MOVE YOUR ENVIRONMENT FORWARD

October 21, 2016

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

Reference: General Permit Registration Modification
Goff West Compressor Station
G35-A107A Plant ID # 033-00187
Clarksburg, Harrison County, West Virginia

Dear Beverly McKeone – NSR Manager,

MK Midstream Holdings, LLC is submitting a General Permit G-35C Registration Modification package for their Goff West Compressor Station facility, Plant ID # 033-00187, located in Clarksburg, Harrison County, West Virginia.

This facility is operating under a current G35-A107B registration issued November 17, 2015 issued to MK Midstream Holdings, LLC which includes equipment at three locations; Goff Compressor Station, Goff M&R and Cather Compression Station. The equipment and its location are noted below:

Engines:

- CE-1R Caterpillar G3516B LE Compressor Engine – Goff Compressor Station
- CE-2R Caterpillar G3516B LE Compressor Engine – Goff Compressor Station
- CE-3R Caterpillar G3516B LE Compressor Engine – Goff Compressor Station
- CE-4R Caterpillar G3516B LE Compressor Engine – Goff Compressor Station
- CE-5R Caterpillar G3608TALE Compressor Engine – Cather Compressor Station
- CE-6R Caterpillar G3606TALE Compressor Engine – Cather Compressor Station

Dehydration Units

- RSV-1 Exterran Dehydration Unit 2012 31 mmscf/day-Goff M&R
- RBV-1 Exterran Reboiler 2012 1.0 mm BTU/Hr – Goff M&R
- RSV-2 Exterran Dehydration Unit 2013 45 mmscf/day-Goff M&R
- RBV-1 Exterran Reboiler 2013 1.0 mm BTU/Hr – Goff M&R

Tanks

- TK-1 Used Oil. Water, Condensate Storage Tank 2011 100 bbl – Goff Compressor Station
- TK-2 TEG & Oil Catch Storage Tank 2011 210 gallons – Goff M&R

MK Midstream is requesting to modify the registration to:

- Increase Dehydration Units RSV-1 and RSV-2's maximum flow rate from 31 mmscf/day and 45 mmscf/day, respectively to 67 mmscf/day, for both units each.

- Add three tanks
  - TK-3 – 100bbl tank located at Goff M&R to collect produced water from dehydration units TEG-1 and TEG-2
  - TK-4 and TK-5 – two – 50 bbl tanks located at Cather Compression Station used to collect produced water from Compressors CE-5 and CE-6

The permit modification application includes information for the dehydration units increased flow and Tanks TK-3, TK-4 and TK-5, as well as, tank load out information. The modification emissions are calculated to be:

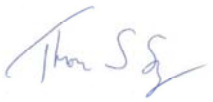
- TK-3 – 11.74 #VOC/yr
- TK-4 – 10.11 #VOC/yr
- TK-5 – 10.11 #VOC/yr
- Tank load-out – 76 #VOC/yr
- Dehydrator Units – 7TPY VOC

Therefore the modification will potentially increase the facility's emission by 14 TPY VOC and 2 TPY HAP for a total facility emission rate of 35 TPY VOC and 10 TPY HAPS (combined).

In addition, it is important to note that pneumatic controllers have a bleed rate of less than 6 CF/hr, Dehydrator annual potential Benzene emissions are less than 1 TPY and tank emissions are less than 6 TPY without controllers.

Please feel free to contact me at (518) 877-7101 x 104 if WVDEP-DAQ has any questions regarding the information in this General Permit Registration Modification.

Sincerely,
HRP Associates, Inc.



Thomas S. Seguljic, PE
Vice President
Enclosures

west virginia department of environmental protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone (304) 926-0475
Fax (304) 926-0479
www.dep.wv.gov

G35-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 COMPRESSOR AND/OR DEHYDRATION FACILITIES

☐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):
MK Midstream Holdings, LLC

Federal Employer ID No. (FEIN): 47-1919654

Applicant's Mailing Address: 65 Professional Place Suite 200

City: Bridgeport | State: WV | ZIP Code: 26330

Facility Name: GOFF WEST STATION

Operating Site Physical Address: Route 50E Davisson Run Road, Clarksburg, Harrison County, WV
If none available, list road, city or town and zip of facility.

City: Clarksburg | Zip Code: 26302 | County: Harrison

Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):
Latitude: 39.275550
Longitude: -80.403099

SIC Code: 1311
NAICS Code: 211111

DAQ Facility ID No. (For existing facilities)
033-00187

CERTIFICATION OF INFORMATION

This G35-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 G35-C Registration Application will be returned to the applicant. Furthermore, if the G35-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 G35-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: _____
Name and Title: Stacey Lucas | Phone: 724-940-1118 | Fax:
Email: slucas@mkeystone.com | Date: October 21, 2016

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

If applicable:
Environmental Contact
Name and Title: Thomas S. Seguljic, PE | Phone: 518-877-7101 | Fax: 518-877-8561
Email: tom.seguljic@hrpassociates.com | Date: October 21, 2016

OPERATING SITE INFORMATION	
Briefly describe the proposed new operation and/or any change(s) to the facility: Modify Permit to increaseTEG-1 and TEG-2 flowrate to 67 mmscf/day and add Produced Water Tanks TK-3, TK-4 and TK-5.	
Directions to the facility: From I-79 South; (1.) At exit 119, take ramp right for US-50 West toward Clarksburg, Travel 7.0 miles (2.) Turn left onto WV-98/Old US 50 / Sun Valley Rd. travel 0.4 miles (3.)turn left to stay on WV-98 and travel 0.3 miles (4.) arrive at the GOFF Compressor Station on the right	
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). ☐ Check attached to front of application. ☐ I wish to pay by electronic transfer. Contact for payment (incl. name and email address): ☐ I wish to pay by credit card. Contact for payment (incl. name and email address): ☒ $500 (Construction, Modification, and Relocation) ☐ $300 (Class II Administrative Update) ☐ $1,000 NSPS fee for 40 CFR60, Subpart IIII, JJJJ and/or OOOO [1] ☒ $2,500 NESHAP fee for 40 CFR63, Subpart ZZZZ and/or HH [2] [1] Only one NSPS fee will apply. [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. *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
☒ G35-C Section Applicability Form – Attachment H	☐ Emission Units/ERD Table – Attachment I
☒ Fugitive Emissions Summary Sheet – Attachment J	
☒ 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 K	
☐ Natural Gas Fired Fuel Burning Unit(s) Data Sheet (GPUs, Heater Treaters, In-Line Heaters if applicable) – Attachment L	
☐ Internal Combustion Engine Data Sheet(s) (include manufacturer performance data sheet(s) if applicable) – Attachment M	
☒ Tanker Truck Loading Data Sheet (if applicable) – Attachment N	
☒ Glycol Dehydration Unit Data Sheet(s) (include wet gas analysis, GRI- GLYCalc™ input and output reports and information on reboiler if applicable) – Attachment O	
☒ Pneumatic Controllers Data Sheet – Attachment P	
☐ Air Pollution Control Device/Emission Reduction Device(s) Sheet(s) (include manufacturer performance data sheet(s) if applicable) – Attachment Q	
☒ Emission Calculations (please be specific and include all calculation methodologies used) – Attachment R	
☒ Facility-wide Emission Summary Sheet(s) – Attachment S	
☒ Class I Legal Advertisement – Attachment T	
☒ 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 ☒ No ☐

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

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

As noted on the attached figure, 4 wellpads owned by Mountaineer Keystone are located within one (1) mile of the Goff West Station:

- Goff 55 - located 2/3 mile to the northeast of Goff Compressor Station;
- Goff 5 HM - located 2/3 mile to the northeast of Goff Compressor Station;
- Goff 3HM - located 1/2 mile to the southeast of Goff Compressor Station; and
- Goff 4 HM - located 1/2 mile to the southeast of Goff Compressor Station.

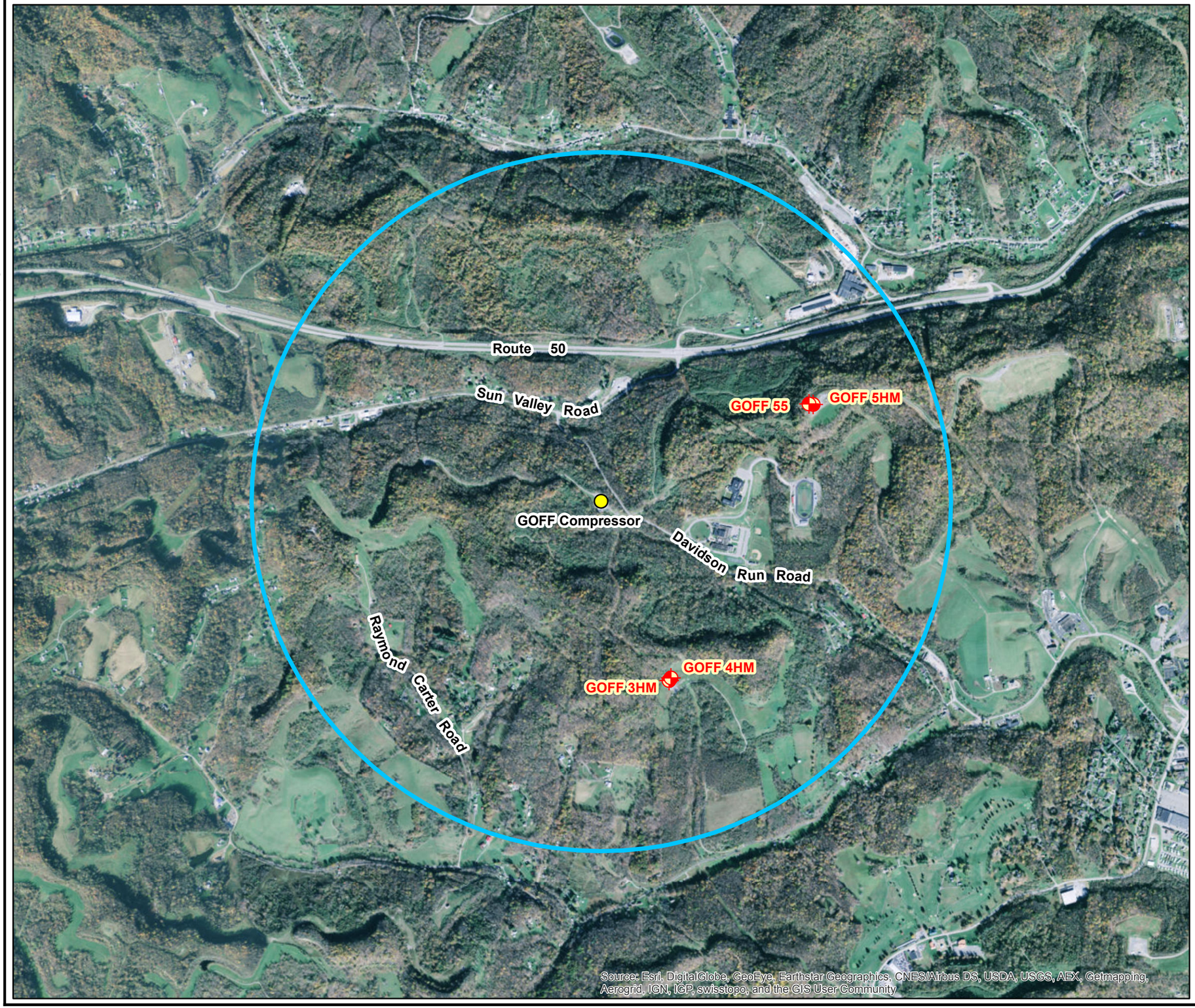
To determine if aggregation of facilities is appropriate, the following three-prong test must be completed:

1. The sources belong to a single major industrial grouping (same two-digit major SIC code);

   The Compressor Stations and wellpads are both listed as SIC Code 1311 which includes:

   Establishments primarily engaged in operating oil and gas field properties. Such activities may include exploration for crude petroleum and natural gas; drilling, competing, and equipping wells; operation of separators, emulsion breakers, desilting equipment, and field gathering lines for crude petroleum; and all other activities in the preparation of oil and gas up to the point of shipment from the producing property. This industry includes the production of oil through the mining and extraction of oil from oil shale and oil sands and the production of gas and hydrocarbon liquids through gasification, liquid faction, and pryolysis at the mine site.
2. The sources are under common control of the same person (or persons under common control);
   The sources are under common control of the same person (or persons under common control) since Mountaineer Keystone is the majority owner of the Goff West Station and Mountaineer Keystone employees work and manage both the well pads and Goff Compressor station.
3. The sources are located on one or more "contiguous or adjacent" properties
   The EPA has established that any operations within 1/4 mile are considered contiguous or adjacent. The noted wellpads are located greater than 1/4 mile from the Goff West Station.

In summary, since the facilities are greater than 1/4 mile apart, the Single source determination does not apply.



Legend

- Well
- 1 Mile Radius

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North

0 750 1,500
Feet

Revisions					
No.					
Date					

Designed By: MEW	Drawn By: DML	Reviewed By: TSS
Issue Date: 10/20/2016	Project No: MOU7000.AC	Sheet Size: 11x17

Radius Map

MK Midstream Holdings, LLC
Goff West CS
Harrison County, West Virginia

FIGURE NO.

1

Path: S:\Data\MMOUKE - MOUNTAINEER KEYSTONE\6031 WALLACE RD EXT, WEXFORD, PA\MOU7000AC\Goff Compressor\Radius maps\Figure 1 - Radius Map.mxd

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.	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?	Yes ☒	No ☐
Will managers or other workers frequently shuttle back and forth to be involved actively at both facilities?	Yes ☒	No ☐
Do the facilities share common payroll activities, employee benefits, health plans, retirement funds, insurance coverage, or other administrative functions? Please explain.	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.	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 B - SITING CRITERIA WAIVER
If applicable, please complete this form and it must be notarized.

G35-C General Permit
Siting Criteria Waiver

WV Division of Air Quality 300' Waiver

I _____ hereby
Print Name

acknowledge and agree that MK Midstream Holdings, LLC will
General Permit Applicant's Name

construct an emission unit(s) at a natural gas compressor and/or dehydration facility that will be located within 300' of my dwelling and/or business.

.

I hereby offer this waiver of siting criteria to the West Virginia Department of Environmental Protection Division of Air Quality as permission to construct, install and operate in such location.

Signed:

_____

Signature Date

_____

Signature Date

Taken, subscribed and sworn before me this _____ day of

_____, 20_____.

My commission expires: _____

SEAL_____
Notary Public

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.

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
MK MIDSTREAM HOLDINGS, LLC
65 PROFESSIONAL PL 200
BRIDGEPORT, WV 26330-1889

BUSINESS REGISTRATION ACCOUNT NUMBER: **2306-9776**

This certificate is issued on: **02/19/2015**

This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with Chapter 11, Article 12, of the West Virginia Code

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

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

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

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

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

atL006 v.4
L0264094016

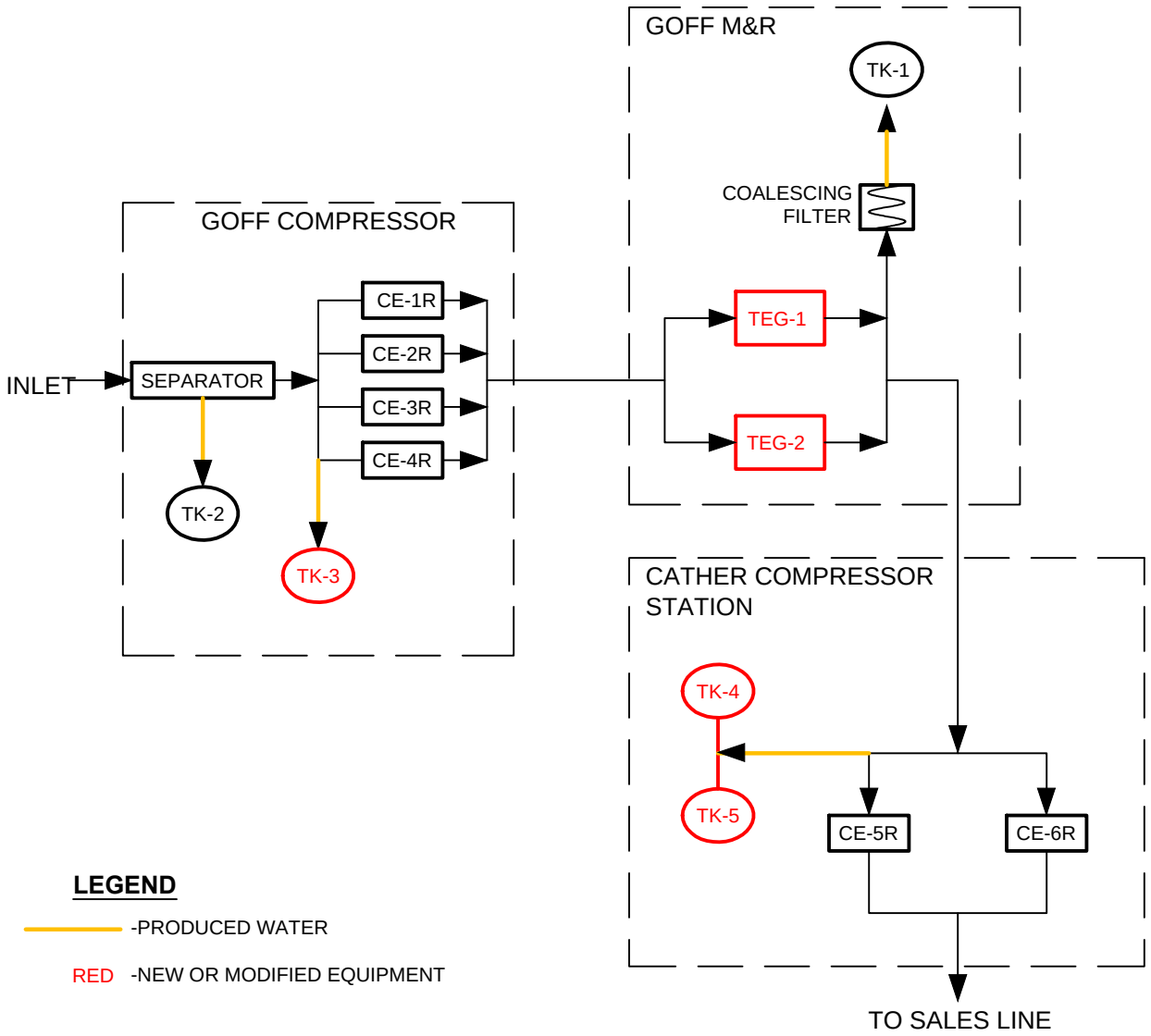
ATTACHMENT D – PROCESS FLOW DIAGRAM

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.

DRAWING NAME: S:\Data\M\MOUKE - MOUNTAINEER KEYSTONE\6031 WALLACE RD EXT, WEXFORD, PA\MOU7000AC\Goff Compressor\ATTACHMENT D - PROCESS FLOW DIAGRAM.dwg LAYOUT: 8.5 x 11 L - SSM PLOT DATE: Oct 21, 2016 - 1:18pm OPERATOR: BOB



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PROCESS FLOW DIAGRAM

GOFF WEST COMPRESSOR STATION

MK MIDSTREAM HOLDINGS, LLC
FACILITY ID 033-00187

SCALE:	NONE
ISSUE DATE:	10/21/2016
PROJECT NUMBER:	MOU7000.AC

ATTACHMENT D

SHEET NO.

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.

PROCESS DESCRIPTION (ATTACHMENT B&C)

Pipeline quality natural gas (methane) is supplied to Four (4) Caterpillar G3516ULB Internal combustion engine (1380 BHP) @ 1400 RPM/each) all with Model DC-65 Oxidation Catalytic Converters, One (1) Caterpillar G3608TALE (2370 BHP@1000 RPM) with EMIT oxidation catalyst, and One (1) Caterpillar G3606TALE (1775 BHP @1000 RPM), equipped with a DCL model DC-64 oxidation catalyst, all for emission reductions. The engines drive compressors to move the natural gas through a pipeline into Two(2) 45.0 MMCFD TEG (Tri-Ethylene Glycol) Dehydrator for drying the gas to below 7.0lbs/MMSCFD of Water Content and eventually sell the dried clean natural gas into a sales line that has a higher pressure (psig) than the wells can produce on their own at.

The engine burns the dried hot natural gas from the discharge of the dehydrator and products of combustion are exhausted through an exhaust line and into a Catalytic Converter and then to a Hospital Grade Muffler/Silencer through a tailpipe and into the atmosphere.

The Tri-Ethylene Glycol (TEG) Dehydrators uses a type of anti-freeze to remove water that is entrained in the gas stream. The re-boiler heats the glycol to a certain temperature and a pump pushes the glycol up through the tower that also has the natural gas flowing though it and absorption tray vessel (Tower) stripes out the water and it is dripped out of the gas stream and piped to a waste tank. The re-boiler has a stack on it and the only real pollutant that is measurable is VOC's (Volatile Organic Chemicals) or Non-Methane Hydrocarbons off of what is called the still column. NOx and CO is the product of combustion of natural gas through the burner and these are vented to the atmosphere through the fire-tube.

Most of the lube oils from the compressor are entrained in the gas stream, but what is caught in a coalescent filter is piped to a waste tank and hauled away by a company like Safety Clean, who disposes of it properly. The engine oil and filters that must be used to keep engine running and in good condition is also piped to either the same tank that has a containment dike around it for accidental spills, is also drained periodically by a safety company that disposes it properly.

There are fugitive emissions associated with piping connection, valves and controllers. These emissions occur due to potential seepage from connections, flanges and open ended lines.

This permit modification includes:

- Increasing Glycol Dehydration units RSV-1 and RSV-2 from 31 mmscf/day and 45 mmscf/day to 67mmscf/day for both units
- Addition of following Tanks:
  1. TK 3-100 bbl Tank used to collect produced water from Compressor CE-1R, CE-2R, CE-3R and CE-4R located on Goff Compressor Station
  2. TK-4 and TK-5 2 50 bbl tanks located on Cather Compressor Station to collect collect produced water from compressor CCE-5R and CE-6R

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.

NOTE:
LOCATIONS ARE APPROXIMATE AND DRAWING IS NOT FOR CONTRUCTION.

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NORTH

0 50' 100'

REVISIONS

NO.	DATE	DESCRIPTION

SCALE: 1" = 100'	ISSUE DATE: 10/21/2016
PROJECT NUMBER: MOU7000.AC	SHEET SIZE: 24"x36"
DESIGNED: MEW	DRAWN: BOB
REVIEWED: MEW	APPROVED: TSS

P.E. SEAL

GOFF WEST COMPRESSOR STATION

MK MIDSTREAM HOLDINGS, LLC
FACILITY 033-00187

PLOT PLAN

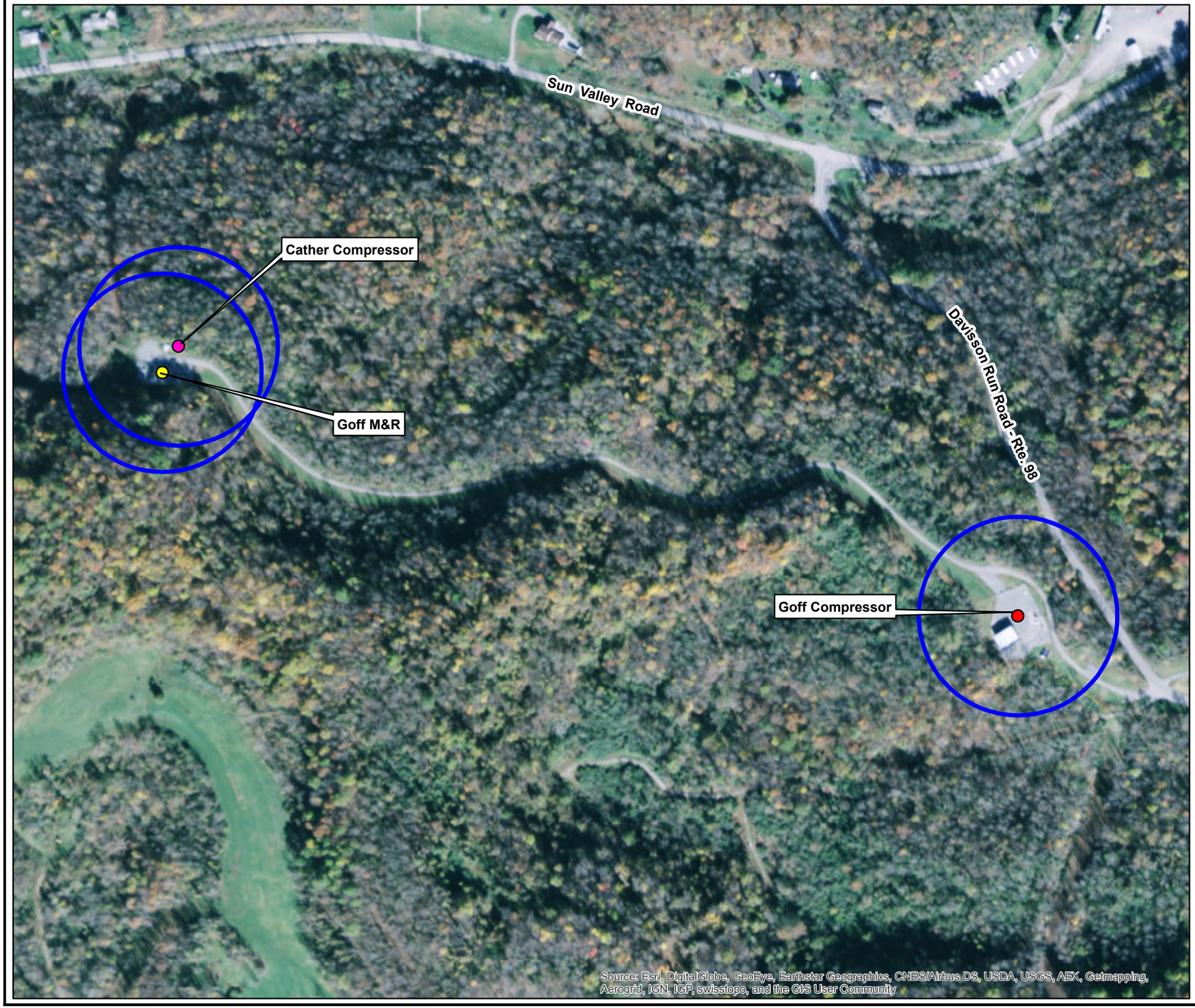
ATTACHMENT
F

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.



Legend

- Goff Compressor
- Goff M-R
- Cather Compressor
- 300 foot Buffer

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FARMINGTON, CT 06032
(860) 674-9570
HRPASSOCIATES.COM

North

0 150 300
Feet

Revisions					
No.					
Date					

Designed By: MEW	Drawn By: BOB	Reviewed By: TSS
Issue Date: 10/21/2016	Project No: MOU7000.AC	Sheet Size: 11x17

Area Map

GOFF West
Compressor Station

MK Midstream Holdings, LLC
Facility ID 033-00187

ATTACHMENT

G

Path: S:\Data\MMOUKE - MOUNTAINEER KEYSTONE\6031 WALLACE RD EXT, WEXFORD, PA\MOU7000AC\Goff Compressor\Attachment G - Area Map.mxd

ATTACHMENT H – G35-C SECTION APPLICABILITY FORM

General Permit G35-C Registration
Section Applicability Form

General Permit G35-C was developed to allow qualified applicants to seek registration for a variety of sources. These sources include 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 G35-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 G35-C APPLICABLE SECTIONS	
☒Section 5.0	Storage Vessels Containing Condensate and/or Produced Water[1]
☐Section 6.0	Storage Vessel Affected Facility (NSPS, Subpart OOOO)
☒Section 7.0	Control Devices and Emission Reduction Devices not subject to NSPS Subpart OOOO and/or NESHAP Subpart HH
☐Section 8.0	Small Heaters and Reboilers not subject to 40CFR60 Subpart Dc
☐Section 9.0	Pneumatic Controllers Affected Facility (NSPS, Subpart OOOO)
☐Section 10.0	Centrifugal Compressor Affected Facility (NSPS, Subpart OOOO)[2]
☐Section 11.0	Reciprocating Compressor Affected Facility (NSPS, Subpart OOOO)[2]
☐Section 12.0	Reciprocating Internal Combustion Engines, Generator Engines. Microturbine Generators
☒Section 13.0	Tanker Truck Loading[3]
☒Section 14.0	Glycol Dehydration Units[4]

1 *Applicants that are subject to Section 5 may also be subject to Section 6 if the applicant is subject to the NSPS, Subpart OOOO control requirements or the applicable control device requirements of Section 7.*

2 *Applicants that are subject to Section 10 and 11 may also be subject to the applicable RICE requirements of Section 12.*

3 *Applicants that are subject to Section 13 may also be subject to control device and emission reduction device requirements of Section 7.*

4 *Applicants that are subject to Section 14 may also be subject to the requirements of Section 8 (reboilers). Applicants that are subject to Section 14 may also be subject to control device and emission reduction device requirements of Section 7.*

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 K 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]

[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:

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)) W-1A W-1B	Stream type (gas, liquid, etc.)	Estimated Emissions (tpy)		
					VOC	HAP	GHG (CO_2e)
Pumps	☐ Yes ☒ No	2	13.3 scf/hr/component	☒ Gas ☐ Liquid ☐ Both	1.00	0	107.13
Valves	☐ Yes ☒ No	63	0.027 scf/hr/component	☒ Gas ☐ Liquid ☐ Both	0.0641	0	6.85
Safety Relief Valves	☐ Yes ☒ No	3	0.040 scf/hr/component	☒ Gas ☐ Liquid ☐ Both	0.0045	0	0.4833
Open Ended Lines	☐ Yes ☒ No	4	0.061 scf/hr/component	☒ Gas ☐ Liquid ☐ Both	0.0092	0	0.9827
Sampling Connections	☐ Yes ☒ No	2	0.003 scf/hr/component	☒ Gas ☐ Liquid ☐ Both	0.0002	0	0.0242
Connections (Not sampling)	☐ Yes ☒ No	253	0.003 scf/hr/component	☒ Gas ☐ Liquid ☐ Both	0.0229	0	2.45
Compressors	☐ Yes ☒ No	6	7 scf/hr/component	☒ Gas ☐ Liquid ☐ Both	1.88	0	169.15
Flanges	☐ Yes ☒ No	36	0.003 scf/hr/component	☒ Gas ☐ Liquid ☐ Both	0.0041	0	0.4350
Other[1]	☐ Yes ☐ No			☐ Gas ☐ Liquid ☐ Both			

[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.):

Please indicate if there are any closed vent bypasses (include component):
Specify all equipment used in the closed vent system (e.g. VRU, ERD, thief hatches, tanker truck loading, etc.)

ATTACHMENT K – 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

1. Bulk Storage Area Name Cather Compressor Station	2. Tank Name
3. Emission Unit ID number TK-4 and TK-5	4. Emission Point ID number
5. Date Installed , Modified or Relocated *(for existing tanks)* Was the tank manufactured after August 23, 2011? ☒ Yes ☐ No	6. Type of change: ☒ New construction ☐ New stored material ☐ Other ☐ Relocation
7A. Description of Tank Modification *(if applicable)*	
7B. Will more than one material be stored in this tank? *If so, a separate form must be completed for each material.* ☐ Yes ☒ No	
7C. Was USEPA Tanks simulation software utilized? ☐ Yes ☒ No ***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.
50 bbl

9A. Tank Internal Diameter (ft.) 10	9B. Tank Internal Height (ft.) 10
10A. Maximum Liquid Height (ft.) 10	10B. Average Liquid Height (ft.) 6.8
11A. Maximum Vapor Space Height (ft.) 1.2	11B. Average Vapor Space Height (ft.)
12. Nominal Capacity *(specify barrels or gallons)*. This is also known as "working volume". 50bbl	
13A. Maximum annual throughput (gal/yr) 8,400	13B. Maximum daily throughput (gal/day) 23
14. Number of tank turnovers per year 1	15. Maximum tank fill rate (gal/min) 0.008

16. Tank fill method ☒ Submerged ☐ Splash ☐ Bottom Loading

17. Is the tank system a variable vapor space system? ☐ Yes ☒ No
If yes, (A) What is the volume expansion capacity of the system (gal)?
(B) What are the number of transfers into the system per year?

18. Type of tank (check all that apply):

☒ Fixed Roof ☒ vertical ☐ horizontal ☐ flat roof ☐ cone roof ☐ dome roof ☐ other (describe)

☐ External Floating Roof ☐ pontoon roof ☐ double deck roof
☐ Domed External (or Covered) Floating Roof
☐ Internal Floating Roof ☐ vertical column support ☐ self-supporting
☐ Variable Vapor Space ☐ lifter roof ☐ diaphragm
☐ Pressurized ☐ spherical ☐ cylindrical
☐ 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	
Produced Liquid	0	0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	AP-42 Section 7.1

[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: ☒ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)			
21A. Shell Color: Tan	21B. Roof Color: Tan	21C. Year Last Painted: 2015	
22. Shell Condition (if metal and unlined): ☒ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable			
22A. Is the tank heated? ☐ Yes ☒ No	22B. If yes, operating temperature:	22C. If yes, how is heat provided to tank?	
23. Operating Pressure Range (psig): **Must be listed for tanks using VRUs with closed vent system.**			
24. Is the tank a **Vertical Fixed Roof Tank**? ☒ Yes ☐ No	24A. If yes, for dome roof provide radius (ft):	24B. If yes, for cone roof, provide slop (ft/ft):	
25. Complete item 25 for **Floating Roof Tanks** ☐ Does not apply ☒			
25A. Year Internal Floaters Installed:			
25B. Primary Seal Type *(check one):* ☐ Metallic (mechanical) shoe seal ☐ Liquid mounted resilient seal ☐ Vapor mounted resilient seal ☐ Other (describe):			
25C. Is the Floating Roof equipped with a secondary seal? ☐ Yes ☐ No			
25D. If yes, how is the secondary seal mounted? *(check one)* ☐ Shoe ☐ Rim ☐ Other (describe):			
25E. Is the floating roof equipped with a weather shield? ☐ Yes ☐ No			
25F. Describe deck fittings:			
26. Complete the following section for **Internal Floating Roof Tanks** ☒ Does not apply			
26A. Deck Type: ☐ Bolted ☐ Welded	26B. For bolted decks, provide deck construction:		
26C. Deck seam. Continuous sheet construction: ☐ 5 ft. wide ☐ 6 ft. wide ☐ 7 ft. wide ☐ 5 x 7.5 ft. wide ☐ 5 x 12 ft. wide ☐ other (describe)			
26D. Deck seam length (ft.):	26E. Area of deck (ft^2):	26F. For column supported tanks, # of columns:	26G. For column supported tanks, diameter of column:
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: Charleston, WV			
30. Daily Avg. Ambient Temperature (°F): 54.75	31. Annual Avg. Maximum Temperature (°F): 65.5		
32. Annual Avg. Minimum Temperature (°F): 44	33. Avg. Wind Speed (mph): 6.3		
34. Annual Avg. Solar Insulation Factor (BTU/ft^2-day): 1123	35. Atmospheric Pressure (psia): 14.617		
LIQUID INFORMATION			
36. Avg. daily temperature range of bulk liquid (°F): 11.5	36A. Minimum (°F): 52.2	36B. Maximum (°F): 63.7	
37. Avg. operating pressure range of tank (psig): 0.7230	37A. Minimum (psig): 0.2777	37B. Maximum (psig): 1.00	
38A. Minimum liquid surface temperature (°F): 52.2	38B. Corresponding vapor pressure (psia): 0.2777		
39A. Avg. liquid surface temperature (°F): 56.3	39B. Corresponding vapor pressure (psia): 0.7230		
40A. Maximum liquid surface temperature (°F): 63.7	40B. Corresponding vapor pressure (psia): 1.00		
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:	Produce Liquid 100%		
41B. CAS number:	NA		
41C. Liquid density (lb/gal):	8.2		
41D. Liquid molecular weight (lb/lb-mole):	20.1		
41E. Vapor molecular weight (lb/lb-mole):	24.55		

41F. Maximum true vapor pressure (psia):	1.00		
41G. Maximum Reid vapor pressure (psia):			
41H. Months Storage per year. From: Jan. To: Dec.	12		
42. Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations.			

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]

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 K – 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

1. Bulk Storage Area Name Goff West Compressor Station	2. Tank Name
3. Emission Unit ID number TK-3	4. Emission Point ID number
5. Date Installed , Modified or Relocated *(for existing tanks)* Was the tank manufactured after August 23, 2011? ☒ Yes ☐ No	6. Type of change: ☒ New construction ☐ New stored material ☐ Other ☐ Relocation
7A. Description of Tank Modification *(if applicable)*	
7B. Will more than one material be stored in this tank? *If so, a separate form must be completed for each material.* ☐ Yes ☒ No	
7C. Was USEPA Tanks simulation software utilized? ☐ Yes ☒ No ***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. 100 bbl	
9A. Tank Internal Diameter (ft.) 8	9B. Tank Internal Height (ft.) 10
10A. Maximum Liquid Height (ft.) 8.5	10B. Average Liquid Height (ft.) 8.5
11A. Maximum Vapor Space Height (ft.) 1.5	11B. Average Vapor Space Height (ft.)
12. Nominal Capacity *(specify barrels or gallons)*. This is also known as "working volume". 100bbl	
13A. Maximum annual throughput (gal/yr) 21,000	13B. Maximum daily throughput (gal/day) 57.5
14. Number of tank turnovers per year 7	15. Maximum tank fill rate (gal/min) 0.04
16. Tank fill method ☒ Submerged ☐ Splash ☐ Bottom Loading	
17. Is the tank system a variable vapor space system? ☐ Yes ☒ No If yes, (A) What is the volume expansion capacity of the system (gal)? (B) What are the number of transfers into the system per year?	
18. Type of tank (check all that apply): ☒ Fixed Roof ☐ vertical ☐ horizontal ☐ flat roof ☐ cone roof ☐ dome roof ☐ other (describe) ☐ External Floating Roof ☐ pontoon roof ☐ double deck roof ☐ Domed External (or Covered) Floating Roof ☐ Internal Floating Roof ☐ vertical column support ☐ self-supporting ☐ Variable Vapor Space ☐ lifter roof ☐ diaphragm ☐ Pressurized ☐ spherical ☐ cylindrical ☐ 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	
Produced Liquid	0	0	7.61E-4	0.0033	5.57E-4	0.0024	0.001	0.0058	AP-4 Section 7.1

[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: ☒ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)			
21A. Shell Color: Tan	21B. Roof Color: Tan	21C. Year Last Painted: 2015	
22. Shell Condition (if metal and unlined): ☒ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable			
22A. Is the tank heated? ☐ Yes ☒ No	22B. If yes, operating temperature:	22C. If yes, how is heat provided to tank?	
23. Operating Pressure Range (psig): **Must be listed for tanks using VRUs with closed vent system.**			
24. Is the tank a **Vertical Fixed Roof Tank**? ☐ Yes ☒ No	24A. If yes, for dome roof provide radius (ft):	24B. If yes, for cone roof, provide slop (ft/ft):	
25. Complete item 25 for **Floating Roof Tanks** ☐ Does not apply ☒			
25A. Year Internal Floaters Installed:			
25B. Primary Seal Type *(check one):* ☐ Metallic (mechanical) shoe seal ☐ Liquid mounted resilient seal ☐ Vapor mounted resilient seal ☐ Other (describe):			
25C. Is the Floating Roof equipped with a secondary seal? ☐ Yes ☐ No			
25D. If yes, how is the secondary seal mounted? *(check one)* ☐ Shoe ☐ Rim ☐ Other (describe):			
25E. Is the floating roof equipped with a weather shield? ☐ Yes ☐ No			
25F. Describe deck fittings:			
26. Complete the following section for **Internal Floating Roof Tanks** ☒ Does not apply			
26A. Deck Type: ☐ Bolted ☐ Welded	26B. For bolted decks, provide deck construction:		
26C. Deck seam. Continuous sheet construction: ☐ 5 ft. wide ☐ 6 ft. wide ☐ 7 ft. wide ☐ 5 x 7.5 ft. wide ☐ 5 x 12 ft. wide ☐ other (describe)			
26D. Deck seam length (ft.):	26E. Area of deck (ft^2):	26F. For column supported tanks, # of columns:	26G. For column supported tanks, diameter of column:
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: Charleston, WV			
30. Daily Avg. Ambient Temperature (°F): 54.75	31. Annual Avg. Maximum Temperature (°F): 65.5		
32. Annual Avg. Minimum Temperature (°F): 44	33. Avg. Wind Speed (mph): 6.3		
34. Annual Avg. Solar Insulation Factor (BTU/ft^2-day): 1123	35. Atmospheric Pressure (psia): 14.617		
LIQUID INFORMATION			
36. Avg. daily temperature range of bulk liquid (°F): 11.5	36A. Minimum (°F): 52.2	36B. Maximum (°F): 63.7	
37. Avg. operating pressure range of tank (psig): 0.7230	37A. Minimum (psig): 0.2777	37B. Maximum (psig): 1.0	
38A. Minimum liquid surface temperature (°F): 52.2	38B. Corresponding vapor pressure (psia): 0.2777		
39A. Avg. liquid surface temperature (°F): 56.3	39B. Corresponding vapor pressure (psia): 0.7230		
40A. Maximum liquid surface temperature (°F): 63.7	40B. Corresponding vapor pressure (psia): 1.00		
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:	Produce Liquid 100%		
41B. CAS number:	NA		
41C. Liquid density (lb/gal):	8.2		
41D. Liquid molecular weight (lb/lb-mole):	20.1		
41E. Vapor molecular weight (lb/lb-mole):	24.55		

41F. Maximum true vapor pressure (psia):	1.00		
41G. Maximum Reid vapor pressure (psia):			
41H. Months Storage per year. From: Jan. To: Dec.	12		
42. Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations.			

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]

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 L – 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]

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 M – 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]			
Engine Manufacturer/Model			
Manufacturers Rated bhp/rpm			
Source Status[2]			
Date Installed/ Modified/Removed/Relocated[3]			
Engine Manufactured /Reconstruction Date[4]			
Check all applicable Federal Rules for the engine (include EPA Certificate of Conformity if applicable)[5]	☐40CFR60 Subpart JJJJ ☐JJJJ Certified? ☐40CFR60 Subpart IIII ☐IIII Certified? ☐40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/ NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources	☐40CFR60 Subpart JJJJ ☐JJJJ Certified? ☐40CFR60 Subpart IIII ☐IIII Certified? ☐40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/ NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources	☐40CFR60 Subpart JJJJ ☐JJJJ Certified? ☐40CFR60 Subpart IIII ☐IIII Certified? ☐40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/ NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources
Engine Type[6]			
APCD Type[7]			
Fuel Type[8]			
H_2S (gr/100 scf)			
Operating bhp/rpm			
BSFC (BTU/bhp-hr)			
Hourly Fuel Throughput	ft^3/hr gal/hr	ft^3/hr gal/hr	ft^3/hr gal/hr
Annual Fuel Throughput (Must use 8,760 hrs/yr unless emergency generator)	MMft^3/yr gal/yr	MMft^3/yr gal/yr	MMft^3/yr 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]**
	NO_x						
	CO						
	VOC						
	SO_2						
	PM_{10}						
	Formaldehyde						
	Total HAPs						
	GHG (CO_2e)						

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 Precombustion Chambers
PSC	Prestratified 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# , 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:

Manufacturer:	Model #:
Design Operating Temperature: °F	Design gas volume: scfm
Service life of catalyst:	Provide manufacturer data? ☐Yes ☐ No
Volume of gas handled: acfm at °F	Operating temperature range for NSCR/Ox Cat: From °F to °F
Reducing agent used, if any:	Ammonia slip (ppm):

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

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

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,

ATTACHMENT N – 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 and will be noted on the issued G35-C Registration.

Emission Unit ID#: LO-1	Emission Point ID#:	Year Installed/Modified:
Emission Unit Description: Produced Water Tank Truck Loading TK-1, TK-2,TK-3,TK-4,TK-5		
Loading Area Data		
Number of Pumps: NA	Number of Liquids Loaded:	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 If Yes, Please describe:		
Provide description of closed vent system and any bypasses. NA		
Are any of the following truck loadout systems utilized? ☐ Closed System to tanker truck passing a MACT level annual leak test? ☐ Closed System to tanker truck passing a NSPS level annual leak test? ☐ 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	2	2	2	2
Days/week	1	1	1	1

Bulk Liquid Data (use extra pages as necessary)

Liquid Name	Production Liquid		
Max. Daily Throughput (1000 gal/day)	21.4		
Max. Annual Throughput (1000 gal/yr)	151.2		
Loading Method[1]	BF		
Max. Fill Rate (gal/min)	60		
Average Fill Time (min/loading)	59		
Max. Bulk Liquid Temperature (°F)	80		
True Vapor Pressure[2]	10.2		
Cargo Vessel Condition[3]	C		
Control Equipment or Method[4]	NA		

Max. Collection Efficiency (%)		0		
Max. Control Efficiency (%)		0		
Max.VOC Emission Rate	Loading (lb/hr)	0.009		
	Annual (ton/yr)	0.038		
Max.HAP Emission Rate	Loading (lb/hr)	0		
	Annual (ton/yr)	0		
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 O – GLYCOL DEHYDRATION UNIT DATA SHEET

Complete this data sheet for each Glycol Dehydration Unit, Reboiler, Flash Tank and/or Regenerator at the facility. Include gas sample analysis and GRI- GLYCalc™ input and aggregate report. Use extra pages if necessary.

Manufacturer: Exterran	Model: HANO-486836035
Max. Dry Gas Flow Rate: 67 mmscf/day	Reboiler Design Heat Input: 1 MMBTU/hr
Design Type: ☒ TEG ☐ DEG ☐ EG	Source Status[1]: MS
Date Installed/Modified/Removed[2]: 12/16	Regenerator Still Vent APCD/ERD[3]: NA
Control Device/ERD ID#[3]: NA	Fuel HV (BTU/scf): 1020
H_2S Content (gr/100 scf): <0.25	Operation (hours/year): 8760
Pump Rate (scfm): 46.5	
Water Content (wt %) in: Wet Gas: 0.17	Dry Gas: 0.014

Is the glycol dehydration unit exempt from 40CFR63 Section 764(d)? ☒ Yes ☐ No: If Yes, answer the following:

The actual annual average flowrate of natural gas to the glycol dehydration unit is less than 85 thousand standard cubic meters per day, as determined by the procedures specified in §63.772(b)(1) of this subpart. ☐ Yes ☒ No

The actual average emissions of benzene from the glycol dehydration unit process vent to the atmosphere are less than 0.90 megagram per year (1 ton per year), as determined by the procedures specified in §63.772(b)(2) of this subpart. ☒ Yes ☐ No

Is the glycol dehydration unit located within an Urbanized Area (UA) or Urban Cluster (UC)? ☐ Yes ☒ No

Is a lean glycol pump optimization plan being utilized? ☐ Yes ☒ No

Recycling the glycol dehydration unit back to the flame zone of the reboiler.
☒ Yes ☐ No

Recycling the glycol dehydration unit back to the flame zone of the reboiler and mixed with fuel.
☐ Yes ☐ No

What happens when temperature controller shuts off fuel to the reboiler?
☒ Still vent emissions to the atmosphere.
☐ Still vent emissions stopped with valve.
☐ Still vent emissions to glow plug.

Please indicate if the following equipment is present.
☐ Flash Tank
☐ Burner management system that continuously burns condenser or flash tank vapors

Control Device Technical Data

Pollutants Controlled	Manufacturer's Guaranteed Control Efficiency (%)
NA	

Emissions Data

Emission Unit ID / Emission Point ID[4]	Description	Calculation Methodology[5]	PTE[6]	Controlled Maximum Hourly Emissions (lb/hr)	Controlled Maximum Annual Emissions (tpy)
	Reboiler Vent	AP-42	NO_x	0.0971	0.4252
		AP-42	CO	0.0816	0.3572
		AP-42	VOC	0.0053	0.0254
		AP-42	SO_2	0.0006	0.0026
		AP-42	PM_{10}	0.0074	0.0323

			GHG (CO_2e)	116.50	510.27
	Glycol Regenerator Still Vent	GRI-GlyCalc™	VOC	1.607	7.03
		GRI-GlyCalc™	Benzene	NA	
		GRI-GlyCalc™	Toluene	NA	
		GRI-GlyCalc™	Ethylbenzene	NA	
		GRI-GlyCalc™	Xylenes	NA	
		GRI-GlyCalc™	n-Hexane	0.26	1.17
	Glycol Flash Tank	GRI-GlyCalc™	VOC	NA	NA
		GRI-GlyCalc™	Benzene	NA	NA
		GRI-GlyCalc™	Toluene	NA	NA
		GRI-GlyCalc™	Ethylbenzene	NA	NA
		GRI-GlyCalc™	Xylenes	NA	NA
		GRI-GlyCalc™	n-Hexane	NA	NA

1 Enter the Source Status using the following codes:
NS Construction of New Source ES Existing Source
MS Modification of Existing Source

2 Enter the date (or anticipated date) of the glycol dehydration unit's installation (construction of source), modification or removal.

3 Enter the Air Pollution Control Device (APCD)/Emission Reduction Device (ERD) type designation using the following codes and the device ID number:
NA None CD Condenser FL Flare
CC Condenser/Combustion Combination TO Thermal Oxidizer O Other (please list)

4 Enter the appropriate Emission Unit ID Numbers and Emission Point ID Numbers for the glycol dehydration unit reboiler vent and glycol regenerator still vent. The glycol dehydration unit reboiler vent and glycol regenerator still vent should be designated RBV-1 and RSV-1, respectively. If the compressor station incorporates multiple glycol dehydration units, a Glycol Dehydration Emission Unit Data Sheet shall be completed for each, using Source Identification RBV-2 and RSV-2, RBV-3 and RSV-3, etc.

5 Enter the Potential Emissions Data Reference designation using the following codes:
MD Manufacturer's Data AP AP-42
GR GRI-GLYCalc™ OT Other (please list)

6 Enter the Reboiler Vent and Glycol Regenerator Still Vent Potential to Emit (PTE) for the listed regulated pollutants in lbs per hour and tons per year. The Glycol Regenerator Still Vent potential emissions may be determined using the most recent version of the thermodynamic software model GRI-GLYCalc™ (Radian International LLC & Gas Research Institute). **Attach all referenced Potential Emissions Data (or calculations) and the GRI-GLYCalc™ Aggregate Calculations Report (shall include emissions reports, equipment reports, and stream reports) to this Glycol Dehydration Emission Unit Data Sheet(s). Backup pumps do not have to be considered as operating for purposes of PTE.** This PTE data shall be incorporated in the Emissions Summary Sheet.

ATTACHMENT P – PNEUMATIC CONTROLLERS 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? ☒ Yes ☐ No 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? ☐ Yes ☒ No Please list approximate number.

ATTACHMENT Q – AIR POLLUTION CONTROL DEVICE / EMISSION REDUCTION DEVICE SHEETS

Complete the applicable air pollution control device sheets for each flare, vapor combustor, thermal oxidizer, condenser, adsorption system, vapor recovery unit, BTEX Eliminator, Reboiler with and without Glow Plug, etc. at the facility. Use extra pages if necessary.

Emissions calculations must be performed using the most conservative control device efficiency.

The following five (5) rows are only to be completed if registering an alternative air pollution control device.	
Emission Unit ID:	Make/Model:
Primary Control Device ID:	Make/Model:
Control Efficiency (%):	APCD/ERD Data Sheet Completed: ☐ Yes ☐ No
Secondary Control Device ID:	Make/Model:
Control Efficiency (%):	APCD/ERD Data Sheet Completed: ☐ Yes ☐ No

VAPOR COMBUSTION
(Including Enclosed Combustors)

General Information

Control Device ID#:	Installation Date: ☐ New ☐ Modified ☐ Relocated	
Maximum Rated Total Flow Capacity scfh scfd	Maximum Design Heat Input (from mfg. spec sheet) MMBTU/hr	Design Heat Content BTU/scf

Control Device Information

Type of Vapor Combustion Control?

☐ Enclosed Combustion Device ☐ Elevated Flare ☐ Ground Flare
☐ Thermal Oxidizer

Manufacturer: Model:	Hours of operation per year?

List the emission units whose emissions are controlled by this vapor control device (Emission Point ID#)

Emission Unit ID#	Emission Source Description	Emission Unit ID#	Emission Source Description

If this vapor combustor controls emissions from more than six (6) emission units, please attach additional pages.

Assist Type (Flares only)	Flare Height	Tip Diameter	Was the design per §60.18?
☐ Steam ☐ Air ☐ Pressure ☐ Non	feet	feet	☐ Yes ☐ No Provide determination.

Waste Gas Information

Maximum Waste Gas Flow Rate (scfm)	Heat Value of Waste Gas Stream BTU/ft^3	Exit Velocity of the Emissions Stream (ft/s)

Provide an attachment with the characteristics of the waste gas stream to be burned.

Pilot Gas Information

Number of Pilot Lights	Fuel Flow Rate to Pilot Flame per Pilot scfh	Heat Input per Pilot BTU/hr	Will automatic re-ignition be used? ☐ Yes ☐ No

If automatic re-ignition is used, please describe the method.

Is pilot flame equipped with a monitor to detect the presence of the flame? ☐ Yes ☐ No	If Yes, what type? ☐ Thermocouple ☐ Infrared ☐ Ultraviolet ☐ Camera ☐ Other:

Describe all operating ranges and maintenance procedures required by the manufacturer to maintain the warranty. *(If unavailable, please indicate).*

Additional information attached? ☐ Yes ☐ No
Please attach copies of manufacturer's data sheets, drawings, flame demonstration per §60.18 or §63.11(b) and performance testing.

CONDENSER		
General Information		
Control Device ID#:	Installation Date: ☐ New ☐ Modified ☐ Relocated	
Manufacturer:	Model:	Control Device Name:
Control Efficiency (%):		
Manufacturer's required temperature range for control efficiency. °F		
Describe the warning and/or alarm system that protects against operation when unit is not meeting the design requirements:		
Describe all operating ranges and maintenance procedures required by the manufacturer to maintain the warranty.		
Additional information attached? ☐ Yes ☐ No Please attach copies of manufacturer's data sheets.		
Is condenser routed to a secondary APCD or ERD? ☐ Yes ☐ No		

ADSORPTION SYSTEM

General Information

Control Device ID#:	Installation Date: ☐ New ☐ Modified ☐ Relocated	
Manufacturer:	Model:	Control Device Name:
Design Inlet Volume: scfm	Adsorbent charge per adsorber vessel and number of adsorber vessels:	
Length of Mass Transfer Zone supplied by the manufacturer:	Adsorber diameter: ft Adsorber area: ft^2	
Adsorbent type and physical properties:	Overall Control Efficiency (%):	
Working Capacity of Adsorbent (%):		

Operating Parameters

Inlet volume: scfm @ °F	
Adsorption time per adsorption bed (life expectancy):	Breakthrough Capacity (lbs of VOC/100 lbs of adsorbent):
Temperature range of carbon bed adsorber. °F - °F	

Control Device Technical Data

Pollutants Controlled	Manufacturer's Guaranteed Control Efficiency (%)

Describe the warning and/or alarm system that protects against operation when unit is not meeting the design requirements:
Has the control device been tested by the manufacturer and certified?
Describe all operating ranges and maintenance procedures required by the manufacturer to maintain the warranty.
Additional information attached? ☐ Yes ☐ No Please attach copies of manufacturer's data sheets, drawings, and performance testing.

VAPOR RECOVERY UNIT

General Information

Emission Unit ID#:	Installation Date: ☐ New ☐ Modified ☐ Relocated

Device Information

Manufacturer:
Model:

List the emission units whose emissions are controlled by this vapor recovery unit (Emission Point ID#)

Emission Unit ID#	Emission Source Description	Emission Unit ID#	Emission Source Description

If this vapor recovery unit controls emissions from more than six (6) emission units, please attach additional pages.

Additional information attached? ☐ Yes ☐ No
Please attach copies of manufacturer's data sheets, drawings, and performance testing.

The registrant may claim a capture and control efficiency of 95 % (which accounts for 5% downtime) for the vapor recovery unit.

The registrant may claim a capture and control efficiency of 98% if the VRU has a backup flare that meet the requirements of Section 8.1.2 of this general permit.

The registrant may claim a capture and control efficiency of 98% if the VRU has a backup VRU.

ATTACHMENT R – 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 as representative; 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.

Tank Emission Calculations

Tank Calculations - 100 bbl (TK-3)

Tank Type: Produced Liquid

Methodology: U.S. EPA, *Compilation of Air Pollutant Emission Factors* (AP-42), Supplement F, Section 7.1, Organic Liquid Storage Tanks.

Activity: Material Storage

Emission Summary: Emissions are "per tank"

Pollutant	*Emission Rates*	
	lbs/yr	tons/yr
VOC	11.74	0.0059

Pressure and Molecular Weight Calculation:

	Weight (lbs)	
Gasoline 15 RVP	6,115	
Water	172,997	Density is based on 60 F
	MW (lb/mol)	
Gasoline 15 RVP	60	
Water	18.02	
	Moles (lbmol)	
Gasoline 15 RVP	102	
Water	9,600	
Total	9,702	
	Mole Fraction (liquid)	
Gasoline 15 RVP	0.0105	
Water	0.9895	
	Vapor Pressure (psia)	
Gasoline 15 RVP	7.8526	
Water	0.4525	Antoine Constants (A=16.3872, B=3885.70, C=230.170)
	Partial Pressure (psia)	
Gasoline 15 RVP	0.0825	
Water	0.4477	
Total	0.5302	
	Mole Fraction (Vapor)	
Gasoline 15 RVP	0.1556	
Water	0.8444	
Molecular Weight	24.55	

Recordkeeping Data:

Compounds in Tank	Gasoline 15 RVP	Water
Component Concentration, Volume Percent:	5.00	95.00
*Tank Liquid Height (Hl), ft.	8.50	
*Tank Shell Height (Hs), ft.	10.00	
Tank Shell Radius (Rs), ft.	4.00	
*Tank Diameter (D), ft.	8.00	
*Molecular Vapor Weight (Mv), lb/lb-mole	24.55	
Daily Maximum Ambient Temperature (Tax), °R	525.17	
Daily Minimum Ambient Temperature (Tan), °R	503.67	
Ideal Gas Constant (R), psia-cu. ft./lb-mole-°R	10.73	
Tank Paint Solar Absorption (α), dimensionless	0.43	Tan, good
Daily Total Solar Insolation Factor (I), Btu/sq. ft.-day	1,123.00	Charleston, WV
*Breather Vent Pressure Setting (Pbp), psig	0.03	(if unknown, enter 0.03)
*Breather Vent Vacuum Setting (Pbv), psig	-0.03	(if unknown, enter -0.03)
Tank Roof Outage (Hro), ft.	0.0833	
Vapor Space Outage (Hvo), cu. ft.	1.58	
Vapor Space Volume (Vv), cu. ft.	79.55	
Daily Ambient Temperature Range (ΔTa), °R	21.50	
Daily Average Ambient Temperature (Taa), °R	514.42	
Liquid Bulk Temperature (Tb), °R	516	
Daily Maximum Liquid Surface Temperature (Tlx), °R	526.37	
Daily Minimum Liquid Surface Temperature (Tln), °R	511.87	
Vapor Pressure at Daily Max. Liquid Surface Temp. (Pvx), psia	1.00	
Vapor Pressure at Daily Min. Liquid Surface Temp. (Pvn), psia	0.2777	
Daily Vapor Pressure Range (ΔPv), psia	0.7230	
Daily Ave. Liquid Surface Temp. (Tla), °R	519.12	
Vapor Pressure at Ave. Liquid Surface Temp. (Pva), psia	0.5302	
Vapor Density (Wv), lbs/cu. ft.	0.0023	
Vented Vapor Saturation Factor (Ks)	0.9574	
Breather Vent Pressure Setting Range (ΔPb), psig	0.0600	
Daily Vapor Temperature Range (ΔTv), °R	29.00	
Vapor Space Expansion Factor (Ke)	0.1027	
Standing Storage Loss (Ls), lbs/year	**6.67**	
Standing Storage Loss (Ls), tons/year	**0.0033**	

*Maximum Throughput, gal/year	21,840	
*Actual Throughput (Qg), gal/year	21,840	
Actual Barrels/year, bbl/year	520	
Maximum Barrels/year, bbl/year	520	
Turnover Factor (Kn)	1.00	For N >36 Kn=(180+N)/6N, for N <=36 Kn=1
Working Loss Product Factor (Kp)	0.75	(1 for organics, 0.75 for crude oils)
*Tank Fill Rate, gal/hour	4,800	
Tank maximum liquid volume (Vlx) ft3	427	
Number of turnovers (N)	6.83	
Actual Working Loss (Lw), lbs/year	**5.08**	
Actual Working Loss (Lw), tons/year	**0.0025**	
TOTAL VOC LOSS:		
Actual (before control) lbs/year	**11.74**	
Actual (before control) tons/year	**0.0059**	

Emission method source: AP-42, Section 7.1, Storage of Organic Liquids
Gasoline Vapor Pressure and Molecular Weight: AP-42, Table 7.1-2
Daily Max. and Min. Ambient Temperatures: AP-42, Table 7.1-7
Daily Total Insolation Factor: AP-42, Table 7.1-6
Tank Paint Solar Absorption: AP-42, Table 7.1-7
*Required Information

Tank Calculations - 50 bbl (TK-4)

Tank Type: Produced Liquid

Methodology: U.S. EPA, *Compilation of Air Pollutant Emission Factors* (AP-42), Supplement F, Section 7.1, Organic Liquid Storage Tanks.

Activity: Material Storage

Emission Summary: Emissions are "per tank"

Pollutant	*Emission Rates*	
VOC	lbs/yr	tons/yr
	10.11	0.0051

Pressure and Molecular Weight Calculation:

	Weight (lbs)	
Gasoline 15 RVP	1,764	
Water	49,903	Density is based on 60 F
	MW (lb/mol)	
Gasoline 15 RVP	60	
Water	18.02	
	Moles (lbmol)	
Gasoline 15 RVP	29	
Water	2,769	
Total	2,799	
	Mole Fraction (liquid)	
Gasoline 15 RVP	0.0105	
Water	0.9895	
	Vapor Pressure (psia)	
Gasoline 15 RVP	7.8526	
Water	0.4525	Antoine Constants (A=16.3872, B=3885.70, C=230.170)
	Partial Pressure (psia)	
Gasoline 15 RVP	0.0825	
Water	0.4477	
Total	0.5302	
	Mole Fraction (Vapor)	
Gasoline 15 RVP	0.1556	
Water	0.8444	
Molecular Weight	24.55	

Recordkeeping Data:

Compounds in Tank	Gasoline 15 RVP	Water
Component Concentration, Volume Percent:	5.00	95.00
*Tank Liquid Height (Hl), ft.	6.80	
*Tank Shell Height (Hs), ft.	8.00	
Tank Shell Radius (Rs), ft.	5.00	
*Tank Diameter (D), ft.	10.00	
*Molecular Vapor Weight (Mv), lb/lb-mole	24.55	
Daily Maximum Ambient Temperature (Tax), °R	525.17	
Daily Minimum Ambient Temperature (Tan), °R	503.67	
Ideal Gas Constant (R), psia-cu. ft./lb-mole-°R	10.73	
Tank Paint Solar Absorption (α), dimensionless	0.43	Tan, good
Daily Total Solar Insolation Factor (I), Btu/sq. ft.-day	1,123.00	Charleston, WV
*Breather Vent Pressure Setting (Pbp), psig	0.03	(if unknown, enter 0.03)
*Breather Vent Vacuum Setting (Pbv), psig	-0.03	(if unknown, enter -0.03)
Tank Roof Outage (Hro), ft.	0.1042	
Vapor Space Outage (Hvo), cu. ft.	1.30	
Vapor Space Volume (Vv), cu. ft.	102.38	
Daily Ambient Temperature Range (ΔTa), °R	21.50	
Daily Average Ambient Temperature (Taa), °R	514.42	
Liquid Bulk Temperature (Tb), °R	516	
Daily Maximum Liquid Surface Temperature (Tlx), °R	526.37	
Daily Minimum Liquid Surface Temperature (Tln), °R	511.87	
Vapor Pressure at Daily Max. Liquid Surface Temp. (Pvx), psia	1.00	
Vapor Pressure at Daily Min. Liquid Surface Temp. (Pvn), psia	0.2777	
Daily Vapor Pressure Range (ΔPv), psia	0.7230	
Daily Ave. Liquid Surface Temp. (Tla), °R	519.12	
Vapor Pressure at Ave. Liquid Surface Temp. (Pva), psia	0.5302	
Vapor Density (Wv), lbs/cu. ft.	0.0023	
Vented Vapor Saturation Factor (Ks)	0.9646	
Breather Vent Pressure Setting Range (ΔPb), psig	0.0600	
Daily Vapor Temperature Range (ΔTv), °R	29.00	
Vapor Space Expansion Factor (Ke)	0.1027	
Standing Storage Loss (Ls), lbs/year	**8.65**	
Standing Storage Loss (Ls), tons/year	**0.0043**	

*Maximum Throughput, gal/year	6,300	
*Actual Throughput (Qg), gal/year	6,300	
Actual Barrels/year, bbl/year	150	
Maximum Barrels/year, bbl/year	150	
Turnover Factor (Kn)	1.00	For N >36 Kn=(180+N)/6N, for N <=36 Kn=1
Working Loss Product Factor (Kp)	0.75	(1 for organics, 0.75 for crude oils)
*Tank Fill Rate, gal/hour	4,800	
Tank maximum liquid volume (Vlx) ft3	534	
Number of turnovers (N)	1.58	
Actual Working Loss (Lw), lbs/year	**1.46**	
Actual Working Loss (Lw), tons/year	**0.0007**	
TOTAL VOC LOSS:		
Actual (before control) lbs/year	**10.11**	
Actual (before control) tons/year	**0.0051**	

Emission method source: AP-42, Section 7.1, Storage of Organic Liquids
Gasoline Vapor Pressure and Molecular Weight: AP-42, Table 7.1-2
Daily Max. and Min. Ambient Temperatures: AP-42, Table 7.1-7
Daily Total Insolation Factor: AP-42, Table 7.1-6
Tank Paint Solar Absorption: AP-42, Table 7.1-7
*Required Information

Tank Calculations - 50 bbl (TK-5)

Tank Type: Produced Liquid

Methodology: U.S. EPA, *Compilation of Air Pollutant Emission Factors* (AP-42), Supplement F, Section 7.1, Organic Liquid Storage Tanks.

Activity: Material Storage

Emission Summary: Emissions are "per tank"

Pollutant	*Emission Rates*	
VOC	lbs/yr	tons/yr
	10.11	0.0051

Pressure and Molecular Weight Calculation:

	Weight (lbs)	
Gasoline 15 RVP	1,764	
Water	49,903	Density is based on 60 F
	MW (lb/mol)	
Gasoline 15 RVP	60	
Water	18.02	
	Moles (lbmol)	
Gasoline 15 RVP	29	
Water	2,769	
Total	2,799	
	Mole Fraction (liquid)	
Gasoline 15 RVP	0.0105	
Water	0.9895	
	Vapor Pressure (psia)	
Gasoline 15 RVP	7.8526	
Water	0.4525	Antoine Constants (A=16.3872, B=3885.70, C=230.170)
	Partial Pressure (psia)	
Gasoline 15 RVP	0.0825	
Water	0.4477	
Total	0.5302	
	Mole Fraction (Vapor)	
Gasoline 15 RVP	0.1556	
Water	0.8444	
Molecular Weight	24.55	

Recordkeeping Data:

Compounds in Tank	Gasoline 15 RVP	Water
Component Concentration, Volume Percent:	5.00	95.00
*Tank Liquid Height (Hl), ft.	6.80	
*Tank Shell Height (Hs), ft.	8.00	
Tank Shell Radius (Rs), ft.	5.00	
*Tank Diameter (D), ft.	10.00	
*Molecular Vapor Weight (Mv), lb/lb-mole	24.55	
Daily Maximum Ambient Temperature (Tax), °R	525.17	
Daily Minimum Ambient Temperature (Tan), °R	503.67	
Ideal Gas Constant (R), psia-cu. ft./lb-mole-°R	10.73	
Tank Paint Solar Absorption (α), dimensionless	0.43	Tan, good
Daily Total Solar Insolation Factor (I), Btu/sq. ft.-day	1,123.00	Charleston, WV
*Breather Vent Pressure Setting (Pbp), psig	0.03	(if unknown, enter 0.03)
*Breather Vent Vacuum Setting (Pbv), psig	-0.03	(if unknown, enter -0.03)
Tank Roof Outage (Hro), ft.	0.1042	
Vapor Space Outage (Hvo), cu. ft.	1.30	
Vapor Space Volume (Vv), cu. ft.	102.38	
Daily Ambient Temperature Range (ΔTa), °R	21.50	
Daily Average Ambient Temperature (Taa), °R	514.42	
Liquid Bulk Temperature (Tb), °R	516	
Daily Maximum Liquid Surface Temperature (Tlx), °R	526.37	
Daily Minimum Liquid Surface Temperature (Tln), °R	511.87	
Vapor Pressure at Daily Max. Liquid Surface Temp. (Pvx), psia	1.00	
Vapor Pressure at Daily Min. Liquid Surface Temp. (Pvn), psia	0.2777	
Daily Vapor Pressure Range (ΔPv), psia	0.7230	
Daily Ave. Liquid Surface Temp. (Tla), °R	519.12	
Vapor Pressure at Ave. Liquid Surface Temp. (Pva), psia	0.5302	
Vapor Density (Wv), lbs/cu. ft.	0.0023	
Vented Vapor Saturation Factor (Ks)	0.9646	
Breather Vent Pressure Setting Range (ΔPb), psig	0.0600	
Daily Vapor Temperature Range (ΔTv), °R	29.00	
Vapor Space Expansion Factor (Ke)	0.1027	
Standing Storage Loss (Ls), lbs/year	**8.65**	
Standing Storage Loss (Ls), tons/year	**0.0043**	

*Maximum Throughput, gal/year	6,300	
*Actual Throughput (Qg), gal/year	6,300	
Actual Barrels/year, bbl/year	150	
Maximum Barrels/year, bbl/year	150	
Turnover Factor (Kn)	1.00	For N >36 Kn=(180+N)/6N, for N <=36 Kn=1
Working Loss Product Factor (Kp)	0.75	(1 for organics, 0.75 for crude oils)
*Tank Fill Rate, gal/hour	4,800	
Tank maximum liquid volume (Vlx) ft3	534	
Number of turnovers (N)	1.58	
Actual Working Loss (Lw), lbs/year	**1.46**	
Actual Working Loss (Lw), tons/year	**0.0007**	
TOTAL VOC LOSS:		
Actual (before control) lbs/year	**10.11**	
Actual (before control) tons/year	**0.0051**	

Emission method source: AP-42, Section 7.1, Storage of Organic Liquids
Gasoline Vapor Pressure and Molecular Weight: AP-42, Table 7.1-2
Daily Max. and Min. Ambient Temperatures: AP-42, Table 7.1-7
Daily Total Insolation Factor: AP-42, Table 7.1-6
Tank Paint Solar Absorption: AP-42, Table 7.1-7
*Required Information

GRI – GLYCalc Model

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Goff West Compressor Station - Glycol Dehy # 1
File Name: C:\Users\vks.HRP\Desktop\Goff West Compressor Station\Goff West Compressor Station uncontrolled - 10192016.ddf
Date: October 20, 2016

DESCRIPTION:

Description: Goff West Compressor Station - Glycol Dehydration Unit with one (1) 1.0 MMBtu/hr Reboiler

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	104.2537	2502.090	456.6314
Ethane	8.5886	206.128	37.6183
Propane	1.0545	25.308	4.6187
Isobutane	0.0846	2.030	0.3705
n-Butane	0.1458	3.499	0.6386
Isopentane	0.0332	0.796	0.1453
n-Pentane	0.0205	0.492	0.0899
Other Hexanes	0.2686	6.446	1.1765
Total Emissions	114.4496	2746.789	501.2890
Total Hydrocarbon Emissions	114.4496	2746.789	501.2890
Total VOC Emissions	1.6072	38.572	7.0394

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	104.2537	2502.090	456.6314
Ethane	8.5886	206.128	37.6183
Propane	1.0545	25.308	4.6187
Isobutane	0.0846	2.030	0.3705
n-Butane	0.1458	3.499	0.6386
Isopentane	0.0332	0.796	0.1453
n-Pentane	0.0205	0.492	0.0899
Other Hexanes	0.2686	6.446	1.1765
Total Emissions	114.4496	2746.789	501.2890
Total Hydrocarbon Emissions	114.4496	2746.789	501.2890
Total VOC Emissions	1.6072	38.572	7.0394

COMBINED REGENERATOR VENT/FLASH GAS EMISSION CONTROL REPORT:

Component	Uncontrolled tons/yr	Controlled tons/yr	% Reduction

Methane	456.6314	456.6314	0.00
Ethane	37.6183	37.6183	0.00
Propane	4.6187	4.6187	0.00
Isobutane	0.3705	0.3705	0.00
n-Butane	0.6386	0.6386	0.00
Isopentane	0.1453	0.1453	0.00
n-Pentane	0.0899	0.0899	0.00
Other Hexanes	1.1765	1.1765	0.00
Total Emissions	501.2890	501.2890	0.00
Total Hydrocarbon Emissions	501.2890	501.2890	0.00
Total VOC Emissions	7.0394	7.0394	0.00

EQUIPMENT REPORTS:

ABSORBER

Calculated Absorber Stages:	1.35	
Specified Dry Gas Dew Point:	7.00	lbs. H2O/MMSCF
Temperature:	110.0	deg. F
Pressure:	900.0	psig
Dry Gas Flow Rate:	67.0000	MMSCF/day
Glycol Losses with Dry Gas:	1.1237	lb/hr
Wet Gas Water Content:	Saturated	
Calculated Wet Gas Water Content:	83.07	lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio:	2.12	gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	8.41%	91.59%
Carbon Dioxide	99.87%	0.13%
Nitrogen	99.99%	0.01%
Methane	99.99%	0.01%
Ethane	99.97%	0.03%
Propane	99.95%	0.05%
Isobutane	99.93%	0.07%
n-Butane	99.91%	0.09%
Isopentane	99.91%	0.09%
n-Pentane	99.89%	0.11%
Other Hexanes	99.86%	0.14%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	22.92%	77.08%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%

Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	0.26%	99.74%
n-Pentane	0.29%	99.71%
Other Hexanes	0.63%	99.37%

STREAM REPORTS:

WET GAS STREAM

Temperature: 110.00 deg. F
Pressure: 914.70 psia
Flow Rate: 2.80e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.75e-001	2.32e+002
Carbon Dioxide	1.63e-001	5.28e+002
Nitrogen	2.69e-001	5.56e+002
Methane	9.57e+001	1.13e+005
Ethane	3.42e+000	7.59e+003
Propane	2.43e-001	7.90e+002
Isobutane	1.31e-002	5.60e+001
n-Butane	1.99e-002	8.51e+001
Isopentane	3.69e-003	1.96e+001
n-Pentane	2.00e-003	1.06e+001
Other Hexanes	1.94e-002	1.23e+002
Total Components	100.00	1.23e+005

DRY GAS STREAM

Temperature: 110.00 deg. F
Pressure: 914.70 psia
Flow Rate: 2.79e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.47e-002	1.95e+001
Carbon Dioxide	1.63e-001	5.28e+002
Nitrogen	2.70e-001	5.56e+002
Methane	9.58e+001	1.13e+005
Ethane	3.43e+000	7.59e+003
Propane	2.43e-001	7.90e+002
Isobutane	1.31e-002	5.60e+001
n-Butane	1.99e-002	8.50e+001
Isopentane	3.70e-003	1.96e+001
n-Pentane	2.00e-003	1.06e+001
Other Hexanes	1.94e-002	1.23e+002
Total Components	100.00	1.23e+005

LEAN GLYCOL STREAM

Temperature: 110.00 deg. F
Flow Rate: 7.50e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.85e+001	4.16e+003
Water	1.50e+000	6.33e+001
Carbon Dioxide	1.65e-012	6.99e-011
Nitrogen	1.46e-013	6.18e-012
Methane	9.13e-018	3.86e-016
Ethane	2.64e-008	1.11e-006
Propane	3.91e-010	1.65e-008
Isobutane	2.74e-011	1.16e-009
n-Butane	4.46e-011	1.88e-009
Isopentane	2.03e-006	8.57e-005
n-Pentane	1.40e-006	5.93e-005
Other Hexanes	4.01e-005	1.69e-003
Total Components	100.00	4.22e+003

RICH GLYCOL AND PUMP GAS STREAM

Temperature: 110.00 deg. F
Pressure: 914.70 psia
Flow Rate: 8.17e+000 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.14e+001	4.16e+003
Water	6.08e+000	2.76e+002
Carbon Dioxide	2.49e-002	1.13e+000
Nitrogen	1.14e-002	5.18e-001
Methane	2.29e+000	1.04e+002
Ethane	1.89e-001	8.59e+000
Propane	2.32e-002	1.05e+000
Isobutane	1.86e-003	8.46e-002
n-Butane	3.21e-003	1.46e-001
Isopentane	7.31e-004	3.32e-002
n-Pentane	4.52e-004	2.06e-002
Other Hexanes	5.94e-003	2.70e-001
Total Components	100.00	4.55e+003

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 7.09e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.33e+001	2.13e+002
Carbon Dioxide	1.38e-001	1.13e+000
Nitrogen	9.89e-002	5.18e-001
Methane	3.48e+001	1.04e+002
Ethane	1.53e+000	8.59e+000

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Goff West Compressor Station - Glycol Dehy # 2
File Name: C:\Users\vks.HRP\Desktop\Goff West Compressor Station\Goff West Compressor Station uncontrolled - 10192016.ddf
Date: October 20, 2016

DESCRIPTION:

Description: Goff West Compressor Station - Glycol Dehydration Unit with one (1) 1.0 MMBtu/hr Reboiler

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	104.2537	2502.090	456.6314
Ethane	8.5886	206.128	37.6183
Propane	1.0545	25.308	4.6187
Isobutane	0.0846	2.030	0.3705
n-Butane	0.1458	3.499	0.6386
Isopentane	0.0332	0.796	0.1453
n-Pentane	0.0205	0.492	0.0899
Other Hexanes	0.2686	6.446	1.1765
Total Emissions	114.4496	2746.789	501.2890
Total Hydrocarbon Emissions	114.4496	2746.789	501.2890
Total VOC Emissions	1.6072	38.572	7.0394

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	104.2537	2502.090	456.6314
Ethane	8.5886	206.128	37.6183
Propane	1.0545	25.308	4.6187
Isobutane	0.0846	2.030	0.3705
n-Butane	0.1458	3.499	0.6386
Isopentane	0.0332	0.796	0.1453
n-Pentane	0.0205	0.492	0.0899
Other Hexanes	0.2686	6.446	1.1765
Total Emissions	114.4496	2746.789	501.2890
Total Hydrocarbon Emissions	114.4496	2746.789	501.2890
Total VOC Emissions	1.6072	38.572	7.0394

COMBINED REGENERATOR VENT/FLASH GAS EMISSION CONTROL REPORT:

Component	Uncontrolled tons/yr	Controlled tons/yr	% Reduction

Methane	456.6314	456.6314	0.00
Ethane	37.6183	37.6183	0.00
Propane	4.6187	4.6187	0.00
Isobutane	0.3705	0.3705	0.00
n-Butane	0.6386	0.6386	0.00
Isopentane	0.1453	0.1453	0.00
n-Pentane	0.0899	0.0899	0.00
Other Hexanes	1.1765	1.1765	0.00
Total Emissions	501.2890	501.2890	0.00
Total Hydrocarbon Emissions	501.2890	501.2890	0.00
Total VOC Emissions	7.0394	7.0394	0.00

EQUIPMENT REPORTS:

ABSORBER

Calculated Absorber Stages:	1.35	
Specified Dry Gas Dew Point:	7.00	lbs. H2O/MMSCF
Temperature:	110.0	deg. F
Pressure:	900.0	psig
Dry Gas Flow Rate:	67.0000	MMSCF/day
Glycol Losses with Dry Gas:	1.1237	lb/hr
Wet Gas Water Content:	Saturated	
Calculated Wet Gas Water Content:	83.07	lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio:	2.12	gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	8.41%	91.59%
Carbon Dioxide	99.87%	0.13%
Nitrogen	99.99%	0.01%
Methane	99.99%	0.01%
Ethane	99.97%	0.03%
Propane	99.95%	0.05%
Isobutane	99.93%	0.07%
n-Butane	99.91%	0.09%
Isopentane	99.91%	0.09%
n-Pentane	99.89%	0.11%
Other Hexanes	99.86%	0.14%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	22.92%	77.08%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%

Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	0.26%	99.74%
n-Pentane	0.29%	99.71%
Other Hexanes	0.63%	99.37%

STREAM REPORTS:

WET GAS STREAM

Temperature: 110.00 deg. F
Pressure: 914.70 psia
Flow Rate: 2.80e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.75e-001	2.32e+002
Carbon Dioxide	1.63e-001	5.28e+002
Nitrogen	2.69e-001	5.56e+002
Methane	9.57e+001	1.13e+005
Ethane	3.42e+000	7.59e+003
Propane	2.43e-001	7.90e+002
Isobutane	1.31e-002	5.60e+001
n-Butane	1.99e-002	8.51e+001
Isopentane	3.69e-003	1.96e+001
n-Pentane	2.00e-003	1.06e+001
Other Hexanes	1.94e-002	1.23e+002
Total Components	100.00	1.23e+005

DRY GAS STREAM

Temperature: 110.00 deg. F
Pressure: 914.70 psia
Flow Rate: 2.79e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.47e-002	1.95e+001
Carbon Dioxide	1.63e-001	5.28e+002
Nitrogen	2.70e-001	5.56e+002
Methane	9.58e+001	1.13e+005
Ethane	3.43e+000	7.59e+003
Propane	2.43e-001	7.90e+002
Isobutane	1.31e-002	5.60e+001
n-Butane	1.99e-002	8.50e+001
Isopentane	3.70e-003	1.96e+001
n-Pentane	2.00e-003	1.06e+001
Other Hexanes	1.94e-002	1.23e+002
Total Components	100.00	1.23e+005

LEAN GLYCOL STREAM

Temperature: 110.00 deg. F
Flow Rate: 7.50e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.85e+001	4.16e+003
Water	1.50e+000	6.33e+001
Carbon Dioxide	1.65e-012	6.99e-011
Nitrogen	1.46e-013	6.18e-012
Methane	9.13e-018	3.86e-016
Ethane	2.64e-008	1.11e-006
Propane	3.91e-010	1.65e-008
Isobutane	2.74e-011	1.16e-009
n-Butane	4.46e-011	1.88e-009
Isopentane	2.03e-006	8.57e-005
n-Pentane	1.40e-006	5.93e-005
Other Hexanes	4.01e-005	1.69e-003
Total Components	100.00	4.22e+003

RICH GLYCOL AND PUMP GAS STREAM

Temperature: 110.00 deg. F
Pressure: 914.70 psia
Flow Rate: 8.17e+000 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.14e+001	4.16e+003
Water	6.08e+000	2.76e+002
Carbon Dioxide	2.49e-002	1.13e+000
Nitrogen	1.14e-002	5.18e-001
Methane	2.29e+000	1.04e+002
Ethane	1.89e-001	8.59e+000
Propane	2.32e-002	1.05e+000
Isobutane	1.86e-003	8.46e-002
n-Butane	3.21e-003	1.46e-001
Isopentane	7.31e-004	3.32e-002
n-Pentane	4.52e-004	2.06e-002
Other Hexanes	5.94e-003	2.70e-001
Total Components	100.00	4.55e+003

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 7.09e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.33e+001	2.13e+002
Carbon Dioxide	1.38e-001	1.13e+000
Nitrogen	9.89e-002	5.18e-001
Methane	3.48e+001	1.04e+002
Ethane	1.53e+000	8.59e+000

Propane	1.28e-001	1.05e+000
Isobutane	7.79e-003	8.46e-002
n-Butane	1.34e-002	1.46e-001
Isopentane	2.46e-003	3.32e-002
n-Pentane	1.52e-003	2.05e-002
Other Hexanes	1.67e-002	2.69e-001
Total Components	100.00	3.29e+002

Propane	1.28e-001	1.05e+000
Isobutane	7.79e-003	8.46e-002
n-Butane	1.34e-002	1.46e-001
Isopentane	2.46e-003	3.32e-002
n-Pentane	1.52e-003	2.05e-002
Other Hexanes	1.67e-002	2.69e-001
Total Components	100.00	3.29e+002

Tank Loadout Calculations

MOUNTAINEER KEYSTONE – TANK LOADOUT CALCULATIONS

Assumptions:

- VOC Emissions equations are from AP-42 Chapter 5: Petroleum Industry, Section 5.2: Transportation and Marketing of Petroleum Liquids.
- Temperature (T) of condensate is 80 °F of 539.67 °R.
- Condensate is assumed to have a Reid Vapor Pressure of 15 psi, this equates to a true vapor pressure (P) of 10.2 psi, pursuant to EPA liquid Storage Tanks Figure 7.1-13a from AP-42 Chapter 7: Liquid Storage Tank, Section 7.1: Organic Liquid Storage Tanks
- Condensate has a molecular weight (M) of Gasoline of 60 g / mol.
- The saturation factor (S) for loading a tanker truck is 1.0, which is the factor for 'dedicated vapor balance service for submerged loading'.
- The tanker trucks utilized have a volume (V) of 3,500 gallons.
- All vapors are considered to have 100% capture, and 98% control (eff).
- Production Liquid is 0.05 % Condensate by weight

Liquid Loading (L_L) = $12.46\left(\frac{SPM}{T}\right) = 12.46\left(\frac{1.0*10.2*60}{539.67}\right)$ =14.13 lbs of VOC per 10^3 gallons

VOC emissions per Load out = (V)*(L_L)*(1-eff) = 3.5*14.13 = 49.455 lbs of VOC per Load out

Production Liquid Load out Factor = 49.455 * 0.05 = 2.47 lbs VOC per Load out

Tank	Capacity (bbl)	Average Annual Loadouts	Annual VOC Emissions (lbs/yr)
TK-1	100	3	7.41
TK-2	210	10	24.70
TK-3	100	6	14.82
TK-4	50	6	14.82
TK-5	50	6	14.82
Total	-	-	**76.57**

Reboiler Calculations

Mountaineer Keystone - Goff West Compressor Station
Plant ID# 033-00187
Dehydrator Reboiler Emission Summary
Criteria Pollutants

Fuel Usage		
Fuel	Units	Total
Natural Gas	ft^3	8,504,854

Emission Factors	
	Reboiler
Pollutant	Natural Gas (lbs/ 10^6 ft^3)
Particulates	7.60
Sulfur Dioxide	0.6000
Oxides of Nitrogen	100.00
PM-10	7.60
VOC	5.50
Carbon Monoxide	84.00
Lead	0.0005
TOC	11.00
CO2 Equiv	120,000

Emissions			
	Reboiler		
Pollutant	Natural Gas (lbs/yr)	Natural Gas (lbs/hr)	Natural Gas (tons/yr)
Particulates	64.64	0.0074	0.0323
Sulfur Dioxide	5.10	0.0006	0.0026
Oxides of Nitrogen	850.49	0.0971	0.4252
PM-10	64.64	0.0074	0.0323
VOC	46.78	0.0053	0.0234
Carbon Monoxide	714.41	0.0816	0.3572
Lead	0.0043	4.85E-07	2.13E-06
TOC	93.55	0.0107	0.0468
CO2 Equiv	1,020,583	116.50	510.29

Notes:

- Natural Gas Emission Factors were taken from AP-42 Tables 1.4-1 and 1.4-2
- Emissions assume 8,760 hours of operation for the reboiler per year
- Heating value of Natural Gas assumed to be 1030 Btu/ft3
- Reboiler rating: 1 MMBtu/hr

Mountaineer Keystone - Goff West Compressor Station
Plant ID# 033-00187
Dehydrator Reboiler Emission Summary
HAPS

Natural Gas Boiler HAP
ft^3
8,504,854

- Emission Factors from AP-42 Tables 1.4-3 and 1.4-4

HAP Emissions			Natural Gas Reboiler	
			(lbs/yr)	(tons/yr)
HAP	CAS No.	Natural Gas ($lb/10^3$ gal)		
2-Methylnaphthalene	91-57-6	2.40E-05	0.0002	1.02E-07
3-Methylchloranthrene	56-49-5	1.80E-06	1.53E-05	7.65E-09
7,12-Dimethylbenz(a)anthracene	-	1.60E-05	0.0001	6.80E-08
Acenaphthene	83-32-9	1.80E-06	1.53E-05	7.65E-09
Acenaphthylene	203-96-8	1.80E-06	1.53E-05	7.65E-09
Anthracene	120-12-7	2.40E-06	2.04E-05	1.02E-08
Benz(a)anthracene	56-55-3	1.80E-06	1.53E-05	7.65E-09
Benzene	71-43-2	2.10E-03	0.0179	8.93E-06
Benzo(a)pyrene	50-32-8	1.20E-06	1.02E-05	5.10E-09
Benzo(b)fluoranthene	205-99-2	1.80E-06	1.53E-05	7.65E-09
Benzo(g,h,i)perylene	191-24-2	1.20E-06	1.02E-05	5.10E-09
Benzo(k)fluoranthene	207-08-9	1.80E-06	1.53E-05	7.65E-09
Chrysene	218-01-9	1.80E-06	1.53E-05	7.65E-09
Dibenzo(a,h)anthracene	53-70-3	1.20E-06	1.02E-05	5.10E-09
Dichlorobenzene	25321-22-6	1.20E-03	0.0102	5.10E-06
Fluoranthene	206-44-0	3.00E-06	2.55E-05	1.28E-08
Fluorene	86-73-7	2.80E-06	2.38E-05	1.19E-08
Formaldehyde	50-00-0	7.50E-02	0.6379	0.0003
Hexane	110-54-3	1.80E+00	15.31	0.0077
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	1.53E-05	7.65E-09
Naphthalene	91-20-3	6.10E-04	0.0052	2.59E-06
Phenanathrene	85-01-8	1.70E-05	0.0001	7.23E-08
Pyrene	129-00-0	5.00E-06	4.25E-05	2.13E-08
Toluene	108-88-3	3.40E-03	0.0289	1.45E-05
Arsenic	7440-38-2	2.00E-04	0.0017	8.50E-07
Beryllium	7440-41-7	1.20E-05	0.0001	5.10E-08
Cadmium	7440-43-9	1.10E-03	0.0094	4.68E-06
Chromium	7440-47-3	1.40E-03	0.0119	5.95E-06
Cobalt	7440-48-4	8.40E-05	0.0007	3.57E-07
Manganese	7439-96-5	3.80E-04	0.0032	1.62E-06
Mercury	7439-97-6	2.60E-04	0.0022	1.11E-06
Nickel	7440-02-0	2.10E-03	0.0179	8.93E-06
Selenium	7782-49-2	2.40E-05	0.0002	1.02E-07
		Total:	**16.06**	**0.0080**

Engine HAP Calculations

Mountaineer Keystone - Goff West Compressor Station
Plant ID# 033-00187
Dehydrator Reboiler Emission Summary
HAPS

1380HP - Natural Gas 4SLB HAP
MMBtu
30,748

- Emission Factors from AP-42 Table 3.2-2

HAP Emissions		Natural Gas 4SLB	
		(lbs/yr)	(tons/yr)
HAP	Natural Gas (lb/MMBtu)		
1,1,2,2-Tetrachloroethane	4.00E-05	1.23	0.0006
1,1,2-Trichloroethane	3.18E-05	0.9778	0.0005
1,3-Butadiene	2.67E-04	8.21	0.0041
1,3-Dichloropropene	2.64E-05	0.8117	0.0004
2-Methylnaphthalene	3.32E-05	1.02	0.0005
2,2,4-Trimethylpentane	2.50E-04	7.69	0.0038
Acenaphthene	1.25E-06	0.0384	1.92E-05
Acenaphthylene	5.53E-06	0.1700	8.50E-05
Acetaldehyde	8.36E-03	257.05	0.1285
Acrolein	5.14E-03	158.04	0.0790
Benzene	4.40E-04	13.53	0.0068
Benzo(b)fluoranthene	1.66E-07	0.0051	2.55E-06
Benzo(e)pyrene	4.15E-07	0.0128	6.38E-06
Benzo(g,h,i)perylene	4.14E-07	0.0127	6.36E-06
Bipheyl	2.12E-04	6.52	0.0033
Carbon Tetrachloride	3.67E-05	1.13	0.0006
Chlorobenzene	3.04E-05	0.9347	0.0005
Chloroform	2.85E-05	0.8763	0.0004
Chrysene	6.93E-07	0.0213	1.07E-05
Ethylbenzene	3.97E-05	1.22	0.0006
Ethylene Dibromide	4.43E-05	1.36	0.0007
Fluoranthene	1.11E-06	0.0341	1.71E-05
Fluorene	5.67E-06	0.1743	8.72E-05
Formaldehyde	5.28E-02	1,623	0.8117
Methanol	2.50E-03	76.87	0.0384
Methylene Chloride	2.00E-05	0.6150	0.0003
n-Hexane	1.11E-03	34.13	0.0171
Naphthalene	7.44E-05	2.29	0.0011
PAH	2.69E-05	0.8271	0.0004
Phenanthrene	1.04E-05	0.3198	0.0002
Phenol	2.40E-05	0.7379	0.0004
Pyrene	1.36E-06	0.0418	2.09E-05
Styrene	2.36E-05	0.7256	0.0004
Tetrachloroethane	2.48E-06	0.0763	3.81E-05
Toluene	4.08E-04	12.55	0.0063
Vinyl Chloride	1.49E-05	0.4581	0.0002
Xylene	1.84E-04	5.66	0.0028
	Total:	**2,220**	**1.11**

Mountaineer Keystone - Goff West Compressor Station
Plant ID# 033-00187
Dehydrator Reboiler Emission Summary
HAPS

1775HP - Natural Gas 4SLB HAP
MMBtu
39,595

- Emission Factors from AP-42 Table 3.2-2

HAP Emissions		Natural Gas 4SLB	
		(lbs/yr)	(tons/yr)
HAP	Natural Gas (lb/MMBtu)		
1,1,2,2-Tetrachloroethane	4.00E-05	1.58	0.0008
1,1,2-Trichloroethane	3.18E-05	1.26	0.0006
1,3-Butadiene	2.67E-04	10.57	0.0053
1,3-Dichloropropene	2.64E-05	1.05	0.0005
2-Methylnaphthalene	3.32E-05	1.31	0.0007
2,2,4-Trimethylpentane	2.50E-04	9.90	0.0049
Acenaphthene	1.25E-06	0.0495	2.47E-05
Acenaphthylene	5.53E-06	0.2190	0.0001
Acetaldehyde	8.36E-03	331.02	0.1655
Acrolein	5.14E-03	203.52	0.1018
Benzene	4.40E-04	17.42	0.0087
Benzo(b)fluoranthene	1.66E-07	0.0066	3.29E-06
Benzo(e)pyrene	4.15E-07	0.0164	8.22E-06
Benzo(g,h,i)perylene	4.14E-07	0.0164	8.20E-06
Bipheyl	2.12E-04	8.39	0.0042
Carbon Tetrachloride	3.67E-05	1.45	0.0007
Chlorobenzene	3.04E-05	1.20	0.0006
Chloroform	2.85E-05	1.13	0.0006
Chrysene	6.93E-07	0.0274	1.37E-05
Ethylbenzene	3.97E-05	1.57	0.0008
Ethylene Dibromide	4.43E-05	1.75	0.0009
Fluoranthene	1.11E-06	0.0440	2.20E-05
Fluorene	5.67E-06	0.2245	0.0001
Formaldehyde	5.28E-02	2,091	1.05
Methanol	2.50E-03	98.99	0.0495
Methylene Chloride	2.00E-05	0.7919	0.0004
n-Hexane	1.11E-03	43.95	0.0220
Naphthalene	7.44E-05	2.95	0.0015
PAH	2.69E-05	1.07	0.0005
Phenanthrene	1.04E-05	0.4118	0.0002
Phenol	2.40E-05	0.9503	0.0005
Pyrene	1.36E-06	0.0538	2.69E-05
Styrene	2.36E-05	0.9344	0.0005
Tetrachloroethane	2.48E-06	0.0982	4.91E-05
Toluene	4.08E-04	16.15	0.0081
Vinyl Chloride	1.49E-05	0.5900	0.0003
Xylene	1.84E-04	7.29	0.0036
	Total:	**2,859**	**1.43**

Mountaineer Keystone - Goff West Compressor Station
Plant ID# 033-00187
Dehydrator Reboiler Emission Summary
HAPS

2370HP - Natural Gas 4SLB HAP
MMBtu
52,823

- Emission Factors from AP-42 Table 3.2-2

HAP Emissions		Natural Gas 4SLB	
		(lbs/yr)	(tons/yr)
HAP	Natural Gas (lb/MMBtu)		
1,1,2,2-Tetrachloroethane	4.00E-05	2.11	0.0011
1,1,2-Trichloroethane	3.18E-05	1.68	0.0008
1,3-Butadiene	2.67E-04	14.10	0.0071
1,3-Dichloropropene	2.64E-05	1.39	0.0007
2-Methylnaphthalene	3.32E-05	1.75	0.0009
2,2,4-Trimethylpentane	2.50E-04	13.21	0.0066
Acenaphthene	1.25E-06	0.0660	3.30E-05
Acenaphthylene	5.53E-06	0.2921	0.0001
Acetaldehyde	8.36E-03	441.60	0.2208
Acrolein	5.14E-03	271.51	0.1358
Benzene	4.40E-04	23.24	0.0116
Benzo(b)fluoranthene	1.66E-07	0.0088	4.38E-06
Benzo(e)pyrene	4.15E-07	0.0219	1.10E-05
Benzo(g,h,i)perylene	4.14E-07	0.0219	1.09E-05
Bipheyl	2.12E-04	11.20	0.0056
Carbon Tetrachloride	3.67E-05	1.94	0.0010
Chlorobenzene	3.04E-05	1.61	0.0008
Chloroform	2.85E-05	1.51	0.0008
Chrysene	6.93E-07	0.0366	1.83E-05
Ethylbenzene	3.97E-05	2.10	0.0010
Ethylene Dibromide	4.43E-05	2.34	0.0012
Fluoranthene	1.11E-06	0.0586	2.93E-05
Fluorene	5.67E-06	0.2995	0.0001
Formaldehyde	5.28E-02	2,789	1.39
Methanol	2.50E-03	132.06	0.0660
Methylene Chloride	2.00E-05	1.06	0.0005
n-Hexane	1.11E-03	58.63	0.0293
Naphthalene	7.44E-05	3.93	0.0020
PAH	2.69E-05	1.42	0.0007
Phenanthrene	1.04E-05	0.5494	0.0003
Phenol	2.40E-05	1.27	0.0006
Pyrene	1.36E-06	0.0718	3.59E-05
Styrene	2.36E-05	1.25	0.0006
Tetrachloroethane	2.48E-06	0.1310	6.55E-05
Toluene	4.08E-04	21.55	0.0108
Vinyl Chloride	1.49E-05	0.7871	0.0004
Xylene	1.84E-04	9.72	0.0049
	Total:	**3,814**	**1.91**

Fugitive Emission Calculations

Mountaineer Keystone - Goff West Compressor Station
Plant ID# 033-00187
Fugitive Emission Calculations

Density		
Pollutant	Density (kg/m^3)	Density (lb/ft^3)
VOC	1.38	0.0860
CH4	0.656	0.0409

Emission Factors		
Component Type	Count	(scf /hr/ component)
Pumps	2	13.30
Valves	63	0.027
Safety Relief Valves	3	0.04
Open Ended Lines	4	0.061
Sampling Connections	2	0.003
Connections	203	0.003
Compressors	6	7.00
Flanges	36	0.003

Emissions			
Componenty Type	VOC Emissions (tons/yr)	Methane (tons/yr)	CO2 eq (tons/yr)
Pumps	1.00	4.29	107.13
Valves	0.0641	0.2740	6.85
Safety Relief Valves	0.0045	0.0193	0.4833
Open Ended Lines	0.0092	0.0393	0.9827
Sampling Connections	0.0002	0.0010	0.0242
Connections	0.0229	0.0981	2.45
Compressors	1.58	6.77	169.15
Flanges	0.0041	0.02	0.4350
Total	**2.69**	**11.50**	**287.51**

Notes:

- VOC calculated using gas analysis average of VOCs
- Emission Factors for Pumps, Valves. Safety Relief Valves, and Open Ended Lines taken from 40 CFR 98 Table W-1A
- Emission Factors for Sampling Connections and Flanges assumed to be equal to Connections
- Emission Factor for Compressors taken from the following presentation:
- VOC volume % assumed to be about 10% of fugitive emissions
- Methane volume % assumed to be about 90% of fugitive emissions

ATTACHMENT S – 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
CE-1R	1.52	6.66	0.52	2.27	0.73	3.2	0.007	0.03	0.1	0.44	0.1	0.44	386	1691
CE-2R	1.52	6.66	0.52	2.27	0.73	3.2	0.007	0.03	0.1	0.44	0.1	0.44	386	1691
CE-3R	1.52	6.66	0.52	2.27	0.73	3.2	0.007	0.03	0.1	0.44	0.1	0.44	386	1691
CE-4R	1.52	6.66	0.52	2.27	0.73	3.2	0.007	0.03	0.1	0.44	0.1	0.44	386	1691
CE-5R	2.61	11.44	1.0	4.39	1.65	7.21	0.01	0.05	0.178	0.78	0.178	0.78	663	2905
CE-6R	1.96	8.57	0.75	3.29	1.23	5.4	0.008	0.035	0.13	0.58	0.13	0.58	497	2178
RSV-1	NA	NA	NA	NA	1.6	7.04	NA	NA	NA	NA	NA	NA	2603	11,400
RBV-1	0.097	0.4252	0.082	0.3572	0.005	0.0234	0.0006	0.0026	0.007	0.0323	0.007	0.0323	116	510
RSV-2	NA	NA	NA	NA	1.6	7.04	NA	NA	NA	NA	NA	NA	2603	11,400
RBV-2	0.897	04252	0.082	0.3572	0.005	0.0234	0.0006	0.0026	0.007	0.0323	0.007	0.0323	116	510
TK-1	NA	NA	NA	NA	0.02	0.1	NA	NA	NA	NA	NA	NA	NA	NA
TK2	NA	NA	NA	NA	<0.01	0.02	NA	NA	NA	NA	NA	NA	NA	NA
TK-3	NA	NA	NA	NA	0.001	0.0053	NA	NA	NA	NA	NA	NA	NA	NA
TK-4	NA	NA	NA	NA	0.002	0.0007	NA	NA	NA	NA	NA	NA	NA	NA
TK-5	NA	NA	NA	NA	0.002	0.0007	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL	13.84	47.5	3.99	17.5	9.04	39.66	0.022	0.21	0.722	3.18	0.722	3.18	8,142	35,677

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 S – 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
CE-1R	0.185	0.8117	0.002	0.0068	0.001	0.0063	0.001	0.0006	6.39E-4	0.0028	0.004	0.0171	0.253	1.11
CE-2R	0.185	0.8117	0.002	0.0068	0.001	0.0063	0.001	0.0006	6.39E-4	0.0028	0.004	0.171	0.253	1.11
.CE-3r	0.185	0.8117	0.002	0.0068	0.001	0.0063	0.001	0.0006	6.39E-4	0.0028	0.004	0.171	0.253	1.11
CE-4R	0.185	0.8117	0.002	0.0068	0.001	0.0063	0.001	0.0006	6.39E-4	0.0028	0.004	0.171	0.253	1.11
CE-5R	0.317	1.39	0.031	0.1358	0.002	0.0108	2.28.E-4	0.0006	0.001	0.0049	0.007	0.0293	0.436	1.91
CE-6R	0.240	1.05	0.002	0.0087	0.002	0.0081	1.83.E-4	0.0008	8.22E-4	0.0036	0.005	00.220	0.326	1.43
RSV-1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.26	1.17	0.26	1.17
RBV-1	6.85E-5	0.0003	2.03E-6	8.93E-6	3.31E-6	1.45E-5	NA	NA	NA	NA	0.002	0.0077	0.002	0.0080
RSV-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.26	1.17	0.26	1.17
RBV-2	6.85E-5	0.0003	2.03E-6	8.93E-6	3.31E-6	1.45E-5	NA	NA	NA	NA	0.002	0.0077	0.002	0.0080
TK-1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TK-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TK-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TK-4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TK-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL	1.30	5.69	0.041	0.172	0.008	0.044	0.013	0.0042	0.0044	0.0197	0.552	2.48	2.298	10.136

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 – CLASS I LEGAL ADVERTISEMENT

Publication of a proper Class I legal advertisement is a requirement of the G35-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

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that MK Midstream Holdings, LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a G35-C (General Permit Modification) for a natural gas compressor and dehydration facility located on Davisson Run Road, Clarksburg, in Harrison County, West Virginia. The latitude and longitude coordinates are: 39.275550 and -80.403099.

The applicant estimates the increased potential to discharge the following Regulated Air Pollutants will be: VOCs- 14 Tons per year and HAPs -2 Tons per year.

Startup of operation is planned to begin on or about the November 24, 2016. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours. Dated this the 24th day of October, 2016.

By: MK Midstream Holdings, LLC
Ms. Stacey Lucus
Vice President, Health, Safety and Environment
65 Professional Place, Suite 200
Bridgeport, WV 26330