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
Bee Lewis 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 Bee Lewis Well Pad.

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

1. Decrease in production.
2. Addition of one 1 MMBtu/hr GPU heater
3. Removal of one Kubota engine

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. 468471 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/297
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

Decreased production and removal of Kubota Engine

Bee Lewis Well Pad

Antero Resources Corporation

GHD | 6320 Rothway Suite 100 Houston Texas 77040
082715 | Report No 297 | February 2017

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west virginia department of environmental protection

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

G70-D GENERAL PERMIT REGISTRATION APPLICATION

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

☐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: Bee Lewis Well Pad

Operating Site Physical Address: 2139 Elliot Rd.

City: West Union	Zip Code: 26456	County: Doddridge

Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):
Latitude: 39.25486
Longitude: -80.82301

SIC Code: 1311 NAICS Code: 211111	DAQ Facility ID No. (For existing facilities) 017-00085

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: Decrease in production and removal of existing Kubota engine.
Directions to the facility: From West Union, Head north on Neely Ave toward Marie St/Old U.S. 50 E for 3 ft, Turn left at the 1st cross street onto Marie St/Old U.S. 50 W and Continue to follow Old U.S. 50 W for 2.3 mi, Turn right onto US-50 W and go 0.4 mi, Turn left at the 1st cross street onto Arnolds Creek Rd/Central Station Rd/Right Fork Run Rd and go 0.4 mi, Turn right onto Co Rte 11/3 and go 1.6 mi. The destination will be on right.

ATTACHMENTS AND SUPPORTING DOCUMENTS	
I have enclosed the following required documents:	
Check payable to WVDEP – Division of Air Quality with the appropriate application fee (per 45CSR13 and 45CSR22). ☒ Check attached to front of application. ☐ I wish to pay by electronic transfer. Contact for payment (incl. name and email address): ☐ I wish to pay by credit card. Contact for payment (incl. name and email address): ☒$500 (Construction, Modification, and Relocation) ☐$300 (Class II Administrative Update) ☒$1,000 NSPS fee for 40 CFR60, Subpart IIII, JJJJ, 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 ☒

Bee Lewis 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 Fritz Well Pad. This is approximately 1.70 miles southwest of the facility.

Attachment B
Siting Criteria Waiver

Attachment B

Siting Waiver
Bee Lewis 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 Bee Lewis 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:

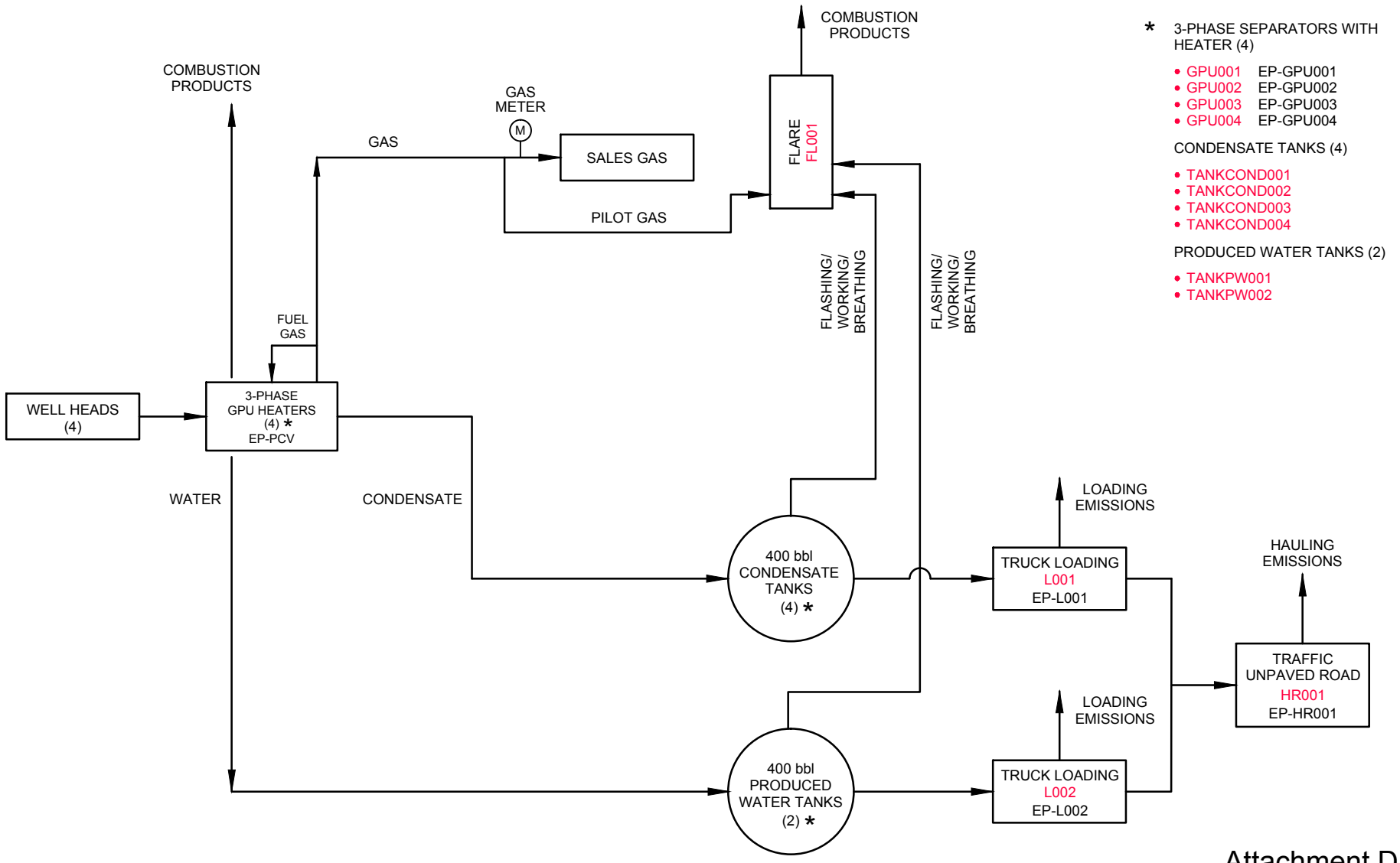
FIRST. The name of the Corporation is Antero Resources Corporation.

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



Attachment D

PROCESS FLOW DIAGRAM - ANTERO RESOURCES BEE LEWIS PAD

Doddridge County, West Virginia

Attachment E
Process Description

Attachment E

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

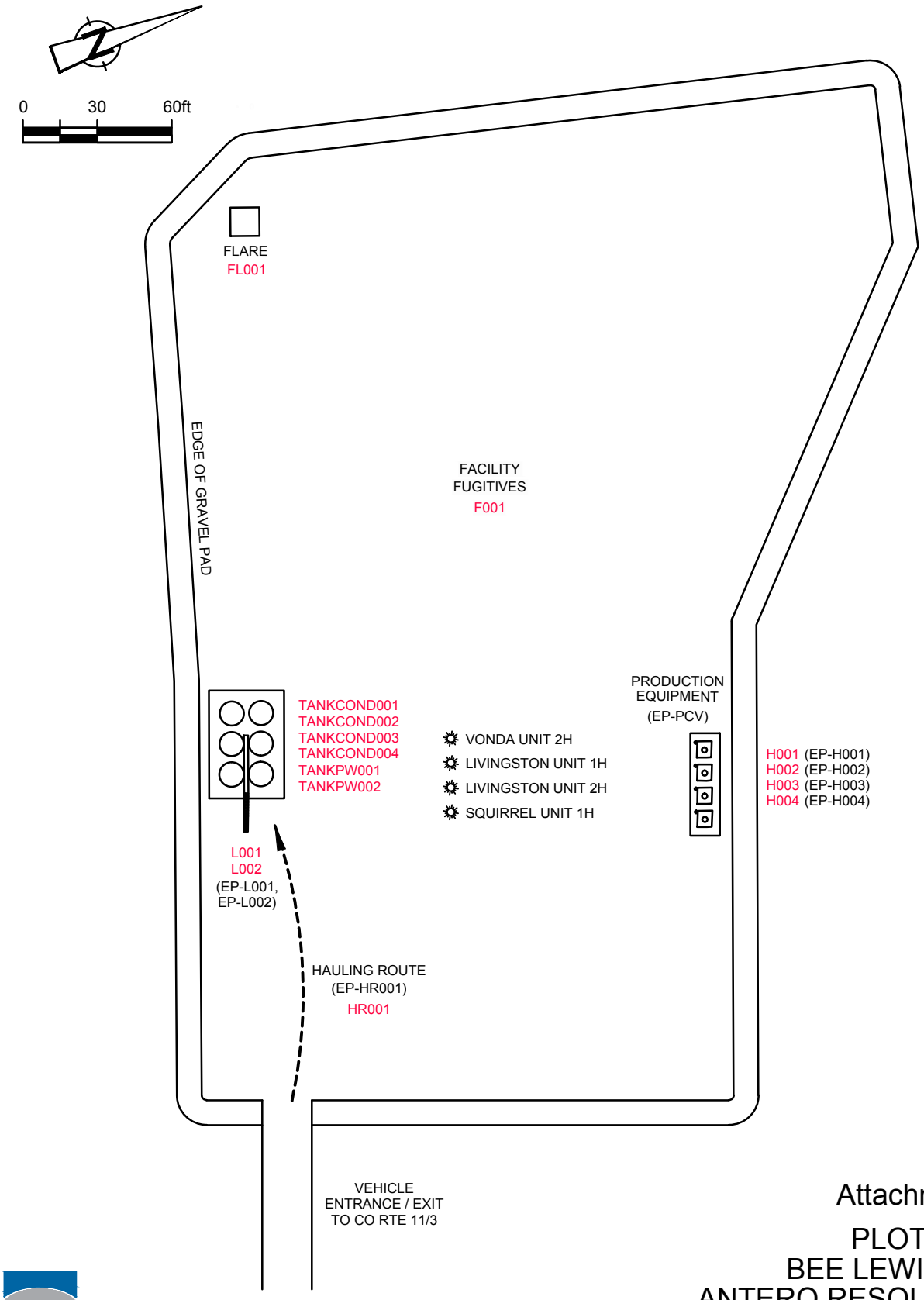
A mixture of condensate, water, and entrained gas from the condensate and gas wells enters the facility through a series of gas production units (GPU001-GPU004) which are 3 phase separators where the gas, condensate, and produced water are separated. The GPUs are fueled by a slip stream of the separated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

The facility has four (4) tanks (TANKCOND001-004) on site to store condensate and two (2) tanks (TANKPW001-002) to store produced water prior to removal from the site. The flashing, working and breathing losses from the tanks are routed to the enclosed combustor (EC001) to control the emissions. The enclosed combustor that will be used to control emissions is 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 representative analysis of the condensate from Nero No. 2H well in McGill Well Pad and site specific gas from Vonda Unit 2H, one of the wells in the Bee Lewis Well Pad. The extended condensate analysis is considered representative of the materials from Bee Lewis Well Pad, being in the same Marcellus rock formation.

Attachment F
Plot Plan

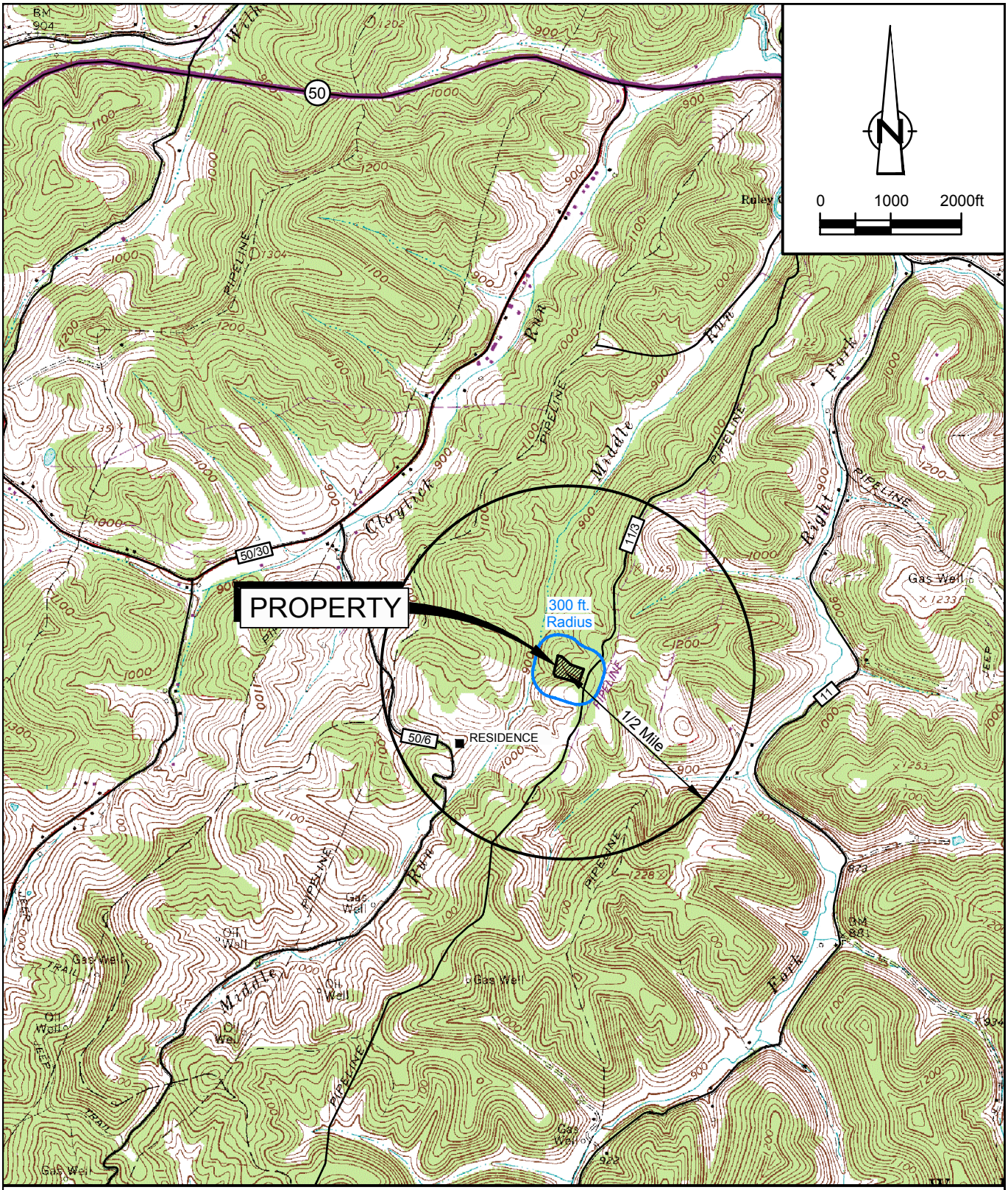


Attachment F

PLOT PLAN
BEE LEWIS PAD
ANTERO RESOURCES
Doddridge County, West Virginia

82715-00(297)GN-WA002 FEB 14, 2017

Attachment G
Area Map



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

SITE COORDINATES: LAT. 39.254867, LONG. -80.823014
SITE ELEVATION: 1000 ft AMSL

GHD

Attachment G

AREA MAP
BEE LEWIS PAD
ANTERO RESOURCES
Doddridge County, West Virginia

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]
GPU001-004	EP-GPU001-004	Gas Production Unit Heater	2014		1.5 MMBtu/hr	Existing	N/A	
F001	F001	Fugitives	2014		N/A	Existing	N/A	
TANKCOND001-004	EP-EC001	Condensate Tank F/W/B	2014		400 bbl each	Modification[1]	EP-EC001	
TANKPW001-002	EP-EC001	PW Tank F/W/B	2014		400 bbl each	Modification[2]	EP-EC001	
L001	EP-L001	Loading (Condensate)	2014		10080 gal/hr 613200 gal/yr	Modification[3]	N/A	
L002	EP-L002	Loading (Produced Water)	2014		10080 gal/hr 2299500 gal/yr	Modification[4]	N/A	
HR001	EP-HR001	Haul Road	2014		Tanker Trucks Condensate: 73 trips per year Tanker Trucks PW: 274 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	
PCV	EP-PCV	Pneumatic CV	2014		6.6 scf/day/PCV	Existing	N/A	
ENG001	EP-ENG001	Compressor Engine	2015	2013	24 HP	Removal-2017	Non-Selective Catalytic Reduction	

Notes:

1. This is not a physical modification. Change in emissions due to decrease in condensate throughput.
2. This is not a physical modification. Change in emissions due to decrease in produced water throughput.
3. This is not physical modification. Change in emissions due to decrease in condensate 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 condensate and produced water throughput.

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	200	EPA	gas	1.302	0.221	5.608	140.207
Valves	☐ Yes ☑ No	208	EPA	liquid	4.905	0.345	0.036	0.899
Connections (Not sampling)	☐ Yes ☑ No	236	EPA	gas	0.068	0.012	0.294	7.353
Flanges	☐ Yes ☑ No	52	EPA	gas	0.029	0.005	0.126	3.159

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?
47017062580000	6/30/2014	4/18/2014	Green	OOOO
47017062240000	6/26/2014	4/12/2014	Green	OOOO
47017062230000	6/20/2014	3/30/2014	Green	OOOO
47017062250000	6/14/2014	3/16/2014	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 001-04
3. Emission Unit ID number: TANKCOND001-004	4. Emission Point ID number. EP-EC001
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): 613200	13B. Maximum daily throughput (gal/day): 1680
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume): 10	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)	1.3337
39A. Average Liquid Surface Temperature (°F)	72.10	39B. Corresponding Vapor Pressure (psia)	2.2962
40A. Maximum Liquid Surface Temperature (°F)	75.94	40B. Corresponding Vapor Pressure (psia)	2.4806

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)	5.9600		
41D. Liquid Molecular Weight (lb/lb-mole)	112.00		
41E. Vapor Molecular Weight (lb/lb-mole)	41.8057		
Maximum Vapor Pressure 41F. True (psia)	2.4806		
41G. Reid (psia)	3.54		
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.	154 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
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): 2299500	13B. Maximum daily throughput (gal/day): 6300
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume): 69	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)	0.2278
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)	18.49		
41E. Vapor Molecular Weight (lb/lb-mole)	18.4903		
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.	154 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	1228.76
GPU002	EP-GPU002	Gas Production Unit Heater	2014	Existing	1.5	1228.76
GPU003	EP-GPU003	Gas Production Unit Heater	2014	Existing	1.5	1228.76
GPU004	EP-GPU004	Gas Production Unit Heater	2014	Existing	1.5	1228.76

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	2013	
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)	9852	
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	2	2	2	2
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)		1.68	6.30	
Max. Annual Throughput (1000 gal/yr)		613.20	2299.50	
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		2.3	0.5	
Cargo Vessel Condition		U	U	
Control Equipment or Method		None	None	
Max. Collection Efficiency (%)		0	0	
Max. Control Efficiency (%)		0	0	
Max VOC Emission Rate	Loading (lb/hr)	8.8379	0.0007	
	Annual (ton/yr)	0.2688	0.0001	
Max HAP Emission Rate	Loading (lb/hr)	1.6368	5.18E-06	
	Annual (ton/yr)	0.0498	5.91E-07	
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	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	Hours of operation per year?	8760
Model:	Model No. 48" HV ECD		

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
TANKCOND001-004	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
3.72 (scfm)	1,936.62 BTU/ft^3	0.0071 (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?
1	17 scfh	20889 BTU/hr	☑ Yes ☐ No

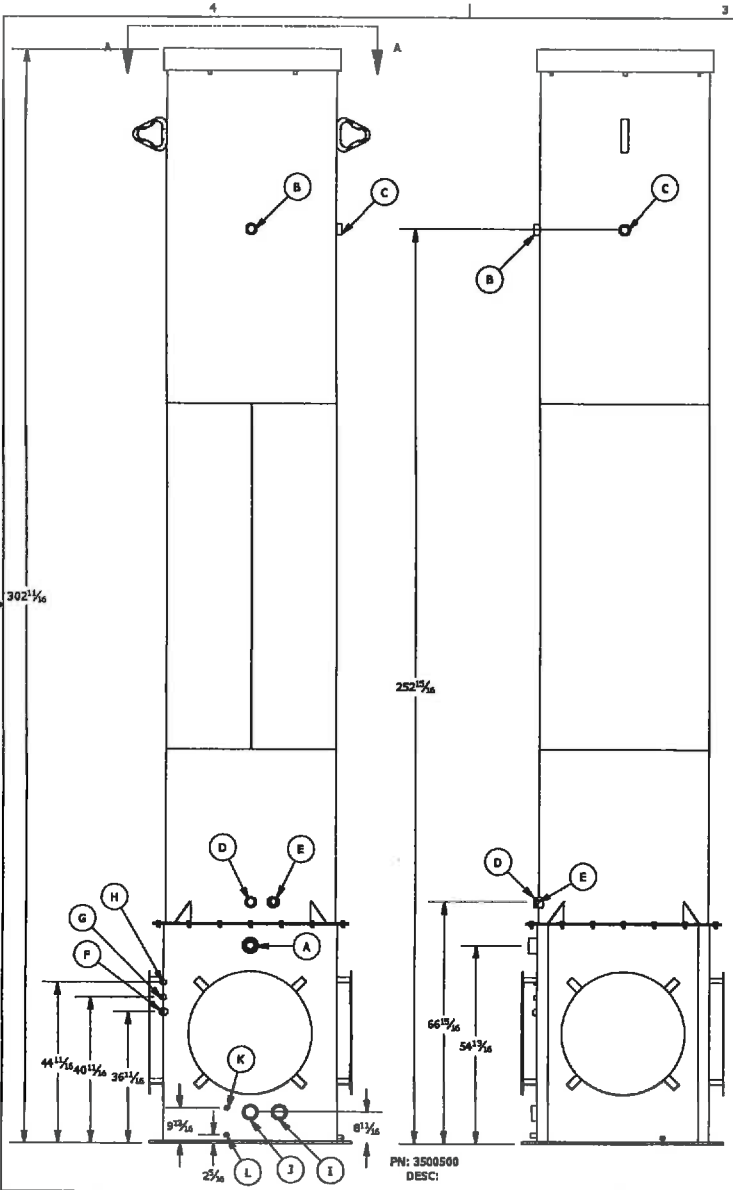
If automatic re-ignition is used, please describe the method. Flame Rectification, a thermocouple equivalent

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).*

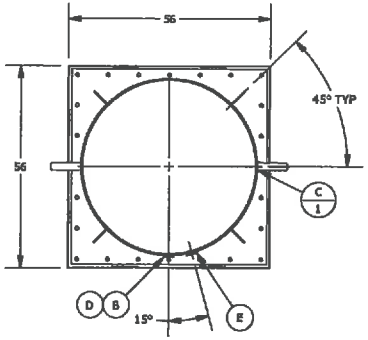
Additional information attached? ☑ Yes ☐ No Manufacturer's specs sheet

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
Bee Lewis 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	Bee Lewis Well Pad
Nearest City/Town	West Union
API Number/SIC Code	1311
Latitude/Longitude	39.254867, -80.823014
County	Doddridge County

Technical Information	
Max Condensate Site Throughput (bbl/day):	40
Max Produced Water Site Throughput (bbl/day):	150
Are there any sour gas streams at this site?	No
Is this site currently operational/producing?	Yes

Equipment/Processes at Site	
Equipment/Process Types	**How many for this site?**
Fugitives	4
Gas Production Unit Heaters	4
Condensate Tanks	4
Produced Water Tanks	2
Loading Jobs	2
Enclosed Combustors	1

Table 2

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

Emission Source	VOC		NO_x		CH_4		CO_{2e}		CO		SO_2		$PM_{2.5}$		PM_{10}		Lead		Total HAPs		Benzene		Xylenes		Formaldehyde	
	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)
UNCONTROLLED (Fugitives, Storage Tanks, Gas Production Unit Heaters)																										
Fugitive Emissions (Component Count, PCV and Hauling)[1]	1.4741	6.4567			1.5343	6.7203	38.359	168.01							0.4482	0.0489			0.1391	0.6091	0.0006	0.0028	2.80E-02	1.23E-01		
Flashing, Working and Breathing (F/W/B) Losses[2]	14.5068	63.5399			3.3243	14.5605	83.1813	364.3343											2.9765	13.0370	0.0013	0.0057	0.0178	0.0779		
Gas Production Unit Heater Emissions[3]	0.0269	0.1176	0.4883	2.1387	0.0112	0.0492	585.96	2,566.49	0.4102	1.7965	0.0029	0.0128	0.0371	0.1625	0.0371	0.1625	2.44E-06	1.07E-05	0.009	0.040	1.03E-05	4.49E-05			0.0004	0.0016
TOTALS:	**16.0078**	**70.1142**	**0.4883**	**2.1387**	**4.8698**	**21.3299**	**707.4966**	**3098.8351**	**0.4102**	**1.7965**	**0.0029**	**0.0128**	**0.0371**	**0.1625**	**0.4853**	**0.2114**	**2.44E-06**	**1.07E-05**	**3.1247**	**13.6863**	**0.0020**	**0.0086**	**0.0458**	**0.2005**	**0.0004**	**0.0016**
UNCONTROLLED (Truck Loading Emissions)																										
Truck Loading Emissions[4]	8.8387	0.2689			0.4584	0.0171	11.5276	0.4328											1.6368	0.0498	0.0005	1.42E-05	0.0072	0.0002		
CONTROLLED EMISSIONS																										
Enclosed Combustor Emissions (from F/W/B losses)[5]	0.2902	1.2712	0.8177	3.5815	0.0607	0.2660	65.5197	286.9764	3.7214	16.2999	1.02E-05	0.0000	0.0014	0.0060	0.0018	0.0080	1.20E-07	5.27E-07	0.0596	0.2609	0.0000	0.0001	0.0004	0.0016	1.28E-06	5.58E-06
TOTALS:	**0.290**	**1.271**	**0.818**	**3.582**	**0.061**	**0.266**	**65.520**	**286.976**	**3.721**	**16.300**	**1.02E-05**	**4.47E-05**	**0.001**	**0.006**	**0.226**	**0.032**	**1.20E-07**	**5.27E-07**	**0.060**	**0.261**	**2.62E-05**	**1.15E-04**	**3.56E-04**	**0.002**	**1.28E-06**	**5.58E-06**
POTENTIAL TO EMIT[6]	**1.7912**	**8.1144**	**1.3060**	**5.7203**	**1.6063**	**7.0525**	**689.8350**	**3021.9101**	**4.1316**	**18.0964**	**0.0029**	**0.0129**	**0.0385**	**0.1685**	**0.2630**	**0.1950**	**2.56E-06**	**1.12E-05**	**0.2078**	**0.9600**	**0.0007**	**0.0030**	**0.0283**	**0.1243**	**0.0004**	**0.0016**
POTENTIAL TO EMIT (Excluding Fugitives)	**0.3171**	**1.6577**	**1.3060**	**5.7203**	**0.0720**	**0.3323**	**651.4763**	**2853.8990**	**4.1316**	**18.0964**	**0.0029**	**0.0129**	**0.0385**	**0.1685**	**0.0389**	**0.1705**	**2.56E-06**	**1.12E-05**	**0.0688**	**0.3509**	**0.0000**	**0.0002**	**0.0004**	**0.0018**	**0.0004**	**0.0016**

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 40 barrels per day, VOC emissions would be 8.8387 pounds per hour when there are truck loading activities. Average hourly VOC emissions from truck loading is 0.0614 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

Bee Lewis Well Pad

Doddridge County, West Virginia

Antero Resources Corporation

Pollutant		Emissions		Threshold Exceeded?		
		Uncontrolled	Controlled	Threshold	Uncontrolled	Controlled
VOC	lbs/hr	16.0078	1.7912	6	**Yes**	
	tons/yr	70.3831	8.1144	10	**Yes**	
NO_X	lbs/hr	0.4883	1.3060	6		
	tons/yr	2.1387	5.7203	10		
CH_4	lbs/hr	4.8698	1.6063			
	tons/yr	21.3470	7.0525			
CO	lbs/hr	0.4102	4.1316	6		
	tons/yr	1.7965	18.0964	10		**Yes**
SO_2	lbs/hr	0.0029	0.0029	6		
	tons/yr	0.0128	0.0129	10		
$PM_{2.5}$	lbs/hr	0.0371	0.0385	6		
	tons/yr	0.1625	0.1685	10		
PM_{10}	lbs/hr	0.4853	0.2630	6		
	tons/yr	0.2114	0.1950	10		
Lead	lbs/hr	2.44E-06	2.56E-06	6		
	tons/yr	1.07E-05	1.12E-05	10		
Total HAPs	lbs/hr	3.1247	0.2078	2	**Yes**	
	tons/yr	13.7361	0.9600	5	**Yes**	
Total TAPs	lbs/hr	0.0023	0.0010	1.14		
n-Hexane	lbs/hr	3.0441	0.1617			
	tons/yr	13.3824	0.7575			
Toluene	lbs/hr	0.0147	0.0063			
	tons/yr	0.0646	0.0276			
Ethylbenzene	lbs/hr	0.0178	0.0105			
	tons/yr	0.0781	0.0460			
Xylenes	lbs/hr	0.0458	0.0283			
	tons/yr	0.2007	0.1243			
Benzene	lbs/hr	0.0020	0.0007			
	tons/yr	0.0086	0.0030			

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
Bee Lewis 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	0.150
	Benzene frac	0.000
	Toluene	0.000
	Ethylbenzene	0.000
	Xylenes	0.000
	n-Hexane	0.026
	HAPs	0.026
	Methane	0.647

Gas					
Number	Component	Pollutant	Emission Factor (kg/hr of THC per component)	kg/hr	lb/yr
200	Valves	Gas VOC	0.004500	0.14	2,603.88
		Non VOC	0.004500	0.76	14,740.92
		HAPs	0.004500	0.02	442.76
		CO2e	0.004500	14.55	280,414.73
236	Connectors	VOC	0.000200	0.01	136.56
		Non-VOC	0.000200	0.04	773.08
		HAPs	0.000200	0.00	23.22
		CO2e	0.000200	0.76	14,706.19
52	Flanges	VOC	0.000390	0.00	58.67
		Non-VOC	0.000390	0.02	332.16
		HAPs	0.000390	0.00	9.98
		CO2e	0.000390	0.327868	6318.678674
			Total VOCs:	0.15	2799.11
			Total THC:	0.97	18645.27
			Total CH4:	0.63	12057.58

Light Liquid Weight Fraction From Analysis:	VOC frac	0.979
	Benzene frac	0.001
	Toluene	0.005
	Ethylbenzene	0.009
	Xylenes	0.024
	n-hexane	0.030
	HAPs	0.069
	Methane	0.007

Light Liquid					
Number	Component	Pollutant	Emission Factor (kg/hr of THC per component)	kg/hr	lb/yr
208	Valves	Light Liquid VOC	0.002500	0.51	9,809.87
		Light Liquid Non-VOC	0.002500	0.01	211.57
		Light Liquid HAPs	0.002500	0.04	690.41
		CO2e	0.002500	0.09	1797.93
			Total VOC:	0.51	9,809.87
			Total THC:	0.52	10,021.44
			Total CH4:	0.00	71.92

Fugitive Total Emissions			
	Annual Emissions (lb/yr)	Annual Emissions (lb/hr)	Annual Emissions (tpy)
VOC	12,608.98	1.44	6.30
Ethylbenzene		0.01	0.05
Toluene		0.01	0.03
Xylenes		0.03	0.12
n-Hexane		0.09	0.39
TAPs (Benzene)		0.00	0.00
HAPs		0.13	0.58
CH_4 [3]		1.38	6.06
CO_{2e}	303,237.54	34.62	151.62

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
Bee Lewis Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

Number of PCVs	16
Bleed Rate (scf/day/PCV)	6.6
Total Bleed Rate (scf/day)	105.6

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	0.418	14.01	0.441408	1.16E-03	0.02	6.79E-04	0.00
Carbon Dioxide	0.1849	44.01	0.1952544	5.15E-04	0.02	9.44E-04	4.13E-03
Methane	80.4725	16.04	84.97896	0.22	3.59	0.15	0.66
Ethane	13.4876	30.07	14.2429056	0.04	1.13	0.05	0.21
Propane	2.8486	44.1	3.0081216	0.01	0.35	0.01	0.06
Isobutane	0.5527	58.12	0.5836512	1.54E-03	0.09	0.00	0.02
n-Butane	0.9447	58.12	0.9976032	2.63E-03	0.15	0.01	0.03
Isopentane	0.2715	72.15	0.286704	7.56E-04	0.05	2.27E-03	0.01
n-Pentane	0.2282	72.15	0.2409792	6.35E-04	0.05	1.91E-03	0.01
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	0.5913	86.18	0.6244128	1.65E-03	0.14	0.01	0.03
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	0.0347	0.1522
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	0.0059	0.0259
HAPs Emissions	0.0059	0.0259
TAPs Emissions	0.00E+00	0.00E+00
CH_4 Emissions	0.1497	0.6555
CO_{2e} emissions	3.7425	16.3923

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
Bee Lewis 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	0.2063	0.0420	0.1841	2.6918	0.0184	0.0806
H2S	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Nitrogen	0.0421	0.0086	0.0376	0.2793	0.0019	0.0084
Carbon Dioxide	0.2362	0.0481	0.2109	2.9514	0.0202	0.0884
Methane	13.9402	2.8410	12.4436	58.6758	0.4013	1.7578
Ethane	23.0743	4.7025	20.5970	25.5158	0.1745	0.7644
Propane	17.8517	3.6382	15.9351	5.5151	0.0377	0.1652
Isobutane	6.8799	1.4021	6.1412	0.9937	0.0068	0.0298
n-Butane	13.0973	2.6692	11.6911	2.0929	0.0143	0.0627
Isopentane	5.2831	1.0767	4.7159	0.5210	0.0036	0.0156
n-Pentane	4.6376	0.9451	4.1397	0.1736	0.0012	0.0052
2-Methylpentane	0.1288	0.0262	0.1150	0.0063	0.0000	0.0002
3-Methylpentane	0.0889	0.0181	0.0793	0.0103	0.0001	0.0003
n-Hexane	12.8887	2.6267	11.5049	0.3043	0.0021	0.0091
Methylcyclopentane	0.0225	0.0046	0.0200	0.0041	0.0000	0.0001
Benzene	0.0057	0.0012	0.0051	0.0086	0.0001	0.0003
2-Methylhexane	0.1610	0.0328	0.1437	0.0055	0.0000	0.0002
3-Methylhexane	0.1357	0.0277	0.1211	0.0055	0.0000	0.0002
Heptane	0.3057	0.0623	0.2729	0.0053	0.0000	0.0002
Methylcyclohexane	0.1605	0.0327	0.1433	0.0287	0.0002	0.0009
Toluene	0.0376	0.0077	0.0336	0.0529	0.0004	0.0016
Octane	0.5008	0.1021	0.4471	0.0035	0.0000	0.0001
Ethylbenzene	0.0324	0.0066	0.0290	0.0446	0.0003	0.0013
m & p-Xylene	0.0309	0.0063	0.0276	0.0389	0.0003	0.0012
o-Xylene	0.0461	0.0094	0.0411	0.0654	0.0004	0.0020
Nonane	0.1720	0.0350	0.1535	0.0013	0.0000	0.0000
C10+	0.0342	0.0070	0.0305	0.0044	0.0000	0.0001
Total VOCs	62.501	12.74	55.8	9.886	0.0676	0.2962
Total CO_{2e}		71.07	311.3		10.05	44.0
CH_4		2.84	12.44		0.40	1.76
Total TAPs (Benzene)		0.0012	0.0051		0.0001	0.0003
Toluene		0.0077	0.0336		0.0004	0.0016
Ethylbenzene		0.0066	0.0290		0.0003	0.0013
Xylenes		0.0157	0.0687		0.0007	0.0031
n-Hexane		2.627	11.505		0.0021	0.0091
Total HAPs		2.658	11.641		0.0035	0.0154
Total	100.00	20.38	89.3	100.00	0.684	3.00

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

Table 7

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

Condensate Tank Information	
Number of Tanks	4
Maximum Working Losses (lbs/hr)	0.7125
Maximum Breathing Losses (lbs/hr)	1.9066
# 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	0.0022	1.56E-05	6.81E-05	0.0000	0.0002	0.0001	0.0003
Carbon Dioxide	0.1600	0.0011	0.0050	0.0031	0.0134	0.0042	0.0184
Methane	3.0943	0.0220	0.0966	0.0590	0.2584	0.0810	0.3550
Ethane	31.7757	0.2264	0.9917	0.6058	2.6536	0.8322	3.6452
Propane	20.4737	0.1459	0.6390	0.3904	1.7097	0.5362	2.3487
Isobutane	7.5200	0.0536	0.2347	0.1434	0.6280	0.1970	0.8627
n-Butane	14.3414	0.1022	0.4476	0.2734	1.1976	0.3756	1.6452
Isopentane	4.9551	0.0353	0.1546	0.0945	0.4138	0.1298	0.5684
n-Pentane	4.2744	0.0305	0.1334	0.0815	0.3570	0.1120	0.4904
2-Methylpentane	0.1163	0.0008	0.0036	0.0022	0.0097	0.0030	0.0133
3-Methylpentane	0.0801	0.0006	0.0025	0.0015	0.0067	0.0021	0.0092
n-Hexane	11.9311	0.0850	0.3724	0.2275	0.9964	0.3125	1.3687
Methylcyclopentane	0.0185	0.0001	0.0006	0.0004	0.0015	0.0005	0.0021
Benzene	0.0034	2.42E-05	0.0001	0.0001	0.0003	0.0001	0.0004
2-Methylhexane	0.0408	2.91E-04	0.0013	0.0008	0.0034	0.0011	0.0047
3-Methylhexane	0.1255	0.0009	0.0039	0.0024	0.0105	0.0033	0.0144
Heptane	0.2672	0.0019	0.0083	0.0051	0.0223	0.0070	0.0306
Methylcyclohexane	0.1419	0.0010	0.0044	0.0027	0.0118	0.0037	0.0163
Toluene	0.0231	1.65E-04	7.22E-04	0.0004	0.0019	0.0006	0.0027
Octane	0.4213	0.0030	0.0131	0.0080	0.0352	0.0110	0.0483
Ethylbenzene	0.0218	1.55E-04	6.79E-04	0.0004	0.0018	0.0006	0.0025
m & p-Xylene	0.0271	1.93E-04	8.46E-04	0.0005	0.0023	0.0007	0.0031
o-Xylene	0.0259	1.84E-04	0.0008	0.0005	0.0022	0.0007	0.0030
Nonane	0.1401	0.0010	0.0044	0.0027	0.0117	0.0037	0.0161
C10+	0.0191	1.36E-04	0.0006	0.0004	0.0016	0.0005	0.0022
Total VOCs	64.968	0.4629	2.028	1.2387	5.4254	1.7016	7.453
Total CO_{2e}		0.5523	2.4192	1.4779	6.4734	2.0303	8.893
CH_4		0.0220	0.0966	0.0590	0.2584	0.0810	0.3550
Total TAPs (Benzene)		2.42E-05	1.06E-04	0.0001	0.0003	0.0001	0.0004
Toluene		1.65E-04	7.22E-04	0.0004	0.0019	0.0006	0.0027
Ethylbenzene		1.55E-04	6.79E-04	0.0004	0.0018	0.0006	0.0025
Xylenes		3.77E-04	0.0017	0.0010	0.0044	0.0014	0.0061
n-Hexane		0.0850	0.3724	0.2275	0.9964	0.3125	1.3687
Total HAPs		0.0857	0.3755	0.2294	1.0048	0.3151	1.3803
Total	100.00	0.7125	3.1209	1.9066	8.3509	2.6191	11.472

Table 7

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

Produced Water Tank Information	
Number of Tanks	2
Maximum Working Losses (lbs/hr)	0.0213
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	91.3064	0.0195	0.0853	0.0076	0.0334	0.0271	0.1186
H2S	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrogen	0.0054	1.15E-06	5.06E-06	4.51E-07	1.98E-06	1.61E-06	7.03E-06
Carbon Dioxide	3.8390	0.0008	0.0036	0.0003	0.0014	0.0011	0.0050
Methane	3.1637	0.0007	0.0030	0.0003	0.0012	0.0009	0.0041
Ethane	1.6229	0.0003	0.0015	0.0001	0.0006	0.0005	0.0021
Propane	0.0546	1.17E-05	0.0001	4.56E-06	2.00E-05	1.62E-05	0.0001
Isobutane	0.0025	5.26E-07	2.30E-06	2.06E-07	9.01E-07	7.32E-07	3.20E-06
n-Butane	0.0047	9.98E-07	4.37E-06	3.90E-07	1.71E-06	1.39E-06	6.08E-06
Isopentane	0.0003	6.42E-08	2.81E-07	2.51E-08	1.10E-07	8.93E-08	3.91E-07
n-Pentane	0.0000	6.30E-09	2.76E-08	2.46E-09	1.08E-08	8.77E-09	3.84E-08
2-Methylpentane	5.85E-07	1.25E-10	5.47E-10	4.88E-11	2.14E-10	1.74E-10	7.60E-10
3-Methylpentane	2.13E-06	4.55E-10	1.99E-09	1.78E-10	7.79E-10	6.33E-10	2.77E-09
n-Hexane	1.00E-05	2.13E-09	9.35E-09	8.34E-10	3.66E-09	2.97E-09	1.30E-08
Methylcyclopentane	1.03E-06	2.20E-10	9.61E-10	8.58E-11	3.76E-10	3.05E-10	1.34E-09
Benzene	1.26E-04	2.69E-08	1.18E-07	1.05E-08	4.61E-08	3.75E-08	1.64E-07
2-Methylhexane	2.96E-08	6.32E-12	2.77E-11	2.47E-12	1.08E-11	8.78E-12	3.85E-11
3-Methylhexane	1.18E-07	2.51E-11	1.10E-10	9.81E-12	4.30E-11	3.49E-11	1.53E-10
Heptane	3.68E-08	7.85E-12	3.44E-11	3.07E-12	1.34E-11	1.09E-11	4.78E-11
Methylcyclohexane	2.28E-06	4.87E-10	2.13E-09	1.90E-10	8.34E-10	6.77E-10	2.97E-09
Toluene	1.69E-04	3.60E-08	1.58E-07	1.41E-08	6.16E-08	5.00E-08	2.19E-07
Octane	3.09E-09	6.60E-13	2.89E-12	2.58E-13	1.13E-12	9.18E-13	4.02E-12
Ethylbenzene	4.26E-05	9.09E-09	3.98E-08	3.56E-09	1.56E-08	1.27E-08	5.54E-08
m & p-Xylene	2.85E-05	6.09E-09	2.67E-08	2.38E-09	1.04E-08	8.46E-09	3.71E-08
o-Xylene	6.12E-05	1.30E-08	5.71E-08	5.10E-09	2.23E-08	1.81E-08	7.95E-08
Nonane	3.45E-10	7.35E-14	3.22E-13	2.87E-14	1.26E-13	1.02E-13	4.48E-13
C10+	5.61E-10	1.20E-13	5.24E-13	4.68E-14	2.05E-13	1.66E-13	7.29E-13
Total VOCs	0.0626	1.33E-05	0.0001	5.22E-06	2.29E-05	1.86E-05	0.0001
Total CO_{2e}		0.0177	0.0775	0.0069	0.0303	0.0246	0.1078
CH_4		0.0007	0.0030	0.0003	0.0012	0.0009	0.0041
Total TAPs (Benzene)		2.69E-08	1.18E-07	1.05E-08	4.61E-08	3.75E-08	1.64E-07
Toluene		3.60E-08	1.58E-07	1.41E-08	6.16E-08	5.00E-08	2.19E-07
Ethylbenzene		9.09E-09	3.98E-08	3.56E-09	1.56E-08	1.27E-08	5.54E-08
Xylenes		1.91E-08	8.38E-08	7.48E-09	3.28E-08	2.66E-08	1.17E-07
n-Hexane		2.13E-09	9.35E-09	8.34E-10	3.66E-09	2.97E-09	1.30E-08
Total HAPs		9.33E-08	4.08E-07	3.65E-08	1.60E-07	1.30E-07	5.68E-07
Total	100.00	0.0213	0.0934	0.0083	0.0365	0.0297	0.1299

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

Table 8

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

Annual Loading	Oil Truck Loading	Water Truck Loading
RVP	3.54	1.0328
Annual Average Temp (F)	72.1	72.1
S (saturation factor)	0.6	0.6
P (true vapor pressure)	2.30	0.45
M (MW of vapor)	41.81	18.49
Collection Efficiency (%)	0.00	0.00
Total Hydrocarbon Loading Loss (lb/10^3 gal)*	1.35	0.12
Maximum Throughput (gallons/hr)**	10,080	10,080
Average Throughput (gallons/yr)	613,200	2,299,500
Total Hydrocarbon Loading Emissions (lbs/hr)	13.60	1.18
Total Hydrocarbon Loading Emissions (tpy)	0.41	0.14

	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	0.0022	2.97E-04	9.03E-06	0.0054	6.41E-05	7.32E-06
Carbon Dioxide	0.1600	0.0218	6.62E-04	3.8390	4.55E-02	5.19E-03
Methane	3.0943	0.4209	1.28E-02	3.1637	3.75E-02	4.28E-03
Ethane	31.7757	4.3226	0.1315	1.6229	1.92E-02	2.19E-03
Propane	20.4737	2.7852	8.47E-02	0.0546	6.47E-04	7.38E-05
Isobutane	7.5200	1.0230	3.11E-02	0.0025	2.92E-05	3.33E-06
n-Butane	14.3414	1.9509	5.93E-02	0.0047	5.54E-05	6.32E-06
Isopentane	4.9551	0.6741	2.05E-02	0.0003	3.57E-06	4.07E-07
n-Pentane	4.2744	0.5815	1.77E-02	0.0000	3.50E-07	3.99E-08
2-Methylpentane	0.1163	0.0158	4.81E-04	5.85E-07	6.93E-09	7.91E-10
3-Methylpentane	0.0801	0.0109	3.31E-04	2.13E-06	2.53E-08	2.88E-09
n-Hexane	11.9311	1.6231	4.94E-02	1.00E-05	1.19E-07	1.35E-08
Methylcyclopentane	0.0185	0.0025	7.66E-05	1.03E-06	1.22E-08	1.39E-09
Benzene	0.0034	0.0005	1.40E-05	0.0001	1.50E-06	1.71E-07
2-Methylhexane	0.0408	0.0056	1.69E-04	2.96E-08	3.51E-10	4.00E-11
3-Methylhexane	0.1255	0.0171	5.19E-04	1.18E-07	1.39E-09	1.59E-10
Heptane	0.2672	0.0363	1.11E-03	3.68E-08	4.36E-10	4.97E-11
Methylcyclohexane	0.1419	0.0193	5.87E-04	2.28E-06	2.70E-08	3.09E-09
Toluene	0.0231	0.0031	9.58E-05	0.0002	2.00E-06	2.28E-07
Octane	0.4213	0.0573	1.74E-03	3.09E-09	3.67E-11	4.18E-12
Ethylbenzene	0.0218	0.0030	9.01E-05	4.26E-05	5.05E-07	5.76E-08
m & p-Xylene	0.0271	0.0037	1.12E-04	2.85E-05	3.38E-07	3.86E-08
o-Xylene	0.0259	0.0035	1.07E-04	6.12E-05	7.25E-07	8.27E-08
Nonane	0.1401	0.0191	5.80E-04	3.45E-10	4.08E-12	4.66E-13
C10+	0.0191	0.0026	7.91E-05	5.61E-10	6.65E-12	7.58E-13
Total VOCs	64.9677	8.8379	0.2688	0.0626	7.41E-04	8.45E-05
Total CH_4		0.4209	0.0128		0.0375	0.0043
Total CO_{2e}		10.5450	0.3207		0.9826	0.1121
Total TAPs (Benzene)		0.0005	1.40E-05		1.50E-06	1.71E-07
Toluene		0.0031	9.58E-05		2.00E-06	2.28E-07
Ethylbenzene		0.0030	9.01E-05		5.05E-07	5.76E-08
Xylenes		0.0072	2.19E-04		1.06E-06	1.21E-07
n-Hexane		1.6231	4.94E-02		1.19E-07	1.35E-08
Total HAPs		1.6368	4.98E-02		5.18E-06	5.91E-07
Total	100.0000	13.6036	0.4138	100.0000	1.1848	0.1351

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
Bee Lewis Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

Gas Production Unit Heater Emissions

Number of Units	4
GPU Heater Rating (MMBtu/hr)	1.50
Operating hours/year	8760
Fuel Heat Value (Btu/scf)	1,228.7600

Pollutant	Emission Factors (lb/MMscf)	lb/hr	tpy
NOx	100	0.488	2.139
CO	84	0.410	1.797
CO_2	120,000	585.957	2566.490
Lead	0.0005	2.44E-06	1.07E-05
N_2O	2.2	0.011	0.047
PM (Total)	7.6	0.037	0.163
SO_2	0.6	0.003	0.013
TOC	11	0.054	0.235
Methane	2.3	0.011	0.049
VOC	5.5	0.027	0.118
HAPS			
2-Methylnaphthalene	2.40E-05	1.17E-07	5.13E-07
Benzene	2.10E-03	1.03E-05	4.49E-05
Dichlorobenzene	1.20E-03	5.86E-06	2.57E-05
Fluoranthene	3.00E-06	1.46E-08	6.42E-08
Fluorene	2.80E-06	1.37E-08	5.99E-08
Formaldehyde	7.50E-02	3.66E-04	1.60E-03
Hexane	1.80E+00	8.79E-03	3.85E-02
Naphthalene	6.10E-04	2.98E-06	1.30E-05
Phenanathrene	1.70E-05	8.30E-08	3.64E-07
Toluene	3.40E-03	1.66E-05	7.27E-05

	lb/hr	tpy
TOTAL Uncontrolled VOC	0.027	0.118
TOTAL Uncontrolled HAPs	0.009	0.040
TOTAL Uncontrolled TAPs (Benzene)	1.03E-05	4.49E-05
TOTAL Uncontrolled Toluene	1.66E-05	7.27E-05
TOTAL Uncontrolled Hexane	0.009	0.038
TOTAL Uncontrolled TAPs (Formaldehyde)	0.000	0.002
TOTAL CH_4	0.011	0.049
TOTAL CO_{2e} Emissions	589.44	2,581.74

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

Table 10

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

General Information	
Unit Name:	EC001

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	1
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)	17	--	184.99	14.04	23.77	0.61	240.41
Maximum Expected Annual Volumetric Flow Rate of Stream (scf/yr)	148,920.00	--	1,620,543.91	122,966.97	208,265.83	5,333.87	2,106,030.59
Heating Content (Btu/ft3)	1,229		2,118.69	1,169.29	2,404.66	102.30	1,936.62

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	-	-	12.738	0.068	1.702	0.000	14.51
Benzene	-	-	0.001	0.000	0.000	0.000	0.001
Toluene	-	-	0.008	0.000	0.001	0.000	0.009
Ethylbenzene	-	-	0.007	0.000	0.001	0.000	0.007
Xylenes	-	-	0.016	0.001	0.001	0.000	0.018
n-Hexane	-	-	2.627	0.002	0.312	0.000	2.941
HAPs	-	-	2.658	0.004	0.315	0.000	2.976
Total Mass Flow	-	-	20.380	0.684	2.619	0.030	23.713
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	-	-	55.791	0.296	7.453	0.000	63.540
Benzene	-	-	0.005	0.000	0.000	0.000	0.006
Toluene	-	-	0.034	0.002	0.003	0.000	0.038
Ethylbenzene	-	-	0.029	0.001	0.002	0.000	0.033
Xylenes	-	-	0.069	0.003	0.006	0.000	0.078
n-Hexane	-	-	11.505	0.009	1.369	0.000	12.883
HAP	-	-	11.641	0.015	1.380	0.000	13.037
Total Mass Flow	-	-	89.264	2.996	11.472	0.130	103.861

Table 10

Enclosed Combustor Emissions
Bee Lewis 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	0.002	-	0.816				0.82
CO	0.001	-	3.720				3.72
PM2.5	0.000	-	0.001	0.000	0.000	0.000	0.00
PM10	0.000	-	0.001	0.000	0.000	0.000	0.00
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	2.040	-	-	-	-	-	2.04
Total VOC	0.000	-	0.255	0.001	0.034	0.000	0.29
Benzene	0.000	-	0.000	0.000	0.000	0.000	0.00
Toluene	0.000	-	0.000	0.000	0.000	0.000	0.00
Ethylbenzene	0.000	-	0.000	0.000	0.000	0.000	0.00
Xylenes	0.000	-	0.000	0.000	0.000	0.000	0.00
n-Hexane	0.000	-	0.053	0.000	0.006	0.000	0.06
HAP	0.000	-	0.053	0.000	0.006	0.000	0.06
N_2O	0.000	-	0.000	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	0.007	-	3.574				3.58
CO	0.006	-	16.294				16.30
PM2.5	0.000	-	0.005	0.000	0.001	0.000	0.01
PM10	0.001	-	0.006	0.000	0.001	0.000	0.01
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	8.935	-	-	-	-	-	8.94
Total VOC	0.000	-	1.116	0.006	0.149	0.000	1.27
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	-	0.001	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	-	0.230	0.000	0.027	0.000	0.26
HAP	0.000	-	0.233	0.000	0.028	0.000	0.26
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

Enclosed Combustor/Vapor Combustor Total Emissions		
	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
Total VOC	0.29	1.27
NOx	0.818	3.582
CO	3.721	16.300
PM2.5	0.001	0.006
PM10	0.002	0.008
H_2S	5.43E-06	2.38E-05
SO_2	1.02E-05	4.47E-05
Benzene (TAPs)	2.62E-05	1.15E-04
Toluene	1.73E-04	7.56E-04
Ethylbenzene	1.50E-04	6.56E-04
Xylenes	3.56E-04	0.002
Hexanes	0.059	0.258
Formaldehyde (TAPs)	1.28E-06	5.58E-06
HAPs	0.06	0.26
CH_4	0.06	0.27
CO_2e	65.52	286.98
N_2O	0.001	0.002
Lead	1.20E-07	5.27E-07

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
Bee Lewis 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	0.002	1,620,544	0.0136	122,967	0.0015	208,266	0.016	5,334	5,285	1	0	--	5,285	4,668,821
Methane	0.321	1,620,544	0.7409	122,967	0.0812	208,266	0.036	5,334	627,980	1	0.98	615,420	12,560	12,560
Ethane	0.283	1,620,544	0.1719	122,967	0.4451	208,266	0.010	5,334	572,788	2	0.98	1,122,665	--	
Propane	0.149	1,620,544	0.0253	122,967	0.1956	208,266	0.000	5,334	285,931	3	0.98	840,637	--	
i-Butane	0.044	1,620,544	0.0035	122,967	0.0545	208,266	0.000	5,334	82,567	4	0.98	323,663	--	
n-Butane	0.083	1,620,544	0.0073	122,967	0.1039	208,266	0.000	5,334	157,309	4	0.98	616,650	--	
Pentane	0.051	1,620,544	0.0020	122,967	0.0539	208,266	0.000	5,334	93,692	5	0.98	459,093	--	
Hexane	0.056	1,620,544	0.0008	122,967	0.0593	208,266	0.000	5,334	103,389	6	0.98	607,925	--	
Benzene	0.000	1,620,544	0.0000	122,967	0.0000	208,266	0.000	5,334	50	6	0.98	294	--	
Heptanes	0.002	1,620,544	0.0000	122,967	0.0019	208,266	0.000	5,334	4,159	7	0.98	28,530	--	
Toluene	0.000	1,620,544	0.0001	122,967	0.0001	208,266	0.000	5,334	280	7	0.98	1,923	--	
Octane	0.002	1,620,544	0.0001	122,967	0.0022	208,266	0.000	5,334	4,058	8	0.98	31,814	--	
Ethyl benzene	0.000	1,620,544	0.0001	122,967	0.0001	208,266	0.000	5,334	211	8	0.98	1,655	--	
Xylenes	0.000	1,620,544	0.0002	122,967	0.0002	208,266	0.000	5,334	502	8	0.98	3,935	--	
Nonane	0.000	1,620,544	0.0000	122,967	0.0005	208,266	0.000	5,334	898	9	0.98	7,922	--	
Decane plus	0.000	1,620,544	0.0000	122,967	0.0001	208,266	0.000	5,334	144	10	0.98	1,409	--	
											Subtotal	**4,663,536**	--	

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	4,668,821	0.12	2000	1	61.80	270.71
CH_4	12,560	0.04	2000	25	0.06	0.27
				CO_2e Emissions	**63.3**	**277.35**

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
Bee Lewis 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)	40
PW Production (bbl/day)	150
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	0.1200	1	73	0.1200	8.7600	3.8175	1.7179
Tanker Trucks PW	10	40	10	0.1200	1	274	0.1200	32.8800	3.8175	1.7179
Pick Up Truck	4	3	10	0.2300	1	730	0.2300	167.9000	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	0.4581	33.4416	0.0167	0.2061	15.0487	0.0075	0.2291	16.7208	0.0084	0.1031	7.5244	0.0038
Tanker Trucks PW	0.4581	125.5204	0.0628	0.2061	56.4842	0.0282	0.2291	62.7602	0.0314	0.1031	28.2421	0.0141
Pick Up Truck	0.0797	58.2075	0.0291	0.0359	26.1934	0.0131	0.0399	29.1038	0.0146	0.0179	13.0967	0.0065
Total Emissions	0.9959	217.1694	0.1086	0.4482	97.7262	0.0489	0.4980	108.5847	0.0543	0.2241	48.8631	0.0244

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
Bee Lewis 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**
$PM_{2.5}$	0.0385	0.1685	0.9959	1.2303	-9.57E-01	-1.0617
PM_{10}	0.2630	0.1950	0.2730	0.4470	-0.0100	-0.2520
VOC (uncontrolled)	16.0078	70.3831	73.2009	322.0106	-57.1931	-251.6275
CO	4.1316	18.0964	6.1602	26.9819	-2.0287	-8.8855
NOx	1.3060	5.7203	0.9298	4.0725	0.3762	1.6478
SO2	0.0029	0.0129	0.0030	0.0133	-9.55E-05	-4.18E-04
Pb	2.56E-06	1.12E-05	3.07E-06	1.34E-05	-5.08E-07	-2.23E-06
HAPs	0.2078	0.9600	0.2287	1.0049	-0.0209	-0.0449
TAPs	0.0010	0.0046	0.0111	0.0486	-1.01E-02	-0.0441

Notes:
1. Change in emissions due to decrease in condensate and PW production rate, and removal of 1 Kubota engine.

Bryan Research & Engineering, Inc.

ProMax® 3.2

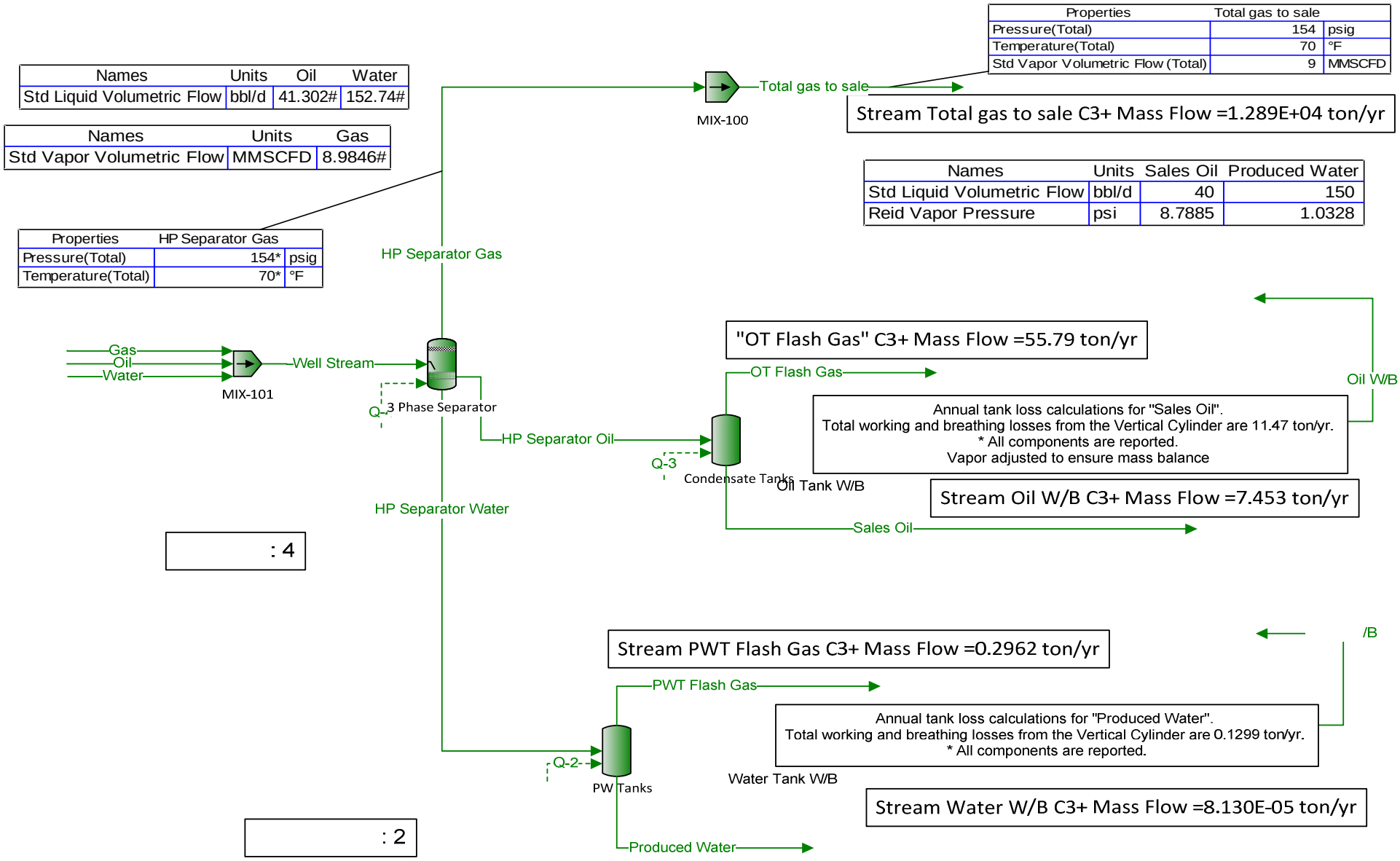
with

TSWEET® & PROSIM®

Simulation Report	
Client Name:	Antero Resources
Location:	Doddridge County, WV
Job:	Bee Lewis Well Pad

Project Name:	Antero Promax Model- VRT
File Name:	\\det-s1.cra.int\Shared\AirQuality\ANTERO RESOURCES\ProMax\Antero WV_1 HP\PROMAX SCENARIO 3.pmx
ProMax Version:	4.0.16071.0

Report Created:	2/10/2017 17:42


Names | Units | Oil | Water
Std Liquid Volumetric Flow | bbl/d | 41.302# | 152.74#
Names | Units | Gas
Std Vapor Volumetric Flow | MMSCFD | 8.9846#
Properties | HP Separator Gas
Pressure(Total) | 154* | psig
Temperature(Total) | 70* | °F
Properties | Total gas to sale
Pressure(Total) | 154 | psig
Temperature(Total) | 70 | °F
Std Vapor Volumetric Flow (Total) | 9 | MMSCFD
Names | Units | Sales Oil | Produced Water
Std Liquid Volumetric Flow | bbl/d | 40 | 150
Reid Vapor Pressure | psi | 8.7885 | 1.0328
MIX-100
Total gas to sale
Stream Total gas to sale C3+ Mass Flow =1.289E+04 ton/yr
HP Separator Gas
Gas
Oil
Water
MIX-101
Well Stream
3 Phase Separator
Q-1
"OT Flash Gas" C3+ Mass Flow =55.79 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 11.47 ton/yr.
* All components are reported.
Vapor adjusted to ensure mass balance
HP Separator Oil
Q-3
Condensate Tanks
Oil Tank W/B
Stream Oil W/B C3+ Mass Flow =7.453 ton/yr
HP Separator Water
Sales Oil
: 4
Stream PWT Flash Gas C3+ Mass Flow =0.2962 ton/yr
/B
PWT Flash Gas
Annual tank loss calculations for "Produced Water".
Total working and breathing losses from the Vertical Cylinder are 0.1299 ton/yr.
* All components are reported.
Q-2
PW Tanks
Water Tank W/B
Stream Water W/B C3+ Mass Flow =8.130E-05 ton/yr
: 2
Produced Water

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*	0.225110	0.0670215	99.9698	0*	0.000340325*	0.422790	99.9967	3.03280	0.0114998	0.225110	100*	93.7137*	11.1038
H2S		0*	0	0	0	0*	0*	0	0	0	0	0	0*	0*	0
Nitrogen		0.418*	0.417221	0.00756998	5.85019E-05	0.0180005*	0.00328277*	0.0555245	2.37036E-06	0.202400	8.61457E-05	0.417221	0*	0.00357301*	0.370217
Carbon Dioxide		0.1849*	0.184351	0.0291553	0.00103697	0.0150005*	0.153150*	0.198206	0.000659645	1.36120	0.00277308	0.184351	0*	1.61293*	0.163788
Methane		80.4725*	80.3137	4.46572	0.0223767	4.77714*	8.12354*	32.0869	0.00178839	74.2383	0.155138	80.3137	0*	3.64643*	71.2779
Ethane		13.4876*	13.4609	4.58006	0.00539557	4.94815*	44.5077*	28.3359	0.000619007	17.2238	0.872705	13.4609	0*	0.997961*	11.9607
Propane		2.8486*	2.84724	3.50684	0.000768451	4.86315*	19.5551*	14.9490	6.44254E-05	2.53862	1.72117	2.84724	0*	0.0229131*	2.53919
Isobutane		0.5527*	0.549693	1.74171	0.000102376	1.36904*	5.44924*	4.37084	6.13646E-06	0.347023	1.33141	0.549693	0*	0.000784438*	0.494124
n-Butane		0.9447*	0.939642	4.33168	0.000219706	3.81511*	10.3922*	8.32083	1.70119E-05	0.730884	3.70913	0.939642	0*	0.00148805*	0.849628
Isopentane		0.2715*	0.268837	2.80583	4.30642E-05	2.45607*	2.89258*	2.70390	2.41230E-06	0.146584	2.82174	0.268837	0*	7.71608E-05*	0.248831
n-Pentane		0.2282*	0.227964	3.17859	1.38676E-05	3.46210*	2.49521*	2.37351	3.21421E-07	0.0488448	3.30423	0.227964	0*	7.57293E-06*	0.213930
2-Methylpentane		0*	0.00507425	0.170388	4.21773E-07	1.49804*	0.0568594*	0.0551892	1.33316E-08	0.00147276	0.188366	0.00507425	0*	1.25533E-07*	0.00512756
3-Methylpentane		0*	0.00348897	0.130200	7.25465E-07	1.04403*	0.0391270*	0.0380723	5.42064E-08	0.00242046	0.144578	0.00348897	0*	4.57611E-07*	0.00357355
n-Hexane		0.5913*	0.503524	24.3545	2.01970E-05	3.65811*	5.83120*	5.52271	3.22174E-07	0.0716645	27.2934	0.503524	0*	2.14709E-06*	0.536141
Methylcyclopentane		0*	0.000888724	0.0425517	3.14720E-07	0.276008*	0.00926851*	0.00985400	3.72703E-08	0.00100046	0.0476546	0.000888724	0*	2.26115E-07*	0.000944730
Benzene		0*	0.000240979	0.0123896	7.90014E-06	0.0760023*	0.00182870*	0.00268764	7.28472E-06	0.00222636	0.0139037	0.000240979	0*	2.98871E-05*	0.000260143
2-Methylhexane		0*	0.00548426	0.588898	3.13655E-07	2.05306*	0.0171603*	0.0593319	6.85495E-09	0.00110626	0.671542	0.00548426	0*	5.46382E-09*	0.00702729
3-Methylhexane		0*	0.00460654	0.549274	3.18436E-07	1.78305*	0.0527486*	0.0500017	8.27301E-09	0.00111838	0.627190	0.00460654	0*	2.17026E-08*	0.00610309
Heptane		0*	0.0104651	1.59703	3.00081E-07	4.42513*	0.112296*	0.112661	3.54565E-09	0.00106924	1.82868	0.0104651	0*	6.79133E-09*	0.0151465
Methylcyclohexane		0*	0.00550323	0.848209	1.86704E-06	2.33607*	0.0608511*	0.0603596	2.19983E-07	0.00593914	0.971161	0.00550323	0*	4.29932E-07*	0.00799598
Toluene		0*	0.00136698	0.244029	3.19024E-05	0.617019*	0.0105816*	0.0150672	2.86815E-05	0.0116425	0.279761	0.00136698	0*	3.38374E-05*	0.00211195
Octane		0*	0.0154323	7.43221	1.74921E-07	11.9694*	0.155346*	0.161897	8.85568E-10	0.000627534	8.56683	0.0154323	0*	5.00875E-10*	0.0409691
Ethylbenzene		0*	0.00105438	0.591327	2.11615E-05	0.908027*	0.00863561*	0.0112806	1.87996E-05	0.00853534	0.681850	0.00105438	0*	7.42641E-06*	0.00310803
m-Xylene		0*	0.00100824	0.618592	1.26337E-05	0.925028*	0.0107499*	0.0107475	1.05738E-05	0.00743829	0.713452	0.00100824	0*	4.96929E-06*	0.00316622
o-Xylene		0*	0.00150124	1.06738	4.44249E-05	1.53505*	0.0102675*	0.0160245	4.09682E-05	0.0125052	1.23146	0.00150124	0*	1.06540E-05*	0.00525421
Nonane		0*	0.00483872	7.41632	5.73564E-08	9.20628*	0.0459912*	0.0495088	2.96758E-10	0.000205744	8.56599	0.00483872	0*	4.96963E-11*	0.0315115
C10+		0*	0.000786358	29.6225	1.57532E-07	31.9660*	0.00465189*	0.00728864	1.41400E-08	0.000517053	34.2443	0.000786358	0*	5.99121E-11*	0.109414
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*	2.22500	0.00274014	121.468	0*	2.11637E-07*	0.00233345	121.467	0.00102197	0.000406696	2.22500	123.696*	0.00150366*	123.696
H2S		0*	0	0	0	0*	0*	0	0	0	0	0	0*	0*	0
Nitrogen		4.12354*	4.12385	0.000309495	7.10827E-05	0.000686368*	2.04145E-06*	0.000306449	2.87931E-06	6.82034E-05	3.04658E-06	4.12385	0*	5.73300E-08*	4.12423
Carbon Dioxide		1.82402*	1.82214	0.00119200	0.00125997	0.000571974*	9.52391E-05*	0.00109393	0.000801278	0.000458688	9.80712E-05	1.82214	0*	2.58799E-05*	1.82460
Methane		793.855*	793.828	0.182579	0.0271887	0.182154*	0.00505177*	0.177093	0.00217239	0.0250164	0.00548651	793.828	0*	5.85080E-05*	794.037
Ethane		133.054*	133.049	0.187254	0.00655589	0.188675*	0.0276779*	0.156390	0.000751915	0.00580397	0.0308635	133.049	0*	1.60126E-05*	133.243
Propane		28.1012*	28.1424	0.143376	0.000933706	0.185434*	0.0121607*	0.0825060	7.82583E-05	0.000855447	0.0608697	28.1424	0*	3.67647E-07*	28.2867
Isobutane		5.45235*	5.43321	0.0712091	0.000124392	0.0522021*	0.00338871*	0.0241234	7.45404E-06	0.000116938	0.0470857	5.43321	0*	1.25865E-08*	5.50455
n-Butane		9.31940*	9.28750	0.177099	0.000266953	0.145472*	0.00646260*	0.0459240	2.06646E-05	0.000246289	0.131175	9.28750	0*	2.38762E-08*	9.46487
Isopentane		2.67833*	2.65721	0.114715	5.23252E-05	0.0936511*	0.00179880*	0.0149233	2.93026E-06	4.93949E-05	0.0997920	2.65721	0*	1.23807E-09*	2.77198
n-Pentane		2.25118*	2.25322	0.129955	1.68498E-05	0.132011*	0.00155169*	0.0130998	3.90434E-07	1.64594E-05	0.116855	2.25322	0*	1.21510E-10*	2.38319
2-Methylpentane		0*	0.0501544	0.00696622	5.12475E-07	0.0571211*	3.53590E-05*	0.000304598	1.61940E-08	4.96281E-07	0.00666163	0.0501544	0*	2.01421E-12*	0.0571211
3-Methylpentane		0*	0.0344853	0.00532318	8.81476E-07	0.0398094*	2.43318E-05*	0.000210127	6.58452E-08	8.15631E-07	0.00511305	0.0344853	0*	7.34249E-12*	0.0398094
n-Hexane		5.83313*	4.97687	0.995723	2.45404E-05	0.139485*	0.00362624*	0.0304807	3.91349E-07	2.41491E-05	0.965243	4.97687	0*	3.44507E-11*	5.97262
Methylcyclopentane		0*	0.00878422	0.00173971	3.82401E-07	0.0105243*	5.76379E-06*	5.43858E-05	4.52727E-08	3.37128E-07	0.00168532	0.00878422	0*	3.62808E-12*	0.0105243
Benzene		0*	0.00238186	0.000506544	9.59907E-06	0.00289800*	1.13721E-06*	1.48335E-05	8.84884E-06	7.50226E-07	0.000491710	0.00238186	0*	4.79546E-10*	0.00289800
2-Methylhexane		0*	0.0542069	0.0240768	3.81107E-07	0.0782841*	1.06715E-05*	0.000327462	8.32679E-09	3.72780E-07	0.0237494	0.0542069	0*	8.76684E-14*	0.0782841
3-Methylhexane		0*	0.0455314	0.0224568	3.86915E-07	0.0679886*	3.28026E-05*	0.000275967	1.00493E-08	3.76866E-07	0.0221808	0.0455314	0*	3.48225E-13*	0.0679886
Heptane		0*	0.103438	0.0652938	3.64614E-07	0.168732*	6.98330E-05*	0.000621796	4.30695E-09	3.60307E-07	0.0646720	0.103438	0*	1.08969E-13*	0.168732
Methylcyclohexane		0*	0.0543944	0.0346786	2.26855E-06	0.0890753*	3.78413E-05*	0.000333134	2.67216E-07	2.00133E-06	0.0343455	0.0543944	0*	6.89838E-12*	0.0890753
Toluene		0*	0.0135114	0.00997702	3.87630E-05	0.0235272*	6.58033E-06*	8.31584E-05	3.48398E-05	3.92322E-06	0.00989386	0.0135114	0*	5.42930E-10*	0.0235272
Octane		0*	0.152534	0.303863	2.12538E-07	0.456397*	9.66048E-05*	0.000893536	1.07571E-09	2.11462E-07	0.302969	0.152534	0*	8.03667E-15*	0.456397
Ethylbenzene		0*	0.0104216	0.0241762	2.57123E-05	0.0346235*	5.37021E-06*	6.22596E-05	2.28361E-05	2.87618E-06	0.0241139	0.0104216	0*	1.19159E-10*	0.0346235
m-Xylene		0*	0.00996551	0.0252908	1.53506E-05	0.0352717*	6.68499E-06*	5.93172E-05	1.28441E-05	2.50651E-06	0.0252315	0.00996551	0*	7.97336E-11*	0.0352717
o-Xylene		0*	0.0148384	0.0436396	5.39785E-05	0.0585320*	6.38500E-06*	8.84418E-05	4.97646E-05	4.21393E-06	0.0435511	0.0148384	0*	1.70947E-10*	0.0585320
Nonane		0*	0.0478263	0.303213	6.96908E-08	0.351039*	2.86005E-05*	0.000273247	3.60475E-10	6.93304E-08	0.302940	0.0478263	0*	7.97391E-16*	0.351039
C10+		0*	0.00777243	1.21110	1.91409E-07	1.21888*	2.89286E-06*	4.02272E-05	1.71761E-08	1.74233E-07	1.21106	0.00777243	0*	9.61306E-16*	1.21888
Mass Fraction		%	%	%	%	%	%	%	%	%	%	%	%	%	%
Water		0*	0.201277	0.0111487	99.9645	0*	0.000145571*	0.206271	99.9949	2.69181	0.00173454	0.201277	100*	91.3064*	9.88354
H2S		0*	0	0	0	0*	0*	0	0	0	0	0	0*	0*	0
Nitrogen		0.580824*	0.580082	0.00195807	9.09645E-05	0.00446810*	0.00218346*	0.0421233	3.68580E-06	0.279342	2.02046E-05	0.580082	0*	0.00541324*	0.512417
Carbon Dioxide		0.403632*	0.402671	0.0118476	0.00253307	0.00584955*	0.160031*	0.236230	0.00161142	2.95140	0.00102179	0.402671	0*	3.83901*	0.356147
Methane		64.0355*	63.9467	0.661501	0.0199252	0.679064*	3.09425*	13.9402	0.00159252	58.6758	0.0208372	63.9467	0*	3.16370*	56.4973
Ethane		20.1167*	20.0887	1.27162	0.00900519	1.31836*	31.7757*	23.0743	0.00103316	25.5158	0.219704	20.0887	0*	1.62289*	17.7697
Propane		6.23059*	6.23128	1.42784	0.00188082	1.90014*	20.4737*	17.8517	0.000157690	5.51509	0.635432	6.23128	0*	0.0546432*	5.53213
Isobutane		1.59343*	1.58570	0.934730	0.000330275	0.705067*	7.52000*	6.87985	1.97975E-05	0.993712	0.647894	1.58570	0*	0.00246580*	1.41899
n-Butane		2.72357*	2.71058	2.32470	0.000708793	1.96481*	14.3414*	13.0973	5.48840E-05	2.09291	1.80495	2.71058	0*	0.00467754*	2.43990
Isopentane		0.971630*	0.962667	1.86921	0.000172457	1.57015*	4.95512*	5.28314	9.66078E-06	0.521045	1.70450	0.962667	0*	0.000301080*	0.887022
n-Pentane		0.816670*	0.816306	2.11754	5.55350E-05	2.21330*	4.27441*	4.63758	1.28722E-06	0.173623	1.99595	0.816306	0*	2.95495E-05*	0.762611
2-Methylpentane		0*	0.0217027	0.135578	2.01743E-06	1.14388*	0.116339*	0.128798	6.37698E-08	0.00625280	0.135905	0.0217027	0*	5.85056E-07*	0.0218321
3-Methylpentane		0*	0.0149224	0.103601	3.47005E-06	0.797202*	0.0800570*	0.0888515	2.59289E-07	0.0102764	0.104312	0.0149224	0*	2.13273E-06*	0.0152154
n-Hexane		2.52751*	2.15358	19.3790	9.66066E-05	2.79326*	11.9311*	12.8887	1.54108E-06	0.304261	19.6921	2.15358	0*	1.00067E-05*	2.28278
Methylcyclopentane		0*	0.00371217	0.0330665	1.47016E-06	0.205824*	0.0185205*	0.0224589	1.74107E-07	0.00414822	0.0335783	0.00371217	0*	1.02918E-06*	0.00392837
Benzene		0*	0.000934229	0.00893599	3.42521E-05	0.0526036*	0.00339156*	0.00568539	3.15850E-05	0.00856786	0.00909282	0.000934229	0*	0.000126257*	0.00100399
2-Methylhexane		0*	0.0272742	0.544859	1.74447E-06	1.82285*	0.0408265*	0.161004	3.81269E-08	0.00546125	0.563379	0.0272742	0*	2.96094E-08*	0.0347909
3-Methylhexane		0*	0.0229091	0.508198	1.77106E-06	1.58311*	0.125495*	0.135685	4.60141E-08	0.00552111	0.526170	0.0229091	0*	1.17610E-07*	0.0302154
Heptane		0*	0.0520448	1.47760	1.66898E-06	3.92893*	0.267164*	0.305720	1.97207E-08	0.00527852	1.53414	0.0520448	0*	3.68034E-08*	0.0749876
Methylcyclohexane		0*	0.0268179	0.768990	1.01751E-05	2.03239*	0.141859*	0.160498	1.19892E-06	0.0287298	0.798348	0.0268179	0*	2.28300E-06*	0.0387903
Toluene		0*	0.00625118	0.207611	0.000163155	0.503745*	0.0231489*	0.0375964	0.000146688	0.0528502	0.215814	0.00625118	0*	0.000168614*	0.00961449
Octane		0*	0.0874907	7.83900	1.10906E-06	12.1148*	0.421323*	0.500825	5.61497E-09	0.00353160	8.19304	0.0874907	0*	3.09429E-09*	0.231224
Ethylbenzene		0*	0.00555567	0.579665	0.000124699	0.854185*	0.0217678*	0.0324330	0.000110785	0.0446439	0.606068	0.00555567	0*	4.26400E-05*	0.0163030
m-Xylene		0*	0.00531254	0.606392	7.44474E-05	0.870178*	0.0270972*	0.0309002	6.23108E-05	0.0389058	0.634158	0.00531254	0*	2.85320E-05*	0.0166082

o-Xylene	0*	0.00791025	1.04633	0.000261785	1.44402*	0.0258812*	0.0460721	0.000241423	0.0654082	1.09459	0.00791025	0*	6.11720E-05*	0.0275607
Nonane	0*	0.0308008	8.78276	4.08312E-07	10.4624*	0.140052*	0.171961	2.11265E-09	0.00130006	9.19820	0.0308008	0*	3.44711E-10*	0.199685
C10+	0*	0.00675577	47.3464	1.51357E-06	49.0294*	0.0191190*	0.0341677	1.35862E-07	0.00440952	49.6291	0.00675577	0*	5.60878E-10*	0.935776
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*	40.0841	0.0493644	2188.29	0*	3.81271E-06*	0.0420377	2188.27	0.0184111	0.00732675	40.0841	2228.42*	0.0270889*	2228.42
H2S	0*	0	0	0	0*	0*	0	0	0	0	0	0*	0*	0
Nitrogen	115.514*	115.523	0.00867001	0.00199127	0.0192275*	5.71879E-05*	0.00858467	8.06592E-05	0.00191061	8.53450E-05	115.523	0*	1.60601E-06*	115.534
Carbon Dioxide	80.2744*	80.1917	0.0524594	0.0554505	0.0251723*	0.00419142*	0.0481433	0.0352639	0.0201866	0.00431606	80.1917	0*	0.00113896*	80.2996
Methane	12735.4*	12734.9	2.92902	0.436174	2.92221*	0.0810428*	2.84100	0.0348504	0.401324	0.0880172	12734.9	0*	0.000938612*	12738.3
Ethane	4000.81*	4000.66	5.63054	0.197129	5.67328*	0.832248*	4.70250	0.0226094	0.174520	0.928037	4000.66	0*	0.000481482*	4006.48
Propane	1239.14*	1240.95	6.32224	0.0411723	8.17682*	0.536234*	3.63815	0.00345085	0.0377215	2.68409	1240.95	0*	1.62116E-05*	1247.32
Isobutane	316.902*	315.790	4.13883	0.00722992	3.03410*	0.196959*	1.40210	0.000433245	0.00679668	2.73673	315.790	0*	7.31557E-07*	319.936
n-Butane	541.664*	539.810	10.2934	0.0155159	8.45515*	0.375621*	2.66920	0.00120107	0.0143148	7.62417	539.810	0*	1.38774E-06*	550.119
Isopentane	193.238*	191.715	8.27657	0.00377520	6.75681*	0.129781*	1.07670	0.000211414	0.00356378	7.19987	191.715	0*	8.93250E-08*	199.995
n-Pentane	162.420*	162.567	9.37610	0.00121570	9.52447*	0.111953*	0.945132	2.81693E-05	0.00118753	8.43097	162.567	0*	8.76679E-09*	171.944
2-Methylpentane	0*	4.32207	0.600317	4.41628E-05	4.92243*	0.00304707*	0.0262488	1.39552E-06	4.27672E-05	0.574068	4.32207	0*	1.73575E-10*	4.92243
3-Methylpentane	0*	2.97178	0.458727	7.59615E-05	3.43059*	0.00209680*	0.0181078	5.67423E-06	7.02873E-05	0.440619	2.97178	0*	6.32742E-10*	3.43059
n-Hexane	502.672*	428.883	85.8068	0.00211478	12.0202*	0.312492*	2.62669	3.37247E-05	0.00208105	83.1801	428.883	0*	2.96880E-09*	514.692
Methylcyclopentane	0*	0.739276	0.146413	3.21827E-05	0.885721*	0.000485077*	0.00457708	3.81013E-06	2.83725E-05	0.141836	0.739276	0*	3.05337E-10*	0.885721
Benzene	0*	0.186051	0.0395671	0.000749801	0.226368*	8.88297E-05*	0.00115867	0.000691199	5.86015E-05	0.0384084	0.186051	0*	3.74582E-08*	0.226368
2-Methylhexane	0*	5.43164	2.41254	3.81876E-05	7.84422*	0.00106930*	0.0328123	8.34361E-07	3.73533E-05	2.37973	5.43164	0*	8.78455E-12*	7.84422
3-Methylhexane	0*	4.56233	2.25022	3.87696E-05	6.81259*	0.00328689*	0.0276525	1.00696E-06	3.77627E-05	2.22256	4.56233	0*	3.48928E-11*	6.81259
Heptane	0*	10.3647	6.54256	3.65350E-05	16.9073*	0.00699740*	0.0623052	4.31564E-07	3.61034E-05	6.48026	10.3647	0*	1.09189E-11*	16.9073
Methylcyclohexane	0*	5.34077	3.40496	0.000222740	8.74596*	0.00371549*	0.0327092	2.62369E-05	0.000196503	3.37225	5.34077	0*	6.77324E-10*	8.74596
Toluene	0*	1.24492	0.919267	0.00357156	2.16776*	0.000606301*	0.00766209	0.00321008	0.000361479	0.911605	1.24492	0*	5.00247E-08*	2.16776
Octane	0*	17.4237	34.7098	2.42779E-05	52.1335*	0.0110350*	0.102067	1.22877E-07	2.41550E-05	34.6077	17.4237	0*	9.18017E-13*	52.1335
Ethylbenzene	0*	1.10641	2.56666	0.00272974	3.67580*	0.000570128*	0.00660979	0.00242439	0.000305350	2.56005	1.10641	0*	1.26505E-08*	3.67580
m-Xylene	0*	1.05799	2.68500	0.00162970	3.74462*	0.000709712*	0.00629741	0.00136360	0.000266103	2.67870	1.05799	0*	8.46492E-09*	3.74462
o-Xylene	0*	1.57532	4.63299	0.00573063	6.21405*	0.000677864*	0.00938942	0.00528326	0.000447372	4.62360	1.57532	0*	1.81486E-08*	6.21405
Nonane	0*	6.13397	38.8886	8.93821E-06	45.0226*	0.00366816*	0.0350453	4.62328E-08	8.89197E-06	38.8535	6.13397	0*	1.02269E-13*	45.0226
C10+	0*	1.34541	209.642	3.31329E-05	210.987*	0.000500754*	0.00696332	2.97318E-06	3.01597E-05	209.635	1.34541	0*	1.66402E-13*	210.987

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*	85.4753
Pressure	psig	1000*	154*	154	154	1000*	1.93019	0*	0	0*	0	154	1000*	-14.2222	1000
Mole Fraction Vapor	%	100	100	0	0	0	100*	100	0	100	0	100	0	100*	88.0282
Mole Fraction Light Liquid	%	0	0	100	100	100	0	0	100	0	100	0	100	0	0.922230
Mole Fraction Heavy Liquid	%	0	0	0	0	0	0	0	0	0	0	0	0	0	11.0496
Molecular Weight	lb/lbmol	20.1603	20.1485	108.301	18.0162	112.857	42.1173	36.9256	18.0156	20.2974	119.440	20.1485	18.0153	18.4903	20.2394
Mass Density	lb/ft^3	4.39425	0.623404	44.5580	62.2681	45.1380	0.123962	0.0955118	62.2225	0.0520759	45.0719	0.623404	62.1852	0.00152472	4.92692
Molar Flow	lbmol/h	986.493	988.408	4.08846	121.505	3.81304	0.0621868	0.551916	121.471	0.0336974	3.53654	988.408	123.696	0.00160453	1114.00
Mass Flow	lb/h	19888.0	19914.9	442.783	2189.06	430.328	2.61914*	20.3798	2188.38	0.683969	422.404	19914.9	2228.42	0.0296681*	22546.8
Vapor Volumetric Flow	ft^3/h	4525.92	31945.5	9.93725	35.1554	9.53361	21.1286	213.375	35.1702	13.1341	9.37178	31945.5	35.8352	19.4581	4576.24
Liquid Volumetric Flow	gpm	564.271	3982.81	1.23893	4.38301	1.18861	2.63422	26.6026	4.38486	1.63749	1.16843	3982.81	4.46777	2.42595	570.544
Std Vapor Volumetric Flow	MMSCFD	8.98460*	9.00204	0.0372361	1.10662	0.0347277	0.000566373	0.00502664	1.10631	0.000306903	0.0322094	9.00204	1.12658	1.46134E-05	10.1459
Std Liquid Volumetric Flow	sgpm	118.343	118.367	1.25607	4.37899	1.20465*	0.0111372	0.0894065	4.37500	0.00399356	1.16666	118.367	4.45477*	6.59738E-05	124.002
Compressibility		0.796438	0.959199	0.0721344	0.00858685	0.434035	0.982766	0.988454	0.000740264	0.996527	0.00677531	0.959199	0.0502914	0.999551	0.712497
Specific Gravity		0.696082	0.695673	0.714425	0.998383	0.723725	1.45420	1.27494	0.997651	0.700814	0.722665	0.695673	0.997052	0.638418	
API Gravity				65.2180	10.0296	60.9102			10.0026		62.3156		9.87799		
Enthalpy	Btu/h	-3.41670E+07	-3.38163E+07	-388114	-1.49425E+07	-362899	-2780.35	-23650.9	-1.49292E+07	-1261.35	-360210	-3.38163E+07	-1.51768E+07	-163.198	-4.97068E+07
Mass Enthalpy	Btu/lb	-1717.97	-1698.04	-876.531	-6825.97	-843.306	-1061.55	-1160.50	-6822.05	-1844.16	-852.762	-1698.04	-6810.58	-5500.78	-2204.61
Mass Cp	Btu/(lb*°F)	0.669451	0.504342	0.501089	0.982129	0.500080	0.410909	0.422599	0.981762	0.477164	0.498717	0.504342	0.979420	0.441508	0.694972
Ideal Gas CpCv Ratio		1.25248	1.25668	1.05057	1.32582	1.04764	1.13085	1.14688	1.32555	1.25908	1.04541	1.25668	1.32512	1.32161	1.25493
Dynamic Viscosity	cP	0.0131444	0.0107575	0.502532	0.995431	0.548675	0.00854041	0.00897891	0.924424	0.0107758	0.585479	0.0107575	0.840378	0.0102841	
Kinematic Viscosity	cSt	0.186739	1.07726	0.704073	0.997985	0.758843	4.30101	5.86875	0.927477	12.9179	0.810933	1.07726	0.843659	421.070	
Thermal Conductivity	Btu/(h*ft*°F)	0.0225246	0.0178578	0.0687332	0.346603	0.0679063	0.0110563	0.0126798	0.349778	0.0172346	0.0691724	0.0178578	0.353848	0.0122558	
Surface Tension	lbf/ft			0.00141913?	0.00502999?	0.000875394			0.00498763?		0.00154045		0.00492045		
Net Ideal Gas Heating Value	Btu/ft^3	1105.70	1102.82	5459.77	0.327078	5675.38	2211.09	1944.14	0.0335831	1058.31	6008.42	1102.82	0	49.9234	998.564
Net Liquid Heating Value	Btu/lb	20758.7	20714.7	18971.3	-1052.52	18915.4	19770.1	19842.0	-1059.00	19701.5	18929.3	20714.7	-1059.76	51.5746	18567.1
Gross Ideal Gas Heating Value	Btu/ft^3	1220.06	1217.01	5865.52	50.6555	6092.57	2404.66	2118.69	50.3452	1169.29	6450.26	1217.01	50.3101	102.295	1106.85
Gross Liquid Heating Value	Btu/lb	22911.4	22865.2	20392.8	7.57387	20317.2	21514.2	21635.8	0.770101	21776.4	20332.8	22865.2	0	1126.43	20597.4

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: **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	0.225110				0.000340325	0.422790		3.03280			0.225110		93.7137	0.0768846
H2S	0	0				0	0		0			0		0	0
Nitrogen	0.418	0.417221				0.00328277	0.0555245		0.202400			0.417221		0.00357301	0.419951
Carbon Dioxide	0.1849	0.184351				0.153150	0.198206		1.36120			0.184351		1.61293	0.184319
Methane	80.4725	80.3137				8.12354	32.0869		74.2383			80.3137		3.64643	80.6996
Ethane	13.4876	13.4609				44.5077	28.3359		17.2238			13.4609		0.997961	13.4244
Propane	2.8486	2.84724				19.5551	14.9490		2.53862			2.84724		0.0229131	2.80203
Isobutane	0.5527	0.549693				5.44924	4.37084		0.347023			0.549693		0.000784438	0.531561
n-Butane	0.9447	0.939642				10.3922	8.32083		0.730884			0.939642		0.00148805	0.898375
Isopentane	0.2715	0.268837				2.89258	2.70390		0.146584			0.268837		7.71608E-05	0.251294
n-Pentane	0.2282	0.227964				2.49521	2.37351		0.0488448			0.227964		7.57293E-06	0.209957
2-Methylpentane	0	0.00507425				0.0568594	0.0551892		0.00147276			0.00507425		1.25533E-07	0.00447394
3-Methylpentane	0	0.00348897				0.0391270	0.0380723		0.00242046			0.00348897		4.57611E-07	0.00305398

n-Hexane	0.5913	0.503524				5.83120	5.52271		0.0716645		0.503524		2.14709E-06	0.438623
Methylcyclopentane	0	0.000888724				0.00926851	0.00985400		0.00100046		0.000888724		2.26115E-07	0.000757320
Benzene	0	0.000240979				0.00182870	0.00268764		0.00222636		0.000240979		2.98871E-05	0.000205148
2-Methylhexane	0	0.00548426				0.0171603	0.0593319		0.00110626		0.00548426		5.46382E-09	0.00480049
3-Methylhexane	0	0.00460654				0.0527486	0.0500017		0.00111838		0.00460654		2.17026E-08	0.00402939
Heptane	0	0.0104651				0.112296	0.112661		0.00106924		0.0104651		6.79133E-09	0.00938053
Methylcyclohexane	0	0.00550323				0.0608511	0.0603596		0.00593914		0.00550323		4.29932E-07	0.00471679
Toluene	0	0.00136698				0.0105816	0.0150672		0.0116425		0.00136698		3.38374E-05	0.00117744
Octane	0	0.0154323				0.155346	0.161897		0.000627534		0.0154323		5.00875E-10	0.0163576
Ethylbenzene	0	0.00105438				0.00863561	0.0112806		0.00853534		0.00105438		7.42641E-06	0.00108820
m-Xylene	0	0.00100824				0.0107499	0.0107475		0.00743829		0.00100824		4.96929E-06	0.00106073
o-Xylene	0	0.00150124				0.0102675	0.0160245		0.0125052		0.00150124		1.06540E-05	0.00160942
Nonane	0	0.00483872				0.0459912	0.0495088		0.000205744		0.00483872		4.96963E-11	0.00693881
C10+	0	0.000786358				0.00465189	0.00728864		0.000517053		0.000786358		5.99121E-11	0.00328504
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	2.22500				2.11637E-07	0.00233345		0.00102197		2.22500		0.00150366	0.753958
H2S	0	0				0	0		0		0		0	0
Nitrogen	4.12354	4.12385				2.04145E-06	0.000306449		6.82034E-05		4.12385		5.73300E-08	4.11819
Carbon Dioxide	1.82402	1.82214				9.52391E-05	0.00109393		0.000458688		1.82214		2.58799E-05	1.80750
Methane	793.855	793.828				0.00505177	0.177093		0.0250164		793.828		5.85080E-05	791.369
Ethane	133.054	133.049				0.0276779	0.156390		0.00580397		133.049		1.60126E-05	131.645
Propane	28.1012	28.1424				0.0121607	0.0825060		0.000855447		28.1424		3.67647E-07	27.4777
Isobutane	5.45235	5.43321				0.00338871	0.0241234		0.000116938		5.43321		1.25865E-08	5.21268
n-Butane	9.31940	9.28750				0.00646260	0.0459240		0.000246289		9.28750		2.38762E-08	8.80978
Isopentane	2.67833	2.65721				0.00179880	0.0149233		4.93949E-05		2.65721		1.23807E-09	2.46428
n-Pentane	2.25118	2.25322				0.00155169	0.0130998		1.64594E-05		2.25322		1.21510E-10	2.05891
2-Methylpentane	0	0.0501544				3.53590E-05	0.000304598		4.96281E-07		0.0501544		2.01421E-12	0.0438730
3-Methylpentane	0	0.0344853				2.43318E-05	0.000210127		8.15631E-07		0.0344853		7.34249E-12	0.0299484
n-Hexane	5.83313	4.97687				0.00362624	0.0304807		2.41491E-05		4.97687		3.44507E-11	4.30130
Methylcyclopentane	0	0.00878422				5.76379E-06	5.43858E-05		3.37128E-07		0.00878422		3.62808E-12	0.00742655
Benzene	0	0.00238186				1.13721E-06	1.48335E-05		7.50226E-07		0.00238186		4.79546E-10	0.00201176
2-Methylhexane	0	0.0542069				1.06715E-05	0.000327462		3.72780E-07		0.0542069		8.76684E-14	0.0470753
3-Methylhexane	0	0.0455314				3.28026E-05	0.000275967		3.76866E-07		0.0455314		3.48225E-13	0.0395136
Heptane	0	0.103438				6.98330E-05	0.000621796		3.60307E-07		0.103438		1.08969E-13	0.0919888
Methylcyclohexane	0	0.0543944				3.78413E-05	0.000333134		2.00133E-06		0.0543944		6.89838E-12	0.0462545
Toluene	0	0.0135114				6.58033E-06	8.31584E-05		3.92322E-06		0.0135114		5.42930E-10	0.0115464
Octane	0	0.152534				9.66048E-05	0.000893536		2.11462E-07		0.152534		8.03667E-15	0.160409
Ethylbenzene	0	0.0104216				5.37021E-06	6.22596E-05		2.87618E-06		0.0104216		1.19159E-10	0.0106713
m-Xylene	0	0.00996551				6.68499E-06	5.93172E-05		2.50651E-06		0.00996551		7.97336E-11	0.0104019
o-Xylene	0	0.0148384				6.38500E-06	8.84418E-05		4.21393E-06		0.0148384		1.70947E-10	0.0157826
Nonane	0	0.0478263				2.86005E-05	0.000273247		6.93304E-08		0.0478263		7.97391E-16	0.0680444
C10+	0	0.00777243				2.89286E-06	4.02272E-05		1.74233E-07		0.00777243		9.61306E-16	0.0322143
Mass Fraction	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
Water	0	0.201277				0.000145571	0.206271		2.69181		0.201277		91.3064	0.0691119
H2S	0	0				0	0		0		0		0	0
Nitrogen	0.580824	0.580082				0.00218346	0.0421233		0.279342		0.580082		0.00541324	0.586999
Carbon Dioxide	0.403632	0.402671				0.160031	0.236230		2.95140		0.402671		3.83901	0.404752
Methane	64.0355	63.9467				3.09425	13.9402		58.6758		63.9467		3.16370	64.5974
Ethane	20.1167	20.0887				31.7757	23.0743		25.5158		20.0887		1.62289	20.1413
Propane	6.23059	6.23128				20.4737	17.8517		5.51509		6.23128		0.0546432	6.16510
Isobutane	1.59343	1.58570				7.52000	6.87985		0.993712		1.58570		0.00246580	1.54159
n-Butane	2.72357	2.71058				14.3414	13.0973		2.09291		2.71058		0.00467754	2.60538
Isopentane	0.971630	0.962667				4.95512	5.28314		0.521045		0.962667		0.000301080	0.904658
n-Pentane	0.816670	0.816306				4.27441	4.63758		0.173623		0.816306		2.95495E-05	0.755843
2-Methylpentane	0	0.0217027				0.116339	0.128798		0.00625280		0.0217027		5.85056E-07	0.0192374
3-Methylpentane	0	0.0149224				0.0800570	0.0888515		0.0102764		0.0149224		2.13273E-06	0.0131317
n-Hexane	2.52751	2.15358				11.9311	12.8887		0.304261		2.15358		1.00067E-05	1.88602
Methylcyclopentane	0	0.00371217				0.0185205	0.0224589		0.00414822		0.00371217		1.02918E-06	0.00318020
Benzene	0	0.000934229				0.00339156	0.00568539		0.00856786		0.000934229		0.000126257	0.000799571
2-Methylhexane	0	0.0272742				0.0408265	0.161004		0.00546125		0.0272742		2.96094E-08	0.0240013
3-Methylhexane	0	0.0229091				0.125495	0.135685		0.00552111		0.0229091		1.17610E-07	0.0201460
Heptane	0	0.0520448				0.267164	0.305720		0.00527852		0.0520448		3.68034E-08	0.0469003
Methylcyclohexane	0	0.0268179				0.141859	0.160498		0.0287298		0.0268179		2.28300E-06	0.0231083
Toluene	0	0.00625118				0.0231489	0.0375964		0.0528502		0.00625118		0.000168614	0.00541319
Octane	0	0.0874907				0.421323	0.500825		0.00353160		0.0874907		3.09429E-09	0.0932324
Ethylbenzene	0	0.00555567				0.0217678	0.0324330		0.0446439		0.00555567		4.26400E-05	0.00576450
m-Xylene	0	0.00531254				0.0270972	0.0309002		0.0389058		0.00531254		2.85320E-05	0.00561900
o-Xylene	0	0.00791025				0.0258812	0.0460721		0.0654082		0.00791025		6.11720E-05	0.00852558
Nonane	0	0.0308008				0.140052	0.171961		0.00130006		0.0308008		3.44711E-10	0.0444050
C10+	0	0.00675577				0.0191190	0.0341677		0.00440952		0.00675577		5.60878E-10	0.0283733
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	40.0841				3.81271E-06	0.0420377		0.0184111		40.0841		0.0270889	13.5828
H2S	0	0				0	0		0		0		0	0
Nitrogen	115.514	115.523				5.71879E-05	0.00858467		0.00191061		115.523		1.60601E-06	115.365
Carbon Dioxide	80.2744	80.1917				0.00419142	0.0481433		0.0201866		80.1917		0.00113896	79.5470
Methane	12735.4	12734.9				0.0810428	2.84100		0.401324		12734.9		0.000938612	12695.5
Ethane	4000.81	4000.66				0.832248	4.70250		0.174520		4000.66		0.000481482	3958.43
Propane	1239.14	1240.95				0.536234	3.63815		0.0377215		1240.95		1.62116E-05	1211.65
Isobutane	316.902	315.790				0.196959	1.40210		0.00679668		315.790		7.31557E-07	302.972
n-Butane	541.664	539.810				0.375621	2.66920		0.0143148		539.810		1.38774E-06	512.044
Isopentane	193.238	191.715				0.129781	1.07670		0.00356378		191.715		8.93250E-08	177.795
n-Pentane	162.420	162.567				0.111953	0.945132		0.00118753		162.567		8.76679E-09	148.548
2-Methylpentane	0	4.32207				0.00304707	0.0262488		4.27672E-05		4.32207		1.73575E-10	3.78077
3-Methylpentane	0	2.97178				0.00209680	0.0181078		7.02873E-05		2.97178		6.32742E-10	2.58082
n-Hexane	502.672	428.883				0.312492	2.62669		0.00208105		428.883		2.96880E-09	370.666
Methylcyclopentane	0	0.739276				0.000485077	0.00457708		2.83725E-05		0.739276		3.05337E-10	0.625015

Benzene	0	0.186051	8.88297E-05	0.00115867	5.86015E-05	0.186051	3.74582E-08	0.157142		
2-Methylhexane	0	5.43164	0.00106930	0.0328123	3.73533E-05	5.43164	8.78455E-12	4.71704		
3-Methylhexane	0	4.56233	0.00328689	0.0276525	3.77627E-05	4.56233	3.48928E-11	3.95934		
Heptane	0	10.3647	0.00699740	0.0623052	3.61034E-05	10.3647	1.09189E-11	9.21746		
Methylcyclohexane	0	5.34077	0.00371549	0.0327092	0.000196503	5.34077	6.77324E-10	4.54154		
Toluene	0	1.24492	0.000606301	0.00766209	0.000361479	1.24492	5.00247E-08	1.06387		
Octane	0	17.4237	0.0110350	0.102067	2.41550E-05	17.4237	9.18017E-13	18.3232		
Ethylbenzene	0	1.10641	0.000570128	0.00660979	0.000305350	1.10641	1.26505E-08	1.13291		
m-Xylene	0	1.05799	0.000709712	0.00629741	0.000266103	1.05799	8.46492E-09	1.10432		
o-Xylene	0	1.57532	0.000677864	0.00938942	0.000447372	1.57532	1.81486E-08	1.67556		
Nonane	0	6.13397	0.00366816	0.0350453	8.89197E-06	6.13397	1.02269E-13	8.72705		
C10+	0	1.34541	0.000500754	0.00696332	3.01597E-05	1.34541	1.66402E-13	5.57629		

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	85.4753
Pressure	psig	1000	154				1.93019	0		0		154		-14.2222	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	20.1603	20.1485				42.1173	36.9256		20.2974		20.1485		18.4903	20.0414
Mass Density	lb/ft^3	4.39425	0.623404				0.123962	0.0955118		0.0520759		0.623404		0.00152472	4.34531
Molar Flow	lbmol/h	986.493	988.408				0.0621868	0.551916		0.0336974		988.408		0.00160453	980.636
Mass Flow	lb/h	19888.0	19914.9				2.61914	20.3798		0.683969		19914.9		0.0296681	19653.3
Vapor Volumetric Flow	ft^3/h	4525.92	31945.5				21.1286	213.375		13.1341		31945.5		19.4581	4522.88
Liquid Volumetric Flow	gpm	564.271	3982.81				2.63422	26.6026		1.63749		3982.81		2.42595	563.891
Std Vapor Volumetric Flow	MMSCFD	8.98460	9.00204				0.000566373	0.00502664		0.000306903		9.00204		1.46134E-05	8.93125
Std Liquid Volumetric Flow	sgpm	118.343	118.367				0.0111372	0.0894065		0.00399356		118.367		6.59738E-05	117.300
Compressibility		0.796438	0.959199				0.982766	0.988454		0.996527		0.959199		0.999551	0.799958
Specific Gravity		0.696082	0.695673				1.45420	1.27494		0.700814		0.695673		0.638418	0.691974
API Gravity															
Enthalpy	Btu/h	-3.41670E+07	-3.38163E+07				-2780.35	-23650.9		-1261.35		-3.38163E+07		-163.198	-3.39326E+07
Mass Enthalpy	Btu/lb	-1717.97	-1698.04				-1061.55	-1160.50		-1844.16		-1698.04		-5500.78	-1726.56
Mass Cp	Btu/(lb**F)	0.669451	0.504342				0.410909	0.422599		0.477164		0.504342		0.441508	0.667333
Ideal Gas CpCv Ratio		1.25248	1.25668				1.13085	1.14688		1.25908		1.25668		1.32161	1.25377
Dynamic Viscosity	cP	0.0131444	0.0107575				0.00854041	0.00897891		0.0107758		0.0107575		0.0102841	0.0131349
Kinematic Viscosity	cSt	0.186739	1.07726				4.30101	5.86875		12.9179		1.07726		421.070	0.188706
Thermal Conductivity	Btu/(h*ft**F)	0.0225246	0.0178578				0.0110563	0.0126798		0.0172346		0.0178578		0.0122558	0.0225493
Surface Tension	lbf/ft														
Net Ideal Gas Heating Value	Btu/ft^3	1105.70	1102.82				2211.09	1944.14		1058.31		1102.82		49.9234	1098.93
Net Liquid Heating Value	Btu/lb	20758.7	20714.7				19770.1	19842.0		19701.5		20714.7		51.5746	20754.2
Gross Ideal Gas Heating Value	Btu/ft^3	1220.06	1217.01				2404.66	2118.69		1169.29		1217.01		102.295	1212.81
Gross Liquid Heating Value	Btu/lb	22911.4	22865.2				21514.2	21635.8		21776.4		22865.2		1126.43	22910.5

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				0.0670215	99.9698	0			99.9967		0.0114998		100		0.0703440
H2S				0	0	0			0		0		0		0
Nitrogen				0.00756998	5.85019E-05	0.0180005			2.37036E-06		8.61457E-05		0		0.0547105
Carbon Dioxide				0.0291553	0.00103697	0.0150005			0.000659645		0.00277308		0		0.119759
Methane				4.46572	0.0223767	4.77714			0.00178839		0.155138		0		24.7128
Ethane				4.58006	0.00539557	4.94815			0.000619007		0.872705		0		15.3581
Propane				3.50684	0.000768451	4.86315			6.44254E-05		1.72117		0		7.85334
Isobutane				1.74171	0.000102376	1.36904			6.13646E-06		1.33141		0		2.83898
n-Butane				4.33168	0.000219706	3.81511			1.70119E-05		3.70913		0		6.37201
Isopentane				2.80583	4.30642E-05	2.45607			2.41230E-06		2.82174		0		2.99442
n-Pentane				3.17859	1.38676E-05	3.46210			3.21421E-07		3.30423		0		3.15617
2-Methylpentane				0.170388	4.21773E-07	1.49804			1.33316E-08		0.188366		0		0.128947
3-Methylpentane				0.130200	7.25465E-07	1.04403			5.42064E-08		0.144578		0		0.0959746
n-Hexane				24.3545	2.01970E-05	3.65811			3.22174E-07		27.2934		0		16.2678
Methylcyclopentane				0.0425517	3.14720E-07	0.276008			3.72703E-08		0.0476546		0		0.0301490
Benzene				0.0123896	7.90014E-06	0.0760023			7.28472E-06		0.0139037		0		0.00854043
2-Methylhexane				0.588898	3.13655E-07	2.05306			6.85495E-09		0.671542		0		0.303773
3-Methylhexane				0.549274	3.18436E-07	1.78305			8.27301E-09		0.627190		0		0.277162
Heptane				1.59703	3.00081E-07	4.42513			3.54565E-09		1.82868		0		0.746989
Methylcyclohexane				0.848209	1.86704E-06	2.33607			2.19983E-07		0.971161		0		0.416787
Toluene				0.244029	3.19024E-05	0.617019			2.86815E-05		0.279761		0		0.116345
Octane				7.43221	1.74921E-07	11.9694			8.85568E-10		8.56683		0		2.88104
Ethylbenzene				0.591327	2.11615E-05	0.908027			1.87996E-05		0.681850		0		0.232996
m-Xylene				0.618592	1.26337E-05	0.925028			1.05738E-05		0.713452		0		0.241981
o-Xylene				1.06738	4.44249E-05	1.53505			4.09682E-05		1.23146		0		0.415792
Nonane				7.41632	5.73564E-08	9.20628			2.96758E-10		8.56599		0		2.75456
C10+				29.6225	1.57532E-07	31.9660			1.41400E-08		34.2443		0		11.5505
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				0.00274014	121.468	0			121.467		0.000406696		123.696		0.00722690
H2S				0	0	0			0		0		0		0
Nitrogen				0.000309495	7.10827E-05	0.000686368			2.87931E-06		3.04658E-06		0		0.00562077
Carbon Dioxide				0.00119200	0.00125997	0.000571974			0.000801278		9.80712E-05		0		0.0123036

Methane			0.182579	0.0271887	0.182154			0.00217239		0.00548651		0		2.53891
Ethane			0.187254	0.00655589	0.188675			0.000751915		0.0308635		0		1.57784
Propane			0.143376	0.000933706	0.185434			7.82583E-05		0.0608697		0		0.806826
Isobutane			0.0712091	0.000124392	0.0522021			7.45404E-06		0.0470857		0		0.291667
n-Butane			0.177099	0.000266953	0.145472			2.06646E-05		0.131175		0		0.654639
Isopentane			0.114715	5.23252E-05	0.0936511			2.93026E-06		0.0997920		0		0.307637
n-Pentane			0.129955	1.68498E-05	0.132011			3.90434E-07		0.116855		0		0.324255
2-Methylpentane			0.00696622	5.12475E-07	0.0571211			1.61940E-08		0.00666163		0		0.0132476
3-Methylpentane			0.00532318	8.81476E-07	0.0398094			6.58452E-08		0.00511305		0		0.00986011
n-Hexane			0.995723	2.45404E-05	0.139485			3.91349E-07		0.965243		0		1.67130
Methylcyclopentane			0.00173971	3.82401E-07	0.0105243			4.52727E-08		0.00168532		0		0.00309740
Benzene			0.000506544	9.59907E-06	0.00289800			8.84884E-06		0.000491710		0		0.000877415
2-Methylhexane			0.0240768	3.81107E-07	0.0782841			8.32679E-09		0.0237494		0		0.0312086
3-Methylhexane			0.0224568	3.86915E-07	0.0679886			1.00493E-08		0.0221808		0		0.0284747
Heptane			0.0652938	3.64614E-07	0.168732			4.30695E-09		0.0646720		0		0.0767431
Methylcyclohexane			0.0346786	2.26855E-06	0.0890753			2.67216E-07		0.0343455		0		0.0428193
Toluene			0.00997702	3.87630E-05	0.0235272			3.48398E-05		0.00989386		0		0.0119529
Octane			0.303863	2.12538E-07	0.456397			1.07571E-09		0.302969		0		0.295988
Ethylbenzene			0.0241762	2.57123E-05	0.0346235			2.28361E-05		0.0241139		0		0.0239372
m-Xylene			0.0252908	1.53506E-05	0.0352717			1.28441E-05		0.0252315		0		0.0248603
o-Xylene			0.0436396	5.39785E-05	0.0585320			4.97646E-05		0.0435511		0		0.0427171
Nonane			0.303213	6.96908E-08	0.351039			3.60475E-10		0.302940		0		0.282995
C10+			1.21110	1.91409E-07	1.21888			1.71761E-08		1.21106		0		1.18666
Mass Fraction	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Water			0.0111487	99.9645	0			99.9949		0.00173454		100		0.0192674
H2S			0	0	0			0		0		0		0
Nitrogen			0.00195807	9.09645E-05	0.00446810			3.68580E-06		2.02046E-05		0		0.0233019
Carbon Dioxide			0.0118476	0.00253307	0.00584955			0.00161142		0.00102179		0		0.0801323
Methane			0.661501	0.0199252	0.679064			0.00159252		0.0208372		0		6.02764
Ethane			1.27162	0.00900519	1.31836			0.00103316		0.219704		0		7.02122
Propane			1.42784	0.00188082	1.90014			0.000157690		0.635432		0		5.26507
Isobutane			0.934730	0.000330275	0.705067			1.97975E-05		0.647894		0		2.50876
n-Butane			2.32470	0.000708793	1.96481			5.48840E-05		1.80495		0		5.63084
Isopentane			1.86921	0.000172457	1.57015			9.66078E-06		1.70450		0		3.28471
n-Pentane			2.11754	5.55350E-05	2.21330			1.28722E-06		1.99595		0		3.46214
2-Methylpentane			0.135578	2.01743E-06	1.14388			6.37698E-08		0.135905		0		0.168946
3-Methylpentane			0.103601	3.47005E-06	0.797202			2.59289E-07		0.104312		0		0.125746
n-Hexane			19.3790	9.66066E-05	2.79326			1.54108E-06		19.6921		0		21.3141
Methylcyclopentane			0.0330665	1.47016E-06	0.205824			1.74107E-07		0.0335783		0		0.0385772
Benzene			0.00893599	3.42521E-05	0.0526036			3.15850E-05		0.00909282		0		0.0101426
2-Methylhexane			0.544859	1.74447E-06	1.82285			3.81269E-08		0.563379		0		0.462785
3-Methylhexane			0.508198	1.77106E-06	1.58311			4.60141E-08		0.526170		0		0.422245
Heptane			1.47760	1.66898E-06	3.92893			1.97207E-08		1.53414		0		1.13801
Methylcyclohexane			0.768990	1.01751E-05	2.03239			1.19892E-06		0.798348		0		0.622184
Toluene			0.207611	0.000163155	0.503745			0.000146688		0.215814		0		0.162984
Octane			7.83900	1.10906E-06	12.1148			5.61497E-09		8.19304		0		5.00355
Ethylbenzene			0.579665	0.000124699	0.854185			0.000110785		0.606068		0		0.376083
m-Xylene			0.606392	7.44474E-05	0.870178			6.23108E-05		0.634158		0		0.390586
o-Xylene			1.04633	0.000261785	1.44402			0.000241423		1.09459		0		0.671139
Nonane			8.78276	4.08312E-07	10.4624			2.11265E-09		9.19820		0		5.37133
C10+			47.3464	1.51357E-06	49.0294			1.35862E-07		49.6291		0		30.3986
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			0.0493644	2188.29	0			2188.27		0.00732675		2228.42		0.130195
H2S			0	0	0			0		0		0		0
Nitrogen			0.00867001	0.00199127	0.0192275			8.06592E-05		8.53450E-05		0		0.157457
Carbon Dioxide			0.0524594	0.0554505	0.0251723			0.0352639		0.00431606		0		0.541475
Methane			2.92902	0.436174	2.92221			0.0348504		0.0880172		0		40.7303
Ethane			5.63054	0.197129	5.67328			0.0226094		0.928037		0		47.4442
Propane			6.32224	0.0411723	8.17682			0.00345085		2.68409		0		35.5775
Isobutane			4.13883	0.00722992	3.03410			0.000433245		2.73673		0		16.9523
n-Butane			10.2934	0.0155159	8.45515			0.00120107		7.62417		0		38.0490
Isopentane			8.27657	0.00377520	6.75681			0.000211414		7.19987		0		22.1956
n-Pentane			9.37610	0.00121570	9.52447			2.81693E-05		8.43097		0		23.3946
2-Methylpentane			0.600317	4.41628E-05	4.92243			1.39552E-06		0.574068		0		1.14161
3-Methylpentane			0.458727	7.59615E-05	3.43059			5.67423E-06		0.440619		0		0.849699
n-Hexane			85.8068	0.00211478	12.0202			3.37247E-05		83.1801		0		144.025
Methylcyclopentane			0.146413	3.21827E-05	0.885721			3.81013E-06		0.141836		0		0.260676
Benzene			0.0395671	0.000749801	0.226368			0.000691199		0.0384084		0		0.0685365
2-Methylhexane			2.41254	3.81876E-05	7.84422			8.34361E-07		2.37973		0		3.12716
3-Methylhexane			2.25022	3.87696E-05	6.81259			1.00696E-06		2.22256		0		2.85322
Heptane			6.54256	3.65350E-05	16.9073			4.31564E-07		6.48026		0		7.68981
Methylcyclohexane			3.40496	0.000222740	8.74596			2.62369E-05		3.37225		0		4.20426
Toluene			0.919267	0.00357156	2.16776			0.00321008		0.911605		0		1.10132
Octane			34.7098	2.42779E-05	52.1335			1.22877E-07		34.6077		0		33.8103
Ethylbenzene			2.56666	0.00272974	3.67580			0.00242439		2.56005		0		2.54129
m-Xylene			2.68500	0.00162970	3.74462			0.00136360		2.67870		0		2.63929
o-Xylene			4.63299	0.00573063	6.21405			0.00528326		4.62360		0		4.53506
Nonane			38.8886	8.93821E-06	45.0226			4.62328E-08		38.8535		0		36.2955
C10+			209.642	3.31329E-05	210.987			2.97318E-06		209.635		0		205.411

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	85.4753		
Pressure	psig	154	154	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	108.301	18.0162	112.857	18.0156	119.440	18.0153	65.7727		
Mass Density	lb/ft^3	44.5580	62.2681	45.1380	62.2225	45.0719	62.1852	38.3088		
Molar Flow	lbmol/h	4.08846	121.505	3.81304	121.471	3.53654	123.696	10.2737		
Mass Flow	lb/h	442.783	2189.06	430.328	2188.38	422.404	2228.42	675.726		
Vapor Volumetric Flow	ft^3/h	9.93725	35.1554	9.53361	35.1702	9.37178	35.8352	17.6389		
Liquid Volumetric Flow	gpm	1.23893	4.38301	1.18861	4.38486	1.16843	4.46777	2.19914		
Std Vapor Volumetric Flow	MMSCFD	0.0372361	1.10662	0.0347277	1.10631	0.0322094	1.12658	0.0935686		
Std Liquid Volumetric Flow	sgpm	1.25607	4.37899	1.20465	4.37500	1.16666	4.45477	2.25616		
Compressibility		0.0721344	0.00858685	0.434035	0.000740264	0.00677531	0.0502914	0.297788		
Specific Gravity		0.714425	0.998383	0.723725	0.997651	0.722665	0.997052	0.614229		
API Gravity		65.2180	10.0296	60.9102	10.0026	62.3156	9.87799	92.9172		
Enthalpy	Btu/h	-388114	-1.49425E+07	-362899	-1.49292E+07	-360210	-1.51768E+07	-685329		
Mass Enthalpy	Btu/lb	-876.531	-6825.97	-843.306	-6822.05	-852.762	-6810.58	-1014.21		
Mass Cp	Btu/(lb*°F)	0.501089	0.982129	0.500080	0.981762	0.498717	0.979420	0.561919		
Ideal Gas CpCv Ratio		1.05057	1.32582	1.04764	1.32555	1.04541	1.32512	1.08101		
Dynamic Viscosity	cP	0.502532	0.995431	0.548675	0.924424	0.585479	0.840378	0.202704		
Kinematic Viscosity	cSt	0.704073	0.997985	0.758843	0.927477	0.810933	0.843659	0.330326		
Thermal Conductivity	Btu/(h*ft**F)	0.0687332	0.346603	0.0679063	0.349778	0.0691724	0.353848	0.0634927		
Surface Tension	lbf/ft	0.00141913	0.00502999?	0.000875394	0.00498763?	0.00154045	0.00492045	0.000547214		
Net Ideal Gas Heating Value	Btu/ft^3	5459.77	0.327078	5675.38	0.0335831	6008.42	0	3367.14		
Net Liquid Heating Value	Btu/lb	18971.3	-1052.52	18915.4	-1059.00	18929.3	-1059.76	19276.3		
Gross Ideal Gas Heating Value	Btu/ft^3	5865.52	50.6555	6092.57	50.3452	6450.26	50.3101	3635.60		
Gross Liquid Heating Value	Btu/lb	20392.8	7.57387	20317.2	0.770101	20332.8	0	20824.9		

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															99.8719
H2S															0
Nitrogen															0.000334364
Carbon Dioxide															0.00389646
Methane															0.104940
Ethane															0.0165314
Propane															0.00174462
Isobutane															0.000163027
n-Butane															0.000365047
Isopentane															4.80023E-05
n-Pentane															1.77430E-05
2-Methylpentane															4.01548E-07
3-Methylpentane															6.60637E-07
n-Hexane															1.80250E-05
Methylcyclopentane															2.89979E-07
Benzene															7.17172E-06
2-Methylhexane															1.91741E-07
3-Methylhexane															1.88770E-07
Heptane															1.94616E-07
Methylcyclohexane															1.25853E-06
Toluene															2.26150E-05
Octane															1.10092E-07
Ethylbenzene															1.22107E-05
m-Xylene															7.74653E-06
o-Xylene															2.62190E-05
Nonane															2.87439E-08
C10+															9.99297E-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															122.935
H2S															0
Nitrogen															0.000411577
Carbon Dioxide															0.00479625
Methane															0.129173
Ethane															0.0203490
Propane															0.00214750
Isobutane															0.000200674
n-Butane															0.000449345
Isopentane															5.90873E-05
n-Pentane															2.18403E-05

November 6, 2014

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

For: Antero Resources Appalachian Corp.
1615 Wynkoop Street
Denver, Colorado 80202

Sample: Nero No. 2H
First Stage Separator Hydrocarbon Liquid
Sampled @ 168 psig & 81 °F

Date Sampled: 10/14/14 Job Number: 45832.002

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2186-M

COMPONENT	MOL %	LIQ VOL %	WT %
Nitrogen	0.018	0.004	0.005
Carbon Dioxide	0.015	0.005	0.006
Methane	4.777	1.626	0.682
Ethane	4.948	2.658	1.324
Propane	4.863	2.691	1.908
Isobutane	1.369	0.900	0.708
n-Butane	3.815	2.416	1.973
2,2 Dimethylpropane	0.071	0.055	0.046
Isopentane	2.456	1.804	1.576
n-Pentane	3.391	2.469	2.177
2,2 Dimethylbutane	0.121	0.101	0.093
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.214	0.176	0.164
2 Methylpentane	1.498	1.249	1.149
3 Methylpentane	1.044	0.856	0.801
n-Hexane	2.751	2.273	2.109
Heptanes Plus	68.649	80.716	85.281
Totals:	100.000	100.000	100.000

Characteristics of Heptanes Plus:

Specific Gravity	0.7559	(Water=1)
°API Gravity	55.70	@ 60°F
Molecular Weight	139.6	
Vapor Volume	17.18	CF/Gal
Weight	6.30	Lbs/Gal

Characteristics of Total Sample:

Specific Gravity	0.7154	(Water=1)
°API Gravity	66.29	@ 60°F
Molecular Weight	112.4	
Vapor Volume	20.20	CF/Gal
Weight	5.96	Lbs/Gal

Base Conditions: 14.850 PSI & 60 °F

Certified: FESCO, Ltd. - Alice, Texas

Analyst: XG
Processor: XGdjv
Cylinder ID: W-872

David Dannhaus 361-661-7015

TANKS DATA INPUT REPORT - GPA 2186-M

COMPONENT	Mol %	LiqVol %	Wt %
Carbon Dioxide	0.015	0.005	0.006
Nitrogen	0.018	0.004	0.005
Methane	4.777	1.626	0.682
Ethane	4.948	2.658	1.324
Propane	4.863	2.691	1.908
Isobutane	1.369	0.900	0.708
n-Butane	3.887	2.471	2.019
Isopentane	2.456	1.804	1.576
n-Pentane	3.391	2.469	2.177
Other C-6's	2.877	2.383	2.206
Heptanes	9.109	8.235	7.991
Octanes	14.305	13.813	13.908
Nonanes	9.207	10.205	10.397
Decanes Plus	31.967	45.408	49.244
Benzene	0.076	0.043	0.053
Toluene	0.617	0.415	0.506
E-Benzene	0.908	0.704	0.858
Xylenes	2.460	1.894	2.324
n-Hexane	2.751	2.273	2.109
2,2,4 Trimethylpentane	0.000	0.000	0.000
Totals:	100.000	100.000	100.000

Characteristics of Total Sample:

Specific Gravity	0.7154	(Water=1)
°API Gravity	66.29	@ 60°F
Molecular Weight	112.4	
Vapor Volume	20.20	CF/Gal
Weight	5.96	Lbs/Gal

Characteristics of Decanes (C10) Plus:

Specific Gravity	0.7759	(Water=1)
Molecular Weight	173.1	

Characteristics of Atmospheric Sample:

°API Gravity	59.77	@ 60°F
Reid Vapor Pressure (ASTM D-5191)	3.54	psi

QUALITY CONTROL CHECK			
	Sampling Conditions	Test Samples	
Cylinder Number	------	W-872*	W-298
Pressure, PSIG	168	154	150
Temperature, °F	81	70	70

* Sample used for analysis

TOTAL EXTENDED REPORT - GPA 2186-M

COMPONENT	Mol %	LiqVol %	Wt %
Nitrogen	0.018	0.004	0.005
Carbon Dioxide	0.015	0.005	0.006
Methane	4.777	1.626	0.682
Ethane	4.948	2.658	1.324
Propane	4.863	2.691	1.908
Isobutane	1.369	0.900	0.708
n-Butane	3.815	2.416	1.973
2,2 Dimethylpropane	0.071	0.055	0.046
Isopentane	2.456	1.804	1.576
n-Pentane	3.391	2.469	2.177
2,2 Dimethylbutane	0.121	0.101	0.093
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.214	0.176	0.164
2 Methylpentane	1.498	1.249	1.149
3 Methylpentane	1.044	0.856	0.801
n-Hexane	2.751	2.273	2.109
Methylcyclopentane	0.276	0.196	0.207
Benzene	0.076	0.043	0.053
Cyclohexane	0.572	0.391	0.428
2-Methylhexane	2.053	1.918	1.831
3-Methylhexane	1.783	1.644	1.590
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C-7's	0.995	0.907	0.878
n-Heptane	3.430	3.179	3.058
Methylcyclohexane	2.336	1.886	2.041
Toluene	0.617	0.415	0.506
Other C-8's	8.334	8.186	8.173
n-Octane	3.635	3.740	3.694
E-Benzene	0.908	0.704	0.858
M & P Xylenes	0.925	0.721	0.874
O-Xylene	1.535	1.172	1.450
Other C-9's	6.075	6.665	6.824
n-Nonane	3.131	3.540	3.573
Other C-10's	7.205	8.687	9.057
n-decane	2.282	2.813	2.888
Undecanes(11)	6.933	8.576	9.068
Dodecanes(12)	4.501	6.014	6.448
Tridecanes(13)	3.174	4.548	4.943
Tetradecanes(14)	2.056	3.156	3.476
Pentadecanes(15)	1.432	2.354	2.624
Hexadecanes(16)	0.949	1.667	1.874
Heptadecanes(17)	0.752	1.397	1.586
Octadecanes(18)	0.575	1.124	1.283
Nonadecanes(19)	0.436	0.889	1.020
Eicosanes(20)	0.329	0.698	0.806
Heneicosanes(21)	0.255	0.568	0.660
Docosanes(22)	0.213	0.494	0.578
Tricosanes(23)	0.164	0.395	0.464
Tetracosanes(24)	0.142	0.355	0.419
Pentacosanes(25)	0.103	0.267	0.317
Hexacosanes(26)	0.089	0.238	0.283
Heptacosanes(27)	0.071	0.198	0.237
Octacosanes(28)	0.054	0.156	0.188
Nonacosanes(29)	0.047	0.140	0.169
Triacontanes(30)	0.035	0.107	0.130
Hentriacontanes Plus(31+)	0.168	0.566	0.726
Total	100.000	100.000	100.000

November 6, 2014

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

For: Antero Resources Appalachian Corp.
1615 Wynkoop Street
Denver, Colorado 80202

Date Sampled: 10/14/14

Date Analyzed: 10/24/14

Sample: Nero No. 2H

Job Number: J45832

FLASH LIBERATION OF HYDROCARBON LIQUID		
	First Stage Separator HC Liquid	**Stock Tank**
Pressure, psig	168	0
Temperature, °F	81	70
Gas Oil Ratio (1)	------	112
Gas Specific Gravity (2)	------	1.194
Separator Volume Factor (3)	1.0721	1.000

STOCK TANK FLUID PROPERTIES	
Shrinkage Recovery Factor (4)	0.9328
Oil API Gravity at 60 °F	59.77
Reid Vapor Pressure, psi (5)	3.54

Quality Control Check			
	Sampling Conditions	**Test Samples**	
Cylinder No.	------	W-872*	W-298
Pressure, psig	168	154	150
Temperature, °F	81	70	70

(1) - Scf of flashed vapor per barrel of stock tank oil
(2) - Air = 1.000
(3) - Separator volume / Stock tank volume
(4) - Fraction of first stage separator liquid
(5) - Absolute pressure at 100 deg F
Analyst: T. G.
* Sample used for flash study
Base Conditions: 14.85 PSI & 60 °F

Certified: FESCO, Ltd. - Alice, Texas

David Dannhaus 361-661-7015

October 28, 2014

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

For: Antero Resources Appalachian Corp.
1615 Wynkoop Street
Denver, Colorado 80202

Sample: Nero No. 2H
Gas Evolved from Hydrocarbon Liquid Flashed
From 168 psig & 81 °F to 0 psig & 70 °F

Date Sampled: 10/14/14 Job Number: 45832.001

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2286

COMPONENT	MOL%	GPM
Hydrogen Sulfide*	< 0.001	
Nitrogen	0.132	
Carbon Dioxide	0.650	
Methane	34.713	
Ethane	29.751	8.019
Propane	18.532	5.146
Isobutane	2.953	0.974
n-Butane	6.222	1.977
2-2 Dimethylpropane	0.064	0.025
Isopentane	1.702	0.627
n-Pentane	1.747	0.638
Hexanes	1.654	0.687
Heptanes Plus	1.880	0.832
Totals	100.000	18.925

Computed Real Characteristics Of Heptanes Plus:

Specific Gravity	3.543	(Air=1)
Molecular Weight	101.49	
Gross Heating Value	5409	BTU/CF

Computed Real Characteristics Of Total Sample:

Specific Gravity	1.194	(Air=1)
Compressibility (Z)	0.9890	
Molecular Weight	34.21	
Gross Heating Value		
Dry Basis	2005	BTU/CF
Saturated Basis	1971	BTU/CF

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

Base Conditions: 14.850 PSI & 60 Deg F

Certified: FESCO, Ltd. - Alice, Texas

Analyst: MR
Processor: IM
Cylinder ID: FL-7S

David Dannhaus 361-661-7015

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2286
TOTAL REPORT

COMPONENT	MOL %	GPM	WT %
Hydrogen Sulfide*	< 0.001		< 0.001
Nitrogen	0.132		0.108
Carbon Dioxide	0.650		0.836
Methane	34.713		16.278
Ethane	29.751	8.019	26.150
Propane	18.532	5.146	23.887
Isobutane	2.953	0.974	5.017
n-Butane	6.222	1.977	10.571
2,2 Dimethylpropane	0.064	0.025	0.135
Isopentane	1.702	0.627	3.590
n-Pentane	1.747	0.638	3.684
2,2 Dimethylbutane	0.059	0.025	0.149
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.094	0.039	0.237
2 Methylpentane	0.497	0.208	1.252
3 Methylpentane	0.315	0.130	0.794
n-Hexane	0.689	0.286	1.736
Methylcyclopentane	0.060	0.021	0.148
Benzene	0.026	0.007	0.059
Cyclohexane	0.100	0.034	0.246
2-Methylhexane	0.198	0.093	0.580
3-Methylhexane	0.203	0.093	0.595
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C7's	0.191	0.084	0.554
n-Heptane	0.309	0.144	0.905
Methylcyclohexane	0.214	0.087	0.614
Toluene	0.064	0.022	0.172
Other C8's	0.333	0.156	1.073
n-Octane	0.086	0.044	0.287
Ethylbenzene	0.002	0.001	0.006
M & P Xylenes	0.016	0.006	0.050
O-Xylene	0.002	0.001	0.006
Other C9's	0.067	0.034	0.247
n-Nonane	0.006	0.003	0.022
Other C10's	0.003	0.002	0.012
n-Decane	0.000	0.000	0.000
Undecanes (11)	0.000	0.000	0.000
Totals	100.000	18.925	100.000

Computed Real Characteristics Of Total Sample:

Specific Gravity	1.194	(Air=1)
Compressibility (Z)	0.9890	
Molecular Weight	34.21	
Gross Heating Value		
Dry Basis	2005	BTU/CF
Saturated Basis	1971	BTU/CF

GAS ANALYTICAL SERVICES

C6+ Gas Analysis Report

Gas Analytical

Report Date: Feb 15, 2016 8:49a

Client:	Antero Resources	Date Sampled:	Feb 2, 2016 10:50a
Site:	Vonda Unit 1H	Analysis Date:	Feb 10, 2016 9:44a
Field No:	9998	Collected By:	M. Hileman
Meter:	40980	Date Effective:	Feb 2, 2016 12:00a
Source Laboratory	Clarksburg (Bridgeport), WV	Sample Pressure (PSI):	184.0
Lab File No:	**X_CH1-9480.CHR**	Sample Temp (°F):	63
Sample Type:	Spot	Field H2O:	No Test
Reviewed By:		Field H2S:	No Test

Component	Mol %	Gal/MSCF
Methane	80.4725	
Ethane	13.4876	3.59
Propane	2.8486	0.78
I-Butane	0.5527	0.18
N-Butane	0.9447	0.30
I-Pentane	0.2715	0.10
N-Pentane	0.2282	0.08
Nitrogen	0.4180	
Oxygen	<MDL	
Carbon Dioxide	0.1849	
Hexanes+	0.5913	0.24
TOTAL	100.0000	5.27

Analytical Results at Base Conditions (Real)		
BTU/SCF (Dry):	1,228.7615	BTU/ft³
BTU/SCF (Saturated):	1,208.2534	BTU/ft³
PSIA:	14.730	PSI
Temperature (°F):	60.00	°F
Z Factor (Dry):	0.99668	
Z Factor (Saturated):	0.99628	

Analytical Results at Contract Conditions (Real)		
BTU/SCF (Dry):	1,228.7615	BTU/ft³
BTU/SCF (Saturated):	1,208.2534	BTU/ft³
PSIA:	14.730	PSI
Temperature (°F):	60.00	°F
Z Factor (Dry):	0.99668	
Z Factor (Saturated):	0.99628	

Calculated Specific Gravities			
Ideal Gravity:	0.6975	Real Gravity:	0.6996
Molecular Wt:	20.2018	lb/lbmol	

Gross Heating Values are Based on:
GPA 2145-09, 2186
Compressibility is Calculated using AGA-8.

Source	Date	Notes

<MDL = Less than Method Detection Limits, NG = Not Given, NT = Not Tested

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									0.2241	0.0244						
EP-PCV					0.0347	0.1522							0.1497	0.6555	3.7425	16.3923
F001					1.4394	6.3045							1.3846	6.0648	34.6162	151.6188
EP-L001					8.8379	0.2688							0.4209	0.0128	10.5450	0.3207
EP-L002					7.41E-04	8.45E-05							0.0375	0.0043	0.9826	0.1121
GPU001-004(emissions per EPN)	0.1221	0.5347	0.1025	0.4491	0.0067	0.0294	0.0007	0.0032	0.0093	0.0406	0.0093	0.0406	0.0028	0.0123	146.4891	641.6224
EP-EC001 -001(emissions per EPN)	0.8177	3.5815	3.7214	16.2999	0.2902	1.2712	0.0000	0.0000	0.0018	0.0080	0.0014	0.0060	0.0607	0.2660	65.5197	286.9764
TOTAL	1.3060	5.7203	4.1316	18.0964	0.3171	1.6577	0.0029	0.0129	0.0389	0.1705	0.0385	0.1685	0.0720	0.3323	651.4763	2853.8990

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	0.0059	0.0259	0.0059	0.0259
F001			0.0006	0.0028	0.0061	0.0267	0.0103	0.0452	0.0280	0.1226	0.0881	0.3859	0.1331	0.5832
EP-L001			4.61E-04	1.40E-05	3.15E-03	9.58E-05	2.96E-03	9.01E-05	0.007	2.19E-04	1.623	0.049	1.637	0.050
EP-L002			1.50E-06	1.71E-07	2.00E-06	2.28E-07	5.05E-07	5.76E-08	1.06E-06	1.21E-07	1.19E-07	1.35E-08	5.18E-06	5.91E-07
GPU001-004(emissions per EPN)	0.0001	0.0004	2.56E-06	1.12E-05	4.15E-06	1.82E-05			0.00E+00	0.00E+00	0.0022	0.0096	0.0023	0.0101
EP-EC001 -001(emissions per EPN)	1.28E-06	5.58E-06	2.62E-05	1.15E-04	1.73E-04	7.56E-04	1.50E-04	6.56E-04	3.56E-04	1.56E-03	5.89E-02	2.58E-01	5.96E-02	2.61E-01
TOTAL	0.0004	0.0016	0.0000	0.0002	0.0002	0.0009	0.0001	0.0007	0.0004	0.0018	0.0676	0.3457	0.0688	0.3509

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
Bee Lewis 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 2139 Elliot Rd. West Union, WV 26456, in Doddridge County, West Virginia.

The latitude and longitude coordinates are: 39.254867 and -80.823014

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

Pollutants	TOTALS (tpy):
NO_X	5.7203
CO	18.0964
$PM_{2.5}$	0.1685
PM_{10}	0.1705
VOC	1.6577
SO_2	0.0129
CO_{2e}	2853.8990
CH_4	0.3323
Formaldehyde	0.0016
Benzene	0.0002
Toluene	0.0009
Ethylbenzene	0.0007
Xylenes	0.0018
Hexane	0.3457
Total HAPs	0.3509

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

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.
Dated this the __ day of _____, 2017

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

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