February 23, 2017 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 Registration G70-D Application
Primm 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 Primm Well Pad.

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

1. Decrease in production.
2. Removal of one Kubota Engine
3. Removal of one enclosed combustor
4. Removal of eight line heaters
5. Removal of four condensate tanks

Please refer to Table 13 in Attachment S - Emissions Calculations for the summary of changes in emissions of regulated air pollutants that will result from the above operational changes.

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. 468472 in the amount of $1,500.00.

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

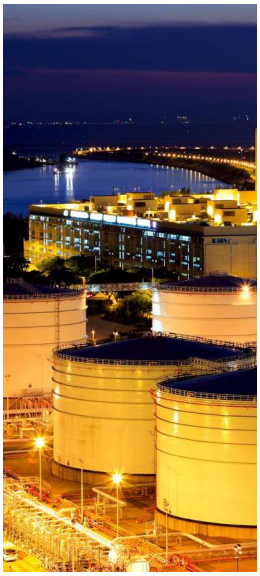
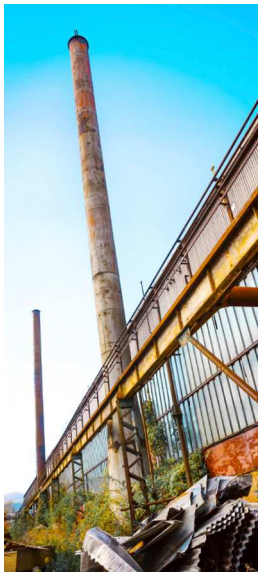
Sincerely,

GHD Services Inc.

Manuel Bautista

MB/ma/298
Encl.
cc: Barry Schatz, Antero Resources Corporation
Elizabeth McLaughlin, Antero Resources Corporation

GHD
6320 Rothway Street Suite 100 Houston Texas 77040 USA
T 713 734 3090 **F** 713 734 3391 **W** www.ghd.com

General Permit G70-D Modification Application

Decrease in production, and removal of one Kubota Engine, eight Line Heaters, four Condensate Tanks, one Enclosed Combustor

Primm Well Pad

Antero Resources Corporation

GHD | 6320 Rothway Suite 100 Houston Texas 77040
082715 | Report No 298 | February 2017

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G70-D General Permit Modification

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

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

SECTION 1. GENERAL INFORMATION

Name of Applicant (as registered with the WV Secretary of State's Office): 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: Primm Well Pad

Operating Site Physical Address: 1313 Oxford Rd

City: West Union	Zip Code: 26456	County: Doddridge

Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):
Latitude: 39.24170
Longitude: -80.85264

SIC Code: 1311 NAICS Code: 211111	DAQ Facility ID No. (For existing facilities) 017-00091

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: 2/23/2017

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: Change in emissions due to the decreased production and removal of one Kubota Engine, eight Line Heaters, four condensate tanks, one enclosed combustor	
Directions to the facility: From Greenwood travel south on Old U.S. 50 W and go 3.4 mi. Turn Right on Oxford Rd and go 1.4 mi to reach destination on the left	

ATTACHMENTS AND SUPPORTING DOCUMENTS	
I have enclosed the following required documents:	
Check payable to WVDEP – Division of Air Quality with the appropriate application fee (per 45CSR13 and 45CSR22). ☒ Check attached to front of application. ☐ I wish to pay by electronic transfer. Contact for payment (incl. name and email address): ☐ I wish to pay by credit card. Contact for payment (incl. name and email address): ☒$500 (Construction, Modification, and Relocation) ☐$300 (Class II Administrative Update) ☒$1,000 NSPS fee for 40 CFR60, Subpart IIII, JJJJ, OOOO and/or OOOOa [1] ☐$2,500 NESHAP fee for 40 CFR63, Subpart ZZZZ and/or HH [2] [1] Only one NSPS fee will apply. [2] Only one NESHAP fee will apply. The Subpart ZZZZ NESHAP fee will be waived for new engines that satisfy requirements by complying with NSPS, Subparts IIII and/or JJJJ. *NSPS and NESHAP fees apply to new construction or if the source is being modified.*	
☒ Responsible Official or Authorized Representative Signature (if applicable)	
☒ Single Source Determination Form **(must be completed in its entirety)** – Attachment A	
☐ Siting Criteria Waiver (if applicable) – Attachment B	☒ Current Business Certificate – Attachment C
☒ Process Flow Diagram – Attachment D	☒ Process Description – Attachment E
☒ Plot Plan – Attachment F	☒ Area Map – Attachment G
☒ G70-D Section Applicability Form – Attachment H	☒ Emission Units/ERD Table – Attachment I
☒ Fugitive Emissions Summary Sheet – Attachment J	
☒ Gas Well Affected Facility Data Sheet (if applicable) – Attachment K	
☒ Storage Vessel(s) Data Sheet (include gas sample data, USEPA Tanks, simulation software (e.g. ProMax, E&P Tanks, HYSYS, etc.), etc. where applicable) – Attachment L	
☒ Natural Gas Fired Fuel Burning Unit(s) Data Sheet (GPUs, Heater Treaters, In-Line Heaters if applicable) – Attachment M	
☒ Internal Combustion Engine Data Sheet(s) (include manufacturer performance data sheet(s) if applicable) – Attachment N	
☒ Tanker Truck Loading Data Sheet (if applicable) – Attachment O	
☐ Glycol Dehydration Unit Data Sheet(s) (include wet gas analysis, GRI- GLYCalc™ input and output reports and information on reboiler if applicable) – Attachment P	
☐ Pneumatic Controllers Data Sheet – Attachment Q	
☐ Pneumatic Pump Data Sheet – Attachment R	
☒ Air Pollution Control Device/Emission Reduction Device(s) Sheet(s) (include manufacturer performance data sheet(s) if applicable) – Attachment S	
☒ Emission Calculations (please be specific and include all calculation methodologies used) – Attachment T	
☒ Facility-wide Emission Summary Sheet(s) – Attachment U	
☒ Class I Legal Advertisement – Attachment V	
☒ 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:QL 3).

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 ☒

Primm 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 nearest 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 Robert Williams Well Pad. This is approximately 0.63 miles southeast of the facility.

Attachment B
Siting Criteria Waiver

Attachment B

Siting Waiver
Primm 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 Primm 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

IN THE OFFICE OF SECRETARY OF STATE

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

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

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

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

APPLICATION FOR AMENDED CERTIFICATE OF AUTHORITY

****** 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:**

1. Name under which the corporation was authorized to transact business in WV: Antero Resources Appalachian Corporation

2. Date Certificate of Authority was issued in West Virginia: 6/25/2008

3. Corporate name has been changed to: Antero Resources Corporation
(Attach one Certified Copy of Name Change as filed in home State of incorporation.)

4. Name the corporation elects to use in WV: Antero Resources Corporation
(due to home state name not being available)

5. 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 — Contact Name
(303) 357-7310 — Phone Number

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

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

Signature: Alvyn A. Schopp **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

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.

Jeffrey W. Bullock, Secretary of State

4520810 8100

130754186

AUTHENTICATION: 0496546

DATE: 06-10-13

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

State of Delaware
Secretary of State
Division of Corporations
Delivered 09:37 AM 06/10/2013
FILED 09:37 AM 06/10/2013
SRV 130754186 - 4520810 FILE

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:

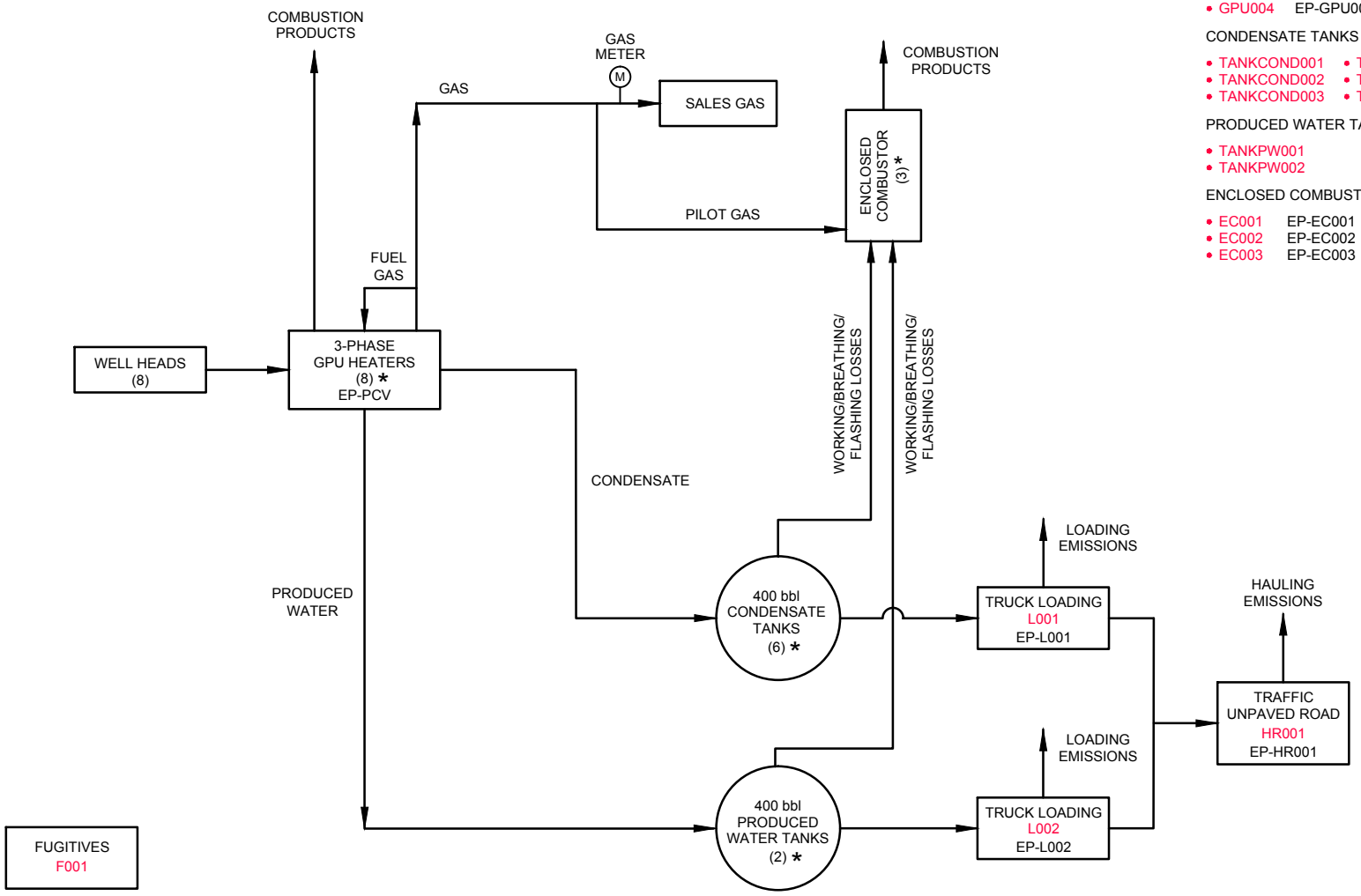
FIRST. The name of the Corporation is Antero Resources Corporation.

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: Alvyn A. Schopp
Title: Vice President of Accounting & Administration / Treasurer

Attachment D
Process Flow Diagram



* 3-PHASE SEPARATORS WITH HEATERS (8)

- GPU001 EP-GPU001
- GPU002 EP-GPU002
- GPU003 EP-GPU003
- GPU004 EP-GPU004
- GPU005 EP-GPU005
- GPU006 EP-GPU006
- GPU007 EP-GPU007
- GPU008 EP-GPU008

CONDENSATE TANKS (6)

- TANKCOND001
- TANKCOND002
- TANKCOND003
- TANKCOND004
- TANKCOND005
- TANKCOND006

PRODUCED WATER TANKS (2)

- TANKPW001
- TANKPW002

ENCLOSED COMBUSTORS (3)

- EC001 EP-EC001
- EC002 EP-EC002
- EC003 EP-EC003

Attachment D

PROCESS FLOW DIAGRAM - ANTERO RESOURCES PRIMM WELL PAD

Doddridge County, West Virginia

82715-00(298)GN-WA001 FEB 16, 2017

Attachment E
Process Description

Attachment E

Process Description
Primm Well Pad
Antero Resources Corporation
Doddridge County, West Virginia

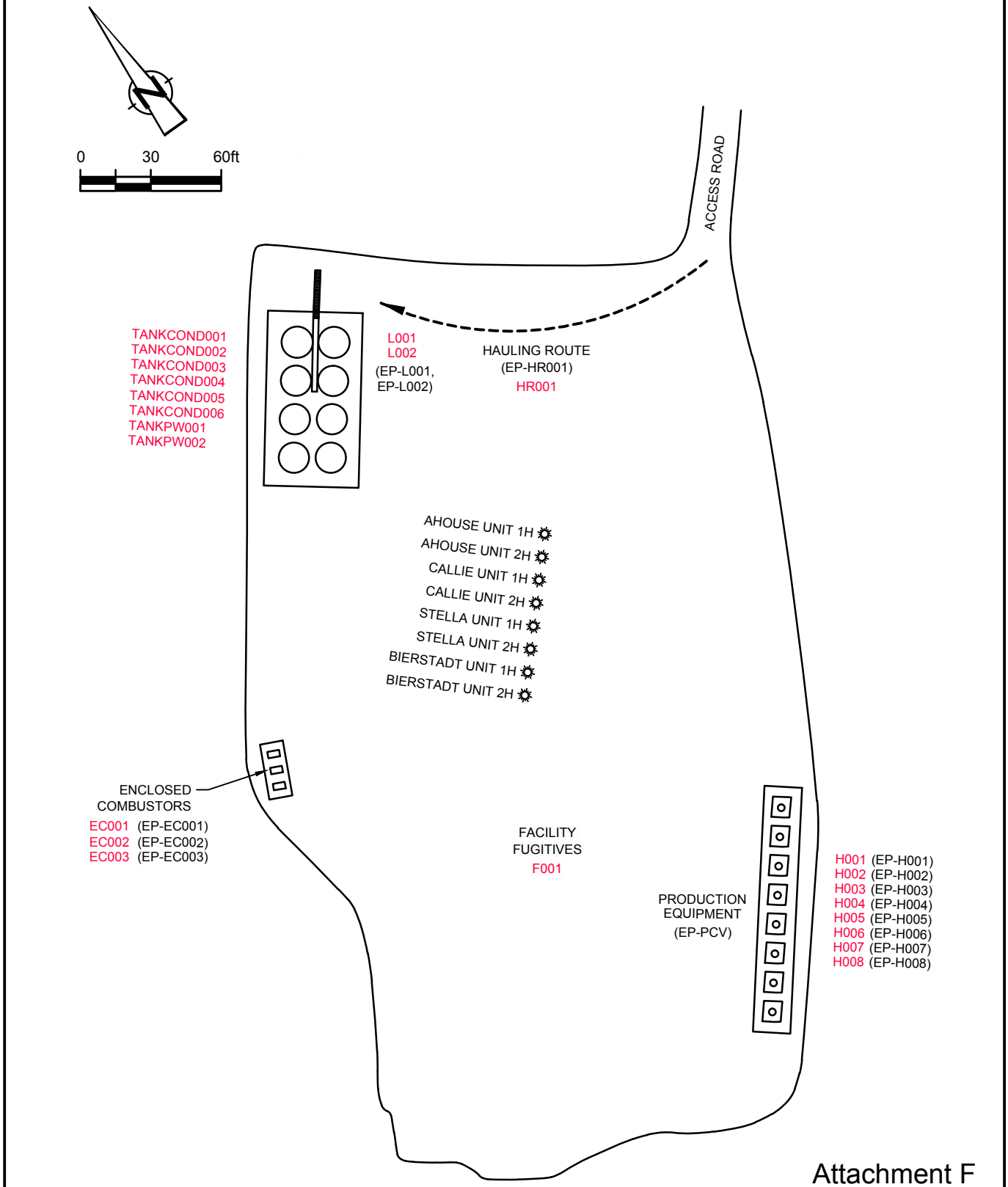
A mixture of condensate, water, and entrained gas from the condensate and gas wells enters the facility through a series of gas production units (GPU001-GPU008) which are 3 phase separators where the gas, condensate, and produced water are separated. The GPUs are fueled by a slip stream of the separated 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 (TANKCOND001-006 and TANKPW001-002).

The facility has six (6) tanks (TANKCOND001-006) 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 routed to three enclosed combustors (EC001-003) to control the emissions. The enclosed combustors that will be used to control emissions are designed to achieve a VOC destruction efficiency of 98 percent.

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 analysis of the condensate and gas from Kuhn 1H, one of the wells in the Primm Well Pad.

Attachment F
Plot Plan

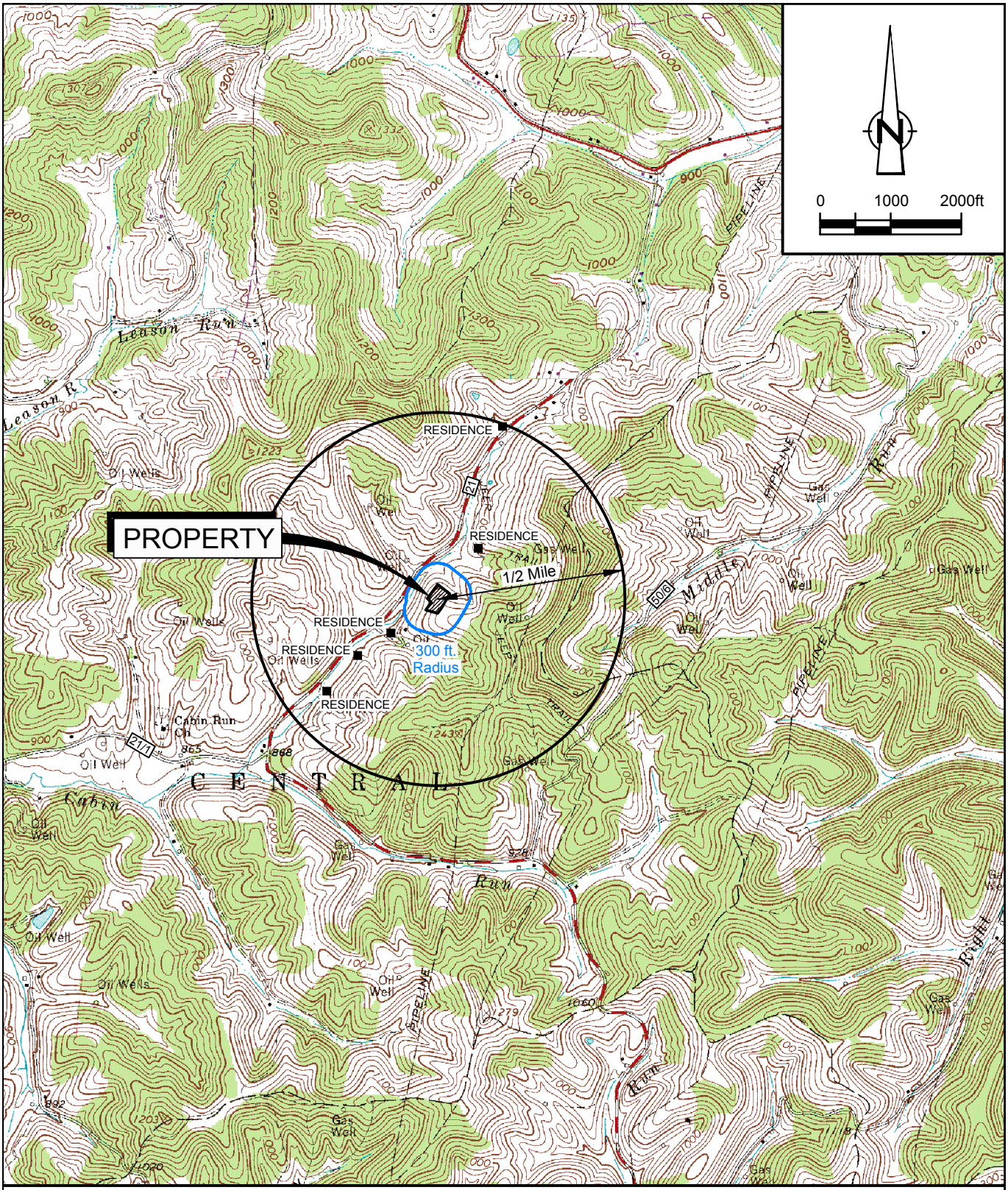


Attachment F

PLOT PLAN
PRIMM WELL PAD
ANTERO RESOURCES
Doddridge County, West Virginia

82715-00(298)GN-WA002 FEB 16, 2017

Attachment G
Area Map



SOURCE: USGS QUADRANGLE MAPS;
WEST UNION AND OXFORD, WEST VIRGINIA

SITE COORDINATES: LAT. 39.2417, LONG. -80.85264
SITE ELEVATION: 1008.6 ft AMSL

GHD

Attachment G

AREA MAP
PRIMM WELL PAD
ANTERO RESOURCES
Doddridge County, West Virginia

82715-00(298)GN-WA003 FEB 16, 2017

Attachment H
G70-C Section Applicability Form

ATTACHMENT H – G70-D SECTION APPLICABILITY FORM

General Permit G70-D Registration[1]
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	
☒Section 5.0	Gas Well Affected Facility (NSPS, Subpart OOOO/OOOOa)
☒Section 6.0	Storage Vessels Containing Condensate and/or Produced Water[1]
☐Section 7.0	Storage Vessel Affected Facility (NSPS, Subpart OOOO/OOOOa)
☒Section 8.0	Control Devices and Emission Reduction Devices not subject to NSPS Subpart OOOO/OOOOa and/or NESHAP Subpart HH
☒Section 9.0	Small Heaters and Reboilers not subject to 40CFR60 Subpart Dc
☐Section 10.0	Pneumatic Controllers Affected Facility (NSPS, Subpart OOOO/OOOOa)
☐Section 11.0	Pneumatic Pump Affected Facility (NSPS, Subpart OOOOa)
☒Section 12.0	Fugitive Emissions GHG and VOC Standards (NSPS, Subpart OOOOa)
☐Section 13.0	Reciprocating Internal Combustion Engines, Generator Engines
☒Section 14.0	Tanker Truck/Rail Car Loading[2]
☐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]
GPU001-008	EP-GPU001-008	Gas Production Unit Heater	2014		1.5 MMBtu/hr	Existing	N/A	
LH001-008	EP-LH001 -008	Gas Production Unit Heater	2014		2.0 MMBtu/hr	Removal-2017	N/A	
F001	F001	Fugitives	2014		N/A	Existing	N/A	
TANKCOND001-006	EP-EC001, EP-EC002, EP-EC003	Condensate Tank F/W/B	2014		400 bbl each	Modification[1]	EP-EC001, EP-EC002, EP-EC003	
TANKCOND007-008	EP-EC001, EP-EC002, EP-EC003	Condensate Tank F/W/B	2014		400 bbl each	Removal - 2017	EP-EC001, EP-EC002, EP-EC003	
TANKCOND009-0010	EP-EC001, EP-EC002, EP-EC003	Condensate Tank F/W/B	2015		400 bbl each	Removal - 2017	EP-EC001, EP-EC002, EP-EC003	
TANKPW001-002	EP-EC001, EP-EC002, EP-EC003	PW Tank F/W/B	2014		400 bbl each	Modification[2]	EP-EC001, EP-EC002, EP-EC003	
L001	EP-L001	Loading (Condensate)	2014		10080 gal/hr 1839600 gal/yr	Modification[3]	N/A	
L002	EP-L002	Loading (Produced Water)	2014		10080 gal/hr 9198000 gal/yr	Modification[4]	N/A	
HR001	EP-HR001	Haul Road	2014		Tanker Trucks Condensate: 219 trips per year Tanker Trucks PW: 1095 trips per year Pick Up Truck: 730 trips per year	Modification[5]	N/A	
EC001	EP-EC001	Enclosed Combustor	2014		12 MMBtu/hr	Modification[6]	N/A	
EC002	EP-EC002	Enclosed Combustor	2015		12 MMBtu/hr	Modification[6]	N/A	
EC003	EP-EC003	Enclosed Combustor	2015		12 MMBtu/hr	Modification[6]	N/A	
EC004	EP-EC004	Enclosed Combustor	2015		12 MMBtu/hr	Removal - 2017	N/A	
PCV	EP-PCV	Pneumatic CV	2014		6.6 scf/day/PCV	Existing	N/A	
ENG001	EP-ENG001	Compressor Engine	2014	2013	24 HP	Removal-2017	Non-Selective Catalytic Reduction	

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.

Notes:

1. This is not a physical modification. Change in emissions due to decrease in condensate throughput and change of number of tanks.
2. This is not a physical modification. Change in emissions due to decrease in PW throughput.
3. This is not physical modification. Change in emissions due to decrease in loading throughput.
4. This is not physical modification. Change in emissions due to decrease in produced water loading throughput.
5. This is not physical modification. Change in emissions due to decrease in loading throughput.
6. This is not physical modification. Change in emissions due to decrease in throughput and change of number of enclosed combustors.

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	☐ Audible, visual, and olfactory (AVO) inspections	☑ Infrared (FLIR) cameras	☐ Other (please describe)	☐ None required

Component Type	Closed Vent System	Count	Source of Leak Factors (EPA, other (specify))	Stream type (gas, liquid, etc.)	Estimated Emissions (tpy)			
					VOC	HAP	GHG (methane)	GHG (CO2e)
Valves	☐ Yes ☑ No	400	EPA	gas	3.137	0.322	10.740	268.493
Valves	☐ Yes ☑ No	416	EPA	liquid	9.716	0.863	0.078	1.941
Connections (Not sampling)	☐ Yes ☑ No	472	EPA	gas	0.165	0.017	0.563	14.081
Flanges	☐ Yes ☑ No	104	EPA	gas	0.071	0.007	0.242	6.050

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?
47017061900000	8/14/2014	7/11/2014	Green	OOOO
47017061910000	8/23/2014	6/26/2014	Green	OOOO
47017061930000	8/30/2014	7/20/2014	Green	OOOO
47017061920000	8/16/2014	7/27/2014	Green	OOOO
47017065630000	9/9/2015	6/17/2015	Green	OOOO
47017065640000	9/13/2015	7/1/2015	Green	OOOO
47017065610000	8/30/2015	5/31/2015	Green	OOOO
47017065620000	9/4/2015	6/4/2015	Green	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 Sheet

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 001-06
3. Emission Unit ID number: TANKCOND001-006	4. Emission Point ID number. EP-EC001, EP-EC002, EP-EC003
5. Date Installed , Modified or Relocated (for existing tanks) 2014 Was the tank manufactured after August 23, 2011 and on or before September 18, 2015? ☑ Yes ☐ No Was the tank manufactured after September 18, 2015? ☐ Yes ☑ No	6. Type of change: ☑ New construction ☐ New stored material ☐ Other ☐ Relocation

7A. Description of Tank Modification (if applicable)

7B. Will more than one material be stored in this tank? If so, a separate form must be completed for each material.
☐ Yes ☑ No

7C. Was USEPA Tanks simulation software utilized?
☐ Yes ☑ No

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

TANK INFORMATION

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 400bbls	
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.: 400bbls	
13A. Maximum annual throughput (gal/yr): 1839600	13B. Maximum daily throughput (gal/day): 5040
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume): 19	15. Maximum tank fill rate (gal/min) 168

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

17. Is the tank system a variable vapor space system? ☐ Yes ☑ No

If yes, (A) What is the volume expansion capacity of the system (gal)?
(B) What are the number of transfers into the system per year?

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

☑ Fixed Roof ☑ vertical ☐ horizontal ☑ flat roof ☐ cone roof ☐ dome roof ☐ other (describe)
☐ External Floating Roof ☐ pontoon roof ☐ double deck roof
☐ Domed External (or Covered) Floating Roof
☐ Internal Floating Roof ☐ vertical column support ☐ self-supporting
☐ Variable Vapor Space ☐ lifter roof ☐ diaphragm
☐ Pressurized ☐ spherical ☐ cylindrical
☐ other

ATTACHMENT L – STORAGE VESSEL DATA SHEET

PRESSURE/VACUUM CONTROL DATA

19. Check as many as apply:

☐ Does Not Apply

☐ Inert Gas Blanket of

☑ Vent to Vapor Combustion Device (vapor combustors, flares, thermal oxidizers, enclosed combustors)

☐ Conservation Vent (psig)

Vacuum Setting Pressure Setting

Emergency relief Valve (psig)

Vacuum Setting Pressure Setting

☐ Thief Hatch Weighted ☐ Yes ☐ No

Complete appropriate Air Pollution Control Device Sheet

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

Material Name	Flashing Loss		Breathing Loss		Working Loss		Total Emission Loss		[1]Estimation Method
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
Please see Table 6 and Table 7									

TANK CONSTRUCTION & OPERATION INFORMATION

21. Tank Shell Construction:
☐ Riveted ☐ Gunite lined ☐ Epoxy-coated Other (describe): Steel

21A. Shell Color: Green	21B. Roof Color: Green	21C. Year Last Painted 2014

22. Shell Condition (if metal and unlined):
☑ No Rust ☐ Light Rust ☐ Dense Rust Not applicable

22A. Is the tank heated? Yes No	22B. If yes, operating temperature:	22C. If yes, how is heat provided to tank?

23. Operating Pressure Range (psig): 0 psig, atmospheric
Must be listed for tanks using VRUs with closed vent system

24. Is the tank a Vertical Fixed Roof Tank? ☑ Yes ☐ No	24A. If yes, for dome roof provide radius (ft): NA	24B. If yes, for cone roof, provide slop (ft/ft): NA

25. Complete the following section for **Floating Roof Tanks** Does Not Apply

25A. Year Internal Floaters Installed:

25B. Primary Seal Type: ☐ Metallic (mechanical) shoe seal ☐ Liquid mounted resilient seal ☐ Vapor mounted resilient seal Other (describe):

25C. Is the Floating Roof equipped with a Secondary Seal? Yes No

25D. If YES, how is the secondary seal mounted? (check one) ☐ Shoe ☐ Rim Other (describe)

25E. Is the Floating Roof equipped with a weather shield? Yes No

25F. Describe deck fittings

26. Complete the following section for Internal Floating Roof Tanks ☑ Does not apply

26A. Deck Type: ☐ Bolted Welded	26B. For bolted decks, provide deck construction

26C. Deck seam:
☐ 5 ft. wide ☐ 6 ft. wide ☐ 7 ft. wide ☐ 5 x 7.5 ft wide ☐ 5 x 12 ft wide ☐ Other (describe)

26D. Deck seam length (ft)	26E. Area of deck (ft_2)	26F. For column supported tanks: Number of columns:	26G. For column supported tanks, Diameter of each column:

27. Closed Vent System with VRU ☐ Yes ☑ No

28. Closed Vent System with Enclosed Combustor? ☑ Yes ☐ No

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/(ftz·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)	2.2013
39A. Average Liquid Surface Temperature (°F)	72.10	39B. Corresponding Vapor Pressure (psia)	3.6401
40A. Maximum Liquid Surface Temperature (°F)	75.94	40B. Corresponding Vapor Pressure (psia)	3.9100

41. Provide the following for <u>each</u> 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)	5.7300		
41D. Liquid Molecular Weight (lb/lb-mole)	96.80		
41E. Vapor Molecular Weight (lb/lb-mole)	43.8175		
Maximum Vapor Pressure 41F. True (psia)	3.9100		
41G. Reid (psia)	5.02		
Months Storage per Year 41H. From - To	year round		
Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations 42.	165 psig; 70 F		

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. EP-EC001, EP-EC002, EP-EC003
5. Date Installed , Modified or Relocated (for existing tanks) 2014 Was the tank manufactured after August 23, 2011 and on or before September 18, 2015? ☑ Yes ☐ No Was the tank manufactured after September 18, 2015? ☐ Yes ☑ No	6. Type of change: ☑ New construction ☐ New stored material ☐ Other ☐ Relocation

7A. Description of Tank Modification (if applicable)

7B. Will more than one material be stored in this tank? If so, a separate form must be completed for each material.
☐ Yes ☑ No

7C. Was USEPA Tanks simulation software utilized?
☐ Yes ☑ No

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

TANK INFORMATION

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 400bbls

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.: 400bbls

13A. Maximum annual throughput (gal/yr): 9198000	13B. Maximum daily throughput (gal/day): 25200
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume): 274	15. Maximum tank fill rate (gal/min) 168

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

17. Is the tank system a variable vapor space system? ☐ Yes ☑ No

If yes, (A) What is the volume expansion capacity of the system (gal)?
(B) What are the number of transfers into the system per year?

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

☑ Fixed Roof ☑ vertical ☐ horizontal ☑ flat roof ☐ cone roof ☐ dome roof ☐ other (describe)
☐ External Floating Roof ☐ pontoon roof ☐ double deck roof
☐ Domed External (or Covered) Floating Roof
☐ Internal Floating Roof ☐ vertical column support ☐ self-supporting
☐ Variable Vapor Space ☐ lifter roof ☐ diaphragm
☐ Pressurized ☐ spherical ☐ cylindrical

ATTACHMENT L – STORAGE VESSEL DATA SHEET

PRESSURE/VACUUM CONTROL DATA

19. Check as many as apply:

☐ Does not apply ☐ Rupture Disc (psig)

☐ Inert Gas Blanket ☐ Carbon Adsorption

☑ Vent to Vapor Combustion Device (vapor combustors, flares, thermal oxidizers, enclosed combustors)

Conservation Vent (psig)
Vacuum Setting Pressure Setting

☐ Emergency relief Valve (psig)
Vacuum Setting Pressure Setting

☐ Thief Hatch Weighted ☐ Yes ☐ No

Complete appropriate Air Pollution Control Device Sheet

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

Material Name	Flashing Loss		Breathing Loss		Working Loss		Total Emission Loss		[1] Estimation Method
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
Please see Table 6 and Table 7									

TANK CONSTRUCTION & OPERATION INFORMATION

21. Tank Shell Construction:
☐ Riveted ☐ Gunite lined ☐ Epoxy-coated ☑ Other(describe): Steel

21A. Shell Color: Green	21B. Roof Color: Green	21C. Year Last Painted 2014

22. Shell Condition (if metal and unlined):
☑ No Rust ☐ Light Rust ☐ Dense Rust Not applicable

22A. Is the tank heated? Yes No	22B. If yes, operating temperature:	22C. If yes, how is heat provided to tank?

23. Operating Pressure Range (psig): 0 psig, atmospheric
Must be listed for tanks using VRUs with closed vent system

24. Is the tank a Vertical Fixed Roof Tank? ☑ Yes ☐ No	24A. If yes, for dome roof provide radius (ft): NA	24B. If yes, for cone roof, provide slop (ft/ft): NA

25. Complete the following section for **Floating Roof Tanks** Does Not Apply

25A. Year Internal Floaters Installed:

25B. Primary Seal Type: Metallic (mechanical) shoe seal Liquid mounted
Vapor mounted resilient seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a Secondary Seal? ☐ Yes ☐ No

25D. If YES, how is the secondary seal mounted? (check one)
☐ Shoe ☐ Rim ☐ Other(describe):

25E. Is the Floating Roof equipped with a weather shield? ☐ Yes ☐ No

25F. Describe deck fittings

26. Complete the following section for Internal Floating Roof Tanks ☑ Does not apply

26A. Deck Type: ☐ Bolted ☐ Welded	26B. For bolted decks, provide deck construction

26C. Deck seam:
☐ 5 ft. wide ☐ 6 ft. wide ☐ 7 ft. wide ☐ 5 x 7.5 ft. wide ☐ 5 x 12 ft. wide ☐ Other (describe)

26D. Deck seam length (ft)	26E. Area of deck (ft^2)	26F. For column supported tanks: Number of columns:	26G. For column supported tanks, Diameter of each column:

27. Closed Vent System with VRU ☐ Yes ☑ No

28. Closed Vent System with Enclosed Combustor? ☑ Yes ☐ No

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/(ft2· 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)	0.2279
39A. Average Liquid Surface Temperature (°F)	72.10	39B. Corresponding Vapor Pressure (psia)	0.4522
40A. Maximum Liquid Surface Temperature (°F)	75.94	40B. Corresponding Vapor Pressure (psia)	0.4985

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)	18.44		
41E. Vapor Molecular Weight (lb/lb-mole)	18.4387		
Maximum Vapor Pressure 41F. True (psia)	0.4985		
41G. Reid (psia)	1.0328		
Months Storage per Year 41H. From - To	year round		
Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations 42.	165 psig; 70 F		

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	2014	Existing	1.5	1277.7
GPU002	EP-GPU002	Gas Production Unit Heater	2014	Existing	1.5	1277.7
GPU003	EP-GPU003	Gas Production Unit Heater	2014	Existing	1.5	1277.7
GPU004	EP-GPU004	Gas Production Unit Heater	2014	Existing	1.5	1277.7
GPU005	EP-GPU005	Gas Production Unit Heater	2014	Existing	1.5	1277.7
GPU006	EP-GPU006	Gas Production Unit Heater	2014	Existing	1.5	1277.7
GPU007	EP-GPU007	Gas Production Unit Heater	2014	Existing	1.5	1277.7
GPU008	EP-GPU008	Gas Production Unit Heater	2014	Existing	1.5	1277.7
LH001	EP-LH001	Line Heater	2014	Removal-2017	2	1277.7
LH002	EP-LH002	Line Heater	2014	Removal-2017	2	1277.7
LH003	EP-LH003	Line Heater	2014	Removal-2017	2	1277.7
LH004	EP-LH004	Line Heater	2014	Removal-2017	2	1277.7
LH005	EP-LH005	Line Heater	2014	Removal-2017	2	1277.7
LH006	EP-LH006	Line Heater	2014	Removal-2017	2	1277.7
LH007	EP-LH007	Line Heater	2014	Removal-2017	2	1277.7
LH008	EP-LH008	Line Heater	2014	Removal-2017	2	1277.7

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

Attachment N
Internal Combustion Engine Data Sheet

ATTACHMENT N – INTERNAL COMBUSTION ENGINE DATA SHEET

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

Emission Unit ID#	ENG001	
Engine Manufacturer/Model	Engine (Kubota DG972-E2)	
Manufacturers Rated bhp/rpm	24 HP @ 3600 rpm	
Source Status	REM	
Date Installed/ Modified/ Removed/ Relocated	2017	
Engine Manufacturer/ Reconstruction Date	2013	
Check all applicable Federal Rules for the engine (include EPA Certification of Conformity if applicable)	☑ 40CFR60 Subpart JJJJ ☑ JJJJ Certified? ☐ 40CFR60 Subpart IIII ☐ IIII Certified? ☑ 40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources	☐ 40CFR60 Subpart JJJJ ☐ JJJJ Certified? ☐ 40CFR60 Subpart IIII ☐ IIII Certified? ☐ 40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources
Engine Type	4SRB	
APCD Type	NSCR	
Fuel Type	RG	
H2S (gr/ 100 scf)	0	
Operating bhp/rpm	16.5 HP @ 2400 rpm	
BSFC (BTU/bhp-hr)	10244	
Hourly Fuel Throughput (Must use 8,760 hrs/yr unless emergency generator)	193 ft^3/hr gal/hr	ft^3/hr gal/hr
Fuel Usage or Hours of Operation Metered	1.6907 $MMft^3/yr$ gal/yr	$MMft^3/yr$ gal/yr

Calculation Methodology	Pollutant	Hourly PTE (lb/hr)	Annual PTE (tons/year)	Hourly PTE (lb/hr)	Annual PTE (tons/year)
MD	NOx	0.0000	0.0000		
MD	CO	0.0000	0.0000		
AP	VOC	0.0000	0.0000		
AP	SO2	0.0000	0.0000		
AP	PM10	0.0000	0.0000		
AP	Formaldehyde	0.0000	0.0000		
AP	Total HAPs	0.0000	0.0000		
OT	GHG (CO2e)	0.0000	0.0000		

Attachment O
Tanker Truck Loading Data Sheet

ATTACHMENT O – TANKER TRUCK LOADING DATA S HEET

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:	2014

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	6	6	6	6
Days/week	2	2	2	2

Bulk Liquid Data (use extra pages as necessary)

Liquid Name		Condensate	Produced Water	
Max. Daily Throughput (1000 gal/day)		5.04	25.20	
Max. Annual Throughput (1000 gal/yr)		1839.60	9198.00	
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		3.6	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)	16.2837	0.0011	
	Annual (ton/yr)	1.4859	0.0005	
Max HAP Emission Rate	Loading (lb/hr)	2.0633	1.12E-05	
	Annual (ton/yr)	0.1883	5.10E-06	
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 R – PNEUMATIC PUMP DATA SHEET

Are there any natural gas-driven diaphragm pumps located at a well site that commenced construction, modification or reconstruction after September 18, 2015?

☐ Yes ☒ No

Please list.

Source ID #	Date	Pump Make/Model	Pump Size

Attachment S
Air Pollution Control Device – Emission Reduction Device Sheets

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

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

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

The following five (5) rows are only to be completed if registering an alternative air pollution control device.

Emission Unit ID:	NA	Make/Model:	NA
Primary Control Device ID:	NA	Make/Model	NA
Control Efficiency (%):	NA	APCD/ERD Data Sheet Completed	☐ Yes ☐ No
Secondary Control Device ID:	NA	Make/Model	NA
Control Efficiency (%):	NA	APCD/ERD Data Sheet Completed	☐ Yes ☐ No

VAPOR COMBUSTION (Including Enclosed Combustors)

General Information

Control Device ID#:	EC001-003	Installation Date: ☑ New ☐ Modified ☐ Relocated	
Maximum Rated Total Flow Capacity	5458 scfh 131000 scfd	Maximum Design Heating Input (from mfg. spec sheet)	12.0 MMBTU/hr
Design Heat Content	2300 BTU/scf		

Control Device Information

Type of Vapor Combustion Control?

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

Manufacturer: Cimarron Model: 48" HV ECD		Hours of operation per year?	8760

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

Emission Unit ID#	Emission Source Description	Emission Unit ID#	Emission Source Description
TANKCOND001-006	Condensate Tanks		
TANKPW001-002	Produced Water Tanks		

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

Assist Type (Flares only)	Flare height	Tip Diameter	Was the design per §60.18?
☐ Steam ☐ Air ☐ Pressure ☑ Non	25 feet	3.33 feet	☑ Yes ☐ No Provide determination

Waste Gas Information

Maximum Waste Gas Flow Rate	Heat Value of Waste Gas Stream	Exit Velocity of the Emission Stream
13.83 (scfm)	2,067.13 BTU/ft^3	0.0265 (ft/s)

Please see Attachment S, Tables 6 & 7 for VOC composition/ characteristics of the waste gas stream to be burned.

Pilot Gas Information

Number of Pilot Lights	Fuel Flow Rate to Pilot Flame per Pilot	Heat Input per Pilot	Will automatic re-ignition be used?
3	17 scfh	21721 BTU/hr	☑ Yes ☐ No

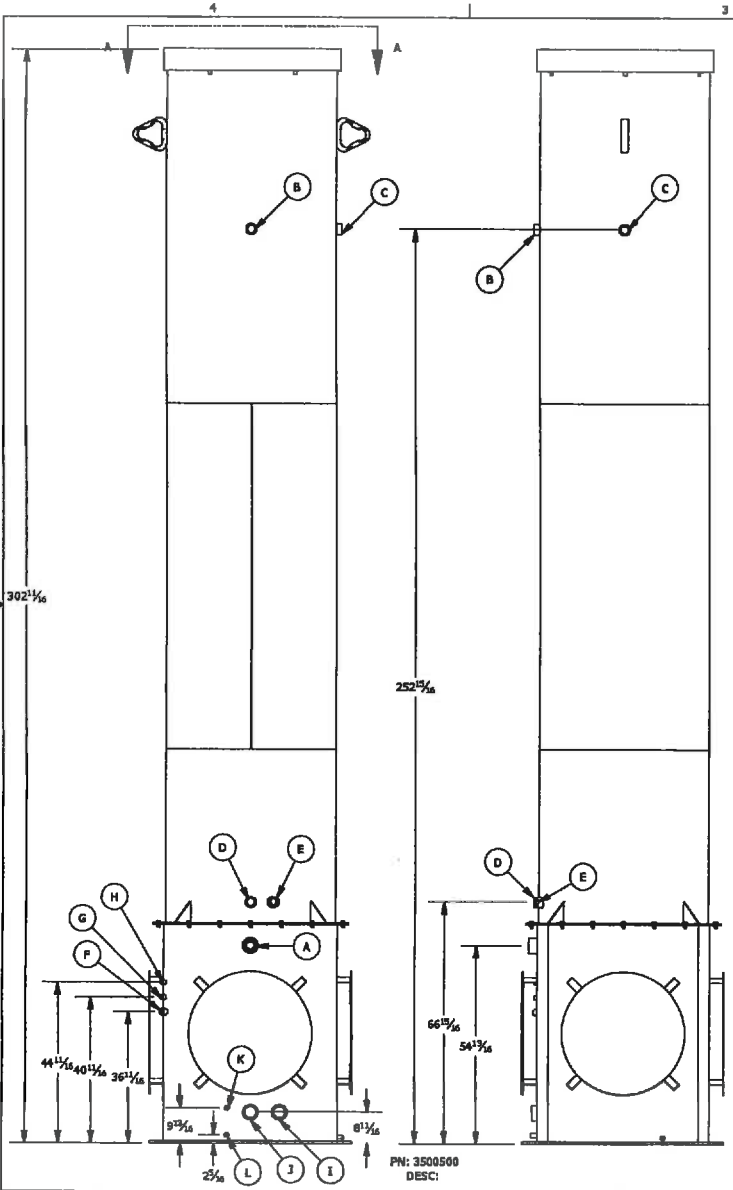
If automatic re-ignition is used, please describe the method. Flame Rectification, a thermocouple equivalent

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

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

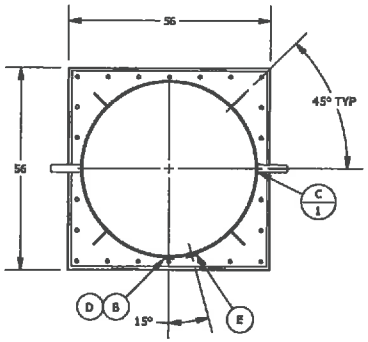
Additional information attached? ☑ Yes ☐ No Manufacturer's specs sheet

Please attach copies of manufacturer's data sheets, drawings, flame demonstration per §60.18 or §63.11 (b) and performance testing.



48" DIA x 302 5/8" HEIGHT, 88 ORIFICES EMISSION CONTROL DEVICE

* >98% TVOC DRE, CERTIFIED USEPA 40 CFR 60, APPENDIX A, SOURCE EMMISIONS TEST METHODS REFERENCED. MEETS ALL EPA & CDPHE REGULATIONS.
* DESTROYS OIL/CONDENSATE PRODUCTION TANK VAPORS W/ NO VISIBLE FLAME.
* EXCELLENT OPACITY AND SMOKELESS OPERATION.
* RELIABLE AND CUSTOMIZABLE IGNITION.
* VERY LOW CAPITAL AND OPERATING COST.
* EASY TO OPERATE AND MAINTAIN.
* FIELD TESTED TO DESTROY UP TO 119.5 MDSCFD (131 MCFD) @ 10 oz/in^2; 2300 BTU/CF WASTE GAS (SG 1.45)
* STRUCTURE CERTIFIED FOR 90 MPH 3-SEC WIND GUST PER ASCE 7-05 & IBC 2006 STANDARDS. HIGHER WIND LOAD RATED STRUCTURES AVAILABLE.



VIEW A-A

PN: 3500500
DESC:

SCHEDULE OF NOZZLES				
MARK	QTY	DESCRIPTION	SERIES	SERVICE
A	1	3" HALF COUPLING	2000#	BURNER WASTE GAS IN
B	1	2" FULL COUPLING	3000#	FLOW TEST/AUTOMATION
C	1	2" FULL COUPLING	3000#	FLOW TEST/AUTOMATION
D	1	2" FULL COUPLING	3000#	SIGHT GLASS
E	1	2" FULL COUPLING	3000#	MANUAL LIGHTING
F	1	1" FULL COUPLING	3000#	PILOT GAS IN
G	1	1/2" FULL COUPLING	3000#	IGNITOR CABLE
H	1	1/2" FULL COUPLING	3000#	AUTOMATION
I	1	3" HALF COUPLING	3000#	DRIP TANK WASTE GAS IN
J	1	3" HALF COUPLING	3000#	DRIP TANK WASTE GAS OUT
K	1	1/2" FULL COUPLING	3000#	AUTOMATION
L	1	1/2" FULL COUPLING	3000#	LIQUID DRAIN

UNLESS OTHERWISE SPECIFIED

1. REMOVE ALL BURRS AND SHARP CORNERS.
2. COR. RAD .03
3. DO NOT SCALE DRAWING.
4. ALL DIMENSIONS ARE IN INCHES.
5. MACHINE FIN.
6. FABRICATION
   .X = ± 0.25
   .XX = ± 0.125
   .XXX = ± 0.06
   ANGLES ± 3°
7. MACHINE
   .X = ±0.030
   .XX = ±0.015
   .XXX = ±0.005
   ANGLES ±1/2°
   CONTRICITY WITHIN 0.010 TIR

APPROVED FOR A.S.M.E CODE, SECTION VIII DIV 1
_____ED,_____ ADDENDA BY_____ DATE_____

CIMARRON
Energy Inc.

TITLE:
48" HIGH VOLUME ECD

DATE:	WO No.:	SHEET: 1 OF 1

DRAWN BY: TDS | REV. | DRAW NO.: 3500500

Attachment T
Emissions Calculations

Table 1

Facility Information
Primm 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	Primm Well Pad
Nearest City/Town	West Union
API Number/SIC Code	1311
Latitude/Longitude	39.2417, -80.85264
County	Doddridge County

Technical Information	
Max Condensate Site Throughput (bbl/day):	120
Max Produced Water Site Throughput (bbl/day):	600
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	8
Gas Production Unit Heaters	8
Condensate Tanks	6
Produced Water Tanks	2
Loading Jobs	2
Enclosed Combustors	3

Table 2

Uncontrolled/Controlled Emissions Summary
Primm 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]	3.0737	13.4629			2.9465	12.9057	73.664	322.65							0.8589	0.2834			0.2849	1.2478	0.0035	0.0153	3.45E-02	1.51E-01		
Flashing, Working and Breathing (F/W/B) Losses[2]	62.6486	274.4008			10.8525	47.5340	271.5252	1189.2805											8.8331	38.6891	0.0214	0.0935	0.0581	0.2543		
Gas Production Unit Heater Emissions[3]	0.0517	0.2263	0.9392	4.1136	0.0216	0.0946	1,127.03	4,936.37	0.7889	3.4555	0.0056	0.0247	0.0714	0.3126	0.0714	0.3126	4.70E-06	2.06E-05	0.018	0.077	1.97E-05	8.64E-05			0.0007	0.0031
TOTALS:	**65.7740**	**288.0900**	**0.9392**	**4.1136**	**13.8206**	**60.5344**	**1472.2149**	**6448.3011**	**0.7889**	**3.4555**	**0.0056**	**0.0247**	**0.0714**	**0.3126**	**0.9303**	**0.5960**	**4.70E-06**	**2.06E-05**	**9.1357**	**40.0143**	**0.0249**	**0.1089**	**0.0926**	**0.4056**	**0.0007**	**0.0031**
UNCONTROLLED (Truck Loading Emissions)																										
Truck Loading Emissions[4]	16.2848	1.4864			0.6562	0.0733	16.4774	1.8543											2.0633	0.1883	0.0032	2.92E-04	0.0103	0.0009		
CONTROLLED EMISSIONS																										
Enclosed Combustor Emissions (from F/W/B losses)[5]	1.2533	5.4892	2.4531	10.7446	0.2039	0.8932	255.2160	1117.8461	11.1643	48.8996	3.06E-05	0.0001	0.0050	0.0220	0.0067	0.0293	4.40E-07	1.93E-06	0.1768	0.7742	0.0004	0.0019	0.0012	0.0051	3.83E-06	1.68E-05
Controlled Fugitive Emissions from Hauling															0.4295	0.1417										
TOTALS:	**1.253**	**5.489**	**2.453**	**10.745**	**0.204**	**0.893**	**255.216**	**1117.846**	**11.164**	**48.900**	**3.06E-05**	**1.34E-04**	**0.005**	**0.022**	**0.436**	**0.171**	**4.40E-07**	**1.93E-06**	**0.177**	**0.774**	**4.27E-04**	**1.87E-03**	**1.16E-03**	**0.005**	**3.83E-06**	**1.68E-05**
POTENTIAL TO EMIT[6]	**4.3786**	**20.6648**	**3.3923**	**14.8582**	**3.1721**	**13.9669**	**1455.9056**	**6378.7208**	**11.9532**	**52.3550**	**0.0057**	**0.0248**	**0.0764**	**0.3346**	**0.5075**	**0.4837**	**5.14E-06**	**2.25E-05**	**0.4793**	**2.2877**	**0.0039**	**0.0176**	**0.0357**	**0.1573**	**0.0007**	**0.0031**
POTENTIAL TO EMIT (Excluding Fugitives)	**1.3049**	**7.2019**	**3.3923**	**14.8582**	**0.2255**	**1.0612**	**1382.2411**	**6056.0704**	**11.9532**	**52.3550**	**0.0057**	**0.0248**	**0.0764**	**0.3346**	**0.0781**	**0.3420**	**5.14E-06**	**2.25E-05**	**0.1944**	**1.0399**	**0.0004**	**0.0022**	**0.0012**	**0.0060**	**0.0007**	**0.0031**

Enter any notes here:	1 - See Tables 4 and 5 for fugitive emission calculations; Table 12 for PM emissions from hauling. 2 - See Tables 6 and 7 for tanks emission calculations 3 - See Table 9 for gas production unit heater emission calculations 4 - The maximum emission was calculated based on tank truck capacity of 200 barrels and actual fill rate of 50 minutes per tank truck. At a production rate of 120 barrels per day, VOC emissions would be 16.2848 pounds per hour when there are truck loading activities. Average hourly VOC emissions from truck loading is 0.3394 pound per hour. 5- See Table 10 and 11 for enclosed combustion emission calculations. 6 - The hourly potential to emit is the sum of emissions from gas production unit heaters, storage tanks, enclosed combustors, and fugitives. Does not include emissions from loading (see footnote 5). The total TPY PTE is the sum of all emissions. PM 10 TPY is the sum of uncontrolled hauling and other PM10 sources.

Table 3

Permits Summary

Primm Well Pad

Doddridge County, West Virginia

Antero Resources Corporation

Pollutant		Emissions		Threshold Exceeded?		
		Uncontrolled	Controlled	Threshold	Uncontrolled	Controlled
VOC	lbs/hr	65.7740	4.3786	6	**Yes**	
	tons/yr	289.5763	20.6648	10	**Yes**	**Yes**
NO_X	lbs/hr	0.9392	3.3923	6		
	tons/yr	4.1136	14.8582	10		**Yes**
CH_4	lbs/hr	13.8206	3.1721			
	tons/yr	60.6077	13.9669			
CO	lbs/hr	0.7889	11.9532	6		**Yes**
	tons/yr	3.4555	52.3550	10		**Yes**
SO_2	lbs/hr	0.0056	0.0057	6		
	tons/yr	0.0247	0.0248	10		
$PM_{2.5}$	lbs/hr	0.0714	0.0764	6		
	tons/yr	0.3126	0.3346	10		
PM_{10}	lbs/hr	0.9303	0.5075	6		
	tons/yr	0.5960	0.4837	10		
Lead	lbs/hr	4.70E-06	5.14E-06	6		
	tons/yr	2.06E-05	2.25E-05	10		
Total HAPs	lbs/hr	9.1357	0.4793	2	**Yes**	
	tons/yr	40.2026	2.2877	5	**Yes**	
Total TAPs	lbs/hr	0.0256	0.0047	1.14		
n-Hexane	lbs/hr	8.9135	0.4117			
	tons/yr	39.2272	1.9893			
Toluene	lbs/hr	0.0713	0.0155			
	tons/yr	0.3129	0.0689			
Ethylbenzene	lbs/hr	0.0327	0.0117			
	tons/yr	0.1435	0.0515			
Xylenes	lbs/hr	0.0926	0.0357			
	tons/yr	0.4066	0.1573			
Benzene	lbs/hr	0.0249	0.0039			
	tons/yr	0.1092	0.0176			

Enter any notes here:	1. Emissions are based on 98% Enclosed Combustor DRE operating 100% of the time. 2. Please see Attachment J - Fugitive Emissions Data Summary Sheet and Attachment T - Emission Points Summary Sheet for sitewide sources and breakdown of emission quantities.

Table 4

Fugitive Emissions
Primm 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	0.181
	Benzene frac	0.000
	Toluene	0.000
	Ethylbenzene	0.000
	Xylenes	0.000
	n-Hexane	0.019
	HAPs	0.019
	Methane	0.619

Gas					
Number	Component	Pollutant	Emission Factor (kg/hr of THC per component)	kg/hr	lb/yr
400	Valves	Gas VOC	0.004500	0.33	6,274.63
		Non VOC	0.004500	1.47	28,414.97
		HAPs	0.004500	0.03	644.66
		CO2e	0.004500	27.86	536,986.73
472	Connectors	VOC	0.000200	0.02	329.07
		Non-VOC	0.000200	0.08	1,490.21
		HAPs	0.000200	0.00	33.81
		CO2e	0.000200	1.46	28,161.97
104	Flanges	VOC	0.000390	0.01	141.39
		Non-VOC	0.000390	0.03	640.28
		HAPs	0.000390	0.00	14.53
		CO2e	0.000390	0.627859	12100.100917
			Total VOCs:	0.35	6745.09
			Total THC:	1.93	37290.55
			Total CH4:	1.20	23089.95

Light Liquid Weight Fraction From Analysis:	VOC frac	0.969
	Benzene frac	0.002
	Toluene	0.006
	Ethylbenzene	0.005
	Xylenes	0.015
	n-hexane	0.058
	HAPs	0.086
	Methane	0.008

Light Liquid					
Number	Component	Pollutant	Emission Factor (kg/hr of THC per component)	kg/hr	lb/yr
416	Valves	Light Liquid VOC	0.002500	1.01	19,431.01
		Light Liquid Non-VOC	0.002500	0.03	611.87
		Light Liquid HAPs	0.002500	0.09	1,725.57
		CO2e	0.002500	0.20	3882.47
			Total VOC:	1.01	19,431.01
			Total THC:	1.04	20,042.88
			Total CH4:	0.01	155.30

Fugitive Total Emissions			
	Annual Emissions (lb/yr)	Annual Emissions (lb/hr)	Annual Emissions (tpy)
VOC	26,176.10	2.99	13.09
Ethylbenzene		0.01	0.05
Toluene		0.01	0.06
Xylenes		0.03	0.15
n-Hexane		0.21	0.93
TAPs (Benzene)		0.00	0.02
HAPs		0.28	1.21
CH_4 [3]		2.65	11.62
CO_{2e}	581,131.26	66.34	290.57

Enter Notes Here:	Fugitive emissions based on an estimated component count Global Warming Potentials from EPA site Reference to Emission factors used: 1. 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. 2. Percent of speciated VOCs used in fugitive calculations are based on the total hydrocarbons, not of the total sample. 3. CH_4 emissions are based on percent of CH4 of the total hydrocarbons

Table 5

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

Number of PCVs	32
Bleed Rate (scf/day/PCV)	6.6
Total Bleed Rate (scf/day)	211.2

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	0.491	14.01	1.036992	2.73E-03	0.04	1.60E-03	0.01
Carbon Dioxide	0.154	44.01	0.325248	8.57E-04	0.04	1.57E-03	6.88E-03
Methane	78.758	16.04	166.336896	0.44	7.03	0.29	1.28
Ethane	13.565	30.07	28.64928	0.08	2.27	0.09	0.41
Propane	4.301	44.1	9.083712	0.02	1.06	0.04	0.19
Isobutane	0.571	58.12	1.205952	3.18E-03	0.18	0.01	0.03
n-Butane	1.128	58.12	2.382336	6.28E-03	0.36	0.02	0.07
Isopentane	0.3	72.15	0.6336	1.67E-03	0.12	5.02E-03	0.02
n-Pentane	0.292	72.15	0.616704	1.63E-03	0.12	4.89E-03	0.02
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	0.44	86.18	0.92928	2.45E-03	0.21	0.01	0.04
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
2-Methylhexane	0.00E+00	100.2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3-Methylhexane	0.00E+00	100.2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Heptane	0.00E+00	100.21	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methylcyclohexane	0.00E+00	98.186	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	106.16	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
o-Xylene	0.00E+00	106.16	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nonane	0.00E+00	128.2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C10+	0.00E+00	174.28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	lb/hr	tpy
VOC Emissions	0.0856	0.3748
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	0.0088	0.0385
HAPs Emissions	0.0088	0.0385
TAPs Emissions	0.00E+00	0.00E+00
CH_4 Emissions	0.2929	1.2831
CO_{2e} emissions	7.3253	32.0849

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

Table 6

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

# Hours Operational	8760

	Condensate Tank Flashing Losses			Produced Water Tank Flashing Losses		
	Vapor Mass Fraction	Flashing Losses		Vapor Mass Fraction	Flashing Losses	
	wt%	lbs/hr	tpy	wt%	lbs/hr	tpy
Water	0.1683	0.1398	0.6122	2.6360	0.0784	0.3433
H2S	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Nitrogen	0.0400	0.0332	0.1454	0.3223	0.0096	0.0420
Carbon Dioxide	0.1550	0.1287	0.5637	2.4902	0.0740	0.3243
Methane	10.8662	9.0232	39.5217	56.3424	1.6751	7.3368
Ethane	18.6302	15.4704	67.7604	25.1095	0.7465	3.2697
Propane	23.1745	19.2440	84.2888	8.1379	0.2419	1.0597
Isobutane	6.6153	5.4933	24.0608	1.0163	0.0302	0.1323
n-Butane	15.0852	12.5267	54.8668	2.5002	0.0743	0.3256
Isopentane	6.1385	5.0974	22.3265	0.5943	0.0177	0.0774
n-Pentane	6.3302	5.2565	23.0236	0.2306	0.0069	0.0300
2-Methylpentane	0.4130	0.3429	1.5020	0.0192	0.0006	0.0025
3-Methylpentane	0.2586	0.2147	0.9406	0.0287	0.0009	0.0037
n-Hexane	9.8345	8.1665	35.7693	0.2212	0.0066	0.0288
Methylcyclopentane	0.1324	0.1099	0.4815	0.0235	0.0007	0.0031
Benzene	0.0235	0.0195	0.0854	0.0359	0.0011	0.0047
2-Methylhexane	0.2661	0.2210	0.9679	0.0086	0.0003	0.0011
3-Methylhexane	0.2111	0.1753	0.7678	0.0081	0.0002	0.0011
Heptane	0.5144	0.4272	1.8710	0.0084	0.0003	0.0011
Methylcyclohexane	0.3206	0.2663	1.1662	0.0547	0.0016	0.0071
Toluene	0.0627	0.0521	0.2280	0.0888	0.0026	0.0116
Octane	0.5359	0.4450	1.9492	0.0036	0.0001	0.0005
Ethylbenzene	0.0236	0.0196	0.0858	0.0326	0.0010	0.0042
m & p-Xylene	0.0324	0.0269	0.1178	0.0408	0.0012	0.0053
o-Xylene	0.0314	0.0261	0.1143	0.0449	0.0013	0.0058
Nonane	0.1323	0.1099	0.4812	0.0009	0.0000	0.0001
C10+	0.0043	0.0036	0.0156	0.0005	0.0000	0.0001
Total VOCs	70.140	58.24	255.1	13.100	0.3895	1.7058
Total CO_{2e}		225.71	988.6		41.95	183.7
CH_4		9.02	39.52		1.68	7.34
Total TAPs (Benzene)		0.0195	0.0854		0.0011	0.0047
Toluene		0.0521	0.2280		0.0026	0.0116
Ethylbenzene		0.0196	0.0858		0.0010	0.0042
Xylenes		0.0530	0.2320		0.0025	0.0112
n-Hexane		8.166	35.769		0.0066	0.0288
Total HAPs		8.311	36.401		0.0138	0.0604
Total	100.00	83.04	363.7	100.00	2.973	13.02

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

Table 7

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

Condensate Tank Information	
Number of Tanks	6
Maximum Working Losses (lbs/hr)	2.2822
Maximum Breathing Losses (lbs/hr)	3.2907
# Hours Operational	8760

	Condensate Tank W/B Losses						
	Vapor Mass Fraction	Working Losses		Breathing Losses		Max W/B Losses	
	wt%	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	0.0020	4.66E-05	2.04E-04	0.0001	0.0003	0.0001	0.0005
Carbon Dioxide	0.1414	0.0032	0.0141	0.0047	0.0204	0.0079	0.0345
Methane	2.7403	0.0625	0.2739	0.0902	0.3950	0.1527	0.6689
Ethane	25.0742	0.5722	2.5064	0.8251	3.6140	1.3973	6.1204
Propane	25.9003	0.5911	2.5890	0.8523	3.7330	1.4434	6.3220
Isobutane	6.9458	0.1585	0.6943	0.2286	1.0011	0.3871	1.6954
n-Butane	15.8558	0.3619	1.5849	0.5218	2.2853	0.8836	3.8702
Isopentane	5.9464	0.1357	0.5944	0.1957	0.8571	0.3314	1.4515
n-Pentane	6.0310	0.1376	0.6029	0.1985	0.8693	0.3361	1.4721
2-Methylpentane	0.3701	0.0084	0.0370	0.0122	0.0533	0.0206	0.0903
3-Methylpentane	0.2311	0.0053	0.0231	0.0076	0.0333	0.0129	0.0564
n-Hexane	9.0142	0.2057	0.9011	0.2966	1.2992	0.5023	2.2003
Methylcyclopentane	0.1079	0.0025	0.0108	0.0036	0.0156	0.0060	0.0263
Benzene	0.0140	3.19E-04	0.0014	0.0005	0.0020	0.0008	0.0034
2-Methylhexane	0.0650	1.48E-03	0.0065	0.0021	0.0094	0.0036	0.0159
3-Methylhexane	0.1881	0.0043	0.0188	0.0062	0.0271	0.0105	0.0459
Heptane	0.4356	0.0099	0.0435	0.0143	0.0628	0.0243	0.1063
Methylcyclohexane	0.2743	0.0063	0.0274	0.0090	0.0395	0.0153	0.0670
Toluene	0.0387	8.82E-04	3.87E-03	0.0013	0.0056	0.0022	0.0094
Octane	0.4520	0.0103	0.0452	0.0149	0.0651	0.0252	0.1103
Ethylbenzene	0.0157	3.59E-04	1.57E-03	0.0005	0.0023	0.0009	0.0038
m & p-Xylene	0.0282	6.43E-04	2.82E-03	0.0009	0.0041	0.0016	0.0069
o-Xylene	0.0174	3.98E-04	0.0017	0.0006	0.0025	0.0010	0.0043
Nonane	0.1080	0.0025	0.0108	0.0036	0.0156	0.0060	0.0264
C10+	0.0021	4.90E-05	0.0002	0.0001	0.0003	0.0001	0.0005
Total VOCs	72.042	1.6441	7.201	2.3707	10.3835	4.0148	17.585
Total CO_{2e}		1.5667	6.8620	2.2590	9.8943	3.8257	16.756
CH_4		0.0625	0.2739	0.0902	0.3950	0.1527	0.6689
Total TAPs (Benzene)		3.19E-04	1.40E-03	0.0005	0.0020	0.0008	0.0034
Toluene		8.82E-04	3.87E-03	0.0013	0.0056	0.0022	0.0094
Ethylbenzene		3.59E-04	1.57E-03	0.0005	0.0023	0.0009	0.0038
Xylenes		1.04E-03	0.0046	0.0015	0.0066	0.0025	0.0111
n-Hexane		0.2057	0.9011	0.2966	1.2992	0.5023	2.2003
Total HAPs		0.2083	0.9124	0.3004	1.3157	0.5087	2.2281
Total	100.00	2.2822	9.9959	3.2907	14.4131	5.5728	24.409

Table 7

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

Produced Water Tank Information	
Number of Tanks	2
Maximum Working Losses (lbs/hr)	0.0400
Maximum Breathing Losses (lbs/hr)	0.0083

	Produced Water Tank W/B Losses						
	Vapor Mass Fraction	Working Losses		Breathing Losses		Max W/B Losses	
	wt%	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
Water	91.8159	0.0367	0.1609	0.0076	0.0334	0.0444	0.1943
H2S	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrogen	0.0064	2.57E-06	1.12E-05	5.32E-07	2.33E-06	3.10E-06	1.36E-05
Carbon Dioxide	3.3260	0.0013	0.0058	0.0003	0.0012	0.0016	0.0070
Methane	3.1195	0.0012	0.0055	0.0003	0.0011	0.0015	0.0066
Ethane	1.6398	0.0007	0.0029	0.0001	0.0006	0.0008	0.0035
Propane	0.0828	3.31E-05	0.0001	6.87E-06	3.01E-05	4.00E-05	0.0002
Isobutane	0.0026	1.04E-06	4.54E-06	2.15E-07	9.41E-07	1.25E-06	5.48E-06
n-Butane	0.0057	2.30E-06	1.01E-05	4.76E-07	2.08E-06	2.77E-06	1.21E-05
Isopentane	0.0004	1.41E-07	6.18E-07	2.92E-08	1.28E-07	1.70E-07	7.46E-07
n-Pentane	0.0000	1.61E-08	7.06E-08	3.34E-09	1.46E-08	1.95E-08	8.53E-08
2-Methylpentane	1.84E-06	7.38E-10	3.23E-09	1.53E-10	6.70E-10	8.91E-10	3.90E-09
3-Methylpentane	6.11E-06	2.44E-09	1.07E-08	5.07E-10	2.22E-09	2.95E-09	1.29E-08
n-Hexane	7.46E-06	2.99E-09	1.31E-08	6.19E-10	2.71E-09	3.61E-09	1.58E-08
Methylcyclopentane	5.98E-06	2.39E-09	1.05E-08	4.96E-10	2.17E-09	2.89E-09	1.26E-08
Benzene	5.43E-04	2.17E-07	9.52E-07	4.50E-08	1.97E-07	2.62E-07	1.15E-06
2-Methylhexane	4.76E-08	1.91E-11	8.34E-11	3.95E-12	1.73E-11	2.30E-11	1.01E-10
3-Methylhexane	1.78E-07	7.12E-11	3.12E-10	1.48E-11	6.47E-11	8.60E-11	3.77E-10
Heptane	6.02E-08	2.41E-11	1.06E-10	4.99E-12	2.19E-11	2.91E-11	1.27E-10
Methylcyclohexane	4.46E-06	1.79E-09	7.82E-09	3.70E-10	1.62E-09	2.16E-09	9.45E-09
Toluene	2.91E-04	1.16E-07	5.09E-07	2.41E-08	1.06E-07	1.40E-07	6.15E-07
Octane	3.21E-09	1.29E-12	5.63E-12	2.66E-13	1.17E-12	1.55E-12	6.80E-12
Ethylbenzene	3.20E-05	1.28E-08	5.60E-08	2.65E-09	1.16E-08	1.54E-08	6.76E-08
m & p-Xylene	3.07E-05	1.23E-08	5.38E-08	2.55E-09	1.12E-08	1.48E-08	6.50E-08
o-Xylene	4.31E-05	1.72E-08	7.55E-08	3.57E-09	1.57E-08	2.08E-08	9.12E-08
Nonane	2.56E-10	1.02E-13	4.48E-13	2.12E-14	9.29E-14	1.24E-13	5.41E-13
C10+	7.68E-12	3.08E-15	1.35E-14	6.37E-16	2.79E-15	3.71E-15	1.63E-14
Total VOCs	0.0925	3.70E-05	0.0002	7.67E-06	3.36E-05	4.47E-05	0.0002
Total CO_{2e}		0.0325	0.1425	0.0067	0.0295	0.0393	0.1721
CH_4		0.0012	0.0055	0.0003	0.0011	0.0015	0.0066
Total TAPs (Benzene)		2.17E-07	9.52E-07	4.50E-08	1.97E-07	2.62E-07	1.15E-06
Toluene		1.16E-07	5.09E-07	2.41E-08	1.06E-07	1.40E-07	6.15E-07
Ethylbenzene		1.28E-08	5.60E-08	2.65E-09	1.16E-08	1.54E-08	6.76E-08
Xylenes		2.95E-08	1.29E-07	6.12E-09	2.68E-08	3.57E-08	1.56E-07
n-Hexane		2.99E-09	1.31E-08	6.19E-10	2.71E-09	3.61E-09	1.58E-08
Total HAPs		3.79E-07	1.66E-06	7.85E-08	3.44E-07	4.57E-07	2.00E-06
Total	100.00	0.0400	0.1753	0.0083	0.0363	0.0483	0.2116

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

Table 8

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

Annual Loading	Oil Truck Loading	Water Truck Loading
RVP	5.02	1.0328
Annual Average Temp (F)	72.1	72.1
S (saturation factor)	0.6	0.6
P (true vapor pressure)	3.64	0.45
M (MW of vapor)	43.82	18.44
Collection Efficiency (%)	0.00	0.00
Total Hydrocarbon Loading Loss (lb/10^3 gal)*	2.24	0.12
Maximum Throughput (gallons/hr)**	10,080	10,080
Average Throughput (gallons/yr)	1,839,600	9,198,000
Total Hydrocarbon Loading Emissions (lbs/hr)	22.60	1.18
Total Hydrocarbon Loading Emissions (tpy)	2.06	0.54

	Condensate Tank Loading Losses			Produced Water Tank Loading Losses		
	Vapor Mass Fraction	Loading Losses		Vapor Mass Fraction	Loading Losses	
	wt%	lbs/hr	tpy	wt%	lbs/hr	tpy
H2S	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrogen	0.0020	4.62E-04	4.21E-05	0.0064	7.58E-05	3.46E-05
Carbon Dioxide	0.1414	0.0320	2.92E-03	3.3260	3.93E-02	1.79E-02
Methane	2.7403	0.6194	5.65E-02	3.1195	3.69E-02	1.68E-02
Ethane	25.0742	5.6676	0.5172	1.6398	1.94E-02	8.84E-03
Propane	25.9003	5.8543	5.34E-01	0.0828	9.78E-04	4.46E-04
Isobutane	6.9458	1.5700	1.43E-01	0.0026	3.06E-05	1.40E-05
n-Butane	15.8558	3.5839	3.27E-01	0.0057	6.78E-05	3.09E-05
Isopentane	5.9464	1.3441	1.23E-01	0.0004	4.17E-06	1.90E-06
n-Pentane	6.0310	1.3632	1.24E-01	0.0000	4.76E-07	2.17E-07
2-Methylpentane	0.3701	0.0837	7.63E-03	1.84E-06	2.18E-08	9.94E-09
3-Methylpentane	0.2311	0.0522	4.77E-03	6.11E-06	7.22E-08	3.29E-08
n-Hexane	9.0142	2.0375	1.86E-01	7.46E-06	8.82E-08	4.02E-08
Methylcyclopentane	0.1079	0.0244	2.23E-03	5.98E-06	7.06E-08	3.22E-08
Benzene	0.0140	0.0032	2.89E-04	0.0005	6.42E-06	2.93E-06
2-Methylhexane	0.0650	0.0147	1.34E-03	4.76E-08	5.62E-10	2.57E-10
3-Methylhexane	0.1881	0.0425	3.88E-03	1.78E-07	2.10E-09	9.60E-10
Heptane	0.4356	0.0985	8.99E-03	6.02E-08	7.11E-10	3.24E-10
Methylcyclohexane	0.2743	0.0620	5.66E-03	4.46E-06	5.27E-08	2.41E-08
Toluene	0.0387	0.0087	7.98E-04	0.0003	3.43E-06	1.57E-06
Octane	0.4520	0.1022	9.32E-03	3.21E-09	3.80E-11	1.73E-11
Ethylbenzene	0.0157	0.0036	3.24E-04	3.20E-05	3.78E-07	1.72E-07
m & p-Xylene	0.0282	0.0064	5.81E-04	3.07E-05	3.63E-07	1.66E-07
o-Xylene	0.0174	0.0039	3.60E-04	4.31E-05	5.09E-07	2.32E-07
Nonane	0.1080	0.0244	2.23E-03	2.56E-10	3.02E-12	1.38E-12
C10+	0.0021	0.0005	4.43E-05	7.68E-12	9.08E-14	4.14E-14
Total VOCs	72.0419	16.2837	1.4859	0.0925	1.09E-03	4.98E-04
Total CH_4		0.6194	0.0565		0.0369	0.0168
Total CO_{2e}		15.5166	1.4159		0.9608	0.4384
Total TAPs (Benzene)		0.0032	2.89E-04		6.42E-06	2.93E-06
Toluene		0.0087	7.98E-04		3.43E-06	1.57E-06
Ethylbenzene		0.0036	3.24E-04		3.78E-07	1.72E-07
Xylenes		0.0103	9.41E-04		8.72E-07	3.98E-07
n-Hexane		2.0375	1.86E-01		8.82E-08	4.02E-08
Total HAPs		2.0633	1.88E-01		1.12E-05	5.10E-06
Total	100.0000	22.6031	2.0625	100.0000	1.1816	0.5391

Enter any notes here

Vapor mass fractions and loading losses from Promax output

Using equation L_L = 12.46 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 throughput in gallons per hour obtained from actual transfer rate of 200 barrels in 50 minutes. (10,080 gal/hr = 200 bbl / 50 min x 42 gal/bbl x 60 min/hr)

Loading emissions are vented to the atmosphere.

Table 9

Gas Production Unit Heater and Line Heater Emissions
Primm Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

Gas Production Unit Heater Emissions

Number of Units	8
GPU Heater Rating (MMBtu/hr)	1.50
Operating hours/year	8760
Fuel Heat Value (Btu/scf)	1,277.7000

Pollutant	Emission Factors (lb/MMscf)	lb/hr	tpy
NOx	100	0.939	4.114
CO	84	0.789	3.455
CO_2	120,000	1127.025	4936.370
Lead	0.0005	4.70E-06	2.06E-05
N_2O	2.2	0.021	0.091
PM (Total)	7.6	0.071	0.313
SO_2	0.6	0.006	0.025
TOC	11	0.103	0.453
Methane	2.3	0.022	0.095
VOC	5.5	0.052	0.226
HAPS			
2-Methylnaphthalene	2.40E-05	2.25E-07	9.87E-07
Benzene	2.10E-03	1.97E-05	8.64E-05
Dichlorobenzene	1.20E-03	1.13E-05	4.94E-05
Fluoranthene	3.00E-06	2.82E-08	1.23E-07
Fluorene	2.80E-06	2.63E-08	1.15E-07
Formaldehyde	7.50E-02	7.04E-04	3.09E-03
Hexane	1.80E+00	1.69E-02	7.40E-02
Naphthalene	6.10E-04	5.73E-06	2.51E-05
Phenanathrene	1.70E-05	1.60E-07	6.99E-07
Toluene	3.40E-03	3.19E-05	1.40E-04

	lb/hr	tpy
TOTAL Uncontrolled VOC	0.052	0.226
TOTAL Uncontrolled HAPs	0.018	0.077
TOTAL Uncontrolled TAPs (Benzene)	1.97E-05	8.64E-05
TOTAL Uncontrolled Toluene	3.19E-05	1.40E-04
TOTAL Uncontrolled Hexane	0.017	0.074
TOTAL Uncontrolled TAPs (Formaldehyde)	0.001	0.003
TOTAL CH_4	0.022	0.095
TOTAL CO_{2e} Emissions	1,133.72	4,965.70

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

Table 10

Enclosed Combustor Emissions
Primm Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

General Information	
Unit Name:	EC001, EC002, EC003

Pollutant	Emission Factor (lb/MMscf)
NOx	100
CO	84
PM10	7.6
PM2.5	5.7
SO_2	0.6
CO_2	120,000
VOC	5.5
benzene	2.10E-03
Hexane	1.80E+00
Toluene	3.40E-03
Formaldehyde	7.50E-02
N_2O	2.20
Lead	5.00E-04

Pollutant	Emission Factor[2] (lb/MMBtu)
NO_x	0.068
CO	0.31

Constants	
Btu/MMBtu	1,000,000
scf/MMscf	1,000,000
lb/ton	2,000
H_2S molecular wei	34.08
SO_2 molecular	64.06
seconds/hour	3,600
inches/ft	12

Destruction Efficiency	
VOC percent destruction efficiency (%)	98
H_2S percent destruction efficiency (%)	98

Enclosed Combustor operating hours	8760
No. of Enclosed Combustors	3
Maximum Design Heat Input Per Enclosed Combustor (MMBtu/hr)	12

Stream Information							
	1	2	3	4	5	6	Total
Stream Sent to Enclosed/Vapor Combustor (Enter Name of Each Stream Here)	pilot(s)	added fuel stream(s)	Oil Tank Flash Emissions	Water Tank Flash Emissions	Oil Tank W/B Emissions	Water Tank W/B Emissions	-
Maximum Expected Hourly Volumetric Flow Rate of Stream (scf/hr)	51	--	719.17	61.19	48.26	0.99	880.61
Maximum Expected Annual Volumetric Flow Rate of Stream (scf/yr)	446,760.00	--	6,299,890.32	536,000.33	422,789.54	8,710.66	7,714,150.85
Heating Content (Btu/ft3)	1,278		2,261.79	1,196.35	2,495.24	102.26	2,067.13

Mass Flow Rates of the Vapors Sent to this Control Device, Hourly Basis (lb/hr)							
	1	2	3	4	5	6	Total
Stream Sent to Enclosed Combustor/Vapor Combustor	pilot(s)	added fuel stream(s)	Oil Tank Flash Emissions	Water Tank Flash Emissions	Oil Tank W/B Emissions	Water Tank W/B Emissions	-
H2S	-	-	0.000	0.000	0.000	0.000	0.000
Total VOC	-	-	58.244	0.389	4.015	0.000	62.65
Benzene	-	-	0.020	0.001	0.001	0.000	0.021
Toluene	-	-	0.052	0.003	0.002	0.000	0.057
Ethylbenzene	-	-	0.020	0.001	0.001	0.000	0.021
Xylenes	-	-	0.053	0.003	0.003	0.000	0.058
n-Hexane	-	-	8.166	0.007	0.502	0.000	8.675
HAPs	-	-	8.311	0.014	0.509	0.000	8.833
Total Mass Flow	-	-	83.040	2.973	5.573	0.048	91.634
Mass Flow Rates of the Vapors Sent to this Control Device, Annual Basis (tpy)							
H2S	-	-	0.000	0.000	0.000	0.000	0.000
Total VOC	-	-	255.110	1.706	17.585	0.000	274.401
Benzene	-	-	0.085	0.005	0.003	0.000	0.094
Toluene	-	-	0.228	0.012	0.009	0.000	0.249
Ethylbenzene	-	-	0.086	0.004	0.004	0.000	0.094
Xylenes	-	-	0.232	0.011	0.011	0.000	0.254
n-Hexane	-	-	35.769	0.029	2.200	0.000	37.998
HAP	-	-	36.401	0.060	2.228	0.000	38.689
Total Mass Flow	-	-	363.713	13.022	24.409	0.212	401.356

Table 10

Enclosed Combustor Emissions
Primm Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

Controlled Emissions							
Hourly (lb/hr)							
	1	2	3	4	5	6	Total
Stream Sent to Enclosed Combustor/Vapor Combustor	pilot(s)	added fuel stream(s)	Oil Tank Flash Emissions	Water Tank Flash Emissions	Oil Tank W/B Emissions	Water Tank W/B Emissions	-
NOx	0.005	-	2.448				2.45
CO	0.004	-	11.160				11.16
PM2.5	0.000	-	0.004	0.000	0.000	0.000	0.01
PM10	0.000	-	0.005	0.000	0.000	0.000	0.01
H2S	0.000	-	0.000	0.000	0.000	0.000	0.00
SO_2	0.000	-	0.000	0.000	0.000	0.000	0.00
CO_2	6.120	-	-	-	-	-	6.12
Total VOC	0.000	-	1.165	0.008	0.080	0.000	1.25
Benzene	0.000	-	0.000	0.000	0.000	0.000	0.00
Toluene	0.000	-	0.001	0.000	0.000	0.000	0.00
Ethylbenzene	0.000	-	0.000	0.000	0.000	0.000	0.00
Xylenes	0.000	-	0.001	0.000	0.000	0.000	0.00
n-Hexane	0.000	-	0.163	0.000	0.010	0.000	0.17
HAP	0.000	-	0.166	0.000	0.010	0.000	0.18
N_2O	0.000	-	0.002	0.000	0.000	0.000	0.00
Lead	0.000	-	0.000	0.000	0.000	0.000	0.00
Formaldehyde	0.000	-	-	-	-	-	0.00
Annual (tpy)							
	1	2	3	4	5	6	Total
Stream Sent to Enclosed Combustor/Vapor Combustor	pilot(s)	added fuel stream(s)	Oil Tank Flash Emissions	Water Tank Flash Emissions	Oil Tank W/B Emissions	Water Tank W/B Emissions	-
NOx	0.022	-	10.722				10.74
CO	0.019	-	48.881				48.90
PM2.5	0.001	-	0.018	0.002	0.001	0.000	0.02
PM10	0.002	-	0.024	0.002	0.002	0.000	0.03
H_2S	0.000	-	0.000	0.000	0.000	0.000	0.00
SO_2	0.000	-	0.000	0.000	0.000	0.000	0.00
CO_2	26.806	-	-	-	-	-	26.81
Total VOC	0.001	-	5.102	0.034	0.352	0.000	5.49
Benzene	0.000	-	0.002	0.000	0.000	0.000	0.00
Toluene	0.000	-	0.005	0.000	0.000	0.000	0.00
Ethylbenzene	0.000	-	0.002	0.000	0.000	0.000	0.00
Xylenes	0.000	-	0.005	0.000	0.000	0.000	0.01
n-Hexane	0.000	-	0.715	0.001	0.044	0.000	0.76
HAP	0.000	-	0.728	0.001	0.045	0.000	0.77
N_2O	0.000	-	0.007	0.001	0.000	0.000	0.01
Lead	0.000	-	0.000	0.000	0.000	0.000	0.00
Formaldehyde	0.000	-	-	-	-	-	0.00

Enclosed Combustor/Vapor Combustor Total Emissions		
	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
Total VOC	1.25	5.49
NOx	2.453	10.745
CO	11.164	48.900
PM2.5	0.005	0.022
PM10	0.007	0.029
H_2S	1.63E-05	7.13E-05
SO_2	3.06E-05	1.34E-04
Benzene (TAPs)	4.27E-04	1.87E-03
Toluene	1.14E-03	4.98E-03
Ethylbenzene	4.29E-04	1.88E-03
Xylenes	1.16E-03	0.005
Hexanes	0.174	0.760
Formaldehyde (TAPs)	3.83E-06	1.68E-05
HAPs	0.18	0.77
CH_4	0.20	0.89
CO_2e	255.22	1117.85
N_2O	0.002	0.008
Lead	4.40E-07	1.93E-06

Enter any notes here as needed
1. Emission Factors from AP-42 Tables 1.4-1, 1.4-2, and 1.4.3
2. Emission Factors from AP-42 Tables 13.5-1 and 13.5-2 for industrial flares

Table 11

Enclosed Combustor GHG Emissions
Primm Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

Enclosed Combustor CO_2 and CH_4 Emissions

Components	Mole fraction of oil flash gas constituents[a]	Volume of oil flash gas sent to Enclosed Combustor *scf/year*	Mole fraction of water flash gas constituents[a]	Volume of water flash gas sent to Enclosed Combustor *scf/year*	Mole fraction of oil tank vapors constituents[a]	Volume of oil tank vapor sent to Enclosed Combustor *scf/year*	Mole fraction of water tank vapors constituents[a]	Volume of water tank vapors sent to Enclosed Combustor *scf/year*	Component volume of gas sent to Enclosed Combustor *scf/year*	Number of carbon atoms	Combustion Efficiency	Combusted CO_2 Volume[b] *scf/year*	Uncombusted CO_2 and CH_4 Volume[b] *scf/year*	Volume GHGs Emitted *scf/year*
CO_2	0.001	6,299,890	0.0117	536,000	0.0014	422,790	0.014	8,711	15,761	1	0	--	15,761	18,388,503
Methane	0.268	6,299,890	0.7262	536,000	0.0749	422,790	0.036	8,711	2,109,034	1	0.98	2,066,853	42,181	42,181
Ethane	0.245	6,299,890	0.1726	536,000	0.3654	422,790	0.010	8,711	1,790,704	2	0.98	3,509,779	--	
Propane	0.208	6,299,890	0.0382	536,000	0.2574	422,790	0.000	8,711	1,438,520	3	0.98	4,229,249	--	
i-Butane	0.045	6,299,890	0.0036	536,000	0.0524	422,790	0.000	8,711	307,658	4	0.98	1,206,019	--	
n-Butane	0.103	6,299,890	0.0089	536,000	0.1195	422,790	0.000	8,711	701,966	4	0.98	2,751,708	--	
Pentane	0.068	6,299,890	0.0024	536,000	0.0727	422,790	0.000	8,711	462,582	5	0.98	2,266,652	--	
Hexane	0.048	6,299,890	0.0006	536,000	0.0489	422,790	0.000	8,711	324,746	6	0.98	1,909,504	--	
Benzene	0.000	6,299,890	0.0001	536,000	0.0001	422,790	0.000	8,711	833	6	0.98	4,900	--	
Heptanes	0.005	6,299,890	0.0001	536,000	0.0036	422,790	0.000	8,711	30,145	7	0.98	206,792	--	
Toluene	0.000	6,299,890	0.0002	536,000	0.0002	422,790	0.000	8,711	1,880	7	0.98	12,894	--	
Octane	0.003	6,299,890	0.0001	536,000	0.0030	422,790	0.000	8,711	21,141	8	0.98	165,742	--	
Ethyl benzene	0.000	6,299,890	0.0001	536,000	0.0001	422,790	0.000	8,711	615	8	0.98	4,820	--	
Xylenes	0.000	6,299,890	0.0002	536,000	0.0002	422,790	0.000	8,711	1,666	8	0.98	13,064	--	
Nonane	0.000	6,299,890	0.0000	536,000	0.0004	422,790	0.000	8,711	2,728	9	0.98	24,059	--	
Decane plus	0.000	6,299,890	0.0000	536,000	0.0000	422,790	0.000	8,711	72	10	0.98	707	--	
											Subtotal	**18,372,742**	--	

Pollutant	Volume Emitted *scf/year*	Density of GHG[c] *lb/scf*	Conversion Factor *lb/ton*	GWF	Emissions[c] *lbs/hr*	Emissions[c] *(tons/yr)*
CO_2	18,388,503	0.12	2000	1	243.42	1,066.19
CH_4	42,181	0.04	2000	25	0.20	0.89
				CO_2e Emissions	**248.5**	**1088.51**

GHG Emissions Summary

Notes

a Flashing/Working/Breathing Losses from ProMax output reports

b 40 CFR 98.233 (n)(4): Eqns: W-19, W-20 and W-21

c 40 CFR 98.233(v) Eqn W-36 - density at 60°F and 14.7 psia

Table 12

Haul Road Emissions
Primm 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)	120
PW Production (bbl/day)	600
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 (miles/hr)	Vehicle Miles Travelled (miles/year)	PM (lbs/VMT)	PM10 (lbs/VMT)
Tanker Trucks Condensate	10	40	10	0.2400	1	219	0.2400	52.5600	3.8175	1.7179
Tanker Trucks PW	10	40	10	0.2400	1	1095	0.2400	262.8000	3.8175	1.7179
Pick Up Truck	4	3	10	0.2200	1	730	0.2200	160.6000	0.3467	0.1560

	Uncontrolled Emissions						Controlled Emissions					
	PM			PM10			PM			PM10		
	(lbs/hr)	(lbs/year)	(tpy)	(lbs/hr)	(lbs/year)	(tpy)	(lbs/hr)	(lbs/year)	(tpy)	(lbs/hr)	(lbs/year)	(tpy)
Tanker Trucks Condensate	0.9162	200.6493	0.1003	0.4123	90.2922	0.0451	0.4581	100.3247	0.0502	0.2061	45.1461	0.0226
Tanker Trucks PW	0.9162	1003.2467	0.5016	0.4123	451.4610	0.2257	0.4581	501.6234	0.2508	0.2061	225.7305	0.1129
Pick Up Truck	0.0763	55.6768	0.0278	0.0343	25.0545	0.0125	0.0381	27.8384	0.0139	0.0172	12.5273	0.0063
Total Emissions	1.9087	1,259.5728	0.6298	0.8589	566.8078	0.2834	0.9543	629.7864	0.3149	0.4295	283.4039	0.1417

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

Table 13

Change in Regulated Air Pollutants Emissions
Primm Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

	Potential Emissions		Previous Permit Application Emissions		Change in Emissions	
Pollutant	**Hourly PTE**	**Yearly PTE**	**Hourly PTE**	**Yearly PTE**	**Hourly PTE**	**Yearly PTE**
$PM_{2.5}$	0.0764	0.3346	0.2065	0.9046	-1.30E-01	-0.5700
PM_{10}	0.5075	0.4837	16.3606	1.2528	-15.8531	-0.7692
VOC (uncontrolled)	65.7740	289.5763	495.9453	2184.5771	-430.1713	-1895.0007
CO	11.9532	52.3550	8.0244	35.1468	3.9288	17.2082
NOx	3.3923	14.8582	3.1490	13.7926	0.2433	1.0656
SO2	0.0057	0.0248	0.0136	0.0598	-7.98E-03	-3.49E-02
Pb	5.14E-06	2.25E-05	0.0000	0.0001	-9.03E-06	-3.96E-05
HAPs	0.4793	2.2877	0.7330	3.2458	-0.2537	-0.9581
TAPs	0.0047	0.0207	0.0271	0.1196	-2.24E-02	-0.0990

Notes:
1. Change in emissions due to the decreased production and removal of one Kubota Engine, eight Line Heaters, four Condensate Tanks, one Enclosed Combustor

Bryan Research & Engineering, Inc.

ProMax® 4.0

Simulation Report

Project: PROMAX SCENARIO 3.pmx

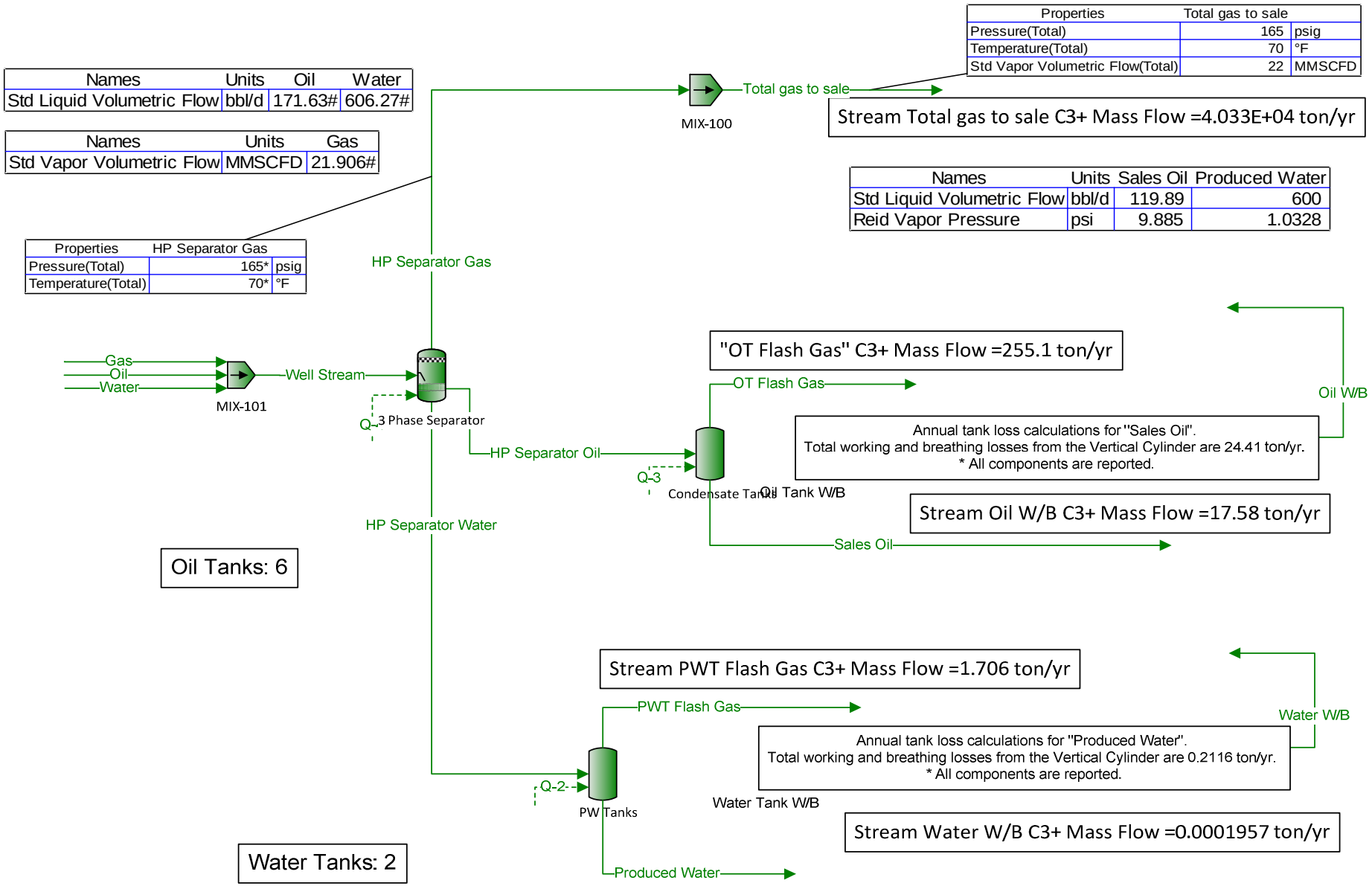
Licensed to GHD Limited and Affiliates

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

ProMax Filename: C:\Users\ychen1\Documents\Drafts\082715- ANTERO\05-ProMax Report\1 HP\PROMAX SCENARIO 3.pmx
ProMax Version: 4.0.16071.0
Simulation Initiated: 2/6/2017 5:25:51 PM

Bryan Research & Engineering, Inc.
Chemical Engineering Consultants
P.O. Box 4747 Bryan, Texas 77805
Office: (979) 776-5220
FAX: (979) 776-4818
mailto:sales@bre.com
http://www.bre.com/

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 171.63# 606.27#
Names Units Gas
Std Vapor Volumetric Flow MMSCFD 21.906#
Properties HP Separator Gas
Pressure(Total) 165* psig
Temperature(Total) 70* °F
Properties Total gas to sale
Pressure(Total) 165 psig
Temperature(Total) 70 °F
Std Vapor Volumetric Flow(Total) 22 MMSCFD
Names Units Sales Oil Produced Water
Std Liquid Volumetric Flow bbl/d 119.89 600
Reid Vapor Pressure psi 9.885 1.0328
MIX-100
Total gas to sale
Stream Total gas to sale C3+ Mass Flow =4.033E+04 ton/yr
HP Separator Gas
Gas
Oil
Water
MIX-101
Well Stream
3 Phase Separator
Q-1
"OT Flash Gas" C3+ Mass Flow =255.1 ton/yr
OT Flash Gas
Oil W/B
Annual tank loss calculations for "Sales Oil".
Total working and breathing losses from the Vertical Cylinder are 24.41 ton/yr.
* All components are reported.
HP Separator Oil
Q-3
Condensate Tanks
Oil Tank W/B
Stream Oil W/B C3+ Mass Flow =17.58 ton/yr
HP Separator Water
Sales Oil
Oil Tanks: 6
Stream PWT Flash Gas C3+ Mass Flow =1.706 ton/yr
PWT Flash Gas
Water W/B
Annual tank loss calculations for "Produced Water".
Total working and breathing losses from the Vertical Cylinder are 0.2116 ton/yr.
* All components are reported.
Q-2
PW Tanks
Water Tank W/B
Stream Water W/B C3+ Mass Flow =0.0001957 ton/yr
Produced Water
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	Status:	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	--	--	MIX-101
	To Block:	MIX-101	MIX-100	Condensate Tanks	PW Tanks	MIX-101	--	--	--	--	--	--	MIX-101	--	3 Phase Separator
Mole Fraction		%	%	%	%	%	%	%	%	%	%	%	%	%	%
Water		0*	0.211816	0.0718619	99.9682	0*	0.000316728*	0.369711	99.9968	3.03266	0.0110071	0.211816	100*	93.9738*	16.8502
H2S		0*	0	0	0	0*	0*	0	0	0	0	0	0*	0*	0
Nitrogen		0.491*	0.488900	0.00965408	7.31615E-05	0.008*	0.00319566*	0.0564688	2.79263E-06	0.238433	8.91593E-05	0.488900	0*	0.00422121*	0.405331
Carbon Dioxide		0.154*	0.153220	0.0252278	0.000914275	0.026*	0.140765*	0.139351	0.000568324	1.17275	0.00191078	0.153220	0*	1.39349*	0.127273
Methane		78.758*	78.4250	4.65473	0.0232365	4.294*	7.48462*	26.8026	0.00175361	72.7919	0.129612	78.4250	0*	3.58543*	65.0347
Ethane		13.565*	13.5309	4.77217	0.00572986	6.734*	36.5389*	24.5170	0.000621969	17.3076	0.738014	13.5309	0*	1.00552*	11.2378
Propane		4.301*	4.32295	5.46172	0.00122592	9.348*	25.7370*	20.7963	9.70545E-05	3.82503	2.32865	4.32295	0*	0.0346135*	3.60694
Isobutane		0.571*	0.582016	1.85563	0.000113362	3.135*	5.23635*	4.50381	6.40672E-06	0.362401	1.31457	0.582016	0*	0.000821258*	0.490363
n-Butane		1.128*	1.16190	5.38195	0.000283866	9.05*	11.9534*	10.2702	2.07457E-05	0.891547	4.38321	1.16190	0*	0.00181969*	0.986061
Isopentane		0.3*	0.319469	3.57608	5.31941E-05	5.331*	3.61138*	3.36669	2.80862E-06	0.170723	3.61886	0.319469	0*	9.00869E-05*	0.280016
n-Pentane		0.292*	0.316182	4.72605	1.99869E-05	6.772*	3.66276*	3.47181	4.35766E-07	0.0662454	4.98231	0.316182	0*	1.02955E-05*	0.282167
2-Methylpentane		0*	0.0163292	0.563894	1.40445E-06	2.622*	0.188181*	0.189628	4.17753E-08	0.00461716	0.640362	0.0163292	0*	3.94457E-07*	0.0159302
3-Methylpentane		0*	0.0101809	0.390511	2.19029E-06	1.662*	0.117515*	0.118750	1.54415E-07	0.00689828	0.446036	0.0101809	0*	1.30719E-06*	0.0100976
n-Hexane		0.44*	0.384543	19.0640	1.59371E-05	6.01*	4.58344*	4.51584	2.39004E-07	0.0531900	22.0363	0.384543	0*	1.59723E-06*	0.399700
Methylcyclopentane		0*	0.00523626	0.256915	1.92118E-06	0.894*	0.0561770*	0.0622436	2.15242E-07	0.00578041	0.296689	0.00523626	0*	1.30947E-06*	0.00543158
Benzene		0*	0.000997351	0.0529387	3.39549E-05	0.174*	0.00785226*	0.0118983	3.11530E-05	0.00952461	0.0613238	0.000997351	0*	0.000128166*	0.00105715
2-Methylhexane		0*	0.00906045	0.967179	5.33251E-07	1.912*	0.0284429*	0.105095	1.09597E-08	0.00176968	1.14332	0.00906045	0*	8.75981E-09*	0.0116165
3-Methylhexane		0*	0.00716169	0.848487	5.09481E-07	1.57*	0.0822720*	0.0833686	1.24508E-08	0.00168409	1.00481	0.00716169	0*	3.27528E-08*	0.00953867
Heptane		0*	0.0176206	2.68043	5.19264E-07	4.277*	0.190505*	0.203146	5.76626E-09	0.00173989	3.18658	0.0176206	0*	1.10753E-08*	0.0259853
Methylcyclohexane		0*	0.0109733	1.68840	3.83738E-06	2.677*	0.122426*	0.129222	4.27707E-07	0.0115534	2.00696	0.0109733	0*	8.38225E-07*	0.0162644
Toluene		0*	0.00228365	0.419215	5.50441E-05	0.606*	0.0183882*	0.0269233	4.91657E-05	0.0199671	0.499366	0.00228365	0*	5.81648E-05*	0.00368181
Octane		0*	0.0165950	8.18628	1.92256E-07	7.984*	0.173377*	0.185645	9.14281E-10	0.000648323	9.82092	0.0165950	0*	5.18549E-10*	0.0485075
Ethylbenzene		0*	0.000770869	0.438508	1.58861E-05	0.412*	0.00648936*	0.00878923	1.40117E-05	0.00636511	0.526306	0.000770869	0*	5.55039E-06*	0.00250314
m-Xylene		0*	0.00106275	0.660686	1.36663E-05	0.607*	0.0116355*	0.0120707	1.13184E-05	0.00796663	0.793208	0.00106275	0*	5.33397E-06*	0.00368788
o-Xylene		0*	0.00102953	0.738043	3.12692E-05	0.657*	0.00719536*	0.0117085	2.86915E-05	0.00876283	0.886444	0.00102953	0*	7.48211E-06*	0.00399166
Nonane		0*	0.00374286	5.86849	4.50461E-08	4.611*	0.0368987*	0.0408160	2.18898E-10	0.000151888	7.05917	0.00374286	0*	3.67593E-11*	0.0280145
C10+		0*	9.49239E-05	26.6410	1.76356E-08	18.627*	0.000474376*	0.000856045	1.50491E-09	5.46570E-05	32.0839	9.49239E-05	0*	7.14847E-13*	0.113170
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*	5.11642	0.00888902	485.874	0*	4.02825E-07*	0.00775847	485.869	0.00435015	0.00113055	5.11642	490.999*	0.00246242*	490.999
H2S		0*	0	0	0	0*	0*	0	0	0	0	0	0*	0*	0
Nitrogen		11.8096*	11.8094	0.00119417	0.000355586	0.00141630*	4.06434E-06*	0.00118501	1.35690E-05	0.000342017	9.15761E-06	11.8094	0*	1.10610E-07*	11.8110
Carbon Dioxide		3.70402*	3.70105	0.00312058	0.00444363	0.00460296*	0.000179029*	0.00292432	0.00276140	0.00168224	0.000196257	3.70105	0*	3.65140E-05*	3.70862
Methane		1894.29*	1894.36	0.575771	0.112936	0.760197*	0.00951917*	0.562459	0.00852054	0.104415	0.0133125	1894.36	0*	9.39500E-05*	1895.05
Ethane		326.266*	326.840	0.590298	0.0278487	1.19217*	0.0464713*	0.514496	0.00302205	0.0248267	0.0758019	326.840	0*	2.63479E-05*	327.458
Propane		103.448*	104.421	0.675593	0.00595833	1.65494*	0.0327330*	0.436416	0.000471573	0.00548676	0.239177	104.421	0*	9.06987E-07*	105.103
Isobutane		13.7337*	14.0586	0.229534	0.000550970	0.555011*	0.00665975*	0.0945136	3.11293E-05	0.000519841	0.135021	14.0586	0*	2.15197E-08*	14.2887
n-Butane		27.1307*	28.0658	0.665725	0.00137967	1.60219*	0.0152027*	0.215523	0.000100800	0.00127887	0.450202	28.0658	0*	4.76817E-08*	28.7329
Isopentane		7.21562*	7.71680	0.442346	0.000258538	0.943785*	0.00459306*	0.0706507	1.36467E-05	0.000244892	0.371695	7.71680	0*	2.36057E-09*	8.15940
n-Pentane		7.02320*	7.63740	0.584593	9.71420E-05	1.19890*	0.00465840*	0.0728569	2.11732E-06	9.50247E-05	0.511736	7.63740	0*	2.69775E-10*	8.22209
2-Methylpentane		0*	0.394433	0.0697514	6.82601E-06	0.464191*	0.000239334*	0.00397939	2.02980E-07	6.62303E-06	0.0657720	0.394433	0*	1.03361E-11*	0.464191
3-Methylpentane		0*	0.245920	0.0483046	1.06454E-05	0.294236*	0.000149460*	0.00249199	7.50279E-07	9.89514E-06	0.0458126	0.245920	0*	3.42526E-11*	0.294236
n-Hexane		10.5829*	9.28869	2.35813	7.74589E-05	1.06399*	0.00582936*	0.0947660	1.16128E-06	7.62976E-05	2.26337	9.28869	0*	4.18526E-11*	11.6469
Methylcyclopentane		0*	0.126483	0.0317793	9.33746E-06	0.158271*	7.14476E-05*	0.00130620	1.04583E-06	8.29163E-06	0.0304731	0.126483	0*	3.43125E-11*	0.158271
Benzene		0*	0.0240911	0.00654830	0.000165030	0.0308044*	9.98673E-06*	0.000249688	0.000151368	1.36624E-05	0.00629861	0.0240911	0*	3.35838E-09*	0.0308044
2-Methylhexane		0*	0.218856	0.119636	2.59175E-06	0.338495*	3.61746E-05*	0.00220545	5.32517E-08	2.53850E-06	0.117431	0.218856	0*	2.29536E-13*	0.338495
3-Methylhexane		0*	0.172991	0.104954	2.47622E-06	0.277948*	0.000104636*	0.00174951	6.04964E-08	2.41572E-06	0.103205	0.172991	0*	8.58230E-13*	0.277948
Heptane		0*	0.425626	0.331559	2.52377E-06	0.757188*	0.000242290*	0.00426307	2.80174E-08	2.49575E-06	0.327296	0.425626	0*	2.90210E-13*	0.757188
Methylcyclohexane		0*	0.265061	0.208848	1.86508E-05	0.473928*	0.000155705*	0.00271176	2.07816E-06	1.65726E-05	0.206136	0.265061	0*	2.19642E-11*	0.473928
Toluene		0*	0.0551617	0.0518552	0.000267530	0.107284*	2.33867E-05*	0.000564992	0.000238889	2.86415E-05	0.0512902	0.0551617	0*	1.52411E-09*	0.107284
Octane		0*	0.400854	1.01261	9.34420E-07	1.41346*	0.000220506*	0.00389581	4.44235E-09	9.29977E-07	1.00871	0.400854	0*	1.35877E-14*	1.41346
Ethylbenzene		0*	0.0186204	0.0542417	7.72109E-05	0.0729393*	8.25336E-06*	0.000184444	6.80806E-05	9.13034E-06	0.0540572	0.0186204	0*	1.45438E-10*	0.0729393
m-Xylene		0*	0.0256709	0.0817242	6.64219E-05	0.107461*	1.47983E-05*	0.000253307	5.49943E-05	1.14276E-05	0.0814709	0.0256709	0*	1.39768E-10*	0.107461
o-Xylene		0*	0.0248685	0.0912929	0.000151977	0.116313*	9.15127E-06*	0.000245706	0.000139408	1.25697E-05	0.0910472	0.0248685	0*	1.96056E-10*	0.116313
Nonane		0*	0.0904092	0.725908	2.18937E-07	0.816318*	4.69288E-05*	0.000856534	1.06359E-09	2.17873E-07	0.725052	0.0904092	0*	9.63213E-16*	0.816318
C10+		0*	0.00229290	3.29538	8.57141E-08	3.29767*	6.03326E-07*	1.79643E-05	7.31214E-09	7.84019E-08	3.29536	0.00229290	0*	1.87313E-17*	3.29767
Mass Fraction		%	%	%	%	%	%	%	%	%	%	%	%	%	%
Water		0*	0.184307	0.0117158	99.9619	0*	0.000130221*	0.168319	99.9950	2.63600	0.00158645	0.184307	100*	91.8159*	14.7096
H2S		0*	0	0	0	0*	0*	0	0	0	0	0	0*	0*	0
Nitrogen		0.667398*	0.661500	0.00244742	0.000113758	0.00230762*	0.00204305*	0.0399764	4.34241E-06	0.322265	1.99822E-05	0.661500	0*	0.00641317*	0.550211
Carbon Dioxide		0.328855*	0.325692	0.0100475	0.00223334	0.0117822*	0.141381*	0.154984	0.00138833	2.49020	0.000672773	0.325692	0*	3.32599*	0.271417
Methane		61.3061*	60.7672	0.675767	0.0206906	0.709317*	2.74027*	10.8662	0.00156155	56.3424	0.0166352	60.7672	0*	3.11948*	50.5557
Ethane		19.7914*	19.6512	1.29858	0.00956303	2.08497*	25.0742*	18.6302	0.00103810	25.1095	0.177540	19.6512	0*	1.63976*	16.3739
Propane		9.20244*	9.20703	2.17950	0.00300048	4.24445*	25.9003*	23.1745	0.000237554	8.13789	0.821506	9.20703	0*	0.0827773*	7.70704
Isobutane		1.61033*	1.63388	0.976036	0.000365713	1.87623*	6.94582*	6.61532	2.06694E-05	1.01628	0.611278	1.63388	0*	0.00258876*	1.38106
n-Butane		3.18119*	3.26178	2.83083	0.000915770	5.41624*	15.8558*	15.0852	6.69300E-05	2.50016	2.03819	3.26178	0*	0.00573599*	2.77715
Isopentane		1.05024*	1.11327	2.33489	0.000213022	3.96046*	5.94641*	6.13847	1.12480E-05	0.594297	2.08887	1.11327	0*	0.000352501*	0.978960
n-Pentane		1.02223*	1.10182	3.08574	8.00399E-05	5.03099*	6.03100*	6.33015	1.74515E-06	0.230604	2.87588	1.10182	0*	4.02852E-05*	0.986482
2-Methylpentane		0*	0.0679659	0.439757	6.71769E-06	2.32661*	0.370093*	0.412966	1.99827E-07	0.0191973	0.441489	0.0679659	0*	1.84354E-06*	0.0665209
3-Methylpentane		0*	0.0423753	0.304543	1.04765E-05	1.47476*	0.231116*	0.258609	7.38624E-07	0.0286817	0.307514	0.0423753	0*	6.10930E-06*	0.0421654
n-Hexane		1.83981*	1.60056	14.8671	7.62297E-05	5.33292*	9.01420*	9.83446	1.14324E-06	0.221154	15.1927	1.60056	0*	7.46484E-06*	1.66906
Methylcyclopentane		0*	0.0212848	0.195670	8.97432E-06	0.774726*	0.107898*	0.132381	1.00550E-06	0.0234716	0.199763	0.0212848	0*	5.97682E-06*	0.0221505
Benzene		0*	0.00376278	0.0374215	0.000147214	0.139950*	0.0139979*	0.0234871	0.000135073	0.0358960	0.0383228	0.00376278	0*	0.000542951*	0.00400137
2-Methylhexane		0*	0.0438500	0.877030	2.96578E-06	1.97275*	0.0650434*	0.266127	6.09575E-08	0.00855566	0.916544	0.0438500	0*	4.76037E-08*	0.0564035
3-Methylhexane		0*	0.0346606	0.769401	2.83358E-06	1.61988*	0.188140*	0.211109	6.92505E-08	0.00814187	0.805512	0.0346606	0*	1.77989E-07*	0.0463146
Heptane		0*	0.0852785	2.43060	2.88799E-06	4.41289*	0.435648*	0.514415	3.20717E-08	0.00841160	2.55454	0.0852785	0*	6.01870E-08*	0.126170
Methylcyclohexane		0*	0.0520393	1.50023	2.09130E-05	2.70649*	0.274331*	0.320639	2.33103E-06	0.0547319	1.57652	0.0520393	0*	4.46355E-06*	0.0773821
Toluene		0*	0.0101628	0.349550	0.000281503	0.574938*	0.0386663*	0.0626899	0.000251451	0.0887642	0.368105	0.0101628	0*	0.000290651*	0.0164382
Octane		0*	0.0915579	8.46238	1.21895E-06	9.39080*	0.451980*	0.535905	5.79703E-09	0.00357312	8.97508	0.0915579	0*	3.21244E-09*	0.268496
Ethylbenzene		0*	0.00395281	0.421299	9.36117E-05	0.450387*	0.0157230*	0.0235809	8.25700E-05	0.0326038	0.447024	0.00395281	0*	3.19577E-05*	0.0128772
m-Xylene		0*	0.00544951	0.634758	8.05310E-05	0.663556*	0.0281915*	0.0323849	6.66986E-05	0.0408073	0.673720	0.00544951	0*	3.07116E-05*	0.0189720

o-Xylene	0*	0.00527917	0.709079	0.000184260	0.718215*	0.0174336*	0.0314132	0.000169077	0.0448856	0.752911	0.00527917	0*	4.30800E-05*	0.0205347
Nonane	0*	0.0231858	6.81134	3.20674E-07	6.08944*	0.108003*	0.132292	1.55836E-09	0.000939894	7.24335	0.0231858	0*	2.55689E-10*	0.174105
C10+	0*	0.000908705	47.7843	1.94011E-07	38.0149*	0.00214575*	0.00428775	1.65564E-08	0.000522674	50.8747	0.000908705	0*	7.68400E-12*	1.08690
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*	92.1738	0.160138	8753.15	0*	7.25700E-06*	0.139771	8753.07	0.0783692	0.0203671	92.1738	8845.48*	0.0443612*	8845.48
H2S	0*	0	0	0	0*	0*	0	0	0	0	0	0*	0*	0
Nitrogen	330.826*	330.822	0.0334528	0.00996117	0.0396753*	0.000113856*	0.0331962	0.000380113	0.00958105	0.000256536	330.822	0*	3.09855E-06*	330.866
Carbon Dioxide	163.012*	162.882	0.137335	0.195562	0.202574*	0.00787896*	0.128698	0.121528	0.0740343	0.00863719	162.882	0*	0.00160697*	163.214
Methane	30389.1*	30390.2	9.23679	1.81177	12.1954*	0.152711*	9.02322	0.136690	1.67508	0.213565	30390.2	0*	0.00150719*	30401.3
Ethane	9810.51*	9827.77	17.7497	0.837385	35.8473*	1.39735*	15.4704	0.0908702	0.746515	2.27929	9827.77	0*	0.000792255*	9846.36
Propane	4561.60*	4604.52	29.7907	0.262736	72.9757*	1.44338*	19.2440	0.0207943	0.241942	10.5467	4604.52	0*	3.99942E-05*	4634.57
Isobutane	798.234*	817.120	13.3410	0.0320236	32.2585*	0.387079*	5.49334	0.00180930	0.0302143	7.84770	817.120	0*	1.25077E-06*	830.493
n-Butane	1576.90*	1631.25	38.6934	0.0801893	93.1225*	0.883616*	12.5267	0.00585872	0.0743306	26.1667	1631.25	0*	2.77137E-06*	1670.02
Isopentane	520.598*	556.757	31.9147	0.0186532	68.0929*	0.331384*	5.09737	0.000984592	0.0176686	26.8174	556.757	0*	1.70312E-07*	588.691
n-Pentane	506.715*	551.029	42.1777	0.00700868	86.4988*	0.336098*	5.25653	0.000152762	0.00685592	36.9211	551.029	0*	1.94640E-08*	593.214
2-Methylpentane	0*	33.9904	6.01085	0.000588233	40.0018*	0.0206247*	0.342926	1.74919E-05	0.000570742	5.66793	33.9904	0*	8.90714E-10*	40.0018
3-Methylpentane	0*	21.1923	4.16267	0.000917373	25.3559*	0.0128797*	0.214748	6.46556E-05	0.000852717	3.94792	21.1923	0*	2.95173E-09*	25.3559
n-Hexane	911.985*	800.456	203.213	0.00667505	91.6900*	0.502347*	8.16650	0.000100074	0.00657497	195.046	800.456	0*	3.60667E-09*	1003.68
Methylcyclopentane	0*	10.6447	2.67453	0.000785835	13.3200*	0.00601299*	0.109929	8.80165E-05	0.000697819	2.56460	10.6447	0*	2.88772E-09*	13.3200
Benzene	0*	1.88180	0.511500	0.0128908	2.40619*	0.000780082*	0.0195036	0.0118236	0.00106720	0.491996	1.88180	0*	2.62329E-07*	2.40619
2-Methylhexane	0*	21.9298	11.9878	0.000259698	33.9178*	0.00362476*	0.220991	5.33592E-06	0.000254362	11.7668	21.9298	0*	2.29999E-11*	33.9178
3-Methylhexane	0*	17.3341	10.5166	0.000248122	27.8509*	0.0104847*	0.175304	6.06185E-06	0.000242060	10.3413	17.3341	0*	8.59963E-11*	27.8509
Heptane	0*	42.6486	33.2228	0.000252887	75.8717*	0.0242779*	0.427168	2.80740E-06	0.000250079	32.7956	42.6486	0*	2.90796E-11*	75.8717
Methylcyclohexane	0*	26.0253	20.5060	0.00183124	46.5331*	0.0152880*	0.266257	0.000204047	0.00162720	20.2397	26.0253	0*	2.15658E-09*	46.5331
Toluene	0*	5.08251	4.77786	0.0246498	9.88502*	0.00215481*	0.0520575	0.0220108	0.00263899	4.72580	5.08251	0*	1.40429E-07*	9.88502
Octane	0*	45.7890	115.669	0.000106737	161.458*	0.0251881*	0.445013	5.07443E-07	0.000106230	115.224	45.7890	0*	1.55210E-12*	161.458
Ethylbenzene	0*	1.97684	5.75856	0.00819710	7.74360*	0.000876218*	0.0195815	0.00722777	0.000969323	5.73898	1.97684	0*	1.54405E-08*	7.74360
m-Xylene	0*	2.72535	8.67625	0.00705168	11.4087*	0.00157106*	0.0268923	0.00583847	0.00121321	8.64935	2.72535	0*	1.48384E-08*	11.4087
o-Xylene	0*	2.64016	9.69211	0.0161347	12.3484*	0.000971545*	0.0260854	0.0148002	0.00133446	9.66602	2.64016	0*	2.08143E-08*	12.3484
Nonane	0*	11.5954	93.1015	2.80798E-05	104.697*	0.00601886*	0.109855	1.36411E-07	2.79434E-05	92.9916	11.5954	0*	1.23537E-13*	104.697
C10+	0*	0.454452	653.144	1.69885E-05	653.598*	0.000119579*	0.00356053	1.44927E-06	1.55393E-05	653.140	0.454452	0*	3.71255E-15*	653.598

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	Solved
Phase: **Total**	**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*	70	70	85*	75.9425*	75.94*	75.94	75.94*	75.94	70	85*	75.9425*	85.1800
Pressure	psig	1000*	165*	165	165	1000*	2.84251	0*	0	0*	0	165	1000*	-14.2235	1000
Mole Fraction Vapor	%	100	100	0	0	0	100*	100	0	100	0	100	0	100*	82.0323
Mole Fraction Light Liquid	%	0	0	100	100	100	0	0	100	0	100	0	100	0	1.15939
Mole Fraction Heavy Liquid	%	0	0	0	0	0	0	0	0	0	0	0	0	0	16.8083
Molecular Weight	lb/lbmol	20.6092	20.7041	110.502	18.0164	97.1164	43.8175	39.5705	18.0156	20.7261	124.994	20.7041	18.0153	18.4387	20.6370
Mass Density	lb/ft^3	4.55631	0.686038	44.9795	62.2674	43.6594	0.136364	0.102524	62.2225	0.0531845	45.7129	0.686038	62.1852	0.00151626	5.44733
Molar Flow	lbmol/h	2405.21	2415.51	12.3696	486.028	17.7037	0.127183	2.09853	485.885	0.143444	10.2711	2415.51	490.999	0.00262033	2913.91
Mass Flow	lb/h	49569.5	50010.9	1366.86	8756.49	1719.32	5.57284*	83.0396	8753.51	2.97303	1283.82	50010.9	8845.48	0.0483154*	60134.3
Vapor Volumetric Flow	ft^3/h	10879.3	72898.2	30.3885	140.627	39.3803	40.8675	809.950	140.681	55.9004	28.0844	72898.2	142.244	31.8649	11039.2
Liquid Volumetric Flow	gpm	1356.38	9088.60	3.78869	17.5327	4.90975	5.09517	100.981	17.5394	6.96940	3.50143	9088.60	17.7344	3.97277	1376.32
Std Vapor Volumetric Flow	MMSCFD	21.9057*	21.9995	0.112657	4.42656	0.161239	0.00115833	0.0191126	4.42525	0.00130643	0.0935449	21.9995	4.47183	2.38649E-05	26.5388
Std Liquid Volumetric Flow	sgpm	291.085	292.410	3.84712	17.5172	5.00587*	0.0229728	0.350341	17.5000	0.0171600	3.49678	292.410	17.6828*	0.000107287	313.774
Compressibility		0.785214	0.954064	0.0776646	0.00914696	0.386148	0.980452	0.986801	0.000740265	0.996367	0.00699094	0.954064	0.0502914	0.999551	0.657443
Specific Gravity		0.711581	0.714856	0.721184	0.998371	0.700018	1.51290	1.36626	0.997651	0.715618	0.732942	0.714856	0.997052	0.636638	
API Gravity				63.3787	10.0312	67.0813			10.0027		59.6347		9.87799		
Enthalpy	Btu/h	-8.37367E+07	-8.31405E+07	-1.19571E+06	-5.97699E+07	-1.53402E+06	-5818.28	-92692.2	-5.97169E+07	-5361.48	-1.08683E+06	-8.31405E+07	-6.02429E+07	-266.222	-1.45514E+08
Mass Enthalpy	Btu/lb	-1689.28	-1662.45	-874.790	-6825.79	-892.225	-1044.04	-1116.24	-6822.05	-1803.37	-846.558	-1662.45	-6810.58	-5510.08	-2419.81
Mass Cp	Btu/(lb*°F)	0.674973	0.502114	0.498911	0.982124	0.511510	0.409457	0.417888	0.981762	0.474773	0.495181	0.502114	0.979420	0.442719	0.714765
Ideal Gas CpCv Ratio		1.24787	1.25089	1.04972	1.32581	1.05549	1.12574	1.13753	1.32555	1.25398	1.04352	1.25089	1.32512	1.32164	1.25262
Dynamic Viscosity	cP	0.0132014	0.0107143	0.531974	0.995441	0.416095	0.00841660	0.00875512	0.924428	0.0107065	0.657031	0.0107143	0.840378	0.0102599	
Kinematic Viscosity	cSt	0.180878	0.974974	0.738337	0.998008	0.594968	3.85316	5.33107	0.927481	12.5673	0.897277	0.974974	0.843659	422.427	
Thermal Conductivity	Btu/(h*ft*°F)	0.0224371	0.0176952	0.0688754	0.346571	0.0662639	0.0108207	0.0120993	0.349778	0.0170692	0.0695770	0.0176952	0.353848	0.0122568	
Surface Tension	lbf/ft			0.00144443?	0.00502981?	0.000670454			0.00498763?		0.00159541		0.00492045		
Net Ideal Gas Heating Value	Btu/ft^3	1127.81	1130.39	5558.52	0.354928	4902.85	2295.60	2077.68	0.0351513	1083.53	6269.71	1130.39	0	49.7780	960.704
Net Liquid Heating Value	Btu/lb	20708.0	20657.5	18927.5	-1051.90	18988.8	19727.2	19781.3	-1058.97	19750.3	18872.3	20657.5	-1059.76	46.3590	17456.9
Gross Ideal Gas Heating Value	Btu/ft^3	1243.74	1246.53	5968.99	50.6851	5271.63	2495.24	2261.79	50.3469	1196.35	6726.42	1246.53	50.3101	102.255	1067.11
Gross Liquid Heating Value	Btu/lb	22842.7	22786.1	20336.6	8.21147	20428.7	21456.2	21546.8	0.804698	21816.0	20258.3	22786.1	0	1126.39	19413.6

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	0.211816					0.000316728	0.369711		3.03266		0.211816		93.9738	0.0760046
H2S	0	0					0	0		0		0		0	0
Nitrogen	0.491	0.488900					0.00319566	0.0564688		0.238433		0.488900		0.00422121	0.493086
Carbon Dioxide	0.154	0.153220					0.140765	0.139351		1.17275		0.153220		1.39349	0.153090
Methane	78.758	78.4250					7.48462	26.8026		72.7919		78.4250		3.58543	78.9097
Ethane	13.565	13.5309					36.5389	24.5170		17.3076		13.5309		1.00552	13.4809
Propane	4.301	4.32295					25.7370	20.7963		3.82503		4.32295		0.0346135	4.23335
Isobutane	0.571	0.582016					5.23635	4.50381		0.362401		0.582016		0.000821258	0.557608
n-Butane	1.128	1.16190					11.9534	10.2702		0.891547		1.16190		0.00181969	1.09735
Isopentane	0.3	0.319469					3.61138	3.36669		0.170723		0.319469		9.00869E-05	0.292737
n-Pentane	0.292	0.316182					3.66276	3.47181		0.0662454		0.316182		1.02955E-05	0.284672
2-Methylpentane	0	0.0163292					0.188181	0.189628		0.00461716		0.0163292		3.94457E-07	0.0140022

3-Methylpentane	0	0.0101809				0.117515	0.118750		0.00689828		0.0101809		1.30719E-06	0.00866053
n-Hexane	0.44	0.384543				4.58344	4.51584		0.0531900		0.384543		1.59723E-06	0.325746
Methylcyclopentane	0	0.00523626				0.0561770	0.0622436		0.00578041		0.00523626		1.30947E-06	0.00432293
Benzene	0	0.000997351				0.00785226	0.0118983		0.00952461		0.000997351		0.000128166	0.000824655
2-Methylhexane	0	0.00906045				0.0284429	0.105095		0.00176968		0.00906045		8.75981E-09	0.00776844
3-Methylhexane	0	0.00716169				0.0822720	0.0833686		0.00168409		0.00716169		3.27528E-08	0.00614113
Heptane	0	0.0176206				0.190505	0.203146		0.00173989		0.0176206		1.10753E-08	0.0155635
Methylcyclohexane	0	0.0109733				0.122426	0.129222		0.0115534		0.0109733		8.38225E-07	0.00922455
Toluene	0	0.00228365				0.0183882	0.0269233		0.0199671		0.00228365		5.81648E-05	0.00194560
Octane	0	0.0165950				0.173377	0.185645		0.000648323		0.0165950		5.18549E-10	0.0178925
Ethylbenzene	0	0.000770869				0.00648936	0.00878923		0.00636511		0.000770869		5.55039E-06	0.000807930
m-Xylene	0	0.00106275				0.0116355	0.0120707		0.00796663		0.00106275		5.33397E-06	0.00113666
o-Xylene	0	0.00102953				0.00719536	0.0117085		0.00876283		0.00102953		7.48211E-06	0.00112371
Nonane	0	0.00374286				0.0368987	0.0408160		0.000151888		0.00374286		3.67593E-11	0.00550255
C10+	0	9.49239E-05				0.000474376	0.000856045		5.46570E-05		9.49239E-05		7.14847E-13	0.000815858
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	5.11642				4.02825E-07	0.00775847		0.00435015		5.11642		0.00246242	1.81677
H2S	0	0				0	0		0		0		0	0
Nitrogen	11.8096	11.8094				4.06434E-06	0.00118501		0.000342017		11.8094		1.10610E-07	11.7865
Carbon Dioxide	3.70402	3.70105				0.000179029	0.00292432		0.00168224		3.70105		3.65140E-05	3.65937
Methane	1894.29	1894.36				0.00951917	0.562459		0.104415		1894.36		9.39500E-05	1886.22
Ethane	326.266	326.840				0.0464713	0.514496		0.0248267		326.840		2.63479E-05	322.240
Propane	103.448	104.421				0.0327330	0.436416		0.00548676		104.421		9.06987E-07	101.192
Isobutane	13.7337	14.0586				0.00665975	0.0945136		0.000519841		14.0586		2.15197E-08	13.3288
n-Butane	27.1307	28.0658				0.0152027	0.215523		0.00127887		28.0658		4.76817E-08	26.2305
Isopentane	7.21562	7.71680				0.00459306	0.0706507		0.000244892		7.71680		2.36057E-09	6.99742
n-Pentane	7.02320	7.63740				0.00465840	0.0728569		9.50247E-05		7.63740		2.69775E-10	6.80465
2-Methylpentane	0	0.394433				0.000239334	0.00397939		6.62303E-06		0.394433		1.03361E-11	0.334702
3-Methylpentane	0	0.245920				0.000149460	0.00249199		9.89514E-06		0.245920		3.42526E-11	0.207017
n-Hexane	10.5829	9.28869				0.00582936	0.0947660		7.62976E-05		9.28869		4.18526E-11	7.78645
Methylcyclopentane	0	0.126483				7.14476E-05	0.00130620		8.29163E-06		0.126483		3.43125E-11	0.103333
Benzene	0	0.0240911				9.98673E-06	0.000249688		1.36624E-05		0.0240911		3.35838E-09	0.0197121
2-Methylhexane	0	0.218856				3.61746E-05	0.00220545		2.53850E-06		0.218856		2.29536E-13	0.185693
3-Methylhexane	0	0.172991				0.000104636	0.00174951		2.41572E-06		0.172991		8.58230E-13	0.146794
Heptane	0	0.425626				0.000242290	0.00426307		2.49575E-06		0.425626		2.90210E-13	0.372021
Methylcyclohexane	0	0.265061				0.000155705	0.00271176		1.65726E-05		0.265061		2.19642E-11	0.220499
Toluene	0	0.0551617				2.33867E-05	0.000564992		2.86415E-05		0.0551617		1.52411E-09	0.0465066
Octane	0	0.400854				0.000220506	0.00389581		9.29977E-07		0.400854		1.35877E-14	0.427693
Ethylbenzene	0	0.0186204				8.25336E-06	0.000184444		9.13034E-06		0.0186204		1.45438E-10	0.0193123
m-Xylene	0	0.0256709				1.47983E-05	0.000253307		1.14276E-05		0.0256709		1.39768E-10	0.0271701
o-Xylene	0	0.0248685				9.15127E-06	0.000245706		1.25697E-05		0.0248685		1.96056E-10	0.0268605
Nonane	0	0.0904092				4.69288E-05	0.000856534		2.17873E-07		0.0904092		9.63213E-16	0.131530
C10+	0	0.00229290				6.03326E-07	1.79643E-05		7.84019E-08		0.00229290		1.87313E-17	0.0195018
Mass Fraction	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
Water	0	0.184307				0.000130221	0.168319		2.63600		0.184307		91.8159	0.0666159
H2S	0	0				0	0		0		0		0	0
Nitrogen	0.667398	0.661500				0.00204305	0.0399764		0.322265		0.661500		0.00641317	0.672024
Carbon Dioxide	0.328855	0.325692				0.141381	0.154984		2.49020		0.325692		3.32599	0.327785
Methane	61.3061	60.7672				2.74027	10.8662		56.3424		60.7672		3.11948	61.5883
Ethane	19.7914	19.6512				25.0742	18.6302		25.1095		19.6512		1.63976	19.7213
Propane	9.20244	9.20703				25.9003	23.1745		8.13789		9.20703		0.0827773	9.08188
Isobutane	1.61033	1.63388				6.94582	6.61532		1.01628		1.63388		0.00258876	1.57677
n-Butane	3.18119	3.26178				15.8558	15.0852		2.50016		3.26178		0.00573599	3.10301
Isopentane	1.05024	1.11327				5.94641	6.13847		0.594297		1.11327		0.000352501	1.02755
n-Pentane	1.02223	1.10182				6.03100	6.33015		0.230604		1.10182		4.02852E-05	0.999242
2-Methylpentane	0	0.0679659				0.370093	0.412966		0.0191973		0.0679659		1.84354E-06	0.0587053
3-Methylpentane	0	0.0423753				0.231116	0.258609		0.0286817		0.0423753		6.10930E-06	0.0363098
n-Hexane	1.83981	1.60056				9.01420	9.83446		0.221154		1.60056		7.46484E-06	1.36571
Methylcyclopentane	0	0.0212848				0.107898	0.132381		0.0234716		0.0212848		5.97682E-06	0.0177002
Benzene	0	0.00376278				0.0139979	0.0234871		0.0358960		0.00376278		0.000542951	0.00313391
2-Methylhexane	0	0.0438500				0.0650434	0.266127		0.00855566		0.0438500		4.76037E-08	0.0378710
3-Methylhexane	0	0.0346606				0.188140	0.211109		0.00814187		0.0346606		1.77989E-07	0.0299379
Heptane	0	0.0852785				0.435648	0.514415		0.00841160		0.0852785		6.01870E-08	0.0758717
Methylcyclohexane	0	0.0520393				0.274331	0.320639		0.0547319		0.0520393		4.46355E-06	0.0440648
Toluene	0	0.0101628				0.0386663	0.0626899		0.0887642		0.0101628		0.000290651	0.00872151
Octane	0	0.0915579				0.451980	0.535905		0.00357312		0.0915579		3.21244E-09	0.0994359
Ethylbenzene	0	0.00395281				0.0157230	0.0235809		0.0326038		0.00395281		3.19577E-05	0.00417303
m-Xylene	0	0.00544951				0.0281915	0.0323849		0.0408073		0.00544951		3.07116E-05	0.00587096
o-Xylene	0	0.00527917				0.0174336	0.0314132		0.0448856		0.00527917		4.30800E-05	0.00580405
Nonane	0	0.0231858				0.108003	0.132292		0.000939894		0.0231858		2.55689E-10	0.0343349
C10+	0	0.000908705				0.00214575	0.00428775		0.000522674		0.000908705		7.68400E-12	0.00786711
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	92.1738				7.25700E-06	0.139771		0.0783692		92.1738		0.0443612	32.7297
H2S	0	0				0	0		0		0		0	0
Nitrogen	330.826	330.822				0.000113856	0.0331962		0.00958105		330.822		3.09855E-06	330.179
Carbon Dioxide	163.012	162.882				0.00787896	0.128698		0.0740343		162.882		0.00160697	161.047
Methane	30389.1	30390.2				0.152711	9.02322		1.67508		30390.2		0.00150719	30259.5
Ethane	9810.51	9827.77				1.39735	15.4704		0.746515		9827.77		0.000792255	9689.46
Propane	4561.60	4604.52				1.44338	19.2440		0.241942		4604.52		3.99942E-05	4462.11
Isobutane	798.234	817.120				0.387079	5.49334		0.0302143		817.120		1.25077E-06	774.697
n-Butane	1576.90	1631.25				0.883616	12.5267		0.0743306		1631.25		2.77137E-06	1524.57
Isopentane	520.598	556.757				0.331384	5.09737		0.0176686		556.757		1.70312E-07	504.856
n-Pentane	506.715	551.029				0.336098	5.25653		0.00685592		551.029		1.94640E-08	490.947
2-Methylpentane	0	33.9904				0.0206247	0.342926		0.000570742		33.9904		8.90714E-10	28.8431
3-Methylpentane	0	21.1923				0.0128797	0.214748		0.000852717		21.1923		2.95173E-09	17.8397
n-Hexane	911.985	800.456				0.502347	8.16650		0.00657497		800.456		3.60667E-09	671.001
Methylcyclopentane	0	10.6447				0.00601299	0.109929		0.000697819		10.6447		2.88772E-09	8.69644

Benzene	0	1.88180	0.000780082	0.0195036	0.00106720	1.88180	2.62329E-07	1.53975
2-Methylhexane	0	21.9298	0.00362476	0.220991	0.000254362	21.9298	2.29999E-11	18.6068
3-Methylhexane	0	17.3341	0.0104847	0.175304	0.000242060	17.3341	8.59963E-11	14.7091
Heptane	0	42.6486	0.0242779	0.427168	0.000250079	42.6486	2.90796E-11	37.2772
Methylcyclohexane	0	26.0253	0.0152880	0.266257	0.00162720	26.0253	2.15658E-09	21.6499
Toluene	0	5.08251	0.00215481	0.0520575	0.00263899	5.08251	1.40429E-07	4.28505
Octane	0	45.7890	0.0251881	0.445013	0.000106230	45.7890	1.55210E-12	48.8548
Ethylbenzene	0	1.97684	0.000876218	0.0195815	0.000969323	1.97684	1.54405E-08	2.05029
m-Xylene	0	2.72535	0.00157106	0.0268923	0.00121321	2.72535	1.48384E-08	2.88452
o-Xylene	0	2.64016	0.000971545	0.0260854	0.00133446	2.64016	2.08143E-08	2.85164
Nonane	0	11.5954	0.00601886	0.109855	2.79434E-05	11.5954	1.23537E-13	16.8694
C10+	0	0.454452	0.000119579	0.00356053	1.55393E-05	0.454452	3.71255E-15	3.86526

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	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	85.1800		
Pressure	psig	1000	165			2.84251	0		0		165	-14.2235	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	20.6092	20.7041			43.8175	39.5705		20.7261		20.7041	18.4387	20.5543		
Mass Density	lb/ft^3	4.55631	0.686038			0.136364	0.102524		0.0531845		0.686038	0.00151626	4.53254		
Molar Flow	lbmol/h	2405.21	2415.51			0.127183	2.09853		0.143444		2415.51	0.00262033	2390.35		
Mass Flow	lb/h	49569.5	50010.9			5.57284	83.0396		2.97303		50010.9	0.0483154	49132.0		
Vapor Volumetric Flow	ft^3/h	10879.3	72898.2			40.8675	809.950		55.9004		72898.2	31.8649	10839.8		
Liquid Volumetric Flow	gpm	1356.38	9088.60			5.09517	100.981		6.96940		9088.60	3.97277	1351.46		
Std Vapor Volumetric Flow	MMSCFD	21.9057	21.9995			0.00115833	0.0191126		0.00130643		21.9995	2.38649E-05	21.7704		
Std Liquid Volumetric Flow	sgpm	291.085	292.410			0.0229728	0.350341		0.0171600		292.410	0.000107287	288.770		
Compressibility		0.785214	0.954064			0.980452	0.986801		0.996367		0.954064	0.999551	0.786968		
Specific Gravity		0.711581	0.714856			1.51290	1.36626		0.715618		0.714856	0.636638	0.709685		
API Gravity															
Enthalpy	Btu/h	-8.37367E+07	-8.31405E+07			-5818.28	-92692.2		-5361.48		-8.31405E+07	-266.222	-8.32485E+07		
Mass Enthalpy	Btu/lb	-1689.28	-1662.45			-1044.04	-1116.24		-1803.37		-1662.45	-5510.08	-1694.39		
Mass Cp	Btu/(lb*°F)	0.674973	0.502114			0.409457	0.417888		0.474773		0.502114	0.442719	0.673724		
Ideal Gas CpCv Ratio		1.24787	1.25089			1.12574	1.13753		1.25398		1.25089	1.32164	1.24846		
Dynamic Viscosity	cP	0.0132014	0.0107143			0.00841660	0.00875512		0.0107065		0.0107143	0.0102599	0.0131969		
Kinematic Viscosity	cSt	0.180878	0.974974			3.85316	5.33107		12.5673		0.974974	422.427	0.181765		
Thermal Conductivity	Btu/(h*ft*°F)	0.0224371	0.0176952			0.0108207	0.0120993		0.0170692		0.0176952	0.0122568	0.0224495		
Surface Tension	lbf/ft														
Net Ideal Gas Heating Value	Btu/ft^3	1127.81	1130.39			2295.60	2077.68		1083.53		1130.39	49.7780	1124.23		
Net Liquid Heating Value	Btu/lb	20708.0	20657.5			19727.2	19781.3		19750.3		20657.5	46.3590	20697.1		
Gross Ideal Gas Heating Value	Btu/ft^3	1243.74	1246.53			2495.24	2261.79		1196.35		1246.53	102.255	1239.90		
Gross Liquid Heating Value	Btu/lb	22842.7	22786.1			21456.2	21546.8		21816.0		22786.1	1126.39	22832.7		

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: **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				0.0718619	99.9682	0			99.9968		0.0110071	100			0.0713926
H2S				0	0	0			0		0	0			0
Nitrogen				0.00965408	7.31615E-05	0.008			2.79263E-06		8.91593E-05	0			0.0668195
Carbon Dioxide				0.0252278	0.000914275	0.026			0.000568324		0.00191078	0			0.0988036
Methane				4.65473	0.0232365	4.294			0.00175361		0.129612	0			24.6605
Ethane				4.77217	0.00572986	6.734			0.000621969		0.738014	0			15.2062
Propane				5.46172	0.00122592	9.348			9.70545E-05		2.32865	0			11.5398
Isobutane				1.85563	0.000113362	3.135			6.40672E-06		1.31457	0			2.83912
n-Butane				5.38195	0.000283866	9.05			2.07457E-05		4.38321	0			7.40101
Isopentane				3.57608	5.31941E-05	5.331			2.80862E-06		3.61886	0			3.43869
n-Pentane				4.72605	1.99869E-05	6.772			4.35766E-07		4.98231	0			4.19533
2-Methylpentane				0.563894	1.40445E-06	2.622			4.17753E-08		0.640362	0			0.383273
3-Methylpentane				0.390511	2.19029E-06	1.662			1.54415E-07		0.446036	0			0.258144
n-Hexane				19.0640	1.59371E-05	6.01			2.39004E-07		22.0363	0			11.4268
Methylcyclopentane				0.256915	1.92118E-06	0.894			2.15242E-07		0.296689	0			0.162595
Benzene				0.0529387	3.39549E-05	0.174			3.11530E-05		0.0613238	0			0.0324329
2-Methylhexane				0.967179	5.33251E-07	1.912			1.09597E-08		1.14332	0			0.452293
3-Methylhexane				0.848487	5.09481E-07	1.57			1.24508E-08		1.00481	0			0.388214
Heptane				2.68043	5.19264E-07	4.277			5.76626E-09		3.18658	0			1.14009
Methylcyclohexane				1.68840	3.83738E-06	2.677			4.27707E-07		2.00696	0			0.750122
Toluene				0.419215	5.50441E-05	0.606			4.91657E-05		0.499366	0			0.179390
Octane				8.18628	1.92256E-07	7.984			9.14281E-10		9.82092	0			2.91790
Ethylbenzene				0.438508	1.58861E-05	0.412			1.40117E-05		0.526306	0			0.158613
m-Xylene				0.660686	1.36663E-05	0.607			1.13184E-05		0.793208	0			0.237551
o-Xylene				0.738043	3.12692E-05	0.657			2.86915E-05		0.886444	0			0.264533
Nonane				5.86849	4.50461E-08	4.611			2.18898E-10		7.05917	0			2.02698
C10+				26.6410	1.76356E-08	18.627			1.50491E-09		32.0839	0			9.70343
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				0.00888902	485.874	0			485.869		0.00113055	490.999			0.0241190
H2S				0	0	0			0		0	0			0
Nitrogen				0.00119417	0.000355586	0.00141630			1.35690E-05		9.15761E-06	0			0.0225740

Carbon Dioxide			0.00312058	0.00444363	0.00460296			0.00276140		0.000196257		0		0.0333794	
Methane			0.575771	0.112936	0.760197			0.00852054		0.0133125		0		8.33119	
Ethane			0.590298	0.0278487	1.19217			0.00302205		0.0758019		0		5.13721	
Propane			0.675593	0.00595833	1.65494			0.000471573		0.239177		0		3.89856	
Isobutane			0.229534	0.000550970	0.555011			3.11293E-05		0.135021		0		0.959157	
n-Butane			0.665725	0.00137967	1.60219			0.000100800		0.450202		0		2.50033	
Isopentane			0.442346	0.000258538	0.943785			1.36467E-05		0.371695		0		1.16171	
n-Pentane			0.584593	9.71420E-05	1.19890			2.11732E-06		0.511736		0		1.41733	
2-Methylpentane			0.0697514	6.82601E-06	0.464191			2.02980E-07		0.0657720		0		0.129483	
3-Methylpentane			0.0483046	1.06454E-05	0.294236			7.50279E-07		0.0458126		0		0.0872103	
n-Hexane			2.35813	7.74589E-05	1.06399			1.16128E-06		2.26337		0		3.86038	
Methylcyclopentane			0.0317793	9.33746E-06	0.158271			1.04583E-06		0.0304731		0		0.0549305	
Benzene			0.00654830	0.000165030	0.0308044			0.000151368		0.00629861		0		0.0109570	
2-Methylhexane			0.119636	2.59175E-06	0.338495			5.32517E-08		0.117431		0		0.152801	
3-Methylhexane			0.104954	2.47622E-06	0.277948			6.04964E-08		0.103205		0		0.131153	
Heptane			0.331559	2.52377E-06	0.757188			2.80174E-08		0.327296		0		0.385165	
Methylcyclohexane			0.208848	1.86508E-05	0.473928			2.07816E-06		0.206136		0		0.253418	
Toluene			0.0518552	0.000267530	0.107284			0.000238889		0.0512902		0		0.0606044	
Octane			1.01261	9.34420E-07	1.41346			4.44235E-09		1.00871		0		0.985770	
Ethylbenzene			0.0542417	7.72109E-05	0.0729393			6.80806E-05		0.0540572		0		0.0535853	
m-Xylene			0.0817242	6.64219E-05	0.107461			5.49943E-05		0.0814709		0		0.0802533	
o-Xylene			0.0912929	0.000151977	0.116313			0.000139408		0.0910472		0		0.0893688	
Nonane			0.725908	2.18937E-07	0.816318			1.06359E-09		0.725052		0		0.684788	
C10+			3.29538	8.57141E-08	3.29767			7.31214E-09		3.29536		0		3.27817	
Mass Fraction	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Water			0.0117158	99.9619	0			99.9950		0.00158645		100		0.0199508	
H2S			0	0	0			0		0		0		0	
Nitrogen			0.00244742	0.000113758	0.00230762			4.34241E-06		1.99822E-05		0		0.0290358	
Carbon Dioxide			0.0100475	0.00223334	0.0117822			0.00138833		0.000672773		0		0.0674504	
Methane			0.675767	0.0206906	0.709317			0.00156155		0.0166352		0		6.13674	
Ethane			1.29858	0.00956303	2.08497			0.00103810		0.177540		0		7.09262	
Propane			2.17950	0.00300048	4.24445			0.000237554		0.821506		0		7.89330	
Isobutane			0.976036	0.000365713	1.87623			2.06694E-05		0.611278		0		2.55971	
n-Butane			2.83083	0.000915770	5.41624			6.69300E-05		2.03819		0		6.67266	
Isopentane			2.33489	0.000213022	3.96046			1.12480E-05		2.08887		0		3.84847	
n-Pentane			3.08574	8.00399E-05	5.03099			1.74515E-06		2.87588		0		4.69527	
2-Methylpentane			0.439757	6.71769E-06	2.32661			1.99827E-07		0.441489		0		0.512338	
3-Methylpentane			0.304543	1.04765E-05	1.47476			7.38624E-07		0.307514		0		0.345073	
n-Hexane			14.8671	7.62297E-05	5.33292			1.14324E-06		15.1927		0		15.2747	
Methylcyclopentane			0.195670	8.97432E-06	0.774726			1.00550E-06		0.199763		0		0.212264	
Benzene			0.0374215	0.000147214	0.139950			0.000135073		0.0383228		0		0.0392978	
2-Methylhexane			0.877030	2.96578E-06	1.97275			6.09575E-08		0.916544		0		0.703010	
3-Methylhexane			0.769401	2.83358E-06	1.61988			6.92505E-08		0.805512		0		0.603410	
Heptane			2.43060	2.88799E-06	4.41289			3.20717E-08		2.55454		0		1.77208	
Methylcyclohexane			1.50023	2.09130E-05	2.70649			2.33103E-06		1.57652		0		1.14248	
Toluene			0.349550	0.000281503	0.574938			0.000251451		0.368105		0		0.256392	
Octane			8.46238	1.21895E-06	9.39080			5.79703E-09		8.97508		0		5.17023	
Ethylbenzene			0.421299	9.36117E-05	0.450387			8.25700E-05		0.447024		0		0.261208	
m-Xylene			0.634758	8.05310E-05	0.663556			6.66986E-05		0.673720		0		0.391205	
o-Xylene			0.709079	0.000184260	0.718215			0.000169077		0.752911		0		0.435639	
Nonane			6.81134	3.20674E-07	6.08944			1.55836E-09		7.24335		0		4.03265	
C10+			47.7843	1.94011E-07	38.0149			1.65564E-08		50.8747		0		29.8328	
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			0.160138	8753.15	0			8753.07		0.0203671		8845.48		0.434510	
H2S			0	0	0			0		0		0		0	
Nitrogen			0.0334528	0.00996117	0.0396753			0.000380113		0.000256536		0		0.632375	
Carbon Dioxide			0.137335	0.195562	0.202574			0.121528		0.00863719		0		1.46901	
Methane			9.23679	1.81177	12.1954			0.136690		0.213565		0		133.653	
Ethane			17.7497	0.837385	35.8473			0.0908702		2.27929		0		154.471	
Propane			29.7907	0.262736	72.9757			0.0207943		10.5467		0		171.909	
Isobutane			13.3410	0.0320236	32.2585			0.00180930		7.84770		0		55.7483	
n-Butane			38.6934	0.0801893	93.1225			0.00585872		26.1667		0		145.325	
Isopentane			31.9147	0.0186532	68.0929			0.000984592		26.8174		0		83.8162	
n-Pentane			42.1777	0.00700868	86.4988			0.000152762		36.9211		0		102.259	
2-Methylpentane			6.01085	0.000588233	40.0018			1.74919E-05		5.66793		0		11.1583	
3-Methylpentane			4.16267	0.000917373	25.3559			6.46556E-05		3.94792		0		7.51538	
n-Hexane			203.213	0.00667505	91.6900			0.000100074		195.046		0		332.670	
Methylcyclopentane			2.67453	0.000785835	13.3200			8.80165E-05		2.56460		0		4.62293	
Benzene			0.511500	0.0128908	2.40619			0.0118236		0.491996		0		0.855871	
2-Methylhexane			11.9878	0.000259698	33.9178			5.33592E-06		11.7668		0		15.3109	
3-Methylhexane			10.5166	0.000248122	27.8509			6.06185E-06		10.3413		0		13.1417	
Heptane			33.2228	0.000252887	75.8717			2.80740E-06		32.7956		0		38.5943	
Methylcyclohexane			20.5060	0.00183124	46.5331			0.000204047		20.2397		0		24.8821	
Toluene			4.77786	0.0246498	9.88502			0.0220108		4.72580		0		5.58400	
Octane			115.669	0.000106737	161.458			5.07443E-07		115.224		0		112.603	
Ethylbenzene			5.75856	0.00819710	7.74360			0.00722777		5.73898		0		5.68888	
m-Xylene			8.67625	0.00705168	11.4087			0.00583847		8.64935		0		8.52009	
o-Xylene			9.69211	0.0161347	12.3484			0.0148002		9.66602		0		9.48784	
Nonane			93.1015	2.80798E-05	104.697			1.36411E-07		92.9916		0		87.8275	
C10+			653.144	1.69885E-05	653.598			1.44927E-06		653.140		0		649.733	

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	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	85.1800
Pressure	psig	165	165	1000	0	0	1000	1000
Mole Fraction Vapor	%	0	0	0	0	0	0	0
Mole Fraction Light Liquid	%	100	100	100	100	100	100	100
Mole Fraction Heavy Liquid	%	0	0	0	0	0	0	0
Molecular Weight	lb/lbmol	110.502	18.0164	97.1164	18.0156	124.994	18.0153	64.4666
Mass Density	lb/ft^3	44.9795	62.2674	43.6594	62.2225	45.7129	62.1852	38.0269
Molar Flow	lbmol/h	12.3696	486.028	17.7037	485.885	10.2711	490.999	33.7836
Mass Flow	lb/h	1366.86	8756.49	1719.32	8753.51	1283.82	8845.48	2177.91
Vapor Volumetric Flow	ft^3/h	30.3885	140.627	39.3803	140.681	28.0844	142.244	57.2729
Liquid Volumetric Flow	gpm	3.78869	17.5327	4.90975	17.5394	3.50143	17.7344	7.14052
Std Vapor Volumetric Flow	MMSCFD	0.112657	4.42656	0.161239	4.42525	0.0935449	4.47183	0.307688
Std Liquid Volumetric Flow	sgpm	3.84712	17.5172	5.00587	17.5000	3.49678	17.6828	7.31527
Compressibility		0.0776646	0.00914696	0.386148	0.000740265	0.00699094	0.0502914	0.294198
Specific Gravity		0.721184	0.998371	0.700018	0.997651	0.732942	0.997052	0.609708
API Gravity		63.3787	10.0312	67.0813	10.0027	59.6347	9.87799	94.4628
Enthalpy	Btu/h	-1.19571E+06	-5.97699E+07	-1.53402E+06	-5.97169E+07	-1.08683E+06	-6.02429E+07	-2.22474E+06
Mass Enthalpy	Btu/lb	-874.790	-6825.79	-892.225	-6822.05	-846.558	-6810.58	-1021.50
Mass Cp	Btu/(lb*°F)	0.498911	0.982124	0.511510	0.981762	0.495181	0.979420	0.564117
Ideal Gas CpCv Ratio		1.04972	1.32581	1.05549	1.32555	1.04352	1.32512	1.08293
Dynamic Viscosity	cP	0.531974	0.995441	0.416095	0.924428	0.657031	0.840378	0.198397
Kinematic Viscosity	cSt	0.738337	0.998008	0.594968	0.927481	0.897277	0.843659	0.325704
Thermal Conductivity	Btu/(h*ft*°F)	0.0688754	0.346571	0.0662639	0.349778	0.0695770	0.353848	0.0630326
Surface Tension	lbf/ft	0.00144443	0.005029817	0.000670454	0.00498763?	0.00159541	0.00492045	0.000519818
Net Ideal Gas Heating Value	Btu/ft^3	5558.52	0.354928	4902.85	0.0351513	6269.71	0	3299.64
Net Liquid Heating Value	Btu/lb	18927.5	-1051.90	18988.8	-1058.97	18872.3	-1059.76	19271.2
Gross Ideal Gas Heating Value	Btu/ft^3	5968.99	50.6851	5271.63	50.3469	6726.42	50.3101	3562.89
Gross Liquid Heating Value	Btu/lb	20336.6	8.21147	20428.7	0.804698	20258.3	0	20820.4

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: **Heavy 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															99.8734
H2S															0
Nitrogen															0.000397879
Carbon Dioxide															0.00324026
Methane															0.103136
Ethane															0.0164700
Propane															0.00258516
Isobutane															0.000166482
n-Butane															0.000432260
Isopentane															5.38193E-05
n-Pentane															2.30437E-05
2-Methylpentane															1.19302E-06
3-Methylpentane															1.77891E-06
n-Hexane															1.26641E-05
Methylcyclopentane															1.57463E-06
Benzene															2.76338E-05
2-Methylhexane															2.92224E-07
3-Methylhexane															2.71064E-07
Heptane															3.02837E-07
Methylcyclohexane															2.32058E-06
Toluene															3.54041E-05
Octane															1.11463E-07
Ethylbenzene															8.50850E-06
m-Xylene															7.77207E-06
o-Xylene															1.71579E-05
Nonane															2.08632E-08
C10+															1.16623E-08
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															489.158
H2S															0
Nitrogen															0.00194872
Carbon Dioxide															0.0158701
Methane															0.505136
Ethane															0.0806666
Propane															0.0126616
Isobutane															0.000815391
n-Butane															0.00211712
Isopentane															0.000263595
n-Pentane															0.000112863
2-Methylpentane															5.84314E-06
3-Methylpentane															8.71272E-06
n-Hexane															6.20260E-05
Methylcyclopentane															7.71221E-06
Benzene															0.000135344
2-Methylhexane															1.43125E-06
3-Methylhexane															1.32761E-06
Heptane															1.48323E-06
Methylcyclohexane															1.13657E-05
Toluene															0.000173402
Octane															5.45923E-07

Ethylbenzene															4.16728E-05
m-Xylene															3.80659E-05
o-Xylene															8.40354E-05
Nonane															1.02184E-07
C10+															5.71192E-08
Mass Fraction	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
Water															99.8630
H2S															0
Nitrogen															0.000618629
Carbon Dioxide															0.00791480
Methane															0.0918319
Ethane															0.0274870
Propane															0.00632699
Isobutane															0.000537059
n-Butane															0.00139444
Isopentane															0.000215517
n-Pentane															9.22773E-05
2-Methylpentane															5.70615E-06
3-Methylpentane															8.50846E-06
n-Hexane															6.05719E-05
Methylcyclopentane															7.35523E-06
Benzene															0.000119804
2-Methylhexane															1.62520E-06
3-Methylhexane															1.50751E-06
Heptane															1.68422E-06
Methylcyclohexane															1.26462E-05
Toluene															0.00018105
Octane															7.06676E-07
Ethylbenzene															5.01358E-05
m-Xylene															4.57965E-05
o-Xylene															0.000101102
Nonane															1.48515E-07
C10+															1.28292E-07
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															8812.32
H2S															0
Nitrogen															0.0545904
Carbon Dioxide															0.698434
Methane															8.10362
Ethane															2.42557
Propane															0.558319
Isobutane															0.0473923
n-Butane															0.123051
Isopentane															0.0190181
n-Pentane															0.00814292
2-Methylpentane															0.000503534
3-Methylpentane															0.000750822
n-Hexane															0.00534512
Methylcyclopentane															0.000649055
Benzene															0.0105720
2-Methylhexane															0.000143414
3-Methylhexane															0.000133029
Heptane															0.000148623
Methylcyclohexane															0.00111595
Toluene															0.0159769
Octane															6.23600E-05
Ethylbenzene															0.00442419
m-Xylene															0.00404127
o-Xylene															0.00892162
Nonane															1.31056E-05
C10+															1.13210E-05

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**	**Solved**
Phase: **Heavy 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														85.1800
Pressure	psig														1000
Mole Fraction Vapor	%														0
Mole Fraction Light Liquid	%														0
Mole Fraction Heavy Liquid	%														100
Molecular Weight	lb/lbmol														18.0172
Mass Density	lb/ft^3														62.0871
Molar Flow	lbmol/h														489.778
Mass Flow	lb/h														8824.41
Vapor Volumetric Flow	ft^3/h														142.129
Liquid Volumetric Flow	gpm														17.7200
Std Vapor Volumetric Flow	MMSCFD														4.46071
Std Liquid Volumetric Flow	sgpm														17.6889
Compressibility															0.0503593
Specific Gravity															0.995481
API Gravity															10.0908
Enthalpy	Btu/h														-6.00404E+07
Mass Enthalpy	Btu/lb														-6803.90

Mass Cp	Btu/(lb*°F)	0.980448
Ideal Gas CpCv Ratio		1.32503
Dynamic Viscosity	cP	0.830159
Kinematic Viscosity	cSt	0.834716
Thermal Conductivity	Btu/(h*ft*°F)	0.352038
Surface Tension	lbf/ft	0.00490729?
Net Ideal Gas Heating Value	Btu/ft^3	1.29035
Net Liquid Heating Value	Btu/lb	-1031.19
Gross Ideal Gas Heating Value	Btu/ft^3	51.6725
Gross Liquid Heating Value	Btu/lb	29.9759

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: **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
Mole Fraction		%	%	%	%	%	%	%	%	%	%	%	%	%	%
Water															93.4335
H2S															0
Nitrogen															0.00468383
Carbon Dioxide															0.00940662
Methane															1.68773
Ethane															0.996612
Propane															0.747040
Isobutane															0.183354
n-Butane															0.477966
Isopentane															0.221937
n-Pentane															0.270731
2-Methylpentane															0.0247323
3-Methylpentane															0.0166588
n-Hexane															0.737342
Methylcyclopentane															0.0104932
Benzene															0.00211863
2-Methylhexane															0.0291851
3-Methylhexane															0.0250503
Heptane															0.0735666
Methylcyclohexane															0.0484049
Toluene															0.0116085
Octane															0.188282
Ethylbenzene															0.0102427
m-Xylene															0.0153356
o-Xylene															0.0170854
Nonane															0.130794
C10+															0.626128
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															489.182
H2S															0
Nitrogen															0.0245227
Carbon Dioxide															0.0492495
Methane															8.83632
Ethane															5.21788
Propane															3.91122
Isobutane															0.959973
n-Butane															2.50245
Isopentane															1.16198
n-Pentane															1.41745
2-Methylpentane															0.129489
3-Methylpentane															0.0872190
n-Hexane															3.86044
Methylcyclopentane															0.0549383
Benzene															0.0110923
2-Methylhexane															0.152802
3-Methylhexane															0.131154
Heptane															0.385166
Methylcyclohexane															0.253429
Toluene															0.0607778
Octane															0.985771
Ethylbenzene															0.0536269
m-Xylene															0.0802914
o-Xylene															0.0894529
Nonane															0.684788
C10+															3.27817
Mass Fraction		%	%	%	%	%	%	%	%	%	%	%	%	%	%
Water															80.0990
H2S															0
Nitrogen															0.00624382
Carbon Dioxide															0.0196999
Methane															1.28842
Ethane															1.42603
Propane															1.56756
Isobutane															0.507127
n-Butane															1.32197
Isopentane															0.761978
n-Pentane															0.929503
2-Methylpentane															0.101422
3-Methylpentane															0.0683140

n-Hexane															3.02368
Methylcyclopentane															0.0420236
Benzene															0.00787509
2-Methylhexane															0.139162
3-Methylhexane															0.119446
Heptane															0.350784
Methylcyclohexane															0.226164
Toluene															0.0508981
Octane															1.02345
Ethylbenzene															0.0517464
m-Xylene															0.0774758
o-Xylene															0.0863160
Nonane															0.798264
C10+															5.90542
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															8812.75
H2S															0
Nitrogen															0.686965
Carbon Dioxide															2.16744
Methane															141.756
Ethane															156.897
Propane															172.468
Isobutane															55.7957
n-Butane															145.448
Isopentane															83.8353
n-Pentane															102.267
2-Methylpentane															11.1588
3-Methylpentane															7.51613
n-Hexane															332.675
Methylcyclopentane															4.62357
Benzene															0.866443
2-Methylhexane															15.3111
3-Methylhexane															13.1419
Heptane															38.5944
Methylcyclohexane															24.8832
Toluene															5.59997
Octane															112.603
Ethylbenzene															5.69330
m-Xylene															8.52413
o-Xylene															9.49676
Nonane															87.8275
C10+															649.733

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	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														85.1800
Pressure	psig														1000
Mole Fraction Vapor	%														0
Mole Fraction Light Liquid	%														6.45265
Mole Fraction Heavy Liquid	%														93.5474
Molecular Weight	lb/lbmol														21.0144
Mass Density	lb/ft^3														55.1765
Molar Flow	lbmol/h														523.562
Mass Flow	lb/h														11002.3
Vapor Volumetric Flow	ft^3/h														199.402
Liquid Volumetric Flow	gpm														24.8606
Std Vapor Volumetric Flow	MMSCFD														4.76840
Std Liquid Volumetric Flow	sgpm														25.0042
Compressibility															0.0660934
Specific Gravity															0.884678
API Gravity															27.1000
Enthalpy	Btu/h														-6.22651E+07
Mass Enthalpy	Btu/lb														-5659.27
Mass Cp	Btu/(lb*°F)														0.898035
Ideal Gas CpCv Ratio															1.27351
Dynamic Viscosity	cP														0.648702
Kinematic Viscosity	cSt														0.733957
Thermal Conductivity	Btu/(h*ft*°F)														0.269029
Surface Tension	lbf/ft														0.00364710?
Net Ideal Gas Heating Value	Btu/ft^3														214.121
Net Liquid Heating Value	Btu/lb														2987.67
Gross Ideal Gas Heating Value	Btu/ft^3														278.239
Gross Liquid Heating Value	Btu/lb														4145.44

February 4, 2014

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

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

Sample: Kuhn 1H
Separator Hydrocarbon Liquid
Sampled @ 220 psig & 30 °F

Date Sampled: 01/13/14 Job Number: 41259.002

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2186-M

COMPONENT	MOL %	LIQ VOL %	WT %
Nitrogen	0.008	0.002	0.002
Carbon Dioxide	0.026	0.010	0.012
Methane	4.294	1.632	0.712
Ethane	6.734	4.039	2.092
Propane	9.348	5.776	4.258
Isobutane	3.135	2.301	1.882
n-Butane	9.050	6.399	5.434
2,2 Dimethylpropane	0.159	0.137	0.119
Isopentane	5.331	4.373	3.974
n-Pentane	6.613	5.376	4.929
2,2 Dimethylbutane	0.204	0.191	0.181
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.466	0.428	0.415
2 Methylpentane	2.622	2.441	2.335
3 Methylpentane	1.662	1.522	1.480
n-Hexane	4.436	4.091	3.949
Heptanes Plus	45.912	61.281	68.228
Totals:	100.000	100.000	100.000

Characteristics of Heptanes Plus:

Specific Gravity	0.7660	(Water=1)
°API Gravity	53.23	@ 60°F
Molecular Weight	143.9	
Vapor Volume	16.90	CF/Gal
Weight	6.38	Lbs/Gal

Characteristics of Total Sample:

Specific Gravity	0.6880	(Water=1)
°API Gravity	74.17	@ 60°F
Molecular Weight	96.8	
Vapor Volume	22.56	CF/Gal
Weight	5.73	Lbs/Gal

Base Conditions: 14.650 PSI & 60 °F

Certified: FESCO, Ltd. - Alice, Texas

Analyst: XG
Processor: JCdjv
Cylinder ID: W-1012

David Dannhaus 361-661-7015

TANKS DATA INPUT REPORT - GPA 2186-M

COMPONENT	Mol %	LiqVol %	Wt %
Carbon Dioxide	0.026	0.010	0.012
Nitrogen	0.008	0.002	0.002
Methane	4.294	1.632	0.712
Ethane	6.734	4.039	2.092
Propane	9.348	5.776	4.258
Isobutane	3.135	2.301	1.882
n-Butane	9.209	6.536	5.553
Isopentane	5.331	4.373	3.974
n-Pentane	6.613	5.376	4.929
Other C-6's	4.954	4.582	4.411
Heptanes	9.556	9.414	9.584
Octanes	10.661	11.267	11.905
Nonanes	4.611	5.694	6.048
Decanes Plus	18.629	32.897	38.137
Benzene	0.174	0.109	0.140
Toluene	0.606	0.455	0.576
E-Benzene	0.412	0.356	0.452
Xylenes	1.264	1.089	1.386
n-Hexane	4.436	4.091	3.949
2,2,4 Trimethylpentane	0.000	0.000	0.000
Totals:	100.000	100.000	100.000

Characteristics of Total Sample:

Specific Gravity	0.6880	(Water=1)
°API Gravity	74.17	@ 60°F
Molecular Weight	96.8	
Vapor Volume	22.56	CF/Gal
Weight	5.73	Lbs/Gal

Characteristics of Decanes (C10) Plus:

Specific Gravity	0.7976	(Water=1)
Molecular Weight	198.2	

Characteristics of Atmospheric Sample:

°API Gravity	63.02	@ 60°F
Reid Vapor Pressure (ASTM D-5191)	5.02	psi

QUALITY CONTROL CHECK			
	Sampling Conditions	Test Samples	
Cylinder Number	------	W-1012*	W-1016
Pressure, PSIG	220	165	159
Temperature, °F	30	70	70

* Sample used for analysis

TOTAL EXTENDED REPORT - GPA 2186-M

COMPONENT	Mol %	LiqVol %	Wt %
Nitrogen	0.008	0.002	0.002
Carbon Dioxide	0.026	0.010	0.012
Methane	4.294	1.632	0.712
Ethane	6.734	4.039	2.092
Propane	9.348	5.776	4.258
Isobutane	3.135	2.301	1.882
n-Butane	9.050	6.399	5.434
2,2 Dimethylpropane	0.159	0.137	0.119
Isopentane	5.331	4.373	3.974
n-Pentane	6.613	5.376	4.929
2,2 Dimethylbutane	0.204	0.191	0.181
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.466	0.428	0.415
2 Methylpentane	2.622	2.441	2.335
3 Methylpentane	1.662	1.522	1.480
n-Hexane	4.436	4.091	3.949
Methylcyclopentane	0.894	0.709	0.777
Benzene	0.174	0.109	0.140
Cyclohexane	0.904	0.690	0.786
2-Methylhexane	1.912	1.994	1.980
3-Methylhexane	1.570	1.616	1.625
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C-7's	1.029	1.043	1.054
n-Heptane	3.248	3.361	3.362
Methylcyclohexane	2.677	2.414	2.715
Toluene	0.606	0.455	0.576
Other C-8's	5.590	6.103	6.365
n-Octane	2.394	2.751	2.825
E-Benzene	0.412	0.356	0.452
M & P Xylenes	0.607	0.528	0.665
O-Xylene	0.657	0.561	0.721
Other C-9's	2.947	3.593	3.843
n-Nonane	1.664	2.101	2.205
Other C-10's	3.005	4.027	4.386
n-decane	1.153	1.587	1.695
Undecanes(11)	3.083	4.239	4.682
Dodecanes(12)	2.125	3.157	3.535
Tridecanes(13)	1.743	2.776	3.151
Tetradecanes(14)	1.281	2.185	2.514
Pentadecanes(15)	1.035	1.891	2.203
Hexadecanes(16)	0.747	1.459	1.713
Heptadecanes(17)	0.687	1.418	1.681
Octadecanes(18)	0.585	1.273	1.518
Nonadecanes(19)	0.503	1.140	1.368
Eicosanes(20)	0.395	0.930	1.122
Heneicosanes(21)	0.341	0.844	1.025
Docosanes(22)	0.281	0.725	0.884
Tricosanes(23)	0.246	0.657	0.807
Tetracosanes(24)	0.221	0.612	0.754
Pentacosanes(25)	0.187	0.538	0.667
Hexacosanes(26)	0.163	0.486	0.605
Heptacosanes(27)	0.140	0.432	0.541
Octacosanes(28)	0.107	0.343	0.430
Nonacosanes(29)	0.103	0.340	0.428
Triacontanes(30)	0.089	0.304	0.384
Hentriacontanes Plus(31+)	0.408	1.533	2.043
Total	100.000	100.000	100.000

Element Material Technology
2129 West Willow Street
Scott, LA
70583-5301 USA

P 337 232 3568
F 337 232 3621
T 888 786 7555
info.scott@element.com
element.com

Gas Analysis Report No: 229140 229140-8 -42 **Date:** 6/29/2016

For: ANTERO RESOURCES
Attn: DOUG STEBBINS

Sample Identification:
Company: ANTERO RESOURCES
Field: WHITE OAKS
Lease: KUNN 1H
STA # : NP

Sample Data: **Date:** 06/22/2016 **By:** R. SWIGER
PSIG: 160 **Temp:** 80 **DEG. F.**

Remarks:

CYL # 1020

Effective Date: 06/22/2016

Hydrocarbon Analysis - Method GPA 2261-13 **Lab Analyst:** LD

Component Name		Mol Percent	GPM @ 14.730 PSIA
Carbon Dioxide	(CO2)	0.154	
Nitrogen	(N2)	0.491	
Methane	(C1)	78.758	
Ethane	(C2)	13.565	3.640
Propane	(C3)	4.301	1.189
Iso-Butane	(IC4)	0.571	0.187
N-Butane	(NC4)	1.128	0.357
Iso-Pentane	(IC5)	0.300	0.110
N-Pentane	(NC5)	0.292	0.106
Hexanes Plus	(C6+)	0.440	0.192
Total		100.000	

Mol Weight: 20.64
BTU/LB: 22896.82

Ethane + GPM: 5.781
Propane + GPM: 2.141
Iso-Pentane + GPM: 0.408

Compressibility Factor: 0.9965
Specific Gravity @ 60 Deg. F. (Air = 1) : 0.715

BTU/Cuft. (Real) 60 Deg. F. - PSIA:	14.650	14.696	14.730	15.025
Dry:	1245.7	1249.6	1252.5	1277.7
Sat:	1224.5	1228.4	1231.2	1256.0

Quality Officer: Tiffany Hebert

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 (CO2e)	
	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									0.4295	0.1417						
EP-PCV					0.0856	0.3748							0.2929	1.2831	7.3253	32.0849
F001					2.9881	13.0881							2.6536	11.6226	66.3392	290.5656
EP-L001					16.2837	1.4859							0.6194	0.0565	15.5166	1.4159
EP-L002					1.09E-03	4.98E-04							0.0369	0.0168	0.9608	0.4384
GPU001-008(emissions per EPN)	0.1174	0.5142	0.0986	0.4319	0.0065	0.0283	0.0007	0.0031	0.0089	0.0391	0.0089	0.0391	0.0027	0.0118	140.8781	617.0463
EP-EC001 -003(emissions per EPN)	0.8177	3.5815	3.7214	16.2999	0.4178	1.8297	0.0000	0.0000	0.0022	0.0098	0.0017	0.0073	0.0680	0.2977	85.0720	372.6154
TOTAL	3.3923	14.8582	11.9532	52.3550	1.3049	7.2019	0.0057	0.0248	0.0781	0.3420	0.0764	0.3346	0.2255	1.0612	1382.2411	6056.0704

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	0.0088	0.0385	0.0088	0.0385
F001			0.0035	0.0153	0.0144	0.0629	0.0113	0.0493	0.0345	0.1513	0.2124	0.9304	0.2761	1.2093
EP-L001			3.16E-03	2.89E-04	8.74E-03	7.98E-04	3.55E-03	3.24E-04	0.010	9.41E-04	2.037	0.186	2.063	0.188
EP-L002			6.42E-06	2.93E-06	3.43E-06	1.57E-06	3.78E-07	1.72E-07	8.72E-07	3.98E-07	8.82E-08	4.02E-08	1.12E-05	5.10E-06
GPU001-008(emissions per EPN)	0.0001	0.0004	2.47E-06	1.08E-05	3.99E-06	1.75E-05			0.00E+00	0.00E+00	0.0021	0.0093	0.0022	0.0097
EP-EC001 -003(emissions per EPN)	1.28E-06	5.58E-06	1.42E-04	6.24E-04	3.79E-04	1.66E-03	1.43E-04	6.26E-04	3.87E-04	1.70E-03	5.79E-02	2.53E-01	5.89E-02	2.58E-01
TOTAL	0.0007	0.0031	0.0004	0.0022	0.0012	0.0059	0.0004	0.0022	0.0012	0.0060	0.1905	1.0203	0.1944	1.0399

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
Primm 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 1313 Oxford Rd, in Doddridge County, West Virginia.

The latitude and longitude coordinates are: 39.2417 and -80.85264

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

Pollutants	TOTALS (tpy):
NO_X	14.8582
CO	52.3550
$PM_{2.5}$	0.3346
PM_{10}	0.3420
VOC	7.2019
SO_2	0.0248
CO_{2e}	6056.0704
CH_4	1.0612
Formaldehyde	0.0031
Benzene	0.0022
Toluene	0.0059
Ethylbenzene	0.0022
Xylenes	0.0060
Hexane	1.0203
Total HAPs	1.0399

Proposed modifications are expected to start upon permit issuance. 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 _____, 2017

By: Antero Resources Corporation
Barry Schatz
Senior Environmental & Regulatory Manager
1615 Wynkoop Street
Denver, CO 80202

www.ghd.com