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Alex Bosiljevac  
Environmental Coordinator

June 22, 2015

**CERTIFIED MAIL #: 7015 1660 0000 9399 6307**

Mr. William F. Durham, Director  
West Virginia Department of Environmental Protection  
Division of Air Quality  
601 57<sup>th</sup> Street, SE  
Charleston, West Virginia, 25304

**RE: Class I Administrative Update Application & Permit Determination  
EQT Gathering, LLC  
Grant Compressor Station**

Dear Mr. Durham,

Enclosed are two electronic copies and one original hard copy of a proposed Class I Administrative Update and Permit Determination for the Grant Compressor Station. A legal advertisement will be published in the next few days and proof of publication will be forwarded as soon as it is received. Please contact me for payment of the application fee by credit card.

If you have any questions concerning this permit application, please contact me at (412) 395-3699 or by email at [abosiljevac@eqt.com](mailto:abosiljevac@eqt.com).

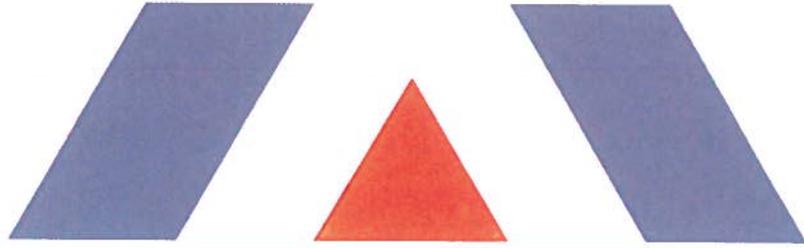
Sincerely,

A handwritten signature in blue ink, appearing to read 'RAB' followed by a stylized flourish.

Alex Bosiljevac  
EQT Corporation

Enclosures





**CLASS I ADMINISTRATIVE UPDATE APPLICATION**  
EQT Gathering, LLC > Grant Compressor Station

**R13-2615A**

TRINITY CONSULTANTS  
4500 Brooktree Drive  
Suite 103  
Wexford, PA 15090  
(724) 935-2611

April 2016

Trinity   
Consultants

*Environmental solutions delivered uncommonly well*

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# 1. INTRODUCTION

EQT Gathering, LLC is submitting this Class I Administrative update application to the West Virginia Department of Environmental Protection (WVDEP) for a natural gas station located in Logan County, West Virginia (Grant Station). Specifically, this application seeks to remove the existing compressor engines at the station, and update the storage tank description in the permit. The Grant Station is currently operating under permit R13-2615A, issued on September 8, 2008.

## 1.1. FACILITY DESCRIPTION

The Grant Station is a natural gas gathering facility. The current permit consists of the following equipment:

- > Two (2) 637 HP Caterpillar 4-stroke lean burn compressor engines;
- > One (1) natural gas fired indirect heater (rated at 0.075 MMBtu/hr);
- > One (1) triethylene glycol (TEG) dehydration unit (10 MMscfd) with associated reboiler (each rated at 0.25 MMBtu/hr);
- > Eleven (11) miscellaneous storage (each rated at 6,500 gallons or less);

EQT is submitting this application to address the following:

- > Removal of the existing stationary compressor engines (S004, S005);
- > Requests that the department remove the following tanks from the current permit;
  - o Two (2) 4,200 gallon Empty Storage Tanks (T8 and T9)
  - o 1,000 gallon Glycol Storage Tank (T5)
  - o 1,000 gallon Methanol Storage Tank (T10)
- > Requests that the department revise the current capacities and description of the seven (7) existing storage tanks in the permit per the updated Attachment I form.

A process flow diagram is included as Attachment F. The project will result in a decrease in emissions from the station. Detailed emission calculations for the remaining emission units are presented in Attachment N. *It is important to note that after the engines are removed, the Grant Station will not meet the definition of Stationary Source under 45 CSR 13. As such, EQT requests that the permit be rescinded.*

## 1.2. SOURCE STATUS

The current permit, R13-2615A, was issued with no sources aggregated with the Grant Station. No changes have been made with respect to nearby sources and/or wells feeding the station since that time. Therefore, stationary source determination is the same for the facility.

## 1.3. R-13 APPLICATION ORGANIZATION

This R-13 permit application is organized as follows:

- > Section 2: R-13 Application Forms;
- > Attachment A: Business Certificate;
- > Attachment B: Map;
- > Attachment C: Installation and Start Up Schedule;
- > Attachment D: Regulatory Discussion;
- > Attachment F: Detailed Process Flow Diagram;
- > Attachment G: Process Description;
- > Attachment I: Emission Units Table; and
- > Attachment N: Supporting Emission Calculations

## 2. R-13 APPLICATION FORMS

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The WVDEP permit application forms contained in this application include all applicable R-13 application forms including the required attachments.

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

**PERMIT DETERMINATION FORM  
(PDF)**

FOR AGENCY USE ONLY: PLANT I.D. # \_\_\_\_\_  
 PDF # \_\_\_\_\_ PERMIT WRITER: \_\_\_\_\_

1. NAME OF APPLICANT (AS REGISTERED WITH THE WV SECRETARY OF STATE'S OFFICE):  
 EQT Gathering, LLC

2. NAME OF FACILITY (IF DIFFERENT FROM ABOVE): Grant Station	3. NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODE: 211111
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4A. MAILING ADDRESS: 625 Liberty Avenue, Suite 1700 Pittsburgh, PA 15222	4B. PHYSICAL ADDRESS: Gaston Caperton Road, Holden, West Virginia
--	--

5A. DIRECTIONS TO FACILITY (PLEASE PROVIDE MAP AS ATTACHMENT A):  
 From Logan, head southwest on Dingess street toward Stratton St, slight right onto WV-10N/Logan Blvd. Continue onto WV-73 W for 3.1 miles and merge onto US. 119 S. Turn right onto Gaston Caperton Rd. Turn left and continue for 0.5 miles

5B. NEAREST ROAD: Gaston Caperton Road	5C. NEAREST CITY OR TOWN: Holden	5D. COUNTY: Logan
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5E. UTM NORTHING (KM): 4,184.540	5F. UTM EASTING (KM): 402.060	5G. UTM ZONE: 17
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6A. INDIVIDUAL TO CONTACT IF MORE INFORMATION IS REQUIRED: Alex Bosiljevac	6B. TITLE: Environmental Coordinator
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6C. TELEPHONE: 412-395-3699	6D. FAX:	6E. E-MAIL: abosiljevac@eqt.com
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7A. DAQ PLANT I.D. NO. (FOR AN EXISTING FACILITY ONLY): 045 - 00122	7B. PLEASE LIST ALL CURRENT 45CSR13, 45CSR14, 45CSR19 AND/OR TITLE V (45CSR30) PERMIT NUMBERS ASSOCIATED WITH THIS PROCESS (FOR AN EXISTING FACILITY ONLY): R13-2615A
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7C. IS THIS PDF BEING SUBMITTED AS THE RESULT OF AN ENFORCEMENT ACTION? IF YES, PLEASE LIST: No

8A. TYPE OF EMISSION SOURCE (CHECK ONE): <input type="checkbox"/> NEW SOURCE <input checked="" type="checkbox"/> ADMINISTRATIVE UPDATE <input type="checkbox"/> MODIFICATION <input type="checkbox"/> OTHER (PLEASE EXPLAIN IN 11B)	8B. IF ADMINISTRATIVE UPDATE, DOES DAQ HAVE THE APPLICANT'S CONSENT TO UPDATE THE EXISTING PERMIT WITH THE INFORMATION CONTAINED HEREIN? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
---	---

9. IS DEMOLITION OR PHYSICAL RENOVATION AT AN EXISTING FACILITY INVOLVED?     YES     NO

10A. DATE OF ANTICIPATED INSTALLATION OR CHANGE: NA	10B. DATE OF ANTICIPATED START-UP: NA
--	--

11A. PLEASE PROVIDE A DETAILED PROCESS FLOW DIAGRAM SHOWING EACH PROPOSED OR MODIFIED PROCESS EMISSION POINT AS ATTACHMENT B.

11B. PLEASE PROVIDE A DETAILED PROCESS DESCRIPTION AS ATTACHMENT C.

12. PLEASE PROVIDE MATERIAL SAFETY DATA SHEETS (MSDS) FOR ALL MATERIALS PROCESSED, USED OR PRODUCED AS ATTACHMENT D. FOR CHEMICAL PROCESSES, PLEASE PROVIDE A MSDS FOR EACH COMPOUND EMITTED TO AIR.

**13A. REGULATED AIR POLLUTANT EMISSIONS:**

⇒ **FOR A NEW FACILITY**, PLEASE PROVIDE PLANT WIDE EMISSIONS BASED ON THE POTENTIAL TO EMIT (PTE) FOR THE FOLLOWING AIR POLLUTANTS INCLUDING ALL PROCESSES.

⇒ **FOR AN EXISTING FACILITY**, PLEASE PROVIDE THE PROPOSED CHANGE IN EMISSIONS BASED ON THE PTE OF ALL PROCESS CHANGES FOR THE FOLLOWING AIR POLLUTANTS.

PTE FOR A GIVEN POLLUTANT IS TYPICALLY BEFORE AIR POLLUTION CONTROL DEVICES AND IS COLLECTED BASED ON THE MAXIMUM DESIGN CAPACITY OF PROCESS EQUIPMENT.

POLLUTANT	HOURLY PTE (LB/HR)	YEARLY PTE (TON/YR) (HOURLY PTE MULTIPLIED BY 8760 HR/YR) DIVIDED BY 2000 LB/TON
PM	0.05	0.23
PM <sub>10</sub>	0.05	0.23
VOCs	5.34	23.37
CO	0.03	0.11
NO <sub>x</sub>	0.03	0.14
SO <sub>2</sub>	< 0.01	< 0.01
Pb	< 0.01	< 0.01
HAPs (AGGREGATE AMOUNT)	0.92	4.01
TAPs (INDIVIDUALLY)*		
OTHER (INDIVIDUALLY)*		

\* ATTACH ADDITIONAL PAGES AS NEEDED

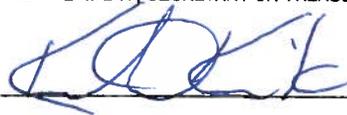
**13B. PLEASE PROVIDE ALL SUPPORTING CALCULATIONS AS ATTACHMENT E.**

CALCULATE AN HOURLY AND YEARLY PTE OF EACH PROCESS EMISSION POINT (SHOWN IN YOUR DETAILED PROCESS FLOW DIAGRAM) FOR ALL AIR POLLUTANTS LISTED ABOVE INCLUDING INDIVIDUAL HAP'S (LISTED IN SECTION 112[b] OF THE 1990 CAAA), TAP'S (LISTED IN 45CSR27), AND OTHER AIR POLLUTANTS (E.G. POLLUTANTS LISTED IN TABLE 45-13A OF 45CSR13, MINERAL ACIDS PER 45CSR7, ETC.)

**14. CERTIFICATION OF DATA**

I, **Kenneth Kirk** (TYPE NAME) ATTEST THAT ALL THE REPRESENTATIONS CONTAINED IN THIS APPLICATION, OR APPENDED HERETO, ARE TRUE, ACCURATE, AND COMPLETE TO THE BEST OF MY KNOWLEDGE BASED ON INFORMATION AND BELIEF AFTER REASONABLE INQUIRY, AND THAT I AM A **RESPONSIBLE OFFICIAL\*\*** (PRESIDENT, VICE PRESIDENT, SECRETARY OR TREASURER, GENERAL PARTNER OR SOLE PROPRIETOR) OF THE APPLICANT.

SIGNATURE OF RESPONSIBLE OFFICIAL: \_\_\_\_\_



TITLE: Executive Vice President

DATE: 6, 22, 16

\*\* THE DEFINITION OF THE PHRASE 'RESPONSIBLE OFFICIAL' CAN BE FOUND AT 45CSR13, SECTION 2.23

**NOTE: PLEASE CHECK ENCLOSED ATTACHMENTS:**

ATTACHMENT A     ATTACHMENT B     ATTACHMENT C     ATTACHMENT D     ATTACHMENT E

RECORDS ON ALL CHANGES ARE REQUIRED TO BE KEPT AND MAINTAINED ON-SITE FOR TWO (2) YEARS.

THE PERMIT DETERMINATION FORM WITH THE INSTRUCTIONS CAN BE FOUND ON DAQ'S PERMITTING SECTION WEB SITE:

[www.dep.wv.gov/daq](http://www.dep.wv.gov/daq)

 <p><b>WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION</b>  <b>DIVISION OF AIR QUALITY</b>          601 57<sup>th</sup> Street, SE          Charleston, WV 25304          (304) 926-0475  <a href="http://www.dep.wv.gov/daq">www.dep.wv.gov/daq</a></p>	<p><b>APPLICATION FOR NSR PERMIT</b> <b>AND</b> <b>TITLE V PERMIT REVISION</b> <b>(OPTIONAL)</b></p>
--	--

PLEASE CHECK ALL THAT APPLY TO NSR (45CSR13) (IF KNOWN): <input type="checkbox"/> CONSTRUCTION <input type="checkbox"/> MODIFICATION <input type="checkbox"/> RELOCATION <input checked="" type="checkbox"/> CLASS I ADMINISTRATIVE UPDATE <input type="checkbox"/> TEMPORARY <input type="checkbox"/> CLASS II ADMINISTRATIVE UPDATE <input type="checkbox"/> AFTER-THE-FACT	PLEASE CHECK TYPE OF 45CSR30 (TITLE V) REVISION (IF ANY): <input type="checkbox"/> ADMINISTRATIVE AMENDMENT <input type="checkbox"/> MINOR MODIFICATION <input type="checkbox"/> SIGNIFICANT MODIFICATION IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS ATTACHMENT S TO THIS APPLICATION
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**FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.**

**Section I. General**

1. Name of applicant (as registered with the WV Secretary of State's Office): EQT Gathering, LLC	2. Federal Employer ID No. (FEIN): 25-2752042
---	--

3. Name of facility (if different from above): Grant Station	4. The applicant is the: <input type="checkbox"/> OWNER <input type="checkbox"/> OPERATOR <input checked="" type="checkbox"/> BOTH
---	---

5A. Applicant's mailing address: 625 Liberty Avenue, Suite 1700  Pittsburgh, PA 15222	5B. Facility's present physical address: Gaston Caperton Road, Holden, West Virginia
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6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia?     YES     NO

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

7. If applicant is a subsidiary corporation, please provide the name of parent corporation:    EQT Corporation

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

- If YES, please explain:    Applicant owns the site
- If NO, you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be <b>constructed, modified, relocated, administratively updated</b> or <b>temporarily permitted</b> (e.g., coal preparation plant, primary crusher, etc.): Natural Gas Compressor Station	10. North American Industry Classification System (NAICS) code for the facility:  211111
--	--

11A. DAQ Plant ID No. (for existing facilities only): 045-00122	11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only): R13-2615A
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**All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.**

12A.

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

From Logan, WV Head southwest on Dingess street toward Stratton St, slight right onto WV-10N/Logan Blvd. Continue onto WV-73 W for 3.1 miles and merge onto US.119 S. Turn right onto Gaston Caperton Rd. Turn left and continue for 0.5 miles, slight light, left and continue for 0.1 mile, and arrive at the station.

12.B. New site address (if applicable):	12C. Nearest city or town: Holden	12D. County: Logan
12.E. UTM Northing (KM): 4184.54	12F. UTM Easting (KM): 402.06	12G. UTM Zone: 17

13. Briefly describe the proposed change(s) at the facility:  
 EQT is proposing to remove the existing compressor engines and also update the storage tank list. Based on current level of emissions, no permit is required.

14A. Provide the date of anticipated installation or change: Upon Issuance of Permit - If this is an <b>After-The-Fact</b> permit application, provide the date upon which the proposed change did happen:     /     /	14B. Date of anticipated Start-Up if a permit is granted:
---	---

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

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

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

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

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

**Section II. Additional attachments and supporting documents.**

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

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

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

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

23. Provide a **Process Description** as **Attachment G**.  
 - Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

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

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H**.  
 - For chemical processes, provide a MSDS for each compound emitted to the air.

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

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

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

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

<input type="checkbox"/> Bulk Liquid Transfer Operations	<input type="checkbox"/> Haul Road Emissions	<input type="checkbox"/> Quarry
<input type="checkbox"/> Chemical Processes	<input type="checkbox"/> Hot Mix Asphalt Plant	<input type="checkbox"/> Solid Materials Sizing, Handling and Storage Facilities
<input type="checkbox"/> Concrete Batch Plant	<input type="checkbox"/> Incinerator	<input type="checkbox"/> Storage Tanks
<input type="checkbox"/> Grey Iron and Steel Foundry	<input type="checkbox"/> Indirect Heat Exchanger	
<input type="checkbox"/> General Emission Unit		

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

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

<input type="checkbox"/> Absorption Systems	<input type="checkbox"/> Baghouse	<input type="checkbox"/> Flare
<input type="checkbox"/> Adsorption Systems	<input type="checkbox"/> Condenser	<input type="checkbox"/> Mechanical Collector
<input type="checkbox"/> Afterburner	<input type="checkbox"/> Electrostatic Precipitator	<input type="checkbox"/> Wet Collecting System
<input type="checkbox"/> Other Collectors, specify		

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

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

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

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

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

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

YES       NO

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

### Section III. Certification of Information

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

<input type="checkbox"/> Authority of Corporation or Other Business Entity	<input type="checkbox"/> Authority of Partnership
<input type="checkbox"/> Authority of Governmental Agency	<input type="checkbox"/> Authority of Limited Partnership

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

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

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

**Certification of Truth, Accuracy, and Completeness**

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

**Compliance Certification**

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

SIGNATURE \_\_\_\_\_

(Please use blue ink)

DATE: \_\_\_\_\_

(Please use blue ink)

35B. Printed name of signee: Kenneth Kirk

35C. Title: Executive Vice President

35D. E-mail: [kkirk@eqt.com](mailto:kkirk@eqt.com)

36E. Phone:

36F. FAX:

36A. Printed name of contact person (if different from above): Alex Bosiljevac

36B. Title: Environmental Coordinator

36C. E-mail: [abosiljevac@eqt.com](mailto:abosiljevac@eqt.com)

36D. Phone: 412-395-3699

36E. FAX:

**PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:**

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

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

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

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

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

**ATTACHMENT A**

**Business Certificate**

**WEST VIRGINIA  
STATE TAX DEPARTMENT  
BUSINESS REGISTRATION  
CERTIFICATE**

ISSUED TO:  
**EQT GATHERING, LLC  
225 N SHORE DR  
PITTSBURGH, PA 15212-5860**

BUSINESS REGISTRATION ACCOUNT NUMBER: **1010-2674**

This certificate is issued on: **06/28/2011**

*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.

**ATTACHMENT B**

**Map**

**ATTACHMENT B - AREA MAP**



**Figure 1 - Map of Grant Station**

UTM Northing (KM): 4,184.385  
UTM Easting (KM): 402.068  
Elevation: ~1,775 ft

## ATTACHMENT C

### Installation and Start Up Schedule

## ATTACHMENT C

### Schedule of Planned Installation and Start-Up

N/A – Units already removed

## ATTACHMENT D

### Regulatory Discussion

## ATTACHMENT D - REGULATORY APPLICABILITY

This section documents the applicability determinations made for Federal and State air quality regulations. In this section, applicability or non-applicability of the following regulatory programs is addressed:

- > Prevention of Significant Deterioration (PSD) permitting;
- > Title V of the 1990 Clean Air Act Amendments;
- > New Source Performance Standards (NSPS);
- > National Emission Standards for Hazardous Air Pollutants (NESHAP); and
- > West Virginia State Implementation Plan (SIP) regulations.

This review is presented to supplement and/or add clarification to the information provided in the WVDEP R13 permit application forms.

In addition to providing a summary of applicable requirements, this section of the application also provides non-applicability determinations for certain regulations, allowing the WVDEP to confirm that identified regulations are not applicable to the Grant Station. Note that explanations of non-applicability are limited to those regulations for which there may be some question of applicability specific to the operations at the Grant Station. Regulations that are categorically non-applicable are not discussed (e.g., NSPS Subpart J, Standards of Performance for Petroleum Refineries).

### Prevention of Significant Deterioration (PSD) Source Classification

Federal construction permitting programs regulate new and modified sources of attainment pollutants under Prevention of Significant Deterioration (PSD) and new and modified sources of non-attainment pollutants under Non-Attainment New Source Review (NNSR). PSD and NNSR regulations apply when a major source makes a change, such as installing new equipment or modifying existing equipment, and a significant increase in emissions results from the change. The Grant Station is not a major source with respect to the NSR program since its potential emissions are below all the NSR/PSD thresholds. The proposed regulatory updates to the permit will not result in an increase in emissions from the compressor engines and potential emissions from the compressor engines are below PSD applicability thresholds. As such, PSD permitting is not triggered by this activity.

### Title V Operating Permit Program

Title 40 of the Code of Federal Regulations Part 70 (40 CFR 70) establishes the federal Title V operating permit program. West Virginia has incorporated the provisions of this federal program in its Title V operating permit program in West Virginia Code of State Regulations (CSR) 45-30. The major source thresholds with respect to the West Virginia Title V operating permit program regulations are 10 tons per year (tpy) of a single HAP, 25 tpy of any combination of HAP, and 100 tpy of all other regulated pollutants. The potential emissions of all regulated pollutants are below the corresponding threshold(s) at this facility. Therefore, the Grant Station is not a major source for Title V purposes.

### New Source Performance Standards

New Source Performance Standards (NSPS), located in 40 CFR 60, require new, modified, or reconstructed sources to control emissions to the level achievable by the best demonstrated technology as specified in the applicable provisions. Moreover, any source subject to an NSPS is also subject to the general provisions of NSPS Subpart A, except where expressly noted. The following is a summary of applicability and non-applicability determinations for NSPS regulations of relevance to the Grant Station.

### ***NSPS Subparts K, Ka, and Kb***

These subparts apply to storage tanks of certain sizes constructed, reconstructed, or modified during various time periods. Subpart K applies to storage tanks constructed, reconstructed, or modified prior to 1978, and Subpart Ka applies to those constructed, reconstructed, or modified prior to 1984. Both Subparts K and Ka apply to storage tanks with a capacity greater than 40,000 gallons. Subpart Kb applies to volatile organic liquid (VOL) storage tanks constructed, reconstructed, or modified after July 23, 1984 with a capacity equal to or greater than 75 m<sup>3</sup> (~19,813 gallons). The storage tanks all have a capacity less than 75 m<sup>3</sup>. As such, Subparts K, Ka, and Kb do not apply to the storage tanks at the facility.

### ***NSPS Subpart 0000—Crude Oil and Natural Gas Production, Transmission, and Distribution***

Subpart 0000, Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution, applies to affected facilities that commenced construction, reconstruction, or modification after August 23, 2011 (see clarification below regarding dates). This NSPS was published in the Federal Register on August 16, 2012, and subsequently amended. The list of potentially affected facilities includes:

- > Gas wellheads;
- > Centrifugal compressors located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment;
- > Reciprocating compressors located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment;
- > Continuous bleed natural gas-driven pneumatic controllers with a bleed rate of > 6 scfh located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment (excluding natural gas processing plants);
- > Continuous bleed natural gas-driven pneumatic controllers located at natural gas processing plants;
- > Storage vessels in the production, processing, or transmission and storage segments; and
- > Sweetening units located onshore that process natural gas produced from either onshore or offshore wells.

The proposed changes do not include any affected facilities under this subpart.

### ***NSPS Subpart 0000a—Crude Oil and Natural Gas Facilities***

Subpart 0000a, Standards of Performance for Crude Oil and Natural Gas Facilities, will apply to affected facilities that commenced construction, reconstruction, or modification after September 18, 2015. This regulation has yet to be finalized. The currently proposed version of the rule includes provisions for the following facilities:

- > Hydraulically fractured wells;
- > Centrifugal compressors located between the wellhead and the point of custody transfer to the natural gas distribution segment;
- > Reciprocating compressors located between the wellhead and the point of custody transfer to the natural gas distribution segment;
- > Continuous bleed natural gas-driven pneumatic controllers with a bleed rate of > 6 scfh located in the production, gathering, processing, or transmission and storage segments (excluding natural gas processing plants);
- > Continuous bleed natural gas-driven pneumatic controllers located at natural gas processing plants;
- > Pneumatic pumps located in the production, gathering, processing, or transmission and storage segments;
- > Storage vessels located in the production, gathering, processing, or transmission and storage segments;
- > The collection of fugitive emissions components at a well site;
- > The collection of fugitive emissions components at a compressor station; and

- > Sweetening units located onshore that process natural gas produced from either onshore or offshore wells.

The proposed changes do not include any affected facilities under this subpart.

## **National Emission Standards for Hazardous Air Pollutants (NESHAP)**

Part 63 NESHAP allowable emission limits are established on the basis of a maximum achievable control technology (MACT) determination for a particular major source. A HAP major source is defined as having potential emissions in excess of 25 tpy for total HAP and/or potential emissions in excess of 10 tpy for any individual HAP. The Grant Station is an Area (minor) source of HAP since its potential emissions of HAP are less than the 10/25 major source thresholds. Besides 40 CFR 63 Subpart A (NESHAP Subpart A), which is similar to 40 CFR 60 Subpart A (NSPS Subpart A), the following NESHAP could potentially apply to the Grant Station:

- > 40 CFR Part 63 Subpart HH – Stationary Reciprocating Internal Combustion Engines (RICE)

The applicability of this NESHAP Subpart is discussed in the following section.

### ***40 CFR 63 Subpart HH - Oil and Natural Gas Production Facilities***

Glycol dehydration units are potentially subject to Subpart HH, NESHAP from Natural Gas Production Facilities. This standard applies to such units at natural gas production facilities that are major or area sources of HAP emissions. The Grant Station is an area source of HAP emissions. Even though the dehydration unit at the station is considered an affected area source, it is exempt from the requirements of § 63.764(d)(2) since the actual average benzene emissions from the glycol dehydration unit process vent to the atmosphere is less than 0.90 Mg (1.0 TPY), as determined by the procedures specified in § 63.772(b)(2). However, the facility must maintain records as required in §63.774(d)(1).

## **West Virginia SIP Regulations**

The Grant Station is potentially subject to regulations contained in the West Virginia Code of State Regulations, Chapter 45 (Code of State Regulations). The Code of State Regulations fall under two main categories, those regulations that are generally applicable (e.g., permitting requirements), and those that have specific applicability (e.g., PM standards for manufacturing equipment).

### ***45 CSR 4: To Prevent and Control the Discharge of Air Pollutants into the Air Which Causes or Contributes to an Objectionable Odor***

According to 45 CSR 4-3:

*No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.*

The Grant Station is generally subject to this requirement. However, due to the nature of the process at the Grant Station, production of objectionable odor from the Grant Station during normal operation is unlikely.

### ***45 CSR 13: Standards of Performance for New Stationary Sources***

45 CSR 13 include state-level permitting requirements. Stationary Source is defined in 45 CSR 13-2:

"Stationary source" means, for the purpose of this rule, any building, structure, facility, installation, or emission unit or combination thereof, excluding any emissions unit which meets or falls below the criteria delineated in Table 45-13B, which:

- a. Is subject to any substantive requirement of an emission control rule promulgated by the Secretary;

- b. Discharges or has the potential to discharge more than six (6) pounds per hour and ten (10) tons per year, or has the potential to discharge more than 144 pounds per calendar day, of any regulated air pollutant;
- c. Discharges or has the potential to discharge more than two (2) pounds per hour or five (5) tons per year of hazardous air pollutants considered on an aggregated basis;
- d. Discharges or has the potential to discharge any air pollutant(s) listed in Table 45-13A in the amounts shown in Table 45-13A or greater; or
- e. An owner or operator voluntarily chooses to be subject to a construction or modification permit pursuant to this rule, even though not otherwise required to do so.

After the removal of the engines, emissions from the station will be below the applicable levels in 45 CSR-13. Additionally, the facility does not contain equipment subject to a substantive requirement (note that the dehydrator is exempt from source testing under Subpart HH). As such, the facility is not classified as a major source and a permit is not required.

#### ***45 CSR 16: Standards of Performance for New Stationary Sources***

45 CSR 16-1 incorporates the federal Clean Air Act (CAA) standards of performance for new stationary sources set forth in 40 CFR Part 60 by reference. As such, by complying with all applicable requirements of 40 CFR Part 60 at the Grant Station, EQT will be complying with 45 CSR 16.

#### ***45 CSR 17: To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter***

According to 45 CSR 17-3.1:

*No person shall cause, suffer, allow or permit fugitive particulate matter to be discharged beyond the boundary lines of the property lines of the property on which the discharge originates or at any public or residential location, which causes or contributes to statutory air pollution.*

Due to the nature of the activities at the Grant Station, it is unlikely that fugitive particulate matter emissions will be emitted under normal operating conditions. However, EQT will take measures to ensure any fugitive particulate matter emissions will not cross the property boundary should any such emissions occur.

#### ***45 CSR 21-28: Petroleum Liquid Storage in Fixed Roof Tanks***

45 CSR 21-28 applies to any fixed roof petroleum liquid storage tank with a capacity greater than 40,000 gallons. The capacity of each storage tank at the Grant Station is less than 40,000 gallons; therefore, 45 CSR 21-28 will not apply to the petroleum liquid storage tanks at this station.

#### ***45 CSR 34: Emissions Standards for Hazardous Air Pollutants***

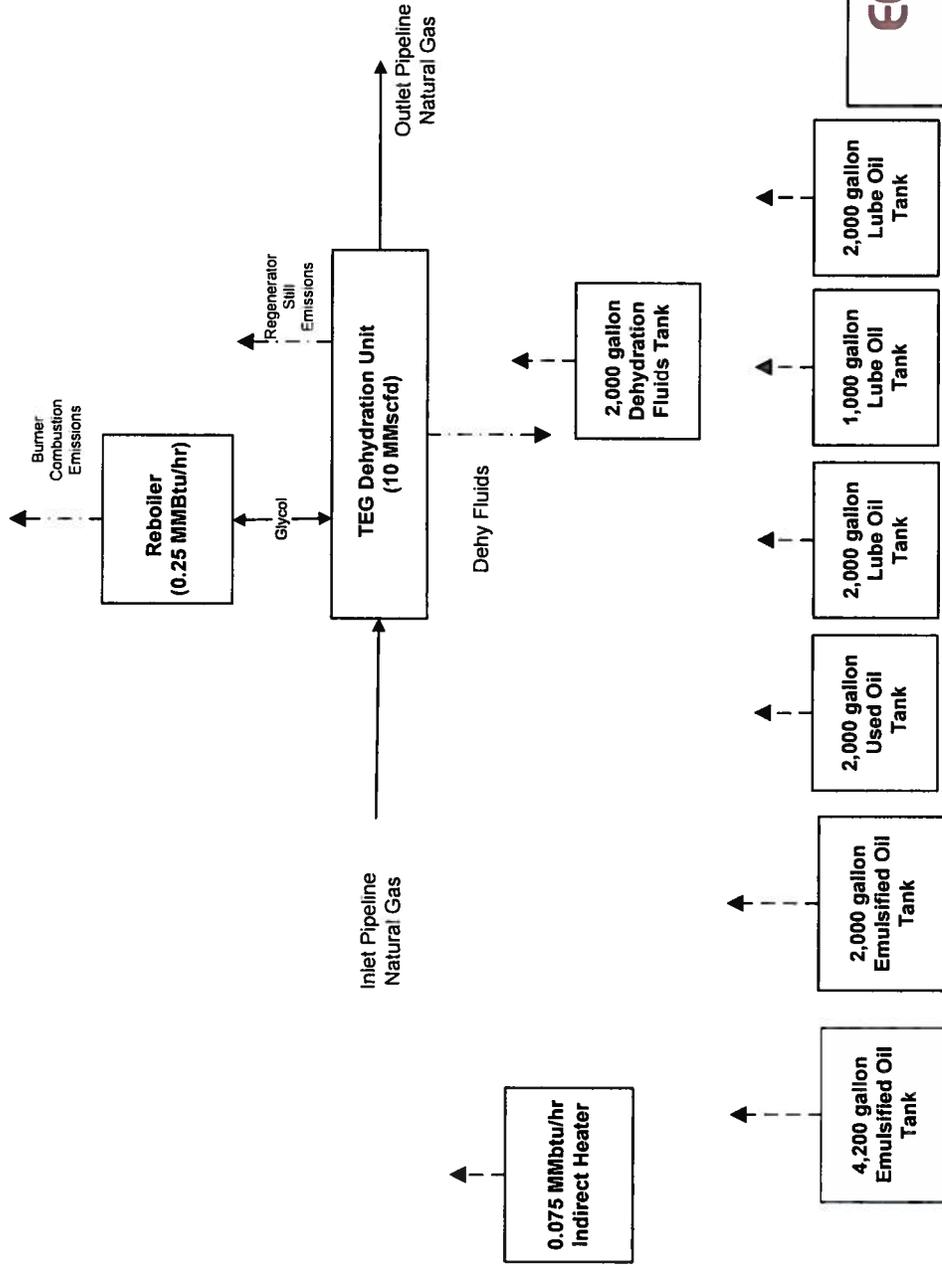
45 CSR 34-1 incorporates the federal Clean Air Act (CAA) national emissions standards for hazardous air pollutants (NESHAPs) as set forth in 40 CFR Parts 61 and 63 by reference. As such, by complying with all applicable requirements of 40 CFR Parts 61 and 63 at the Grant Station, EQT will be complying with 45 CSR 34.

#### ***Non-Applicability of Other SIP Rules***

A thorough examination of the West Virginia SIP rules with respect to applicability at the Grant Station reveals many SIP regulations that do not apply or impose additional requirements on operations. Such SIP rules include those specific to a particular type of industrial operation that is categorically not applicable to the Grant Station.

## ATTACHMENT F

### Detailed Process Flow Diagram



**EQT** Where energy meets innovation.  
**EQT Gathering, LLC**

**Process Flow Diagram**  
 Grant Station

**Trinity**  
 Consultants

April 2016

**Flow Legend**

→ Gas/Water/Condensate Flow

- - - → Stack Emissions

## ATTACHMENT G

### Process Description

## ATTACHMENT G - PROCESS DESCRIPTION

EQT is submitting this application to remove the existing compressor engines and change the descriptions of several storage tanks at the Grant Station.

A process flow diagram is included as Attachment F.

# ATTACHMENT I

## Emission Units Table

## Attachment I

### Emission Units Table

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

Emission Unit ID <sup>1</sup>	Emission Point ID <sup>2</sup>	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type <sup>3</sup> and Date of Change	Control Device <sup>4</sup>
S001	S001	NATCO Glycol Dehydration Unit Still Vent	2000	10 MMSCFD	Existing, No Change	NA
S002	S002	NATCO Glycol Dehydration Unit Reboiler	2000	0.25 MMBtu/hr	Existing, No Change	NA
S003	S003	De-ethanizer/Indirect Heater	2000	0.075 MMBtu/hr	Existing, No Change	NA
S004	S004	Caterpillar G3412 LE Compressor Engine #1	2008	673 HP	Removal	None
S005	S005	Caterpillar G3412 LE Compressor Engine #1	2008	673 HP	Removal	None
T1	T1	Emulsified Oil Tank	2008	2,000 gallon	Existing, Description Change	None
T2	T2	Lube Oil Tank	2008	2,000 gallon	Existing, Description Change	None
T3	T3	Screw Compressor Lube Oil Tank	2008	1,000 gallon	Existing, Description Change	None
T4	T4	Used Oil Tank	2008	2,000 gallon	Existing, Description Change	None
T6	T6	Dehy Condensate Tank	2008	2,000 gallon	Existing, Description Change	None
T7	T7	Lube Oil Tank	2008	2,000 gallon	Existing, Description Change	None
T11	T11	Emulsified Oil Tank	2008	4,200 gallon	Existing, Description Change	None

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

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

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

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

## ATTACHMENT N

### Supporting Emission Calculations

Company Name: EQT Gathering, LLC  
 Facility Name: Grant Station  
 Project Description: R-13 Permit Application

Site Wide Emission Calculations

Fuel Type	Dehydration Unit		Reboiler		De-ethanizer/ Indirect Heater		Miscellaneous Storage Tanks		Road Emissions		Fugitives & Blowdowns		Grant Station Total (excluding fugitives)		Grant Station Total	
	Natural Gas 10	MMscfd Existing	Natural Gas 0.25	MMBtu/hr Existing	Natural Gas 0.08	MMBtu/hr Existing	N/A	galtons Existing	Existing	Existing	Existing	Existing	Existing	Existing	Existing	Existing
Capacity																
Unit																
Status																
Operating Hours (hrs)																
# of Emission Units	1	1	1	1	1	1	7	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760
Pollutant	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy
PM <sub>10</sub>	--		0.01	0.00	0.00	--	--	0.22	--	--	--	--	0.01	0.23		
PM <sub>2.5</sub>	--		0.01	0.00	0.00	--	--	0.02	--	--	--	--	0.01	0.03		
SO <sub>x</sub>	--		0.00	1.9E-04	0.00	--	--	--	--	--	--	--	0.00	0.00		
CO	--		0.09	0.03	0.03	--	--	--	--	--	--	--	0.11	0.11		
NO <sub>x</sub>	--		0.10	0.03	0.03	--	--	--	--	--	--	--	0.14	0.14		
VOC	17.46		0.01	0.00	0.00	0.00	0.00	--	--	--	5.91	17.47	167.86	23.37		
CO <sub>2</sub>	0.29		128	39.46	39.46	--	--	--	--	--	0.01	167.86	168	168		
CH <sub>4</sub>	6.19		0.00	0.00	0.00	--	--	--	--	--	6.76	6.76	13	13		
N <sub>2</sub> O	--		0.00	7.4E-05	7.4E-05	--	--	--	--	--	--	--	0.00	0.00		
CO <sub>2</sub> e <sup>1</sup>	155		128	39.50	39.50	--	--	--	--	--	169	322.75	492	492		
Formaldehyde	--		7.8E-05	2.4E-05	2.4E-05	--	--	--	--	--	--	--	0.00	0.00		
Total HAPs (including HCHO)	3.89		0.00	0.00	0.00	0.00	0.00	--	--	--	0.12	3.90	4.01	4.01		

1. Conversion to CO<sub>2</sub>e based on CH<sub>4</sub> GWP = 25 and N<sub>2</sub>O GWP = 298, per 40 CFR 98.

2. VOC excludes Formaldehyde.

Company Name: **EQT Gathering, LLC**  
 Facility Name: **Grant Station**  
 Project Description: **R-13 Permit Application**

Natural Gas Glycol Dehydration Unit Data Sheet

<b>General Glycol Dehydration Unit Data</b>	<b>Manufacturer and Model</b>	Exterran
	<b>Max Dry Gas Flow Rate (mmscf/day)</b>	10
	<b>Design Heat Input (mmbtu/hr)</b>	0.25
	<b>Design Type (DEG or TEG)</b>	TEG
	<b>Source Status</b>	ES
	<b>Date Installed/Modified/Removed</b>	2000
	<b>Regenerator Still Vent APCD</b>	None
	<b>Fuel HHV(Btu/scf)</b>	1,050
	<b>H<sub>2</sub>S Content (gr/100 scf)</b>	N/A
	<b>Max. Annual Hours of Operation (hr/yr):</b>	8,760
	<b>Enclosed Flare Rating (MMBtu/hr)</b>	NA

**GRI GLYCalc Emissions Data:**

Pollutant	Regenerator Controlled Emissions		
	lbs/hr	lbs/day	tpy
Methane	1.4130	33.91	6.189
Ethane	1.1597	27.83	5.079
Propane	0.9591	23.02	4.201
Isobutane	0.1672	4.01	0.732
n-Butane	0.4987	11.97	2.184
Isopentane	0.1300	3.12	0.569
n-Pentane	0.1573	3.78	0.689
n-Hexane	0.0644	1.55	0.282
Cyclohexane	0.0631	1.51	0.276
Other Hexanes	0.0732	1.76	0.321
Heptanes	0.1685	4.04	0.738
Benzene	0.1527	3.66	0.669
Toluene	0.3269	7.85	1.432
Xylenes	0.3450	8.28	1.511
C8 + Heavier Hydrocarbons	0.8799	21.12	3.854
<b>Total Emissions</b>	<b>6.56</b>	<b>157.41</b>	<b>28.73</b>
<b>Total Hydrocarbon Emissions</b>	<b>6.56</b>	<b>157.41</b>	<b>28.73</b>
<b>Total VOC Emissions</b>	<b>3.99</b>	<b>95.67</b>	<b>17.46</b>
<b>Total HAP Emissions</b>	<b>0.89</b>	<b>21.34</b>	<b>3.89</b>
<b>Total BTEX Emissions</b>	<b>0.82</b>	<b>19.79</b>	<b>3.61</b>

**Notes:**

1. Based on GRI GLYCalc 4.0 run at design maximum operating condition of 10 MMscfd at 800 psig and 110 f

**Dehydrator Greenhouse Gas (GHG) Emissions Calculations:**

Pollutant	Regenerator Controlled Emissions		
	lbs/hr	lbs/day	tpy
Carbon Dioxide	0.07	1.57	0.29
GHG (CO <sub>2</sub> e)	35.39	849.37	155.01

Company Name: **EQT Gathering, LLC**  
 Facility Name: **Grant Station**  
 Project Description: **R-13 Permit Application**

**Reboiler Emissions Calculations**

**Reboiler Information:**

Source ID:	S002
Projected Startup Date:	2013

**Reboiler Fuel Information:**

Fuel Type:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,050
Heat Duty/Output Rating (MMBtu/hr)	0.16
Heat Input (MMBtu/hr)	0.25
Potential Fuel Consumption (MMBtu/yr):	2,190
Max. Fuel Consumption (MMscf/hr):	0.0002
Max. Fuel Consumption (MMscf/yr):	2.1
Max. Annual Hours of Operation (hr/yr):	8,760

**Reboiler Emissions Data:**

Pollutant	Emission Factor	Units	Maximum Potential Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
NO <sub>x</sub>	100	lb/MMScf	0.02	0.10	AP-42, Table 1.4-1 (Jul-1998)
VOC	5.5	lb/MMScf	0.00	0.01	AP-42, Table 1.4-2 (Jul-1998)
CO	84	lb/MMScf	0.02	0.09	AP-42, Table 1.4-1 (Jul-1998)
SO <sub>x</sub>	0.6	lb/MMScf	1.4E-04	0.00	AP-42, Table 1.4-2 (Jul-1998)
PM <sub>10</sub>	7.6	lb/MMScf	0.00	0.01	AP-42, Table 1.4-2 (Jul-1998)
PM <sub>2.5</sub>	7.6	lb/MMScf	0.00	0.01	AP-42, Table 1.4-2 (Jul-1998)
Formaldehyde (HCHO)	0.08	lb/MMScf	1.8E-05	7.8E-05	AP-42, Table 1.4-3 (Jul-1998)
GHG (CO <sub>2</sub> e)	See Table Below		29.28	128.24	40 CFR 98, Tables C-1 & C-2
Other (Total HAP except HCHO)	See Table Below		0.00	0.00	AP-42, Tables 1.4-3 & 1.4-4 (Jul-1998)

**Notes:**

1. PM<sub>10</sub> and PM<sub>2.5</sub> are total values (filterable + condensable).
2. GHG (CO<sub>2</sub>e) is carbon dioxide equivalent, which is the summation of CO<sub>2</sub> (GWP = 1) + CH<sub>4</sub> (GWP = 25) + N<sub>2</sub>O (GWP = 298).
3. Total HAP is the summation of all hazardous air pollutants for which there is a published emission factor for this source type.

Company Name: **EQT Gathering, LLC**  
 Facility Name: **Grant Station**  
 Project Description: **R-13 Permit Application**

Reboiler Emissions Calculations

Greenhouse Gas (GHG) & Hazardous Air Pollutant (HAP) Emissions Calculations:

Pollutant	Emission Factor	Units	Maximum Potential Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
<b>GHGs:</b>					
CO <sub>2</sub>	53.06	kg/MMBtu	29.25	128.11	40 CFR 98, Tables C-1 & C-2
CH <sub>4</sub>	0.001	kg/MMBtu	0.00	0.00	40 CFR 98, Tables C-1 & C-2
N <sub>2</sub> O	0.0001	kg/MMBtu	5.5E-05	2.4E-04	40 CFR 98, Tables C-1 & C-2
<b>GHG (CO<sub>2</sub>e)</b>			<b>29</b>	<b>128</b>	
<b>Organic HAPs:</b>					
2-Methylnaphthalene	2.40E-05	lb/MMscf	5.7E-09	2.5E-08	AP-42, Table 1.4-3 (Jul-1998)
3-Methylchloranthrene	1.80E-06	lb/MMscf	4.3E-10	1.9E-09	AP-42, Table 1.4-3 (Jul-1998)
7,12-Dimethylbenz(a)anthracene	1.60E-05	lb/MMscf	3.8E-09	1.7E-08	AP-42, Table 1.4-3 (Jul-1998)
Benzene	2.10E-03	lb/MMscf	5.0E-07	2.2E-06	AP-42, Table 1.4-3 (Jul-1998)
Benzo(a)pyrene	1.20E-06	lb/MMscf	2.9E-10	1.3E-09	AP-42, Table 1.4-3 (Jul-1998)
Benzo(b)fluoranthene	1.80E-06	lb/MMscf	4.3E-10	1.9E-09	AP-42, Table 1.4-3 (Jul-1998)
Benzo(g,h,i)perylene	1.20E-06	lb/MMscf	2.9E-10	1.3E-09	AP-42, Table 1.4-3 (Jul-1998)
Benzo(k)fluoranthene	1.80E-06	lb/MMscf	4.3E-10	1.9E-09	AP-42, Table 1.4-3 (Jul-1998)
Chrysene	1.80E-06	lb/MMscf	4.3E-10	1.9E-09	AP-42, Table 1.4-3 (Jul-1998)
Dibenzo(a,h)anthracene	1.20E-06	lb/MMscf	2.9E-10	1.3E-09	AP-42, Table 1.4-3 (Jul-1998)
Dichlorobenzene	1.20E-03	lb/MMscf	2.9E-07	1.3E-06	AP-42, Table 1.4-3 (Jul-1998)
Fluoranthene	3.00E-06	lb/MMscf	7.1E-10	3.1E-09	AP-42, Table 1.4-3 (Jul-1998)
Fluorene	2.80E-06	lb/MMscf	6.7E-10	2.9E-09	AP-42, Table 1.4-3 (Jul-1998)
n-Hexane	1.80E+00	lb/MMscf	4.3E-04	1.9E-03	AP-42, Table 1.4-3 (Jul-1998)
Indeno(1,2,3-c,d)pyrene	1.80E-06	lb/MMscf	4.3E-10	1.9E-09	AP-42, Table 1.4-3 (Jul-1998)
Naphthalene	6.10E-04	lb/MMscf	1.5E-07	6.4E-07	AP-42, Table 1.4-3 (Jul-1998)
Phenanthrene	1.70E-05	lb/MMscf	4.0E-09	1.8E-08	AP-42, Table 1.4-3 (Jul-1998)
Pyrene	5.00E-06	lb/MMscf	1.2E-09	5.2E-09	AP-42, Table 1.4-3 (Jul-1998)
Toluene	3.40E-03	lb/MMscf	8.1E-07	3.5E-06	AP-42, Table 1.4-3 (Jul-1998)
<b>Metal HAPs:</b>					
Arsenic	2.00E-04	lb/MMscf	4.8E-08	2.1E-07	AP-42, Table 1.4-4 (Jul-1998)
Beryllium	1.20E-05	lb/MMscf	2.9E-09	1.3E-08	AP-42, Table 1.4-4 (Jul-1998)
Cadmium	1.10E-03	lb/MMscf	2.6E-07	1.1E-06	AP-42, Table 1.4-4 (Jul-1998)
Chromium	1.40E-03	lb/MMscf	3.3E-07	1.5E-06	AP-42, Table 1.4-4 (Jul-1998)
Cobalt	8.40E-05	lb/MMscf	2.0E-08	8.8E-08	AP-42, Table 1.4-4 (Jul-1998)
Lead	5.00E-04	lb/MMscf	1.2E-07	5.2E-07	AP-42, Table 1.4-2 (Jul-1998)
Manganese	3.80E-04	lb/MMscf	9.0E-08	4.0E-07	AP-42, Table 1.4-4 (Jul-1998)
Mercury	2.60E-04	lb/MMscf	6.2E-08	2.7E-07	AP-42, Table 1.4-4 (Jul-1998)
Nickel	2.10E-03	lb/MMscf	5.0E-07	2.2E-06	AP-42, Table 1.4-4 (Jul-1998)
Selenium	2.40E-05	lb/MMscf	5.7E-09	2.5E-08	AP-42, Table 1.4-4 (Jul-1998)
<b>Total HAP (except HCHO)</b>			<b>4.3E-04</b>	<b>1.9E-03</b>	

Company Name:  
 Facility Name:  
 Project Description:

**EQT Gathering, LLC**  
**Grant Station**  
**R-13 Permit Application**

**De-ethanizer Emissions Calculations**

**Fuel Gas Heater Information:**

Source ID:	S003
Projected Startup Date:	2008

**Line Heater Fuel Information:**

Fuel Type:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,050
Heat Duty/Output Rating (MMBtu/hr)	0.05
Heat Input (MMBtu/hr)	0.08
Maximum Heat Input (MMBtu/yr):	675
Max. Fuel Consumption at 100% Load (MMscf/hr):	0.0001
Max. Fuel Consumption at 100% Load (MMscf/yr):	0.6
Potential Annual Hours of Operation (hr/yr):	8,760

**Line Heater Emissions Data:**

Pollutant	Emission Factor	Units	Maximum Potential Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
NO <sub>x</sub>	100	lb/MMScf	0.01	0.03	AP-42, Table 1.4-1 (Jul-1998)
VOC	5.5	lb/MMScf	4.0E-04	0.00	AP-42, Table 1.4-2 (Jul-1998)
CO	84	lb/MMScf	0.01	0.03	AP-42, Table 1.4-1 (Jul-1998)
SO <sub>x</sub>	0.6	lb/MMScf	4.4E-05	1.9E-04	AP-42, Table 1.4-2 (Jul-1998)
PM <sub>10</sub>	7.6	lb/MMScf	0.00	0.00	AP-42, Table 1.4-2 (Jul-1998)
PM <sub>2.5</sub>	7.6	lb/MMScf	0.00	0.00	AP-42, Table 1.4-2 (Jul-1998)
Formaldehyde (HCHO)	0.08	lb/MMScf	5.5E-06	2.4E-05	AP-42, Table 1.4-3 (Jul-1998)
GHG (CO <sub>2</sub> e)	See Table Below		9.02	39.50	40 CFR 98, Tables C-1 & C-2
Other (Total HAP except HCHO)	See Table Below		1.3E-04	0.00	AP-42, Tables 1.4-3 & 1.4-4 (Jul-1998)

**Notes:**

1. PM<sub>10</sub> and PM<sub>2.5</sub> are total values (filterable + condensable).
2. GHG (CO<sub>2</sub>e) is carbon dioxide equivalent, which is the summation of CO<sub>2</sub> (GWP = 1) + CH<sub>4</sub> (GWP = 25) + N<sub>2</sub>O (GWP = 298).
3. Total HAP is the summation of all hazardous air pollutants for which there is a published emission factor for this source type.

Company Name:  
 Facility Name:  
 Project Description:

**EQT Gathering, LLC**  
**Grant Station**  
**R-13 Permit Application**

De-ethanizer Emissions Calculations

**Greenhouse Gas (GHG) & Hazardous Air Pollutant (HAP) Emissions Calculations:**

Pollutant	Emission Factor	Units	Maximum Potential Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
<b>GHGs:</b>					
CO <sub>2</sub>	53.06	kg/MMBtu	9.01	39.46	40 CFR 98, Tables C-1 & C-2
CH <sub>4</sub>	0.001	kg/MMBtu	1.7E-04	7.4E-04	40 CFR 98, Tables C-1 & C-2
N <sub>2</sub> O	0.0001	kg/MMBtu	1.7E-05	7.4E-05	40 CFR 98, Tables C-1 & C-2
<b>GHG (CO<sub>2</sub>e)</b>			<b>9.02</b>	<b>39.50</b>	
<b>Organic HAPs:</b>					
2-Methylnaphthalene	2.40E-05	lb/MMscf	1.8E-09	7.7E-09	AP-42, Table 1.4-3 (Jul-1998)
3-Methylchloranthrene	1.80E-06	lb/MMscf	1.3E-10	5.8E-10	AP-42, Table 1.4-3 (Jul-1998)
7,12-Dimethylbenz(a)anthracene	1.60E-05	lb/MMscf	1.2E-09	5.1E-09	AP-42, Table 1.4-3 (Jul-1998)
Benzene	2.10E-03	lb/MMscf	1.5E-07	6.7E-07	AP-42, Table 1.4-3 (Jul-1998)
Benzo(a)pyrene	1.20E-06	lb/MMscf	8.8E-11	3.9E-10	AP-42, Table 1.4-3 (Jul-1998)
Benzo(b)fluoranthene	1.80E-06	lb/MMscf	1.3E-10	5.8E-10	AP-42, Table 1.4-3 (Jul-1998)
Benzo(g,h,i)perylene	1.20E-06	lb/MMscf	8.8E-11	3.9E-10	AP-42, Table 1.4-3 (Jul-1998)
Benzo(k)fluoranthene	1.80E-06	lb/MMscf	1.3E-10	5.8E-10	AP-42, Table 1.4-3 (Jul-1998)
Chrysene	1.80E-06	lb/MMscf	1.3E-10	5.8E-10	AP-42, Table 1.4-3 (Jul-1998)
Dibenzo(a,h)anthracene	1.20E-06	lb/MMscf	8.8E-11	3.9E-10	AP-42, Table 1.4-3 (Jul-1998)
Dichlorobenzene	1.20E-03	lb/MMscf	8.8E-08	3.9E-07	AP-42, Table 1.4-3 (Jul-1998)
Fluoranthene	3.00E-06	lb/MMscf	2.2E-10	9.6E-10	AP-42, Table 1.4-3 (Jul-1998)
Fluorene	2.80E-06	lb/MMscf	2.1E-10	9.0E-10	AP-42, Table 1.4-3 (Jul-1998)
n-Hexane	1.80E+00	lb/MMscf	1.3E-04	5.8E-04	AP-42, Table 1.4-3 (Jul-1998)
Indeno(1,2,3-c,d)pyrene	1.80E-06	lb/MMscf	1.3E-10	5.8E-10	AP-42, Table 1.4-3 (Jul-1998)
Naphthalene	6.10E-04	lb/MMscf	4.5E-08	2.0E-07	AP-42, Table 1.4-3 (Jul-1998)
Phenanthrene	1.70E-05	lb/MMscf	1.2E-09	5.5E-09	AP-42, Table 1.4-3 (Jul-1998)
Pyrene	5.00E-06	lb/MMscf	3.7E-10	1.6E-09	AP-42, Table 1.4-3 (Jul-1998)
Toluene	3.40E-03	lb/MMscf	2.5E-07	1.1E-06	AP-42, Table 1.4-3 (Jul-1998)
<b>Metal HAPs:</b>					
Arsenic	2.00E-04	lb/MMscf	1.5E-08	6.4E-08	AP-42, Table 1.4-4 (Jul-1998)
Beryllium	1.20E-05	lb/MMscf	8.8E-10	3.9E-09	AP-42, Table 1.4-4 (Jul-1998)
Cadmium	1.10E-03	lb/MMscf	8.1E-08	3.5E-07	AP-42, Table 1.4-4 (Jul-1998)
Chromium	1.40E-03	lb/MMscf	1.0E-07	4.5E-07	AP-42, Table 1.4-4 (Jul-1998)
Cobalt	8.40E-05	lb/MMscf	6.2E-09	2.7E-08	AP-42, Table 1.4-4 (Jul-1998)
Lead	5.00E-04	lb/MMscf	3.7E-08	1.6E-07	AP-42, Table 1.4-2 (Jul-1998)
Manganese	3.80E-04	lb/MMscf	2.8E-08	1.2E-07	AP-42, Table 1.4-4 (Jul-1998)
Mercury	2.60E-04	lb/MMscf	1.9E-08	8.4E-08	AP-42, Table 1.4-4 (Jul-1998)
Nickel	2.10E-03	lb/MMscf	1.5E-07	6.7E-07	AP-42, Table 1.4-4 (Jul-1998)
Selenium	2.40E-05	lb/MMscf	1.8E-09	7.7E-09	AP-42, Table 1.4-4 (Jul-1998)
<b>Total HAP (except HCHO)</b>			<b>1.3E-04</b>	<b>0.00</b>	

Company Name: EQT Gathering, LLC  
 Facility Name: Grant Station  
 Project Description: R-13 Permit Application

**Storage Tank Emissions Calculations**

Tank Description	Tank Contents	Tank ID #	Number of Tanks	Tank Capacity (gal)	Tank Diameter (ft)	Tank Length (ft)	VOC Emissions (tpy)	HAP Emissions (tpy)
Dehydration Fluids Tank	Produced Water	T1	1	2,000	10	3.4	<0.01	<0.01
Lube Oil Tank	Lube Oil	T2	1	2,000	5.3	12.0	<0.01	<0.01
Lube Oil Tank	Lube Oil	T3	1	2,000	5.3	12.1	<0.01	<0.01
Lube Oil Tank	Lube Oil	T4	1	1,000	4.8	7.3	<0.01	<0.01
Used Oil Tank	Used Oil	T5	1	2,000	5.3	12.1	<0.01	<0.01
Emulsified Oil Tank	Oil + Water	T6	1	4,200	5.3	25.5	<0.01	<0.01
Emulsified Oil Tank	Oil + Water	T7	1	2,000	5.3	12.1	<0.01	<0.01

Company Name: **EQT Gathering, LLC**  
 Facility Name: **Grant Station**  
 Project Description: **R-13 Permit Application**

**Hual Road Emissions Calculations**

**Unpaved Road Emissions**

Unpaved Roads:  $E \text{ (lb/VMT)} = k(s/12)^2(w/3)^b * [(365-p)/365]$

	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	
k Factor (lb/VMT)	4.9	1.5	0.15	AP-42 Table 13.2.2-2 (Final, 11/06)
Silt content, %	4.8	%		AP-42 Table 13.2.2-1 (11/06), for Sand and Gravel Processing
Number of Rain Days, p	150			AP-42 Figure 13.2.1-2
a	0.7	0.9	0.9	AP-42 Table 13.2.2-2 (Final, 11/06)
b	0.45	0.45	0.45	AP-42 Table 13.2.2-2 (Final, 11/06)

Description	Weight of Empty Truck (tons)	Weight of Truck w/ Max Load (tons)	Mean Vehicle Weight (tons)	Length of Unpaved Road		Trips Per Year	Mileage Per Year	Control (%)	Emissions (tpy)	
				Traveled (mile)	Weight (tons)				PM	PM <sub>2.5</sub>
Liquids Hauling	20	40	30	0.25	0.25	730	365	0	0.78	0.20
Employee Vehicles	3	3	3	0.25	0.25	200	100	0	0.08	0.02
<b>Total Potential Emissions</b>									<b>0.86</b>	<b>0.22</b>

Company Name: **EQT Gathering, LLC**  
 Facility Name: **Grant Station**  
 Project Description: **R-13 Permit Application**

**Fugitive Emissions Calculations**

**Fugitive Component Information:**

Component Type	Component Count	Gas Leak Emission Factor		Average Gas Leak Rate (lb/hr)	Max Gas Leak Rate (tpy)	Potential VOC Emissions (tpy)	Potential HAP Emissions (tpy)
		(lb/hr/component)	Factor Source				
Connectors	219	0.0004	EPA Protocol, Table 2-4	0.10	0.51	0.10	0.00
Flanges	350	0.001	EPA Protocol, Table 2-4	0.30	1.58	0.32	0.01
Open-Ended Lines	0	0.004	EPA Protocol, Table 2-4	0.00	0.00	0.00	0.00
Pump Seals	2	0.005	EPA Protocol, Table 2-4	0.01	0.06	0.01	0.00
Valves	432	0.010	EPA Protocol, Table 2-4	4.29	22.53	4.59	9.1E-02
Other	38	0.019	EPA Protocol, Table 2-4	0.74	3.87	0.79	0.02
<b>Total</b>				<b>5.43</b>	<b>28.55</b>	<b>5.82</b>	<b>0.12</b>

**Notes:**

- The component type "Other" includes any equipment type other than compressor seals, pressure relief valves, flanges, open-ended lines, pumps and valves that have fugitive emissions.
- The component count is an engineering estimate based on the design of a Grant station.
- Table 2-4 :Oil & Gas Production Operations Average Emission Factors, Protocol for Equipment Leak Emission Estimates, EPA 453/R-95-017, November 1995. Emission factors based on average measured TOC from component types indicated in gas service at O&G Production Operations
- Assumes maximum leak rate 20% greater than measured average leak rate.

**VOC and HAP Vented Blowdown Emissions**

Blowdown Emissions Sources	Vented Gas Volume Per Blowdown Event (scf)	Number of Blowdown Events per year	Total Volume NG Emitted (scf/yr)	Potential VOC Emissions (tpy)	Potential HAP Emissions (tpy)
Misc venting	5,000	10	50,000	0.09	0.00
<b>Total</b>				<b>0.09</b>	<b>0.001</b>

Density of natural gas: 0.05 lb/ft<sup>3</sup> @ STP (www.engineeringtoolbox.com)

**GHG Vented Blowdown Emissions**

Blowdown Emissions Sources	Vented Gas Volume Per Blowdown Event (scf)	Number of Blowdown Events per year	Total Volume NG Emitted (scf/yr)	Potential CH <sub>4</sub> Emissions <sup>1</sup> (tpy)	Potential CO <sub>2</sub> Emissions <sup>1</sup> (tpy)	Potential CO <sub>2,e</sub> Emissions (tpy)
Misc venting	5,000	10	50,000	0.8	0.00	20
<b>Total</b>				<b>0.8</b>	<b>0.002</b>	<b>20</b>

1. Calculated in accordance with Equations W-14 and W-35, and W-36 in Subpart W of 40 CFR 98.

Company Name: **EQT Gathering, LLC**  
 Facility Name: **Grant Station**  
 Project Description: **R-13 Permit Application**

**Fugitive Emissions Calculations**

**GHG Fugitive Emissions from Component Leaks:**

Component Type	Component Count	GHG Emission Factor		CH <sub>4</sub> Emissions (tpy)	CO <sub>2</sub> Emissions (tpy)	CO <sub>2</sub> e Emissions (tpy)
		(scf/hr/component)	Factor Source			
Connectors	219	0.004	40 CFR 98, Table W-1A	0.12	1.3E-04	3.10
Flanges	350	0.004	40 CFR 98, Table W-1A	0.20	2.1E-04	4.95
Open-Ended Lines	0	0.061	40 CFR 98, Table W-1A	0.00	0.0E+00	0.00
Pump Seals	2	13.3	40 CFR 98, Table W-1A	3.76	4.0E-03	94.10
Valves	432	0.03	40 CFR 98, Table W-1A	1.65	1.7E-03	41.26
Other	38	0.04	40 CFR 98, Table W-1A	0.22	2.3E-04	5.38
<b>Total</b>				<b>5.95</b>	<b>0.01</b>	<b>148.79</b>

**Notes:**

- The component count is an engineering estimate based on the design of a Grant station.
- Table W-1 of Subpart W - Default Whole Gas Emission Factors for Onshore Production, 40 CFR 98, Subpart W, Pre-publication version, November 8, 2010.
- Calculated in accordance with Equations W-31, W-35 and W-36 in Subpart W of 40 CFR 98.
- GHG (CO<sub>2</sub>e) is carbon dioxide equivalent, which is the summation of CO<sub>2</sub> (GWP = 1) + CH<sub>4</sub> (GWP = 25) + N<sub>2</sub>O (GWP = 298).

**Fugitive Component Emissions Data:**

Pollutant	Atmospheric Emissions		Emissions Estimation Method
	lbs/hr	tpy	
VOC	1.35	5.91	EPA Protocol, Table 2-4 & Site-Specific Gas Analysis
HAPs	0.03	0.12	EPA Protocol, Table 2-4 and Site-Specific Gas Analysis
GHG (CO <sub>2</sub> e)	39	169	40 CFR 98, Table W-1A and Site-Specific Gas Analysis

**Company Name:** EQT Gathering, LLC  
**Facility Name:** Grant Station  
**Project Description:** R-13 Permit Application

**Site-Specific Gas Analysis**

**Sample Location:** Grant Extended Gas Analysis  
**Sample Date:** 4/11/2014  
**HHV (Btu/scf):** 1,261

Constituent	Natural Gas Stream Speciation (Vol. %)	Natural Gas Stream Speciation (Wt. %)
Carbon Dioxide	0.08%	0.17%
Nitrogen	0.675%	0.892%
Methane	76.320%	57.720%
Ethane	14.698%	20.838%
Propane	5.432%	11.295%
Isobutane	0.503%	1.379%
n-Butane	1.276%	3.496%
Isopentane	0.359%	1.221%
n-Pentane	0.267%	0.909%
Cyclopentane	0.016%	0.053%
n-Hexane	0.078%	0.317%
Cyclohexane	0.015%	0.059%
Other Hexanes	0.333%	1.351%
Heptanes	0.024%	0.114%
Methylcyclohexane	0.015%	0.070%
2,2,4-Trimethylpentane	0.002%	0.011%
Benzene	0.003%	0.011%
Toluene	0.003%	0.012%
Ethylbenzene	0.009%	0.045%
Xylenes	0.002%	0.010%
C8 + Heavies	0.006%	0.033%
Totals	100%	100%

TOC (Total)	99.36%	98.94%
VOC (Total)	8.34%	20.39%
HAP (Total)	0.10%	0.41%

## GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Grant Compressor Station, WV  
 File Name: Z:\Client\EQT Corporation\West Virginia\Grant\Projects\153901.0094 Grant  
 Station Updates\Draft\Class I AA - Permit Determination\Attachment N - Emission  
 Calculations\20150525 Grant\_Dehy Emissions.ddf  
 Date: April 12, 2016

## DESCRIPTION:

Description: Increasing thruput from 6 to 10 MMSCF/D

Annual Hours of Operation: 8760.0 hours/yr

## EMISSIONS REPORTS:

## UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	1.4130	33.912	6.1890
Ethane	1.1597	27.833	5.0795
Propane	0.9591	23.019	4.2010
Isobutane	0.1672	4.013	0.7323
n-Butane	0.4987	11.970	2.1845
Isopentane	0.1300	3.120	0.5694
n-Pentane	0.1573	3.775	0.6890
n-Hexane	0.0644	1.545	0.2819
Cyclohexane	0.0631	1.515	0.2765
Other Hexanes	0.0732	1.758	0.3208
Heptanes	0.1685	4.043	0.7378
Benzene	0.1527	3.664	0.6687
Toluene	0.3269	7.845	1.4318
Xylenes	0.3450	8.281	1.5113
C8+ Heavies	0.8799	21.117	3.8539
<b>Total Emissions</b>	<b>6.5588</b>	<b>157.411</b>	<b>28.7276</b>
<b>Total Hydrocarbon Emissions</b>	<b>6.5588</b>	<b>157.411</b>	<b>28.7276</b>
<b>Total VOC Emissions</b>	<b>3.9861</b>	<b>95.666</b>	<b>17.4590</b>
<b>Total HAP Emissions</b>	<b>0.8890</b>	<b>21.335</b>	<b>3.8937</b>
<b>Total BTEX Emissions</b>	<b>0.8246</b>	<b>19.791</b>	<b>3.6118</b>

## EQUIPMENT REPORTS:

## ABSORBER

Calculated Absorber Stages: 1.47  
 Specified Dry Gas Dew Point: 7.00 lbs. H2O/MMSCF  
 Temperature: 110.0 deg. F  
 Pressure: 800.0 psig  
 Dry Gas Flow Rate: 10.0000 MMSCF/day  
 Glycol Losses with Dry Gas: 0.1982 lb/hr  
 Wet Gas Water Content: Saturated  
 Calculated Wet Gas Water Content: 91.73 lbs. H2O/MMSCF  
 Calculated Lean Glycol Recirc. Ratio: 1.99 gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	7.62%	92.38%
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	99.94%	0.06%
n-Butane	99.92%	0.08%
Isopentane	99.92%	0.08%
n-Pentane	99.90%	0.10%
n-Hexane	99.84%	0.16%
Cyclohexane	99.32%	0.68%
Other Hexanes	99.88%	0.12%
Heptanes	99.73%	0.27%
Benzene	94.07%	5.93%
Toluene	91.92%	8.08%
Xylenes	85.20%	14.80%
C8+ Heavies	98.95%	1.05%

REGENERATOR

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No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	21.82%	78.18%
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	0.50%	99.50%
n-Pentane	0.50%	99.50%
n-Hexane	0.50%	99.50%
Cyclohexane	3.20%	96.80%
Other Hexanes	1.00%	99.00%
Heptanes	0.50%	99.50%
Benzene	5.00%	95.00%
Toluene	7.91%	92.09%
Xylenes	12.95%	87.05%
C8+ Heavies	12.05%	87.95%

STREAM REPORTS:

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WET GAS STREAM

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Temperature: 110.00 deg. F  
 Pressure: 814.70 psia

Flow Rate: 4.18e+005 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.93e-001	3.83e+001
Carbon Dioxide	1.07e-001	5.17e+001
Nitrogen	1.24e+000	3.81e+002
Methane	8.06e+001	1.42e+004
Ethane	1.19e+001	3.93e+003
Propane	4.04e+000	1.96e+003
Isobutane	4.05e-001	2.59e+002
n-Butane	9.32e-001	5.96e+002
Isopentane	2.02e-001	1.60e+002
n-Pentane	1.93e-001	1.53e+002
n-Hexane	4.29e-002	4.07e+001
Cyclohexane	9.98e-003	9.24e+000
Other Hexanes	6.29e-002	5.96e+001
Heptanes	5.59e-002	6.16e+001
Benzene	2.99e-003	2.57e+000
Toluene	3.99e-003	4.05e+000
Xylenes	2.00e-003	2.33e+000
C8+ Heavies	4.49e-002	8.42e+001
Total Components	100.00	2.20e+004

## DRY GAS STREAM

Temperature: 110.00 deg. F  
 Pressure: 814.70 psia  
 Flow Rate: 4.17e+005 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.47e-002	2.92e+000
Carbon Dioxide	1.07e-001	5.17e+001
Nitrogen	1.24e+000	3.81e+002
Methane	8.07e+001	1.42e+004
Ethane	1.19e+001	3.93e+003
Propane	4.05e+000	1.96e+003
Isobutane	4.06e-001	2.59e+002
n-Butane	9.33e-001	5.96e+002
Isopentane	2.02e-001	1.60e+002
n-Pentane	1.93e-001	1.53e+002
n-Hexane	4.29e-002	4.06e+001
Cyclohexane	9.93e-003	9.18e+000
Other Hexanes	6.29e-002	5.96e+001
Heptanes	5.58e-002	6.15e+001
Benzene	2.82e-003	2.42e+000
Toluene	3.68e-003	3.72e+000
Xylenes	1.70e-003	1.99e+000
C8+ Heavies	4.45e-002	8.33e+001
Total Components	100.00	2.20e+004

## LEAN GLYCOL STREAM

Temperature: 110.00 deg. F  
 Flow Rate: 1.17e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
-----		
TEG	9.85e+001	6.48e+002
Water	1.50e+000	9.88e+000
Carbon Dioxide	9.92e-013	6.53e-012
Nitrogen	6.31e-013	4.15e-012
Methane	7.21e-018	4.75e-017
Ethane	8.31e-008	5.47e-007
Propane	5.93e-009	3.90e-008
Isobutane	7.62e-010	5.02e-009
n-Butane	1.88e-009	1.24e-008
Isopentane	9.92e-005	6.53e-004
n-Pentane	1.20e-004	7.90e-004
n-Hexane	4.91e-005	3.23e-004
Cyclohexane	3.17e-004	2.09e-003
Other Hexanes	1.12e-004	7.40e-004
Heptanes	1.29e-004	8.47e-004
Benzene	1.22e-003	8.04e-003
Toluene	4.26e-003	2.81e-002
Xylenes	7.80e-003	5.13e-002
C8+ Heavies	1.83e-002	1.21e-001
-----		
Total Components	100.00	6.58e+002

## RICH GLYCOL STREAM

-----  
Temperature: 110.00 deg. F  
Pressure: 814.70 psia  
Flow Rate: 1.25e+000 gpm  
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
-----		
TEG	9.26e+001	6.48e+002
Water	6.47e+000	4.53e+001
Carbon Dioxide	9.33e-003	6.53e-002
Nitrogen	5.92e-003	4.14e-002
Methane	2.02e-001	1.41e+000
Ethane	1.66e-001	1.16e+000
Propane	1.37e-001	9.59e-001
Isobutane	2.39e-002	1.67e-001
n-Butane	7.13e-002	4.99e-001
Isopentane	1.87e-002	1.31e-001
n-Pentane	2.26e-002	1.58e-001
n-Hexane	9.24e-003	6.47e-002
Cyclohexane	9.32e-003	6.52e-002
Other Hexanes	1.06e-002	7.40e-002
Heptanes	2.42e-002	1.69e-001
Benzene	2.30e-002	1.61e-001
Toluene	5.07e-002	3.55e-001
Xylenes	5.66e-002	3.96e-001
C8+ Heavies	1.43e-001	1.00e+000
-----		
Total Components	100.00	7.00e+002

## REGENERATOR OVERHEADS STREAM

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Temperature: 212.00 deg. F  
Pressure: 14.70 psia  
Flow Rate: 8.16e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	9.14e+001	3.54e+001
Carbon Dioxide	6.91e-002	6.53e-002
Nitrogen	6.88e-002	4.14e-002
Methane	4.10e+000	1.41e+000
Ethane	1.79e+000	1.16e+000
Propane	1.01e+000	9.59e-001
Isobutane	1.34e-001	1.67e-001
n-Butane	3.99e-001	4.99e-001
Isopentane	8.38e-002	1.30e-001
n-Pentane	1.01e-001	1.57e-001
n-Hexane	3.47e-002	6.44e-002
Cyclohexane	3.49e-002	6.31e-002
Other Hexanes	3.95e-002	7.32e-002
Heptanes	7.82e-002	1.68e-001
Benzene	9.09e-002	1.53e-001
Toluene	1.65e-001	3.27e-001
Xylenes	1.51e-001	3.45e-001
C8+ Heavies	2.40e-001	8.80e-001
Total Components	100.00	4.20e+001