



February 23, 2018

Reference No. 082715

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

Dear Ms. Beverly McKeone:

**Re: General Permit G70-D Modification Application
Swisher Well Pad
Antero Resources Corporation**

GHD Services Inc. (GHD) would like to submit this General Permit Modification application that we prepared on behalf of Antero Resources Corporation for an oil and gas facility identified as Swisher Well Pad.

A General Permit Registration Modification is requested due to the following planned operational change:

1. Removal of one Cimarron enclosed combustor

Enclosed are the following documents:

- Original copy of the G70-D General Permit Modification Application.
- Two CD copies of the G70-D General Permit Modification Application.
- The application fee with check no. 513953 in the amount of \$1,500.00.

Please let us know if you have any questions or require additional information.

Sincerely,

GHD Services Inc.

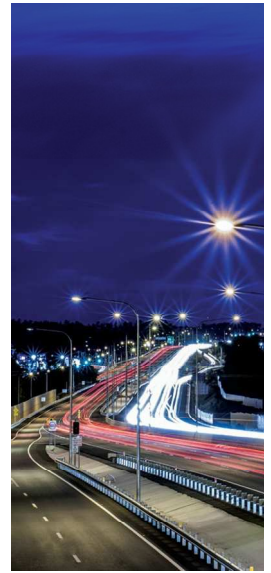
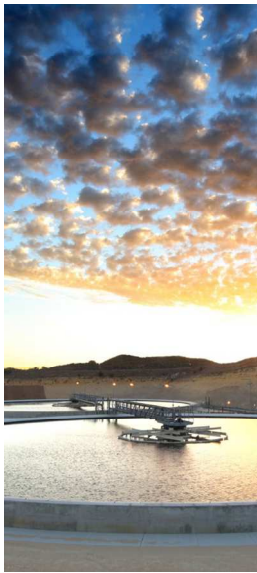
A handwritten signature in black ink, appearing to read "Manuel Bautista", is written over a light blue horizontal line.

Manuel Bautista

MB/ma/401

Encl.

cc: Barry Schatz, Antero Resources Corporation
Elizabeth McLaughlin, Antero Resources Corporation



G70-D General Permit Modification Application

Remove one Cimarron enclosed combustor

Swisher Well Pad

Antero Resources Corporation

GHD 6320 Rothway Suite 100 Houston Texas 77040
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west virginia department of environmental protection

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

G70-D GENERAL PERMIT REGISTRATION APPLICATION

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

- | | |
|--|---|
| <input type="checkbox"/> CONSTRUCTION | <input type="checkbox"/> CLASS I ADMINISTRATIVE UPDATE |
| <input checked="" type="checkbox"/> MODIFICATION | <input type="checkbox"/> CLASS II ADMINISTRATIVE UPDATE |
| <input type="checkbox"/> RELOCATION | |

SECTION 1. GENERAL INFORMATION

Name of Applicant (as registered with the WV Secretary of State's Office): Antero Resources Corporation

Federal Employer ID No. (FEIN): 80-0162034

Applicant's Mailing Address: 1615 Wynkoop Street

City: Denver

State: CO

ZIP Code: 80202

Facility Name: Swisher Well Pad

Operating Site Physical Address: : 3779 Meathouse Fork Rd

City: New Milton

Zip Code: 26411

County: Doddridge

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

Latitude: 39.21029

Longitude: -80.66636

SIC Code: 1311

DAQ Facility ID No. (For existing facilities)
017-00082

NAICS Code: 211111

CERTIFICATION OF INFORMATION

This G70-D General Permit Registration Application shall be signed below by a Responsible Official. A Responsible Official is a President, Vice President, Secretary, Treasurer, General Partner, General Manager, a member of the Board of Directors, or Owner, depending on business structure. A business may certify an Authorized Representative who shall have authority to bind the Corporation, Partnership, Limited Liability Company, Association, Joint Venture or Sole Proprietorship. Required records of daily throughput, hours of operation and maintenance, general correspondence, compliance certifications and all required notifications must be signed by a Responsible Official or an Authorized Representative. If a business wishes to certify an Authorized Representative, the official agreement below shall be checked off and the appropriate names and signatures entered. **Any administratively incomplete or improperly signed or unsigned G70-D Registration Application will be returned to the applicant. Furthermore, if the G70-D forms are not utilized, the application will be returned to the applicant. No substitution of forms is allowed.**

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

I hereby certify that all information contained in this G70-D General Permit Registration Application and any supporting documents appended hereto is, to the best of my knowledge, true, accurate and complete, and that all reasonable efforts have been made to provide the most comprehensive information possible.

Responsible Official Signature: _____

Name and Title:

Phone:

Fax:

Email:

Date:

If applicable:

Authorized Representative Signature: Barry Schatz

Name and Title: Barry Schatz/ Senior Environmental & Regulatory Manager Phone: 303-357-7276 Fax: 303-357-7315

Email: bschatz@anteroresources.com

Date: 2/23/2018

If applicable:

Environmental Contact

Name and Title:

Phone:

Fax:

Email:

Date:

OPERATING SITE INFORMATION	
Briefly describe the proposed new operation and/or any change(s) to the facility:	
Modification of a natural gas and oil production facility: Remove one Cimarron enclosed combustor;	
Directions to the facility: From Clarksburg: Drive west on US-50 W for 23 miles. Turn left onto Snowbird Rd for 1.8 miles. Turn left onto WV-18 S for 3.1 miles. Turn left onto Meathouse Fork and drive for 3.8 miles.	
ATTACHMENTS AND SUPPORTING DOCUMENTS	
I have enclosed the following required documents:	
Check payable to WVDEP – Division of Air Quality with the appropriate application fee (per 45CSR13 and 45CSR22).	
<input checked="" type="checkbox"/> Check attached to front of application. <input type="checkbox"/> I wish to pay by electronic transfer. Contact for payment (incl. name and email address): <input type="checkbox"/> I wish to pay by credit card. Contact for payment (incl. name and email address):	
<input checked="" type="checkbox"/> \$500 (Construction, Modification, and Relocation) <input type="checkbox"/> \$300 (Class II Administrative Update) <input checked="" type="checkbox"/> \$1,000 NSPS fee for 40 CFR60, Subpart IIII, JJJJ, OOOO and/or OOOOa ¹ <input type="checkbox"/> \$2,500 NESHAP fee for 40 CFR63, Subpart ZZZZ and/or HH ²	
¹ Only one NSPS fee will apply. ² Only one NESHAP fee will apply. The Subpart ZZZZ NESHAP fee will be waived for new engines that satisfy requirements by complying with NSPS, Subparts IIII and/or JJJJ. <i>NSPS and NESHAP fees apply to new construction or if the source is being modified.</i>	
<input checked="" type="checkbox"/> Responsible Official or Authorized Representative Signature (if applicable)	
<input checked="" type="checkbox"/> Single Source Determination Form (must be completed in its entirety) – Attachment A	
<input type="checkbox"/> Siting Criteria Waiver (if applicable) – Attachment B	<input checked="" type="checkbox"/> Current Business Certificate – Attachment C
<input checked="" type="checkbox"/> Process Flow Diagram – Attachment D	<input checked="" type="checkbox"/> Process Description – Attachment E
<input checked="" type="checkbox"/> Plot Plan – Attachment F	<input checked="" type="checkbox"/> Area Map – Attachment G
<input checked="" type="checkbox"/> G70-D Section Applicability Form – Attachment H	<input checked="" type="checkbox"/> Emission Units/ERD Table – Attachment I
<input checked="" type="checkbox"/> Fugitive Emissions Summary Sheet – Attachment J	
<input checked="" type="checkbox"/> Gas Well Affected Facility Data Sheet (if applicable) – Attachment K	
<input checked="" type="checkbox"/> Storage Vessel(s) Data Sheet (include gas sample data, USEPA Tanks, simulation software (e.g. ProMax, E&P Tanks, HYSYS, etc.), etc. where applicable) – Attachment L	
<input checked="" type="checkbox"/> Natural Gas Fired Fuel Burning Unit(s) Data Sheet (GPUs, Heater Treaters, In-Line Heaters if applicable) – Attachment M	
<input type="checkbox"/> Internal Combustion Engine Data Sheet(s) (include manufacturer performance data sheet(s) if applicable) – Attachment N	
<input checked="" type="checkbox"/> Tanker Truck Loading Data Sheet (if applicable) – Attachment O	
<input type="checkbox"/> Glycol Dehydration Unit Data Sheet(s) (include wet gas analysis, GRI- GLYCalc™ input and output reports and information on reboiler if applicable) – Attachment P	
<input type="checkbox"/> Pneumatic Controllers Data Sheet – Attachment Q	
<input type="checkbox"/> Pneumatic Pump Data Sheet – Attachment R	
<input type="checkbox"/> Air Pollution Control Device/Emission Reduction Device(s) Sheet(s) (include manufacturer performance data sheet(s) if applicable) – Attachment S	
<input checked="" type="checkbox"/> Emission Calculations (please be specific and include all calculation methodologies used) – Attachment T	
<input checked="" type="checkbox"/> Facility-wide Emission Summary Sheet(s) – Attachment U	
<input checked="" type="checkbox"/> Class I Legal Advertisement – Attachment V	
<input checked="" type="checkbox"/> One (1) paper copy and two (2) copies of CD or DVD with pdf copy of application and attachments	

**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: January 23, 2015

ATTN.: Director

Corporation's / other business entity's Federal Employer I.D. Number 80-0162034

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) 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.



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

Name of Corporation or business entity

Attachment A

Single Source Determination Form

ATTACHMENT A - SINGLE SOURCE DETERMINATION FORM

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

“Building, Structure, Facility, or Installation” means all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control). Pollutant-emitting activities are a part of the same industrial grouping if they belong to the same “Major Group” (i.e., which have the same two (2)-digit code) as described in the Standard Industrial Classification Manual, 1987 (United States Government Printing Office stock number GPO 1987 0-185-718:QL3).

The Source Determination Rule for the oil and gas industry was published in the Federal Register on June 3, 2016 and will become effective on August 2, 2016. EPA defined the term “adjacent” and stated that equipment and activities in the oil and gas sector that are under common control will be considered part of the same source if they are located on the same site or on sites that share equipment and are within ¼ mile of each other.

Is there equipment and activities in the same industrial grouping (defined by SIC code)?

Yes No

Is there equipment and activities under the control of the same person/people?

Yes No

Is there equipment and activities located on the same site or on sites that share equipment and are within ¼ mile of each other?

Yes No

Swisher Well Pad calculation of potential to emit included all of the emission sources that belong to the same industrial grouping, are located on contiguous or adjacent properties, and are under the control of the same person. The nearby emission source that belongs to the same industrial grouping and under the control of the same person but not located on contiguous or adjacent property is the well pad site identified as Snake Run Well Pad. Proposed Swisher Well Pad site is located approximately 0.87 miles Northwest of the Snake Run Well Pad.

Attachment B

Siting Criteria Waiver

Attachment B

Siting Waiver

Swisher Well Pad

Antero Resources Corporation

Doddridge County, West Virginia

A Siting Waiver form is not required because there are no occupied dwelling structures within 300 feet of Swisher Well Pad.

Attachment C

Current Business Certificate

State of West Virginia



Certificate

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

ANTERO RESOURCES CORPORATION

a corporation formed under the laws of Delaware, which is authorized to transact business in West Virginia by a Certificate of Authority has filed in my office as required by the provisions of the West Virginia Code, a copy of an amendment to its Articles of Incorporation authenticated by the proper office of the state or country of its incorporation and was found to conform to law.

Therefore, I issue this

CERTIFICATE OF AMENDMENT TO CERTIFICATE OF AUTHORITY



*Given under my hand and the
Great Seal of the State of
West Virginia on this day of
June 10, 2013*

Natalie E. Tennant

Secretary of State

FILED

JUN 10 2013

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



Penney Barker, Manager
IN THE OFFICE OF Corporations Division
SECRETARY OF STATE 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

**APPLICATION FOR
AMENDED CERTIFICATE
OF AUTHORITY**

FILE ONE ORIGINAL
(Two if you want a filed
stamped copy returned to you)
FEE: \$25.00

**** In accordance with the provisions of the West Virginia Code, the undersigned corporation hereby ****
applies for an Amended Certificate of Authority and submits the following statement:

- Name under which the corporation was authorized to transact business in WV: Antero Resources Appalachian Corporation
- Date Certificate of Authority was issued in West Virginia: 6/25/2008
- Corporate name has been changed to: Antero Resources Corporation
(Attach one **Certified Copy of Name Change** as filed in home State of Incorporation.)
- Name the corporation elects to use in WV: Antero Resources Corporation
(due to home state name not being available)
- Other amendments: _____
(attach additional pages if necessary)

6. Name and phone number of contact person. (This is optional, however, if there is a problem with the filing, listing a contact person and phone number may avoid having to return or reject the document.)

Alvyn A. Schopp (303) 367-7310
Contact Name Phone Number

7. Signature Information (See below ***Important Legal Notice Regarding Signature***):

Print Name of Signer: Alvyn A. Schopp Title/Capacity: Authorized Person

Signature: Date: June 10, 2013

***Important Legal Notice Regarding Signature:** Per West Virginia Code §31D-1-129. Penalty for signing false document. Any person who signs a document he or she knows is false in any material respect and knows that the document is to be delivered to the secretary of state for filing is guilty of a misdemeanor and, upon conviction thereof, shall be fined not more than one thousand dollars or confined in the county or regional jail not more than one year, or both.

Delaware

PAGE 1

The First State

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF AMENDMENT OF "ANTERO RESOURCES APPALACHIAN CORPORATION", CHANGING ITS NAME FROM "ANTERO RESOURCES APPALACHIAN CORPORATION" TO "ANTERO RESOURCES CORPORATION", FILED IN THIS OFFICE ON THE TENTH DAY OF JUNE, A.D. 2013, AT 9:37 O'CLOCK A.M.

A FILED COPY OF THIS CERTIFICATE HAS BEEN FORWARDED TO THE NEW CASTLE COUNTY RECORDER OF DEEDS.

4520810 8100

130754186



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


Jeffrey W. Bullock, Secretary of State
AUTHENTICATION: 0496546

DATE: 06-10-13

AMENDMENT TO THE
AMENDED AND RESTATED
CERTIFICATE OF INCORPORATION
OF
ANTERO RESOURCES APPALACHIAN CORPORATION

Antero Resources Appalachian Corporation (the "Corporation"), a corporation organized and existing under the laws of the State of Delaware, hereby certifies as follows:

1. The original Certificate of Incorporation of the Corporation was filed under the name Antero Resources Barnett Corporation with the filing of the original Certificate of Incorporation of the Corporation with the Secretary of State of the State of Delaware on March 18, 2008.

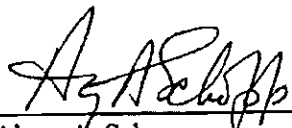
2. This Amendment to the Amended and Restated Certificate of Incorporation has been duly adopted and approved in accordance with Sections 242 of the General Corporation Law of the State of Delaware.

3. Article FIRST of the Amended and Restated Certificate of Incorporation is hereby amended to read in its entirety as follows:

FIRST. The name of the Corporation is Antero Resources Corporation.

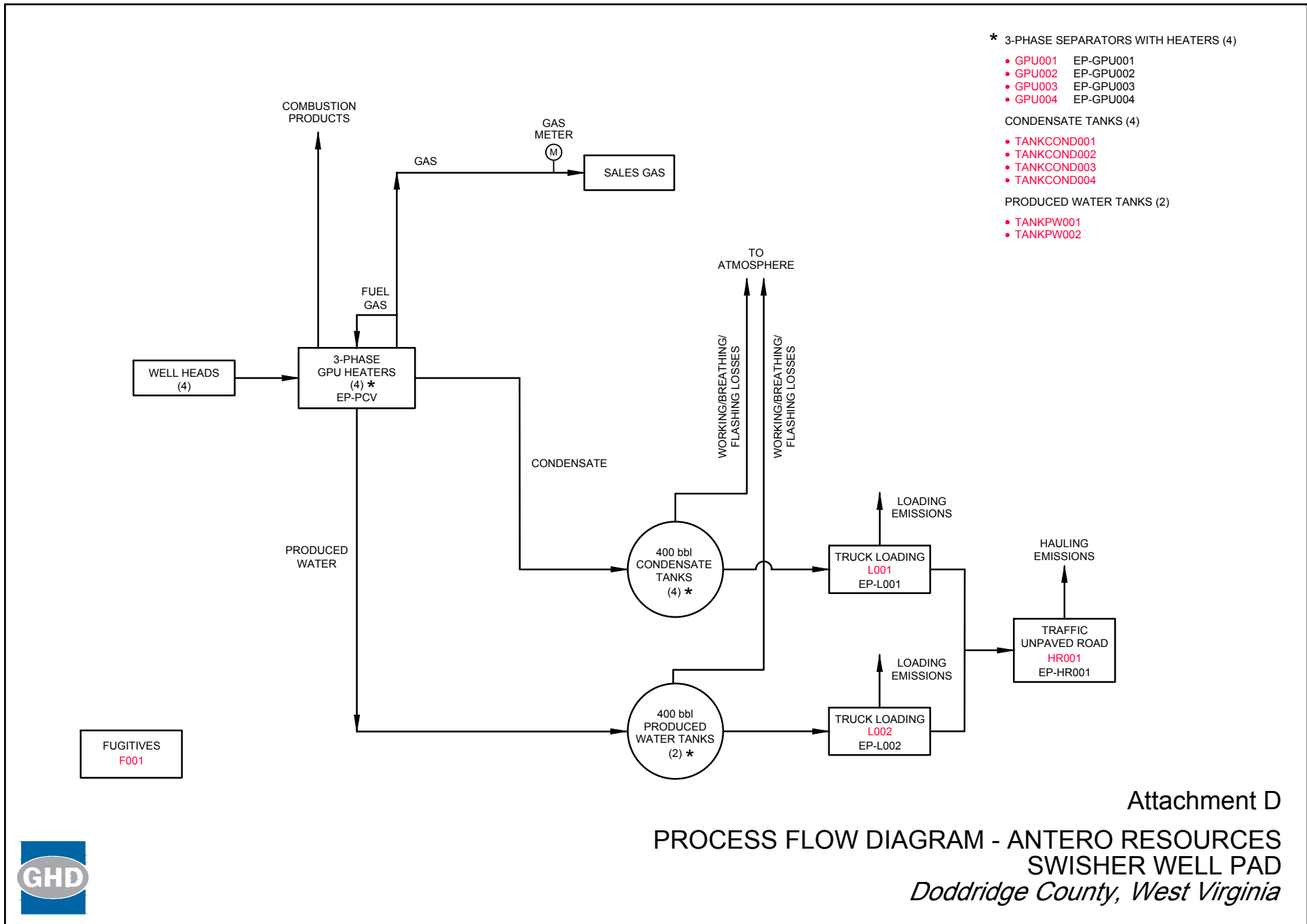
IN WITNESS WHEREOF, the Corporation has caused this Certificate of Amendment to be executed by its duly authorized officer on the 10th day of June, 2013.

ANTERO RESOURCES APPALACHIAN CORPORATION

By: 
Name: Alwyn A. Schopp
Title: Vice President of Accounting &
Administration / Treasurer

Attachment D

Process Flow Diagram



Attachment D
**PROCESS FLOW DIAGRAM - ANTERO RESOURCES
 SWISHER WELL PAD**
Doddridge County, West Virginia



Attachment E

Process Description

Attachment E

Process Description

Swisher Well Pad

Antero Resources Corporation

Doddridge County, West Virginia

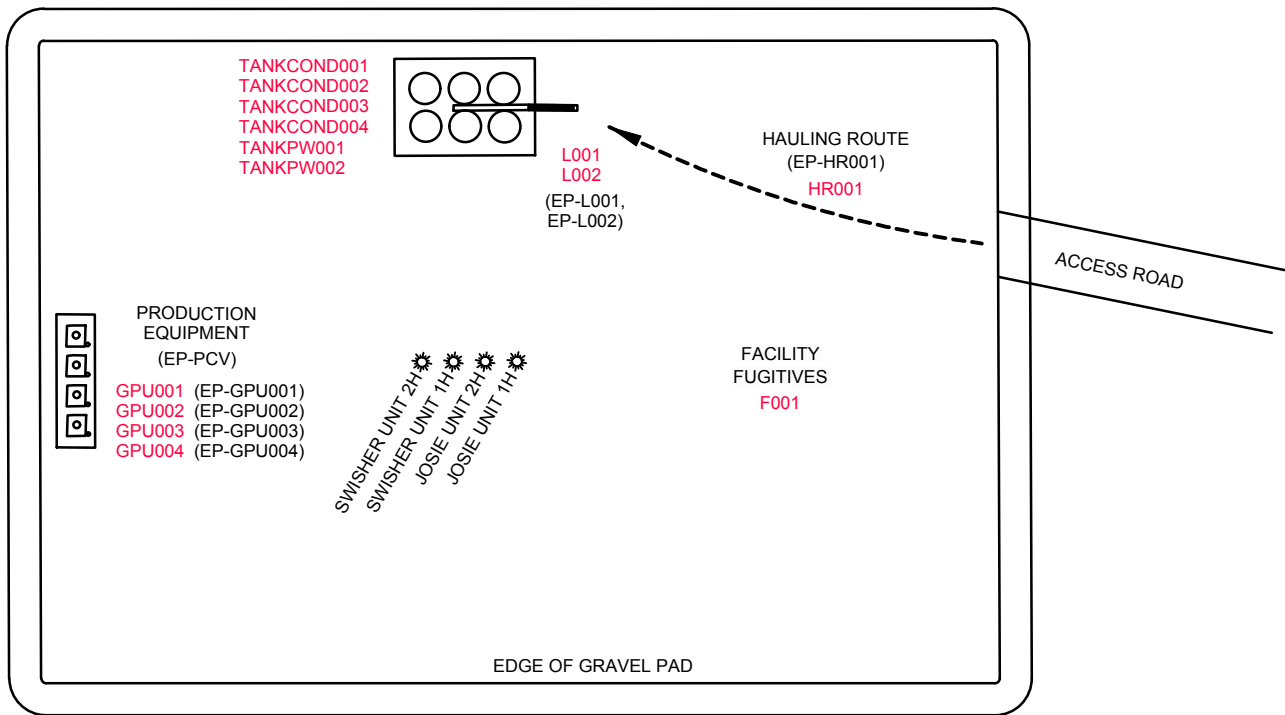
A mixture of condensate, water, and entrained gas from the condensate and gas wells enters the facility through a series of gas production units (GPU001-GPU004) which are 3 phase separators where the gas, condensate, and produced water are separated. The GPUs are fueled by a slip stream of the separated gas. The separated gas is then metered and sent to the sales gas pipeline. The separated condensate and water from the separators flow to their respective storage tanks (TANKCOND001-004 and TANKPW001-002).

The facility has four (4) tanks (TANKCOND001-004) on site to store condensate and two (2) tanks (TANKPW001-002) to store produced water prior to removal from the site. The flashing, working and breathing losses from the tanks are vented to the atmosphere.

Condensate and produced water are transported off site on an as needed basis via tanker truck. Truck loading connections are in place to pump condensate (L001) and produced water (L002) from the storage tanks into tanker trucks. Emissions from the loading operations are vented to the atmosphere.

Emissions from the facility's emission sources were calculated using the extended condensate and gas analysis from Yoke 1H, one of the wells in Maxwell Horizontal well. These extended analyses are considered representative of the materials from Swisher Well Pad, being in the same Marcellus rock formation.

Attachment F Plot Plan



Attachment F

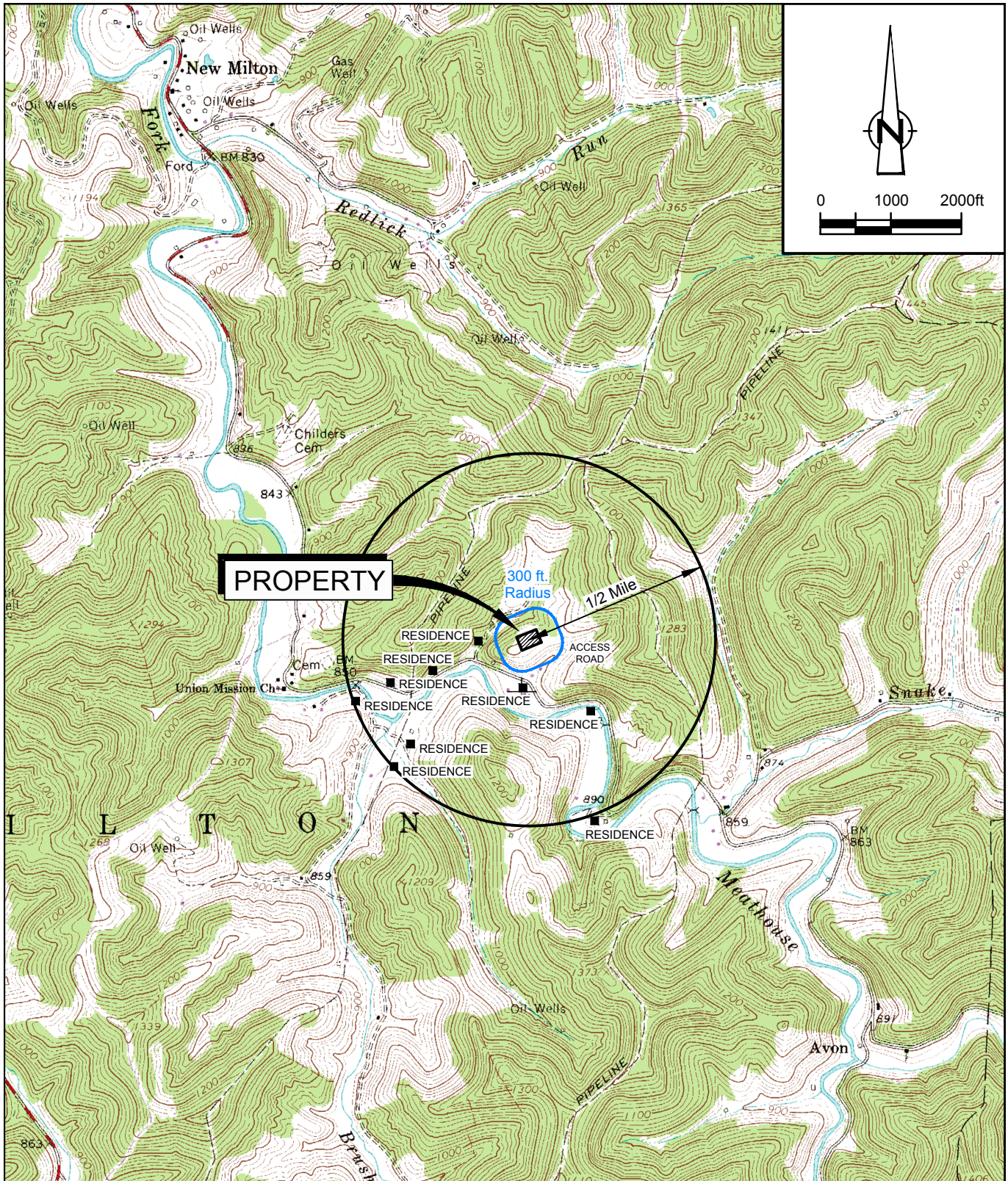
PLOT PLAN
SWISHER WELL PAD
ANTERO RESOURCES

Doddridge County, West Virginia



Attachment G

Area Map



SOURCE: USGS QUADRANGLE MAPS;
NEW MILTON, WEST VIRGINIA

SITE COORDINATES: UTM ZONE 17S 528824, 4340187 NAD 83
SITE ELEVATION: 976 ft AMSL



Attachment G
AREA MAP
SWISHER WELL PAD
ANTERO RESOURCES
Doddridge County, West Virginia

Attachment H

G70-D Section Applicability Form

ATTACHMENT H – G70-D SECTION APPLICABILITY FORM

**General Permit G70-D Registration¹
Section Applicability Form**

General Permit G70-D was developed to allow qualified applicants to seek registration for a variety of sources. These sources include gas well affected facilities, storage vessels, gas production units, in-line heaters, heater treaters, glycol dehydration units and associated reboilers, pneumatic controllers, centrifugal compressors, reciprocating compressors, reciprocating internal combustion engines (RICES), tank truck loading, fugitive emissions, completion combustion devices, flares, enclosed combustion devices, and vapor recovery systems. All registered facilities will be subject to Sections 1.0, 2.0, 3.0, and 4.0.

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

GENERAL PERMIT G70-D APPLICABLE SECTIONS	
<input checked="" type="checkbox"/> Section 5.0	Gas Well Affected Facility (NSPS, Subpart OOOO/OOOOa)
<input checked="" type="checkbox"/> Section 6.0	Storage Vessels Containing Condensate and/or Produced Water ¹
<input type="checkbox"/> Section 7.0	Storage Vessel Affected Facility (NSPS, Subpart OOOO/OOOOa)
<input checked="" type="checkbox"/> Section 8.0	Control Devices and Emission Reduction Devices not subject to NSPS Subpart OOOO/OOOOa and/or NESHAP Subpart HH
<input checked="" type="checkbox"/> Section 9.0	Small Heaters and Reboilers not subject to 40CFR60 Subpart Dc
<input type="checkbox"/> Section 10.0	Pneumatic Controllers Affected Facility (NSPS, Subpart OOOO/OOOOa)
<input type="checkbox"/> Section 11.0	Pneumatic Pump Affected Facility (NSPS, Subpart OOOOa)
<input checked="" type="checkbox"/> Section 12.0	Fugitive Emissions GHG and VOC Standards (NSPS, Subpart OOOOa)
<input type="checkbox"/> Section 13.0	Reciprocating Internal Combustion Engines, Generator Engines
<input checked="" type="checkbox"/> Section 14.0	Tanker Truck/Rail Car Loading ²
<input type="checkbox"/> Section 15.0	Glycol Dehydration Units ³

- 1 Applicants that are subject to Section 6 may also be subject to Section 7 if the applicant is subject to the NSPS, Subparts OOOO or OOOOa control requirements or the applicable control device requirements of Section 8.*
- 2 Applicants that are subject to Section 14 may also be subject to control device and emission reduction device requirements of Section 8.*
- 3 Applicants that are subject to Section 15 may also be subject to the requirements of Section 9 (reboilers). Applicants that are subject to Section 15 may also be subject to control device and emission reduction device requirements of Section 8.*

Attachment I

Emission Units/ ERD Table

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

Include ALL emission units and air pollution control devices /ERDs that will be part of this permit application review. This information is required for all sources regardless of whether it is a construction, modification, or administrative update.

Emission Unit ID ¹	Emission Point ID ²	Emission Unit Description	Year Installed	Manufac. Date ³	Design Capacity	Type ⁴ and Date of Change	Control Device(s) ⁵	ERD (s) ⁶
GPU001, GPU002, GPU003, GPU004	EP-GPU001, EP-GPU002, EP-GPU003, EP-GPU004	Gas Production Unit Heater	2013		1 MMBtu/hr	Existing	N/A	
F001	F001	Fugitives	2013		N/A	Existing	N/A	
TANKCOND001-004	EP-TANKCOND001-009	Condensate Tank F/W/B	2013		400 bbl each	Existing	N/A	
TANKPW001-002	EP-TANKPW001-002	PW Tank F/W/B	2013		400 bbl each	Existing	N/A	
L001	EP-L001	Loading (Condensate)	2013		10080 gal/hr 61320 gal/yr	Existing	N/A	
L002	EP-L002	Loading (Produced Water)	2013		10080 gal/hr 735840 gal/yr	Existing	N/A	
HR001	EP-HR001	Haul Road	2013		Tanker Trucks Condensate: 8 trips per year Tanker Trucks PW: 88 trips per year Pick Up Truck: 730 trips per year	Existing	N/A	
EC001	EP-EC001	Enclosed Combustor	2013		12 MMBtu/hr	Removal - 2018	N/A	
PCV	EP-PCV	Pneumatic CV	2013		6.6 scf/day/PCV	Existing	N/A	

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

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

3 When required by rule.

4 New, modification, removal, existing.

5 For Control Devices use the following numbering system: 1C, 2C, 3C, ... or other appropriate designation.

6 For ERDs use the following numbering system: 1D, 2D, 3D, ... or other appropriate designation.

Attachment J

Fugitive Emissions Summary Sheet

ATTACHMENT J – FUGITIVE EMISSIONS SUMMARY SHEET

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

Source/Equipment:

Leak Detection Method Used		<input type="checkbox"/> Audible, visual, and olfactory (AVO) inspections	<input checked="" type="checkbox"/> Infrared (FLIR) cameras	<input type="checkbox"/> Other (please describe)	<input type="checkbox"/> None required			
Component Type	Closed Vent System	Count	Source of Leak Factors (EPA, other (specify))	Stream type (gas, liquid, etc.)	Estimated Emissions (tpy)			
					VOC	HAP	GHG (methane)	GHG (CO ₂ e)
Valves	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	200	EPA	gas	1.656	0.197	5.226	130.646
Valves	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	208	EPA	liquid	4.897	0.247	0.039	0.971
Connections (Not sampling)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	236	EPA	gas	0.087	0.010	0.274	6.852
Flanges	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	52	EPA	gas	0.037	0.004	0.118	2.944

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

Please provide an explanation of the sources of fugitive emissions (e. g. pigging operations, equipment blowdowns, pneumatic controllers, etc.)

Please indicate if there are any closed vent bypasses (include component)

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

Attachment K

Gas Well Affected Facility Data Sheet

ATTACHMENT K – GAS WELL AFFECTED FACILITY DATA SHEET

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

API Number	Date of Flowback	Date of Well Completion	Green Completion and/or Combustion Device	Subject to OOOO or OOOOa?
47017062650000	7/2/2014	5/1/2014	Green Completion	OOOO
47017062610000	7/2/2014	5/8/2014	Green Completion	OOOO
47017062950000	7/3/2014	5/16/2014	Green Completion	OOOO
47017062960000	7/4/2014	5/23/2014	Green Completion	OOOO

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

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

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

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

Where,

- 047 = State code. The state code for WV is 047.*
- 001 = County Code. County codes are odd numbers, beginning with 001 (Barbour) and continuing to 109 (Wyoming).*
- 00001 = Well number. Each well will have a unique well number.*

Attachment L

Storage Vessel Data Sheets

ATTACHMENT L – STORAGE VESSEL DATA SHEET

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

The following information is REQUIRED:

- Composition of the representative sample used for the simulation
- For each stream that contributes to flashing emissions:
 - Temperature and pressure (inlet and outlet from separator(s))
 - Simulation-predicted composition
 - Molecular weight
 - Flow rate
- Resulting flash emission factor or flashing emissions from simulation
- Working/breathing loss emissions from tanks and/or loading emissions if simulation is used to quantify those emissions

Additional information may be requested if necessary.

GENERAL INFORMATION (REQUIRED)

1. Bulk Storage Area Name	Tanks	2. Tank Name:	Condensate Tank 001-004
3. Emission Unit ID number:	TANKCOND001-004	4. Emission Point ID number.	
5. Date Installed, Modified or Relocated (for existing tanks) 2013		6. Type of change:	
Was the tank manufactured after August 23, 2011 and on or before September 18, 2015? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input checked="" type="checkbox"/> New construction <input type="checkbox"/> New stored material <input type="checkbox"/> Other	
Was the tank manufactured after September 18, 2015? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Relocation	
7A. Description of Tank Modification (if applicable)			
7B. Will more than one material be stored in this tank? If so, a separate form must be completed for each material. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
7C. Was USEPA Tanks simulation software utilized? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			

If Yes, please provide the appropriate documentation and items 8-42 below are not required.

TANK INFORMATION

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 400bbbls			
9A. Tank Internal Diameter (ft):	12	9B. Tank Internal Height (or Length) (ft):	20
10A. Maximum Liquid Height (ft):	18	10B. Average Liquid Height (ft):	10
11A. Maximum Vapor Space Height (ft):	18	11B. Average Vapor Space Height (ft):	10
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights.: 400bbbls			
13A. Maximum annual throughput (gal/yr):	61,320	13B. Maximum daily throughput (gal/day):	168
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume):	1	15. Maximum tank fill rate (gal/min)	168
16. Tank fill method <input type="checkbox"/> Submerged <input checked="" type="checkbox"/> Splash <input type="checkbox"/> Bottom Loading			
17. Is the tank system a variable vapor space system? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
If yes, (A) What is the volume expansion capacity of the system (gal)? (B) What are the number of transfers into the system per year?			
18. Type of tank (check all that apply):			
<input checked="" type="checkbox"/> Fixed Roof <input checked="" type="checkbox"/> vertical <input type="checkbox"/> horizontal <input checked="" type="checkbox"/> flat roof <input type="checkbox"/> cone roof <input type="checkbox"/> dome roof <input type="checkbox"/> other (describe)			
<input type="checkbox"/> External Floating Roof <input type="checkbox"/> pontoon roof <input type="checkbox"/> double deck roof			
<input type="checkbox"/> Domed External (or Covered) Floating Roof			
<input type="checkbox"/> Internal Floating Roof <input type="checkbox"/> vertical column support <input type="checkbox"/> self-supporting			
<input type="checkbox"/> Variable Vapor Space <input type="checkbox"/> lifter roof <input type="checkbox"/> diaphragm			
<input type="checkbox"/> Pressurized <input type="checkbox"/> spherical <input type="checkbox"/> cylindrical			
<input type="checkbox"/> other			

ATTACHMENT L – STORAGE VESSEL DATA SHEET

SITE INFORMATION

29. Provide the city and state on which the data in this section are based.: West Union, WV			
30. Daily Average Ambient Temperature (°F):	72.10	31. Annual Average Maximum Temperature (°F):	75.94
32. Annual Average Minimum Temperature (°F):	46.56	33. Average Wind Speed (miles/hr): 18.5 mph	
34. Annual Average Solar Insulation Factor (BTU/(ft ² -day))	1030.235999	35. Atmospheric Pressure (psia): 14.8 (based off local conditions, could not find annual)	

LIQUID INFORMATION

36. Average daily temperature range of bulk liquid (F):	72.10	36A. Minimum (°F):	46.56	36B. Maximum (°F)	75.94
37. Average operating pressure range of tank (psig):	atmosphere	37A. Minimum (psig)	0	37B. Maximum (psig)	atmosphere
38A. Minimum Liquid Surface Temperature (°F)	46.56	38B. Corresponding Vapor Pressure (psia)	0.8145		
39A. Average Liquid Surface Temperature (°F)	72.10	39B. Corresponding Vapor Pressure (psia)	1.4589		
40A. Maximum Liquid Surface Temperature (°F)	75.94	40B. Corresponding Vapor Pressure (psia)	1.5850		

41. Provide the following for each liquid or gas to be stored in tank. Add additional pages if necessary.

41A. Material Name or Composition	Condensate		
41B. CAS Number	mix of HC		
41C. Liquid Density (lb/gal)	6.0500		
41D. Liquid Molecular Weight (lb/lb-mole)	113.20		
41E. Vapor Molecular Weight (lb/lb-mole)	45.2280		
Maximum Vapor Pressure	1.5850		
41F. True (psia)			
41G. Reid (psia)	2.51		
Months Storage per Year	year round		
41H. From - To			
Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations	198 psig; 70 F		
42.			

ATTACHMENT L – STORAGE VESSEL DATA SHEET

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

The following information is REQUIRED:

- Composition of the representative sample used for the simulation
- For each stream that contributes to flashing emissions:
 - Temperature and pressure (inlet and outlet from separator(s))
 - Simulation-predicted composition
 - Molecular weight
 - Flow rate
- Resulting flash emission factor or flashing emissions from simulation
- Working/breathing loss emissions from tanks and/or loading emissions if simulation is used to quantify those emissions

Additional information may be requested if necessary.

GENERAL INFORMATION (REQUIRED)

1. Bulk Storage Area Name	Tanks	2. Tank Name:	Produced Water Tank 001-002
3. Emission Unit ID number:	TANKPW001-002	4. Emission Point ID number.	
5. Date Installed, Modified or Relocated (for existing tanks)		6. Type of change:	
2013		<input checked="" type="checkbox"/> New construction <input type="checkbox"/> New stored material <input type="checkbox"/> Other	
Was the tank manufactured after August 23, 2011 and on or before September 18, 2015? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Relocation	
Was the tank manufactured after September 18, 2015? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
7A. Description of Tank Modification (if applicable)			
7B. Will more than one material be stored in this tank? If so, a separate form must be completed for each material. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
7C. Was USEPA Tanks simulation software utilized? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			

If Yes, please provide the appropriate documentation and items 8-42 below are not required.

TANK INFORMATION

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 400bbbls			
9A. Tank Internal Diameter (ft): 12	9B. Tank Internal Height (or Length) (ft):		20
10A. Maximum Liquid Height (ft): 18	10B. Average Liquid Height (ft):		10
11A. Maximum Vapor Space Height (ft): 18	11B. Average Vapor Space Height (ft):		10
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights.: 400bbbls			
13A. Maximum annual throughput (gal/yr):	735,840	13B. Maximum daily throughput (gal/day):	2,016
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume):	22	15. Maximum tank fill rate (gal/min)	168
16. Tank fill method <input type="checkbox"/> Submerged <input checked="" type="checkbox"/> Splash <input type="checkbox"/> Bottom Loading			
17. Is the tank system a variable vapor space system? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
If yes, (A) What is the volume expansion capacity of the system (gal)? (B) What are the number of transfers into the system per year?			
18. Type of tank (check all that apply):			
<input checked="" type="checkbox"/> Fixed Roof <input checked="" type="checkbox"/> vertical <input type="checkbox"/> horizontal <input checked="" type="checkbox"/> flat roof <input type="checkbox"/> cone roof <input type="checkbox"/> dome roof <input type="checkbox"/> other (describe)			
<input type="checkbox"/> External Floating Roof <input type="checkbox"/> pontoon roof <input checked="" type="checkbox"/> double deck roof			
<input type="checkbox"/> Domed External (or Covered) Floating Roof			
<input type="checkbox"/> Internal Floating Roof <input type="checkbox"/> vertical column support <input type="checkbox"/> self-supporting			
<input type="checkbox"/> Variable Vapor Space <input type="checkbox"/> lifter roof <input type="checkbox"/> diaphragm			
<input type="checkbox"/> Pressurized <input type="checkbox"/> spherical <input type="checkbox"/> cylindrical			

ATTACHMENT L – STORAGE VESSEL DATA SHEET

SITE INFORMATION

29. Provide the city and state on which the data in this section are based.: West Union, WV			
30. Daily Average Ambient Temperature (°F):	72.10	31. Annual Average Maximum Temperature (°F):	75.94
32. Annual Average Minimum Temperature (°F):	46.56	33. Average Wind Speed (miles/hr): 5.9 mph	
34. Annual Average Solar Insulation Factor (BTU/(ft ² -day))	1030.236	35. Atmospheric Pressure (psia): 14.8 (based off local conditions, could not find annual)	

LIQUID INFORMATION

36. Average daily temperature range of bulk liquid (F):	72.10	36A. Minimum (°F):	46.56	36B. Maximum (°F)	75.94
37. Average operating pressure range of tank (psig):	atmosphere	37A. Minimum (psig)	0	37B. Maximum (psig)	atmosphere
38A. Minimum Liquid Surface Temperature (°F)	46.56	38B. Corresponding Vapor Pressure (psia)	0.2276		
39A. Average Liquid Surface Temperature (°F)	72.10	39B. Corresponding Vapor Pressure (psia)	0.4517		
40A. Maximum Liquid Surface Temperature (°F)	75.94	40B. Corresponding Vapor Pressure (psia)	0.4979		

41. Provide the following for each liquid or gas to be stored in tank. Add additional pages if necessary.

41A. Material Name or Composition	Produced Water		
41B. CAS Number	mix of HC and water		
41C. Liquid Density (lb/gal)	8.3300		
41D. Liquid Molecular Weight (lb/lb-mole)	18.46		
41E. Vapor Molecular Weight (lb/lb-mole)	18.4592		
Maximum Vapor Pressure	0.4979		
41F. True (psia)			
41G. Reid (psia)	1.0319		
Months Storage per Year	year round		
41H. From - To			
Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations	198 psig; 70 F		
42.			

Attachment M
Natural Gas Fired Fuel Burning Unit(s)
Data Sheet

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

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

Emission Unit ID#	Emission Point ID#	Emission Unit Description (Manufacturer, model#)	Year Installed/Modified	Type and Date of Change	Maximum Design Heat Input (MMBTU/hr)	Fuel Heating Value (BTU/scf)
GPU001	EP-GPU001	Gas Production Unit Heater	2013	Existing	1.0	1247.06
GPU002	EP-GPU002	Gas Production Unit Heater	2013	Existing	1.0	1247.06
GPU003	EP-GPU003	Gas Production Unit Heater	2013	Existing	1.0	1247.06
GPU004	EP-GPU004	Gas Production Unit Heater	2013	Existing	1.0	1247.06

1. Enter the appropriate Emission Unit (or Source) identification number for each fuel burning unit located at the production pad. Gas Producing Unit Burners should be designated GPU-1, GPU-2, etc. Heater Treaters should be designated HT-1, HT-2, etc. Heaters or Line Heaters should be designated LH-1, LH-2, etc. For sources, use 1S, 2S, 3S...or other appropriate designation. Enter glycol dehydration unit Reboiler Vent data on the Glycol Dehydration Unit Data Sheet.
2. Enter the appropriate Emission Point identification numbers for each fuel burning unit located at the production pad. Gas Producing Unit Burners should be designated GPU-1, GPU-2, etc. Heater Treaters should be designated HT-1, HT-2, etc. Heaters or Line Heaters should be designated LH-1, LH-2, etc. For emission points, use 1E, 2E, 3E...or other appropriate designation.
3. New, modification, removal.
4. Enter design heat input capacity in MMBtu/hr.
5. Enter the fuel heating value in BTU/standard cubic foot.

Attachment O

Tanker Truck Loading Data Sheet

ATTACHMENT O – TANKER TRUCK LOADING DATA SHEET

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

Truck Loadout Collection Efficiencies

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

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

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

Emission Unit ID#: L001, L002	Emission Point ID#: EP-L001, EP-L002	Year Installed/ Modified: 2013
-------------------------------	--------------------------------------	-----------------------------------

Emission Unit Description: **Condensate Loading, Produced Water Loading**

Loading Area Data

Number of Pumps: **2** Number of Liquids Loaded: **2** Max number of trucks loading at one time: **2**

Are Tanker trucks pressure tested for leaks at this any other location? Yes No Not Required
 If Yes, Please Describe: Tank trucks are pressure tested for leaks at the location of the leak testing company. Trucks are tested using EPA Method 27-internal vapor valve test and issued certification that DOT requirements are met.

Provide description of closed vent system and any bypasses

Are any of the following truck loadout systems utilized? **No**
 Closed System to Tanker Truck passing a MACT level annual leak test?
 Closed System to Tanker Truck passing a NSPS level annual leak test?
 Closed System to Tanker Truck not passing an annual leak test and has vapor return?

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

Time	Jan - Mar	Apr - Jun	Jul - Sept	Oct - Dec
Hours/day	1	1	1	1
Days/week	1	1	1	1

Bulk Liquid Data (use extra pages as necessary)

Liquid Name	Condensate	Produced Water	
Max. Daily Throughput (1000 gal/day)	0.17	2.02	
Max. Annual Throughput (1000 gal/yr)	61	736	
Loading Method	BF	BF	
Max. Fill Rate (gal/min)	168	168	
Average Fill Time (min/loading)	50	50	
Max. Bulk Liquid Temperature (F)	72.1	72.1	
True Vapor Pressure	1.5	0.5	
Cargo Vessel Condition	U	U	
Control Equipment or Method	None	None	
Max. Collection Efficiency (%)	0	0	
Max. Control Efficiency (%)	0	0	
Max VOC Emission Rate	Loading (lb/hr)	8.9188	0.0011
	Annual (ton/yr)	0.0271	0.0000
Max HAP Emission Rate	Loading (lb/hr)	1.9356	9.39E-07
	Annual (ton/yr)	0.0059	3.43E-08
Estimation Method	Promax	Promax	

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

Attachment Q

Pneumatic Controllers Data Sheet

**ATTACHMENT Q – PNEUMATIC CONTROLLERS
DATA SHEET**

Are there any continuous bleed natural gas driven pneumatic controllers at this facility that commenced construction, modification or reconstruction after August 23, 2011, and on or before September 18, 2015?

Yes No

Please list approximate number.

Are there any continuous bleed natural gas driven pneumatic controllers at this facility that commenced construction, modification or reconstruction after September 18, 2015?

Yes No

Please list approximate number.

Are there any continuous bleed natural gas driven pneumatic controllers at this facility with a bleed rate greater than 6 standard cubic feet per hour that are required based on functional needs, including but not limited to response time, safety and positive actuation that commenced construction, modification or reconstruction after August 23, 2011, and on or before September 18, 2015?

Yes No

Please list approximate number.

Are there any continuous bleed natural gas driven pneumatic controllers at this facility with a bleed rate greater than 6 standard cubic feet per hour that are required based on functional needs, including but not limited to response time, safety and positive actuation that commenced construction, modification or reconstruction after September 18, 2015?

Yes No

Please list approximate number.

Attachment R

Pneumatic Pump Data Sheet

Attachment T

Emissions Calculations

Table 1

**Facility Information
Swisher Well Pad
Doddridge County, West Virginia
Antero Resources Corporation**

Oil and Gas Site General Information

Administrative Information	
Company Name	Antero Resources Corporation
Facility/Well Name	Swisher Well Pad
Nearest City/Town	New Milton
API Number/SIC Code	1311
Latitude/Longitude	39.21029, -80.66636
County	Doddridge County

Technical Information	
Max Condensate Site Throughput (bbl/day):	4
Max Produced Water Site Throughput (bbl/day):	48
Are there any sour gas streams at this site?	No
Is this site currently operational/producing?	Yes

Equipment/Processes at Site	
Equipment/Process Types	How many for this site?
Fugitives	4
Gas Production Unit Heaters	4
Condensate Tanks	4
Produced Water Tanks	2
Loading Jobs	2

Table 2

Uncontrolled/Controlled Emissions Summary
Swisher Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

Emission Source	VOC		NO _x		CH ₄		CO _{2e}		CO		SO ₂		PM _{2.5}		PM ₁₀		Lead		Total HAPs		Benzene		Xylenes		Formaldehyde		
	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	
UNCONTROLLED (Fugitives, Storage Tanks, Gas Production Unit Heaters)																											
Fugitive Emissions (Component Count, PCV and Hauling) ¹	1.5589	6.8279			1.3998	6.1311	34.996	153.28							0.9120	0.0400			0.1089	0.4768	0.0005	0.0023	0.0241	0.1057			
Flashing, Working and Breathing (F/W/B) Losses ²	5.2742	23.1008			0.5791	2.5365	14.4919	63.4747											1.0960	4.8006	0.0000	0.0002	0.0014	0.0059			
Gas Production Unit Heater Emissions ³	0.0176	0.0773	0.3208	1.4049	0.0074	0.0323	384.91	1,685.89	0.2694	1.1801	0.0019	0.0084	0.0244	0.1068	0.0244	0.1068	1.60E-06	7.02E-06	0.006	0.026	6.74E-06	2.95E-05				0.0002	0.0011
TOTALS:	6.8507	30.0060	0.3208	1.4049	1.9863	8.7000	434.3929	1902.6410	0.2694	1.1801	0.0019	0.0084	0.0244	0.1068	0.9364	0.1467	1.60E-06	7.02E-06	1.2109	5.3039	0.0006	0.0025	0.0255	0.1117	0.0002	0.0011	
UNCONTROLLED (Truck Loading Emissions)																											
Truck Loading Emissions ⁴	8.9199	0.0272			0.0654	0.0014	1.6777	0.0370											1.9356	0.0059	0.0000	1.53E-07	0.0019	0.0000			
CONTROLLED EMISSIONS																											
Controlled Fugitive Emissions from Hauling															0.4560	0.0200											
TOTALS:	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00E+00	0.00E+00	0.000	0.000	0.456	0.020	0.00E+00	0.00E+00	0.000	0.000	0.00E+00	0.0000	0.0000	0.000	0.00E+00	0.00E+00	
POTENTIAL TO EMIT⁵	15.7706	30.0331	0.3208	1.4049	2.0517	8.7014	436.0706	1902.6780	0.2694	1.1801	0.0019	0.0084	0.0244	0.1068	0.4804	0.1268	1.60E-06	7.02E-06	3.1465	5.3097	0.0006	0.0025	0.0273	0.1117	0.0002	0.0011	
POTENTIAL TO EMIT(Excluding Fugitives)	14.2117	23.2052	0.3208	1.4049	0.6519	2.5703	401.0750	1749.3969	0.2694	1.1801	0.0019	0.0084	0.0244	0.1068	0.0244	0.1068	1.60E-06	7.02E-06	3.0376	4.8329	0.0001	0.0002	0.0032	0.0059	0.0002	0.0011	

Enter any notes here:

1 - See Tables 4 and 5 for fugitive emission calculations; Table 10 for PM emissions from hauling.
 2 - See Tables 6 and 7 for tanks emission calculations
 3 - See Table 9 for gas production unit heater and line heater emissions calculations.
 4 - The maximum emission was calculated based on actual filling rate of 4 barrels per minute. At a production rate of 4 barrels per day, VOC emissions would be 8.9199 pounds per hour when there are truck loading activities. Average hourly VOC emissions from truck loading is 0.0062 pound per hour.
 5 - The maximum hourly potential to emit is the sum of emissions from gas production unit heaters, storage tanks, loading, and fugitives.
 PM 10 TPY is the sum of hauling and other PM10 sources.

Table 3

**Permits Summary
Swisher Well Pad
Doddridge County, West Virginia
Antero Resources Corporation**

Pollutant		Emissions		Threshold Exceeded?		
		Uncontrolled	Controlled	Threshold	Uncontrolled	Controlled
VOC	lbs/hr	15.7706		6	Yes	
	tons/yr	30.0331		10	Yes	
NO _x	lbs/hr	0.3208		6		
	tons/yr	1.4049		10		
CH ₄	lbs/hr	2.0517				
	tons/yr	8.7014				
CO	lbs/hr	0.2694		6		
	tons/yr	1.1801		10		
SO ₂	lbs/hr	0.0019		6		
	tons/yr	0.0084		10		
PM _{2.5}	lbs/hr	0.0244		6		
	tons/yr	0.1068		10		
PM ₁₀	lbs/hr	0.9364	0.4804	6		
	tons/yr	0.1467	0.1268	10		
Lead	lbs/hr	1.60E-06		6		
	tons/yr	7.02E-06		10		
Total HAPs	lbs/hr	3.1465		2	Yes	
	tons/yr	5.3097		5	Yes	
Total TAPs	lbs/hr	0.0008		1.14		
n-Hexane	lbs/hr	3.1019				
	tons/yr	5.1280				
Toluene	lbs/hr	0.0055				
	tons/yr	0.0221				
Ethylbenzene	lbs/hr	0.0109				
	tons/yr	0.0445				
Xylenes	lbs/hr	0.0273				
	tons/yr	0.1117				
Benzene	lbs/hr	0.0006				
	tons/yr	0.0025				

Enter any notes here:	Please see Attachment J - Fugitive Emissions Data Summary Sheet and Attachment T - Emission Points Summary Sheet for sitewide sources and breakdown of emission quantities.
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Table 4

Fugitive Emissions
Swisher Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

VOC Type:	Condensate VOC
Emission Type:	Steady State (continuous)

Gas Weight Fraction From Analysis:	VOC frac	0.191
	Benzene frac	0.000
	Toluene	0.000
	Ethylbenzene	0.000
	Xylenes	0.000
	n-Hexane	0.023
	HAPs	0.023
	Methane	0.603

Gas					
Number	Component	Pollutant	Emission Factor (kg/hr of THC per component)	kg/hr	lb/yr
200	Valves	Gas VOC	0.004500	0.17	3,312.30
		Non VOC	0.004500	0.73	14,032.50
		HAPs	0.004500	0.02	393.94
		CO2e	0.004500	13.56	261,291.78
236	Connectors	VOC	0.000200	0.01	173.71
		Non-VOC	0.000200	0.04	735.93
		HAPs	0.000200	0.00	20.66
		CO2e	0.000200	0.71	13,703.30
52	Flanges	VOC	0.000390	0.00	74.64
		Non-VOC	0.000390	0.02	316.20
		HAPs	0.000390	0.00	8.88
		CO2e	0.000390	0.305509	5887.774788
Total VOCs:				0.18	3560.65
Total THC:				0.97	18645.27
Total CH4:				0.58	11235.31

Light Liquid Weight Fraction From Analysis:	VOC frac	0.977
	Benzene frac	0.000
	Toluene	0.004
	Ethylbenzene	0.008
	Xylenes	0.021
	n-hexane	0.015
	HAPs	0.049
	Methane	0.008

Light Liquid					
Number	Component	Pollutant	Emission Factor (kg/hr of THC per component)	kg/hr	lb/yr
208	Valves	Light Liquid VOC	0.002500	0.51	9,794.28
		Light Liquid Non-VOC	0.002500	0.01	227.16
		Light Liquid HAPs	0.002500	0.03	494.37
		CO2e	0.002500	0.10	1941.36
Total VOC:				0.51	9,794.28
Total THC:				0.52	10,021.44
Total CH4:				0.00	77.65

Fugitive Total Emissions			
	Annual Emissions (lb/yr)	Annual Emissions (lb/hr)	Annual Emissions (tpy)
VOC	13,354.93	1.52	6.68
Ethylbenzene		0.01	0.04
Toluene		0.00	0.02
Xylenes		0.02	0.11
n-Hexane		0.07	0.29
TAPs (Benzene)		0.00	0.00
HAPs		0.10	0.46
CH ₄ ³		1.29	5.66
CO _{2e}	282,824.21	32.29	141.41

Enter Notes Here:	Fugitive emissions based on an estimated component count Global Warming Potentials from EPA site Reference to Emission factors used:
	<ol style="list-style-type: none"> Emission factors are for oil and gas production facilities (not refineries) come from the EPA's "Protocol for Equipment Leak Emission Estimates" November 1995, EPA 4531, R-95-017, Table 2-4. Percent of speciated VOCs used in fugitive calculations are based on the total hydrocarbons, not of the total sample. CH₄ emissions are based on percent of CH₄ of the total hydrocarbons

Table 5

Pneumatic Control Valve Emissions
Swisher Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

Number of PCVs	12
Bleed Rate (scf/day/PCV)	6.6
Total Bleed Rate (scf/day)	79.2

Component	Mol%	Molecular Weight (lb/lb-mole)	Component Flow (scf/day)	Component Moles (lb-moles)	Component Emissions		
					(lbs/day)	(lbs/hr)	(tons/year)
H2S	0.00E+00	34.08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrogen	0.4946	28.01	0.3917	1.03E-03	0.0289	0.0012	0.0053
Carbon Dioxide	0.1467	44.01	0.1162	3.06E-04	0.0135	0.0006	0.0025
Methane	77.6927	16.04	61.5326	0.1621	2.6009	0.1084	0.4747
Ethane	14.1987	30.07	11.2454	0.0296	0.8911	0.0371	0.1626
Propane	4.4938	44.10	3.5591	0.0094	0.4136	0.0172	0.0755
Isobutane	0.5666	58.12	0.4487	1.18E-03	0.0687	0.0029	0.0125
n-Butane	1.1838	58.12	0.9376	0.0025	0.1436	0.0060	0.0262
2,2 Dimethylpropane	0.00E+00	72.15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Isopentane	0.3749	72.15	0.2969	0.0008	0.0565	0.0024	0.0103
n-Pentane	0.2914	72.15	0.2308	0.0006	0.0439	0.0018	0.0080
2,2 Dimethylbutane	0.00E+00	86.18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cyclopentane	0.00E+00	70.10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,3 Dimethylbutane	0.00E+00	86.18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Methylpentane	0.00E+00	86.18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3-Methylpentane	0.00E+00	86.18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
n-Hexane	0.5451	86.17	0.4317	0.0011	0.0980	0.0041	0.0179
Methylcyclopentane	0.00E+00	84.16	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	0.00E+00	78.11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cyclohexane	0.00E+00	84.16	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Methylhexane	0.00E+00	100.20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3-Methylhexane	0.00E+00	100.20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,2,4 Trimethylpentane	0.00E+00	114.23	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Heptane	0.00E+00	100.20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methylcyclohexane	0.00E+00	98.19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	0.00E+00	92.14	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Octane	0.00E+00	114.23	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	106.17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
m & p-Xylene	0.00E+00	106.17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
o-Xylene	0.00E+00	106.17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nonane	0.00E+00	128.26	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C10+	0.00E+00	159.20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	lb/hr	tpy
VOC Emissions	0.0343	0.1504
Benzene Emissions	0.00E+00	0.00E+00
Toluene Emissions	0.00E+00	0.00E+00
Ethylbenzene Emissions	0.00E+00	0.00E+00
Xylene Emissions	0.00E+00	0.00E+00
n-Hexane Emissions	0.0041	0.0179
HAPs Emissions	0.0041	0.0179
TAPs Emissions	0.00E+00	0.00E+00
CH ₄ Emissions	0.1084	0.4747
CO _{2e} emissions	2.7098	11.8690

Enter any notes here:	<p>1. PCV bleed rate obtained from the user manual for PCV http://issuu.com/rmcprocesscontrols/docs/mizer-pilot-operation--parts---installation-manual</p> <p>2. Emissions per hour= Mol % x no. of PCV x bleed rate x MW / 379.48 / 24</p>
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Table 6

**Uncontrolled Flashing Emissions
Swisher Well Pad
Doddridge County, West Virginia
Antero Resources Corporation**

# Hours Operational	8760
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	Condensate Tank Flashing Losses			Produced Water Tank Flashing Losses		
	Vapor Mass Fraction wt%	Flashing Losses		Vapor Mass Fraction wt%	Flashing Losses	
		lbs/hr	tpy		lbs/hr	tpy
Water	0.1279	0.0059	0.0259	2.6280	0.0075	0.0326
H2S	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Nitrogen	0.0331	0.0015	0.0067	0.3258	0.0009	0.0040
Carbon Dioxide	0.1251	0.0058	0.0253	2.5891	0.0073	0.0321
Methane	8.9760	0.4147	1.8165	55.6518	0.1578	0.6910
Ethane	17.2730	0.7981	3.4956	26.0069	0.0737	0.3229
Propane	22.3400	1.0322	4.5210	8.2053	0.0233	0.1019
Isobutane	6.3360	0.2927	1.2822	0.9451	0.0027	0.0117
n-Butane	15.6088	0.7212	3.1588	2.4336	0.0069	0.0302
2,2 Dimethylpropane	0.0007	0.0000	0.0001	0.0000	0.0000	0.0000
Isopentane	7.5763	0.3501	1.5332	0.6541	0.0019	0.0081
n-Pentane	6.2089	0.2869	1.2565	0.1981	0.0006	0.0025
2,2 Dimethylbutane	0.0018	0.0001	0.0004	0.0001	0.0000	0.0000
Cyclopentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2,3 Dimethylbutane	0.0027	0.0001	0.0006	0.0002	0.0000	0.0000
2-Methylpentane	0.0145	0.0007	0.0029	0.0006	0.0000	0.0000
3-Methylpentane	0.0102	0.0005	0.0021	0.0010	0.0000	0.0000
n-Hexane	15.0095	0.6935	3.0375	0.2830	0.0008	0.0035
Methylcyclopentane	0.0023	0.0001	0.0005	0.0003	0.0000	0.0000
Benzene	0.0006	0.0000	0.0001	0.0009	0.0000	0.0000
Cyclohexane	0.0044	0.0002	0.0009	0.0014	0.0000	0.0000
2-Methylhexane	0.0185	0.0009	0.0038	0.0005	0.0000	0.0000
3-Methylhexane	0.0155	0.0007	0.0031	0.0005	0.0000	0.0000
2,2,4 Trimethylpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Heptane	0.0307	0.0014	0.0062	0.0004	0.0000	0.0000
Methylcyclohexane	0.0188	0.0009	0.0038	0.0027	0.0000	0.0000
Toluene	0.0049	0.0002	0.0010	0.0068	0.0000	0.0001
Octane	0.0867	0.0040	0.0175	0.0005	0.0000	0.0000
Ethylbenzene	0.0082	0.0004	0.0016	0.0110	0.0000	0.0001
m & p-Xylene	0.0066	0.0003	0.0013	0.0081	0.0000	0.0001
o-Xylene	0.0128	0.0006	0.0026	0.0181	0.0001	0.0002
Nonane	0.0607	0.0028	0.0123	0.0004	0.0000	0.0000
C10+	0.0848	0.0039	0.0172	0.0256	0.0001	0.0003
Total VOCs	73.465	3.39	14.9	12.798	0.0363	0.1589
Total CO _{2e}		10.37	45.4		3.95	17.3
CH ₄		0.41	1.82		0.16	0.69
Total TAPs (Benzene)		0.0000	0.0001		0.0000	0.0000
Toluene		0.0002	0.0010		0.0000	0.0001
Ethylbenzene		0.0004	0.0016		0.0000	0.0001
Xylenes		0.0009	0.0039		0.0001	0.0003
n-Hexane		0.693	3.038		0.0008	0.0035
Total HAPs		0.695	3.044		0.0009	0.0041
Total	100.00	4.62	20.2	100.00	0.283	1.24

Enter any notes here:	Vapor mass fractions and Flashing losses from Promax output
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Table 7

Uncontrolled Working and Breathing Losses
Swisher Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

Condensate Tank Information	
Number of Tanks	4
Maximum Working Losses (lbs/hr)	0.0546
Maximum Breathing Losses (lbs/hr)	1.8782
# Hours Operational	8760

	Condensate Tank W/B Losses						
	Vapor Mass Fraction wt%	Working Losses		Breathing Losses		Max W/B Losses	
		lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
H2S	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrogen	0.0003	1.63E-07	7.13E-07	0.0000	0.0000	0.0000	0.0000
Carbon Dioxide	0.0134	0.0000	0.0000	0.0003	0.0011	0.0003	0.0011
Methane	0.3098	0.0002	0.0007	0.0058	0.0255	0.0060	0.0262
Ethane	4.2962	0.0023	0.0103	0.0807	0.3534	0.0830	0.3637
Propane	20.8316	0.0114	0.0498	0.3913	1.7137	0.4026	1.7635
Isobutane	9.9703	0.0054	0.0238	0.1873	0.8202	0.1927	0.8440
n-Butane	24.9196	0.0136	0.0596	0.4680	2.0500	0.4816	2.1096
2,2 Dimethylpropane	0.0009	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001
Isopentane	10.2785	0.0056	0.0246	0.1931	0.8456	0.1987	0.8701
n-Pentane	8.2843	0.0045	0.0198	0.1556	0.6815	0.1601	0.7013
2,2 Dimethylbutane	0.0025	0.0000	0.0000	0.0000	0.0002	0.0000	0.0002
Cyclopentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2,3 Dimethylbutane	0.0037	0.0000	0.0000	0.0001	0.0003	0.0001	0.0003
2-Methylpentane	0.0194	0.0000	0.0000	0.0004	0.0016	0.0004	0.0016
3-Methylpentane	0.0137	0.0000	0.0000	0.0003	0.0011	0.0003	0.0012
n-Hexane	20.6665	0.0113	0.0494	0.3882	1.7001	0.3994	1.7495
Methylcyclopentane	0.0028	0.0000	0.0000	0.0001	0.0002	0.0001	0.0002
Benzene	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.0054	0.0000	0.0000	0.0001	0.0004	0.0001	0.0005
2-Methylhexane	0.0072	0.0000	0.0000	0.0001	0.0006	0.0001	0.0006
3-Methylhexane	0.0219	0.0000	0.0001	0.0004	0.0018	0.0004	0.0019
2,2,4 Trimethylpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Heptane	0.0404	0.0000	0.0001	0.0008	0.0033	0.0008	0.0034
Methylcyclohexane	0.0259	0.0000	0.0001	0.0005	0.0021	0.0005	0.0022
Toluene	0.0045	2.44E-06	1.07E-05	0.0001	0.0004	0.0001	0.0004
Octane	0.1070	0.0001	0.0003	0.0020	0.0088	0.0021	0.0091
Ethylbenzene	0.0082	4.47E-06	1.96E-05	0.0002	0.0007	0.0002	0.0007
m & p-Xylene	0.0088	4.80E-06	2.10E-05	0.0002	0.0007	0.0002	0.0007
o-Xylene	0.0110	6.00E-06	0.0000	0.0002	0.0009	0.0002	0.0009
Nonane	0.0727	0.0000	0.0002	0.0014	0.0060	0.0014	0.0062
C10+	0.0729	3.98E-05	0.0002	0.0014	0.0060	0.0014	0.0062
Total VOCs	95.380	0.0520	0.228	1.7914	7.8465	1.8435	8.074
Total CO _{2e}		0.0042	0.0185	0.1457	0.6383	0.1500	0.657
CH ₄		0.0002	0.0007	0.0058	0.0255	0.0060	0.0262
Total TAPs (Benzene)		2.83E-07	1.24E-06	0.0000	0.0000	0.0000	0.0000
Toluene		2.44E-06	1.07E-05	0.0001	0.0004	0.0001	0.0004
Ethylbenzene		4.47E-06	1.96E-05	0.0002	0.0007	0.0002	0.0007
Xylenes		1.08E-05	0.0000	0.0004	0.0016	0.0004	0.0017
n-Hexane		0.0113	0.0494	0.3882	1.7001	0.3994	1.7495
Total HAPs		0.0113	0.0495	0.3888	1.7029	0.4001	1.7523
Total	100.00	0.0546	0.2390	1.8782	8.2266	1.9328	8.466

Table 7

Uncontrolled Working and Breathing Losses
Swisher Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

Produced Water Tank Information	
Number of Tanks	2
Maximum Working Losses (lbs/hr)	0.0121
Maximum Breathing Losses (lbs/hr)	0.0083

	Produced Water Tank W/B Losses						
	Vapor Mass Fraction wt%	Working Losses		Breathing Losses		Max W/B Losses	
		lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
Water	91.6537	0.0111	0.0484	0.0076	0.0334	0.0187	0.0818
H2S	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrogen	0.0065	7.83E-07	3.43E-06	5.39E-07	2.36E-06	1.32E-06	5.79E-06
Carbon Dioxide	3.4624	0.0004	0.0018	0.0003	0.0013	0.0007	0.0031
Methane	3.0850	0.0004	0.0016	0.0003	0.0011	0.0006	0.0028
Ethane	1.7004	0.0002	0.0009	0.0001	0.0006	0.0003	0.0015
Propane	0.0836	1.01E-05	0.0000	6.94E-06	3.04E-05	1.70E-05	0.0001
Isobutane	0.0024	2.91E-07	1.27E-06	2.00E-07	8.77E-07	4.91E-07	2.15E-06
n-Butane	0.0056	6.74E-07	2.95E-06	4.64E-07	2.03E-06	1.14E-06	4.99E-06
2,2 Dimethylpropane	0.0000	4.53E-12	1.98E-11	3.12E-12	1.37E-11	7.65E-12	3.35E-11
Isopentane	0.0004	4.68E-08	2.05E-07	3.23E-08	1.41E-07	7.91E-08	3.47E-07
n-Pentane	0.0000	4.18E-09	1.83E-08	2.88E-09	1.26E-08	7.06E-09	3.09E-08
2,2 Dimethylbutane	0.0000	6.00E-13	2.63E-12	4.14E-13	1.81E-12	1.01E-12	4.44E-12
Cyclopentane	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,3 Dimethylbutane	0.0000	3.25E-12	1.42E-11	2.24E-12	9.81E-12	5.49E-12	2.40E-11
2-Methylpentane	5.48E-08	6.61E-12	2.89E-11	4.55E-12	1.99E-11	1.12E-11	4.89E-11
3-Methylpentane	2.06E-07	2.48E-11	1.09E-10	1.71E-11	7.50E-11	4.20E-11	1.84E-10
n-Hexane	9.56E-06	1.15E-09	5.05E-09	7.95E-10	3.48E-09	1.95E-09	8.53E-09
Methylcyclopentane	8.73E-08	1.05E-11	4.61E-11	7.26E-12	3.18E-11	1.78E-11	7.79E-11
Benzene	1.33E-05	1.60E-09	7.02E-09	1.10E-09	4.84E-09	2.71E-09	1.19E-08
Cyclohexane	5.90E-07	7.11E-11	3.12E-10	4.90E-11	2.15E-10	1.20E-10	5.26E-10
2-Methylhexane	2.78E-09	3.35E-13	1.47E-12	2.31E-13	1.01E-12	5.66E-13	2.48E-12
3-Methylhexane	1.10E-08	1.32E-12	5.79E-12	9.11E-13	3.99E-12	2.23E-12	9.78E-12
2,2,4 Trimethylpentane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Heptane	3.01E-09	3.63E-13	1.59E-12	2.50E-13	1.09E-12	6.12E-13	2.68E-12
Methylcyclohexane	2.24E-07	2.70E-11	1.18E-10	1.86E-11	8.16E-11	4.56E-11	2.00E-10
Toluene	2.23E-05	2.69E-09	1.18E-08	1.85E-09	8.11E-09	4.54E-09	1.99E-08
Octane	4.32E-10	5.21E-14	2.28E-13	3.59E-14	1.57E-13	8.80E-14	3.86E-13
Ethylbenzene	1.08E-05	1.31E-09	5.72E-09	9.00E-10	3.94E-09	2.21E-09	9.66E-09
m & p-Xylene	6.11E-06	7.37E-10	3.23E-09	5.08E-10	2.22E-09	1.24E-09	5.45E-09
o-Xylene	1.74E-05	2.10E-09	9.19E-09	1.45E-09	6.33E-09	3.55E-09	1.55E-08
Nonane	9.67E-11	1.17E-14	5.11E-14	8.04E-15	3.52E-14	1.97E-14	8.63E-14
C10+	3.17E-08	3.82E-12	1.67E-11	2.63E-12	1.15E-11	6.46E-12	2.83E-11
Total VOCs	0.0921	1.11E-05	0.0000	7.65E-06	3.35E-05	1.88E-05	0.0001
Total CO _{2e}		0.0097	0.0426	0.0067	0.0293	0.0164	0.0719
CH ₄		0.0004	0.0016	0.0003	0.0011	0.0006	0.0028
Total TAPs (Benzene)		1.60E-09	7.02E-09	1.10E-09	4.84E-09	2.71E-09	1.19E-08
Toluene		2.69E-09	1.18E-08	1.85E-09	8.11E-09	4.54E-09	1.99E-08
Ethylbenzene		1.31E-09	5.72E-09	9.00E-10	3.94E-09	2.21E-09	9.66E-09
Xylenes		2.84E-09	1.24E-08	1.95E-09	8.56E-09	4.79E-09	2.10E-08
n-Hexane		1.15E-09	5.05E-09	7.95E-10	3.48E-09	1.95E-09	8.53E-09
Total HAPs		9.59E-09	4.20E-08	6.60E-09	2.89E-08	1.62E-08	7.09E-08
Total	100.00	0.0121	0.0528	0.0083	0.0364	0.0204	0.0892

Enter any notes here:	Vapor mass fractions, working losses and breathing losses from Promax output
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Table 8

Loading Emissions
Swisher Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

Annual Loading	Oil Truck Loading	Water Truck Loading
RVP	2.51	1.0319
Annual Average Temp (F)	72.1	72.1
S (saturation factor)	0.6	0.6
P (true vapor pressure)	1.46	0.45
M (MW of vapor)	45.23	18.46
Collection Efficiency (%)	0.00	0.00
Total Hydrocarbon Loading Loss (lb/10 ³ gal)*	0.93	0.12
Maximum Throughput (gallons/hr)**	10,080	10,080
Average Throughput (gallons/yr)	61,320	735,840
Total Hydrocarbon Loading Emissions (lbs/hr)	9.35	1.18
Total Hydrocarbon Loading Emissions (tpy)	0.03	0.04

	Condensate Tank Loading Losses			Produced Water Tank Loading Losses		
	Vapor Mass Fraction wt%	Loading Losses lbs/hr	Loading Losses tpy	Vapor Mass Fraction wt%	Loading Losses lbs/hr	Loading Losses tpy
H2S	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrogen	0.0003	2.79E-05	8.48E-08	0.0065	7.67E-05	2.80E-06
Carbon Dioxide	0.0134	0.0012	3.80E-06	3.4624	4.09E-02	1.49E-03
Methane	0.3098	0.0290	8.81E-05	3.0850	3.64E-02	1.33E-03
Ethane	4.2962	0.4017	0.0012	1.7004	2.01E-02	7.33E-04
Propane	20.8316	1.9479	5.92E-03	0.0836	9.87E-04	3.60E-05
Isobutane	9.9703	0.9323	2.84E-03	0.0024	2.85E-05	1.04E-06
n-Butane	24.9196	2.3302	7.09E-03	0.0056	6.60E-05	2.41E-06
2,2 Dimethylpropane	0.0009	0.0001	2.65E-07	0.0000	4.44E-10	1.62E-11
Isopentane	10.2785	0.9611	2.92E-03	0.0004	4.59E-06	1.67E-07
n-Pentane	8.2843	0.7747	2.36E-03	0.0000	4.09E-07	1.49E-08
2,2 Dimethylbutane	0.0025	0.0002	7.08E-07	0.0000	5.88E-11	2.15E-12
Cyclopentane	0.0000	0.0000	0.00E+00	0.0000	0.00E+00	0.00E+00
2,3 Dimethylbutane	0.0037	0.0003	1.05E-06	0.0000	3.18E-10	1.16E-11
2-Methylpentane	0.0194	0.0018	5.51E-06	5.48E-08	6.47E-10	2.36E-11
3-Methylpentane	0.0137	0.0013	3.90E-06	2.06E-07	2.43E-09	8.89E-11
n-Hexane	20.6665	1.9325	5.88E-03	9.56E-06	1.13E-07	4.12E-09
Methylcyclopentane	0.0028	0.0003	7.98E-07	8.73E-08	1.03E-09	3.77E-11
Benzene	0.0005	0.0000	1.47E-07	0.0000	1.57E-07	5.73E-09
Cyclohexane	0.0054	0.0005	1.54E-06	0.0000	6.97E-09	2.54E-10
2-Methylhexane	0.0072	0.0007	2.03E-06	0.0000	3.29E-11	1.20E-12
3-Methylhexane	0.0219	0.0020	6.22E-06	0.0000	1.29E-10	4.73E-12
2,2,4 Trimethylpentane	0.0000	0.0000	0.00E+00	0.0000	0.00E+00	0.00E+00
Heptane	0.0404	0.0038	1.15E-05	3.01E-09	3.55E-11	1.30E-12
Methylcyclohexane	0.0259	0.0024	7.37E-06	2.24E-07	2.65E-09	9.66E-11
Toluene	0.0045	0.0004	1.27E-06	0.0000	2.63E-07	9.61E-09
Octane	0.1070	0.0100	3.04E-05	4.32E-10	5.11E-12	1.86E-13
Ethylbenzene	0.0082	0.0008	2.33E-06	1.08E-05	1.28E-07	4.67E-09
m & p-Xylene	0.0088	0.0008	2.50E-06	6.11E-06	7.22E-08	2.63E-09
o-Xylene	0.0110	0.0010	3.13E-06	1.74E-05	2.06E-07	7.51E-09
Nonane	0.0727	0.0068	2.07E-05	9.67E-11	1.14E-12	4.17E-14
C10+	0.0729	0.0068	2.07E-05	3.17E-08	3.74E-10	1.37E-11
Total VOCs	95.3802	8.9188	0.0271	0.0921	0.0011	0.0000
Total CH ₄		0.0290	0.0001		0.0364	0.0013
Total CO _{2e}		0.7256	0.0022		0.9521	0.0348
Total TAPs (Benzene)		0.0000	0.0000		1.57E-07	5.73E-09
Toluene		0.0004	0.0000		2.63E-07	9.61E-09
Ethylbenzene		0.0008	0.0000		1.28E-07	4.67E-09
Xylenes		0.0019	0.0000		2.78E-07	1.01E-08
n-Hexane		1.9325	0.0059		1.13E-07	4.12E-09
Total HAPs		1.9356	0.0059		9.39E-07	3.43E-08
Total	100.0000	9.3508	0.0284	100.0000	1.1815	0.0431

Enter any notes here

Vapor mass fractions and loading losses from Promax output

*Using equation $L_1 = 12.46 \cdot \text{SPM}/T$ from AP-42, Chapter 5, Section 5.2-4

MW was obtained by Promax; RVP was taken from laboratory reports

Annual Average Temp (F) obtained from Charleston, WV (preset in Promax)

S (saturation factor) is based on submerged loading, dedicated service as it was most representative

True vapor pressure (TVP) equation from AP-42, Chapter 7, Figure 7.1-13a

** Maximum condensate throughput in gallons per hour is based on actual filling rate of 4 barrels per minute. (10080 gal/hr = 4 bbl/ min x 42 gal/bbl x 60 min/hr)

Loading emissions are vented to the atmosphere.

Table 9

**Gas Production Unit Heater Emissions
Swisher Well Pad
Doddridge County, West Virginia
Antero Resources Corporation**

Gas Production Unit Heater Emissions

Number of Units	4
GPU Heater Rating (MMBtu/hr)	1.00
Operating hours/year	8760
Fuel Heat Value (Btu/scf)	1,247.06

Pollutant	Emission Factors (lb/MMscf)	lb/hr	tpy
NOx	100	0.321	1.405
CO	84	0.269	1.180
CO ₂	120,000	384.905	1685.885
Lead	0.0005	1.60E-06	7.02E-06
N ₂ O	2.2	0.007	0.031
PM (Total)	7.6	0.024	0.107
SO ₂	0.6	0.002	0.008
TOC	11	0.035	0.155
Methane	2.3	0.007	0.032
VOC	5.5	0.018	0.077
HAPS			
2-Methylnaphthalene	2.40E-05	7.70E-08	3.37E-07
Benzene	2.10E-03	6.74E-06	2.95E-05
Dichlorobenzene	1.20E-03	3.85E-06	1.69E-05
Fluoranthene	3.00E-06	9.62E-09	4.21E-08
Fluorene	2.80E-06	8.98E-09	3.93E-08
Formaldehyde	7.50E-02	2.41E-04	1.05E-03
Hexane	1.80E+00	5.77E-03	2.53E-02
Naphthalene	6.10E-04	1.96E-06	8.57E-06
Phenanathrene	1.70E-05	5.45E-08	2.39E-07
Toluene	3.40E-03	1.09E-05	4.78E-05

	lb/hr	tpy
TOTAL Uncontrolled VOC	0.018	0.077
TOTAL Uncontrolled HAPs	0.006	0.026
TOTAL Uncontrolled TAPs (Benzene)	6.74E-06	2.95E-05
TOTAL Uncontrolled Toluene	1.09E-05	4.78E-05
TOTAL Uncontrolled Hexane	0.006	0.025
TOTAL Uncontrolled TAPs (Formaldehyde)	0.000	0.001
TOTAL CH ₄	0.007	0.032
TOTAL CO _{2e} Emissions	387.19	1,695.90

Enter any notes here:
All Emission Factors based off AP-42 Sec 1.4 Natural Gas Combustion

Table 10

**Haul Road Emissions
Swisher Well Pad
Doddridge County, West Virginia
Antero Resources Corporation**

	PM	PM10
Particle Size Multiplier (k)	0.8	0.36
Silt Content of Road Surface Material (s) (%)	5.1	5.1
Days per Year with Precipitation > 0.01 in (p)	150	150
Control Efficiency for Watering ¹ (%)	50	50

Tanker Truck Trip Calculation	
Condensate Production (bbl/day)	4
PW Production (bbl/day)	48
Condensate Truck Capacity (bbl)	200
PW Truck Capacity (bbl)	200

Pick Up Truck Trip Calculation	
No of Trips Per day	2
Trips Per Year	730

	# of Wheels	Mean Vehicle Weight (W) (tons)	Mean Vehicle Speed (S) (mph)	Miles Per Trip (miles)	Maximum Trips per Hour	Maximum Trips per Year	Vehicle Miles Travelled		PM (lbs/VMT)	PM10 (lbs/VMT)
							(miles/hr)	(miles/year)		
Tanker Trucks Condensate	10	40	10	0.2500	1	8	0.2500	2.0000	3.8175	1.7179
Tanker Trucks PW	10	40	10	0.2500	1	88	0.2500	22.0000	3.8175	1.7179
Pick Up Truck	4	3	10	0.3400	1	730	0.3400	248.2000	0.3467	0.1560

	Uncontrolled Emissions						Controlled Emissions					
	(lbs/hr)	PM (lbs/year)	(tpy)	(lbs/hr)	PM10 (lbs/year)	(tpy)	(lbs/hr)	PM (lbs/year)	(tpy)	(lbs/hr)	PM10 (lbs/year)	(tpy)
Tanker Trucks Condensate	0.9544	7.6351	0.0038	0.4295	3.4358	0.0017	0.4772	3.8175	0.0019	0.2147	1.7179	0.0009
Tanker Trucks PW	0.9544	83.9856	0.0420	0.4295	37.7935	0.0189	0.4772	41.9928	0.0210	0.2147	18.8968	0.0094
Pick Up Truck	0.1179	86.0459	0.0430	0.0530	38.7207	0.0194	0.0589	43.0229	0.0215	0.0265	19.3603	0.0097
Total Emissions	2.0266	177.6666	0.0888	0.9120	79.9500	0.0400	1.0133	88.8333	0.0444	0.4560	39.9750	0.0200

Enter any notes here:	1 EPA, AP-42, Volume I, Section 13.2.2 Unpaved Roads (11/06); assume 2:1 moisture ratio Section 13.2.2 Unpaved Roads (11/06) Source: Attachment L, Fugitive Emissions from Unpaved Haul Roads, Rev 03/2007, West Virginia Department of Environmental Protection
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Bryan Research & Engineering, Inc.

ProMax[®] 4.0

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Simulation Report

Project: PROMAX SCENARIO 3.pmx

Licensed to GHD Limited and Affiliates

Client Name: Antero Resources Corporation
Location: West Virginia
Job: Swisher

ProMax Filename: I:\Air Quality\6-chars\08----\0827--\082715\ANTERO RESOURCES\01-ProMax\Model 2017-2018\HP\PROMAX SCENARIO 3.pmx
ProMax Version: 4.0.16071.0
Simulation Initiated: 2/16/2018 2:47:24 PM

Bryan Research & Engineering, Inc.

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Report Navigator can be activated via the ProMax Navigator Toolbar.
An asterisk (*), throughout the report, denotes a user specified value.
A question mark (?) after a value, throughout the report, denotes an extrapolated or approximate value.

Names	Units	Oil	Water
Std Liquid Volumetric Flow	bbl/d	4.2355#	50.441#

Names	Units	Gas
Std Vapor Volumetric Flow	MMSCFD	9.9795#

Properties	Total gas to sale	
Pressure(Total)	198	psig
Temperature(Total)	70	°F
Std Vapor Volumetric Flow (Total)	10	MMSCFD

Stream Total gas to sale C3+ Mass Flow = 1.895E+04 ton/yr

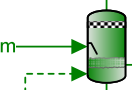
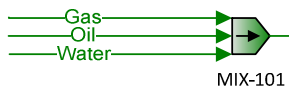
Names	Units	Sales Oil	Produced Water
Std Liquid Volumetric Flow	bbl/d	4.0003	48
Reid Vapor Pressure	psi	10.978	1.0319

Stream Oil W/B C3+ Mass Flow = 8.074 ton/yr

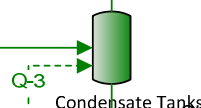
Stream PWT Flash Gas C3+ Mass Flow = 0.1589 ton/yr

Stream Water W/B C3+ Mass Flow = 8.214E-05 ton/yr

Properties	HP Separator Gas	
Pressure(Total)	198*	psig
Temperature(Total)	70*	°F



HP Separator Gas
HP Separator Oil
HP Separator Water

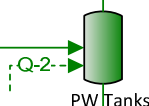


"OT Flash Gas" C3+ Mass Flow = 14.87 ton/yr

Annual tank loss calculations for "Sales Oil".
Total working and breathing losses from the Vertical Cylinder are 8.466 ton/yr.
* All components are reported.
Vapor adjusted to ensure mass balance

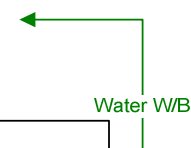
Oil Tanks: 4

Stream PWT Flash Gas C3+ Mass Flow = 0.1589 ton/yr



Annual tank loss calculations for "Produced Water".
Total working and breathing losses from the Vertical Cylinder are 0.08922 ton/yr.
* All components are reported.

Water Tanks: 2



Process Streams	Gas	HP Separator Gas	HP Separator Oil	HP Separator Water	Oil	Oil W/B	OT Flash Gas	Produced Water	PWT Flash Gas	Sales Oil	Total gas to sale	Water	Water W/B	Well Stream	
Composition	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	
Phase: Total	From Block:	3 Phase Separator	3 Phase Separator	3 Phase Separator			Condensate Tanks	PW Tanks	PW Tanks	Condensate Tanks	MIX-100				
Mole Fraction	To Block:	MIX-101	MIX-100	Condensate Tanks	PW Tanks	MIX-101						MIX-101		3 Phase Separator	
		%	%	%	%	%	%	%	%	%	%	%	%	%	
Water		0	0.180407	0.0750812	99.9629	0	0.000514940*	0.296075	99.9969	3.03261	0.00976826	0.180407	100*	93.9122*	3.59291
H2S		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrogen		0.494658*	0.493810	0.0112905	8.76346E-05	0.013*	0.000613390*	0.0492394	2.83210E-06	0.241807	7.50327E-05	0.493810	0	0.00427806*	0.476199
Carbon Dioxide		0.146717*	0.146423	0.0283049	0.00102139	0.014*	0.0174822*	0.118657	0.000592675	1.22303	0.00162849	0.146423	0	1.45225*	0.141400
Methane		77.7018*	77.5677	5.40884	0.0270287	5.372*	1.11246*	23.3338	0.00173730	72.1172	0.111244	77.5677	0	3.54975*	74.8850
Ethane		14.2004*	14.1752	6.04377	0.00695173	5.517*	8.22964*	23.9565	0.000646104	17.9804	0.749791	14.1752	0	1.04385*	13.6872
Propane		4.49433*	4.48536	6.70896	0.00145477	4.82*	27.2112*	21.1283	9.81447E-05	3.86836	2.44745	4.48536	0	0.0349794*	4.33296
Isobutane		0.566666*	0.565291	2.08204	0.000124530	1.445*	9.88062*	4.54619	5.97549E-06	0.338050	1.35378	0.565291	0	0.000765478*	0.546610
n-Butane		1.18394*	1.18026	6.36941	0.000325518	3.282*	24.6955*	11.1996	2.02523E-05	0.870450	4.94187	1.18026	0	0.00177524*	1.14213
2,2-Dimethylpropane		0	3.96722E-05	0.000254462	5.15048E-09	0.111*	0.000743370*	0.000396395	1.56639E-10	1.42395E-05	0.000212515	3.96722E-05	0	9.60889E-09*	3.84073E-05
Isopentane		0.374944*	0.373079	4.46265	6.91973E-05	2.1*	8.20581*	4.37932	3.10016E-06	0.188471	4.48728	0.373079	0	9.93728E-05*	0.362069
n-Pentane		0.291434*	0.289618	4.60812	2.03964E-05	2.012*	6.61373*	3.58890	3.75466E-07	0.0570876	4.90934	0.289618	0	8.86500E-06*	0.281558
2,2-Dimethylbutane		0	6.73279E-05	0.00174551	4.39575E-09	0.19*	0.00166287*	0.000881368	7.32308E-11	1.23252E-05	0.00200090	6.73279E-05	0	1.06645E-09*	6.57422E-05
Cyclopentane		0	0	0	0	0	0	0	0	0	0	0	0	0	0
2,3-Dimethylbutane		0	9.91826E-05	0.00346623	1.47853E-08	0.281*	0.00247352*	0.00132770	5.45749E-10	4.06030E-05	0.00498225	9.91826E-05	0	5.77159E-09*	9.72293E-05
2-Methylpentane		0	0.000520830	0.00102526	4.94654E-08	1.478*	0.0129445*	0.00701140	1.24383E-09	0.000137499	0.0240364	0.000520830	0	1.17369E-08*	0.000511405
3-Methylpentane		0	0.000366137	0.0157709	8.69635E-08	1.041*	0.00915769*	0.00495177	5.21677E-09	0.000233096	0.0189668	0.000366137	0	4.41332E-08*	0.000360198
n-Hexane		0.545164*	29.6294	2.42489E-05	1.974*	13.8135*		7.26370	3.06696E-07	0.0626866	36.2394	2.42489E-05	0	2.04826E-06*	0.526701
Methylcyclopentane		0	0.87912E-05	0.00452755	3.28353E-08	0.231*	0.00192071*	0.00111804	3.15128E-09	8.46436E-05	0.00553521	0.87912E-05	0	1.91589E-08*	7.99287E-05
Benzene		0	2.23215E-05	0.00132792	8.45586E-07	0.064*	0.000382349*	0.000307872	7.63932E-07	0.000233592	2.23215E-05	0.00132792	0	3.14082E-06*	2.21448E-05
Cyclohexane		0	0.000161231	0.0122714	1.53505E-07	0.465*	0.00369941*	0.00220316	3.04412E-08	0.000350490	0.0152470	0.000161231	0	1.29406E-07*	0.000160895
2-Methylhexane		0	0.000576305	0.0713701	3.69709E-08	1.696*	0.00411149*	0.00771968	6.41395E-10	0.000103590	0.0901815	0.000576305	0	5.12313E-10*	0.000586836
3-Methylhexane		0	0.000479713	0.0606973	3.72014E-08	1.42*	0.0125633*	0.00644618	7.67881E-10	0.000103887	0.0837268	0.000479713	0	2.01865E-09*	0.000491337
2,2,4-Trimethylpentane		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heptane		0	0.000963164	0.166683	3.08246E-08	2.893*	0.0232452*	0.0127836	2.88499E-10	8.70703E-05	0.212167	0.000963164	0	5.53760E-10*	0.00100101
Methylcyclohexane		0	0.00058961	0.106744	2.25326E-07	1.775*	0.0151955*	0.00800601	2.15109E-08	0.000581175	0.135927	0.00058961	0	4.41296E-08*	0.000614171
Toluene		0	0.000162880	0.0325131	4.31395E-06	0.495*	0.00279845*	0.00220927	3.77719E-06	0.00153424	0.0414691	0.000162880	0	4.2562E-06*	0.000171276
Octane		0	0.00247561	1.29449	3.07716E-08	8.505*	0.0599554*	0.0316444	1.23207E-10	8.73903E-05	1.66771	0.00247561	0	6.98333E-11*	0.00294283
Ethylbenzene		0	0.000246973	0.152614	5.51194E-06	0.878*	0.00444629*	0.00320219	4.75578E-06	0.00216084	0.196771	0.000246973	0	1.88266E-06*	0.000303798
m-Xylene		0	0.000202090	0.137819	2.81073E-06	0.734*	0.00477221*	0.00286015	2.25481E-06	0.00158740	0.177521	0.000202090	0	1.06192E-06*	0.000253973
o-Xylene		0	0.000391138	0.310615	1.28521E-05	1.476*	0.00596402*	0.00504075	1.16122E-05	0.00354722	0.400926	0.000391138	0	3.02621E-06*	0.000510713
Nonane		0	0.00159340	2.63379	2.02762E-08	7.697*	0.0326303*	0.0197323	8.29567E-11	5.7786E-05	3.40636	0.00159340	0	1.39217E-11*	0.00266325
C10+		0	0.00199057	29.5401	1.47249E-06	42.021*	0.0262749*	0.021211	3.04337E-07	0.00333114	38.2639	0.00199057	0	3.66113E-09*	0.0145398
Molar Flow		lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h
Water		0	1.98017	0.000364641	38.8702	0	1.72790E-07*	0.000328023	38.8698	0.000413560	3.66185E-05	1.98017	40.8507*	0.00103630*	40.8507
H2S		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrogen		5.42015*	5.48338E-05	5.42015	3.40764E-05	5.11431E-05*	2.05825E-07*	1.10087E-06	5.45526E-05	3.29756E-05	2.81276E-07	5.42015	0	4.72072E-08*	5.42020
Carbon Dioxide		1.60763*	1.60715	0.000137466	0.000397165	5.50772E-05*	5.86622E-06*	0.000131361	0.000230378	0.000166786	6.10476E-06	1.60715	0	1.60251E-05*	1.60769
Methane		851.407*	851.391	0.0262687	0.0105100	0.0211339*	0.000373288*	0.0258517	0.000675307	0.00983470	0.000417023	851.391	0	3.91705E-05*	851.428
Ethane		155.599*	155.588	0.0293524	0.00270315	0.0217044*	0.00276184*	0.0265416	0.000251147	0.00245201	0.00281076	155.588	0	1.15186E-05*	155.620
Propane		49.2460*	49.2318	0.0325829	0.000565683	0.0189623*	0.00913080*	0.0234081	3.81498E-05	0.000527533	0.00917482	49.2318	0	3.85987E-07*	49.2649
Isobutane		6.20917*	6.20469	0.0101117	4.84230E-05	0.00568475*	0.00331548*	0.00503675	2.32273E-06	4.61003E-05	0.00507493	6.20469	0	8.44683E-08*	6.21485
n-Butane		12.9278*	12.9547	0.0309338	0.000126577	0.0129117*	0.00828667*	0.0124082	7.87225E-06	0.00018704	0.0185257	12.9547	0	1.95893E-08*	12.9858
2,2-Dimethylpropane		0	0.000435446	0.123583E-06	2.00274E-09	0.000436684*	2.49441E-07*	4.39168E-07	6.08869E-11	1.94186E-09	7.96661E-07	0.000435446	0	1.06031E-13*	0.000436684
Isopentane		4.10840*	4.09496	0.0216734	2.69071E-05	0.00826158*	0.00275349*	0.00485187	1.20506E-06	5.27020E-05	0.0168216	4.09496	0	1.09655E-07*	4.11664
n-Pentane		3.19335*	3.17888	0.0223799	7.93105E-06	0.00791538*	0.00221926*	0.00397616	1.45947E-07	7.78510E-06	0.0184037	3.17888	0	9.78228E-11*	3.20126
2,2-Dimethylbutane		0	0.000738997	8.47730E-06	1.70927E-09	0.000747476*	5.57981E-07*	9.76473E-07	2.84655E-11	1.68080E-09	7.50083E-06	0.000738997	0	1.17680E-14*	0.000747476
Cyclopentane		0	0	0	0	0	0	0	0	0	0	0	0	0	0
2,3-Dimethylbutane		0	0.00108864	1.68342E-05	5.74922E-09	0.00110548*	8.29997E-07*	1.47097E-06	2.12138E-10	5.53708E-09	1.53632E-05	0.00108864	0	6.36879E-14*	0.00110548
2-Methylpentane		0	0.00571669	9.78736E-05	1.92344E-08	0.00581458*	4.34357E-06*	7.76797E-06	4.83488E-10	1.87509E-08	9.01056E-05	0.00571669	0	1.29514E-13*	0.00581458
3-Methylpentane		0	0.00401876	7.65932E-05	3.38154E-08	0.00409538*	3.07289E-06*	5.49207E-06	2.02781E-09	3.17876E-08	7.11011E-05	0.00401876	0	4.86997E-13*	0.00409538
n-Hexane		5.97356*	5.83742	0.143899	9.42908E-06	0.00776589*	0.00463516*	0.00804749	1.19216E-07	9.30986E-06	0.135852	5.83742	0	2.26020E-11*	5.98132
Methylcyclopentane		0	0.000866773	2.19886E-05	1.27679E-08	0.000908774*	6.44500E-07*	1.23868E-06	1.22493E-09	1.15429E-08	2.07499E-05	0.000866773	0	2.11413E-13*	0.000908774
Benzene		0	0.000245004	6.44921E-06	3.28803E-07	0.000251782*	1.28298E-07*	3.41093E-07	2.96948E-07	3.18552E-08	6.10812E-06	0.000245004	0	3.46581E-11*	0.000251782
Cyclohexane		0	0.00176969	5.95976E-05	5.96295E-08	0.00182935*	1.24135E-06*	2.44090E-06	1.18328E-05	4.77967E-08	5.71567E-05	0.00176969	0	1.42796E-12*	0.00182935
2-Methylhexane		0													

Isopentane	1.29507*	1.28895	3.35907	0.000277107	1.33375*	10.2785*	7.57635	1.24156E-05	0.654099	2.89438	1.28895	0*	0.000388404*	1.25488	
n-Pentane	1.00663*	1.00060	3.46857	8.16791E-05	1.27786*	8.28431*	6.20889	1.50367E-06	0.198125	3.16661	1.00060	0*	3.46493E-05*	0.975839	
2,2-Dimethylbutane	0.000277833	0.000277833	0.00156929	2.10254E-08	0.144133*	0.00248783*	0.00182123	3.50292E-10	5.10913E-05	0.00154153	0.000277833	0*	4.97863E-09*	0.000272150	
Cyclopentane	0*	0	0	0	0*	0*	0*	0	0	0	0	0*	0*	0	
2,3-Dimethylbutane	0*	0.000409283	0.00311629	7.07202E-08	0.213165*	0.00370066*	0.00274352	2.61053E-09	0.000168310	0.00315736	0.000409283	0*	2.69442E-08*	0.000402495	
2-Methylpentane	0*	0.00214924	0.0181180	2.36599E-07	1.12120*	0.0193664*	0.0144881	5.94972E-09	0.000569971	0.0185180	0.00214924	0*	5.47930E-08*	0.00211704	
3-Methylpentane	0*	0.00151089	0.0141787	4.15958E-07	0.789698*	0.0137009*	0.0102433	2.49538E-08	0.000966247	0.0146123	0.00151089	0*	2.06032E-07*	0.00149110	
n-Hexane	2.24910*	2.19463	26.6381	0.000115986	1.49477*	20.6665*	15.0095	1.46705E-06	0.028292	27.9195	2.19463	0*	9.56215E-06*	2.17775	
Methylcyclopentane	0*	0.000325591	0.00397525	1.53382E-07	0.171136*	0.00280637*	0.00225623	1.47212E-08	0.000342663	0.00416466	0.000325591	0*	8.73496E-08*	0.000323177	
Benzene	0*	8.34923E-05	0.00108215	3.66610E-06	0.0440072*	0.000518510*	0.000576648	3.31226E-06	0.000877695	0.00113785	8.34923E-05	0*	1.32907E-05*	8.30937E-05	
Cyclohexane	0*	0.000649768	0.0107744	7.16335E-07	0.344495*	0.00540526*	0.00444604	1.42206E-07	0.00141889	0.0114718	0.000649768	0*	5.89989E-07*	0.000650470	
2-Methylhexane	0*	0.00276525	0.0746088	2.05620E-07	1.49599*	0.00715247*	0.0185481	3.56742E-09	0.000499302	0.0807861	0.00276525	0*	2.78098E-09*	0.00282471	
3-Methylhexane	0*	0.00230178	0.0690967	2.06902E-07	1.25254*	0.0218556*	0.0154883	4.27093E-09	0.000500732	0.0750038	0.00230178	0*	1.09578E-08*	0.00238503	
2,2,4-Trimethylpentane	0*	0	0	0	0*	0*	0*	0	0	0	0	0*	0*	0	
Heptane	0*	0.00462149	0.174247	1.71436E-07	2.55183*	0.0404380*	0.0307152	1.60462E-09	0.000419677	0.190063	0.00462149	0*	3.00597E-09*	0.00481832	
Methylcyclohexane	0*	0.00276912	0.109343	1.22798E-06	1.53418*	0.0259027*	0.0188364	1.17236E-07	0.00274490	0.119316	0.00276912	0*	2.24091E-07*	0.00289681	
Toluene	0*	0.000718646	0.0312533	2.20619E-05	0.401488*	0.00447651*	0.00488366	1.93180E-05	0.00679994	0.0341593	0.000718646	0*	2.22900E-05*	0.000758084	
Octane	0*	0.0135414	1.54266	1.95098E-07	8.55216*	0.107002*	0.0866751	7.81204E-10	0.000480184	1.70310	0.0135414	0*	4.32139E-10*	0.0161481	
Ethylbenzene	0*	0.00125556	0.169033	3.24799E-05	0.820546*	0.00819522*	0.00851178	2.80257E-05	0.0110350	0.186761	0.00125556	0*	1.08278E-05*	0.0154934	
m-Xylene	0*	0.00102738	0.152425	1.65627E-05	0.685969*	0.00879592*	0.00663445	1.32875E-05	0.00810658	0.168490	0.00102738	0*	6.10745E-06*	0.01129524	
o-Xylene	0*	0.00198846	0.344034	7.57331E-05	1.37941*	0.0109928*	0.0128322	6.84301E-05	0.0181150	0.380529	0.00198846	0*	1.74047E-05*	0.00260459	
Nonane	0*	0.00978599	3.52414	1.44341E-07	8.69007*	0.0726568*	0.0606844	5.90580E-10	0.000355527	3.90578	0.00978599	0*	9.67282E-11*	0.0164805	
C10+	0*	0.0152321	49.2477	1.30604E-05	59.1113*	0.0728953*	0.0847634	2.69950E-06	0.02366029	54.6649	0.0152321	0*	3.16841E-08*	0.116113	
Mass Flow	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h
Water	0*	35.6732	0.00656911	700.257	0*	3.11286E-06*	0.00590942	700.249	0.00745041	0.000659692	35.6732	735.937*	0.0186891*	735.937	
H2S	0*	0	0	0	0*	0*	0	0	0	0	0	0*	0*	0	
Nitrogen	151.837*	151.836	0.00153608	0.000954595	0.00143269*	5.76586E-06*	0.00152820	3.08390E-05	0.000923756	7.87951E-06	151.836	0*	1.32244E-06*	151.838	
Carbon Dioxide	70.7511*	70.7300	0.00604982	0.0174790	0.00242392*	0.000258170*	0.00578115	0.0101388	0.00734018	0.000286868	70.7300	0*	0.000705258*	70.7536	
Methane	13658.7*	13658.4	0.168606	0.421415	0.168606	0.339040*	0.00598461*	0.414725	0.0108336	0.157773	13658.4	0*	0.000628392*	13659.0	
Ethane	4678.70*	4678.39	0.828597	0.0812812	0.652629*	0.08030352*	0.789080	0.00755175	0.0737295	0.00689007	4678.39	0*	0.000346354*	4679.35	
Propane	2171.53*	2170.91	1.43676	0.0249441	0.836154*	0.402628*	1.03220	0.00168224	0.0232619	0.404569	2170.91	0*	1.70204E-08*	2172.37	
Isobutane	360.891*	360.630	0.587713	0.00281445	0.330410*	0.192703*	0.292747	0.000135002	0.00267945	0.294966	360.630	0*	4.90949E-07*	361.221	
n-Butane	754.010*	752.955	1.79794	0.00735691	0.750455*	0.481640*	0.721189	0.000457553	0.00689935	1.07875	752.955	0*	1.13857E-06*	754.761	
2,2-Dimethylpropane	0*	0.0314169	8.91635E-05	1.44495E-07	0.0315062*	1.79968E-05*	3.18654E-05	4.39292E-09	1.40103E-07	5.74781E-05	0.0314169	0*	7.65004E-12*	0.0315062	
Isopentane	296.416*	295.446	1.56371	0.00194131	0.596063*	0.198661*	0.350057	8.69439E-05	0.00185437	1.21365	295.446	0*	7.91148E-08*	297.012	
n-Pentane	230.396*	229.352	1.61468	0.000572215	0.571085*	0.160117*	0.286875	1.05299E-05	0.000561685	1.32781	229.352	0*	7.05779E-09*	230.967	
2,2-Dimethylbutane	0*	0.0636834	0.000730534	1.47297E-07	0.0644140*	4.80842E-05*	8.41479E-05	2.45303E-09	1.44844E-07	0.000646387	0.0636834	0*	1.01411E-12*	0.0644140	
Cyclopentane	0*	0	0	0	0*	0*	0*	0	0	0	0	0*	0*	0	
2,3-Dimethylbutane	0*	0.0938138	0.00145069	4.95441E-07	0.0952650*	7.15253E-05*	0.000126761	1.82811E-08	4.77160E-07	0.00132393	0.0938138	0*	5.48833E-12*	0.0952650	
2-Methylpentane	0*	0.492638	0.00843429	1.65753E-06	0.501073*	0.000374308*	0.000669407	4.16648E-08	1.61587E-06	0.00776488	0.492638	0*	1.11609E-11*	0.501073	
3-Methylpentane	0*	0.346318	0.00600604	2.91405E-06	0.352921*	0.000264808*	0.000473281	1.74747E-07	2.73931E-06	0.00612716	0.346318	0*	4.19672E-11*	0.352921	
n-Hexane	514.774*	503.041	12.4005	0.000812554	0.669228*	0.399436*	0.694394	1.02734E-05	0.000802281	11.7071	503.041	0*	1.94773E-09*	515.443	
Methylcyclopentane	0*	0.0746303	0.00185055	1.07454E-06	0.0764819*	5.42408E-05*	0.000104247	1.03090E-07	9.71448E-07	0.000174630	0.0746303	0*	7.7924E-11*	0.0764819	
Benzene	0*	0.0191377	0.000503760	2.56834E-05	0.0196671*	1.00216E-05*	2.66434E-05	2.31951E-05	2.48827E-06	0.000477117	0.0191377	0*	2.07021E-09*	0.0196671	
Cyclohexane	0*	0.148936	0.00501570	1.01839E-06	1.53595*	0.000104471*	0.000205424	9.95843E-07	4.02255E-06	0.00481028	0.148936	0*	1.20176E-10*	0.153957	
2-Methylhexane	0*	0.633835	0.0347318	1.44050E-06	0.668568*	0.000138241*	0.000856994	2.49820E-08	1.41552E-06	0.0338748	0.633835	0*	5.68464E-13*	0.668568	
3-Methylhexane	0*	0.527601	0.0321658	1.44948E-06	0.559768*	0.000422418*	0.000715618	2.99085E-08	1.41958E-06	0.0314502	0.527601	0*	2.23202E-12*	0.559768	
2,2,4-Trimethylpentane	0*	0	0	0	0*	0*	0*	0	0	0	0	0*	0*	0	
Heptane	0*	1.05931	0.0811152	1.20102E-06	1.14043*	0.000781575*	0.00141916	1.12369E-08	1.18978E-06	0.0796961	1.05931	0*	6.12292E-13*	1.14043	
Methylcyclohexane	0*	0.634724	0.0509013	8.60277E-06	0.685634*	0.000500640*	0.000870314	8.20981E-07	7.78178E-06	0.0500310	0.634724	0*	4.56456E-11*	0.685634	
Toluene	0*	0.164724	0.01045490	1.000154558	0.179428*	8.65207E-05*	0.000225524	0.000135280	1.92778E-05	0.0143235	0.164724	0*	4.54029E-09*	0.179428	
Octane	0*	3.10388	0.718138	0.36679E-06	3.82202*	0.00206810*	0.00400473	5.47063E-09	1.36132E-06	0.714133	3.10388	0*	8.80234E-14*	3.82202	
Ethylbenzene	0*	0.287792	0.0786882	0.000227543	0.366707*	0.000158395*	0.000376644	0.000196259	3.12843E-05	0.0783115	0.287792	0*	2.20553E-09*	0.366707	
m-Xylene	0*	0.235491	0.0709567	0.000116032	0.306564*	0.000170005*	0.000306538	9.30501E-05	2.29821E-05	0.0706502	0.235491	0*	1.24404E-09*	0.306564	
o-Xylene	0*	0.455784	0.160154	0.000530559	0.616470*	0.000212462*	0.000592897	0.000479203	5.13561E-05	0.159562	0.455784	0*	3.54521E-09*	0.616470	
Nonane	0*	2.24309	1.64056	1.01120E-06	3.88365*	0.00140429*	0.00280386	4.13572E-09	1.00707E-06	1.63775	2.24309	0*	1.97028E-14*	3.88365	
C10+	0*	3.49142	22.9257	9.14967E-05	26.4172*	0.00140890*	0.00391640	1.89041E-05	7.25926E-05	22.9218	3.49142	0*	6.45585E-12*	26.4172	

Process Streams	Gas	HP Separator Gas	HP Separator Oil	HP Separator Water	Oil	Oil W/B	OT Flash Gas	Produced Water	PWT Flash Gas	Sales Oil	Total gas to sale	Water	Water W/B	Well Stream
Properties	Status:	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved
Phase: Total	From Block:	--	3 Phase Separator	3 Phase Separator	3 Phase Separator	--	--	Condensate Tanks	--	--	Condensate Tanks	--	--	MIX-101
	To Block:	MIX-101	MIX-100											

Dynamic Viscosity	cP	0.0132437	0.0107484	0.396202	0.995426	0.564623	0.00759372	0.00860584	0.924428	0.0107005	0.509293	0.0107484	0.840378	0.0102652	
Kinematic Viscosity	cSt	0.177337	0.811127	0.567266	0.998028	0.769973	5.13725	4.96485	0.927481	12.5220	0.710024	0.811127	0.843659	421.896	
Thermal Conductivity	Btu/(h*ft ² *F)	0.0223973	0.0177499	0.0668743	0.346486	0.0671709	0.00931614	0.0117250	0.349781	0.0170232	0.0678379	0.0177499	0.353848	0.0122491	
Surface Tension	lbf/ft			0.001301807	0.005029327	0.000912533			0.00498763?		0.00150124		0.00492045		
Net Ideal Gas Heating Value	Btu/ft ³	1141.90	1139.83	4847.00	0.411364	5699.39	2982.76	2185.77	0.0306025	1085.73	5633.50	1139.83	0	50.0724	1102.45
Net Liquid Heating Value	Btu/lb	20684.2	20650.2	19033.4	-1050.66	18873.6	19492.5	19744.4	-1059.07	19729.8	18955.1	20650.2	-1059.76	52.7987	20004.7
Gross Ideal Gas Heating Value	Btu/ft ³	1258.84	1256.65	5211.27	50.7449	6112.33	3232.21	2377.78	50.3422	1198.74	6048.68	1256.65	50.3101	102.541	1217.10
Gross Liquid Heating Value	Btu/lb	22808.7	22772.9	20475.5	9.52417	20252.2	21135.9	21491.7	0.705462	21792.9	20363.6	22772.9	0	1131.45	22094.6

Process Streams	Gas	HP Separator Gas	HP Separator Oil	HP Separator Water	Oil	Oil W/B	OT Flash Gas	Produced Water	PWT Flash Gas	Sales Oil	Total gas to sale	Water	Water W/B	Well Stream
Composition	Status: Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved
Phase: Vapor	From Block: --	3 Phase Separator	3 Phase Separator	3 Phase Separator	--	--	Condensate Tanks	PW Tanks	PW Tanks	Condensate Tanks	MIX-100	--	--	MIX-101
	To Block: MIX-101	MIX-100	Condensate Tanks	PW Tanks	MIX-101	--	--	--	--	--	--	MIX-101	--	3 Phase Separator
Mole Fraction	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Water	0	0.180407			0.000514940		0.296075		3.03261		0.180407		93.9122	0.0737837
H2S	0	0			0		0		0		0		0	0
Nitrogen	0.494658	0.493810			0.000613390		0.0492394		0.241807		0.493810		0.00427806	0.494693
Carbon Dioxide	0.146717	0.146423			0.0174822		0.118657		1.22303		0.146423		1.45225	0.146520
Methane	77.7018	77.5677			1.11246		23.3338		72.1172		3.54975		77.6876	
Ethane	14.2004	14.1752			8.22964		23.9565		17.9804		14.1752		1.04385	14.1834
Propane	4.49433	4.48536			27.2112		21.1283		3.86836		4.48536		0.0349794	4.48075
Isobutane	0.566666	0.565291			9.88062		4.54619		0.338050		0.565291		0.000765478	0.563535
n-Butane	1.18394	1.18026			24.6955		11.1996		0.870450		1.18026		0.00177524	1.17497
2,2-Dimethylpropane	0	3.96722E-05			0.000743370		0.000396395		1.42395E-05		3.96722E-05		9.60889E-09	3.94806E-05
Isopentane	0.374944	0.373079			8.20581		4.37932		0.188471		0.373079		9.93728E-05	0.370316
n-Pentane	0.291434	0.289618			6.61373		3.58890		0.0570876		0.289618		8.86500E-06	0.286994
2,2-Dimethylbutane	0	6.73279E-05			0.00166287		0.000881368		1.23252E-05		6.73279E-05		1.06645E-09	6.64822E-05
Cyclopentane	0	0			0		0		0		0		0	0
2,3-Dimethylbutane	0	9.91826E-05			0.00247352		0.00132770		4.06030E-05		9.91826E-05		5.77159E-09	9.77312E-05
2-Methylpentane	0	0.000520830			0.0129445		0.00701140		0.000137499		0.000520830		0.000513004	0.000513004
3-Methylpentane	0	0.000366137			0.00915769		0.00495717		0.000233096		0.000366137		4.41332E-08	0.000360283
n-Hexane	0.545164	0.531830			13.8135		7.26370		0.0682686		0.531830		2.04826E-06	0.522792
Methylcyclopentane	0	8.07912E-05			0.00192071		0.00111804		8.45436E-05		8.07912E-05		1.91899E-08	7.92206E-05
Benzene	0	2.23215E-05			0.000382349		0.000307872		0.000233592		2.23215E-05		3.14082E-06	2.19276E-05
Cyclohexane	0	0.000161231			0.00369941		0.00220316		0.000350490		0.000161231		1.29406E-07	0.000158285
2-Methylhexane	0	0.000576305			0.00411149		0.00771968		0.000103590		0.000576305		5.12313E-10	0.000566990
3-Methylhexane	0	0.000479713			0.0125633		0.00644618		0.000103887		0.000479713		2.01865E-09	0.000472021
2,2,4-Trimethylpentane	0	0			0		0		0		0		0	0
Heptane	0	0.000963164			0.0232452		0.0127836		8.70703E-05		0.000963164		5.53760E-10	0.000951846
Methylcyclohexane	0	0.000588961			0.0151955		0.00800061		0.000581175		0.000588961		4.21296E-08	0.000578518
Toluene	0	0.000162880			0.00279845		0.00220927		0.00153424		0.000162880		4.46562E-06	0.000160628
Octane	0	0.00247561			0.0539554		0.0316444		8.73903E-05		0.00247561		6.98333E-11	0.00255767
Ethylbenzene	0	0.000246973			0.00444629		0.00320219		0.00216084		0.000246973		1.88266E-06	0.000257168
m-Xylene	0	0.000202090			0.00477221		0.00260615		0.00158740		0.000202090		1.06192E-06	0.000212341
o-Xylene	0	0.000391138			0.00596402		0.00504075		0.00354722		0.000391138		3.02621E-06	0.000416541
Nonane	0	0.00159340			0.0326303		0.0197323		5.75786E-05		0.00159340		1.39217E-11	0.00192134
C10+	0	0.00199057			0.0262749		0.0221211		0.00333114		0.00199057		3.66113E-09	0.00522331
Molar Flow	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h
Water	0	1.98017			1.72790E-07		0.000328023		0.000413560		1.98017		0.00103630	0.808247
H2S	0	0			0		0		0		0		0	0
Nitrogen	5.42015	5.42011			2.05825E-07		5.45526E-05		3.29755E-05		5.42011		4.72072E-08	5.41900
Carbon Dioxide	1.60763	1.60715			5.86622E-06		0.000131361		0.000166786		1.60715		1.60251E-05	1.60502
Methane	851.407	851.391			0.000373288		0.0258517		0.00983470		851.391		3.91705E-05	851.011
Ethane	155.599	155.588			0.00276148		0.0265416		0.00245201		155.588		1.15186E-05	155.369
Propane	49.2460	49.2318			0.00913080		0.0234081		0.000527533		49.2318		3.85987E-07	49.0834
Isobutane	6.20917	6.20469			0.00331548		0.00503675		4.61003E-05		6.20469		8.44683E-09	6.17311
n-Butane	12.9728	12.9547			0.00828667		0.0124082		0.000118704		12.9547		1.95893E-08	12.8709
2,2-Dimethylpropane	0	0.000435446			2.49441E-07		4.39168E-07		1.94186E-09		0.000435446		1.06031E-13	0.000432482
Isopentane	4.10840	4.09496			0.00275349		0.00485188		2.57020E-05		4.09496		1.09655E-09	4.05655
n-Pentane	3.19335	3.17888			0.00221926		0.00397616		7.78510E-06		3.17888		9.78228E-11	3.14381
2,2-Dimethylbutane	0	0.000738997			5.57981E-07		9.76473E-07		1.68080E-09		0.000738997		1.17680E-14	0.000728265
Cyclopentane	0	0			0		0		0		0		0	0
2,3-Dimethylbutane	0	0.00108864			8.29997E-07		1.47097E-06		5.53708E-09		0.00108864		6.36879E-14	0.00107057
2-Methylpentane	0	0.00571669			4.34357E-06		7.67979E-06		1.87509E-08		0.00571669		1.29514E-13	0.00561958
3-Methylpentane	0	0.00401876			3.07289E-06		5.49207E-06		3.17876E-08		0.00401876		4.86997E-13	0.00394664
n-Hexane	5.97356	5.83742			0.00463516		0.00804749		9.30986E-06		5.83742		2.26020E-11	5.72681
Methylcyclopentane	0	0.00086773			6.44500E-07		1.23868E-06		1.15429E-08		0.00086773		2.11413E-13	0.000867804
Benzene	0	0.000245004			1.28298E-07		3.41093E-07		3.18552E-08		0.000245004		3.46581E-11	0.000240196
Cyclohexane	0	0.00176969			1.24135E-06		2.44090E-06		4.77967E-08		0.00176969		1.42796E-12	0.00173389
2-Methylhexane	0	0.00632558			1.37962E-06		8.5267E-06		1.41267E-08		0.00632558		5.65323E-15	0.00621097
3-Methylhexane	0	0.00526538			4.21567E-06		7.14176E-06		1.41671E-08		0.00526538		2.22752E-14	0.00517065
2,2,4-Trimethylpentane	0	0			0		0		0		0		0	0
Heptane	0	0.0105718			7.80000E-06		1.41630E-05		1.18739E-08		0.0105718		6.11059E-15	0.0104268
Methylcyclohexane	0	0.00646450			5.09889E-06		8.86393E-06		7.92555E-08		0.00646450		0.00633724	0.00633724
Toluene	0	0.00178779			9.39029E-07		2.44766E-06		2.09227E-07		0.00178779		4.92769E-11	0.00175956
Octane	0	0.0271725			1.81049E-05		3.50590E-05		1.19175E-08		0.0271725		7.70591E-16	0.0280174
Ethylbenzene	0	0.00271080			1.49197E-06		3.54773E-06		2.94676E-07		0.00271080		2.07746E-11	

H2S	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrogen	0.663391	0.662417	0.000298321	0.0330752	0.325840	0.662417	0.00649232	0.663899						
Carbon Dioxide	0.309119	0.308575	0.0133575	0.125122	2.58913	3.46237	0.308918							
Methane	59.6762	59.5878	0.309838	8.97597	55.6518	59.5878	3.08501	59.7067						
Ethane	20.4417	20.4105	4.29617	17.2730	26.0069	20.4105	1.70038	20.4314						
Propane	9.48766	9.47106	20.8316	22.3400	8.20526	9.47106	0.0835592	9.46556						
Isobutane	1.57677	1.57333	9.97028	6.33597	0.945133	1.57333	0.00241025	1.56914						
n-Butane	3.29435	3.28493	24.9196	15.6088	2.43364	3.28493	0.00558967	3.27166						
2,2-Dimethylpropane	0	0.000137063	0.000931140	0.000685773	4.94189E-05	0.000137063	0.000136462	0.000136462						
Isopentane	1.29507	1.28895	10.2785	7.57635	0.654099	1.28895	0.000388404	1.27998						
n-Pentane	1.00663	1.00060	8.28431	6.20889	0.198125	1.00060	0.00493E-05	0.991976						
2,2-Dimethylbutane	0	0.000277833	0.00248783	0.00182123	5.10913E-05	0.000277833	4.97863E-09	0.000274466						
Cyclopentane	0	0	0	0	0	0	0	0						
2,3-Dimethylbutane	0	0.000409283	0.00370066	0.00274352	0.000168310	0.000409283	2.69442E-08	0.000403475						
2-Methylpentane	0	0.00214924	0.0193664	0.0144881	0.000569971	0.00214924	5.47930E-08	0.00211789						
3-Methylpentane	0	0.00151089	0.0137009	0.0102433	0.000966247	0.00151089	2.06032E-07	0.00148740						
n-Hexane	2.24910	2.19463	20.6665	15.0095	0.282992	2.19463	9.56215E-06	2.15830						
Methylcyclopentane	0	0.000325591	0.00280637	0.00225623	0.000342663	0.000325591	8.73496E-08	0.000319405						
Benzene	0	8.34923E-05	0.000518510	0.000576648	8.34923E-05	0.000576648	1.32907E-05	8.20540E-05						
Cyclohexane	0	0.000649768	0.00540526	0.00444604	0.00141889	0.000649768	5.89989E-07	0.000638178						
2-Methylhexane	0	0.00276525	0.00715247	0.0185481	0.000499302	0.00276525	2.78098E-09	0.00272177						
3-Methylhexane	0	0.002301178	0.0218556	0.0154883	0.000500732	0.002301178	1.09578E-08	0.00226589						
2,2,4-Trimethylpentane	0	0	0	0	0	0	0	0						
Heptane	0	0.00462149	0.0404380	0.0307152	0.000419677	0.00462149	3.00597E-09	0.00456923						
Methylcyclohexane	0	0.00276912	0.0259027	0.0188364	0.00274490	0.00276912	2.24091E-07	0.00272124						
Toluene	0	0.000719646	0.00447651	0.00488106	0.00679994	0.000719646	2.22900E-05	0.000709025						
Octane	0	0.0135414	0.107002	0.0866751	0.000480184	0.0135414	4.32139E-10	0.0139965						
Ethylbenzene	0	0.00125556	0.00819522	0.00815178	0.0110350	0.00125556	1.08278E-05	0.00130797						
m-Xylene	0	0.00102738	0.00879592	0.00663445	0.00810658	0.00102738	6.10745E-06	0.00107998						
o-Xylene	0	0.00198846	0.0109926	0.0128322	0.0181150	0.00198846	1.74047E-05	0.00211856						
Nonane	0	0.00978599	0.0726568	0.0606844	0.000355227	0.00978599	9.67282E-11	0.0118053						
C10+	0	0.0152321	0.0728953	0.0847634	0.0256059	0.0152321	3.16941E-08	0.0399874						

Mass Flow	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h
Water	0	35.6732	3.11286E-06	0.00590942	0.00745041	35.6732	0.0186691	14.5608						
H2S	0	0	0	0	0	0	0	0						
Nitrogen	151.837	151.836	5.76586E-06	0.00152820	151.836	1.32244E-06	151.805	151.805						
Carbon Dioxide	70.7511	70.7300	0.000258170	0.00578115	70.7300	0.000705258	70.6362	70.6362						
Methane	13658.7	13658.4	0.00598946	0.414725	13658.4	0.000628392	13652.3	13652.3						
Ethane	4678.70	4678.39	0.0830352	0.798080	4678.39	0.000346354	4671.78	4671.78						
Propane	2171.53	2170.91	0.402628	1.03220	2170.91	0.0232619	2164.36	2164.36						
Isobutane	360.891	360.630	0.192703	0.292747	360.630	0.00267945	358.795	358.795						
n-Butane	754.010	752.955	0.481640	0.721189	752.955	0.00689935	748.086	748.086						
2,2-Dimethylpropane	0	0.0314169	1.79968E-05	3.16854E-05	0.0314169	7.65004E-12	0.0312030	0.0312030						
Isopentane	296.416	295.446	0.198661	0.350057	295.446	0.00185437	292.675	292.675						
n-Pentane	230.396	229.352	0.160117	0.286875	229.352	0.000561685	226.822	226.822						
2,2-Dimethylbutane	0	0.0636834	4.80842E-05	8.41479E-05	0.0636834	1.01411E-07	0.0627585	0.0627585						
Cyclopentane	0	0	0	0	0	0	0	0						
2,3-Dimethylbutane	0	0.0938138	7.15253E-05	0.000126761	0.0938138	5.48833E-12	0.0922571	0.0922571						
2-Methylpentane	0	0.492638	0.000374308	0.000669407	0.492638	1.11609E-11	0.484270	0.484270						
3-Methylpentane	0	0.346318	0.000264808	0.000473281	0.346318	4.19672E-11	0.340103	0.340103						
n-Hexane	514.774	503.041	0.399436	0.693496	503.041	1.94773E-09	493.510	493.510						
Methylcyclopentane	0	0.0746303	5.42408E-05	0.000104247	0.0746303	1.77924E-11	0.0730339	0.0730339						
Benzene	0	0.0191377	1.00216E-05	2.66434E-05	0.0191377	2.70721E-09	0.0187622	0.0187622						
Cyclohexane	0	0.148936	0.000104471	0.000205424	0.148936	1.20176E-10	0.145923	0.145923						
2-Methylhexane	0	0.633835	0.000138241	0.000856994	0.633835	5.66464E-13	0.622351	0.622351						
3-Methylhexane	0	0.527601	0.000422418	0.000715618	0.527601	2.23202E-12	0.518109	0.518109						
2,2,4-Trimethylpentane	0	0	0	0	0	0	0	0						
Heptane	0	1.05931	0.000781575	0.00141916	1.05931	6.12292E-13	1.04478	1.04478						
Methylcyclohexane	0	0.634724	0.000500640	0.000870314	0.634724	4.56456E-11	0.622229	0.622229						
Toluene	0	0.164724	8.65207E-05	0.000225524	0.164724	4.54029E-09	0.162123	0.162123						
Octane	0	3.10388	0.00206810	0.00400473	3.10388	8.80234E-14	3.20038	3.20038						
Ethylbenzene	0	0.287792	0.000158395	0.000376644	0.287792	2.20553E-09	0.299076	0.299076						
m-Xylene	0	0.235491	0.000170005	0.000306538	0.235491	1.24404E-09	0.246944	0.246944						
o-Xylene	0	0.455784	0.000212462	0.000592897	0.455784	3.54521E-09	0.484421	0.484421						
Nonane	0	2.24309	0.00140429	0.00280386	2.24309	1.97028E-14	2.69936	2.69936						
C10+	0	3.49142	0.00140890	0.00391640	3.49142	6.45585E-12	9.14337	9.14337						

Process Streams	Gas	HP Separator Gas	HP Separator Oil	HP Separator Water	Oil	Oil W/B	OT Flash Gas	Produced Water	PWT Flash Gas	Sales Oil	Total gas to sale	Water	Water W/B	Well Stream
Properties	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved
Phase: Vapor	From Block: --	3 Phase Separator	3 Phase Separator	3 Phase Separator	--	--	Condensate Tanks	PW Tanks	PW Tanks	Condensate Tanks	MIX-100	--	--	MIX-101
	To Block: MIX-101	MIX-100	Condensate Tanks	PW Tanks	MIX-101	--	--	--	--	--	--	MIX-101	--	3 Phase Separator
Property	Units													
Temperature	°F	85	70		75.9425		75.94		75.94		70		75.9425	84.2905
Pressure	psig	1000	198		-5.64168		0		0		198		-14.2232	1000
Mole Fraction Vapor	%	100	100		100		100		100		100		100	100
Mole Fraction Light Liquid	%	0	0		0		0		0		0		0	0
Mole Fraction Heavy Liquid	%	0	0		0		0		0		0		0	0
Molecular Weight	lb/lbmol	20.8882	20.8831		57.5996		41.7039		20.7889		20.8831		18.4592	20.8737
Mass Density	lb/ft³	4.66216	0.827243		0.0922791		0.108210		0.0533466		0.827243		0.00151894	4.66984
Molar Flow	lbmol/h	1095.74	1097.61		0.0335553		0.110791		0.0136371		1097.61		0.00110347	1095.43
Mass Flow	lb/h	22888.0	22921.5		1.93277		4.62039		0.283500		22921.5		0.0203692	22865.6
Vapor Volumetric Flow	ft³/h	4909.31	27708.3		20.9449		42.6985		5.31430		27708.3		13.4102	4896.45
Liquid Volumetric Flow	gpm	612.069	3454.54		2.61131		5.32345		0.662562		3454.54		1.67192	610.466

Std Vapor Volumetric Flow	MMSCFD	9.97955	9.99661	0.000305609	0.00100904	0.000124202	9.99661	1.00500E-05	9.97673
Std Liquid Volumetric Flow	sgpm	133.508	133.565	0.00679393	0.0190133	0.00163613	133.565	4.52552E-05	133.366
Compressibility		0.777773	0.944608	0.983230	0.985362	0.996343	0.944608	0.999551	0.776968
Specific Gravity		0.721213	0.721036	1.98876	1.43992	0.717783	0.721036	0.637347	0.720713
API Gravity									
Enthalpy	Btu/h	-3.83063E+07	-3.78651E+07	-1826.95	-5028.57	-511.236	-3.78651E+07	-112.153	-3.83520E+07
Mass Enthalpy	Btu/lb	-1673.64	-1651.95	-945.250	-1088.34	-1803.30	-1651.95	-506.01	-1677.28
Mass Cp	Btu/(lb*°F)	0.679363	0.505983	0.401622	0.415698	0.474112	0.505983	0.442335	0.680045
Ideal Gas CpCv Ratio		1.24499	1.24908	1.09451	1.13041	1.25347	1.24908	1.32153	1.24536
Dynamic Viscosity	cP	0.0132437	0.0107484	0.00759372	0.00860584	0.0107005	0.0107484	0.0102652	0.0132421
Kinematic Viscosity	cSt	0.177337	0.811127	5.13725	4.96485	12.5220	0.811127	421.896	0.177025
Thermal Conductivity	Btu/(h*ft**F)	0.0223973	0.0177499	0.00931614	0.0117250	0.0170232	0.0177499	0.0122491	0.0223846
Surface Tension	lbf/ft								
Net Ideal Gas Heating Value	Btu/ft³	1141.90	1139.83	2982.76	2185.77	1085.73	1139.83	50.0724	1140.42
Net Liquid Heating Value	Btu/lb	20684.2	20650.2	19492.5	19744.4	19729.8	20650.2	52.7987	20671.2
Gross Ideal Gas Heating Value	Btu/ft³	1258.84	1256.65	3232.21	2377.78	1198.74	1256.65	102.541	1257.26
Gross Liquid Heating Value	Btu/lb	22808.7	22772.9	21135.9	21491.7	21792.9	22772.9	1131.45	22795.3

Process Streams	Gas	HP Separator Gas	HP Separator Oil	HP Separator Water	Oil	Oil W/B	OT Flash Gas	Produced Water	PWT Flash Gas	Sales Oil	Total gas to sale	Water	Water W/B	Well Stream
Composition	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved
Phase: Light Liquid	From Block: --	3 Phase Separator	3 Phase Separator	3 Phase Separator	--	--	Condensate Tanks	PW Tanks	PW Tanks	Condensate Tanks	MIX-100	--	--	MIX-101
	To Block:	MIX-101	MIX-100	Condensate Tanks	PW Tanks	MIX-101	--	--	--	--	--	MIX-101	--	3 Phase Separator
Mole Fraction	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Water			0.0750812		99.9629				99.9969		0.00976826		100	0.0609321
H2S			0		0				0		0		0	0
Nitrogen			0.0112905		8.76346E-05		0.013		2.83210E-06		7.50327E-05			0.0706754
Carbon Dioxide			0.0283049		0.00102139		0.014		0.000592675		0.00162849			0.0968941
Methane			5.40884		0.0270287		5.372		0.00173730		0.111244			25.7026
Ethane			6.04377		0.00695173		5.517		0.000646104		0.749791			16.7552
Propane			6.70896		0.00145477		4.82		9.81447E-05		2.44745			12.3531
Isobutane			2.08204		0.000124530		1.445		5.97549E-06		1.35378			2.85275
n-Butane			6.36941		0.000325518		3.282		2.02523E-05		4.94187			7.84870
2,2-Dimethylpropane			0.000254462		5.15048E-09		0.111		1.56639E-10		0.000212515			0.000287487
Isopentane			4.46265		6.91973E-05		2.1		3.10016E-06		4.48728			4.11302
n-Pentane			4.60812		2.03964E-05		2.012		3.75468E-07		4.90934			3.93272
2,2-Dimethylbutane			0.00174551		4.39575E-09		0.19		7.32308E-11		0.00200090			0.001315044
Cyclopentane			0		0		0		0		0			0
2,3-Dimethylbutane			0.00346623		1.47853E-08		0.281		5.45749E-10		0.00409825			0.00238903
2-Methylpentane			0.0201526		4.94654E-08		1.478		1.24383E-09		0.0240364			0.0133473
3-Methylpentane			0.0157709		8.69635E-08		1.041		5.21677E-09		0.0189668			0.0101803
n-Hexane			29.6294		2.42489E-05		1.974		3.06696E-07		36.2394			17.4221
Methylcyclopentane			0.00452755		3.28353E-08		0.231		3.15128E-09		0.00553521			0.00280385
Benzene			0.00132792		8.45586E-07		0.064		7.63932E-07		0.00162939			0.000773336
Cyclohexane			0.0122714		1.53350E-07		0.465		3.04412E-08		0.0152470			0.00653134
2-Methylhexane			0.0713701		3.69709E-08		1.696		6.41395E-10		0.0901815			0.0315739
3-Methylhexane			0.0660973		3.72014E-08		1.42		7.67881E-10		0.0837268			0.0284598
2,2,4-Trimethylpentane			0		0		0		0		0			0
Heptane			0.166683		3.08246E-08		2.893		2.88499E-10		0.212167			0.0653419
Methylcyclohexane			0.106744		2.25326E-07		1.775		2.15109E-08		0.135927			0.0442018
Toluene			0.0325131		4.31393E-06		0.495		3.77719E-06		0.0414691			0.0127790
Octane			1.29449		3.07716E-08		8.505		1.23207E-10		1.66771			0.372534
Ethylbenzene			0.152614		5.51194E-06		0.878		4.75578E-06		0.196771			0.0435372
m-Xylene			0.137619		2.81073E-06		0.734		2.25481E-06		0.177521			0.0384050
o-Xylene			0.310615		1.28521E-05		1.476		1.16122E-05		0.400926			0.0849768
Nonane			2.63379		2.02762E-08		7.697		8.29567E-11		3.40636			0.632103
C10+			29.5401		1.47249E-06		42.021		3.04337E-07		38.2639			7.39975
Molar Flow	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h
Water			0.000364641		38.8702		0		38.8698		3.66185E-05		40.8507	0.000890103
H2S			0		0		0		0		0		0	0
Nitrogen			5.48338E-05		3.40764E-05		5.11431E-05		1.10087E-06		2.81276E-07			0.00103243
Carbon Dioxide			0.000137466		0.000397165		5.50772E-05		0.000230378		6.10476E-06			0.00141544
Methane			0.0262687		0.0105100		0.0211339		0.000675307		0.000417023			0.375466
Ethane			0.0293524		0.00270315		0.0217044		0.000251147		0.00281076			0.244762
Propane			0.0325829		0.000565683		0.0189623		3.81498E-05		0.00917482			0.180455
Isobutane			0.0101117		4.84230E-05		0.00568475		2.32273E-06		0.00507493			0.0416733
n-Butane			0.0309338		0.000126577		0.0129117		7.87225E-06		0.0185257			0.114655
2,2-Dimethylpropane			1.23583E-06		2.00274E-09		0.000436684		6.08869E-11		7.96661E-07			4.19965E-06
Isopentane			0.0216734		2.69071E-05		0.00826158		1.20506E-06		0.0168216			0.0600835
n-Pentane			0.0223799		7.93105E-06		0.00791538		1.45947E-07		0.0184037			0.0574496
2,2-Dimethylbutane			8.47730E-06		1.70927E-09		0.000747476		2.84655E-11		7.50083E-06			1.92102E-05
Cyclopentane			0		0		0		0		0			0
2,3-Dimethylbutane			1.68342E-05		5.74922E-09		0.00110548		2.12138E-10		1.53632E-05			3.48992E-05
2-Methylpentane			9.78736E-05		1.92344E-08		0.00581458		4.83488E-10		9.01056E-05			0.000194979
3-Methylpentane			7.65932E-05		3.38154E-08		0.00409538		2.02781E-09		7.11011E-05			0.000148715
n-Hexane			0.143899		9.42908E-06		0.00776589		1.19216E-07		0.135852			0.254504
Methylcyclopentane			2.19886E-05		1.27679E-08		0.000908774		1.22493E-09		2.07499E-05			4.09589E-05
Benzene			6.44921E-06		3.28803E-07		0.000251782		2.96948E-07		6.10812E-06			1.12970E-05
Cyclohexane			5.95976E-05		5.96295E-08		0.00182935		1.18328E-08		5.71567E-05			9.54106E-05
2-Methylhexane			0.000346618		1.43760E-08		0.00667221		2.49316E-10		0.000338065			0.000461235
3-Methylhexane			0.000321010		1.44656E-08		0.00558640		2.98483E-10		0.000313868			0.000415744
2,2,4-Trimethylpentane			0		0		0		0		0			0
Heptane			0.000809518		1.19860E-08		0.0113813		1.12142E-10		0.000795355			0.000954522
Methylcyclohexane			0.000518417		8.76170E-08		0.00698300		8.36148E-09		0.000509553			0.000645706

Toluene	0.000157904	1.67745E-06	0.00194737		1.46823E-06	0.000155456	0	0.000186677
Octane	0.000268686	1.19654E-08	0.0334594		4.78919E-11	0.00625180	0	0.00544201
Ethylbenzene	0.000741187	2.14330E-06	0.00345413		1.84862E-06	0.000737640	0	0.000635996
m-Xylene	0.000668363	1.09294E-06	0.00288762		8.76467E-07	0.000665475	0	0.000561025
o-Xylene	0.00150854	4.99750E-06	0.00580671		4.51376E-06	0.00150296	0	0.00124135
Nonane	0.0127913	7.88431E-09	0.0302807		3.22461E-11	0.0127695	0	0.00923383
C10+	0.143465	5.72570E-07	0.165314		1.18299E-07	0.143440	0	0.108096

Mass Fraction	%	%	%	%	%	%	%	%
Water	0.0141114	99.9560	0		99.9954	0.00157326	100	0.0198962
H2S	0	0	0		0	0	0	0
Nitrogen	0.00329972	0.000136261	0.00320580		4.40380E-06	1.87914E-05	0	0.0358854
Carbon Dioxide	0.0129959	0.00249499	0.00542377		0.00144782	0.000640730	0	0.0772908
Methane	0.905259	0.0240672	0.758637		0.00154703	0.0159548	0	7.47364
Ethane	1.89594	0.0116022	1.46033		0.00107839	0.201559	0	9.13174
Propane	3.08637	0.00356057	1.87098		0.000240223	0.964834	0	9.87314
Isobutane	1.26249	0.000401740	0.739328		1.92783E-05	0.703447	0	3.00531
n-Butane	3.86224	0.00105014	1.67922		6.53384E-05	2.56789	0	8.26845
2,2-Dimethylpropane	0.000191536	2.06256E-08	0.0704984		6.27307E-10	0.000137076	0	0.000375951
Isopentane	3.35907	0.000277107	1.33375		1.24156E-05	2.89438	0	5.37866
n-Pentane	3.46857	8.16791E-05	1.27786		1.50367E-06	3.16661	0	5.14287
2,2-Dimethylbutane	0.00156929	2.10254E-08	0.144133		3.50292E-10	0.00154153	0	0.00205402
Cyclopentane	0	0	0		0	0	0	0
2,3-Dimethylbutane	0.00311629	7.07202E-08	0.213165		2.61053E-09	0.00315736	0	0.00373154
2-Methylpentane	0.0181180	2.36599E-07	1.12120		5.94972E-09	0.0185180	0	0.0208479
3-Methylpentane	0.0141787	4.15958E-07	0.789698		2.49538E-08	0.0146123	0	0.0159011
n-Hexane	26.6381	0.000115986	1.49747		1.46705E-06	27.9195	0	27.2125
Methylcyclopentane	0.00397525	1.53382E-07	0.171136		1.47212E-08	0.00416466	0	0.00427702
Benzene	0.00108215	3.66610E-06	0.0440072		3.31226E-06	0.00113785	0	0.00109489
Cyclohexane	0.0107744	7.16335E-07	0.344495		1.42206E-07	0.0114718	0	0.00996299
2-Methylhexane	0.0746088	2.05620E-07	1.49599		3.56742E-09	0.0807861	0	0.0573441
3-Methylhexane	0.0690967	2.06902E-07	1.25254		4.27093E-09	0.0750038	0	0.0516883
2,2,4-Trimethylpentane	0	0	0		0	0	0	0
Heptane	0.174247	1.71436E-07	2.55183		1.60462E-09	0.190063	0	0.118673
Methylcyclohexane	0.109343	1.22798E-06	1.53418		1.17236E-07	0.119316	0	0.0786637
Toluene	0.0312533	2.20619E-05	0.401488		1.93180E-05	0.0341593	0	0.0213414
Octane	1.54266	1.95098E-07	8.55216		7.81204E-10	1.70310	0	0.771301
Ethylbenzene	0.169033	3.24799E-05	0.820546		2.80257E-05	0.186761	0	0.0837772
m-Xylene	0.152425	1.65627E-05	0.685969		1.32875E-05	0.168490	0	0.0739015
o-Xylene	0.344034	7.57331E-05	1.37941		6.84301E-05	0.380529	0	0.163518
Nonane	3.52414	1.44341E-07	8.69007		5.90580E-10	3.90578	0	1.46942
C10+	49.2477	1.30604E-05	59.1113		2.69950E-06	54.6649	0	21.4328

Mass Flow	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h
Water	0.00656911	700.257	0		700.249	0.00659692	735.937	0.0160354						
H2S	0	0	0		0	0	0	0						
Nitrogen	0.00153608	0.000954595	0.00143269		3.08390E-05	7.87951E-06	0	0.0289220						
Carbon Dioxide	0.00604982	0.0174790	0.00242392		0.0101388	0.000268668	0	0.0622928						
Methane	0.421415	0.168606	0.339040		0.0108336	0.00669007	0	6.02340						
Ethane	0.882597	0.0812812	0.652629		0.00755175	0.0845168	0	7.35976						
Propane	1.43676	0.0249441	0.836154		0.00168224	0.404569	0	7.95729						
Isobutane	0.587713	0.00281445	0.330410		0.000135002	0.294966	0	2.42214						
n-Butane	1.79794	0.00735691	0.750455		0.000457553	1.07675	0	6.66398						
2,2-Dimethylpropane	8.91635E-05	1.44495E-07	0.0315062		4.39292E-09	5.74781E-05	0	0.000302999						
Isopentane	1.56371	0.00194131	0.596063		8.69439E-05	1.21365	0	4.33495						
n-Pentane	1.61468	0.000572215	0.571085		1.05299E-05	1.32781	0	4.14492						
2,2-Dimethylbutane	0.000730534	1.47297E-07	0.0644140		2.45303E-09	0.000646387	0	0.00165545						
Cyclopentane	0	0	0		0	0	0	0						
2,3-Dimethylbutane	0.00145069	4.95441E-07	0.0952650		1.82811E-08	0.00132393	0	0.00300745						
2-Methylpentane	0.00843429	1.65753E-06	0.501073		4.16648E-08	0.00776488	0	0.0168024						
3-Methylpentane	0.00660044	2.91405E-06	0.352921		1.74747E-07	0.00612716	0	0.0128156						
n-Hexane	12.4005	0.000812554	0.669228		1.02734E-05	11.7071	0	21.9320						
Methylcyclopentane	0.00185055	1.07454E-06	0.0764819		1.03090E-07	0.00174630	0	0.00344708						
Benzene	0.000503760	2.56834E-05	0.0196671		2.31951E-05	0.000477117	0	0.000882428						
Cyclohexane	0.00501570	5.01839E-06	0.153957		9.95843E-07	0.00481028	0	0.00802971						
2-Methylhexane	0.0347318	1.44050E-06	0.668568		2.49820E-08	0.0338748	0	0.0462167						
3-Methylhexane	0.0321658	1.44948E-06	0.559768		2.99085E-08	0.0314502	0	0.0416584						
2,2,4-Trimethylpentane	0	0	0		0	0	0	0						
Heptane	0.0811152	1.20102E-06	1.14043		1.12369E-08	0.0796961	0	0.0956449						
Methylcyclohexane	0.0509013	8.60277E-06	0.685634		8.20981E-07	0.0500310	0	0.0633993						
Toluene	0.0145490	0.000154558	0.179428		0.000135280	0.0143235	0	0.0172001						
Octane	0.718138	1.36679E-06	3.82202		5.47063E-09	0.714133	0	0.621633						
Ethylbenzene	0.0786882	0.000227543	0.366707		0.000196259	0.0783115	0	0.0675205						
m-Xylene	0.0709567	0.000116032	0.306564		9.30501E-05	0.0706502	0	0.0595612						
o-Xylene	0.160154	0.000530559	0.616470		0.000479203	0.159562	0	0.131788						
Nonane	1.64056	1.01120E-06	3.88365		4.13572E-09	1.63775	0	1.18429						
C10+	22.9257	9.14967E-05	26.4172		1.89041E-05	22.9218	0	17.2738						

Process Streams	Gas	HP Separator Gas	HP Separator Oil	HP Separator Water	Oil	Oil W/B	OT Flash Gas	Produced Water	PWT Flash Gas	Sales Oil	Total gas to sale	Water	Water W/B	Well Stream
Properties	Status:	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved
Phase: Light Liquid	From Block:	--	3 Phase Separator	3 Phase Separator	3 Phase Separator	--	--	Condensate Tanks	PW Tanks	PW Tanks	Condensate Tanks	MIX-100	--	MIX-101
	To Block:	MIX-101	MIX-100	Condensate Tanks	PW Tanks	MIX-101	--	--	--	--	--	MIX-101	--	3 Phase Separator
Property	Units													
Temperature	°F		70	70	85			75.94		75.94		85		84.2905
Pressure	psig		198	198	1000			0		0		1000		1000

Methylcyclohexane	0.0634048
Toluene	0.0173048
Octane	0.621634
Ethylbenzene	0.0676316
m-Xylene	0.0596204
o-Xylene	0.132048
Nonane	1.18429
C10+	17.2738

Process Streams	Gas	HP Separator Gas	HP Separator Oil	HP Separator Water	Oil	Oil W/B	OT Flash Gas	Produced Water	PWT Flash Gas	Sales Oil	Total gas to sale	Water	Water W/B	Well Stream	
Properties	Status:	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	
Phase: Mixed Liquid	From Block:	--	3 Phase Separator	3 Phase Separator	3 Phase Separator	--	--	Condensate Tanks	PW Tanks	PW Tanks	Condensate Tanks	MIX-100	--	--	MIX-101
	To Block:	MIX-101	MIX-100	Condensate Tanks	PW Tanks	MIX-101	--	--	--	--	--	MIX-101	--	3 Phase Separator	
Property	Units														
Temperature	°F	84.2905													
Pressure	psig	1000													
Mole Fraction Vapor	%	0													
Mole Fraction Light Liquid	%	3.51553													
Mole Fraction Heavy Liquid	%	96.4845													
Molecular Weight	lb/lbmol	19.3234													
Mass Density	lb/ft³	57.7235													
Molar Flow	lbmol/h	41.5531													
Mass Flow	lb/h	802.948													
Vapor Volumetric Flow	ft³/h	13.9102													
Liquid Volumetric Flow	gpm	1.73426													
Std Vapor Volumetric Flow	MMSCFD	0.378450													
Std Liquid Volumetric Flow	sgpm	1.73616													
Compressibility		0.0581884													
Specific Gravity		0.925516													
API Gravity		20.4124													
Enthalpy	Btu/h	-5.00302E+06													
Mass Enthalpy	Btu/lb	-6230.82													
Mass Cp	Btu/(lb*°F)	0.941847													
Ideal Gas CpCv Ratio		1.30031													
Dynamic Viscosity	cP	0.726327													
Kinematic Viscosity	cSt	0.785522													
Thermal Conductivity	Btu/(h*ft*°F)	0.304129													
Surface Tension	lb/ft	0.004175127													
Net Ideal Gas Heating Value	Btu/ft³	101.379													
Net Liquid Heating Value	Btu/lb	1024.13													
Gross Ideal Gas Heating Value	Btu/ft³	158.248													
Gross Liquid Heating Value	Btu/lb	2140.94													

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

For: Antero Resources Appalachian Corp.
 1625 17th Street
 Denver, Colorado 80202

Sample: Yoke No. 1H
 Separator Hydrocarbon Liquid
 Sampled @ 200 psig & 69 °F

Date Sampled: 09/25/13

Job Number: 35843.002

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2186-M

COMPONENT	MOL %	LIQ VOL %	WT %
Nitrogen	0.013	0.003	0.003
Carbon Dioxide	0.014	0.005	0.006
Methane	5.372	1.842	0.761
Ethane	5.517	2.986	1.465
Propane	4.820	2.687	1.877
Isobutane	1.445	0.957	0.742
n-Butane	3.282	2.094	1.685
2,2 Dimethylpropane	0.111	0.086	0.071
Isopentane	2.100	1.554	1.338
n-Pentane	2.012	1.476	1.282
2,2 Dimethylbutane	0.190	0.160	0.144
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.281	0.233	0.214
2 Methylpentane	1.478	1.241	1.125
3 Methylpentane	1.041	0.860	0.792
n-Hexane	1.974	1.643	1.502
Heptanes Plus	<u>70.350</u>	<u>82.174</u>	<u>86.993</u>
Totals:	100.000	100.000	100.000

Characteristics of Heptanes Plus:

Specific Gravity ----- 0.7687 (Water=1)
 °API Gravity ----- 52.59 @ 60°F
 Molecular Weight ----- 140.0
 Vapor Volume ----- 17.42 CF/Gal
 Weight ----- 6.40 Lbs/Gal

Characteristics of Total Sample:

Specific Gravity ----- 0.7261 (Water=1)
 °API Gravity ----- 63.39 @ 60°F
 Molecular Weight ----- 113.2
 Vapor Volume ----- 20.35 CF/Gal
 Weight ----- 6.05 Lbs/Gal

Base Conditions: 14.650 PSI & 60 °F

Certified: FESCO, Ltd. - Alice, Texas

Analyst: XG
 Processor: JCdjv
 Cylinder ID: T-943

David Dannhaus 361-661-7015

TANKS DATA INPUT REPORT

COMPONENT	Mol %	LiqVol %	Wt %
Carbon Dioxide	0.014	0.005	0.006
Nitrogen	0.013	0.003	0.003
Methane	5.372	1.842	0.761
Ethane	5.517	2.986	1.465
Propane	4.820	2.687	1.877
Isobutane	1.445	0.957	0.742
n-Butane	3.393	2.180	1.756
Isopentane	2.100	1.554	1.338
n-Pentane	2.012	1.476	1.282
Other C-6's	2.989	2.494	2.275
Heptanes	6.705	6.069	5.827
Octanes	10.280	9.819	9.895
Nonanes	7.698	8.452	8.624
Decanes Plus	42.021	55.063	59.304
Benzene	0.064	0.036	0.044
Toluene	0.495	0.336	0.403
E-Benzene	0.878	0.686	0.823
Xylenes	2.210	1.712	2.072
n-Hexane	1.974	1.643	1.502
2,2,4 Trimethylpentane	<u>0.000</u>	<u>0.000</u>	<u>0.000</u>
Totals:	100.000	100.000	100.000

Characteristics of Total Sample:

Specific Gravity -----	0.7261	(Water=1)
°API Gravity -----	63.39	@ 60°F
Molecular Weight-----	113.2	
Vapor Volume -----	20.35	CF/Gal
Weight -----	6.05	Lbs/Gal

Characteristics of Decanes (C10) Plus:

Specific Gravity -----	0.7820	(Water=1)
Molecular Weight-----	159.8	

Characteristics of Atmospheric Sample:

°API Gravity -----	56.94	@ 60°F
Reid Vapor Pressure (ASTM D-5191)-----	2.51	psi

QUALITY CONTROL CHECK			
	Sampling Conditions	Test Samples	
Cylinder Number	-----	T-943*	T-966
Pressure, PSIG	200	198	209
Temperature, °F	69	70	70

* Sample used for analysis

TOTAL EXTENDED REPORT

COMPONENT	Mol %	LiqVol %	Wt %
Nitrogen	0.013	0.003	0.003
Carbon Dioxide	0.014	0.005	0.006
Methane	5.372	1.842	0.761
Ethane	5.517	2.986	1.465
Propane	4.820	2.687	1.877
Isobutane	1.445	0.957	0.742
n-Butane	3.282	2.094	1.685
2,2 Dimethylpropane	0.111	0.086	0.071
Isopentane	2.100	1.554	1.338
n-Pentane	2.012	1.476	1.282
2,2 Dimethylbutane	0.190	0.160	0.144
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.281	0.233	0.214
2 Methylpentane	1.478	1.241	1.125
3 Methylpentane	1.041	0.860	0.792
n-Hexane	1.974	1.643	1.502
Methylcyclopentane	0.231	0.166	0.172
Benzene	0.064	0.036	0.044
Cyclohexane	0.465	0.321	0.346
2-Methylhexane	1.696	1.596	1.501
3-Methylhexane	1.420	1.319	1.256
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C-7's	0.906	0.814	0.794
n-Heptane	1.987	1.855	1.758
Methylcyclohexane	1.775	1.444	1.539
Toluene	0.495	0.336	0.403
Other C-8's	6.320	6.110	6.152
n-Octane	2.185	2.265	2.204
E-Benzene	0.878	0.686	0.823
M & P Xylenes	0.734	0.576	0.688
O-Xylene	1.476	1.136	1.384
Other C-9's	5.324	5.750	5.936
n-Nonane	2.373	2.702	2.688
Other C-10's	8.709	10.336	10.867
n-decane	2.435	3.024	3.060
Undecanes(11)	11.327	13.792	14.705
Dodecanes(12)	8.408	11.059	11.955
Tridecanes(13)	5.532	7.802	8.550
Tetradecanes(14)	2.884	4.357	4.840
Pentadecanes(15)	1.477	2.391	2.688
Hexadecanes(16)	0.586	1.013	1.148
Heptadecanes(17)	0.267	0.487	0.558
Octadecanes(18)	0.187	0.359	0.414
Nonadecanes(19)	0.095	0.190	0.220
Eicosanes(20)	0.047	0.098	0.114
Heneicosanes(21)	0.025	0.055	0.065
Docosanes(22)	0.019	0.043	0.051
Tricosanes(23)	0.008	0.020	0.024
Tetracosanes(24)	0.005	0.013	0.015
Pentacosanes(25)	0.003	0.008	0.010
Hexacosanes(26)	0.002	0.005	0.005
Heptacosanes(27)	0.001	0.003	0.004
Octacosanes(28)	0.001	0.002	0.003
Nonacosanes(29)	0.001	0.002	0.002
Triacontanes(30)	0.000	0.001	0.001
Hentriacontanes Plus(31+)	<u>0.001</u>	<u>0.003</u>	<u>0.004</u>
Total	100.000	100.000	100.000



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

For: Antero Resources Appalachian Corp.
 1625 17th Street
 Denver, Colorado 80202

Date Sampled: 09/25/2013

Date Analyzed: 10/02/2013

Sample: Yoke No. 1H

Job Number: J35843

FLASH LIBERATION OF HYDROCARBON LIQUID		
	Separator HC Liquid	Stock Tank
Pressure, psig	200	0
Temperature, °F	69	70
Gas Oil Ratio (1)	-----	142
Gas Specific Gravity (2)	-----	1.144
Separator Volume Factor (3)	1.0761	1.000

STOCK TANK FLUID PROPERTIES	
Shrinkage Recovery Factor (4)	0.9293
Oil API Gravity at 60 °F	56.94
Reid Vapor Pressure, psi (5)	2.51

Quality Control Check			
	Sampling Conditions	Test Samples	
Cylinder No.	-----	T-943*	T-966
Pressure, psig	200	198	209
Temperature, °F	69	70	70

(1) - Scf of flashed vapor per barrel of stock tank oil

(2) - Air = 1.000

(3) - Separator volume / Stock tank volume

(4) - Fraction of first stage separator liquid

(5) - Absolute pressure at 100 deg F

Analyst: _____ O. A.

* Sample used for flash study

Base Conditions: 14.73 PSI & 60 °F

Certified: FESCO, Ltd. - Alice, Texas

 David Dannhaus 361-661-7015

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

For: Antero Resources Appalachian Corp.
 1625 17th Street
 Denver, Colorado 80202

Sample: Yoke No. 1H
 Gas Evolved from Hydrocarbon Liquid Flashed
 From 200 psig & 69 °F to 0 psig & 70 °F

Date Sampled: 09/25/13

Job Number: 35843.001

CHROMATOGRAPH EXTENDED ANALYSIS - SUMMATION REPORT

COMPONENT	MOL%	GPM
Hydrogen Sulfide*	< 0.001	
Nitrogen	0.250	
Carbon Dioxide	0.123	
Methane	35.935	
Ethane	30.932	8.225
Propane	18.489	5.065
Isobutane	3.361	1.094
n-Butane	5.774	1.810
2-2 Dimethylpropane	0.073	0.028
Isopentane	1.682	0.612
n-Pentane	1.243	0.448
Hexanes	1.135	0.466
Heptanes Plus	<u>1.003</u>	<u>0.440</u>
Totals	100.000	18.186

Computed Real Characteristics Of Heptanes Plus:

Specific Gravity ----- 3.585 (Air=1)
 Molecular Weight ----- 102.82
 Gross Heating Value ----- 5398 BTU/CF

Computed Real Characteristics Of Total Sample:

Specific Gravity ----- 1.144 (Air=1)
 Compressibility (Z) ----- 0.9902
 Molecular Weight ----- 32.81
 Gross Heating Value
 Dry Basis ----- 1914 BTU/CF
 Saturated Basis ----- 1882 BTU/CF

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

Base Conditions: 14.650 PSI & 60 Deg F

Certified: FESCO, Ltd. - Alice, Texas

Analyst: MR
 Processor: ANB
 Cylinder ID: ST-20

 David Dannhaus 361-661-7015

**CHROMATOGRAPH EXTENDED ANALYSIS
TOTAL REPORT**

COMPONENT	MOL %	GPM	WT %
Hydrogen Sulfide*	< 0.001		< 0.001
Nitrogen	0.250		0.213
Carbon Dioxide	0.123		0.165
Methane	35.935		17.569
Ethane	30.932	8.225	28.350
Propane	18.489	5.065	24.850
Isobutane	3.361	1.094	5.954
n-Butane	5.774	1.810	10.229
2,2 Dimethylpropane	0.073	0.028	0.161
Isopentane	1.682	0.612	3.699
n-Pentane	1.243	0.448	2.734
2,2 Dimethylbutane	0.070	0.029	0.184
Cyclopentane	0.102	0.042	0.218
2,3 Dimethylbutane	0.371	0.151	0.975
2 Methylpentane	0.231	0.095	0.607
3 Methylpentane	0.000	0.000	0.000
n-Hexane	0.361	0.148	0.948
Methylcyclopentane	0.035	0.012	0.090
Benzene	0.019	0.005	0.045
Cyclohexane	0.053	0.018	0.136
2-Methylhexane	0.106	0.049	0.324
3-Methylhexane	0.105	0.048	0.321
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C7's	0.117	0.051	0.354
n-Heptane	0.114	0.052	0.348
Methylcyclohexane	0.101	0.040	0.302
Toluene	0.038	0.013	0.107
Other C8's	0.159	0.074	0.534
n-Octane	0.039	0.020	0.136
Ethylbenzene	0.002	0.001	0.006
M & P Xylenes	0.018	0.007	0.058
O-Xylene	0.002	0.001	0.006
Other C9's	0.062	0.031	0.239
n-Nonane	0.012	0.007	0.047
Other C10's	0.018	0.010	0.078
n-Decane	0.003	0.002	0.013
Undecanes (11)	<u>0.000</u>	<u>0.000</u>	<u>0.000</u>
Totals	100.000	18.186	100.000

Computed Real Characteristics Of Total Sample:

Specific Gravity -----	1.144	(Air=1)
Compressibility (Z) -----	0.9902	
Molecular Weight -----	32.81	
Gross Heating Value		
Dry Basis -----	1914	BTU/CF
Saturated Basis -----	1882	BTU/CF

Antero Resources
Yoke Unit 1H - Maxwell Horizontal Pad

Tag Name	Value	Units	Timestamp
Accumulated Gas Flow	1096710	MCF	10/22/2013 15:07:41
Casing Pressure	230.75	PSIA	10/22/2013 15:07:40
Current Day Gas Flow	884.15	MCF	10/22/2013 15:07:41
Differential Pressure	8.09	inH2O	10/22/2013 15:07:41
Flow Rate	3450.06	MCF Per Day	10/22/2013 15:07:41
Pressure	170	PSIA	10/22/2013 15:07:41
Previous Day Energy	4288.41	MBTU	10/22/2013 15:07:41
Previous Day Gas Flow	3438.81	MCF	10/22/2013 15:07:41
Temperature	65.59	F	10/22/2013 15:07:41
Tubing Pressure	372.66	PSIA	10/22/2013 15:07:40
Daily AP	8.05	PSIA	10/22/2013 09:00:00
Daily DP	169.51	inH2O	10/22/2013 09:00:00
Daily Energy	4288.41	MBTU	10/22/2013 09:00:00
Daily Flow	3438.81	MCF	10/22/2013 09:00:00
Daily Tf	65.05	F	10/22/2013 09:00:00
Hourly AP	169.39	PSIA	10/22/2013 10:00:00
Hourly DP	8	Inches	10/22/2013 10:00:00
Hourly Energy	178.4	MBTU	10/22/2013 10:00:00
Hourly Flow Time	3600	Seconds	10/22/2013 10:00:00
Hourly Tf	63.5	F	10/22/2013 10:00:00
Hourly Volume	143	MCF	10/22/2013 10:00:00
Argon	0	%	10/22/2013 15:07:44
BTU	1247.06	BTU	10/22/2013 15:07:41
CO2	0.1467	%	10/22/2013 15:07:44
Carbon Monoxide	0	%	10/22/2013 15:07:44
Decane	0	%	10/22/2013 15:07:44
Ethane	14.1987	%	10/22/2013 15:07:44
Helium	0	%	10/22/2013 15:07:44
Heptane	0	%	10/22/2013 15:07:44
Hexane	0.5451	%	10/22/2013 15:07:44
Hydrogen	0	%	10/22/2013 15:07:44
Hydrogen Sulfide	0	%	10/22/2013 15:07:44
Iso-Butane	0.5666	%	10/22/2013 15:07:44
Iso-Pentane	0.3749	%	10/22/2013 15:07:44
Methane	77.6927	%	10/22/2013 15:07:44
N2	0.4946	%	10/22/2013 15:07:44
N-Butane	1.1838	%	10/22/2013 15:07:44
Nonane	0	%	10/22/2013 15:07:44
N-Pentane	0.2914	%	10/22/2013 15:07:44
Octane	0	%	10/22/2013 15:07:44
Oxygen	0.0117	%	10/22/2013 15:07:44
Plate Size	3.75	Inches	10/22/2013 15:07:43
Propane	4.4938	%	10/22/2013 15:07:44
SPG	0.7248		10/22/2013 15:07:41
Water	0	%	10/22/2013 15:07:44

Attachment U

Facility-wide Emissions Summary Sheet(s)

ATTACHMENT U – FACILITY-WIDE CONTROLLED EMISSIONS SUMMARY SHEET

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

Emission Point ID#	NOx		CO		VOC		SO2		PM10		PM2.5		CH ₄		GHG (CO ₂ e)	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
EP-HR001									0.4560	0.0200						
EP-PCV					0.0343	0.1504							0.1084	0.4747	2.7098	11.8690
F001					1.5245	6.6775							1.2914	5.6565	32.2859	141.4121
EP-L001					8.9188	0.0271							0.0290	0.0001	0.7256	0.0022
EP-L002					0.0011	0.0000							0.0364	0.0013	0.9521	0.0348
EP-GPU001, EP-GPU002, EP-GPU003, EP-GPU004 (emissions per EPN)	0.0802	0.3512	0.0674	0.2950	0.0044	0.0193	0.0005	0.0021	0.0061	0.0267	0.0061	0.0267	0.0018	0.0081	96.2263	421.4713
EP-TANKCOND001-004 (emissions per EPN)	0.0000	0.0000	0.0000	0.0000	1.3095	5.7354	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1052	0.4607	2.6310	11.5236
EP-TANKPW001-002 (emissions per EPN)	0.0000	0.0000	0.0000	0.0000	0.0182	0.0795	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0792	0.3469	1.9840	8.6901
TOTAL	0.3208	1.4049	0.2694	1.1801	14.2117	23.2052	0.0019	0.0084	0.0244	0.1068	0.0244	0.1068	0.6519	2.5703	401.0750	1749.3969

Annual emissions shall be based on 8760 hours per year of operation for all emission units except emergency generators.

According to 45CSR14 Section 2.43.e, fugitive emissions are not included in the major source determination because it is not listed as one of the source categories in Table 1. Therefore, fugitive emissions shall not be included in the PTE above

ATTACHMENT U – FACILITY-WIDE CONTROLLED EMISSIONS SUMMARY SHEET

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

Emission Point ID#	Formaldehyde		Benzene		Toluene		Ethylbenzene		Xylenes		Hexane		Total HAPs	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
EP-HR001														
EP-PCV			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0041	0.0179	0.0041	0.0179
F001			0.0005	0.0023	0.0047	0.0206	0.0096	0.0420	0.0241	0.1057	0.0658	0.2884	0.1048	0.4589
EP-L001			0.0000	0.0000	0.0004	0.0000	0.0008	0.0000	0.0019	0.0000	1.9325	0.0059	1.9356	0.0059
EP-L002			1.57E-07	5.73E-09	2.63E-07	9.61E-09	1.28E-07	4.67E-09	2.78E-07	1.01E-08	1.13E-07	4.12E-09	9.39E-07	3.43E-08
EP-GPU001, EP-GPU002, EP-GPU003, EP-GPU004 (emissions per EPN)	6.01E-05	2.63E-04	1.68E-06	7.38E-06	2.73E-06	1.19E-05			0.00E+00	0.00E+00	0.0014	0.0063	0.0015	0.0066
EP-TANKCOND001-004 (emissions per EPN)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0003	0.0001	0.0006	0.0003	0.0014	0.2732	1.1968	0.2738	1.1991
EP-TANKPW001-002 (emissions per EPN)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0002	0.0004	0.0018	0.0005	0.0020
TOTAL	0.0002	0.0011	0.0001	0.0002	0.0008	0.0015	0.0013	0.0025	0.0032	0.0059	3.0320	4.8217	3.0376	4.8329

Annual emissions shall be based on 8760 hours per year of operation for all emission units except emergency generators.

According to 45CSR14 Section 2.43.e, fugitive emissions are not included in the major source determination because it is not listed as one of the source categories in Table 1. Therefore, fugitive emissions shall not be included in the PTE above

Attachment V
Class I Legal Advertisement

Attachment V

**Air Quality Permit Notice
Notice of Application
Swisher Well Pad
Antero Resources Corporation
Doddridge County, West Virginia**

Notice is given that Antero Resources Corporation has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a G70-D General Permit Modification for an Oil and Natural Gas Production facility located at 3779 Meathouse, in Doddridge County, West Virginia.

The latitude and longitude coordinates are: 39.21029 and -80.66636

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

Pollutants	TOTALS (tpy):
NO _x	1.4049
CO	1.1801
PM _{2.5}	0.1068
PM ₁₀	0.1068
VOC	23.2052
SO ₂	0.0084
CO _{2e}	1,749.40
Formaldehyde	0.0011
Benzene	0.0002
Toluene	0.0015
Ethylbenzene	0.0025
Xylenes	0.0059
Hexane	4.8217
Total HAPs	4.8329

Proposed changes will be implemented upon issuance of the permit. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.

Dated this the __ day of _____, 2018

By: Antero Resources Corporation
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