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January 26, 2018

Assistant Director for Permitting
WV Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

SUBJECT: Antero Midstream LLC – Tamela Compressor Station
West Virginia Department of Environmental Protection, Division of Air Quality, 45CSR13 Class II Update Application for R13-3216B

To Whom it May Concern:

On behalf of Antero Midstream LLC, please find attached the 45CSR13 Air Permit Class II Update for permit number R13-3216B for the Tamela Compressor Station (Facility ID 017-00131) located in Doddridge County, West Virginia. A third Capstone C200 200 kilowatt generator is added to the Tamela Compressor Station as part of this Class II Update.

Enclosed are one hardcopy and two CDs containing the entire permit application including the application form and required attachments. Per 45CSR22, a $300 application fee is also enclosed, which covers the Class II application fee.

A copy of the Air Quality Permit Notice for the advertisement is included as Attachment P. As the Notice is being submitted simultaneously with the application, the official affidavit of publication will be submitted to the Division of Air Quality separately once it is completed.

Please call if you have any questions or if I can be of further assistance. I can be reached at (719) 632-3593 or by email at kmeszaros@kleinfelder.com.

Sincerely,
KLEINFELDER

Kaitlin Meszaros

Kaitlin Meszaros
Air Quality Specialist

Enclosures: Tamela Compressor Station R13-3216B Class II Update Application

KLEINFELDER 1801 California Street, Suite 1100, Denver, CO 80202 p | 303.237.6601 f | 303.237.6602

Antero Midstream LLC

Tamela Compressor Station

NSR Class II Update Application
West Virginia Department of Environmental Protection
Division of Air Quality
45CSR13 Class II Update to R13-3216B

Doddridge County, West Virginia

January 2018

Prepared by:

1801 California Street, Suite 1100
Denver, CO 80202
(303) 237-6601
Fax (303) 237-6602
www.kleinfelder.com

DEN18O72053

Table of Contents

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

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

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

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

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

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

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

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

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

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
Antero Midstream LLC

2. Federal Employer ID No. ***(FEIN):***
46-5517375

3. Name of facility *(if different from above):*
Tamela Compressor Station

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

5A. Applicant's mailing address:
1615 Wynkoop Street
Denver, CO 80202

5B. Facility's present physical address:
Long Run Rd
West Union, WV 26456

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:

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: Antero Midstream LLC owns the land for the proposed site
- If **NO,** you are not eligible for a permit for this source.

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

10. North American Industry Classification System **(NAICS)** code for the facility:
221210

11A. DAQ Plant ID No. (for existing facilities only):
017 – 00131

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
R13-3216B

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 Pennsboro, WV, head southeast on Collins Avenue. Turn left onto Main street and then the first right onto Wells Avenue. Make a slight right onto WV-74N and continue for 1.7 miles. Turn left onto facility entrance.

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
Long Run West Union, WV 26456	West Union	Doddridge
12.E. UTM Northing (KM): 4352.966	12F. UTM Easting (KM): 513.556	12G. UTM Zone: 17

13. Briefly describe the proposed change(s) at the facility:
Add third Capstone generator (200 kW).

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

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

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

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

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

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

Section II. Additional attachments and supporting documents.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

☒ General Emission Unit, specify: Generators

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

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

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

☐ Other Collectors, specify :

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

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

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

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

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

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

☐ **YES** ☒ **NO**

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

Section III. Certification of Information

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

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

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

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

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

Certification of Truth, Accuracy, and Completeness

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

Compliance Certification

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

SIGNATURE _____ DATE: 1/24/2018

(Please use blue ink) *(Please use blue ink)*

35B. Printed name of signee: Ward McNeilly		35C. Title: Vice President, Reserves Planning and Midstream
35D. E-mail: wmcneilly@anteroresources.com	36E. Phone: (303) 357-6822	36F. FAX: (303)357-7315
36A. Printed name of contact person (if different from above): Barry Schatz		36B. Title: Senior Environmental and Regulatory Manager
36C. E-mail: bschatz@anteroresources.com	36D. Phone: (303) 357-7276	36E. FAX: (303)357-7315

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

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

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

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

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

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

Discussion of Nearby Facilities

Tamela Compressor Station – Closest Antero Facilities

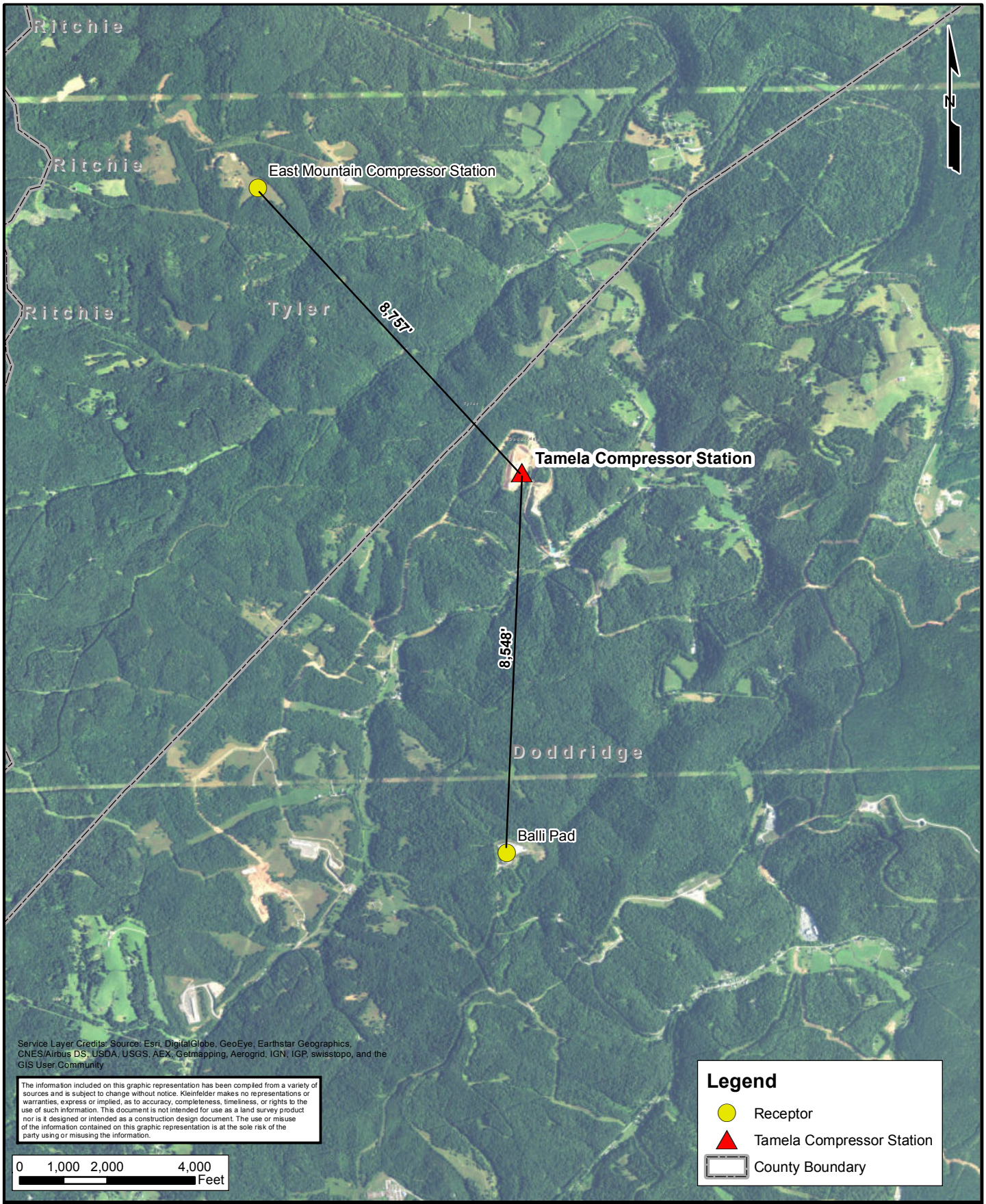
1. Common Control: Only those facilities that are owned and managed by Antero were included in the aggregation discussion. This includes Antero Resources Corporation production facilities in addition to the Antero Midstream LLC midstream facilities.

2. SIC Code: The Tamela Compressor Station will operate under SIC code 4923 (natural gas distribution). The closest facility owned by Antero Midstream LLC with this SIC code is the East Mountain Compressor station which is 1.7 miles northwest of the Facility. All Antero Resources Corporation production facilities operate under the SIC code of 1311 (crude petroleum and natural gas extraction). The closest facility operated by Antero Resources Corporation with the SIC code of 1311 is the Balli Pad 1.6 miles to the south.

3. Contiguous or Adjacent: The land between the Tamela Compressor Station and its nearest facility operating under SIC code 4923 is not owned or managed by Antero Midstream LLC or Antero Resources Corporation. Therefore, the two facilities are not contiguous or adjacent.

Based on this three-pronged evaluation, although the Tamela Compressor Station and East Mountain Compressor Station do belong to the same major industrial group, they should not be aggregated because they are not contiguous or adjacent.

The Tamela Compressor Station and Balli Pad should not be aggregated because they do not belong to the same major industrial group and do not directly rely on each other nor are they contiguous or adjacent.



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PROJECT NO.	20161767.001A
DRAWN:	6/20/2017
DRAWN BY:	N.Peace
CHECKED BY:	M. Steyskal
FILE NAME:	TamelaCompressor_UpdatedReceptor.mxd

Antero Midstream LLC

Tamela Compressor Station
Doddridge County, West Virginia

FIGURE

Attachment A.
Business Certificate

State of West Virginia

Certificate

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

ANTERO MIDSTREAM LLC

Control Number: 9A5E1

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

has filed its "Application for Certificate of Authority" in my office according to the provisions of West Virginia Code §31B-10-1002. I hereby declare the organization to be registered as a foreign limited liability company from its effective date of April 29, 2014, until a certificate of cancellation is filed with our office.

Therefore, I hereby issue this

CERTIFICATE OF AUTHORITY OF A FOREIGN LIMITED LIABILITY COMPANY

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

Given under my hand and the Great Seal of the State of West Virginia on this day of April 29, 2014

Natalie E Tennant

Secretary of State

FILED

APR 29 2014

IN THE OFFICE OF
WV SECRETARY OF STATE

Submitted by:
CT Corporation Rep-Terry Stamper
Terry.Stamper@wolterskluwer.com
304-776-1152

1152

Natalie E. Tennant
Secretary of State
1900 Kanawha Blvd E
Bldg 1, Suite 157-K
Charleston, WV 25305

Penney Barker, Manager
Corporations Division
Tel: (304)558-8000
Fax: (304)558-8381
Website: www.wvsos.com
E-mail: business@wvsos.com

Office Hours: Monday – Friday
8:30 a.m. – 5:00 p.m. ET

Control # A45E1

FILE ONE ORIGINAL.
(Two if you want a filed stamped copy returned to you)
FEE: $150

WV APPLICATION FOR CERTIFICATE OF AUTHORITY OF LIMITED LIABILITY COMPANY

1. The **name** of the company as registered in its **home state** is: Antero Midstream LLC

   and the **state or country of organization** is: Delaware

☒ **CHECK HERE to indicate you have obtained and submitted with this application a CERTIFICATE OF EXISTENCE (GOOD STANDING), dated during the current tax year, from your home state of original incorporation as required to process your application. The certificate may be obtained by contacting the Secretary of State's Office in the home state of original incorporation.**

2. The **name** to be used in **West Virginia** will be: [The **name must contain one of the required terms** such as limited liability company" or abbreviations such as "LLC" or "PLLC". See instructions for complete list of acceptable terms and requirements for use of trade name.]
   ☒ **Home State name as listed above,** if available in WV (If name is not available, check DBA Name box below and follow special instructions in **Section 2.** attached.)
   ☐ **DBA name** _____ (See special instructions in **Section 2.** Regarding the **Letter of Resolution** attached to this application.)

3. The company will be a: [See instructions for limitations on professions which may form P.L.L.C. in WV. All members must have WV professional license. In most cases, a **Letter of Authorization/Approval from the appropriate State Licensing Board** is required to process the application.]
   ☒ regular **L.L.C.**
   ☐ **Professional L.L.C.** for the profession of _____

4. The street address of the **principal office** is:
   No. & Street: 1625 17th Street, Suite 300
   City/State/Zip: Denver, Colorado 80202

   and the mailing address (if different) is:
   Street/Box: _____
   City/State/Zip: _____

5. The **address** of the **designated office** of the company in WV, if any, will be:
   No. & Street: 5400 D Big Tyler Road
   City/State/Zip: Charleston, West Virginia 25313

6. **Agent of Process:** Properly designated person to whom notice of legal process may be sent, if any:
   Name: C T Corporation System
   Address: 5400 D Big Tyler Road
   City/State/Zip: Charleston, West Virginia 25313

RECEIVED

APR 29 2014

214913 3/2/2014 8:35:00

7. **E-mail address** where business correspondence may be received: jgiannaula@anteroresources.com

8. **Website address of the business,** if any: N/A

9. The company is:
   - [X] an **at-will** company, for an indefinite period
   - [ ] a **term** company, for the term of _____ years, which will expire on _____.

10. The company is:
   - [X] **member**-managed. [List the names and addresses of all members.]
   - [ ] **manager**-managed. [List the names and addresses of all managers.]

List the **Name(s) and Address(es) of the Member(s)/Manager(s)** of the company (attach additional pages if necessary).

Name	Street Address	City, State, Zip
Antero Resources Corporation	1625 17th Street, Suite 300	Denver, Colorado 80202

11. All or specified members of a limited liability company are liable in their capacity as members for all or specified debts, obligations or liabilities of the company.
   - [X] **No**--All debts, obligations and liabilities are those of the company.
   - [ ] **Yes**--Those persons who are liable in their capacity as members for all debts, obligations or liability of the company have consented in writing to the adoption of the provision or to be bound by the provision.

12. The **purpose** for which this limited liability company is formed are as follows:
(Describe the type(s) of business activity which will be conducted, for example, "real estate," "construction of residential and commercial buildings," "commercial printing," "professional practice of architecture.")

Midstream oil and gas operating company

13. Is the business a **Scrap Metal Dealer**?
   - [ ] **Yes** [If "Yes," you must complete the **Scrap Metal Dealer Registration Form** (Form SMD-1) and proceed to question 14.].
   - [X] **No** [Proceed to question 14.]

14. The number of pages attached and included in this application is: 3

15. The requested **effective date** is: [Requested date *may not be earlier than filing nor later than 90 days after filing in our office.*]
☒ the date & time of filing in the Secretary of State's Office
☐ the following date _____ and time _____

16. **Contact and Signature Information*** (See below ***Important Legal Notice Regarding Signature***):

a.	Alvyn A. Schopp	(313) 357-7310
	Contact Name	Phone Number
b.	Alvyn A. Schopp	Chief Administrative Officer and Regional Vice President
	Print or type name of signer	Title / Capacity of Signer
c.	_____	April 28, 2014
	Signature	**Date**

****Important Legal Notice Regarding Signature:* Per West Virginia Code §31B-2-209, Liability for false statement in filed record.** If a record authorized or required to be filed under this chapter contains a false statement, one who suffers loss by reliance on the statement may recover damages for the loss from a person who signed the record or caused another to sign it on the person's behalf and knew the statement to be false at the time the record was signed.

Delaware

The First State

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY "ANTERO MIDSTREAM LLC" IS DULY FORMED UNDER THE LAWS OF THE STATE OF DELAWARE AND IS IN GOOD STANDING AND HAS A LEGAL EXISTENCE SO FAR AS THE RECORDS OF THIS OFFICE SHOW, AS OF THE TWENTY-NINTH DAY OF APRIL, A.D. 2014.

AND I DO HEREBY FURTHER CERTIFY THAT THE ANNUAL TAXES HAVE NOT BEEN ASSESSED TO DATE.

Jeffrey W. Bullock, Secretary of State

5466900 8300

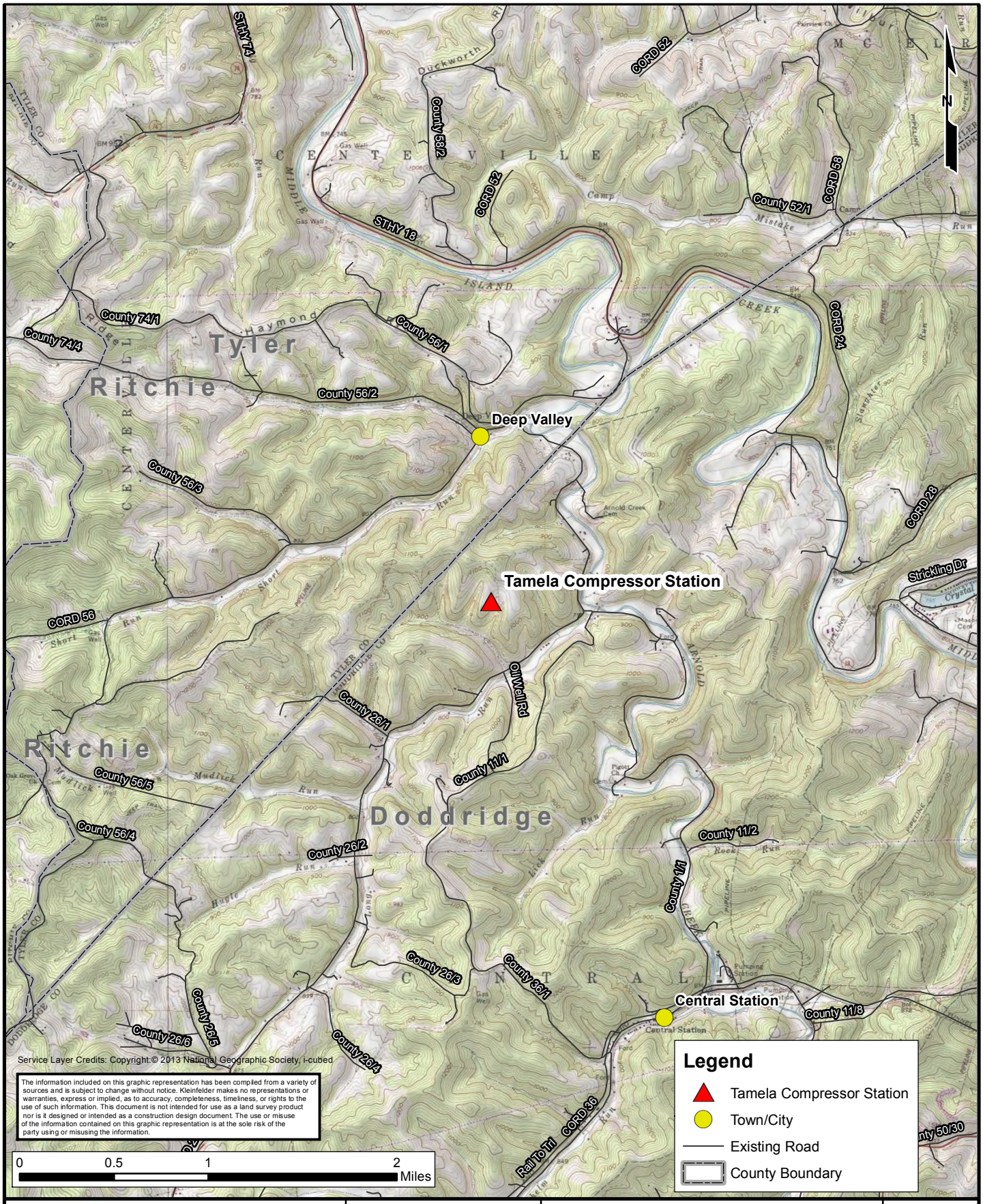
AUTHENTICATION: 1328067

140532521

DATE: 04-29-14

You may verify this certificate online at corp.delaware.gov/authver.shtml

Attachment B.
Area Map



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PROJECT NO.	20152091.001A
DRAWN:	10/6/2014
DRAWN BY:	J. Weber
CHECKED BY:	K.Meszaros
FILE NAME:	TamelaCompressor_Topo.mxd

Antero Midstream LLC

Tamela Compressor Station
Doddridge County, West Virginia

FIGURE

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PROJECT NO.	20152091.001A
DRAWN:	10/6/2014
DRAWN BY:	J. Weber
CHECKED BY:	K.Meszaros
FILE NAME:	TamelaCompressor_Receptor_Aerial.mxd

Antero Midstream LLC

Tamela Compressor Station
Doddridge County, West Virginia

FIGURE

Attachment C.
Installation and Startup Schedule

Tamela Compressor Station – Installation and Startup Schedule

The Tamela Compressor Station is an existing facility located in Doddridge County, WV, approximately 4.0 miles northwest of West Union, WV. Equipment is currently installed and operating per permit R13-3216B. The third generator is currently installed and will continue to operate per the permit conditions set for the other onsite generators.

Attachment D.
Regulatory Discussion

Tamela Compressor Station – Regulatory Discussion

Federal Regulations

40 CFR Part 60 – Standards of Performance for New Stationary Sources

I. *Subpart Kb - Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984.*

Applicability: Subpart Kb applies to volatile organic liquid storage tanks with a capacity greater than or equal to 75 m^3 (§60.110b(a)). Storage vessels with a design capacity less than 1,589.874 m3 do not apply to this subpart if they are used store condensate prior to custody transfer. The condensate and produced water storage tanks at the Tamela Compressor Station are 64 m^3. The settler tank is 79 m^3, but stores condensate prior to custody transfer. Therefore, Subpart Kb does not apply to the Tamela Compressor Station.

II. *Subpart GG - Standards of Performance for Stationary Gas Turbines*

Applicability: Subpart GG applies to all stationary gas turbines with a heat input at peak load equal to or greater than 10 million BTU per hour based on the lower heating value of the fuel (§60.330(a)). Since the microturbine generators at the Tamela Compressor Station have a heat input rating less than 10 million Btu per hour, Subpart GG does not apply.

III. *Subpart KKK - Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants for Which Construction, Reconstruction, or Modification Commenced After January 20, 1984, and on or Before August 23, 2011.*

Applicability: Subpart KKK applies to facilities built or modified before August 23, 2011, so Subpart KKK will not apply as the Tamela Compressor Station was constructed after August 23, 2011.

IV. *Subpart LLL - Standards of Performance for SO_2 Emissions from Onshore Natural Gas Processing for Which Construction, Reconstruction, or Modification Commenced After January 20, 1984, and on or Before August 23, 2011.*

Applicability: Subpart LLL applies to facilities built or modified before August 23, 2011, so Subpart LLL will not apply as the Tamela Compressor Station was constructed after August 23, 2011.

V. *Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*

Applicability: Subpart JJJJ applies to rich burn engines that were ordered after June 12, 2006 and manufactured on or after July 1, 2007 for engines with maximum power

greater than or equal to 500 hp (§60.4230(a)(4)(i)). Thus, Subpart JJJJ applies to the Tamela Compressor Station as the compressor engines were installed after July 1, 2007 and manufactured after July 1, 2010.

VI. *Subpart KKKK - Standards of Performance for Stationary Combustion Turbines*

Applicability: Subpart KKKK applies to all stationary combustion turbines with a heat input at peak load equal to or greater than 10 million BTU per hour based on the higher heating value of the fuel (§60.4305(a)). Since the microturbine generators at the Tamela Compressor Station have a heat input rating less than 10 million Btu per hour, Subpart KKKK does not apply.

VII. *Subpart OOOO - Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for Which Construction, Modification or Reconstruction Commenced after August 23, 2011, and on or before September 18, 2015*

Applicability: Subpart OOOO applies to reciprocating compressor facilities that were constructed, modified, or reconstructed after August 23, 2011 and on or before September 18, 2015 (§60.5365(c)). Tamela Compressor Station was not constructed during this time period, therefore Quad O does not apply.

VIII. *Subpart OOOOa - Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for Which Construction, Modification or Reconstruction Commenced after September 18, 2015*

Applicability: Subpart OOOOa applies to reciprocating compressor facilities that were constructed, modified, or reconstructed after September 18, 2015 (§60.5365a(c)). Also, Subpart OOOOa applies to storage vessel affected facilities with individual tank emissions greater than 6 tons per year (§60.5365a(e)). Lastly, the collection of fugitive emissions components at a compressor station is an affected facility under this Subpart (§60.5365a(j)). Since the Tamela Compressor Station was built after September 18, 2015 and is a compressor station with reciprocating compressors, Subpart OOOOa does apply. The pneumatic devices that were installed at Tamela Compressor Station are air-actuated or electric and therefore exempt from the requirements of this Subpart. The storage tank affected facility applicability for the onsite storage tanks will be determined within the first 30 days of production, per Subpart OOOOa.

40 CFR Part 61 – National Emission Standards for Hazardous Air Pollutants

I. *Subpart V – National Emission Standard for Equipment Leaks (Fugitive Emission Sources)*

Applicability: Subpart V applies to components such as compressors, valves, and pumps that are intended to operate in volatile hazardous air pollutant (VHAP) service (§61.240(a)). VHAP service means that a component contains or contacts a fluid that is at least 10 percent by weight a VHAP. Subpart V does not apply to the Tamela

Compressor Station because none of the components have fluid (natural gas, water, or condensate) that is over 10 percent by weight of any VHAP.

40 CFR Part 63 – National Emission Standards for Hazardous Air Pollutants for Source Categories

I. Subpart HH – National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities

Applicability: Subpart HH applies to oil and natural gas production facilities that are a major or area source of HAP emissions, and that process, upgrade, or store hydrocarbon liquids or natural gas prior to the transmission and storage source category (§63.760(a)). Subpart HH does apply to the Tamela Compressor Station, and because it is an area source of HAP emissions, the two (2) TEG dehydrators are applicable sources under Subpart HH (§63.760(b)(2)). However, actual benzene emissions from the dehydrators at the Tamela Compressor Station are less than 1 ton per year, so both dehydrators are exempt from all requirements except recordkeeping (§63.764(e)(1)(ii)).

II. Subpart HHH – National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities

Applicability: Subpart HHH applies to natural gas transmission and storage facilities that are a major source of HAP emissions (§63.1270(a)). Subpart HHH does not apply to the Tamela Compressor Station as it is not a major source of HAP emissions. Further, the Tamela Compressor Station is prior to the gas transmission and storage phase.

III. Subpart EEEE – National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline)

Applicability: Subpart EEEE applies to organic liquids distribution operations that are located at major source of HAP emissions (§63.2334(a)). Subpart EEEE does not apply to the Tamela Compressor Station as it is not a major source of HAP emissions.

IV. Subpart YYYY – National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines

Applicability: Subpart YYYY applies to stationary combustion turbines located at major sources of HAP emissions (§63.6085(a)). Since the Tamela Compressor Station is not a major source of HAP emissions, Subpart YYYY does not apply.

V. Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

Applicability: Subpart ZZZZ applies to stationary RICE at a major or area source of HAP emissions (§63.6585). Subpart ZZZZ applies to the Tamela Compressor Station as the

compressor engines are new RICE. The engines will meet Subpart ZZZZ by meeting 40 CFR Part 60, Subpart JJJJ as the Tamela Compressor Station is an area source of HAP emissions (§63.6590(c)(1)).

VI. *Subpart DDDDD – National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters*

Applicability: Subpart DDDDD applies to process heaters at a major source of HAP emissions (§63.7485). Subpart DDDDD does not apply to the Tamela Compressor Station as it is not a major source of HAP emissions.

West Virginia State Regulations

Title 45 Legislative Rule – Division of Environmental Protection, Office of Air Quality

The following Title 45 Legislative Rules will be applicable to the Tamela Compressor Station:

I. *45CSR2 – To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers*

II. *45CSR2A – Testing, Monitoring, Recordkeeping and Reporting Requirements Under 45CSR2*

III. *45CSR4 – To Prevent and Control the Discharge of Air Pollutants into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors*

IV. *45CSR6 – Control of Air Pollution from Combustion of Refuse*

V. *45CSR8 – Ambient Air Quality Standards*

VI. *45CSR11 – Prevention of Air Pollution Emergency Episodes*

VII. *45CSR13 – Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation*

VIII. *45CSR16 – Standards of Performance for New Stationary Sources Pursuant to 40 CFR, Part 60*

IX. *45CSR20 – Good Engineering Practice as Applicable to Stack Heights*

X. *45CSR22 – Air Quality Management Fee Program*

XI. *45CSR27 – To Prevent and Control the Emissions of Toxic Air Pollutants*

XII. *45CSR33 – Acid Rain Provisions and Permits*

XIII. *45CSR34 – Emission Standards for Hazardous Air Pollutants for Source Categories Pursuant to 40 CFR, Part 63*

XIV. *45CSR38 – Provisions for Determination of Compliance with Air Quality Management Rules*

XV. *45CSR42 – Greenhouse Gas Emissions Inventory*

Attachment E.
Plot Plan

NOTES:

REFERENCE DRAWINGS

DWG. NO.	TITLE

REVISIONS

NO.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
1	ISSUED FOR REVIEW	SB		JW		PS	

Antero

TAMELA SMITH COMPRESSOR STA.

KAHUNA VENTURES LLC
WESTMINSTER, CO 80021
303-451-7374
BY: KAHUNA DESIGN LLC.

SITE
EQUIPMENT LOCATION PLAN

DRAWN BY: S. MINJAREZ	CHECKED: J. WARMAN	APPROVED: P. STOCKEBRAND
CREATION DATE: 09/09/14	CHECK DATE:	APPR. DATE:
Proj. No.:	DWG. No.: TSCS-PI-3006	SHEET No.: 1 OF 1
SCALE: 1"=30'		

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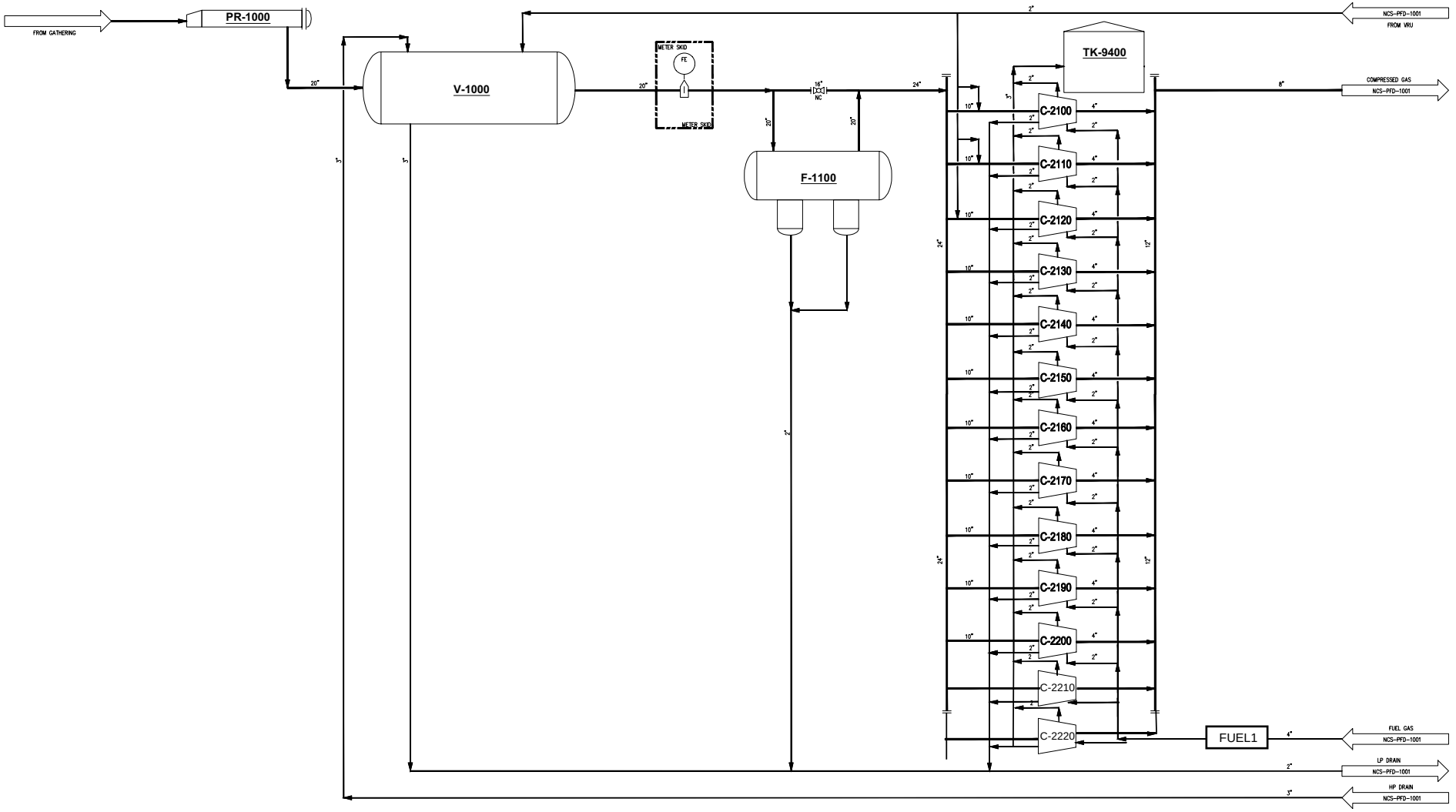
PLOT TIME/DATE: September 11, 2014

FILE LOCATION: N:\PROJECTS\ANTERO RESOURCES\MEA\2014.00 - WEST MOUNTAIN CS\3000-SITE PLAN - DATA\TSCS-PI-3006.DWG

Attachment F.
Process Flow Diagram



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REFERENCE DRAWINGS		REVISIONS							
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		A	ISSUED FOR REVIEW	AC	05/08/14	JW	05/08/14	PS	05/08/14
DWG. NO.	TITLE	NO.	DESCRIPTION	BY	DATE	CHK.	DATE	APPR.	DATE

Antero Resources
KAHUNA VENTURES LLC
WESTMINSTER, CO 80031
303-451-7574
BY: KAHUNA DESIGN LLC.

PROCESS FLOW DIAGRAM

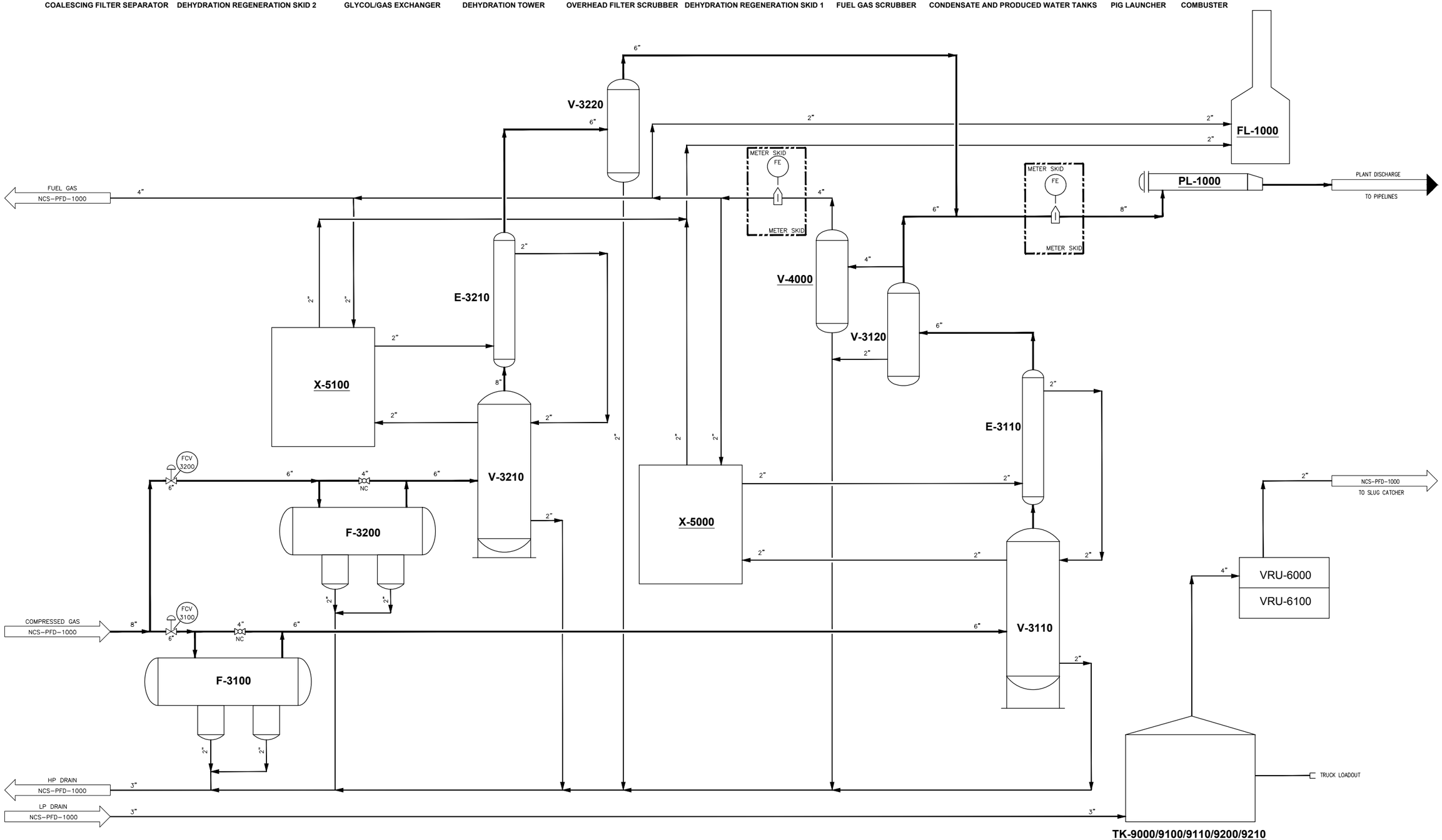
DRAWN BY: A. COOLEY	CHECKED: J. WARMAN	APPROVED: P. STOCKEBRAND
CREATION DATE: 05/05/14	CHECK DATE: 05/05/14	APPR. DATE: 05/05/14
Proj. No.: 4083.0164.00	DWG. No.: TCS-PFD-1000	SHEET No.: 1 OF 2
SCALE: NONE		B

PLOT TIME/DATE: June 19, 2014

LAST SAVED: 06/19/14 BY: Alex Cooley

FILE LOCATION: K:\PROJECTS\ANTERO APPALACHIAN RESOURCES\4083.0164.00 - NICHOLS CS\100-PFD-PID\NCS-PFD-1000.DWG

F-3100/3200 COALESCING FILTER SEPARATOR | **X-5100** DEHYDRATION REGENERATION SKID 2 | **E-3110/3210** GLYCOL/GAS EXCHANGER | **V-3110/3210** DEHYDRATION TOWER | **V-3120/3220** OVERHEAD FILTER SCRUBBER | **X-5000** DEHYDRATION REGENERATION SKID 1 | **V-4000** FUEL GAS SCRUBBER | **TK-9000/9100/9110/9200/9210** CONDENSATE AND PRODUCED WATER TANKS | **PL-1000** PIG LAUNCHER | **FL-1000** COMBUSTER



NOTES:

REFERENCE DRAWINGS

DWG. NO.	TITLE

REVISIONS

NO.	DESCRIPTION	BY	DATE	CHK.	DATE	APPR.	DATE
B	ISSUED FOR AIR PERMIT	AC	06/19/14	LW	06/19/14	PS	06/19/14
A	ISSUED FOR REVIEW	AC	05/06/14	JW	05/06/14	PS	05/06-14

Antero Resources

KAHUNA VENTURES LLC
WESTMINSTER, CO 80021
303-451-7374
BY: KAHUNA DESIGN LLC.

PROCESS FLOW DIAGRAM

DRAWN BY: A. COOLEY	CHECKED: J. WARMAN	APPROVED: P. STOCKEBRAND
CREATION DATE: 05/05/14	CHECK DATE: 05/05/14	APPR. DATE: 05/06/14
Proj. No.: 4083.0164.00	DWG. No.: TCS-PFD-1001	SHEET No. 2 OF 2
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PLOT TIME/DATE: June 19, 2014

LAST SAVED: 06/18/14 BY: Abra Cooley

FILE LOCATION:N:\PROJECTS\ANTERO APPALACHIAN RESOURCES\4083.0164.00 - NICHOLS CS\1000-PFD-PID\NCS-PFD-1001.DWG

Attachment G.
Process Description

Tamela Compressor Station – Process Description

The Tamela Compressor Station is located in Doddridge County, West Virginia. Gas from surrounding pipelines enters the facility through one (1) receiver and associated slug catcher. From there, the gas is metered and routed through a filter separator. Any produced liquids from the scrubber or separator are sent to the 500 barrel settling tank (TK-9000). Gas from the filter separator is sent to thirteen (13) 1680 hp Waukesha compressor engines (C-2100 – C-2220). The thirteen (13) compressor engines are controlled with NSCR catalysts and air-fuel ratio controllers (1C – 11C, 15C & 16C). Fuel gas for the compressor engines will be treated prior to the engines by a fuel conditioning skid with a 0.5 MMBtu/hr heater (FUEL1) to allow more complete combustion. Produced fluids are routed to the settling tank and high pressure gas is sent to one of the two (2) TEG dehydrators.

Each TEG dehydrator (V-3110 & V-3210) contains a flash gas tank and 1.5 MMBtu/hr reboiler (F-3100 & F-3200). Each dehydrator has a design rate of 110 MMscf/day. Within the dehydrator unit, vent gas from the flash gas tank (V-3120 & V-3220) is routed to the reboiler (F-3100 & F-3200) and used as fuel. In the case where the flash tank gas cannot be used by the reboiler due to excess gas or the reboiler being offline, the gas will be sent to the VRUs (VRU-6000 and VRU-6100) via the storage tanks (TK-9000 –TK-9210) and thus controlled by 98%. Combustion emissions from each reboiler are routed to the atmosphere. The dehydrator still vents (V-3110 & V-3210) are controlled by a flare with at least 98% control efficiency (FL-1000). Produced fluids from the dehydrator are routed to the settling tank. The dry gas from the dehydration process is either routed to a fuel gas scrubber, metered, and routed to the compressors as fuel gas or metered and sent to the high pressure facility discharge pipeline.

All produced fluids enter one (1) 500 barrel settling tank (TK-9000) where the fluids settle out as either condensate or produced water. The produced water goes to two (2) 400 barrel produced water tanks (TK-9200 – TK-9210) and the condensate goes to two (2) 400 barrel condensate tanks (TK-9100 – TK-9110). Flashing only occurs at the settling tank as the fluids stabilize in the settling tank before going to the other storage tanks. All five (5) tanks are connected to a primary vapor recovery unit (VRU-6000) where tank vapors are collected and recycled back into the gas system right before the initial filter scrubber. A second vapor recovery unit (VRU-6100) is used as back-up to the primary vapor recovery unit. The produced fluids are trucked out via tanker trucks as needed (LDOUT1). The loading emissions are uncontrolled. The anticipated production is 150 barrels per day of condensate and 45 barrels per day of produced water.

Three (3) natural gas microturbine generators, each rated at 200 kWe, will supply power to the facility (G-8000, G-8100, G-8200). Emissions were calculated as though each generator operates 8760 hours per year as to not limit operations. The fuel line for the generators will be heated by a small catalytic heater (CATHT1) with a burner rating of 24 Btu/hr.

There will also be small storage tanks located at the facility. Their ID number, description, and exact size are listed in the table below.

Fugitive emissions from component leaks and emissions from venting or blowdown events (VENT1) will also occur.

Tag Number	Description	Gallons
TK-9300 & TK-9320	Compressor Skid Oily Water Tanks	500 each
TK-9310 & TK-9330	Used Oil Tank	500 each
TK-9410	TEG Make-Up Tank	1,000
TK-9420	Compressor Coolant Tank	2,000
TK-9430	Engine Lube Oil Tank	2,000
TK-9440	Compressor Lube Oil Tank	2,000
TK-9400	Compressor Waste Oil Tank	4,200

Attachment H.
Material Safety Data Sheets

SAFETY DATA SHEET

Material Name: Wet Field Natural Gas

SYNONYMS: **CNG, Natural Gas, Methane.**

* * * Section 1 – PRODUCT AND COMPANY IDENTIFICATION * * *

PRODUCT NAME: **Wet Field Natural Gas**
PRODUCT CODES: **CAS Reg. No. 68410-63-9**

EMERGENCY PHONE: **(800) 878-1373**
AFTER HOURS: **(800) 878-1373**

PRODUCER: **Antero Resources**
ADDRESS: **1615 Wynkoop Street**
Denver, Colorado 80202

CHEMTREC PHONE: **(800) 424-9300**

* * * Section 2 – HAZARDS IDENTIFICATION * * *

GHS Classification:

Flammable Gas – Category 1.
Gases Under Pressure – Gas.
Specific Target Organ Systemic Toxicity (STOT) – Single Exposure Category 2.

GHS LABEL ELEMENTS

Symbol(s)

Signal Word

Danger

Hazard Statements

Extremely flammable gas.
Contains gas under pressure, may explode if heated.
May cause damage to central nervous and respiratory systems.

Precautionary Statements

Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking.
Do not breathe fume/gas/mist/vapors/spray.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.

Response

Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.
If exposed to gas, or concerned about possible exposure: Call a POISON CENTER or doctor/physician.

Storage

Protect from sunlight. Store in a well-ventilated place.
Store in a secure area.

Disposal

Dispose of contents/containers in accordance with local/regional/national/international regulations.

* * * Section 3 – COMPOSITION / INFORMATION ON INGREDIENTS * * *

CAS #	Component	Percent
74-82-8	Methane	72 - 97
78-84-0	Ethane	2.2 - 14
74-98-6	Propane	0.0 – 8.0
106-97-8	Butanes	0.0 – 3.5
109-66-0	Pentanes	0.0 – 1.4
110-54-3	Hexanes	0.0 – 0.5
7727-37-9	Nitrogen	< 0.4
124-38-9	Carbon Dioxide	< 0.2
7782-44-7	Oxygen	< 0.04

Because natural gas is a natural product, composition can vary greatly.

* * * Section 4 – FIRST AID MEASURES * * *

First Aid: Eyes

In case of freeze burn, cover eyes to protect from light. Flush eyes with running water for at least fifteen (15) minutes. Following flushing, seek medical attention.

First Aid: Skin

Remove contaminated clothing. In case of blistering, frostbite or freeze burns, seek immediate medical attention.

Material Name: Wet Field Natural Gas

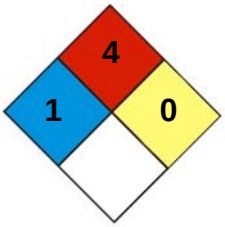
First Aid: Ingestion

Risk of ingestion is extremely low. However, if oral exposure occurs, seek immediate medical assistance.

First Aid: Inhalation

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

* * * Section 5 – FIRE FIGHTING MEASURES * * *



NFPA 704 Hazard Class

Health: **1** Flammability: **4** Instability: **0** (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

General Fire Hazards

See Section 9 for Flammability Properties.
Forms a flammable mixture with air. If released, the resulting vapors will disperse with the prevailing wind. If a source of ignition is present where the vapor exists at a 5 – 15% concentration in air, the vapor will burn along the flame front toward the source of the fuel.

Hazardous Combustion Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

Extinguishing Media

Any extinguisher suitable for Class B fires, dry chemical, firefighting foam, CO2, and other gaseous agents. However, fire should not be extinguished unless flow of gas can be immediately stopped.

Unsuitable Extinguishing Media

None.

Fire Fighting Equipment / Instructions

Gas fires should not be extinguished unless flow of gas can be immediately stopped. Shut off gas source and allow gas to burn out. If spill or leak has not ignited, determine

if water spray may assist in dispersing gas or vapor to protect personnel attempting to stop leak. Use water to cool equipment, surfaces and piping exposed to fire and excessive heat. For large fire, the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Isolate area, particularly around piping. Let the fire burn unless leak can be stopped. Concentrate fire-fighting efforts on objects / materials ignited by the initial fire. Withdraw immediately in the event of a rising sound from a venting safety device.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH-approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

* * * Section 6 – ACCIDENTAL RELEASE MEASURES * * *

Recovery and Neutralization

Stop the source of the release, if safe to do so.

Materials and Methods for Clean-Up

Consider the use of water spray to disperse gas vapors. Do not use water spray to direct gas vapors toward sewer or drainage systems. Isolate the area until gas has dispersed. Ventilate and gas test area before entering.

Emergency Measures

Evacuate nonessential personnel and secure all ignition sources. No road flares, smoking or flames in hazard area. Consider wind direction. Stay upwind and uphill, if possible. Vapor cloud may be white, but color will dissipate as cloud disperses. Fire and explosion hazard is still present.

Personal Precautions and Protective Equipment

Cooling effect of expanding gas from leak may present frostbite / freeze burn hazard. Wear flame retardant (FR) clothing around un-ignited leak. Wear fire protective clothing around an active fire.

Environmental Precautions

Do not flush gas vapors toward sewer or drainage systems.

Prevention of Secondary Hazards

None.

* * * Section 7 – HANDLING AND STORAGE * * *

Handling Procedures

Keep away from flame, sparks and excessive temperatures. Bond and ground containers. Use only in well ventilated areas.

Storage Procedures

Natural gas will be contained in the pipeline. Keep away from flame, sparks, excessive temperatures and open flames. Empty pipeline segments may contain explosive residues from natural gas liquids. Do not cut, heat, weld or expose containers to sources of ignition sections of pipeline unless the sections have been purged of natural gas residues.

Incompatibilities

Keep away from strong oxidizers, ignition sources and heat.

* * * Section 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION * * *

Component Exposure Limits

Methane (74-82-8)

ACGIH: 1000 ppm TWA (listed under Aliphatic hydrocarbon gases : Alkane C1-4)

Ethane (74-84-0)

ACGIH: 1000 ppm TWA (listed under Aliphatic hydrocarbon gases : Alkane C1-4)

Propane (74-98-6)

ACGIH: 2500 ppm TWA (listed under Aliphatic hydrocarbon gases : Alkane C1-4)

Butane (106-97-8)

ACGIH: 800 ppm TWA (listed under Aliphatic hydrocarbon gases : Alkane C1-4)

Pentanes (109-66-0)

ACGIH: 600 ppm TWA (listed under Pentane, all isomers)

Hexanes (110-54-3)

ACGIH: 50 ppm TWA (listed under n-Hexane)

Material Name: Wet Field Natural Gas

Nitrogen (7727-37-9)

Simple Asphyxiant

Carbon Dioxide (124-38-9)

ACGIH: 5000 ppm TWA (listed under Carbon Dioxide)

Oxygen (7782-44-7)

N/A – Necessary for life

Engineering Measures

Use adequate ventilation to keep gas and vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces. Use explosion-proof equipment and lighting in classified / controlled areas.

Personal Protective Equipment: Respiratory

Use a NIOSH approved positive-pressure, supplied air respirator with escape bottle or self-contained breathing apparatus (SCBA) for gas concentrations above occupational exposure limits, for potential for uncontrolled release, if exposure levels are not known, or in an oxygen-deficient atmosphere. CAUTION: Flammability limits (i.e., explosion hazard should be considered when assessing the need to expose personnel to concentrations requiring respiratory protection.

Personal Protective Equipment: Hands

Use cold-impervious, insulating flame-retardant (FR) gloves where contact with pressurized gas may occur.

Personal Protective Equipment: Eyes

Where there is a possibility of pressurized gas contact, wear splash-proof safety goggles and faceshield.

Personal Protective Equipment: Skin and Body

Where contact with pressurized gas may occur, wear flame-retardant (FR) and a faceshield.

* * * Section 9 – PHYSICAL AND CHEMICAL PROPERTIES * * *

Appearance:	Colorless	**Odor:**	Odorless to slight petroleum odor
Physical State:	Gas	**pH:**	ND
Vapor Pressure:	40 atm @ -187°F (-86°C)	**Vapor Density:**	0.6
Boiling Point:	-259°F (-162°C)	**Melting Point:**	ND
Solubility (H2O):	3.5%	**Specific Gravity:**	0.4 @ -263°F (-164°C)

Material Name: Wet Field Natural Gas

Evaporation Rate:	ND	**VOC:**	ND
Octanol / H2O Coeff.:	ND	**Flash Point:**	Flammable Gas
Flash Point Method:	N/A		
Lower Flammability Limit: (LFL):	3.8 – 6.5	**Upper Flammability Limit: (UFL):**	13-17
Auto Ignition:	900-1170°F (482-632°C)	**Burning Rate:**	ND

* * * Section 10 – CHEMICAL STABILITY & REACTIVITY INFORMATION * * *

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

Keep away from strong oxidizers, ignition sources and heat.

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

* * * Section 11 – TOXICOLOGICAL INFORMATION * * *

Acute Toxicity

A: General Product Information

Methane and ethane, the main components of natural gas, are considered practically inert in terms of physiological effects. At high concentrations these materials act as simple asphyxiants and may cause death due to lack of oxygen.

B. Component Analysis – LD50/LC50

Methane (74-82-8)

Inhalation LC50 Mouse 326 g/m3 2h

Ethane (74-84-0)

Inhalation LC50 Rat 658 mg/l 4h

Propane (74-98-6)

Inhalation LC50 Rat 658 mg/l 4h

Material Name: Wet Field Natural Gas

Butanes (106-97-8)
Inhalation LC50 Rat 658 g/m3 4h

Pentanes (109-66-0)
Inhalation LD50 Rat 364 g/m3 4h

Hexanes (110-54-3)
Inhalation LC50 Rat > 20 mg/l 4h

Nitrogen (7727-37-9)
Simple Asphyxiant

Carbon Dioxide (124-38-9)
Inhalation LC50 Human 100,000 ppm 1minute

Oxygen (7782-44-7)
N/A – Necessary for life

Potential Health Effects: Skin Corrosion Property / Stimulativeness
This product is not reported to have any skin sensitization effects.

Generative Cell Mutagenicity
This product is not reported to have any mutagenic effects.

Carcinogenicity

A: General Product Information
This product is not reported to have any carcinogenic effects.

B: Component Carcinogenicity
None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

Reproductive Toxicity
This product is not reported to have any reproductive toxicity effects.

Specified Target Organ General Toxicity: Single Exposure
This product may cause damage to the heart.

Specified Target Organ General Toxicity: Repeated Exposure
This product is not reported to have any specific target organ repeat effects.

Aspiration Respiratory Organs Hazard
This product is not reported to have any aspiration hazard effects.

* * * Section 12 – ECOLOGICAL INFORMATION * * *

Ecotoxicity

A: General Product Information

Keep gas and vapors out of sewers, drainage areas, and waterways. Report spills and releases, as applicable under Federal and State regulations.

B: Component Analysis – Ecotoxicity – Aquatic Toxicity

No ecotoxicity data are available for this product's components.

Persistance / Degradability

No information available.

Bioaccumulation

No information available.

Mobility in Soil

No information available.

* * * Section 13 – DISPOSAL CONSIDERATIONS * * *

Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment Recommendations.

Disposal of Contaminated Containers or Packaging

Dispose of contents / container in accordance with local / regional / national / international regulations.

* * * Section 14 – TRANSPORTATION INFORMATION * * *

DOT Information

Shipping Name: Natural Gas, Compressed

UN #: 1971 **Hazard Class:** 2.1

Placard:

* * * Section 15 – REGULATORY INFORMATION * * *

Regulatory Information

Component Analysis

None of this products components are listed under SARA Section 302 (40 CFR 355 Appendix A.
n-hexane is listed under SARA Section 313 (40 CFR 372.65). However the concentration of this component is approximately 0.01 % in compressed natural gas and is therefore far under the reporting threshold for the chemical.

n-hexane is listed under CERCLA (40 CFR 302.4). However the concentration of this component is approximately 0.01 % in compressed natural gas and is therefore far under the reporting threshold for the chemical.

SARA Section 311/312 – Hazard Classes

Acute Health	Chronic Health	Fire	Sudden Release of Pressure	Reactive
---	---	X	X	---

SARA Section 313 – Supplier Notification

This product contains one chemical (n-Hexane) that is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-to-know act (EPCRA) of 1986 and of 40 CFR 372. However the concentration of this component is approximately 0.01 % in compressed natural gas and is therefore far under the reporting threshold for the chemical.

State Regulations

Component Analysis – State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Methane	74-82-8	No	No	Yes	Yes	Yes	No
Ethane	78-84-0	No	No	Yes	Yes	Yes	No
Propane	74-98-6	No	No	Yes	Yes	Yes	Yes
Butane	106-97-8	Yes	No	Yes	Yes	Yes	Yes
Pentanes	109-66-0	Yes	No	Yes	Yes	Yes	Yes
Hexanes	110-54-3	Yes	Yes	Yes	Yes	Yes	Yes
Nitrogen	7727-37-9	No	No	No	No	No	No
Carbon Dioxide	124-38-9	Yes	No	Yes	Yes	Yes	Yes
Oxygen	7782-44-7	No	No	No	No	No	No

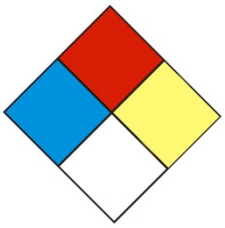
SAFETY DATA SHEET

Material Name: Wet Field Natural Gas

* * * Section 16 – OTHER INFORMATION * * *

NFPA® Hazard Rating

Health	1
Fire	4
Reactivity	0



HMIS® Hazard Rating

Health	1	Moderate
Fire	4	Severe
Physical	0	Minimal
		* Chronic

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act: ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; NJTSR = New Jersey Trade Secret Registry.

Literature References

None

Other Information

The information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

Date of Preparation: February 7, 2014

Date of Last Revision: March 4,, 2014

End of Sheet

SAFETY DATA SHEET

Material Name: Dry Field Natural Gas **US GHS**

SYNONYMS: **CNG, Natural Gas, Methane.**

* * * Section 1 – PRODUCT AND COMPANY IDENTIFICATION * * *

PRODUCT NAME: **Dry Field Natural Gas**
PRODUCT CODES: **CAS Reg. No. 68410-63-9**

EMERGENCY PHONE: **(800) 878-1373**
AFTER HOURS: **(800) 878-1373**

PRODUCER: **Antero Resources**
ADDRESS: **1615 Wynkoop Street**
Denver, Colorado 80202

CHEMTREC PHONE: **(800) 424-9300**

* * * Section 2 – HAZARDS IDENTIFICATION * * *

GHS Classification:

Flammable Gas – Category 1.
Gases Under Pressure – Gas.
Specific Target Organ Systemic Toxicity (STOT) – Single Exposure Category 2.

GHS LABEL ELEMENTS

Symbol(s)

Signal Word

Danger

Hazard Statements

Extremely flammable gas.
Contains gas under pressure, may explode if heated.
May cause damage to central nervous and respiratory systems.

Precautionary Statements

Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking.
Do not breathe fume/gas/mist/vapors/spray.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.

Response

Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.
If exposed to gas, or concerned about possible exposure: Call a POISON CENTER or doctor/physician.

Storage

Protect from sunlight. Store in a well-ventilated place.
Store in a secure area.

Disposal

Dispose of contents/containers in accordance with local/regional/national/international regulations.

* * * Section 3 – COMPOSITION / INFORMATION ON INGREDIENTS * * *

CAS #	Component	Percent
74-82-8	Methane	95.01
78-84-0	Ethane	3.99
74-98-6	Propane	0.32
106-97-8	Butanes	0.07
109-66-0	Pentanes	0.02
110-54-3	Hexanes	0.01
7727-37-9	Nitrogen	0.35
124-38-9	Carbon Dioxide	0.19
7782-44-7	Oxygen	0.03

Because natural gas is a natural product, composition can vary greatly.

* * * Section 4 – FIRST AID MEASURES * * *

First Aid: Eyes

In case of freeze burn, cover eyes to protect from light. Flush eyes with running water for at least fifteen (15) minutes. Following flushing, seek medical attention.

First Aid: Skin

Remove contaminated clothing. In case of blistering, frostbite or freeze burns, seek immediate medical attention.

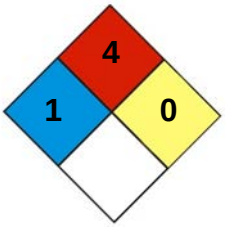
First Aid: Ingestion

Risk of ingestion is extremely low. However, if oral exposure occurs, seek immediate medical assistance.

First Aid: Inhalation

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

* * * Section 5 – FIRE FIGHTING MEASURES * * *



NFPA 704 Hazard Class

Health: **1** Flammability: **4** Instability: **0** (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

General Fire Hazards

See Section 9 for Flammability Properties.
Forms a flammable mixture with air. If released, the resulting vapors will disperse with the prevailing wind. If a source of ignition is present where the vapor exists at a 5 – 15% concentration in air, the vapor will burn along the flame front toward the source of the fuel.

Hazardous Combustion Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

Extinguishing Media

Any extinguisher suitable for Class B fires, dry chemical, fire fighting foam, CO2, and other gaseous agents. However, fire should not be extinguished unless flow of gas can be immediately stopped.

Unsuitable Extinguishing Media

None.

Fire Fighting Equipment / Instructions

Gas fires should not be extinguished unless flow of gas can be immediately stopped. Shut off gas source and allow gas to burn out. If spill or leak has not ignited, determine

if water spray may assist in dispersing gas or vapor to protect personnel attempting to stop leak. Use water to cool equipment, surfaces and piping exposed to fire and excessive heat. For large fire, the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Isolate area, particularly around piping. Let the fire burn unless leak can be stopped. Concentrate fire-fighting efforts on objects / materials ignited by the initial fire. Withdraw immediately in the event of a rising sound from a venting safety device.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH-approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

* * * Section 6 – ACCIDENTAL RELEASE MEASURES * * *

Recovery and Neutralization

Stop the source of the release, if safe to do so.

Materials and Methods for Clean-Up

Consider the use of water spray to disperse gas vapors. Do not use water spray to direct gas vapors toward sewer or drainage systems. Isolate the area until gas has dispersed. Ventilate and gas test area before entering.

Emergency Measures

Evacuate nonessential personnel and secure all ignition sources. No road flares, smoking or flames in hazard area. Consider wind direction. Stay upwind and uphill, if possible. Vapor cloud may be white, but color will dissipate as cloud disperses. Fire and explosion hazard is still present.

Personal Precautions and Protective Equipment

Cooling effect of expanding gas from leak may present frostbite / freeze burn hazard. Wear flame retardant (FR) clothing around un-ignited leak. Wear fire protective clothing around an active fire.

Environmental Precautions

Do not flush gas vapors toward sewer or drainage systems.

Prevention of Secondary Hazards

None.

* * * Section 7 – HANDLING AND STORAGE * * *

Handling Procedures

Keep away from flame, sparks and excessive temperatures. Bond and ground containers. Use only in well ventilated areas.

Storage Procedures

Natural gas will be contained in the pipeline. Keep away from flame, sparks, excessive temperatures and open flames. Empty pipeline segments may contain explosive residues from natural gas liquids. Do not cut, heat, weld or expose containers to sources of ignition sections of pipeline unless the sections have been purged of natural gas residues.

Incompatibilities

Keep away from strong oxidizers, ignition sources and heat.

* * * Section 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION * * *

Component Exposure Limits

Methane (74-82-8)

ACGIH: 1000 ppm TWA (listed under Aliphatic hydrocarbon gases : Alkane C1-4)

Ethane (74-84-0)

ACGIH: 1000 ppm TWA (listed under Aliphatic hydrocarbon gases : Alkane C1-4)

Propane (74-98-6)

ACGIH: 2500 ppm TWA (listed under Aliphatic hydrocarbon gases : Alkane C1-4)

Butane (106-97-8)

ACGIH: 800 ppm TWA (listed under Aliphatic hydrocarbon gases : Alkane C1-4)

Pentanes (109-66-0)

ACGIH: 600 ppm TWA (listed under Pentane, all isomers)

Hexanes (110-54-3)

ACGIH: 50 ppm TWA (listed under n-Hexane)

Nitrogen (7727-37-9)

Simple Asphyxiant

Carbon Dioxide (124-38-9)

ACGIH: 5000 ppm TWA (listed under Carbon Dioxide)

Oxygen (7782-44-7)

N/A – Necessary for life

Engineering Measures

Use adequate ventilation to keep gas and vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces. Use explosion-proof equipment and lighting in classified / controlled areas.

Personal Protective Equipment: Respiratory

Use a NIOSH approved positive-pressure, supplied air respirator with escape bottle or self-contained breathing apparatus (SCBA) for gas concentrations above occupational exposure limits, for potential for uncontrolled release, if exposure levels are not known, or in an oxygen-deficient atmosphere. CAUTION: Flammability limits (i.e., explosion hazard should be considered when assessing the need to expose personnel to concentrations requiring respiratory protection.

Personal Protective Equipment: Hands

Use cold-impervious, insulating flame-retardant (FR) gloves where contact with pressurized gas may occur.

Personal Protective Equipment: Eyes

Where there is a possibility of pressurized gas contact, wear splash-proof safety goggles and faceshield.

Personal Protective Equipment: Skin and Body

Where contact with pressurized gas may occur, wear flame-retardant (FR) and a faceshield.

* * * Section 9 – PHYSICAL AND CHEMICAL PROPERTIES * * *

Appearance:	Colorless	**Odor:**	Odorless to slight petroleum odor
Physical State:	Gas	**pH:**	ND
Vapor Pressure:	40 atm @ -187°F (-86°C)	**Vapor Density:**	0.6
Boiling Point:	-259°F (-162°C)	**Melting Point:**	ND
Solubility (H2O):	3.5%	**Specific Gravity:**	0.4 @ -263°F (-164°C)

Evaporation Rate:	ND	**VOC:**	ND
Octanol / H2O Coeff.:	ND	**Flash Point:**	Flammable Gas
Flash Point Method:	N/A		
Lower Flammability Limit: (LFL):	3.8 – 6.5	**Upper Flammability Limit: (UFL):**	13-17
Auto Ignition:	900-1170°F (482-632°C)	**Burning Rate:**	ND

* * * Section 10 – CHEMICAL STABILITY & REACTIVITY INFORMATION * * *

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

Keep away from strong oxidizers, ignition sources and heat.

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

* * * Section 11 – TOXICOLOGICAL INFORMATION * * *

Acute Toxicity

A: General Product Information

Methane and ethane, the main components of natural gas, are considered practically inert in terms of physiological effects. At high concentrations these materials act as simple asphyxiants and may cause death due to lack of oxygen.

B. Component Analysis – LD50/LC50

Methane (74-82-8)

Inhalation LC50 Mouse 326 g/m3 2h

Ethane (74-84-0)

Inhalation LC50 Rat 658 mg/l 4h

Propane (74-98-6)

Inhalation LC50 Rat 658 mg/l 4h

Butanes (106-97-8)
Inhalation LC50 Rat 658 g/m3 4h

Pentanes (109-66-0)
Inhalation LD50 Rat 364 g/m3 4h

Hexanes (110-54-3)
Inhalation LC50 Rat > 20 mg/l 4h

Nitrogen (7727-37-9)
Simple Asphyxiant

Carbon Dioxide (124-38-9)
Inhalation LC50 Human 100,000 ppm 1minute

Oxygen (7782-44-7)
N/A – Necessary for life

Potential Health Effects: Skin Corrosion Property / Stimulativeness
This product is not reported to have any skin sensitization effects.

Generative Cell Mutagenicity
This product is not reported to have any mutagenic effects.

Carcinogenicity

A: General Product Information
This product is not reported to have any carcinogenic effects.

B: Component Carcinogenicity
None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

Reproductive Toxicity
This product is not reported to have any reproductive toxicity effects.

Specified Target Organ General Toxicity: Single Exposure
This product may cause damage to the heart.

Specified Target Organ General Toxicity: Repeated Exposure
This product is not reported to have any specific target organ repeat effects.

Aspiration Respiratory Organs Hazard
This product is not reported to have any aspiration hazard effects.

* * * Section 12 – ECOLOGICAL INFORMATION * * *

Ecotoxicity

A: General Product Information

Keep gas and vapors out of sewers, drainage areas, and waterways. Report spills and releases, as applicable under Federal and State regulations.

B: Component Analysis – Ecotoxicity – Aquatic Toxicity

No ecotoxicity data are available for this product's components.

Persistance / Degradability

No information available.

Bioaccumulation

No information available.

Mobility in Soil

No information available.

* * * Section 13 – DISPOSAL CONSIDERATIONS * * *

Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment Recommendations.

Disposal of Contaminated Containers or Packaging

Dispose of contents / container in accordance with local / regional / national / international regulations.

* * * Section 14 – TRANSPORTATION INFORMATION * * *

DOT Information

Shipping Name: Natural Gas, Compressed

UN #: 1971 **Hazard Class:** 2.1

Placard:

* * * Section 15 – REGULATORY INFORMATION * * *

Regulatory Information

Component Analysis

None of this products components are listed under SARA Section 302 (40 CFR 355 Appendix A.
n-hexane is listed under SARA Section 313 (40 CFR 372.65). However the concentration of this component is approximately 0.01 % in compressed natural gas and is therefore far under the reporting threshold for the chemical.

n-hexane is listed under CERCLA (40 CFR 302.4). However the concentration of this component is approximately 0.01 % in compressed natural gas and is therefore far under the reporting threshold for the chemical.

SARA Section 311/312 – Hazard Classes

Acute Health	Chronic Health	Fire	Sudden Release of Pressure	Reactive
---	---	X	X	---

SARA Section 313 – Supplier Notification

This product contains one chemical (n-Hexane) that is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-to-know act (EPCRA) of 1986 and of 40 CFR 372. However the concentration of this component is approximately 0.01 % in compressed natural gas and is therefore far under the reporting threshold for the chemical.

State Regulations

Component Analysis – State

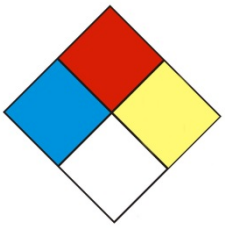
The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Methane	74-82-8	No	No	Yes	Yes	Yes	No
Ethane	78-84-0	No	No	Yes	Yes	Yes	No
Propane	74-98-6	No	No	Yes	Yes	Yes	Yes
Butane	106-97-8	Yes	No	Yes	Yes	Yes	Yes
Pentanes	109-66-0	Yes	No	Yes	Yes	Yes	Yes
Hexanes	110-54-3	Yes	Yes	Yes	Yes	Yes	Yes
Nitrogen	7727-37-9	No	No	No	No	No	No
Carbon Dioxide	124-38-9	Yes	No	Yes	Yes	Yes	Yes
Oxygen	7782-44-7	No	No	No	No	No	No

* * * Section 16 – OTHER INFORMATION * * *

NFPA® Hazard Rating

Health	1
Fire	4
Reactivity	0



HMIS® Hazard Rating

Health	1	Moderate
Fire	4	Severe
Physical	0	Minimal
		* Chronic

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act: ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; NJTSR = New Jersey Trade Secret Registry.

Literature References

None

Other Information

The information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

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Date of Preparation: January 30, 2014

Date of Last Revision: March 4, 2014

End of Sheet

Attachment I.
Emission Units Table

Attachment I

Emission Units Table

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

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
C-2100	1E	Compressor Engine #1	2016	1,680 hp	N/A	NSCR (1C)
C-2110	2E	Compressor Engine #2	2016	1,680 hp	N/A	NSCR (2C)
C-2120	3E	Compressor Engine #3	2016	1,680 hp	N/A	NSCR (3C)
C-2130	4E	Compressor Engine #4	2016	1,680 hp	N/A	NSCR (4C)
C-2140	5E	Compressor Engine #5	2016	1,680 hp	N/A	NSCR (5C)
C-2150	6E	Compressor Engine #6	2016	1,680 hp	N/A	NSCR (6C)
C-2160	7E	Compressor Engine #7	2016	1,680 hp	N/A	NSCR (7C)
C-2170	8E	Compressor Engine #8	2016	1,680 hp	N/A	NSCR (8C)
C-2180	9E	Compressor Engine #9	2016	1,680 hp	N/A	NSCR (9C)
C-2190	10E	Compressor Engine #10	2016	1,680 hp	N/A	NSCR(10C)
C-2200	11E	Compressor Engine #11	2016	1,680 hp	N/A	NSCR(11C)
G-8000	12E	Microturbine Generator #1	2016	200 kWe	N/A	None
G-8100	13E	Microtrubine Generator #2	2016	200 kWe	N/A	None
V-3110	14E	Dehydrator Still Vent #1	2016	110 MMscfd	N/A	FL-1000 (12C)
V-3120	15E	Dehydrator Flash Tank #1	2016	110 MMscfd	N/A	98% control
F-3100	16E	Dehydrator Reboiler #1	2016	1.5 mmbtu/hr	N/A	None
V-3210	17E	Dehydrator Still Vent #2	2016	110 MMscfd	N/A	FL-1000 (12C)
V-3220	18E	Dehydrator Flash Tank #2	2016	110 MMscfd	N/A	98% contol
F-3200	19E	Dehydrator Reboiler #2	2016	1.5 mmbtu/hr	N/A	None
TK-9000	20E	Settling Tank 1	2016	500 barrel	N/A	VRU-6000 & VRU-6100 (13C & 14C)
TK-9200	21E	Condensate Tank 1	2016	400 barrel	N/A	VRU-6000 & VRU-6100 (13C & 14C)
TK-9210	22E	Condensate Tank 2	2016	400 barrel	N/A	VRU-6000 & VRU-6100 (13C & 14C)
TK-9100	23E	Produced Water Tank 1	2016	400 barrel	N/A	VRU-6000 & VRU-6100 (13C & 14C)

TK-9110	24E	Produced Water Tank 2	2016	400 barrel	N/A	VRU-6000 & VRU-6100 (13C & 14C)
CATHT1	27E	Catalytic Heater for Generator Fuel	2016	0.024 MMBtu/hr	N/A	None
-----	-----	NSCR Catalyst for Compressor #1	2016	-----	N/A	1C
-----	-----	NSCR Catalyst for Compressor #2	2016	-----	N/A	2C
-----	-----	NSCR Catalyst for Compressor #3	2016	-----	N/A	3C
-----	-----	NSCR Catalyst for Compressor #4	2016	-----	N/A	4C
-----	-----	NSCR Catalyst for Compressor #5	2016	-----	N/A	5C
----	----	NSCR Catalyst for Compressor #6	2016	----	N/A	6C
----	----	NSCR Catalyst for Compressor #7	2016	----	N/A	7C
----	----	NSCR Catalyst for Compressor #8	2016	----	N/A	8C
----	----	NSCR Catalyst for Compressor #9	2016	----	N/A	9C
----	----	NSCR Catalyst for Compressor #10	2016	----	N/A	10C
----	----	NSCR Catalyst for Compressor #11	2016	----	N/A	11C
FL-1000	26E	Flare Combustion Device 1	2016	4.8 MMBtu/hr	N/A	12C
----	-----	Vapor Recovery Unit 1	2016	40 Mscfd	N/A	13C
----	----	Vapor Recovery Unit 2	2016	40 Mscfd	N/A	14C
C-2210	28E	Compressor Engine #12	2016	1,680 hp	N/A	NSCR (15C)
C-2220	29E	Compressor Engine #13	2016	1,680 hp	N/A	NSCR (16C)
----	----	NSCR Catalyst for Compressor #12	2016	----	N/A	15C
----	----	NSCR Catalyst for Compressor #13	2016	----	N/A	16C
LDOUT1	30E	Hydrocarbon Truck loading	2016	195 bbl/day	N/A	None
FUEL1	31E	Fuel Conditioning Heater	2017	0.5 MMBtu/hr	N/A	None
VENT1	32E	Venting Episodes	2016	Variable	N/A	None
G-8200	33E	Microturbine Generator #3	2016	200 kW	New	None

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

Attachment J.
Emission Point Data Summary Sheet

Attachment J

EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m[4])
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
1E	Upward Vertical Stack	C-2100	Com-pressor engine 1	1C	NSCR catalyst	C	8,760	NOx CO VOC PM10 SO2 Total HAPs Formaldehyde CO2e	50.37 47.41 1.52 0.27 0.008 0.35 0.19 2083	220.62 207.64 6.65 1.18 0.036 1.54 0.81 9125	1.26 1.19 0.24 0.27 0.008 0.18 0.019 1992	5.52 5.19 1.06 1.18 0.036 0.81 0.081 8725	Gas/Vapor	EE	
2E	Upward Vertical Stack	C-2110	Com-pressor engine 2	2C	NSCR catalyst	C	8,760	NOx CO VOC PM10 SO2 Total HAPs Formaldehyde CO2e	50.37 47.41 1.52 0.27 0.008 0.35 0.19 2083	220.62 207.64 6.65 1.18 0.036 1.54 0.81 9125	1.26 1.19 0.24 0.27 0.008 0.18 0.019 1992	5.52 5.19 1.06 1.18 0.036 0.81 0.081 8725	Gas/Vapor	EE	
3E	Upward Vertical Stack	C-2120	Com-pressor engine 3	3C	NSCR catalyst	C	8,760	NOx CO VOC PM10 SO2 Total HAPs Formaldehyde CO2e	50.37 47.41 1.52 0.27 0.008 0.35 0.19 2083	220.62 207.64 6.65 1.18 0.036 1.54 0.81 9125	1.26 1.19 0.24 0.27 0.008 0.18 0.019 1992	5.52 5.19 1.06 1.18 0.036 0.81 0.081 8725	Gas/Vapor	EE	

4E	Upward Vertical Stack	C-2130	Com-pressor engine 4	4C	NSCR catalyst	C	8,760	NOx CO VOC PM10 SO2 Total HAPs Formaldehyde CO2e	50.37 47.41 1.52 0.27 0.008 0.35 0.19 2083	220.62 207.64 6.65 1.18 0.036 1.54 0.81 9125	1.26 1.19 0.24 0.27 0.008 0.18 0.019 1992	5.52 5.19 1.06 1.18 0.036 0.81 0.081 8725	Gas/Vapor	EE	
5E	Upward Vertical Stack	C-2140	Com-pressor engine 5	5C	NSCR catalyst	C	8,760	NOx CO VOC PM10 SO2 Total HAPs Formaldehyde CO2e	50.37 47.41 1.52 0.27 0.008 0.35 0.19 2083	220.62 207.64 6.65 1.18 0.036 1.54 0.81 9125	1.26 1.19 0.24 0.27 0.008 0.18 0.019 1992	5.52 5.19 1.06 1.18 0.036 0.81 0.081 8725	Gas/Vapor	EE	
6E	Upward Vertical Stack	C-2150	Com-pressor engine 6	6C	NSCR catalyst	C	8,760	NOx CO VOC PM10 SO2 Total HAPs Formaldehyde CO2e	50.37 47.41 1.52 0.27 0.008 0.35 0.19 2083	220.62 207.64 6.65 1.18 0.036 1.54 0.81 9125	1.26 1.19 0.24 0.27 0.008 0.18 0.019 1992	5.52 5.19 1.06 1.18 0.036 0.81 0.081 8725	Gas/Vapor	EE	
7E	Upward Vertical Stack	C-2160	Com-pressor engine 7	7C	NSCR catalyst	C	8,760	NOx CO VOC PM10 SO2 Total HAPs Formaldehyde CO2e	50.37 47.41 1.52 0.27 0.008 0.35 0.19 2083	220.62 207.64 6.65 1.18 0.036 1.54 0.81 9125	1.26 1.19 0.24 0.27 0.008 0.18 0.019 1992	5.52 5.19 1.06 1.18 0.036 0.81 0.081 8725	Gas/Vapor	EE	

8E	Upward Vertical Stack	C-2170	Com-pressor engine 8	8C	NSCR catalyst	C	8,760	NOx CO VOC PM10 SO2 Total HAPs Formaldehyde CO2e	50.37 47.41 1.52 0.27 0.008 0.35 0.19 2083	220.62 207.64 6.65 1.18 0.036 1.54 0.81 9125	1.26 1.19 0.24 0.27 0.008 0.18 0.019 1992	5.52 5.19 1.06 1.18 0.036 0.81 0.081 8725	Gas/Vapor	EE	
9E	Upward Vertical Stack	C-2180	Com-pressor engine 9	9C	NSCR catalyst	C	8,760	NOx CO VOC PM10 SO2 Total HAPs Formaldehyde CO2e	50.37 47.41 1.52 0.27 0.008 0.35 0.19 2083	220.62 207.64 6.65 1.18 0.036 1.54 0.81 9125	1.26 1.19 0.24 0.27 0.008 0.18 0.019 1992	5.52 5.19 1.06 1.18 0.036 0.81 0.081 8725	Gas/Vapor	EE	
10E	Upward Vertical Stack	C-2190	Com-pressor engine 10	10C	NSCR catalyst	C	8,760	NOx CO VOC PM10 SO2 Total HAPs Formaldehyde CO2e	50.37 47.41 1.52 0.27 0.008 0.35 0.19 2083	220.62 207.64 6.65 1.18 0.036 1.54 0.81 9125	1.26 1.19 0.24 0.27 0.008 0.18 0.019 1992	5.52 5.19 1.06 1.18 0.036 0.81 0.081 8725	Gas/Vapor	EE	
11E	Upward Vertical Stack	C-2200	Com-pressor engine 11	11C	NSCR catalyst	C	8,760	NOx CO VOC PM10 SO2 Total HAPs Formaldehyde CO2e	50.37 47.41 1.52 0.27 0.008 0.35 0.19 2083	220.62 207.64 6.65 1.18 0.036 1.54 0.81 9125	1.26 1.19 0.24 0.27 0.008 0.18 0.019 1992	5.52 5.19 1.06 1.18 0.036 0.81 0.081 8725	Gas/Vapor	EE	

12E	Upward Vertical Stack	G8000	Microturbine Generator	----	----	C	8,760	NOx CO VOC PM10 SO2 Total HAPs Formaldehyde CO2e	0.080 0.22 0.020 0.014 0.007 0.002 0.001 266	0.35 0.96 0.088 0.060 0.031 0.009 0.006 1166	0.080 0.22 0.020 0.014 0.007 0.002 0.001 266	0.35 0.96 0.088 0.060 0.031 0.009 0.006 1166	Gas/Vapor	EE	
13E	Upward Vertical Stack	G8100	Microturbine Generator	----	----	C	8,760	NOx CO VOC PM10 SO2 Total HAPs Formaldehyde CO2e	0.080 0.22 0.020 0.014 0.007 0.002 0.001 266	0.35 0.96 0.088 0.060 0.031 0.009 0.006 1166	0.080 0.22 0.020 0.014 0.007 0.002 0.001 266	0.35 0.96 0.088 0.060 0.031 0.009 0.006 1166	Gas/Vapor	EE	
14E	Upward Vertical Stack	V-3110	Dehydrator Still Vent 1	12C	Flare-98% Control	C	8,760	VOC Total HAPs Benzene Toluene Ethylbenzene Xylenes n-Hexane CO2e	16.88 5.04 1.18 2.67 0.17 0.59 0.44 462.5	73.93 22.10 5.16 11.70 0.74 2.59 1.91 2026	0.34 0.10 0.024 0.053 0.003 0.012 0.009 9.51	1.48 0.44 0.10 0.23 0.015 0.052 0.038 41.66	Gas/Vapor	EE	
15E	Used for fuel in 16E	V-3120	Dehydrator Flash Gas 1	Used for Fuel in 16E	98% Combustion	C	8,760	VOC Total HAPs Benzene Toluene Ethylbenzene Xylenes n-Hexane CO2e	48.87 1.31 0.094 0.12 0.004 0.009 1.08 2876	214.06 5.73 0.41 0.53 0.017 0.038 4.73 12595	0.98 0.026 0.002 0.002 0.0001 0.0002 0.022 59.74	4.28 0.11 0.0083 0.011 0.0003 0.0008 0.095 261.7	Gas/Vapor	EE	

16E	Upward Vertical Stack	F-3100	Dehydrator Reboiler 1	---	----	C	8,760	NOx CO VOC PM10 SO2 Total HAPs Formaldehyde CO2e	0.15 0.12 0.008 0.011 0.001 0.003 0.0001 176.1	0.64 0.54 0.035 0.049 0.0039 0.012 0.0005 771.2	0.15 0.12 0.008 0.011 0.001 0.003 0.0001 176.1	0.64 0.54 0.035 0.049 0.0039 0.012 0.0005 771.2	Gas/Vapor	EE	
17E	Upward Vertical Stack	V-3210	Dehydrator Still Vent 2	12C	Flare-98% Control	C	8,760	VOC Total HAPs Benzene Toluene Ethylbenzene Xylenes n-Hexane CO2e	16.88 5.04 1.18 2.67 0.17 0.59 0.44 462.5	73.93 22.10 5.16 11.70 0.74 2.59 1.91 2026	0.34 0.10 0.024 0.053 0.003 0.012 0.009 9.51	1.48 0.44 0.10 0.23 0.015 0.052 0.038 41.66	Gas/Vapor	EE	
18E	Used for fuel in 19E	V-3220	Dehydrator Flash Gas 2	Used for Fuel in 19E	98% Combustion	C	8,760	VOC Total HAPs Benzene Toluene Ethylbenzene Xylenes n-Hexane CO2e	48.87 1.31 0.094 0.12 0.004 0.009 1.08 2876	214.06 5.73 0.41 0.53 0.017 0.038 4.73 12595	0.98 0.026 0.002 0.002 0.0001 0.0002 0.022 59.74	4.28 0.11 0.0083 0.011 0.0003 0.0008 0.095 261.7	Gas/Vapor	EE	
19E	Upward Vertical Stack	F-3200	Dehydrator Reboiler 2	---	----	C	8,760	NOx CO VOC PM10 SO2 Total HAPs Formaldehyde CO2e	0.15 0.12 0.008 0.011 0.001 0.003 0.0001 176.1	0.64 0.54 0.035 0.049 0.0039 0.012 0.0005 771.2	0.15 0.12 0.008 0.011 0.001 0.003 0.0001 176.1	0.64 0.54 0.035 0.049 0.0039 0.012 0.0005 771.2	Gas/Vapor	EE	

20E	Upward Vertical Stack	TK-9000	Settler Tank	13C	VRU-98% capture	C	8,760	VOC Total HAPs Benzene Toluene Ethylbenzene Xylenes n-Hexane CO2e	157.6 4.75 0.076 0.18 0.065 0.17 4.26 567	690.43 20.80 0.33 0.79 0.29 0.73 18.66 2483	3.15 0.095 1.5e-3 3.6e-3 1.3e-3 3.3e-3 8.5e-2 11.56	13.81 0.42 6.7e-3 1.6e-2 5.7e-3 1.5e-2 3.7e-1 51	Gas/Vapor	EE	
21E	Upward Vertical Stack	TK-9200	Condensate Tank 1	13C	VRU-98% capture	C	8,760	VOC Total HAPs Benzene Toluene Ethylbenzene Xylenes n-Hexane CO2e	1.61 0.050 5.3e-4 1.4e-3 5.4e-4 1.3e-3 4.6e-2 0.53	7.05 0.22 0.002 0.006 0.002 0.006 0.20 2.32	0.032 0.001 1.1e-5 2.7e-5 1.1e-5 2.5e-5 9.3e-4 0.012	0.14 4.4e-3 4.7e-5 1.2e-4 4.7e-5 1.1e-4 4.1e-3 0.052	Gas/Vapor	EE	
22E	Upward Vertical Stack	TK-9210	Condensate Tank 2	13C	VRU-98% capture	C	8,760	VOC Total HAPs Benzene Toluene Ethylbenzene Xylenes n-Hexane CO2e	1.61 0.050 5.3e-4 1.4e-3 5.4e-4 1.3e-3 4.6e-2 0.53	7.05 0.22 0.002 0.006 0.002 0.006 0.20 2.32	0.032 0.001 1.1e-5 2.7e-5 1.1e-5 2.5e-5 9.3e-4 0.012	0.14 4.4e-3 4.7e-5 1.2e-4 4.7e-5 1.1e-4 4.1e-3 0.052	Gas/Vapor	EE	
23E	Upward Vertical Stack	TK-9100	Produced Water Tank 1	13C	VRU-98% capture	C	8,760	VOC Total HAPs Benzene Toluene Ethylbenzene Xylenes n-Hexane CO2e	6.7e-5 2.5e-7 1.5e-7 7.5e-8 8.7e-9 1.3e-8 6.4e-9 2.6e-3	2.9e-4 1.1e-6 6.5e-7 3.3e-7 3.8e-8 5.8e-8 2.8e-8 0.011	1.3e-6 5.0e-9 3.0e-9 1.5e-9 1.7e-10 2.7e-10 1.3e-10 8.6e-5	5.9e-6 2.2e-8 1.3e-8 6.6e-9 7.6e-10 1.2e-9 5.6e-10 3.8e-4	Gas/Vapor	EE	

24E	Upward Vertical Stack	TK-9110	Produced Water Tank 2	13C	VRU-98% capture	C	8,760	VOC Total HAPs Benzene Toluene Ethylbenzene Xylenes n-Hexane CO2e	6.7e-5 2.5e-7 1.5e-7 7.5e-8 8.7e-9 1.3e-8 6.4e-9 2.6e-3	2.9e-4 1.1e-6 6.5e-7 3.3e-7 3.8e-8 5.8e-8 2.8e-8 0.011	1.3e-6 5.0e-9 3.0e-9 1.5e-9 1.7e-10 2.7e-10 1.3e-10 8.6e-5	5.9e-6 2.2e-8 1.3e-8 6.6e-9 7.6e-10 1.2e-9 5.6e-10 3.8e-4	Gas/Vapor	EE	
26E	Upward Vertical Stack	FL-1000	Flare combustion device 1	---	---	C	8,760	NOx CO VOC PM10 Total HAPs CO2e	--- --- --- --- --- ---	--- --- --- --- --- ---	0.33 1.78 1.1e-4 1.5e-4 3.7E-5 565	1.44 7.79 4.7e-4 6.5e-4 1.6e-4 2476	Gas/Vapor	EE	
27E	Upward Vertical Stack	CATHT 1	Catalytic Heater for Generator Fuel	---	---	C	8,760	NOx CO VOC PM10 SO2 Total HAPs Formaldehyde CO2e	0.0024 0.0020 1.3 E-4 1.8 E-4 1.4 E-5 4.4 E-5 1.8 E-6 2.82	0.010 0.0087 5.7 E-4 7.8E-4 6.2 E-5 1.9 E-4 7.7 E-6 12	0.0024 0.0020 1.3 E-4 1.8 E-4 1.4 E-5 4.4 E-5 1.8 E-6 2.82	0.010 0.0087 5.7 E-4 7.8E-4 6.2 E-5 1.9 E-4 7.7 E-6 12	Gas/Vapor	EE	
28E	Upward Vertical Stack	C-2210	Compressor engine 12	15C	NSCR catalyst	C	8,760	NOx CO VOC PM10 SO2 Total HAPs Formaldehyde CO2e	50.37 47.41 1.52 0.27 0.008 0.35 0.19 2083	220.62 207.64 6.65 1.18 0.036 1.54 0.81 9125	1.26 1.19 0.24 0.27 0.008 0.18 0.019 1992	5.52 5.19 1.06 1.18 0.036 0.81 0.081 8725	Gas/Vapor	EE	

29E	Upward Vertical Stack	C-2220	Com-pressor engine 13	16C	NSCR catalyst	C	8,760	NOx CO VOC PM10 SO2 Total HAPs Formaldehyde CO2e	50.37 47.41 1.52 0.27 0.008 0.35 0.19 2083	220.62 207.64 6.65 1.18 0.036 1.54 0.81 9125	1.26 1.19 0.24 0.27 0.008 0.18 0.019 1992	5.52 5.19 1.06 1.18 0.036 0.81 0.081 8725	Gas/Vapor	EE	
31E	Upward Vertical Stack	FUEL1	Fuel Conditi oning Heater	---	---	C	8,760	NOx CO VOC PM10 SO2 Total HAPs CO2e	0.049 0.041 0.0027 0.0037 2.9E-4 9.2E-4 58.7	0.21 0.18 0.012 0.016 0.0013 0.0040 257.1	0.049 0.041 0.0027 0.0037 2.9E-4 9.2E-4 58.7	0.21 0.18 0.012 0.016 0.0013 0.0040 257.1	Gas/Vapor	EE	
32E	Relief Vent	VENT1	Venting Episode s	---	---	Intermi ttent	Varia ble	VOC Total HAPs Benzene Toluene Ethylbenzene Xylenes n-Hexane CO2e	--- --- --- --- --- --- --- ---	22.50 0.46 0.014 0.025 0.0014 0.0035 0.42 2107	--- --- --- --- --- --- --- ---	22.50 0.46 0.014 0.025 0.0014 0.0035 0.42 2107	Gas/Vapor	EE	
33E	Upward Vertical Stack	G8200	Microtu rbine Genera tor	----	----	C	8,760	NOx CO VOC PM10 SO2 Total HAPs Formaldehyde CO2e	0.080 0.22 0.020 0.014 0.007 0.002 0.001 266	0.35 0.96 0.088 0.060 0.031 0.009 0.006 1166	0.080 0.22 0.020 0.014 0.007 0.002 0.001 266	0.35 0.96 0.088 0.060 0.031 0.009 0.006 1166	Gas/Vapor	EE	

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

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S,

Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

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

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

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

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data								
Emission Point ID No.	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2]	Northing	Easting
1E/1C	1.1	1224	8876	156	1,025	25	4352.993	513.570
2E/2C	1.1	1224	8876	156	1,025	25	4352.984	513.568
3E/3C	1.1	1224	8876	156	1,025	25	4352.975	513.567
4E/4C	1.1	1224	8876	156	1,025	25	4352.967	513.566
5E/5C	1.1	1224	8876	156	1,025	25	4352.958	513.565
6E/6C	1.1	1224	8876	156	1,025	25	4352.949	513.563
7E/7C	1.1	1224	8876	156	1,025	25	4352.940	513.562
8E/8C	1.1	1224	8876	156	1,025	25	4352.931	513.561
9E/9C	1.1	1224	8876	156	1,025	25	4352.922	513.559
10E/10C	1.1	1224	8876	156	1,025	25	4352.913	513.558
11E/11C	1.1	1224	8876	156	1,025	25	4352.904	513.557
12E	0.5	535	1.3 kg/s mass flow	TBC	1,025	10	4352.929	513.529
13E	0.5	535	1.3 kg/s mass flow	TBC	1,025	10	4352.937	513.529
33E	0.5	535	1.3 kg/s mass flow	TBC	1,025	10	4352.941	513.529
14E/12C/26E	5	1400	7069	6	1,025	15	4352.992	513.526
15E	Combusted in 16E		N/A	N/A	1,025	N/A	4352.951	513.532
16E	0.75	350	530	20	1,025	~18	4352.963	513.534
17E/12C/26E	5	1400	7069	6	1,025	15	4352.992	513.526
18E	Combusted in 19E		N/A	N/A	1,025	N/A	4352.975	513.537
19E	0.75	350	530	20	1,025	~18	4352.987	513.539
20E-24E/13C-14C	Emissions captured in closed loop system with VRU				1,025	N/A	4353.011	513.559

27E	0.5	200	70.7	6	1,025	5	4352.933	513.529
28E/15C	1.1	1224	8876	156	1,025	TBD	4352.895	513.555
29E/16C	1.1	1224	8876	156	1,025	TBD	4352.886	513.554
31E	3	1000	2545	6	1,025	20	4353.002	513.526
32E	Venting emissions occur at various locations across the facility							

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

Attachment L.
Emission Unit Data Sheets

Generators

NATURAL GAS COMPRESSOR/GENERATOR ENGINE DATA SHEET

Source Identification Number[1]		12E		13E		33E	
Engine Manufacturer and Model		Capstone C200 Standard		Capstone C200 Standard		Capstone C200 Standard	
Manufacturer's Rated bhp/rpm		200 kWe		200 kWe		200 kWe	
Source Status[2]		ES		ES		NS	
Date Installed/Modified/Removed[3]		2016		2016		2016	
Engine Manufactured/Reconstruction Date[4]		TBD		TBD		TBD	
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart JJJJ? (Yes or No)[5]		N/A		N/A		N/A	
Engine, Fuel and Combustion Data	Engine Type[6]	N/A		N/A		N/A	
	APCD Type[7]	N/A		N/A		N/A	
	Fuel Type[8]	RG		RG		RG	
	H_2S (gr/100 scf)	0		0		0	
	Operating kWe	200		200		200	
	BSFC (Btu/kWe)	10,300		10,300		10,300	
	Fuel throughput (ft^3/hr)	1,823		1,823		1,823	
	Fuel throughput ($MMft^3$/yr)	15.97		15.97		15.97	
	Operation (hrs/yr)	8,760		8,760		8,760	
Reference[9]	Potential Emissions[10]	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
MD	NO_X	0.08	0.35	0.08	0.35	0.08	0.35
MD	CO	0.22	0.96	0.22	0.96	0.22	0.96
MD	VOC	0.02	0.09	0.02	0.09	0.02	0.09
AP	SO_2	0.01	0.03	0.01	0.03	0.01	0.03
AP	PM_{10}	0.01	0.06	0.01	0.06	0.01	0.06
AP	Formaldehyde	0.001	0.006	0.001	0.006	0.001	0.006

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

2. Enter the Source Status using the following codes:

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

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

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

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

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

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

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

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

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

8. Enter the Fuel Type using the following codes:

PQ	Pipeline Quality Natural Gas	RG	Raw Natural Gas

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

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

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

C200 MicroTurbine
High-pressure Natural Gas

World's largest air-bearing microturbine produces 200kW of clean, green, and reliable power.

- Ultra-low emissions
- One moving part – minimal maintenance and downtime
- Patented air bearing – no lubricating oil or coolant
- 5 and 9 year Factory Protection Plans available
- Remote monitoring and diagnostic capabilities
- Integrated utility synchronization and protection
- Small, modular design allows for easy, low-cost installation
- Proven technology with tens of millions of run hours and counting
- Internal fuel gas compressor available for low fuel pressure natural gas applications

C200 MicroTurbine

Electrical Performance[1]

Electrical Power Output	200kW
Voltage	400–480 VAC
Electrical Service	3-Phase, 4 wire
Frequency	50/60 Hz, grid connect operation
	10–60 Hz, stand alone operation
Maximum Output Current	290A RMS @ 400V, grid connect operation
	240A RMS @ 480V, grid connect operation
	310A RMS, stand alone operation[2]
Electrical Efficiency LHV	33%

Fuel/Engine Characteristics[1]

Natural Gas HHV	30.7–47.5 MJ/m^3 (825–1,275 BTU/scf)
Inlet Pressure[3]	517–552 kPa gauge (75–80 psig)
Fuel Flow HHV	2,400 MJ/hr (2,280,000 BTU/hr)
Net Heat Rate LHV	10.9 MJ/kWh (10,300 BTU/kWh)

Exhaust Characteristics[1]

NOx Emissions @ 15% O_2[4]	< 9 ppmvd (18 mg/m^3)
NOx / Electrical Output[4]	0.14 g/bhp-hr (0.4 lb/MWhe)
Exhaust Gas Flow	1.3 kg/s (2.9 lbm/s)
Exhaust Gas Temperature	280°C (535°F)
Exhaust Energy	1,420 MJ/hr (1,350,000 BTU/hr)

Reliable power when and where you need it. Clean and simple.

Dimensions & Weight[5]

Width x Depth x Height[6]	1.7 x 3.8 x 2.5 m (67 x 150 x 98 in)
Weight – Grid Connect Model	2776 kg (6,120 lb)
Weight – Dual Mode Model	3413 kg (7,525 lb)

Minimum Clearance Requirements[7]

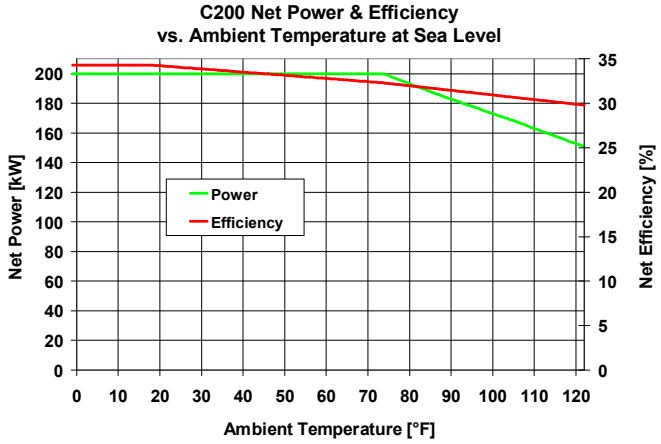
Vertical Clearance	0.6 m (24 in)
Horizontal Clearance	
Left & Right	1.1 m (42 in)
Front	1.1 m (42 in)
Rear	1.8 m (70 in)

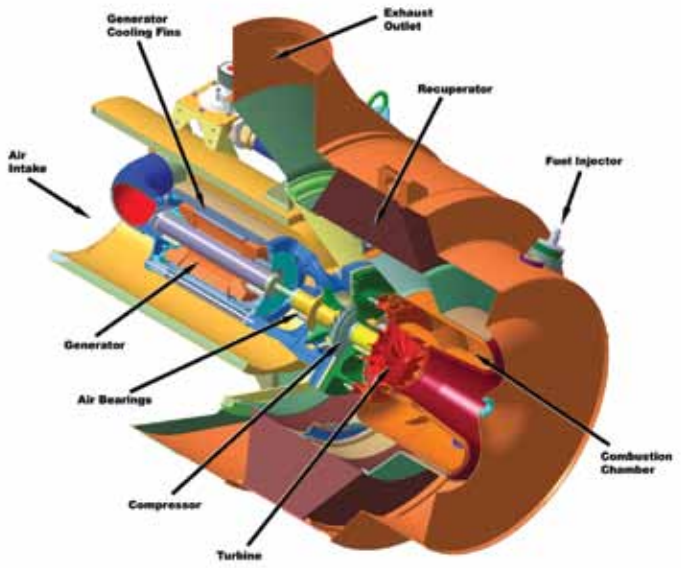
Sound Levels

Acoustic Emissions at Full Load Power	
Nominal at 10 m (33 ft)	65 dBA

Certifications

- UL 2200 and UL 1741 natural gas operation[8]
- Complies with IEEE 1547 and meets statewide utility interconnection requirements for California Rule 21 and the New York State Public Service Commission
- CE certified





(1) Nominal full power performance at ISO conditions: 59°F, 14.696 psia, 60% RH
(2) With linear load
(3) Inlet pressure for standard natural gas at 39.4 MJ/Nm³ (1,000 BTU/scf) (HHV)
(4) Emissions for standard natural gas at 39.4 MJ/Nm³ (1,000 BTU/scf) (HHV)
(5) Approximate dimensions and weight
(6) Height dimensions are to the roof line. Exhaust outlet extends at least 8 inches above the roof line
(7) Clearance requirements may increase due to local code considerations
(8) All natural gas models are planned to be UL Listed

Specifications are not warranted and are subject to change without notice.

21211 Nordhoff Street • Chatsworth • CA • 91311 • 866.422.7786 • 818.734.5300 • www.capstoneturbine.com

Capstone Turbine Corporation • 21211 Nordhoff Street • Chatsworth • CA 91311 • USA
Phone: (818) 734-5300 • Fax: (818) 734-5320 • Web: www.microturbine.com

Technical Reference

Capstone MicroTurbine™ Systems Emissions

Summary

Capstone MicroTurbine™ systems are inherently clean and can meet some of the strictest emissions standards in the world. This technical reference is to provide customers with information that may be requested by local air permitting organizations or to compare air quality impacts of different technologies for a specific project. The preferred units of measure are "output based"; meaning that the quantity of a particular exhaust emission is reported relative to the useable output of the microturbine – typically in pounds per megawatt hour for electrical generating equipment. This technical reference also provides volumetric measurements in parts per million and milligrams per normal cubic meter. A conversion between several common units is also provided.

Maximum Exhaust Emissions at ISO Conditions

Table 1 below summarizes the exhaust emissions at full power and ISO conditions for different Capstone microturbine models. Note that the fuel can have a significant impact on certain emissions. For example landfill and digester gas can be made up of a wide variety of fuel elements and impurities, and typically contains some percentage of carbon dioxide (CO_2). This CO_2 dilutes the fuel, makes complete combustion more difficult, and results in higher carbon monoxide emissions (CO) than for pipeline-quality natural gas.

Table 1. Emission for Different Capstone Microturbine Models in [lb/MWhe]

Model	Fuel	NOx	CO	VOC (5)
C30 NG	Natural Gas (1)	0.64	1.8	0.23
CR30 MBTU	Landfill Gas (2)	0.64	22.0	1.00
CR30 MBTU	Digester Gas (3)	0.64	11.0	1.00
C30 Liquid	Diesel #2 (4)	2.60	0.41	0.23
C65 NG Standard	Natural Gas (1)	0.46	1.25	0.10
C65 NG Low NOx	Natural Gas (1)	0.17	1.30	0.10
C65 NG CARB	Natural Gas (1)	0.17	0.24	0.05
CR65 Landfill	Landfill Gas (2)	0.46	4.0	0.10
CR65 Digester	Digester Gas (3)	0.46	4.0	0.10
C200 NG	Natural Gas (1)	0.40	1.10	0.10
C200 NG CARB	Natural Gas (1)	0.14	0.20	0.04
CR200 Digester	Digester Gas (3)	0.40	3.6	0.10

Notes:

(1) Emissions for standard natural gas at 1,000 BTU/scf (HHV) or 39.4 MJ/m3 (HHV)
(2) Emissions for surrogate gas containing 42% natural gas, 39% CO2, and 19% Nitrogen
(3) Emissions for surrogate gas containing 63% natural gas and 37% CO2
(4) Emissions for Diesel #2 according to ASTM D975-07b
(5) Expressed as Methane

Table 2 provides the same output-based information shown in Table 1, but expressed in grams per horsepower hour (g/hp-hr).

Table 2. Emission for Different Capstone Microturbine Models in [g/hp-hr]

Model	Fuel	NOx	CO	VOC [5]
C30 NG	Natural Gas [1]	0.22	0.60	0.078
CR30 MBTU	Landfill Gas [2]	0.22	7.4	0.340
CR30 MBTU	Digester Gas [3]	0.22	3.7	0.340
C30 Liquid	Diesel #2 [4]	0.90	0.14	0.078
C65 NG Standard	Natural Gas [1]	0.16	0.42	0.034
C65 NG Low NOx	Natural Gas [1]	0.06	0.44	0.034
C65 NG CARB	Natural Gas [1]	0.06	0.08	0.017
CR65 Landfill	Landfill Gas [2]	0.16	1.4	0.034
CR65 Digester	Digester Gas [3]	0.16	1.4	0.034
C200 NG	Natural Gas [1]	0.14	0.37	0.034
C200 NG CARB	Natural Gas [1]	0.05	0.07	0.014
CR200 Digester	Digester Gas [3]	0.14	1.3	0.034

Notes: - same as for Table 1

Emissions may also be reported on a volumetric basis, with the most common unit of measurement being parts per million. This is typically a measurement that is corrected to specific oxygen content in the exhaust and without considering moisture content. The abbreviation for this unit of measurement is “ppmvd” (parts per million by volume, dry) and is corrected to 15% oxygen for electrical generating equipment such as microturbines. The relationship between an output based measurement like pounds per MWh and a volumetric measurement like ppmvd depends on the characteristics of the generating equipment and the molecular weight of the criteria pollutant being measured. Table 3 expresses the emissions in ppmvd at 15% oxygen for the Capstone microturbine models shown in Table 1. Note that raw measurements expressed in ppmv will typically be lower than the corrected values shown in Table 3 because the microturbine exhaust has greater than 15% oxygen.

Another volumetric unit of measurement expresses the mass of a specific criteria pollutant per standard unit of volume. Table 4 expresses the emissions in milligrams per normal cubic meter at 15% oxygen. Normal conditions for this purpose are expresses as one atmosphere of pressure and zero degrees Celsius. Note that both the ppmvd and mg/m3 measurements are for specific oxygen content. A conversion can be made to adjust either unit of measurement to other reference oxygen contents, if required. Use the equation below to convert from one reference oxygen content to another:

$$\text{Emissions at New } O_2 = \frac{(20.9 - \text{New } O_2 \text{ Percent})}{(20.9 - \text{Current } O_2 \text{ Percent})} \text{ X Emissions at Current } O_2$$

For example, to express 9 ppmvd of NOx at 15% oxygen to ppmvd at 3% oxygen:

$$\text{Emissions at 3\% } O_2 = \frac{(20.9 - 3.0)}{(20.9 - 15.0)} \text{ X } 9 = 27 \text{ ppmvd}$$

Greenhouse Gas Emissions

Many gasses are considered "greenhouse gasses", and agencies have ranked them based on their global warming potential (GWP) in the atmosphere compared with carbon dioxide (CO_2), as well as their ability to maintain this effect over time. For example, methane is a greenhouse gas with a GWP of 21. Criteria pollutants like NOx and organic compounds like methane are monitored by local air permitting authorities, and are subject to strong emissions controls. Even though some of these criteria pollutants can be more troublesome for global warming than CO_2, they are released in small quantities – especially from Capstone microturbines. So the major contributor of concern is carbon dioxide, or CO_2. Emission of CO_2 depends on two things:

1. Carbon content in the fuel
2. Efficiency of converting fuel to useful energy

It is for these reasons that many local authorities are focused on using clean fuels (for example natural gas compared with diesel fuel), achieving high efficiency using combined heat and power systems, and displacing emissions from traditional power plants using renewable fuels like waste landfill and digester gasses.

Table 5 shows the typical CO_2 emissions due to combustion for different Capstone microturbine models at full power and ISO conditions. The values do not include CO_2 that may already exist in the fuel itself, which is typical for renewable fuels like landfill and digester gas. These values are expressed on an output basis, as is done for criteria pollutants in Table 1. The table shows the pounds per megawatt hour based on electric power output only, as well as considering total useful output in a CHP system with total 70% efficiency (LHV). As for criteria pollutants, the relative quantity of CO_2 released is substantially less when useful thermal output is also considered in the measurement.

Table 5. CO_2 Emission for Capstone Microturbine Models in [lb/MWh]

Model	Fuel	CO_2	
		Electric Only	70% Total CHP
C30 NG	Natural Gas (1)	1,690	625
CR30 MBTU	Landfill Gas (1)	1,690	625
CR30 MBTU	Digester Gas (1)	1,690	625
C30 Liquid	Diesel #2 (2)	2,400	855
C65 NG Standard	Natural Gas (1)	1,520	625
C65 NG Low NOx	Natural Gas (1)	1,570	625
C65 NG CARB	Natural Gas (1)	1,570	625
CR65 Landfill	Landfill Gas (1)	1,520	625
CR65 Digester	Digester Gas (1)	1,520	625
C200 NG	Natural Gas (1)	1,330	625
C200 NG CARB	Natural Gas (1)	1,330	625
CR200 Digester	Digester Gas (1)	1,330	625

Notes:

(1) Emissions due to combustion, assuming natural gas with CO_2 content of 117 lb/MMBTU (HHV)

(2) Emissions due to combustion, assuming diesel fuel with CO_2 content of 160 lb/MMBTU (HHV)

Attachment N.
Supporting Emissions Calculations

Emission Calculations

Emissions Summary Total

Company:	**Antero Midstream LLC**
Facility Name:	**Tamela Compressor Station**
Facility Location:	**Doddridge County, West Virginia**

UNCONTROLLED POTENTIAL EMISSION SUMMARY

Source	NOx		CO		VOC		SO_2		PM-10		HAPs		Formaldehyde		CO_2e
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	tpy
Engines															
Compressor Engine 1	50.37	220.62	47.41	207.64	1.52	6.65	0.0082	0.036	0.27	1.18	0.35	1.54	0.19	0.81	9,125
Compressor Engine 2	50.37	220.62	47.41	207.64	1.52	6.65	0.0082	0.036	0.27	1.18	0.35	1.54	0.19	0.81	9,125
Compressor Engine 3	50.37	220.62	47.41	207.64	1.52	6.65	0.0082	0.036	0.27	1.18	0.35	1.54	0.19	0.81	9,125
Compressor Engine 4	50.37	220.62	47.41	207.64	1.52	6.65	0.0082	0.036	0.27	1.18	0.35	1.54	0.19	0.81	9,125
Compressor Engine 5	50.37	220.62	47.41	207.64	1.52	6.65	0.0082	0.036	0.27	1.18	0.35	1.54	0.19	0.81	9,125
Compressor Engine 6	50.37	220.62	47.41	207.64	1.52	6.65	0.0082	0.036	0.27	1.18	0.35	1.54	0.19	0.81	9,125
Compressor Engine 7	50.37	220.62	47.41	207.64	1.52	6.65	0.0082	0.036	0.27	1.18	0.35	1.54	0.19	0.81	9,125
Compressor Engine 8	50.37	220.62	47.41	207.64	1.52	6.65	0.0082	0.036	0.27	1.18	0.35	1.54	0.19	0.81	9,125
Compressor Engine 9	50.37	220.62	47.41	207.64	1.52	6.65	0.0082	0.036	0.27	1.18	0.35	1.54	0.19	0.81	9,125
Compressor Engine 10	50.37	220.62	47.41	207.64	1.52	6.65	0.0082	0.036	0.27	1.18	0.35	1.54	0.19	0.81	9,125
Compressor Engine 11	50.37	220.62	47.41	207.64	1.52	6.65	0.0082	0.036	0.27	1.18	0.35	1.54	0.19	0.81	9,125
Compressor Engine 12	50.37	220.62	47.41	207.64	1.52	6.65	0.0082	0.036	0.27	1.18	0.35	1.54	0.19	0.81	9,125
Compressor Engine 13	50.37	220.62	47.41	207.64	1.52	6.65	0.0082	0.036	0.27	1.18	0.35	1.54	0.19	0.81	9,125
Fuel Conditioning Heater	0.049	0.21	0.041	0.18	0.0027	0.012	0.00029	0.0013	0.0037	0.016	0.00092	0.0040	0.000037	0.00016	257
Turbines															
Microturbine Generator 1	0.080	0.35	0.22	0.96	0.020	0.088	0.0070	0.031	0.014	0.060	0.0021	0.0093	0.0015	0.0064	1,166
Microturbine Generator 2	0.080	0.35	0.22	0.96	0.020	0.088	0.0070	0.031	0.014	0.060	0.0021	0.0093	0.0015	0.0064	1,166
Microturbine Generator 3	0.080	0.35	0.22	0.96	0.020	0.088	0.0070	0.031	0.014	0.060	0.0021	0.0093	0.0015	0.0064	1,166
Catalytic Heater for Generator Fuel	0.0024	0.010	0.0020	0.0087	0.00013	0.00057	0.000014	0.000062	0.00018	0.00078	0.000044	0.00019	0.0000018	0.0000077	12
Dehydrator															
TEG Dehydrator 1	---	---	---	---	65.75	287.99	---	---	---	---	6.35	27.83	---	---	14,621
TEG Dehydrator 2	---	---	---	---	65.75	287.99	---	---	---	---	6.35	27.83	---	---	14,621
Reboiler 1	0.15	0.64	0.12	0.54	0.0081	0.035	0.00088	0.0039	0.011	0.049	0.0028	0.012	0.00011	0.00048	771
Reboiler 2	0.15	0.64	0.12	0.54	0.0081	0.035	0.00088	0.0039	0.011	0.049	0.0028	0.012	0.00011	0.00048	771
Combustors															
Flare and Pilot	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Hydrocarbon Loading															
Truck Loadout	---	---	---	---	72.85	7.66	---	---	---	---	2.19	0.23	---	---	28
Venting Emissions															
Venting Emissions	---	---	---	---	---	22.50	---	---	---	---	---	0.46	---	---	2,107
Fugitive Emissions															
Component Leak Emissions	---	---	---	---	2.18	9.54	---	---	---	---	0.051	0.22	---	---	198
Haul Road Dust Emissions	---	---	---	---	---	---	---	---	0.075	0.33	---	---	---	---	---
Storage Tanks															
Produced Water Tanks	---	---	---	---	1.34E-04	5.86E-04	---	---	---	---	5.04E-07	2.21E-06	---	---	0.023
Settler Tank	---	---	---	---	157.63	690.43	---	---	---	---	4.75	20.80	---	---	2,483
Condensate Tanks	---	---	---	---	3.22	14.11	---	---	---	---	0.10	0.44	---	---	4.6
Total Facility PTE =	**655.40**	**2,870.65**	**617.25**	**2,703.54**	**387.20**	**1,407.04**	**0.13**	**0.57**	**3.66**	**16.01**	**24.36**	**97.88**	**2.41**	**10.56**	**158,000**

Emissions Summary Total

Company:	**Antero Midstream LLC**
Facility Name:	**Tamela Compressor Station**
Facility Location:	**Doddridge County, West Virginia**

CONTROLLED POTENTIAL EMISSION SUMMARY

Source	NOx		CO		VOC		SO_2		PM-10		HAPs		Formaldehyde		CO_2e
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	tpy
Engines															
Compressor Engine 1	1.26	5.52	1.19	5.19	0.24	1.06	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,725
Compressor Engine 2	1.26	5.52	1.19	5.19	0.24	1.06	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,725
Compressor Engine 3	1.26	5.52	1.19	5.19	0.24	1.06	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,725
Compressor Engine 4	1.26	5.52	1.19	5.19	0.24	1.06	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,725
Compressor Engine 5	1.26	5.52	1.19	5.19	0.24	1.06	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,725
Compressor Engine 6	1.26	5.52	1.19	5.19	0.24	1.06	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,725
Compressor Engine 7	1.26	5.52	1.19	5.19	0.24	1.06	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,725
Compressor Engine 8	1.26	5.52	1.19	5.19	0.24	1.06	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,725
Compressor Engine 9	1.26	5.52	1.19	5.19	0.24	1.06	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,725
Compressor Engine 10	1.26	5.52	1.19	5.19	0.24	1.06	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,725
Compressor Engine 11	1.26	5.52	1.19	5.19	0.24	1.06	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,725
Compressor Engine 12	1.26	5.52	1.19	5.19	0.24	1.06	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,725
Compressor Engine 13	1.26	5.52	1.19	5.19	0.24	1.06	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,725
Fuel Conditioning Heater	0.049	0.21	0.041	0.18	0.0027	0.012	0.00029	0.0013	0.0037	0.016	0.00092	0.0040	0.000037	0.00016	257
Turbines															
Microturbine Generator 1	0.080	0.35	0.22	0.96	0.020	0.088	0.0070	0.031	0.014	0.060	0.0021	0.0093	0.0015	0.0064	1,166
Microturbine Generator 2	0.080	0.35	0.22	0.96	0.020	0.088	0.0070	0.031	0.014	0.060	0.0021	0.0093	0.0015	0.0064	1,166
Microturbine Generator 3	0.080	0.35	0.22	0.96	0.020	0.088	0.0070	0.031	0.014	0.060	0.0021	0.0093	0.0015	0.0064	1,166
Catalytic Heater for Generator Fuel	0.0024	0.010	0.0020	0.0087	0.00013	0.00057	0.000014	0.000062	0.00018	0.00078	0.000044	0.00019	0.0000018	0.0000077	12
Dehydrator															
TEG Dehydrator 1	---	---	---	---	1.31	5.76	---	---	---	---	0.13	0.56	---	---	303
TEG Dehydrator 2	---	---	---	---	1.31	5.76	---	---	---	---	0.13	0.56	---	---	303
Reboiler 1	0.15	0.64	0.12	0.54	0.0081	0.035	0.00088	0.0039	0.011	0.049	0.0028	0.012	0.00011	0.00048	771
Reboiler 2	0.15	0.64	0.12	0.54	0.0081	0.035	0.00088	0.0039	0.011	0.049	0.0028	0.012	0.00011	0.00048	771
Combustors															
Flare and Pilot	0.33	1.44	1.78	7.79	0.00011	0.00047	0.000012	0.000051	0.00015	0.00065	0.000037	0.00016	---	---	2,476
Hydrocarbon Loading															
Truck Loadout	---	---	---	---	72.85	7.66	---	---	---	---	2.19	0.23	---	---	28
Venting Emissions															
Venting Emissions	---	---	---	---	---	22.50	---	---	---	---	---	0.46	---	---	2107
Fugitive Emissions															
Component Leak Emissions	---	---	---	---	2.18	9.54	---	---	---	---	0.051	0.22	---	---	198
Haul Road Dust Emissions	---	---	---	---	---	---	---	---	0.08	0.33	---	---	---	---	---
Storage Tanks															
Produced Water Tanks	---	---	---	---	2.68E-06	1.17E-05	---	---	---	---	1.01E-08	4.42E-08	---	---	0.00075
Settler Tank	---	---	---	---	3.15	13.81	---	---	---	---	0.095	0.42	---	---	51
Condensate Tanks	---	---	---	---	0.064	0.28	---	---	---	---	0.00200	0.0088	---	---	0.10
Total Facility PTE =	**17.28**	**75.70**	**18.14**	**79.43**	**84.11**	**79.50**	**0.13**	**0.57**	**3.66**	**16.01**	**4.95**	**13.04**	**0.25**	**1.07**	**124,199**

HAP Emissions Summary Total

Company:	**Antero Midstream LLC**
Facility Name:	**Tamela Compressor Station**
Facility Location:	**Doddridge County, West Virginia**

CONTROLLED POTENTIAL EMISSION SUMMARY

Source	Benzene		Toluene		Ethylbenzene		Xylenes		n-Hexane	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Engines										
Compressor Engine 1	0.022	0.096	0.0078	0.034	0.00035	0.0015	0.0027	0.012	---	---
Compressor Engine 2	0.022	0.096	0.0078	0.034	0.00035	0.0015	0.0027	0.012	---	---
Compressor Engine 3	0.022	0.096	0.0078	0.034	0.00035	0.0015	0.0027	0.012	---	---
Compressor Engine 4	0.022	0.096	0.0078	0.034	0.00035	0.0015	0.0027	0.012	---	---
Compressor Engine 5	0.022	0.096	0.0078	0.034	0.00035	0.0015	0.0027	0.012	---	---
Compressor Engine 6	0.022	0.096	0.0078	0.034	0.00035	0.0015	0.0027	0.012	---	---
Compressor Engine 7	0.022	0.096	0.0078	0.034	0.00035	0.0015	0.0027	0.012	---	---
Compressor Engine 8	0.022	0.096	0.0078	0.034	0.00035	0.0015	0.0027	0.012	---	---
Compressor Engine 9	0.022	0.096	0.0078	0.034	0.00035	0.0015	0.0027	0.012	---	---
Compressor Engine 10	0.022	0.096	0.0078	0.034	0.00035	0.0015	0.0027	0.012	---	---
Compressor Engine 11	0.022	0.096	0.0078	0.034	0.00035	0.0015	0.0027	0.012	---	---
Compressor Engine 12	0.022	0.096	0.0078	0.034	0.00035	0.0015	0.0027	0.012		
Compressor Engine 13	0.022	0.096	0.0078	0.034	0.00035	0.0015	0.0027	0.012		
Fuel Conditioning Heater	---	---	---	---	---	---	---	---	---	---
Turbines										
Microturbine Generator 1	0.000025	0.00011	0.00027	0.0012	0.000066	0.00029	0.00013	0.00058	---	---
Microturbine Generator 2	0.000025	0.00011	0.00027	0.0012	0.000066	0.00029	0.00013	0.00058	---	---
Microturbine Generator 3	0.000025	0.00011	0.00027	0.0012	0.000066	0.00029	0.00013	0.00058		
Catalytic Heater for Generator Fuel	---	---	---	---	---	---	---	---	---	---
Dehydrator										
TEG Dehydrator 1	0.025	0.11	0.056	0.24	0.0035	0.015	0.012	0.053	0.030	0.13
TEG Dehydrator 2	0.025	0.11	0.056	0.24	0.0035	0.015	0.012	0.053	0.030	0.13
Reboiler 1	---	---	---	---	---	---	---	---	---	---
Reboiler 2	---	---	---	---	---	---	---	---	---	---
Combustors										
Flare and Pilot	---	---	---	---	---	---	---	---	---	---
Hydrocarbon Loading										
Truck Loadout	0.035	0.0037	0.084	0.0088	0.030	0.0032	0.077	0.0081	1.97	0.21
Venting Emissions										
Venting Emissions	---	0.014	---	0.025	---	0.0014	---	0.0035	---	0.42
Fugitive Emissions										
Component Leak Emissions	0.0013	0.0055	0.0025	0.011	0.00037	0.0016	0.00095	0.0042	0.046	0.20
Haul Road Dust Emissions	---	---	---	---	---	---	---	---	---	---
Storage Tanks										
Produced Water Tanks	5.94E-09	2.60E-08	3.01E-09	1.32E-08	3.47E-10	1.52E-09	5.30E-10	2.32E-09	2.56E-10	1.12E-09
Settler Tank	1.52E-03	6.66E-03	3.62E-03	1.59E-02	1.30E-03	5.70E-03	3.34E-03	1.46E-02	8.52E-02	3.73E-01
Condensate Tanks	2.13E-05	9.32E-05	5.48E-05	2.40E-04	2.16E-05	9.44E-05	5.03E-05	2.20E-04	1.85E-03	8.12E-03
Total Facility PTE =	**0.38**	**1.51**	**0.30**	**1.00**	**0.044**	**0.063**	**0.14**	**0.29**	**2.16**	**1.48**

Compressor Engine Emission Calculations

Company:	**Antero Midstream LLC**
Facility Name:	**Tamela Compressor Station**
Facility Location:	**Doddridge County, West Virginia**
Source Description:	**Compressor Engines**

Source Information-Per Engine

Emission Unit ID:	C-2100 - C-2220	
Engine Make/Model	Waukesha 7044 GSI	
Service	Compression	
Controls - Y or N / Type	Y	NSCR/AFRC
Site Horsepower Rating[1]	1,680	hp
Fuel Consumption (BSFC)[1]	8,289	Btu/(hp-hr)
Heat Rating[2]	13.93	MMBtu/hr
Fuel Consumption[2,3]	107.75	MMscf/yr
Fuel Consumption[1]	12,300	scf/hr
Fuel Heating Value[1]	1,130	Btu/scf
Operating Hours	8,760	hrs/yr

Notes:

1. Values from Waukesha specification sheet
2. Calculated values
3. Annual fuel consumption is 100% of maximum fuel consumption at 100% load.

Potential Emissions per Engine

	Uncontrolled					***Controlled***					
Pollutant	**Emission Factor**		**Estimated Emissions[2]**			**Emission Factor**		**Estimated Emissions[2]**			**Source of Emissions Factors**
	(lb/MMBtu)	**(g/bhp-hr)**	**(lb/hr)**	**(lb/yr)**	**(tpy)**	**(lb/MMBtu)**	**(g/bhp-hr)**	**(lb/hr)**	**(lb/yr)**	**(tpy)**	
NOx[1,4]	---	13.6	50.37	---	220.62	---	0.34	1.26	---	5.52	Manufacturer's Specs - uncontrolled, Catalyst Specs - controlled
CO[1,4]	---	12.8	47.41	---	207.64	---	0.32	1.19	---	5.19	Manufacturer's Specs - uncontrolled, Catalyst Specs - controlled
VOC[1,4]	---	0.41	1.52	---	6.65	---	0.066	0.24	---	1.06	Manufacturer's Specs - uncontrolled, Catalyst Specs - controlled
SO_2	5.88E-04	---	0.0082	---	0.036	5.88E-04	---	0.0082	---	0.036	AP-42, Chapter 3.2, Table 3.2-3
$PM_{2.5}/PM_{10}$	1.94E-02	---	0.27	---	1.18	1.94E-02	---	0.27	---	1.18	AP-42, Chapter 3.2, Table 3.2-3
Total PM	1.94E-02	---	0.27	---	1.18	1.94E-02	---	0.27	---	1.18	AP-42, Chapter 3.2, Table 3.2-3
1,1,2,2-Tetrachloroethane	2.53E-05	---	0.00035	3.09	0.0015	2.53E-05	---	0.00035	3.09	0.0015	AP-42, Chapter 3.2, Table 3.2-3
1,3-Butadiene	6.63E-04	---	0.0092	80.88	0.040	6.63E-04	---	0.0092	80.88	0.040	AP-42, Chapter 3.2, Table 3.2-3
Acetaldehyde	2.79E-03	---	0.039	340.3	0.17	2.79E-03	---	0.039	340.3	0.17	AP-42, Chapter 3.2, Table 3.2-3
Acrolein	2.63E-03	---	0.037	320.8	0.16	2.63E-03	---	0.037	320.8	0.16	AP-42, Chapter 3.2, Table 3.2-3
Benzene	1.58E-03	---	0.022	192.7	0.096	1.58E-03	---	0.022	192.7	0.096	AP-42, Chapter 3.2, Table 3.2-3
Ethylbenzene	2.48E-05	---	0.00035	3.03	0.0015	2.48E-05	---	0.00035	3.03	0.0015	AP-42, Chapter 3.2, Table 3.2-3
Formaldehyde[1,4]	---	0.05	0.19	1,622	0.81	---	0.01	0.019	162.2	0.081	Manufacturer's Specs - uncontrolled, Catalyst Specs - controlled
Methanol	3.06E-03	---	0.043	373.3	0.19	3.06E-03	---	0.043	373.3	0.19	AP-42, Chapter 3.2, Table 3.2-3
Methylene Chloride	4.12E-05	---	0.00057	5.03	0.0025	4.12E-05	---	0.00057	5.03	0.0025	AP-42, Chapter 3.2, Table 3.2-3
PAH	1.41E-04	---	0.0020	17.20	0.0086	1.41E-04	---	0.0020	17.20	0.0086	AP-42, Chapter 3.2, Table 3.2-3
Toluene	5.58E-04	---	0.0078	68.07	0.034	5.58E-04	---	0.0078	68.07	0.034	AP-42, Chapter 3.2, Table 3.2-3
Xylenes	1.95E-04	---	0.0027	23.79	0.012	1.95E-04	---	0.0027	23.79	0.012	AP-42, Chapter 3.2, Table 3.2-3
Other HAPs[2]	2.10E-04	---	0.0029	25.59	0.013	2.10E-04	---	0.0029	25.59	0.013	AP-42, Chapter 3.2, Table 3.2-3
Total HAPS			0.35	3,076	1.54			0.18	1,616	0.81	
Pollutant	**Emission Factor**		**Estimated Emissions[2]**			**Emission Factor**		**Estimated Emissions[2]**			**Source of Emissions Factors**
	(kg/MMBtu)	**(g/bhp-hr)**	**(lb/hr)**	**(lb/yr)**	**(tpy)**	**(kg/MMBtu)**	**(g/bhp-hr)**	**(lb/hr)**	**(lb/yr)**	**(tpy)**	
CO_2[1]	---	527	1,952	---	8,549	---	527	1,952	---	8,549	Manufacturer's Specs
CH_4[1,4]	---	1.41	5.22	---	22.87	---	0.42	1.57	---	6.86	Manufacturer's Specs - uncontrolled, Catalyst Specs - controlled
N_2O	0.0001	---	0.0031	---	0.013	0.0001	---	0.0031	---	0.013	40 CFR Part 98, Subpart C, Table C-2
CO_2e[2]	---	---	2,083	---	9,125	---	---	1,992	---	8,725	40 CFR Part 98, Subpart A, Table A-1, effective January 2014

Notes:

4. Due to variable load conditions, the catalyst efficiency may vary. The catalyst efficiencies used in the emissions are typical based on expected operating conditions. The catalyst specification sheet shows typical destruction efficiencies that were used in the calculations. The emission factors shown on the catalyst specification sheet are not site specific, so those will vary; however the efficiencies will be the same.

Example Calculations

lb/hr = (g/hp-hr) * (hp) * (1 lb/453.6 g) or (lb/MMBtu) * (MMBtu/hr)

tpy = (lb/hr) * (8,760 hrs/yr) / (2,000 lb/ton)

Natural Gas Fueled Fuel Conditioning Heater Emissions

Company:	**Antero Midstream LLC**
Facility Name:	**Tamela Compressor Station**
Location:	**Doddridge County, West Virginia**
Source Description:	**Fuel Conditioning Heater**

Source Information

Emission Unit ID:	FUEL1	
Source Description:	Fuel Conditioning Heater	
Hours of Operation	8,760	hr/yr
Design Heat Rate	0.50	MMBtu/hr
Fuel Heat Value	1,020	Btu/scf
Fuel Use	4.29	MMscf/yr

Emission Calculations per Heater

Pollutant	Emission Factor (lb/MMscf)	Emissions (lb/hr)	Emissions (tpy)	Emission Factor Source
NO_X	100	0.049	0.21	AP-42 Ch. 1.4 Table 1.4-1
CO	84	0.041	0.18	AP-42 Ch. 1.4 Table 1.4-1
VOC	5.5	0.0027	0.012	AP-42 Ch. 1.4 Table 1.4-2
PM_{10}	7.6	0.0037	0.016	AP-42 Ch. 1.4 Table 1.4-2
SO_2	0.6	0.00029	0.0013	AP-42 Ch. 1.4 Table 1.4-2
Formaldehyde	0.075	0.000037	0.00016	AP-42 Ch. 1.4 Table 1.4-3
Total HAPs (including HCHO)[1]	1.9	0.00092	0.0040	AP-42 Ch. 1.4 Table 1.4-3
Pollutant	**Emission Factor (kg/MMBtu)**	**Emissions (lb/hr)**	**Emissions (tpy)**	**Emission Factor Source**
Carbon Dioxide	53.06	58.63	256.8	40 CFR Part 98, Subpart C, Table C-1
Methane	0.001	0.0011	0.0048	40 CFR Part 98, Subpart C, Table C-2
Nitrous Oxide	0.0001	0.00011	0.00048	40 CFR Part 98, Subpart C, Table C-2
CO_2e	----	58.69	257.1	40 CFR Part 98, Subpart A, Table A-1

1. Only those HAP pollutants above detection thresholds were included.

Sample Calculations:

$$\text{Fuel Consumption (MMscf/yr)} = \frac{\text{Heater Size (MMBtu/hr)} * \text{Hours of Operation (hrs/yr)}}{\text{Fuel Heat Value (Btu/scf)} * \text{Heater Efficiency}}$$

$$\text{Emissions (tons/yr)} = \frac{\text{Emission Factor (lbs/MMscf)} * \text{Fuel Consumption (MMscf/yr)}}{\text{2,000 (lbs/ton)}}$$

Microturbine Generator Emission Calculations

Company:	**Antero Midstream LLC**
Facility Name:	**Tamela Compressor Station**
Facility Location:	**Doddridge County, West Virginia**
Source Description:	**Microturbine Generators**

Source Information

Emission Unit ID:	G-8000, G-8100, G-8200	
Make/Model	Capstone C200 Standard	
Microturbine Rating	200	kWe
Number of Microturbines	3	units
Net Heat Rate	10,300	Btu/kWhe
Heat Input [1]	2.06	MMBtu/hr
Operating Hours	8,760	hrs/yr

Notes:

1) Calculated

Potential Emissions per Generator

	Uncontrolled					***Controlled***					
Pollutant	**Emission Factor**		**Estimated Emissions[1]**			**Emission Factor**		**Estimated Emissions[1]**			**Source of Emissions Factors**
	(lb/MMBtu)	**(lb/MWhe)**	**(lb/hr)**	**(lb/yr)**	**(tpy)**	**(lb/MMBtu)**	**(lb/MWhe)**	**(lb/hr)**	**(lb/yr)**	**(tpy)**	
NOx	---	0.40	0.080	---	0.35	---	0.40	0.080	---	0.35	Manufacturer Specifications
CO	---	1.10	0.22	---	0.96	---	1.10	0.22	---	0.96	Manufacturer Specifications
VOC	---	0.10	0.020	---	0.088	---	0.10	0.020	---	0.088	Manufacturer Specifications
SO_2	3.40E-03	---	0.0070	---	0.031	3.40E-03	---	0.0070	---	0.031	AP-42, Chapter 3.1, Table 3.1-2a
$PM_{2.5}/PM_{10}$	6.60E-03	---	0.014	---	0.060	6.60E-03	---	0.014	---	0.060	AP-42, Chapter 3.1, Table 3.1-2a
1,3-Butadiene	4.30E-07	---	8.86E-07	0.0078	3.88E-06	4.30E-07	---	8.86E-07	0.0078	3.88E-06	AP-42, Chapter 3.1, Table 3.1-3
Acetaldehyde	4.00E-05	---	8.24E-05	0.72	3.61E-04	4.00E-05	---	8.24E-05	0.72	3.61E-04	AP-42, Chapter 3.1, Table 3.1-3
Acrolein	6.40E-06	---	1.32E-05	0.12	5.77E-05	6.40E-06	---	1.32E-05	0.12	5.77E-05	AP-42, Chapter 3.1, Table 3.1-3
Benzene	1.20E-05	---	2.47E-05	0.22	1.08E-04	1.20E-05	---	2.47E-05	0.22	1.08E-04	AP-42, Chapter 3.1, Table 3.1-3
Ethylbenzene	3.20E-05	---	6.59E-05	0.58	2.89E-04	3.20E-05	---	6.59E-05	0.58	2.89E-04	AP-42, Chapter 3.1, Table 3.1-3
Formaldehyde	7.10E-04	---	1.46E-03	12.81	6.41E-03	7.10E-04	---	1.46E-03	12.81	6.41E-03	AP-42, Chapter 3.1, Table 3.1-3
Naphthalene	1.30E-06	---	2.68E-06	0.023	1.17E-05	1.30E-06	---	2.68E-06	0.023	1.17E-05	AP-42, Chapter 3.1, Table 3.1-3
PAH	2.20E-06	---	4.53E-06	0.040	1.99E-05	2.20E-06	---	4.53E-06	0.040	1.99E-05	AP-42, Chapter 3.1, Table 3.1-3
Propylene Oxide	2.90E-05	---	5.97E-05	0.52	2.62E-04	2.90E-05	---	5.97E-05	0.52	2.62E-04	AP-42, Chapter 3.1, Table 3.1-3
Toluene	1.30E-04	---	2.68E-04	2.35	1.17E-03	1.30E-04	---	2.68E-04	2.35	1.17E-03	AP-42, Chapter 3.1, Table 3.1-3
Xylenes	6.40E-05	---	1.32E-04	1.15	5.77E-04	6.40E-05	---	1.32E-04	1.15	5.77E-04	AP-42, Chapter 3.1, Table 3.1-3
Total HAPS			0.0021	18.54	0.0093			0.0021	18.54	0.0093	
Pollutant	**Emission Factor**		**Estimated Emissions[1]**			**Emission Factor**		**Estimated Emissions[1]**			**Source of Emissions Factors**
	(kg/MMBtu)	**(lb/MWhe)**	**(lb/hr)**		**(tpy)**	**(kg/MMBtu)**	**(lb/MWhe)**	**(lb/hr)**		**(tpy)**	
CO_2	---	1,330	266.0	---	1,165	---	1,330	266.0	---	1,165	Manufacturer Specifications
CH_4	0.001	---	0.0046	---	0.020	0.001	---	0.0046	---	0.020	40 CFR Part 98, Subpart C, Table C-2
N_2O	0.0001	---	0.00046	---	0.0020	0.0001	---	0.00046	---	0.0020	40 CFR Part 98, Subpart C, Table C-2
CO_2e	---	---	266.2	---	1,166	---	---	266.2	---	1,166	40 CFR Part 98, Subpart A, Table A-1, effective January 2014

Example Calculations

lb/hr = (lb/Mwhe) * kWe * (1 MWe/1000 kWe) or (lb/MMBtu) * (MMBtu/hr) or (kg/MMBtu) * (MMBtu/hr) * (2.21 lb/kg)

tpy = (lb/hr) * (hr/yr) * (ton/2000 lb)

Natural Gas Fueled Catalytic Heater Emissions

Company:	**Antero Midstream LLC**
Facility Name:	**Tamela Compressor Station**
Location:	**Doddridge County, West Virginia**
Source Description:	**Catalytic Heater for Generator Fuel**

Source Information

Emission Unit ID:	CATHT1	
Source Description:	Generator Fuel Heater	
Hours of Operation	8,760	hr/yr
Design Heat Rate	0.024	MMBtu/hr
Fuel Heat Value	1,020	Btu/scf
Fuel Use	0.21	MMscf/yr

Emission Calculations per Heater

Pollutant	Emission Factor (lb/MMscf)	Emissions (lb/hr)	Emissions (tpy)	Emission Factor Source
NO_X	100	0.0024	0.010	AP-42 Ch. 1.4 Table 1.4-1
CO	84	0.0020	0.0087	AP-42 Ch. 1.4 Table 1.4-1
VOC	5.5	0.00013	0.00057	AP-42 Ch. 1.4 Table 1.4-2
PM_{10}	7.6	0.00018	0.00078	AP-42 Ch. 1.4 Table 1.4-2
SO_2	0.6	0.000014	0.000062	AP-42 Ch. 1.4 Table 1.4-2
Formaldehyde	0.075	0.0000018	0.0000077	AP-42 Ch. 1.4 Table 1.4-3
Total HAPs (including HCHO)[1]	1.9	0.000044	0.00019	AP-42 Ch. 1.4 Table 1.4-3
Pollutant	**Emission Factor (kg/MMBtu)**	**Emissions (lb/hr)**	**Emissions (tpy)**	**Emission Factor Source**
Carbon Dioxide	53.06	2.81	12.3	40 CFR Part 98, Subpart C, Table C-1
Methane	0.001	0.000053	0.00023	40 CFR Part 98, Subpart C, Table C-2
Nitrous Oxide	0.0001	0.0000053	0.000023	40 CFR Part 98, Subpart C, Table C-2
CO_2e	----	2.82	12.3	40 CFR Part 98, Subpart A, Table A-1

1. Only those HAP pollutants above detection thresholds were included.

Sample Calculations:

$$\text{Fuel Consumption (MMscf/yr)} = \frac{\text{Heater Size (MMBtu/hr)} * \text{Hours of Operation (hrs/yr)}}{\text{Fuel Heat Value (Btu/scf)} * \text{Heater Efficiency}}$$

$$\text{Emissions (tons/yr)} = \frac{\text{Emission Factor (lbs/MMscf)} * \text{Fuel Consumption (MMscf/yr)}}{\text{2,000 (lbs/ton)}}$$

Dehydrator Emissions

Company:	**Antero Midstream LLC**
Facility Name:	**Tamela Compressor Station**
Facility Location:	**Doddridge County, West Virginia**
Source Description:	**Dehydrator Units**

Potential Emissions per Dehydrator

Pollutant	Emission Unit ID: V-3110/V-3210 Dehydrator Still Vent		Emission Unit ID: V-3120/V-3220 Flash Tank Gas	
		(tpy)	(lb/hr)	(tpy)
Uncontrolled Emissions [1]				
VOC	16.88	73.93	48.87	214.06
Total HAPs	5.04	22.10	1.31	5.73
Benzene	1.18	5.16	0.094	0.41
Toluene	2.67	11.70	0.12	0.53
Ethylbenzene	0.17	0.74	0.0039	0.017
Xylenes	0.59	2.59	0.0087	0.038
n-Hexane	0.44	1.91	1.08	4.73
Methane	18.49	80.98	114.94	503.42
Carbon Dioxide	0.27	1.17	2.27	9.94
CO_2e	462.5	2,026	2,876	12,595
Controlled Emissions [2,3]				
VOC	0.34	1.48	0.98	4.28
Total HAPs	0.10	0.44	0.026	0.11
Benzene	0.024	0.10	0.0019	0.0083
Toluene	0.053	0.23	0.0024	0.011
Ethylbenzene	0.0034	0.015	0.00010	0.00030
Xylenes	0.012	0.052	0.00020	0.00080
n-Hexane	0.0087	0.038	0.022	0.095
Methane	0.37	1.62	2.30	10.07
Carbon Dioxide	0.27	1.17	2.27	9.94
CO_2e	9.51	41.66	59.74	261.7

Pollutant	Dehydrator Emission Totals	
	(lb/hr)	(tpy)
Uncontrolled Emissions [1]		
VOC	65.75	288.0
Total HAPs	6.35	27.83
Benzene	1.27	5.58
Toluene	2.79	12.23
Ethylbenzene	0.17	0.76
Xylenes	0.60	2.63
n-Hexane	1.51	6.63
Methane	133.4	584.4
Carbon Dioxide	2.54	11.11
CO_2e	3,338	14,621
Controlled Emissions [2,3]		
VOC	1.31	5.76
Total HAPs	0.13	0.56
Benzene	0.025	0.11
Toluene	0.056	0.24
Ethylbenzene	0.0035	0.015
Xylenes	0.012	0.053
n-Hexane	0.030	0.13
Methane	2.67	11.69
Carbon Dioxide	2.54	11.11
CO_2e	69.25	303.3

[1]Output from GRI-GLYCalc 4.0 for both the still vent and flash tank gas emissions

[2]Controlled emissions assume that the glycol still vent is equipped with a condenser and is controlled by a combustor with 98% control efficiency.

[3]Flash tank gas is used in the reboiler as the primary fuel source. However, in the case that gas cannot be used in the reboiler, the gas is sent to the primary/backup VRU system via the storage tanks for 98% control.

Natural Gas Fueled Dehydrator Reboiler Emissions

Company:	**Antero Midstream LLC**
Facility Name:	**Tamela Compressor Station**
Location:	**Doddridge County, West Virginia**
Source Description:	**Dehydrator Reboilers**

Source Information

Emission Unit ID:	F-3100 & F-3200	
Source Description:	Dehydrator Reboiler	
Hours of Operation	8,760	hr/yr
Design Heat Rate	1.5	MMBtu/hr
Fuel Heat Value	1,020	Btu/scf
Fuel Use	12.9	MMscf/yr

Emission Calculations per Reboiler

Pollutant	Emission Factor (lb/MMscf)	Emissions (lb/hr)	Emissions (tpy)	Emission Factor Source
NO_X	100	0.15	0.64	AP-42 Ch. 1.4 Table 1.4-1
CO	84	0.12	0.54	AP-42 Ch. 1.4 Table 1.4-1
VOC	5.5	0.0081	0.035	AP-42 Ch. 1.4 Table 1.4-2
PM_{10}	7.6	0.011	0.049	AP-42 Ch. 1.4 Table 1.4-2
SO_2	0.6	0.00088	0.0039	AP-42 Ch. 1.4 Table 1.4-2
Formaldehyde	0.075	0.00011	0.00048	AP-42 Ch. 1.4 Table 1.4-3
Total HAPs (including HCHO)	1.9	0.0028	0.012	AP-42 Ch. 1.4 Table 1.4-3
Pollutant	**Emission Factor (kg/MMBtu)**	**Emissions (lb/hr)**	**Emissions (tpy)**	**Emission Factor Source**
Carbon Dioxide	53.06	175.9	770.4	40 CFR Part 98, Subpart C, Table C-1
Methane	0.001	0.0033	0.015	40 CFR Part 98, Subpart C, Table C-2
Nitrous Oxide	0.0001	0.00033	0.0015	40 CFR Part 98, Subpart C, Table C-2
CO_2e	----	176.1	771.2	40 CFR Part 98, Subpart A, Table A-1

Sample Calculations:

$$\text{Fuel Consumption (MMscf/yr)} = \frac{\text{Heater Size (MMBtu/hr)} * \text{Hours of Operation (hrs/yr)}}{\text{Fuel Heat Value (Btu/scf)} * \text{Heater Efficiency}}$$

$$\text{Emissions (tons/yr)} = \frac{\text{Emission Factor (lbs/MMscf)} * \text{Fuel Consumption (MMscf/yr)}}{\text{2,000 (lbs/ton)}}$$

Flare Emissions

Company:	**Antero Midstream LLC**
Facility Name:	**Tamela Compressor Station**
Facility Location:	**Doddridge County, West Virginia**
Source Description:	**Flare for Dehydrator Still Vent Gas**
Emission Unit ID:	**FL-1000**

Combusted Gas Emissions

Flare Heat Input :	4.80	MMBtu/hr
Hours of Operation:	8,760	hr/yr

Pollutant	Emission Factor[1] (lb/MMBtu)	Emissions (lbs/hr)	Emissions (tons/yr)
Particulate Matter ($PM/PM_{10}/PM_{2.5}$)	N/A - Smokeless Design		
Nitrogen Oxides (NO_x)	0.068	0.33	1.43
Carbon Monoxide (CO)	0.37	1.78	7.78

[1] Emission Factors from Table 13.5-1 of AP-42 Section 13.5 (Sept 1991)

Pilot Emissions

Pilot Heating Value:	1,214	Btu/scf
Hours of Operation:	8,760	hr/yr
Total Pilot Natural Gas Usage:	1.64E-05	MMscf/hr

Pollutant	Emission Factor (lb/MMscf)	Emissions (lbs/hr)	Emissions (tons/yr)
Particulate Matter ($PM/PM_{10}/PM_{2.5}$)[2]	7.6	1.48E-04	6.50E-04
Nitrogen Oxides (NOx)	100	1.95E-03	8.55E-03
Sulfur Dioxide (SO_2)[2]	0.6	1.17E-05	5.13E-05
Carbon Monoxide (CO)[2]	84	1.64E-03	7.18E-03
Volatile Organic Compounds (VOC)[2]	5.5	1.07E-04	4.70E-04
Total HAPs[2,3]	1.88	3.67E-05	1.61E-04

[2] Emission Factors from AP-42 Tables 1.4-1, 1.4-2, 1.4-3, and 1.4-4 (7/98).

[3] Sum of Emissions Factors published for pollutants classified as "HAPS" under AP-42 Table 1.4-3.

Total Flare Emissions

Pollutant	Potential Emission Rate (lbs/hr)	Potential Emission Rate (tons/year)
Particulate Matter ($PM/PM_{10}/PM_{2.5}$)	1.48E-04	6.50E-04
Nitrogen Oxides (NOx)	0.33	1.44
Sulfur Dioxide (SO_2)	1.17E-05	5.13E-05
Carbon Monoxide (CO)	1.78	7.79
Volatile Organic Compounds (VOC)	1.07E-04	4.70E-04
Total HAPs	3.67E-05	1.61E-04

Greenhouse Gas Emissions

Pollutant	Emission Factor (kg/MMBtu)	Emissions (lb/hr)	Emissions (tpy)	Emission Factor Source
Carbon Dioxide	53.06	565.2	2,476	40 CFR Part 98, Subpart C, Table C-1
Methane	0.001	0.011	0.047	40 CFR Part 98, Subpart C, Table C-2
Nitrogen Dioxide	0.0001	0.0011	0.0047	40 CFR Part 98, Subpart C, Table C-2
CO_2e	----	565.2	2,476	40 CFR Part 98, Subpart A, Table A-1

Truck Loading Emissions

Company:	**Antero Midstream LLC**
Facility Name:	**Tamela Compressor Station**
Facility Location:	**Doddridge County, West Virginia**
Source Description:	**Production Liquids Truck Loadout**
Emission Unit ID:	**LDOUT1**

AP - 42, Chapter 5.2 $L_L = 12.46 \times S \times P \times M / T$

L_L = Loading Loss Emission Factor (lbs VOC/1000 gal loaded)
- S = Saturation Factor
- P = True Vapor Pressure of the Loaded Liquid (psia)
- M = Vapor Molecular Weight of the Loaded Liquid (lbs/lbmol)
- T = Temperature of Loaded Liquid (ºR)

VOC Emissions (tpy) = $\dfrac{L_L \text{ (lbs VOC/1000 gal)} * 42 \text{ gal/bbl} * 365 \text{ days/year} * \text{production (bbl/day)}}{1000 \text{ gal} * 2000 \text{ lbs/ton}}$

								Uncontrolled						
Source	**S[1]**	**P (psia)[2]**	**M[3]**	**T (ºF)[4]**	**T (ºR)**	**L_L (lb/1000 gal)**	**Production (bbl/day)**	**VOC (tpy)**	**Benzene (tpy)[5]**	**Toluene (tpy)[5]**	**E-Benzene (tpy)[5]**	**Xylene (tpy)[5]**	**n-Hexane (tpy)[5]**	**CO_2e (tpy)[5]**
Condensate	0.6	12.0	38.6	60	519.67	6.66	150	7.66	0.0037	0.0088	0.0032	0.0081	0.21	27.86
Produced Water	0.6	0.32	18.2	60	519.67	0.0084	45	0.0029	1.41E-06	3.35E-06	1.20E-06	3.09E-06	7.86E-05	0.011

Notes:
1. Saturation factor from AP-42, Table 5.2-1 (Submerged loading (bottom loading): dedicated normal service)
2. True vapor pressure for condensate and produced water is from the ProMax 4.0 model output
3. Molecular weight of the liquid vapor for condensate is from the ProMax 4.0 model output and the molecular weight of the liquid vapor for produced water is derived from the produced water working and breathing emissions.
4. Temperature is the liquid bulk temperature used in the ProMax 4.0 model
5. HAPs and CO_2e emissions are calculated using the flash gas vapor weight percents from the ProMax 4.0 output.

Assume 1 truck loaded per hour, 260 bbl truck, for short term emissions

								Uncontrolled						
Source	**S[1]**	**P (psia)[2]**	**M[3]**	**T (ºF)[4]**	**T (ºR)**	**L_L (lb/1000 gal)**	**Loading (bbl/hr)**	**VOC (lb/hr)**	**Benzene (lb/hr)[5]**	**Toluene (lb/hr)[5]**	**E-Benzene (lb/hr)[5]**	**Xylene (lb/hr)[5]**	**n-Hexane (lb/hr)[5]**	**CO_2e (lb/hr)[5]**
Condensate	0.6	12.0	38.6	60	519.67	6.66	260	72.76	0.035	0.084	0.030	0.077	1.96	264.6
Produced Water	0.6	0.32	18.2	60	519.67	0.0084	260	0.092	4.46E-05	1.06E-04	3.81E-05	9.79E-05	2.49E-03	0.33

Storage Tank Flashing Emissions Calculated by ProMax Simulation

Company:	**Antero Midstream LLC**
Facility Name:	**Tamela Compressor Station**
Facility Location:	**Doddridge County, West Virginia**
Source Description:	**Settling Tank**
Emission Unit ID:	**TK-9000**

Settling Tank Flashing Emissions

Component	Uncontrolled Flashing Emissions [1] (lb/hr)	Uncontrolled Flashing Emissions (tons/yr)	Controlled Flashing Emissions [2,3] (lb/hr)	Controlled Flashing Emissions [2,3] (tons/yr)
Methane	22.64	99.18	0.45	1.98
Ethane	47.59	208.43	0.95	4.17
Propane	59.22	259.38	1.18	5.19
i-Butane	15.70	68.74	0.31	1.37
n-Butane	36.40	159.44	0.73	3.19
i-Pentane	13.51	59.18	0.27	1.18
n-Pentane	13.68	59.92	0.27	1.20
2-Methylpentane (Hexanes)	6.70	29.33	0.13	0.59
n-Heptane	3.98	17.45	0.080	0.35
n-Octane	1.51	6.62	0.030	0.13
n-Nonane	0.21	0.92	0.0042	0.018
Decanes+	0.078	0.34	0.0016	0.0069
Benzene	0.075	0.33	0.0015	0.0066
Toluene	0.18	0.79	0.0036	0.016
Ethylbenzene	0.064	0.28	0.0013	0.0056
o-Xylene	0.17	0.72	0.0033	0.014
n-Hexane	4.20	18.41	0.084	0.37
2,2,4-Trimethylpentane	0.00	0.00	0.00	0.00
Water	1.86	8.14	1.86	8.14
Nitrogen	0.087	0.38	0.087	0.38
Carbon Dioxide	0.23	1.00	0.23	1.00
VOC Subtotal	155.68	681.86	3.11	13.64
HAP Subtotal	4.69	20.53	0.094	0.41
CO_2e Subtotal	566.33	2,480.5	11.55	50.59
Total	228.08	998.99	6.69	29.30

Notes:

1. Flashing emissions calculated by ProMax 4.0. Flash gas is "Flash Gas" of the associated ProMax simulation. Flashing only occurs in the settling tank as all pressurized fluids flow into the settling tank and then separate out at atmospheric conditions to the condensate and produced water tanks.

2. Tanks are controlled by a VRU with assumed 98% capture efficiency; but will likely be higher as vapors are recycled back into the system.

3. VRU-100 is the primary VRU to collect storage tank vapors and VRU-200 is the backup VRU in times when the primary VRU is undergoing maintenance or shutdown.

Storage Tank Working and Breathing Emissions

Company:	**Antero Midstream LLC**
Facility Name:	**Tamela Compressor Station**
Facility Location:	**Doddridge County, West Virginia**
Source Description:	**Condensate, Settling, and Produced Water Tanks**
Emission Unit ID:	**TK-9000, TK-9100, TK-9110, TK-9200, TK-9210**

TANK DESCRIPTION	Uncontrolled VOC Emissions[1] (tons/yr)	Uncontrolled Benzene Emissions[1] (tons/yr)	Uncontrolled Toluene Emissions[1] (tons/yr)	Uncontrolled Ethylbenzene Emissions[1] (tons/yr)	Uncontrolled Xylene Emissions[1] (tons/yr)	Uncontrolled n-Hexane Emissions[1] (tons/yr)	Uncontrolled CH_4 Emissions[1] (tons/yr)	Uncontrolled CO_2e Emissions (tons/yr)
400 bbl Hydrocarbon Storage Tank (TK-9200)	7.05	0.0023	0.0060	0.0024	0.0055	0.20	0.093	2.32
400 bbl Hydrocarbon Storage Tank (TK-9210)	7.05	0.0023	0.0060	0.0024	0.0055	0.20	0.093	2.32
500 bbl Settling Tank (TK-9000)	8.57	0.0028	0.0073	0.0029	0.0067	0.25	0.11	2.82
400 bbl Produced Water Storage Tank[2] (TK-9100)	2.93E-04	6.50E-07	3.30E-07	3.80E-08	5.80E-08	2.80E-08	4.50E-04	1.14E-02
400 bbl Produced Water Storage Tank[2] (TK-9210)	2.93E-04	6.50E-07	3.30E-07	3.80E-08	5.80E-08	2.80E-08	4.50E-04	1.14E-02
TOTAL	**22.68**	**0.0075**	**0.019**	**0.0076**	**0.018**	**0.65**	**0.30**	**7.49**

TANK DESCRIPTION	Controlled VOC Emissions[3,4] (tons/yr)	Controlled Benzene Emissions[3,4] (tons/yr)	Controlled Toluene Emissions[3,4] (tons/yr)	Controlled Ethylbenzene Emissions[3,4] (tons/yr)	Controlled Xylene Emissions[3,4] (tons/yr)	Controlled n-Hexane Emissions[3,4] (tons/yr)	Controlled CH_4 Emissions[3,4] (tons/yr)	Controlled CO_2e Emissions[3,4] (tons/yr)
400 bbl Hydrocarbon Storage Tank (TK-9200)	0.14	4.66E-05	1.20E-04	4.72E-05	1.10E-04	4.06E-03	1.85E-03	5.19E-02
400 bbl Hydrocarbon Storage Tank (TK-9210)	0.14	4.66E-05	1.20E-04	4.72E-05	1.10E-04	4.06E-03	1.85E-03	5.19E-02
500 bbl Settling Tank (TK-9000)	0.17	5.66E-05	1.46E-04	5.74E-05	1.34E-04	4.93E-03	2.25E-03	6.31E-02
400 bbl Produced Water Storage Tank[2] (TK-9100)	5.86E-06	1.30E-08	6.60E-09	7.60E-10	1.16E-09	5.60E-10	9.00E-06	3.75E-04
400 bbl Produced Water Storage Tank[2] (TK-9210)	5.86E-06	1.30E-08	6.60E-09	7.60E-10	1.16E-09	5.60E-10	9.00E-06	3.75E-04
TOTAL	**0.45**	**1.50E-04**	**3.86E-04**	**1.52E-04**	**3.54E-04**	**1.31E-02**	**0.0060**	**0.17**

Notes:

1. ProMax 4.0 used to calculated working and breathing emissions.
2. Produced water assumed to have no more than 10% hydrocarbon liquid.
3. Tanks are controlled by a VRU with assumed 98% capture efficiency; but will likely be higher as vapors are recycled back into the system.
4. VRU-100 is the primary VRU to collect storage tank vapors and VRU-200 is the backup VRU in times when the primary VRU is undergoing maintenance or shutdown.

Emissions From Venting Episodes

Company:	**Antero Midstream LLC**
Facility Name:	**Tamela Compressor Station**
Facility Location:	**Doddridge County, West Virginia**
Source Description:	**Emissions-Venting Episodes**
Emission Unit ID:	**VENT1**

VOC Venting Emissions						
Type of Event[1]	**Number Of Events (event/yr)**	**Amount Vented per Event (scf/event)**	**Molecular Weight of Vented Gas (lb/lb-mol)**	**Total Emissions (ton/yr)**	**VOC Weight Fraction[4]**	**VOC Emissions (ton/yr)**
Compressor Blowdown[2]	936	2,236	20.43	56.35	0.17	9.35
Compressor Startup	936	1,050	20.43	26.46	0.17	4.39
Plant Shutdown	2	100,000	20.43	5.38	0.17	0.89
Low Pressure Pig Venting[3]	593	516	20.43	8.23	0.17	1.37
High Pressure Pig Venting[3]	520	2,801	20.43	39.21	0.17	6.50
Total Emissions (tons/yr)						**22.50**

HAPs Venting Emissions										
Type of Event[1]	**Benzene Weight Fraction[4]**	**Benzene Emissions (tpy)**	**Toluene Weight Fraction[4]**	**Toluene Emissions (tpy)**	**Ethylbenzene Weight Fraction[4]**	**Ethylbenzene Emissions (tpy)**	**Xylene Weight Fraction[4]**	**Xylene Emissions (tpy)**	**n-Hexane Weight Fraction[4]**	**n-Hexane Emissions (tpy)**
Compressor Blowdown[2]	1.03E-04	0.0058	1.85E-04	0.010	1.04E-05	0.00059	2.60E-05	0.0015	3.09E-03	0.17
Compressor Startup	1.03E-04	0.0027	1.85E-04	0.0049	1.04E-05	0.00027	2.60E-05	0.00069	3.09E-03	0.082
Plant Shutdown	1.03E-04	0.00056	1.85E-04	0.0010	1.04E-05	0.000056	2.60E-05	0.00014	3.09E-03	0.017
Low Pressure Pig Venting[3]	1.03E-04	0.00085	1.85E-04	0.0015	1.04E-05	0.000086	2.60E-05	0.00021	3.09E-03	0.025
High Pressure Pig Venting[3]	1.03E-04	0.0040	1.85E-04	0.0072	1.04E-05	0.00041	2.60E-05	0.0010	3.09E-03	0.12
Total Emissions (tons/yr)		**0.014**		**0.025**		**0.0014**		**0.0035**		**0.42**

GHG Venting Emissions								
Type of Event[1]	**Number Of Events (event/yr)**	**Amount Vented per Event (scf/event)**	**Molecular Weight of Vented Gas (lb/lb-mol)**	**CH_4 Weight Fraction[4]**	**CO_2 Weight Fraction[4]**	**CH_4 Emissions (ton/yr)**	**CO_2 Emissions (ton/yr)**	**CO_2e Emissions (tpy)**
Compressor Blowdown[2]	936	2,236	20.43	0.62	0.0040	35.00	0.22	875.28
Compressor Startup	936	1,050	20.43	0.62	0.0040	16.43	0.11	410.95
Plant Shutdown	2	100,000	20.43	0.62	0.0040	3.34	0.021	83.63
Low Pressure Pig Venting[3]	593	516	20.43	0.62	0.0040	5.11	0.033	127.90
High Pressure Pig Venting[3]	520	2,801	20.43	0.62	0.0040	24.36	0.16	609.03
Total Emissions (tons/yr)						**84.25**	**0.54**	**2,106.8**

1) Estimated number of events and venting per event from engineering. Compressor blowdowns are calculated to be 120.4 lb/event.

2) Total number of compressor blowdowns based on 18 blowdowns per week.

3) Total number of pigging events based on expected operations.

4) Weight fractions are from a gas analysis from a nearby, representative compressor station.

Component Fugitive Emissions

Company:	**Antero Midstream LLC**
Facility Name:	**Tamela Compressor Station**
Facility Location:	**Doddridge County, West Virginia**
Source Description:	**Fugitive Emissions - Component Leaks**

VOC Fugitive Emissions						
Equipment Type and Service	**Number of Units [1]**	**Hours of Operation (hours/yr)**	**THC Emission Factor[2] (kg/hr-unit)**	**VOC Weight Fraction[3]**	**THC Emissions (tpy)**	**VOC Emissions (tpy)**
Flanges - Gas Service	850	8,760	3.90E-04	0.17	3.21	0.54
Valves - Gas Service	750	8,760	4.50E-03	0.17	32.67	5.48
Compressor Seals Gas Service	39	8,760	8.80E-03	0.17	3.32	0.56
Flanges - Liquid Service	400	8,760	1.10E-04	0.69	0.43	0.29
Valves - Liquid Service	160	8,760	2.50E-03	0.69	3.87	2.67
Total Emissions (tons/yr)					**43.50**	**9.54**

HAPs Fugitive Emissions										
Equipment Type and Service	**Benzene Weight Fraction[3]**	**Benzene Emissions (tpy)**	**Toluene Weight Fraction[2]**	**Toluene Emissions (tpy)**	**Ethylbenzene Weight Fraction[2]**	**Ethylbenzene Emissions (tpy)**	**Xylene Weight Fraction[2]**	**Xylene Emissions (tpy)**	**n-Hexane Weight Fraction[2]**	**n-Hexane Emissions (tpy)**
Flanges - Gas Service	1.04E-04	0.00034	1.87E-04	0.00060	1.05E-05	0.000034	2.63E-05	0.000084	3.13E-03	0.010
Valves - Gas Service	1.04E-04	0.0034	1.87E-04	0.0061	1.05E-05	0.00034	2.63E-05	0.00086	3.13E-03	0.10
Compressor Seals Gas Service	1.04E-04	0.00035	1.87E-04	0.00062	1.05E-05	0.000035	2.63E-05	0.000087	3.13E-03	0.010
Flanges - Liquid Service	3.34E-04	0.00014	7.94E-04	0.00034	2.85E-04	0.00012	7.33E-04	0.00031	1.86E-02	0.0079
Valves - Liquid Service	3.34E-04	0.0013	7.94E-04	0.0031	2.85E-04	0.0011	7.33E-04	0.0028	1.86E-02	0.072
Total Emissions (tons/yr)		**0.0055**		**0.011**		**0.0016**		**0.0042**		**0.20**

1) Component counts from Engineering Lists.

2) API average emission factors are for oil and gas production operations - Table 2.4, EPA Protocol for Equipment Leak Emission Estimates - 1995.

3) Gas weight fractions from a representative gas analysis and liquid weight fractions from a ProMax 4.0 model run.

GHG Fugitive Emissions								
Equipment Type	**Number of Units [1]**	**Hours of Operation (hours/yr)**	**Emission Factor[2] (scf/hr-unit)**	**CH_4 Concentration[3]**	**CO_2 Concentration[3]**	**CH_4 Emissions (tpy)**	**CO_2 Emissions (tpy)**	**CO_2e Emissions (tpy)**
Flanges	1,250	8,760	0.003	0.98	0.011	0.68	0.021	16.97
Valves - Gas Service	750	8,760	0.027	0.98	0.011	3.66	0.11	91.63
Valves - Liquid Service	160	8,760	0.050	0.98	0.011	1.45	0.045	36.20
Compressor Seals	39	8,760	0.300	0.98	0.011	2.11	0.065	52.94
Total Emissions (tons/yr)						**7.90**	**0.24**	**197.73**

1) Component counts from Engineering Lists.

2) Emission factors from 40 CFR Part 98 Subpart W, Table W1-A.

3) CH_4 and CO_2 concentrations as defined in 40 CFR Part 98.233(r)

Fugitive Dust Emissions

Company:	**Antero Midstream LLC**
Facility Name:	**Tamela Compressor Station**
Facility Location:	**Doddridge County, West Virginia**
Source Description:	**Fugitive Dust Emissions**

Gravel Access Road	Loaded Truck Weight[1]	Trips per year[2]	Trips per day[2]	Distance per round trip (truck in and out)[3]		VMT per year[4]
	tons			feet	miles	miles
Condensate Tank Truck	40.00	365	1.0	4,020	0.76	278
Produced Water Tank Truck	40.00	365	1.0	4,020	0.76	278

Equation Parameter	PM-10/PM2.5	PM-Total
E, annual size-specific emission factor for PM_{10} & $PM_{2.5}$ (upaved industrial roads) extrapolated for natural mitigation[6]	**see table below**	**see table below**
k, Particle size multiplier for particle size range (PM_{10}), (lb/VMT) (Source: AP-42 Table 13.2.2-2)	**1.5**	**4.9**
k, Particle size multiplier for particle size range ($PM_{2.5}$), (lb/VMT) (Source: AP-42 Table 13.2.2-2)	**0.15**	
s, surface material silt content, (%) (Source: AP-42 Table 13.2.2-1)	**4.8**	**4.8**
W, mean weight (tons) of the vehicles traveling the road	**40.00**	**40.00**
a, constant for PM_{10} and $PM_{2.5}$ on industrial roads (Source: AP-42 Table 13.2.2-2)	**0.9**	**0.7**
b, constant for PM_{10} and $PM_{2.5}$ on industrial roads (Source: AP-42 Table 13.2.2-2)	**0.45**	**0.45**
P, number of "wet" days with at least 0.254 mm (0.01 in) of precipitation during the averaging period, based on AP-42 Figure 13.2.2-1.	**160**	**160**

$$E=\left[k\left(\frac{s}{12}\right)^{a}\times\left(\frac{W}{3}\right)^{b}\right]\times(365-P/365)$$

Source of Equation: AP-42 Section 13.2.2

PM_{10} Emissions

Emission Factor (lb/VMT)	Vehicle miles traveled (VMT/yr)[4]	Annual Uncontrolled PM_{10} Emissions (tpy)
1.18	555.80	0.33

$PM_{2.5}$ Emissions (tons/yr)

Emission Factor (lb/VMT)	Vehicle miles traveled (VMT/yr)[4]	Annual Uncontrolled $PM_{2.5}$ Emissions (tpy)
0.12	555.80	0.033

PM- Total Emissions (tons/yr)

Emission Factor (lb/VMT)	Vehicle miles traveled (VMT/yr)[4]	Annual Uncontrolled PM-Total Emissions (tpy)
4.65	555.80	1.29

Table Notes:

1. Loaded truck weight is based on typical weight limit for highway vehicles.
2. Based on production, it's assumed a maximum of one condensate truck (260 bbl truck) and one produced water truck (260 bbl truck) will be onsite per day.
3. Distance per round trip is based on the site layout. The one way distance is measured as 2,010 feet for the gravel access road.
4. VMT/yr = Trips/yr x Roundtrip Distance
5. Hourly emissions determined from tons per year calculation using 2,000 lb/ton and 8,760 hours per year.

Facility Gas Analysis

	MOL %	MW	Component Weight lb/lb-mol	Wt. Fraction
Methane	79.12	16.04	12.69	0.62
Ethane	13.66	30.07	4.11	0.20
Propane	4.13	44.10	1.82	0.089
i-Butane	0.52	58.12	0.30	0.015
n-Butane	0.96	58.12	0.56	0.027
i-Pentane	0.27	72.15	0.20	0.010
n-Pentane	0.24	72.15	0.17	0.0084
Hexanes	0.13	106.72	0.14	0.0067
Heptanes	0.094	100.20	0.094	0.0046
Octanes	0.023	114.23	0.026	0.0013
Nonanes	0.0052	128.26	0.0067	0.00033
Decanes+	0.00030	142.29	0.00043	0.000021
n-Hexane	0.073	86.18	0.063	0.0031
Benzene	0.0027	78.11	0.0021	0.00010
Toluene	0.0041	92.14	0.0038	0.00018
Ethylbenzene	0.00020	106.17	0.00021	0.000010
Xylenes	0.00050	106.16	0.00053	0.000026
Nitrogen	0.54	28.01	0.15	0.0074
Carbon Dioxide	0.18	44.01	0.081	0.0040
Oxygen	0.029	32.01	0.0092	0.00045
Totals	100.0		20.43	1.00

Heating Value (Btu/scf)	1,213.6
Molecular weight	20.43
VOC weight fraction	0.17
Methane weight fraction	0.62
THC weight fraction	0.99
VOC of THC wt fraction	0.17
Methane of THC wt fraction	0.63
Benzene of THC wt fraction	0.00010
Toluene of THC wt fraction	0.00019
E-benzene of THC wt fraction	0.000011
Xylene of THC wt fraction	0.000026
n-Hexane of THC wt fraction	0.0031

1. Gas analysis is a representative sample from a nearby compressor station.

Facility Tank Vent Gas Analysis

	MOL %	MW	Component Weight lb/lb-mol	Wt. Fraction
Methane	23.89	16.04	3.83	0.10
Ethane	26.79	30.07	8.05	0.21
Propane	22.73	44.10	10.02	0.26
i-Butane	4.57	58.12	2.66	0.069
n-Butane	10.60	58.12	6.16	0.16
i-Pentane	3.17	72.15	2.29	0.059
n-Pentane	3.21	72.15	2.32	0.060
Hexanes	1.32	86.18	1.13	0.029
Heptanes	0.67	100.20	0.67	0.017
Octanes	0.22	114.23	0.26	0.0066
Nonanes	0.028	128.26	0.036	0.00092
Decanes+	0.0087	151.80	0.013	0.00034
n-Hexane	0.83	86.18	0.71	0.018
Benzene	0.016	78.11	0.013	0.00033
Toluene	0.033	92.14	0.030	0.00079
Ethylbenzene	0.010	106.17	0.011	0.00028
Xylenes	0.026	106.17	0.028	0.00073
Nitrogen	0.053	28.01	0.015	0.00038
Carbon Dioxide	0.088	44.01	0.039	0.0010
Water	1.75	18.02	0.31	0.0081
Totals	100.00		38.60	1.00

Molecular weight	38.60
VOC weight fraction	0.68
CH4 weight fraction	0.10
THC weight fraction	0.99
VOC of THC wt fraction	0.69
CH4 of THC wt fraction	0.10
Benzene of THC wt fraction	0.00033
Toluene of THC wt fraction	0.00079
E-benzene of THC wt fraction	0.00029
Xylene of THC wt fraction	0.00073
n-Hexane of THC wt fraction	0.019

1. Tank vent gas analysis retrieved from "Flash Gas" stream from ProMax 4.0 simulation.

Attachment O.
Monitoring, Recordkeeping, Reporting, and Testing Plans

Monitoring, Recordkeeping, Reporting, and Testing Plans

The following is a summary of the methods to comply with the requirements of West Virginia Division of Air Quality (WVDAQ) 45CSR13 rules and regulations for the Tamela Compressor Station, including federal and state regulatory requirements.

1. Summary of Key Operational Throughput Limits

a. Maximum dry gas throughput into each Dehydrators: 110 MMscf/day or 40,150 MMscf/year.

b. Maximum liquids loaded out: 2,989,350 gallons per year.

2. Operational Requirements

a. Compressor engines will operate with the catalytic converter in place at all times and will be fueled by natural gas only.

b. Catalysts installed on all compressor engines will be operated per manufacturer instructions.

c. Reciprocating compressor rod packing will be replaced within 36 months of last packing/startup or within 26,000 operating hours, whichever comes first.

d. Microturbines will be fueled by natural gas only.

e. Each Dehydrators Reboiler will operate at no more than 1.5 MMBtu/hr and fueled only by natural gas or off-gases from the dehydrator flash tanks.

f. No fuel-burning unit of any kind will have opacity greater than 10 percent based on a six minute block average observation.

g. The dehydrator flare capacity will not exceed 4.80 MMBtu/hr, will achieve 98 percent destruction efficiency, will operate at all times that gas is vented to it, will have a flame present at all times, and will have no visible emissions other than for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

h. The flare will be operated per manufacturer instructions.

i. Produced water, Condensate, and Settling storage tanks potential emissions will be routed to the VRU with recovery greater than 98 percent at all times.

j. Storage tanks will be covered and routed to a closed vent system with no detectable emissions.

k. Liquid loadout trucks will use the submerged-fill method.

l. Dehydrator still vents will be controlled by the flare.

m. Dehydrator flash tank vent gas is to be used in the reboiler as fuel or routed to the VRU system.

3. Monitoring

a. Non-certified engines will be stack tested within 1 year of startup and every 8,760 hours of operation thereafter.

b. Catalyst inlet temperature will be monitored.

c. Compressor run time or number of months since compressor rod repacking will be monitored or tracked.

d. Rolling 12-month average dry gas throughput for the dehydrators will be monitored.

e. Initial Method 22 observation of the flare will be conducted for a minimum of 2 hours.

f. Monthly Method 22 observations of the flare will be conducted for a minimum of 10 minutes each.

g. Monthly olfactory, visual, and auditory inspections will be conducted of the tanks closed vent and control system (flare) for leaks or defects that could result in emissions. Leaks will be repaired as soon as practicable (no later than 5 days for first attempt).

h. The presence of flare flame will continuously be monitored.

i. Monthly and rolling twelve-month average amount of liquids loaded out will be monitored.

4. Recordkeeping

a. Records will be kept on-site for a minimum of 2 years, and in company records (on or off-site) for a minimum of 5 years.

b. Records of inspection, observations, preventive maintenance, malfunctions, and shutdowns of all onsite equipment will be kept.

c. Records of the date, time, duration of each time that a flame is not present at the flare and startup, shutdown, malfunctions of the flare will be kept.

d. Records of engine maintenance and engine run time will be kept.

e. Records of catalyst inlet temperature will be kept.

f. Records of the actual annual average natural gas throughput in the dehydrators will be kept.

5. Notifications and Reports

a. WVDAQ will be notified within 30 calendar days of commencement of construction.

b. WVDAQ will be notified within 30 calendar days of startup.

c. Upon startup, a Certificate to Operate (CTO) application will be filed and fees to WVDAQ will be paid for the period from startup to the following June 30 and then annually renew the CTO and pay fees. CTO will be maintained on-site.

d. An annual report of compliance with 40 CFR 60 Subpart OOOOa for applicable affected facilities will be submitted within 90 days after one year of operations startup.

e. For stack testing, a protocol will be filed at least 30 days prior to test and WVDAQ and EPA will be notified of the test at least 15 days prior to test. Results will be reported within 60 days of the test.

f. If operations are suspended for 60 days or more, WVDAQ will be notified within 2 weeks after the 60th day.

Attachment P.
Public Notice

AIR QUALITY PERMIT NOTICE
Notice of Application – Tamela Compressor Station

Notice is given that Antero Midstream LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a 45CSR13 Class II Update for a Natural Gas Compressor Station located northwest of Long Run near West Union, in Doddridge County, West Virginia. The facility is currently covered under permit R13-3216B. The latitude and longitude coordinates are: 39.32611N, 80.84278W.

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

Pollutant	Change in Potential Emissions (tons/yr)
Nitrogen Oxides (NOx)	0.35
Carbon Monoxide (CO)	0.96
Volatile Organic Compounds (VOC)	0.088
Particulate Matter less than 10 µm (PM_{10})	0.060
Particulate Matter less than 2.5 µm ($PM_{2.5}$)	0.060
Sulfur Dioxide (SO_2)	0.031
Formaldehyde	0.0064
Total HAPs	0.0093
Carbon Dioxide equivalent (CO_2e)	1,166

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 the 26th day of January 2018.

By: Antero Midstream LLC
Barry Schatz
Senior Environmental and Regulatory Manager
1615 Wynkoop Street
Denver, CO 80202

Attachment R.
Authority/Delegation of Authority

Attachment R
AUTHORITY OF CORPORATION
OR OTHER BUSINESS ENTITY (DOMESTIC OR FOREIGN)

TO: The West Virginia Department of Environmental Protection, Division of Air Quality

DATE: August 5 , 2015

ATTN.: Director

Corporation's / other business entity's Federal Employer I.D. Number 46-5517375

The undersigned hereby files with the West Virginia Department of Environmental Protection, Division of Air Quality, a permit application and hereby certifies that the said name is a trade name which is used in the conduct of an incorporated business or other business entity.

Further, the corporation or the business entity certifies as follows:

(1) Luz Slauter and Barry Schatz (is/are) the authorized representative(s) and in that capacity may represent the interest of the corporation or the business entity and may obligate and legally bind the corporation or the business entity.

(2) The corporation or the business entity is authorized to do business in the State of West Virginia.

(3) If the corporation or the business entity changes its authorized representative(s), the corporation or the business entity shall notify the Director of the West Virginia Department of Environmental Protection, Division of Air Quality, immediately upon such change.

W. McNeilly

Ward McNeilly, Vice President - Vice President Reserves Planning & Midstream

President or Other Authorized Officer
(Vice President, Secretary, Treasurer or other official in charge of a principal business function of the corporation or the business entity)

(If not the President, then the corporation or the business entity must submit certified minutes or bylaws stating legal authority of other authorized officer to bind the corporation or the business entity).

Secretary

Antero Midstream LLC

Name of Corporation or business entity