inc.

1610 Woodstead Ct, Suite 245, The Woodlands, Texas 77380 USA
*Tel:* 877-965-8989 *Fax:* 281-605-5858 info@dcl-inc.com www.dcl-inc.com

**GLOBAL LEADER IN EMISSION CONTROL SOLUTIONS**

| | | | |
|---|---|---|---|
| **To:** | Chris Magee | **Phone:** | |
| **Company:** | USA Compression | **Email** | |
| **Date:** | | **No. Pages:** | 1 |

Dear Chris,

We hereby guarantee that our Model DC64A specified below with two (2) elements installed as described below, and sized for the following engine:

| **Engine Data** | |
|---|---|
| Engine Model | Caterpillar G3516B |
| Power | 1380HP |
| Fuel | PQNG |
| Exhaust Flow Rate | 9103 acfm |
| Exhaust Temperature | 992 °F |

| **Catalyst Data** | |
|---|---|
| Catalyst Model | DC64A |
| Type | Oxidation- A |
| # of Elements | 2 |
| Cell Density | 300 cpsi |
| Approx Dimensions | See attached drawing |
| Approx Pressure Drop | 3.4” w.c |

will perform as follows:

| Exhaust Component | Engine Output (g/bhp-hr) | Converter Output (% Reduction or g/bhp-hr) |
|---|---|---|
| CO | 2.43 | 93% |
| VOC | 0.48 | 0.25 |
| Formaldehyde (HCHO) | 0.43 | 0.05 |

for a period of 1 year or 8000 hours, whichever comes first, subject to all terms and conditions contained in the attached warranty document being respected and met.

Best Regards,

On behalf of DCL America Inc.

**Lisa Barber**
416-788-8021
lbarber@dcl-inc.com

# G3516B

## GAS ENGINE SITE SPECIFIC TECHNICAL DATA

CATERPILLAR®

GAS COMPRESSION APPLICATION

| | | | |
|---|---|---|---|
| ENGINE SPEED (rpm): | 1400 | RATING STRATEGY: | STANDARD |
| COMPRESSION RATIO: | 8 | RATING LEVEL: | CONTINUOUS |
| AFTERCOOLER TYPE: | SCAC | FUEL SYSTEM: | CAT WIDE RANGE WITH AIR FUEL RATIO CONTROL |
| AFTERCOOLER - STAGE 2 INLET (°F): | 130 | | |
| AFTERCOOLER - STAGE 1 INLET (°F): | 201 | **SITE CONDITIONS:** | |
| JACKET WATER OUTLET (°F): | 210 | FUEL: | Rice Roger Perry 3-18-16 |
| ASPIRATION: | TA | FUEL PRESSURE RANGE(psig): | 7.0-40.0 |
| COOLING SYSTEM: | JW+OC+1AC, 2AC | FUEL METHANE NUMBER: | 80.7 |
| CONTROL SYSTEM: | ADEM3 | FUEL LHV (Btu/scf): | 965 |
| EXHAUST MANIFOLD: | DRY | ALTITUDE(ft): | 1200 |
| COMBUSTION: | LOW EMISSION | MAXIMUM INLET AIR TEMPERATURE(°F): | 90 |
| NOx EMISSION LEVEL (g/bhp-hr NOx): | 0.5 | STANDARD RATED POWER: | 1380 bhp@1400rpm |
| SET POINT TIMING: | 30 | | |

| | | | | MAXIMUM RATING | SITE RATING AT MAXIMUM INLET AIR TEMPERATURE | | |
|---|---|---|---|---|---|---|---|
| **RATING** | | **NOTES** | **LOAD** | **100%** | **100%** | **75%** | **50%** |
| ENGINE POWER | (WITHOUT FAN) | (1) | bhp | 1380 | 1380 | 1035 | 690 |
| INLET AIR TEMPERATURE | | | °F | 90 | 90 | 90 | 90 |
| **ENGINE DATA** | | | | | | | |
| FUEL CONSUMPTION (LHV) | | (2) | Btu/bhp-hr | 7443 | 7443 | 7971 | 8562 |
| FUEL CONSUMPTION (HHV) | | (2) | Btu/bhp-hr | 8250 | 8250 | 8836 | 9490 |
| AIR FLOW (@inlet air temp, 14.7 psia) | (WET) | (3)(4) | ft3/min | 3202 | 3202 | 2512 | 1756 |
| AIR FLOW | (WET) | (3)(4) | lb/hr | 13861 | 13861 | 10873 | 7601 |
| FUEL FLOW (60ºF, 14.7 psia) | | | scfm | 177 | 177 | 142 | 102 |
| INLET MANIFOLD PRESSURE | | (5) | in Hg(abs) | 94.6 | 94.6 | 76.8 | 54.0 |
| EXHAUST TEMPERATURE - ENGINE OUTLET | | (6) | °F | 992 | 992 | 986 | 1006 |
| EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia) | (WET) | (7)(4) | ft3/min | 9100 | 9100 | 7117 | 5050 |
| EXHAUST GAS MASS FLOW | (WET) | (7)(4) | lb/hr | 14343 | 14343 | 11260 | 7879 |
| **EMISSIONS DATA - ENGINE OUT** | | | | | | | |
| NOx (as NO2) | | (8)(9) | g/bhp-hr | 0.50 | 0.50 | 0.50 | 0.50 |
| CO | | (8)(9) | g/bhp-hr | 2.43 | 2.43 | 2.60 | 2.55 |
| THC (mol. wt. of 15.84) | | (8)(9) | g/bhp-hr | 4.76 | 4.76 | 5.10 | 5.17 |
| NMHC (mol. wt. of 15.84) | | (8)(9) | g/bhp-hr | 0.71 | 0.71 | 0.76 | 0.78 |
| NMNEHC (VOCs) (mol. wt. of 15.84) | | (8)(9)(10) | g/bhp-hr | 0.48 | 0.48 | 0.51 | 0.52 |
| HCHO (Formaldehyde) | | (8)(9) | g/bhp-hr | 0.43 | 0.43 | 0.42 | 0.42 |
| CO2 | | (8)(9) | g/bhp-hr | 473 | 473 | 504 | 548 |
| EXHAUST OXYGEN | | (8)(11) | % DRY | 9.0 | 9.0 | 8.7 | 8.3 |
| **HEAT REJECTION** | | | | | | | |
| HEAT REJ. TO JACKET WATER (JW) | | (12) | Btu/min | 23599 | 23599 | 21679 | 20030 |
| HEAT REJ. TO ATMOSPHERE | | (12) | Btu/min | 6110 | 6110 | 5092 | 4074 |
| HEAT REJ. TO LUBE OIL (OC) | | (12) | Btu/min | 4475 | 4475 | 3978 | 3363 |
| HEAT REJ. TO A/C - STAGE 1 (1AC) | | (12)(13) | Btu/min | 11582 | 11582 | 9646 | 3430 |
| HEAT REJ. TO A/C - STAGE 2 (2AC) | | (12)(13) | Btu/min | 5519 | 5519 | 5204 | 3397 |

| **COOLING SYSTEM SIZING CRITERIA** | | | |
|---|---|---|---|
| TOTAL JACKET WATER CIRCUIT (JW+OC+1AC) | (13)(14) | Btu/min | 43489 |
| TOTAL AFTERCOOLER CIRCUIT (2AC) | (13)(14) | Btu/min | 5795 |
| A cooling system safety factor of 0% has been added to the cooling system sizing criteria. | | | |

**CONDITIONS AND DEFINITIONS**

Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site inlet air temperature. 100% rating at maximum inlet air temperature is the maximum engine capability for the specified fuel at site altitude and maximum site inlet air temperature. Maximum rating is the maximum capability at the specified aftercooler inlet temperature for the specified fuel at site altitude and reduced inlet air temperature. Lowest load point is the lowest continuous duty operating load allowed. No overload permitted at rating shown.

For notes information consult page three.

## ATTACHMENT O – TANKER TRUCK LOADING DATA SHEET

Complete this data sheet for each new or modified bulk liquid transfer area or loading rack at the facility. This is to be used for bulk liquid transfer operations to tanker trucks. Use extra pages if necessary.

***Truck Loadout Collection Efficiencies***

The following applicable capture efficiencies of a truck loadout are allowed:

- For tanker trucks passing the MACT level annual leak test – 99.2%
- For tanker trucks passing the NSPS level annual leak test – 98.7%
- For tanker trucks not passing one of the annual leak tests listed above – 70%

Compliance with this requirement shall be demonstrated by keeping records of the applicable MACT or NSPS Annual Leak Test certification for ***every*** truck and railcar loaded/unloaded. This requirement can be satisfied if the trucking company provided certification that its entire fleet was compliant. This certification must be submitted in writing to the Director of the DAQ. These additional requirements must be noted in the Registration Application.

| | | |
|---|---|---|
| Emission Unit ID#: **TL-1** | Emission Point ID#: **12E** | Year Installed/Modified: **NEW** |
| Emission Unit Description: **Produced Water Truck Loading** | | |
| **Loading Area Data** | | |
| Number of Pumps**: 1 on truck** | Number of Liquids Loaded: **1** | Max number of trucks loading at one (1) time: **1** |
| Are tanker trucks pressure tested for leaks at this or any other location? ☐ Yes ☒ No ☐ Not Required<br>If Yes, Please describe: | | |
| Provide description of closed vent system and any bypasses. **N/A** | | |
| Are any of the following truck loadout systems utilized? **No**<br>☐ Closed System to tanker truck passing a MACT level annual leak test?<br>☐ Closed System to tanker truck passing a NSPS level annual leak test?<br>☐ Closed System to tanker truck not passing an annual leak test and has vapor return? | | |

**Projected Maximum Operating Schedule (for rack or transfer point as a whole)**

| Time | Jan – Mar | Apr - Jun | Jul – Sept | Oct - Dec |
|---|---|---|---|---|
| Hours/day | **24** | **24** | **24** | **24** |
| Days/week | **7** | **7** | **7** | **7** |

**Bulk Liquid Data (use extra pages as necessary)**

| | | | |
|---|---|---|---|
| Liquid Name | Produced Water | | |
| Max. Daily Throughput (1000 gal/day) | **35.3** | | |
| Max. Annual Throughput (1000 gal/yr) | **12,877.2** | | |
| Loading Method[1] | **Sub** | | |
| Max. Fill Rate (gal/min) | **50 gpm** | | |
| Average Fill Time (min/loading) | **120** | | |
| Max. Bulk Liquid Temperature ($^{o}$F) | **80** | | |
| True Vapor Pressure[2] | **0.3 psia** | | |
| Cargo Vessel Condition[3] | **U** | | |
| Control Equipment or Method[4] | **None** | | |
| Max. Collection Efficiency (%) | **N/A** | | |

| | | | | |
|---|---|---|---|---|
| Max. Control Efficiency (%) | | **N/A** | | |
| Max.VOC Emission Rate | Loading (lb/hr) | **<0.01** | | |
| | Annual (ton/yr) | **0.01** | | |
| Max.HAP Emission Rate | Loading (lb/hr) | **<0.01** | | |
| | Annual (ton/yr) | **<0.01** | | |
| Estimation Method[5] | | **EPA** | | |

1 BF Bottom Fill SP Splash Fill SUB Submerged Fill
2 At maximum bulk liquid temperature
3 B Ballasted Vessel C Cleaned U Uncleaned (dedicated service)
O Other (describe)
4 List as many as apply (complete and submit appropriate Air Pollution Control Device Sheets)
CA Carbon Adsorption VB Dedicated Vapor Balance (closed system)
ECD Enclosed Combustion Device F Flare
TO Thermal Oxidization or Incineration
5 EPA EPA Emission Factor in AP-42 MB Material Balance
TM Test Measurement based upon test data submittal O Other (describe)

| ATTACHMENT Q – PNEUMATIC CONTROLLERS<br>DATA SHEET |
| --- |
| **Are there any continuous bleed natural gas driven pneumatic controllers at this facility that commenced construction, modification or reconstruction after August 23, 2011?**<br><br>☐ Yes ☒ No<br><br>Please list approximate number. |
| **Are there any continuous bleed natural gas driven pneumatic controllers at this facility with a bleed rate greater than 6 standard cubic feet per hour that are required based on functional needs, including but not limited to response time, safety and positive actuation that commenced construction, modification or reconstruction after August 23, 2011?**<br><br>☐ Yes ☒ No<br><br>Please list approximate number. |

## ATTACHMENT S – EMISSIONS CALCULATIONS

Provide detailed potential to emit (PTE) emission calculations for criteria and hazardous air pollutants (HAPs) for each emission point identified in the application. For hazardous air pollutants and volatile organic compounds (VOCs), the speciated emission calculations must be included.

Use the following guidelines to ensure complete emission calculations:

- All emission sources and fugitive emissions are included in the emission calculations, as well as all methods used to calculate the emissions.
- Proper emission point identification numbers and APCD and ERD identification numbers are used consistently in the emission calculations that are used throughout the application.
- A printout of the emission summary sheets is attached to the registration application.
- Printouts of any modeling must be included with the emission calculations. The modeling printout must show all inputs/outputs or assumptions that the modeled emissions are based upon.
- If emissions are provided from the manufacturer, the manufacturer's documentation and/or certified emissions must also be included.
- The emission calculations results must match the emissions provided on the emissions summary sheet.
- If calculations are based on a compositional analysis of the gas, attach the laboratory analysis. Include the following information: the location that the sample was taken (and whether the sample was taken from the actual site or a representative site); the date the sample was taken; and, if the sample is considered representative, the reasons that it is considered representative (same gas field, same formation and depth, distance from actual site, etc.).
- Provide any additional clarification as necessary. Additional clarification or information is especially helpful when reviewing modeling calculations to assist the engineer in understanding the basis of assumptions and/or inputs.

Please follow specific guidance provided on the emissions summary sheet when providing the calculations.

# EMISSIONS SUMMARY

**Kassay Well Pad**
**Northeast Natural Energy**
**Monongalia County**

| Source | Description | NOx lb/hr | CO lb/hr | CO2e lb/hr | VOC lb/hr | SO2 lb/hr | PM lb/hr | acrolein lb/hr | acetaldehyde lb/hr | n-Hexane lb/Hr | benzene lb/hr | toluene lb/hr | xylenes lb/hr | formaldehyde lb/hr | Total HAPs lb/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CE-1 | Compressor Engine #1 | 1.52 | 0.52 | 1748 | 0.760 | 0.01 | 0.11 | 0.059 | 0.095 | 0.0012 | 0.0005 | 0.0004 | 0.0002 | 0.144 | 0.303 |
| CE-2 | Compressor Engine #2 | 1.52 | 0.52 | 1748 | 0.760 | 0.01 | 0.11 | 0.059 | 0.095 | 0.0012 | 0.0005 | 0.0004 | 0.0002 | 0.144 | 0.303 |
| GPU-1- GPU-7 | Seven GPUs | 0.70 | 0.59 | 846 | 0.04 | 0.00 | 0.05 | | | 0.013 | 0.002 | 0.000 | | 0.001 | 0.013 |
| --- | Haul Road Fugitive Dust | | | | | | 8.26 | | | | | | | | |
| T01-T04 | Produced Water Tanks[2] | | | 310 | 0.23 | | | | | 0.024 | 0.002 | 0.007 | 0.011 | | 0.045 |
| TL-1 | Produced Water Truck Loading | | | 6 | 0.00 | | | | | | | | | | |
| --- | Equipment Fugitive Emissions | | | 18 | 0.00 | | | | | | | | | | |
| --- | Blowdowns[1] | | | N/A | N/A | | | | | | | | | | |
| **Total** | | 3.74 | 1.62 | 4,674 | 1.80 | 0.02 | 8.54 | 0.117 | 0.190 | 0.039 | 0.005 | 0.008 | 0.011 | 0.288 | 0.664 |

| Source | | NOx tpy | CO tpy | CO2e tpy | VOC tpy | SO2 tpy | PM tpy | acrolein tpy | acetaldehyde tpy | n-Hexane TPY | benzene tpy | toluene tpy | xylenes tpy | formaldehyde tpy | Total HAPs tpy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CE-1 | Compressor Engine #1 | 6.66 | 2.27 | 7,655 | 3.33 | 0.03 | 0.50 | 0.256 | 0.417 | 0.005 | 0.002 | 0.002 | 0.001 | 0.630 | 1.327 |
| CE-2 | Compressor Engine #2 | 6.66 | 2.27 | 7,655 | 3.33 | 0.03 | 0.50 | 0.256 | 0.417 | 0.005 | 0.002 | 0.002 | 0.001 | 0.630 | 1.327 |
| GPU-1- GPU-7 | Seven GPUs | 3.07 | 2.58 | 3,703 | 0.17 | 0.02 | 0.23 | | | 0.055 | 0.000 | 0.000 | | 0.002 | 0.058 |
| --- | Haul Road Fugitive Dust | | | | | | 12.66 | | | | | | | | |
| T01-T04 | Produced Water Tanks[2] | | | 1358 | 1.01 | | | | | 0.107 | 0.008 | 0.030 | 0.050 | | 0.200 |
| TL-1 | Produced Water Truck Loading | | | 10 | 0.01 | | | | | | | | | | |
| --- | Equipment Fugitive Emissions | | | 78 | 0.02 | | | | | | | | | | |
| --- | Blowdowns[1] | | | 40 | 0.01 | | | | | | | | | | |
| **Total** | | 16.39 | 7.11 | 20,500 | 7.87 | 0.08 | 13.89 | 0.513 | 0.834 | 0.173 | 0.012 | 0.034 | 0.052 | 1.263 | 2.911 |

[1] See Attachment J for Blowdown Calculations

[2] Water tank emissions are uncontrolled.

# ENGINE EMISSIONS

**Kassay Well Pad**
**Northeast Natural Energy**
**Monongalia County**

**Proposed Emission Rates**

**Source CE-1**

**Engine Data:**

| | | |
|---|---|---|
| Engine Manufacturer | CAT | |
| Engine Model | 3516 B | |
| Type (Rich-burn or Low Emission) | Low Emissions | |
| Aspiration (Natural or Turbocharged) | Natural | |
| Turbocharge Cooler Temperature | 130 | deg. F |
| Manufacturer Rating | 1,380 | hp |
| Speed at Above Rating | 1,400 | rpm |
| Configeration ( In-line or Vee) | V-16 | |
| Number of Cylinders | 16 | |
| Engine Bore | 6.700 | inches |
| Engine Stroke | 7.500 | inches |
| Fuel Heat Content | 1,032 | BTU/scf |
| Engine Displacement | 4,231 | cu. in. |
| Fuel Consumption (HHV) | 8,255 | Btu/bhp-hr |

| **Emission Rates:** | g/bhp-hr | lb/hr | tons/year | g/hr | lb/day | AP-42 4strokelean lb/mmbtu | |
|---|---|---|---|---|---|---|---|
| Oxides of Nitrogen, NOx | 0.50 | 1.52 | 6.66 | 690 | 36.51 | | Comment |
| Carbon Monoxide CO | 0.17 | 0.52 | 2.27 | 235 | 12.41 | | 453.59 grams = 1 pound |
| VOC (NMNEHC) | 0.24 | 0.76 | 3.33 | 331 | 18.24 | | 2,000 pounds = 1 ton |
| CO2e | | 1748 | 7655.19 | | | | |
| CO2 | 473 | 1439 | 6303.02 | 652,740 | 34537.12 | | |
| **Total Annual Hours of Operation** | **8,760** | | | | | | |
| SO2 | | 0.0067 | 0.0293 | | | 0.000588 | |
| PM (Condensable+ Filterable) | | 0.1138 | 0.4985 | | | 0.00999 | |
| $CH_4$ as $CO_{2e}$ | 4.05 | 308.04 | 1349.2 | | | | **Mfg. Spec Used** |
| $N_2O$ as $CO_{2e}$ | | 0.679 | 2.9738 | | | 0.0002 | Factor From 40 CFR 98, Table C-2 |
| acrolein | | 0.0586 | 0.2565 | | | 0.00514 | |
| acetaldehyde | | 0.0952 | 0.4171 | | | 0.00836 | |
| formaldehyde | 0.047 | 0.1439 | 0.6303 | | | | **Mfg. Spec Used** |
| biphenyl | | 0.0002 | 0.0010 | | | 0.000212 | |
| benzene | | 0.0005 | 0.0021 | | | 0.00044 | |
| toluene | | 0.0004 | 0.0019 | | | 0.000408 | |
| ethylbenzene | | 4E-05 | 0.0002 | | | 3.97E-05 | |
| xylene | | 0.0002 | 0.0009 | | | 0.000184 | |
| methanol | | 0.0027 | 0.0118 | | | 0.0025 | |
| n-hexane | | 0.0012 | 0.0052 | | | 0.00111 | |
| total HAPs | | 0.3029 | 1.3269 | | | 0.018394 | |

**Exhaust Parameters:**

| | | |
|---|---|---|
| Exhaust Gas Temperature | 992 | deg. F |
| Exhaust Gas Flow Rate | 9216 | acfm |
| Total Exhaust Gas Volume Flow, wet | 9,216 | acfm |
| Total Exhaust Gas Volume Flow, wet | 153.6 | acf per sec |
| Exhaust Stack Height | 260 | inches |
| | 21.67 | feet |
| Exhaust Stack Inside Diameter | 20 | inches |
| | 1.667 | feet |
| Exhaust Stack Velocity | 70.4 | ft/sec |
| | 4,224.3 | ft/min |

$$\frac{4 \times \text{acfm}}{3.1416 \times (\text{stack diameter})^2}$$

# ENGINE EMISSIONS

**Kassay Well Pad**
**Northeast Natural Energy**
**Monongalia County**

**Proposed Emission Rates**

**Source CE-2**

**Engine Data:**

| | | |
|---|---|---|
| Engine Manufacturer | CAT | |
| Engine Model | 3516 B | |
| Type (Rich-burn or Low Emission) | Low Emissions | |
| Aspiration (Natural or Turbocharged) | Natural | |
| Turbocharge Cooler Temperature | 130 | deg. F |
| Manufacturer Rating | 1,380 | hp |
| Speed at Above Rating | 1,400 | rpm |
| Configeration ( In-line or Vee) | V-16 | |
| Number of Cylinders | 16 | |
| Engine Bore | 6.700 | inches |
| Engine Stroke | 7.500 | inches |
| Fuel Heat Content | 1,032 | BTU/scf |
| Engine Displacement | 4,231 | cu. in. |
| Fuel Consumption (HHV) | 8,255 | Btu/bhp-hr |

| **Emission Rates:** | g/bhp-hr | lb/hr | tons/year | g/hr | lb/day | AP-42 4strokelean lb/mmbtu | Comment |
|---|---|---|---|---|---|---|---|
| Oxides of Nitrogen, NOx | 0.50 | 1.52 | 6.66 | 690 | 36.51 | | 453.59 grams = 1 pound |
| Carbon Monoxide CO | 0.17 | 0.52 | 2.27 | 235 | 12.41 | | 2,000 pounds = 1 ton |
| VOC (NMNEHC) | 0.24 | 0.76 | 3.33 | 331 | 18.24 | | |
| CO2e | | 1748 | 7655.19 | | | | |
| CO2 | 473 | 1439 | 6303.02 | 652,740 | 34537.12 | | |
| **Total Annual Hours of Operation** | **8,760** | | | | | | |
| SO2 | | 0.0067 | 0.0293 | | | 0.000588 | |
| PM (Condensable+ Filterable) | | 0.1138 | 0.4985 | | | 0.00999 | |
| $CH_4$ as $CO_{2e}$ | 4.05 | 308.04 | 1349.2 | | | | **Mfg. Spec Used** |
| $N_2O$ as $CO_{2e}$ | | 0.679 | 2.9738 | | | 0.0002 | Factor From 40 CFR 98, Table C-2 |
| acrolein | | 0.0586 | 0.2565 | | | 0.00514 | |
| acetaldehyde | | 0.0952 | 0.4171 | | | 0.00836 | |
| formaldehyde | 0.047 | 0.1439 | 0.6303 | | | | **Mfg. Spec Used** |
| biphenyl | | 0.0002 | 0.0010 | | | 0.000212 | |
| benzene | | 0.0005 | 0.0021 | | | 0.00044 | |
| toluene | | 0.0004 | 0.0019 | | | 0.000408 | |
| ethylbenzene | | 4E-05 | 0.0002 | | | 3.97E-05 | |
| xylene | | 0.0002 | 0.0009 | | | 0.000184 | |
| methanol | | 0.0027 | 0.0118 | | | 0.0025 | |
| n-hexane | | 0.0012 | 0.0052 | | | 0.00111 | |
| total HAPs | | 0.3029 | 1.3269 | | | 0.018394 | |

**Exhaust Parameters:**

| | | |
|---|---|---|
| Exhaust Gas Temperature | 992 | deg. F |
| Exhaust Gas Flow Rate | 9216 | acfm |
| Total Exhaust Gas Volume Flow, wet | 9,216 | acfm |
| Total Exhaust Gas Volume Flow, wet | 153.6 | acf per sec |
| Exhaust Stack Height | 260 | inches |
| | 21.67 | feet |
| Exhaust Stack Inside Diameter | 20 | inches |
| | 1.667 | feet |
| Exhaust Stack Velocity | 70.4 | ft/sec |
| | 4,224.3 | ft/min |

$$\frac{4 \times \text{acfm}}{3.1416 \times (\text{stack diameter})^{\wedge}2}$$

**Kassay Well Pad**
**Northeast Natural Energy**
**Monongalia County**

**Potential Emission Rates**

## Sources GPU-1 to GPU-7

| | | | |
|---|---|---|---|
| Burner Duty Rating | 7000.0 | Mbtu/hr | Seven Units at 1.0 Mbtu/Hr Each |
| Burner Efficiency | 98.0 | % | |
| Gas Heat Content (HHV) | 1032.2 | Btu/scf | |
| Total Gas Consumption | 166085.2 | scfd | |
| H2S Concentration | 0.000 | Mole % | |
| Hours of Operation | 8760 | | |

| | | | | |
|---|---|---|---|---|
| NOx | 0.7003 | lbs/hr | 3.067 | TPY |
| CO | 0.5882 | lbs/hr | 2.576 | TPY |
| CO2 | 840.3 | lbs/hr | 3680.7 | TPY |
| CO2e | 846 | lbs/hr | 3,703 | tpy |
| VOC | 0.0385 | lbs/hr | 0.169 | TPY |
| SO2 | 0.0042 | lbs/hr | 0.018 | TPY |
| H2S | 0.0000 | lbs/hr | 0.000 | TPY |
| PM10 | 0.0532 | lbs/hr | 0.233 | TPY |
| CHOH | 0.0005 | lbs/hr | 0.002 | TPY |
| Benzene | 0.0000 | lbs/hr | 0.000 | TPY |
| N-Hezane | 0.0126 | lbs/hr | 0.055 | TPY |
| Toluene | 0.0000 | lbs/hr | 0.000 | TPY |
| Total HAPs | 0.0132 | lbs/hr | 0.058 | TPY |

**AP-42 Factors Used**

| | | | |
|---|---|---|---|
| **NOx** | **100** | **Lbs/MMCF** | |
| **CO** | **84** | **Lbs/MMCF** | |
| **$CO_2$** | **120,000** | **Lbs/MMCF** | **Global Warming Potential = 1** |
| **VOC** | **5.5** | **Lbs/MMCF** | |
| **PM** | **7.6** | **Lbs/MMCF** | |
| **$SO_2$** | **0.6** | **Lbs/MMCF** | |
| **$CH_4$** | **2.3** | **Lbs/MMCF** | **Global Warming Potential = 25** |
| **$N_2O$** | **2.2** | **Lbs/MMCF** | **Global Warming Potential =310** |
| **HCOH** | **0.075** | **Lbs/MMCF** | |
| **Benzene** | **0.0021** | **Lbs/MMCF** | |
| **n-Hexane** | **1.8** | **Lbs/MMCF** | |
| **Toluene** | **0.0034** | **Lbs/MMCF** | |

**FUGITIVE EMISSIONS**

**Kassay Well Pad**
**Northeast Natural Energy**
**Monongalia County**

## Fugitive VOC Emissions

| | | |
|---|---|---|
| Volatile Organic Compounds, NMNEHC from gas analysis: | 0.48 | weight percent |
| Methane from gas analysis: | 93.21 | weight percent |
| Carbon Dioxide from gas analysis: | 0.70 | weight percent |
| Gas Density | 0.0462 | lb/scf |

| Emission Source: | Number | Oil & Gas Production* | VOC % | VOC, lb/hr | VOC TPY | CO2 lb/Hr | CO2 TPY | CH4 lb/hr | CH4 TPY | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|
| **Valves:** | | | | | | | | | | |
| Gas/Vapor: | 42 | 0.02700 scf/hr | 0.5 | 0.000 | 0.001 | 0.000 | 0.002 | 0.049 | 0.2139 | 5.348 |
| Light Liquid: | - | 0.05000 scf/hr | 100.0 | 0.000 | 0.000 | | | | | 0.000 |
| Heavy Liquid (Oil): | - | 0.00050 scf/hr | 100.0 | 0.000 | 0.000 | | | | | 0.000 |
| Low Bleed Pneumatic | - | 1.39000 scf/hr | 0.5 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.0000 | 0.000 |
| **Relief Valves:** | 21 | 0.04000 scf/hr | 0.5 | 0.000 | 0.001 | 0.000 | 0.001 | 0.036 | 0.1584 | 3.962 |
| **Open-ended Lines, gas:** | 7 | 0.06100 sfc/hr | 0.5 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.0006 | 0.016 |
| **Open-ended Lines, liquid:** | - | 0.05000 lb/hr | 100.0 | 0.000 | 0.000 | | | | | 0.000 |
| **Pump Seals:** | | | | | | | | | | |
| Gas: | - | 0.00529 lb/hr | 0.5 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.0000 | 0.000 |
| Light Liquid: | - | 0.02866 lb/hr | 100.0 | 0.000 | 0.000 | | | | | 0.000 |
| Heavy Liquid (Oil): | - | 0.00133 lb/hr | 100.0 | 0.000 | 0.000 | | | | | 0.000 |
| **Compressor Seals, Gas:** | 2 | 0.01940 lb/hr | 0.5 | 0.000 | 0.001 | 0.000 | 0.001 | 0.002 | 0.0073 | 0.184 |
| **Connectors:** | | | | | | | | | | |
| Gas: | 180 | 0.00300 scf/hr | 0.5 | 0.000 | 0.001 | 0.000 | 0.001 | 0.023 | 0.1018 | 2.547 |
| Light Liquid: | 0 | 0.00700 scf/hr | 100.0 | 0.000 | 0.000 | | | | | 0.000 |
| Heavy Liquid (Oil): | - | 0.00030 scf/hr | 100.0 | 0.000 | 0.000 | | | | | 0.000 |
| **Sampling Connectors:** | | | | | | | | | | |
| Gas: | 14 | 0.03300 lb/hr | 0.5 | 0.002 | 0.010 | 0.000 | 0.000 | 0.431 | 1.8861 | 47.152 |
| Light Liquid: | - | 0.03300 lb/hr | 100.0 | 0.000 | 0.000 | | | | | 0.000 |
| **Flanges:** | | | | | | | | | | |
| Gas: | 210 | 0.00086 lb/hr | 0.5 | 0.001 | 0.004 | 0.001 | 0.006 | 0.168 | 0.7373 | 18.438 |
| 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 |

***Fugitive Calculations:***

| | lb/hr | t/y |
|---|---|---|
| VOC | **0.004** | **0.017** |
| CH4 | **0.709** | **3.105** |
| CO2 | **0.002** | **0.011** |
| CO2e | **17.724** | **77.63** |

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

## GAS ANALYSIS INFORMATION

**Kassay Well Pad**
**Northeast Natural Energy**
**Monongalia County**

## Fuel 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 | 0.2163 | 0.061 | 0.002 | 0.365 | | | - | | 0.0022 | |
| Carbon Dioxide, CO2 | 0.2653 | 0.117 | 0.004 | 0.703 | | | - | | 0.0026 | |
| Hydrogen Sulfide, H2S | | - | - | - | | | - | | - | |
| Helium, He | | - | - | - | | | - | | - | |
| Oxygen, O2 | | - | - | - | | | - | | - | |
| Methane, CH4 | 96.4458 | 15.473 | 0.534 | 93.205 | 877.1 | 974.1 | 9.191 | | 0.9625 | |
| Ethane, C2H6 | 2.8984 | 0.872 | 0.030 | 5.250 | 46.9 | 51.3 | 0.483 | | 0.0287 | 0.771 |
| Propane | 0.1582 | 0.070 | 0.002 | 0.420 | 3.7 | 4.0 | 0.038 | 0.420 | 0.0016 | 0.043 |
| Iso-Butane | 0.0041 | 0.002 | 0.000 | 0.014 | 0.1 | 0.1 | 0.001 | 0.014 | 0.0000 | 0.001 |
| Normal Butane | 0.0119 | 0.007 | 0.000 | 0.042 | 0.4 | 0.4 | 0.004 | 0.042 | 0.0001 | 0.004 |
| Iso Pentane | | - | - | - | | | - | - | - | - |
| Normal Pentane | | - | - | - | | | - | - | - | - |
| Hexane | | - | - | - | | | - | - | - | - |
| Heptane | | - | - | - | | | - | - | - | - |
| | 100.000 | 16.601 | 0.573 | | 928.1 | 1,029.9 | 9.717 | 0.476 | 0.9978 | 0.819 |

**Gas Density (STP) = 0.046**

| | |
|---|---|
| Ideal Gross (HHV) | 1,029.9 |
| Ideal Gross (sat'd) | 1,012.8 |
| GPM | - |
| Real Gross (HHV) | 1,032.2 |
| Real Net (LHV) | 930.2 |

## GAS ANALYSIS INFORMATION

**Kassay Well Pad**
**Northeast Natural Energy**
**Monongalia County**

## Flash 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 | 0.6160 | 0.173 | 0.006 | 0.977 | | | - | | 0.0062 | |
| Carbon Dioxide, CO2 | 3.6910 | 1.624 | 0.056 | 9.199 | | | - | | 0.0368 | |
| Hydrogen Sulfide, H2S | | - | - | - | | | - | | - | |
| Helium, He | | - | - | - | | | - | | - | |
| Oxygen, O2 | | - | - | - | | | - | | - | |
| Methane, CH4 | 93.2080 | 14.953 | 0.516 | 84.682 | 847.6 | 941.4 | 8.883 | | 0.9302 | |
| Ethane, C2H6 | 2.1550 | 0.648 | 0.022 | 3.670 | 34.9 | 38.1 | 0.359 | | 0.0214 | 0.573 |
| Propane | 0.0840 | 0.037 | 0.001 | 0.210 | 1.9 | 2.1 | 0.020 | 0.210 | 0.0008 | 0.023 |
| Iso-Butane | 0.0080 | 0.005 | 0.000 | 0.026 | 0.2 | 0.3 | 0.002 | 0.026 | 0.0001 | 0.003 |
| Normal Butane | 0.0140 | 0.008 | 0.000 | 0.046 | 0.4 | 0.5 | 0.004 | 0.046 | 0.0001 | 0.004 |
| Iso Pentane | 0.0010 | 0.001 | 0.000 | 0.004 | 0.0 | 0.0 | 0.000 | 0.004 | 0.0000 | 0.000 |
| Normal Pentane | 0.0080 | 0.006 | 0.000 | 0.033 | 0.3 | 0.3 | 0.003 | 0.033 | 0.0001 | 0.003 |
| Hexane | 0.0840 | 0.072 | 0.002 | 0.410 | 3.7 | 4.0 | 0.038 | 0.410 | 0.0008 | 0.034 |
| Heptane | 0.1310 | 0.131 | 0.005 | 0.743 | 6.7 | 7.2 | 0.069 | 0.743 | 0.0013 | 0.060 |
| | 100.000 | 17.658 | 0.610 | | 895.8 | 993.9 | 9.379 | 1.472 | 0.9978 | 0.701 |

**Gas Density (STP) = 0.049**

| | |
|---|---|
| Ideal Gross (HHV) | 993.9 |
| Ideal Gross (sat'd) | 977.4 |
| GPM | - |
| Real Gross (HHV) | 996.1 |
| Real Net (LHV) | 897.8 |

**GAS DATA INFORMATION**

Specific Graivity 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:

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

**Ideal Gas at 14.696 psia and 60°F**

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

**Real Gas at 14.696 psia and 60°F**

| | | MW lb/mol | Specific Gravity | Lb per Cu Ft | Cu Ft per Lb | LHV, dry Btu/scf | HHV, dry Btu/scf | LHV Btu/lb | HHV Btu/lb | cu ft of air / 1 cu ft of gas | Gal/Mole | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen | N2 | 28.013 | 0.9672 | 0.0738 | 13.552 | 0 | 0 | 0 | 0 | 0 | 4.1513 | |
| Carbon Dioxide | CO2 | 44.010 | 1.5196 | 0.1159 | 8.626 | 0 | 0 | 0 | 0 | 0 | 6.4532 | |
| Hydrogen Sulfide | H2S | 34.076 | 1.1766 | 0.0898 | 11.141 | 621 | 672 | 6,545 | 7,100 | 7.15 | 5.1005 | |
| Water | H2O | 18.000 | 0.6215 | 0.0474 | 21.091 | | | | | | 3.8376 | |
| Oxygen | O2 | 31.999 | 1.1048 | 0.0843 | 11.864 | 0 | 0 | 0 | 0 | 0 | 3.3605 | |
| Methane | CH4 | 16.043 | 0.5539 | 0.0423 | 23.664 | 911 | 1,012 | 21,520 | 23,879 | 9.53 | 6.4172 | |
| Ethane | C2H6 | 30.070 | 1.0382 | 0.0792 | 12.625 | 1,631 | 1,783 | 20,432 | 22,320 | 16.68 | 10.126 | |
| Propane | C3H8 | 44.097 | 1.5226 | 0.1162 | 8.609 | 2,353 | 3,354 | 19,944 | 21,661 | 23.82 | 10.433 | |
| Iso-Butane | C4H10 | 58.124 | 2.0069 | 0.1531 | 6.532 | 3,101 | 3,369 | 19,629 | 21,257 | 30.97 | 12.386 | |
| Normal Butane | C4H10 | 58.124 | 2.0069 | 0.1531 | 6.532 | 3,094 | 3,370 | 19,680 | 21,308 | 30.97 | 11.937 | |
| Iso Pentane | C5H12 | 72.151 | 2.4912 | 0.1901 | 5.262 | 3,709 | 4,001 | 19,478 | 21,052 | 38.11 | 13.86 | |
| Normal Pentane | C5H12 | 72.151 | 2.4912 | 0.1901 | 5.262 | 3,698 | 4,009 | 19,517 | 21,091 | 38.11 | 13.713 | |
| Hexane | C6H14 | 86.178 | 2.9755 | 0.2270 | 4.405 | 4,404 | 4,756 | 19,403 | 20,940 | 45.26 | 15.566 | 16.3227 |
| Heptane | C7H16 | 100.205 | 3.4598 | 0.2639 | 3.789 | 5,101 | 5,503 | 22,000 | 23,000 | 52.41 | 17.468 | 17.468 |

GAS ANALYTICAL SERVICES

C6+ Gas Analysis Report

**Gas Analytical**

Report Date: May 20, 2015 8:24a

| | | | |
|---|---|---|---|
| Client: | Northeast Natural Energy | Date Sampled: | May 15, 2015 |
| Site: | Yost 3H | Analysis Date: | May 19, 2015 4:15p |
| Field No: | | Collected By: | G. Cutright GAS |
| Meter: | | Date Effective: | May 1, 2015 12:00a |
| Source Laboratory | Clarksburg (Bridgeport), WV | Sample Pressure (PSI): | 947.0 |
| **Lab File No:** | **X_CH1-3439.CHR** | Sample Temp (°F): | |
| Sample Type: | Spot | Field H2O (lb/MMSCFD): | No Test |
| Reviewed By: | | Field H2S (PPM): | No Test |

| Component | Mol % | Gal/MSCF |
|---|---|---|
| Methane | 96.4458 | |
| Ethane | 2.8984 | 0.77 |
| Propane | 0.1582 | 0.04 |
| I-Butane | 0.0041 | 0.00 |
| N-Butane | 0.0119 | 0.00 |
| I-Pentane | <MDL | 0.00 |
| N-Pentane | <MDL | 0.00 |
| Nitrogen | 0.2163 | |
| Oxygen | <MDL | |
| Carbon Dioxide | 0.2653 | |
| Hexanes+ | <MDL | 0.00 |
| TOTAL | 100.0000 | 0.82 |

| Analytical Results at Base Conditions (Real) | |
|---|---|
| BTU/SCF (Dry): | 1,034.1157 BTU/ft³ |
| BTU/SCF (Saturated): | 1,016.9952 BTU/ft³ |
| PSIA: | 14.730 PSI |
| Temperature (°F): | 60.00 °F |
| Z Factor (Dry): | 0.99789 |
| Z Factor (Saturated): | 0.99754 |

| Analytical Results at Contract Conditions (Real) | |
|---|---|
| BTU/SCF (Dry): | 1,034.1157 BTU/ft³ |
| BTU/SCF (Saturated): | 1,016.9952 BTU/ft³ |
| PSIA: | 14.730 PSI |
| Temperature (°F): | 60.00 °F |
| Z Factor (Dry): | 0.99789 |
| Z Factor (Saturated): | 0.99754 |

| Calculated Specific Gravities | | | |
|---|---|---|---|
| Ideal Gravity: | 0.5732 | Real Gravity: | 0.5741 |
| Molecular Wt: | 16.6002 lb/lbmol | | |

Gross Heating Values are Based on:
GPA 2145-09, 2186
Compressibility is Calculated using AGA-8.

| Source | Date | Notes |
|---|---|---|



<MDL = Less than Method Detection Limits, NG = Not Given, NT = Not Tested

# Attachment I
## FUGITIVE EMISSIONS FROM UNPAVED HAULROADS

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

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

| Item Number | Description | Number of Wheels | Mean Vehicle Weight (tons) | Mean Vehicle Speed (mph) | Miles per Trip | Maximum Trips per Hour | Maximum Trips per Year | Control Device ID Number | Control Efficiency (%) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Produced Water Tanker Truck | 18 | 27 | 10 | 1.12 | 1 | 3066 | None | 0 |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |

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

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

Where:

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

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

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

SUMMARY OF UNPAVED HAULROAD EMISSIONS

| Item No. | PM | | | | PM-10 | | | |
|---|---|---|---|---|---|---|---|---|
| | Uncontrolled | | Controlled | | Uncontrolled | | Controlled | |
| | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY |
| 1 | 8.26 | 12.66 | 8.26 | 12.66 | 1.12 | 1.71 | 1.12 | 1.71 |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| TOTALS | 8.26 | 12.66 | 8.26 | 12.66 | 1.12 | 1.71 | 1.12 | 1.71 |

## FUGITIVE EMISSIONS FROM PAVED HAULROADS

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

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

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

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

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

Where:

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

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

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

SUMMARY OF PAVED HAULROAD EMISSIONS

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

## G3516TALE JGT-4, 2 Stage

(Note: assumed ideal gas behavior and used OD for volume calc)

| Cylinders | Bore, in | Stroke, in | Rod Diameter, in | Pocket Clearance, $in^3$ | Total Cylinder Volume, $in^3$ |
|---|---|---|---|---|---|
| 1st Stage Cylinder | 6.38 | 4.50 | 2.00 | 0.00 | 129 |
| 1st Stage Cylinder | 6.38 | 4.50 | 2.00 | 0.00 | 129 |
| 2nd Stage Cylinder | 6.38 | 4.50 | 2.00 | 0.00 | 129 |
| 2nd Stage Cylinder | 6.38 | 4.50 | 2.00 | 0.00 | 129 |

| Scrubbers/Suction & Discharge Drums | OD, in | Height/Length, in | Total Volume, $in^3$ |
|---|---|---|---|
| 1st Stage Scrubber | 24.00 | 68.00 | 30762 |
| 1st Stage Suction Drum | 16.00 | 114.50 | 23022 |
| 1st Stage Discharge Drum | 16.00 | 114.50 | 23022 |
| 2nd Stage Scrubber | 24.00 | 68.00 | 30762 |
| 2nd Stage Suction Drum | 16.00 | 114.50 | 23022 |
| 2nd Stage Discharge Drum | 16.00 | 114.50 | 23022 |

| Cooler Section | No. of Tubes | OD, in | Length, in | Total Cooler Tube Volume, $in^3$ |
|---|---|---|---|---|
| 1st Stage Cooler Section | 86 | 0.75 | 216 | 8207 |
| 2nd Stage Cooler Section | 146 | 0.75 | 216 | 13932 |

| Piping | OD, in | Length, in | Total Piping Volume, $in^3$ |
|---|---|---|---|
| 1st Stg Piping | 6.00 | 150.00 | 4241 |
| 2nd Stg Piping | 6.00 | 150.00 | 4241 |

| Equipment | Volume, $in^3$ | Temperature, R | Pressure, psig | Calculated Moles |
|---|---|---|---|---|
| 1st Stage Total | 89512 | 718 | 160 | 1.17 |
| 2nd Stage Total | 95238 | 715 | 390 | 2.91 |
| | | | Total Moles | 4.08 |

*Estimated*

Total Volume of Blowdown Gas @ STP = 1570 $ft^3$ *Does not include fuel scrubber*

# Northeast Natural Energy, LLC
# Kassay Well Pad
# Produced Water Tank Emissions

Utilizing direct measurements of tank vent emissions from Produced Water Tanks at an area well pad owned and operated by Northeast (attached), gas emissions were determined to be 3.80 scf per barrel of water. Thus, with an anticipated maximum water production rate at the Kassay Well Pad being 840 BBL/day, an emission rate of 3192 SCFD is anticipated. The natural gas constituents were forced into solution in the Produced Water by the high pressures in the gas production zone. As they are not soluble in water, they are quickly volatilized as the pressure on the water is released as it progresses from the well to the atmospheric pressure tank (flash gas). Working and breathing emissions from Produced Water are nominal, again as the gas constituents are not water soluble and flash out upon release of pressure.

The composition of the flash gas is assumed to be very similar to that of the nearby pad where flash gas testing was performed. As noted on the attached analysis, the specific gravity of the flash gas was measured to be 0.612. Thus, as shown in the following calculation spreadsheet, annual flash emissions at the maximum production rate of 306,600 BBL/yr is 64.23 tpy of total vapors and 1.01 tpy of VOCs (0.23 lb/hr). Potential HAP emissions are 0.20 tpy (0.045 lb/hr).

Methane comprises approximately 84.6% of the gas by weight. Thus, methane emissions are projected to be 54.3 tpy. Using a GHG factor of 25, potential $CO_{2e}$ emissions will be 1357.5 tpy or 309.9 lb/Hr $CO_{2e}$

There are three tanks that will receive and accumulate produced water prior to shipment off-site. Assuming this water and associated emissions are distributed proportionately between these tanks, potential emissions are as follows:

| | | | | VOC | | HAP | | Co2e | |
|---|---|---|---|---|---|---|---|---|---|
| Tank | Capacity | BBL/Day | BBL/Yr | Lb/Hr | TPY | Lb/Hr | TPY | Lb/Hr | TPY |
| T01 | 400 BBl | 333 | 121,545 | 0.091 | 0.40 | 0.018 | 0.08 | 122.7 | 537.6 |
| T02 | 400 BBL | 333 | 121,545 | 0.091 | 0.40 | 0.018 | 0.08 | 122.7 | 537.6 |
| T03 | 210 BBL | 174 | 63,510 | 0.048 | 0.21 | 0.009 | 0.04 | 64.5 | 282.3 |
| Total | 1010 BBL | 840 | 306,600 | 0.23 | 1.01 | 0.045 | 0.20 | 309.9 | 1357.5 |

**Northeast Natural Energy - Kassay**

# Flash Emission Calculations - Produced Water

Using Gas-Water Ratio Method

## Un-Controlled

| Site specific data | | | | |
|---|---|---|---|---|
| Gas-Water-ratio | = | 3.8 | scf/bbl | Using GOW from comparable well pad |
| Throughput | = | 306,600 | bbl/yr | (840 BBL/Day) |
| Stock tank gas molecular weight | = | 39.56 | g/mole | |

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

**Equations**

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

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

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

Q = Throughput (bbl/yr)

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

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

$E_{spec}$ = Flash emission from constituent

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

# Flash Emissions

| Constituent | TPY | |
|---|---|---|
| Total | 64.2324 | $E_{TOT}$ |
| **VOC** | **1.0059** | Sum of C3+ |
| Nitrogen | 6.30E-01 | |
| Carbon Dioxide | 5.90E+00 | |
| Methane | 5.43E+01 | |
| Ethane | 2.35E+00 | |
| Propane | 1.35E-01 | |
| Isobutane | 1.67E-02 | |
| n-Butane | 2.95E-02 | |
| 2,2 Dimethylpropane | 0.00E+00 | |
| Isopentane | 2.57E-03 | |
| n-Pentane | 2.12E-02 | |
| 2,2 Dimethylbutane | 0.00E+00 | |
| Cyclopentane | 0.00E+00 | |
| 2,3 Dimethylbutane | 6.42E-03 | |
| 2 Methylpentane | 2.51E-02 | |
| 3 Methylpentane | 3.47E-02 | |
| n-Hexane | 1.07E-01 | HAP |
| Methylcyclopentane | 3.08E-02 | |
| Benzene | 8.35E-03 | HAP |
| Cyclohexane | 4.88E-02 | |
| 2-Methylhexane | 1.09E-02 | |
| 3-Methylhexane | 1.09E-02 | |
| 2,2,4 Trimethylpentane | 0.00E+00 | |
| Other C7's | 2.18E-02 | |
| n-Heptane | 2.18E-02 | |
| Methylcyclohexane | 2.51E-02 | |
| Toluene | 3.02E-02 | HAP |
| Other C8's | 6.81E-02 | |
| n-Octane | 4.56E-02 | |
| Ethylbenzene | 3.85E-03 | HAP |
| M & P Xylenes | 4.24E-02 | HAP |
| O-Xylene | 7.71E-03 | HAP |
| Other C9's | 9.63E-02 | |
| n-Nonane | 4.18E-02 | |
| Other C10's | 7.71E-02 | |
| n-Decane | 1.54E-02 | |
| Undecanes (11) | 2.12E-02 | |

May 19, 2014

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

**For:** Northeast Natural Energy LLC
707 Virginia St. East, Suite 1200
Charleston, West Virginia 25301

**Date Sampled:** 04/16/14

**Date Analyzed:** 04/30/14

**Job Number:** J42910

**Sample:** Statler No. 6H

| FLASH LIBERATION OF SEPARATOR WATER | | |
|---|---|---|
| | **Separator** | **Stock Tank** |
| Pressure, psig | 670 | 0 |
| Temperature, °F | 73 | 70 |
| Gas Water Ratio (1) | ------ | 3.80 |
| Gas Specific Gravity (2) | ------ | 0.612 |
| Separator Volume Factor (3) | 1.000 | 1.000 |

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

Piston No. : WF-305*

**Base Conditions: 14.85 PSI & 60 °F**

Certified: FESCO, Ltd. - Alice, Texas

David Dannhaus 361-661-7015

May 1, 2014

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

**For:** Northeast Natural Energy LLC
707 Virginia St. East, Suite 1200
Charleston, West Virginia 25301

**Sample:** Statler No. 6H
Gas Liberated from Separator Water
From 670 psig & 73 °F to 0 psig & 70 °F

Date Sampled: 04/16/14 Job Number: 42910.001

**CHROMATOGRAPH EXTENDED ANALYSIS - SUMMATION REPORT - GPA 2286**

| COMPONENT | MOL% | GPM |
|---|---|---|
| Hydrogen Sulfide* | < 0.001 | |
| Nitrogen | 0.619 | |
| Carbon Dioxide | 3.691 | |
| Methane | 93.208 | |
| Ethane | 2.155 | 0.581 |
| Propane | 0.084 | 0.023 |
| Isobutane | 0.008 | 0.003 |
| n-Butane | 0.014 | 0.004 |
| 2-2 Dimethylpropane | 0.000 | 0.000 |
| Isopentane | 0.001 | 0.000 |
| n-Pentane | 0.008 | 0.003 |
| Hexanes | 0.055 | 0.023 |
| Heptanes Plus | 0.157 | 0.072 |
| Totals | 100.000 | 0.709 |

**Computed Real Characteristics Of Heptanes Plus:**

| | | |
|---|---|---|
| Specific Gravity | 3.811 | (Air=1) |
| Molecular Weight | 110.14 | |
| Gross Heating Value | 5776 | BTU/CF |

**Computed Real Characteristics Of Total Sample:**

| | | |
|---|---|---|
| Specific Gravity | 0.612 | (Air=1) |
| Compressibility (Z) | 0.9977 | |
| Molecular Weight | 17.68 | |
| Gross Heating Value | | |
| Dry Basis | 1007 | BTU/CF |
| Saturated Basis | 990 | BTU/CF |

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

Base Conditions: 14.850 PSI & 60 Deg F

Certified: FESCO, Ltd. - Alice, Texas

Analyst: MR
Processor: AL
Cylinder ID: WF# 13 S

David Dannhaus 361-661-7015

## CHROMATOGRAPH EXTENDED ANALYSIS
## TOTAL REPORT - GPA 2286

| COMPONENT | MOL % | GPM | WT % |
|---|---|---|---|
| Hydrogen Sulfide* | < 0.001 | | < 0.001 |
| Nitrogen | 0.619 | | 0.981 |
| Carbon Dioxide | 3.691 | | 9.190 |
| Methane | 93.208 | | 84.597 |
| Ethane | 2.155 | 0.581 | 3.666 |
| Propane | 0.084 | 0.023 | 0.210 |
| Isobutane | 0.008 | 0.003 | 0.026 |
| n-Butane | 0.014 | 0.004 | 0.046 |
| 2,2 Dimethylpropane | 0.000 | 0.000 | 0.000 |
| Isopentane | 0.001 | 0.000 | 0.004 |
| n-Pentane | 0.008 | 0.003 | 0.033 |
| 2,2 Dimethylbutane | 0.000 | 0.000 | 0.000 |
| Cyclopentane | 0.000 | 0.000 | 0.000 |
| 2,3 Dimethylbutane | 0.002 | 0.001 | 0.010 |
| 2 Methylpentane | 0.008 | 0.003 | 0.039 |
| 3 Methylpentane | 0.011 | 0.005 | 0.054 |
| n-Hexane | 0.034 | 0.014 | 0.166 |
| Methylcyclopentane | 0.010 | 0.003 | 0.048 |
| Benzene | 0.003 | 0.001 | 0.013 |
| Cyclohexane | 0.016 | 0.005 | 0.076 |
| 2-Methylhexane | 0.003 | 0.001 | 0.017 |
| 3-Methylhexane | 0.003 | 0.001 | 0.017 |
| 2,2,4 Trimethylpentane | 0.000 | 0.000 | 0.000 |
| Other C7's | 0.006 | 0.003 | 0.034 |
| n-Heptane | 0.006 | 0.003 | 0.034 |
| Methylcyclohexane | 0.007 | 0.003 | 0.039 |
| Toluene | 0.009 | 0.003 | 0.047 |
| Other C8's | 0.017 | 0.008 | 0.106 |
| n-Octane | 0.011 | 0.006 | 0.071 |
| Ethylbenzene | 0.001 | 0.000 | 0.006 |
| M & P Xylenes | 0.011 | 0.004 | 0.066 |
| O-Xylene | 0.002 | 0.001 | 0.012 |
| Other C9's | 0.021 | 0.011 | 0.150 |
| n-Nonane | 0.009 | 0.005 | 0.065 |
| Other C10's | 0.015 | 0.009 | 0.120 |
| n-Decane | 0.003 | 0.002 | 0.024 |
| Undecanes (11) | 0.004 | 0.002 | 0.033 |
| Totals | 100.000 | 0.709 | 100.000 |

**Computed Real Characteristics Of Total Sample:**

| | | |
|---|---|---|
| Specific Gravity | 0.612 | (Air=1) |
| Compressibility (Z) | 0.9977 | |
| Molecular Weight | 17.68 | |
| Gross Heating Value | | |
| Dry Basis | 1007 | BTU/CF |
| Saturated Basis | 990 | BTU/CF |

# Produced Water
# Truck Loading Lost Emissions Per AP-42

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

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

Where:

$L_L$ = uncontrolled loading loss in pounds per 1000 gallons of liquid loaded
S= saturation factor (0.6)
P=true vapor pressure of liquid loaded: 0.3 psia (water at 60 Deg. F)
M= Molecular weight of vapor in lb/lb-mole 17.68 (flash gas of comparable water sample)
T= temperature of bulk liquid loaded in deg R or 460+deg F (60 Deg F)

Thus, $L_L = 12.46[0.6 \times 0.3 \times 17.68]/[460+60]$
$L_L = 0.076$ lb/1000 gallons loaded

Based on sample data of breathing vapor (attached), these emissions are 1.55% VOCs. It is assumed that vapor composition from truck loading is the same as that from the tank breathing vapors.

Given a maximum loading of 840 BBL (35,280 gallons) a day, uncontrolled VOC emissions are estimated at 0.04 lb of VOC per day [35.28 x 0.076 x .0155]. With all daily loading taking place within 10 hours, the average hourly un-controlled emission rate is therefore estimated at <0.01 lb/hr VOCs. Emissions from truck loading are un-controlled.

Methane is approximately 84.6 % of emissions. Thus, potential daily methane emissions are estimated at 2.27 lb of Methane per day [35.28 x 0.076 x 0.846]. Thus, with all daily loading taking place within 10 hours each day, potential hourly emissions are estimated at 0.23 lb/hour [5.75 lb/hr CO2e]

Maximum annual throughput is 12,877,200 gallons (306,600 barrels) per year. Thus, un-captured/un-controlled VOC emissions are conservatively estimated at 15.2 pounds per year [12,877 x 0.076 x 0.0155] or 0.01 tons per year. Annual potential emissions of methane is 827.9 pounds per year [12,877 x 0.076 x 0.846] or 10.35 tpy of CO2e.

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## ATTACHMENT T – FACILITY-WIDE CONTROLLED EMISSIONS SUMMARY SHEET

List all sources of emissions in this table. Use extra pages if necessary.

| Emission Point ID# | $NO_x$ | | CO | | VOC | | $SO_2$ | | $PM_{10}$ | | $PM_{2.5}$ | | GHG ($CO_2e$) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | lb/hr | tpy | lb/hr | tpy | lb/hr | tpy | lb/hr | tpy | lb/hr | tpy | lb/hr | tpy | lb/hr | tpy |
| 1E | 0.10 | 0.438 | 0.084 | 0.368 | <0.01 | 0.024 | <0.01 | <0.01 | <0.01 | 0.033 | <0.01 | <0.033 | 121 | 529 |
| 2E | 0.10 | 0.438 | 0.084 | 0.368 | <0.01 | 0.024 | <0.01 | <0.01 | <0.01 | 0.033 | <0.01 | <0.033 | 121 | 529 |
| 3E | 0.10 | 0.438 | 0.084 | 0.368 | <0.01 | 0.024 | <0.01 | <0.01 | <0.01 | 0.033 | <0.01 | <0.033 | 121 | 529 |
| 4E | 0.10 | 0.438 | 0.084 | 0.368 | <0.01 | 0.024 | <0.01 | <0.01 | <0.01 | 0.033 | <0.01 | <0.033 | 121 | 529 |
| 5E | 0.10 | 0.438 | 0.084 | 0.368 | <0.01 | 0.024 | <0.01 | <0.01 | <0.01 | 0.033 | <0.01 | <0.033 | 121 | 529 |
| 6E | 0.10 | 0.438 | 0.084 | 0.368 | <0.01 | 0.024 | <0.01 | <0.01 | <0.01 | 0.033 | <0.01 | <0.033 | 121 | 529 |
| 7E | 0.10 | 0.438 | 0.084 | 0.368 | <0.01 | 0.024 | <0.01 | <0.01 | <0.01 | 0.033 | <0.01 | <0.033 | 121 | 529 |
| 8E | 1.52 | 6.66 | 0.52 | 2.27 | 0.76 | 3.33 | <0.01 | 0.03 | 0.11 | 0.50 | 0.11 | 0.50 | 1748 | 7655 |
| 9E | 1.52 | 6.66 | 0.52 | 2.27 | 0.76 | 3.33 | <0.01 | 0.03 | 0.11 | 0.50 | 0.11 | 0.50 | 1748 | 7655 |
| 10E | | | | | 0.091 | 0.40 | | | | | | | | |
| 11E | | | | | 0.091 | 0.40 | | | | | | | | |
| 12E | | | | | 0.048 | 0.21 | | | | | | | | |
| 13E | | | | | <0.01 | 0.01 | | | | | | | 5.75 | 10.35 |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| **TOTAL** | 3.74 | 16.39 | 1.62 | 7.11 | 1.80 | 7.84 | 0.02 | 0.08 | 0.28 | 1.23 | 0.28 | 1.23 | 4,656 | 20,381 |

Annual emissions shall be based on 8,760 hours per year of operation for all emission units except emergency generators.
According to 45CSR14 Section 2.43.e, fugitive emissions are not included in the major source determination because it is not listed as one of the source categories in Table 1. Therefore, fugitive emissions shall not be included in the PTE above.

## ATTACHMENT T – FACILITY-WIDE HAP CONTROLLED EMISSIONS SUMMARY SHEET

List all sources of emissions in this table. Use extra pages if necessary.

| Emission Point ID# | Formaldehyde | | Benzene | | Toluene | | Ethylbenzene | | Xylenes | | Hexane | | Total HAPs | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | lb/hr | tpy | lb/hr | tpy | lb/hr | tpy | lb/hr | tpy | lb/hr | tpy | lb/hr | tpy | lb/hr | tpy |
| 1E | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 2E | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 3E | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 4E | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 5E | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 6E | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 7E | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 8E | 0.14 | 0.63 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.30 | 1.33 |
| 9E | 0.14 | 0.63 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.30 | 1.33 |
| 10E | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.010 | <0.01 | 0.015 | <0.01 | 0.016 | 0.01 | 0.05 | 0.017 | 0.078 |
| 11E | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.010 | <0.01 | 0.015 | <0.01 | 0.016 | 0.01 | 0.05 | 0.017 | 0.078 |
| 12E | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.01 | <0.01 | 0.02 | 0.01 | 0.042 |
| 13E | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| **TOTAL** | 0.288 | 1.263 | <0.01 | <0.01 | 0.01 | 0.03 | 0.01 | 0.04 | 0.01 | 0.05 | 0.04 | 0.17 | 0.66 | 2.91 |

Annual emissions shall be based on 8,760 hours per year of operation for all emission units except emergency generators.
According to 45CSR14 Section 2.43.e, fugitive emissions are not included in the major source determination because it is not listed as one of the source categories in Table 1. Therefore, fugitive emissions shall not be included in the PTE above.

## ATTACHMENT U – CLASS I LEGAL ADVERTISEMENT

Publication of a proper Class I legal advertisement is a requirement of the G70-C registration process. In the event the applicant's legal advertisement fails to follow the requirements of 45CSR13, Section 8 or the requirements of Chapter 59, Article 3, of the West Virginia Code, the application will be considered incomplete and no further review of the application will occur until this is corrected.

The applicant, utilizing the format for the Class I legal advertisement example provided on the following page, shall have the legal advertisement appear a minimum of one (1) day in the newspaper most commonly read in the area where the facility exists or will be constructed. The notice must be published no earlier than five (5) working days of receipt by this office of your application. The original affidavit of publication must be received by this office no later than the last day of the public comment period.

The advertisement shall contain, at a minimum, the name of the applicant, the type and location of the source, the type and amount of air pollutants that will be discharged (excluding fugitive emissions), the nature of the permit being sought, the proposed start-up date for the source, and a contact telephone number for more information.

The location of the source should be as specific as possible starting with: 1.) the street address of the source; 2.) the nearest street or road; 3.) the nearest town or unincorporated area, 4.) the county, and 5.) latitude and longitude coordinates in decimal format.

Types and amounts of pollutants discharged must include all regulated pollutants (Nitrogen Oxides, Carbon Monoxide, Particulate Matter-2.5, Particulate Matter-10, Volatile Organic Compounds, Sulfur Dioxide, Formaldehyde, Benzene, Toluene, Ethylbenzene, Xylenes, Hexane, Total Hazardous Air Pollutants and their potential to emit or the permit level being sought in units of tons per year.

In the event the 30th day is a Saturday, Sunday, or legal holiday, the comment period will be extended until 5:00 p.m. on the following regularly scheduled business day.

A list of qualified newspapers that are eligible to publish legal ads may be found:

http://www.sos.wv.gov/elections/resource/Documents/Qualified%20Newspapers.pdf

# RECOMMENDED PUBLIC NOTICE TEMPLATE

**AIR QUALITY PERMIT NOTICE**
**Notice of Application**

Notice is given that Northeast Natural Energy, LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a G70-C General Permit Registration for its Kassay Well Pad located along Yank Hollow Road, near Fairview in Monongalia County, West Virginia. The latitude and longitude coordinates are: 39.65851 latitude and -80.194503 longitude.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be:

16.39 tons per year of Nitrogen Oxides
7.11 tons per year of Carbon Monoxide
7.87 tons per year of Volatile Organic Carbons
0.08 tons per year of Sulfur Oxides
0.51 tons per year of Acrolein
0.83 tons per year of Acetaldehyde
0.01 tons per year of Benzene
1.26 tons per year of Formaldehyde
0.17 tons per year of n-Hexane
1.23 tons per year of Particulate Matter
20,479 tons per year of Greenhouse Gases

Startup of operation is planned to begin on or about the first day of March, 2017. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.
Dated this the **(Day)** day of **(Month)**, **(Year)**.

By: Northeast Natural Energy, LLC
Brett Loflin
Vice President Regulatory Affairs
48 Donley Street Suite 601
Morgantown, WV 26501