Kees, Roy F

From: Elizabeth McLaughlin <emclaughlin@anteroresources.com>
Sent: Friday, August 21, 2015 2:20 PM
To: Kees, Roy F
Cc: Barry Schatz
Subject: RE: Weigle East Problem

Roy,

The Weigle East pad is not producing yet. The first few wells do not come online next year so we do not have a site specific gas or liquids analysis. We over permitted the production for that site from what we actually anticipate. Since only a few of the wells will be coming online next spring, I can re-run ProMax for just that set of wells and get you a lower more accurate emission number and then we can modify, if needed, based on actual production and an actual analysis before the next set of wells is drilled.

Let me know how you would like us to proceed in order to get the permit approved. Please give me a call on my cell (listed below) if you have any questions.

Thanks,

Betsy McLaughlin
Contract Employee
Kleinfelder Inc.
Office: 303-357-6839
Cell: 401-378-7856

From: Kees, Roy F [mailto:Roy.F.Kees@wv.gov]
Sent: Friday, August 21, 2015 6:26 AM
To: Elizabeth McLaughlin
Cc: Barry Schatz
Subject: Weigle East Problem

Betsy, the Director has kicked Weigle East back with some concerns. The 96.91 tons/year of VOC is very close to Major Source thresholds and would make the site ineligible for the G70-A General Permit. He would like to see new calculations based on a site specific sample rather than a representative sample from the Vogt pad. You can just email these to me when available.

Thanks

Roy Kees

From: Elizabeth McLaughlin [mailto:emclaughlin@anteroresources.com]
Sent: Wednesday, August 19, 2015 1:59 PM
To: Kees, Roy F
Subject: RE: ANTERO RESOURCES- Walnut West and Eddy Affidavits

Perfect. Thanks!

From: Kees, Roy F [mailto:Roy.F.Kees@wv.gov]
Sent: Wednesday, August 19, 2015 11:13 AM

To: Elizabeth McLaughlin
Subject: RE: ANTERO RESOURCES- Walnut West and Eddy Affidavits

Betsy, Weigle East and Walnut West have both been turned in for signature.

Thanks

Roy Kees

From: Elizabeth McLaughlin [mailto:emclaughlin@anteroresources.com]
Sent: Wednesday, August 12, 2015 3:42 PM
To: Kees, Roy F
Cc: Barry Schatz
Subject: ANTERO RESOURCES- Walnut West and Eddy Affidavits

Dear Mr. Kees:

Re: **Original Affidavit of Publication**
Walnut West Wellpad- Permit No. G70-A075A
Eddy Wellpad- Permit No. G70-A061A

Antero Resources Corporation would like to submit the Original Affidavits of Publication (originals sent via FedEx) from *The Pennsboro News*. These are being submitted in accordance with a permit application requirement for an oil and gas facility.

Thanks,

Betsy McLaughlin
Contract Employee
Kleinfelder Inc.
Office: 303-357-6839
Cell: 401-378-7856

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

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

August 5, 2015

Barry Schatz
1615 Wynkoop Street
Denver, CO 80202

RE: Application Status: Complete
Antero Resources Corporation
Weigle East Wellpad
Permit Application G70-A073A
Plant ID No. 095-00045

Dear Mr. Schatz:

Your application for a General Permit Registration for a Natural Gas Well Pad was received by this Division on June 2, 2015 and assigned to the writer for review. Upon review of said application, it has been determined that the application was complete as submitted, therefore, the statutory review period commenced on August 5, 2015

In the case of this application, the agency believes it will take approximately 45 days to make a final permit determination.

This determination of completeness shall not relieve the permit applicant of the requirement to subsequently submit, in a timely manner, any additional or corrected information deemed necessary for a final permit determination.

Should you have any questions, please contact me at (304) 926-0499 ext. 1222.

Sincerely,

Roy F. Kees, P.E.
Engineer - NSR Permitting

July 28, 2015

Antero Resources
1615 Wynkoop Street
Denver, CO 80202
Office 303.357.7310
Fax 303.357.7315

Mr. Roy Kees
Division of Air Quality
WV Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304

JUL 30 2015

Dear Mr. Kees:

Re: Original Affidavit of Publication
Weigle East Wellpad – Permit No. G70-A073A

Antero Resources Corporation would like to re-submit the updated Original Affidavit of Publication from *The Tyler Star News*. The legal advertisement for this facility was resubmitted to illustrate updated emissions from the addition of two (2) enclosed combustors and to correct the initial legal advertisement that ran on June 10, 2015 which included incorrect emissions. This is being submitted in accordance with a permit application requirement for an oil and gas facility.

Sincerely,

Barry Schatz

Barry Schatz
Senior Environmental and Regulatory Manager

Encl.

Air Quality Permit Notice Notice of Application
Weigle East Well Pad
Antero Resources Corporation
Tyler, 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 General Permit Registration Modification for an Oil and Natural Gas facility located near the intersection of Co Rd 18/14 and Lemasters Bridge Road in Tyler, West Virginia.

The latitude and longitude coordinates are: 39.46623 degrees N and -80.852782 degrees W

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

Pollutants	Totals (tpy)
VOC	96.9070
NOx	18.5673
CO2e	51417.0000
CO	20.8220
SO2	0.0542
PM2.5	0.9742
PM10	20.6926
Lead	5.98E-05
Total HAPs	5.2676
Benzene	0.1187
Formaldehyde	0.3132
Xylenes	0.4648

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

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1227, during normal business hours.
Dated this the 8 day of July, 2015

TSN 7/15 1835

TYLER STAR NEWS

July 15, 2015

of Tyler:

he undersigned, a Notary Public,

Brian Clutter who, being duly sworn,

states that he is the manager of the Tyler Star News, a weekly newspaper of general circulation, published at Sistersville, County of Tyler, State of West Virginia, and that a copy of the notice attached hereto was published for 1 successive weeks in the Tyler Star News, beginning on the 15 day of July, 2015 and ending on the 15 day of July, 2015.

Manager, Tyler Star News

Subscribed and sworn to before me, a Notary Public of said County, on this 15 day of July, 2015.

Notary Public

My commission expires on the 4th day of January, 2016.

Printers Fee.....

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
DIANN S. WRIGHT
218 South 2nd Avenue
Paden City, West Virginia 26159
My Commission Expires Jan. 4, 2016

July 15, 2015

Reference No. 082715

Mr. Roy Kees
Division of Air Quality
WV Department of Environmental Protection
601 57th Street, SE
Charleston, West Virginia 25304

Dear Mr. Kees:

Re: General Permit Registration G70-A Modification Application Update
Weigle East Well Pad
Antero Resources Corporation

GHD Services Inc. (GHD) would like to submit this update to the General Permit Modification application that we submitted on June 1, 2015 on behalf of Antero Resources Corporation for an oil and gas facility identified as Weigle East well pad.

As discussed during our phone call on July 8, 2015, we are re-publishing the legal advertisement due to inadvertent use of lower emission quantities. Since we are re-publishing the legal advertisement, you approved of updating the application to include the proposed addition of two enclosed combustors. The addition of the two combustors will not result in increase in emissions.

Attached are copies of the attachments that were revised due to the addition of two combustors.

1) Attachment B – Process Description
2) Attachment G – Emission Unit Data Sheet
3) Attachment H – Air Pollution Control Device Data Sheet
4) Attachment I – Emission Calculations
5) Attachment J – Class I Legal Advertisement
6) Attachment O – Emission Summary

We appreciate your assistance and guidance to avoid re-submitting a modification. Please let us know if you have any questions or require additional information.

GHD Services Inc. d/b/a GHD Environmental and Consulting Inc.
6320 Rothway Suite 100 Houston Texas 77040 USA
T 713 734 3090 F 713 734 3391 W www.ghd.com

REGISTERED COMPANY FOR ISO 9001 ENGINEERING DESIGN

Sincerely,

GHD

Manuel Bautista

MB/ma/195

Encl.

cc: Barry Schatz, Antero Resources Corporation

Attachment B

Process Description
Weigle East Well Pad
Antero Resources Corporation
Tyler County, West Virginia

A mixture of condensate, water, and entrained gas from the wells enters the facility through a series of Gas Production Unit Heaters (H001 – H014) which are 3-phase separators where the gas, condensate, and produced water are separated. The heaters are fueled by a slip stream of the separated gas.

The gas from the 3 phase separators is sent to the sales gas line. The condensate from the 3-phase separator is sent to a low pressure 2-phase separator where flashing emissions are recovered and sent to the sales gas lines through the high pressure compressors (ENG001-002). The condensate then flows to the vapor recovery towers (VRT001-004) where gas is further separated. Gas from the VRTs is recovered via the low pressure compressors (ENG003-004) and sent to the sales gas line through the high pressure compressors. The condensate from the VRTs flows to the condensate storage tanks (TANKSCOND001-0010). The water from the 3 phase separator is sent to the produced water tanks (TANKPW001-002).

Flashing, working, and breathing losses from the condensate and produced water tanks are routed to up to four enclosed combustors (EC001-004). The enclosed combustors that will be used to control emissions are designed to achieve a VOC destruction efficiency of 98 percent.

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

Emissions from the Facility's emission sources were calculated using the extended analysis of the condensate and gas analysis from Seaborn Unit 1H well, one of the wells in the Vogt Pad. These extended analyses are considered representative of the materials from Weigle East well pad, being in the same Marcellus rock formation.

Weigle East 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 Pierpoint well pad. This operates independently and is approximately 1.06 miles southwest of the facility.

Attachment G: Emission Units Data Sheet

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

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
H001, H002, H003, H004, H005, H006, H007, H008, H009, H010, H011, H012, H013, H014	EP-H001, EP-H002, EP-H003, EP-H004, EP-H005, EP-H006, EP-H007, EP-H008, EP-H009, EP-H010, EP-H011, EP-H012, EP-H013, EP-H014	Gas Processing Unit Heater	2015	1.5 MMBtu/hr (each)	New	N/A
F001	F001	Fugitives	2015	N/A	New	N/A
TANKCOND001-010	EP-EC001, EP-EC002, EP-EC003, EP-EC004	Condensate Tank F/W/B	2015	400 bbl each	New	EP-EC001, EP-EC002, EP-EC003, EP-EC004
TANKPW001-002	EP-EC001, EP-EC002, EP-EC003, EP-EC004	PW Tank F/W/B	2015	400 bbl each	New	EP-EC001, EP-EC002, EP-
L001	EP-L001	Loading (Condensate)	2015	200BBL capacity (each)	New	N/A
L002	EP-L002	Loading (Water)	2015	200BBL capacity (each)	New	N/A
HR001	EP-HR001	Haul Truck	2015	40 ton capacity	New	N/A
EC001, EC002, EC0003, EC004	EP-EC001, EP-EC002, EP-EC003, EP-EC004	Enclosed Combustor	2015	90scf/min	New	N/A
PCV	EP-PCV	Pneumatic CV	2015	6.6 scf/day/PCV	New	N/A
ENG001, ENG002, ENG003, ENG004	EP-ENG001, EP-ENG002, EP-ENG003, EP-ENG004	Compressor Engine	2015	HP=72, LP=98	New	N/A
ENG001	EP-ENG001	Compressor Engine	2015	HP=24	Removal	N/A

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

Attachment G: Natural Gas Fired Fuel Burning Units

Emission Data Sheet

Complete the information on this data for each Gas Producing Unit(s), Heater Treater(s), and in-line heater(s) at the production pad. Reboiler information should be entered on the Glycol Dehydration Emission Unit Data Sheet.

Emission Unit ID #[1]	Emission Point ID#[2]	Emission Unit Description (Manufacturer / Model #)	Year Installed/ Modified	Type[3] and Date of Change	Control Device[4]	Design Heat Input (mmBtu/hr)[5]	Fuel Heating Value (Btu/scf)[6]
H001	EP-H001	Gas Processing Unit Heater	2015	New	--	1.50	1,218.95
H002	EP-H002	Gas Processing Unit Heater	2015	New	--	1.50	1,218.95
H003	EP-H003	Gas Processing Unit Heater	2015	New	--	1.50	1,218.95
H004	EP-H004	Gas Processing Unit Heater	2015	New	--	1.50	1,218.95
H005	EP-H005	Gas Processing Unit Heater	2015	New	--	1.50	1,218.95
H006	EP-H006	Gas Processing Unit Heater	2015	New	--	1.50	1,218.95
H007	EP-H007	Gas Processing Unit Heater	2015	New	--	1.50	1,218.95
H008	EP-H008	Gas Processing Unit Heater	2015	New	--	1.50	1,218.95
H009	EP-H009	Gas Processing Unit Heater	2015	New	--	1.50	1,218.95
H010	EP-H010	Gas Processing Unit Heater	2015	New	--	1.50	1,218.95
H011	EP-H011	Gas Processing Unit Heater	2015	New	--	1.50	1,218.95
H012	EP-H012	Gas Processing Unit Heater	2015	New	--	1.50	1,218.95
H013	EP-H013	Gas Processing Unit Heater	2015	New	--	1.50	1,218.95
H014	EP-H014	Gas Processing Unit Heater	2015	New	--	1.50	1,218.95
ENG001	EP-ENG001	ZPP 428 2.8L Engine	2015	New	--	--	1,218.95
ENG002	EP-ENG002	ZPP 428 2.8L Engine	2015	New	--	--	1,218.95
ENG003	EP-ENG003	ZPP 644 4.4L Engine	2015	New	--	--	1,218.95
ENG004	EP-ENG004	ZPP 644 4.4L Engine	2015	New	--	--	1,218.95
EC001	EP-EC001	Enclosed Combustor	2015	New	EC001	--	1,218.95
EC002	EP-EC002	Enclosed Combustor	2015	New	EC002	--	1,218.95
EC003	EP-EC003	Enclosed Combustor	2015	New	EC003	--	1,218.95
EC004	EP-EC004	Enclosed Combustor	2015	New	EC004	--	1,218.95
ENG001	EP-ENG001	Kubota Engine	2015	Removal	--	--	1,218.95

1 Enter the appropriate Emission Unit (or Sources) 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 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 Complete appropriate air pollution control device sheet for any control device.

5 Enter design heat input capacity in mmBtu/hr.

6 Enter the fuel heating value in Btu/standard cubic foot.

Attachment H: Air Pollution Control Device

Vapor Combustion Control Device Sheet

Complete this vapor combustion control device sheet for each enclosed combustion device, thermal oxidizer, or completion combustion device that is located at the natural gas production pad for the purpose of thermally destructing waste gas to control emissions of regulated pollutants to the atmosphere.

IMPORTANT: READ THE INSTRUCTIONS ACCOMPANYING THIS FORM BEFORE COMPLETING.

General Information

1. Control Device ID#: EC001, EC002, EC0003, EC004	2. Installation Date: 2015

3. Maximum Rated Total Flow Capacity: 131,000 scfd	4. Maximum Design Heat Input: 6.6 MMBtu/hr	5. Design Heat Content: 2300BTU/scf

Control Device Information

6. Select the type of vapor combustion control device being used: Elevated Flare

7. Manufacturer: Model No. Cimmaron, Model No. 48" HV ECD	8. Hours of operation per year: 8760

9. List the emission units whose emissions are controlled by this vapor combustion control device: (Emission Point ID#:)

10. Emission Unit ID#	Emission Source Description:	Emission Unit ID#	Emission Source Description:
TANKCOND001-010	Condensate Tank		
TANKPW001-002	PW Tanks		

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

11. Assist Type	12. Flare Height (ft)	13. Tip Diameter (ft)	14. Was the design per §60.18?
Steam - Air - Pressure - X Non -	25ft	3.33	Yes

Waste Gas Information

15. Maximum waste gas flow rate (scfm):	16. Heat value of waste gas stream (BTU/ft3)	17. Temperature of the emissions stream (°F)	18. Exit Velocity of the emissions stream (ft/s)
90.97	1,790.86	900	1.74E-01

19. Provide an attachment with the characteristics of the waste gas stream to be burned.

Pilot Information

20. Type/Grade of pilot fuel:	21. Number of pilot lights:	22. Fuel flow rate to pilot flame per pilot (scf/hr):	23. Heat input per pilot (BTU/hr):	24. Will automatic re-ignition be used?
Natural Gas	1	12.6	12800	Yes

25. If automatic re-ignition will be used, describe the method: Based on a monitoring system

26. Describe the method of controlling flame: Flame Rectification, a thermocouple equivalent

27. Is pilot flame equipped with a monitor to detect the presence of the flame? Yes	28. If yes, what type? Thermocouple

29. Pollutant(s) Controlled	30. % Capture Efficiency	31. Manufacturer's Guaranteed Control Efficiency (%)
F/W/B Emissions from TANKCOND	98	98
F/W/B Emissions from TANKPW	98	98

Attachment H: Air Pollution Control Device

Vapor Combustion Control Device Sheet

Complete this vapor combustion control device sheet for each enclosed combustion device, thermal oxidizer, or completion combustion device that is located at the natural gas production pad for the purpose of thermally destructing waste gas to control emissions of regulated pollutants to the atmosphere.

32. Has the control device been tested by the manufacturer and certified? Yes, see spec sheet.
33. Describe all operating ranges and maintenance procedures required by the manufacturer to maintain warranty: See spec sheet for operating ranges. MONITORING 1) Report any period when visible emissions exceeded 5 minutes during any two-hour period. 2) Monitor the presence of pilot flame at all times with the Flame rectification system, a thermocouple equivalent. 3) Monitor visible emissions from the vapor combustor. 4) Monitor throughput to the vapor combustor. RECORDKEEPING 1) Record the times and duration of periods when the pilot flame was not present. 2) Records of throughput to the vapor combustor. 3) Records of vapor combustor malfunction or shutdown which resulted in excess emissions. 4) Records of vapor combustor inspection and maintenance activities conducted. REPORTING 1) Report any period when visible emissions exceeded 5 minutes during any two-hour period.
34. Additional Information Attached? **YES** *Please attach a copy of manufacturer's data sheet. Please attach a copy of manufacturer's drawing.* *Please attach a copy of the manufacturer's performance testing.*

If any of the requested information is not available, please contact the manufacturer.

Attachment J

Air Quality Permit Notice
Notice of Application
Weigle East Well Pad
Antero Resources Corporation
Tyler, 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 General Permit Registration Modification for an Oil and Natural Gas facility located near the intersection of Co Rd 18/14 and Lemasters Bridge Road in Tyler, West Virginia.

The latitude and longitude coordinates are: 39.46623 degrees N and -80.852782 degrees W

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

Pollutants	TOTALS (tpy):
VOC	96.9070
NO_X	18.5673
CO_{2e}	51417.0000
CO	20.8220
SO_2	0.0542
$PM_{2.5}$	0.9742
PM_{10}	20.6926
Lead	5.98E-05
Total HAPs	5.2676
Benzene	0.1187
Formaldehyde	0.3132
Xylenes	0.4648

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

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1227, during normal business hours.
Dated this the __ day of _____, 2015

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

Table 1

Facility Information
Weigle East Wellpad
Tyler, West Virginia
Antero Resources Corporation

Oil and Gas Site General Information	
Administrative Information	
Company Name	Antero Resources Corporation
Facility/Well Name	Weigle East Wellpad
Nearest City/Town	Middlebourne
API Number/SIC Code	1311
Latitude/Longitude	39.46623, -80.852782
County	Tyler

Technical Information	
Max Condensate Site Throughput (bbl/day):	2,800
Max Produced Water Site Throughput (bbl/day):	33,600
Are there any sour gas streams at this site?	No
Is this site currently operational/producing?	Yes

Equipment/Processes at Site	
Equipment/Process Types	**How many for this site?**
Fugitives	14
IC Engines	4
Turbines	0
Diesel Engines	0
Gas Processing Unit Heaters	14
Condensate Tanks	10
Produced Water Tanks	2
Miscellaneous Tanks	0
Loading Jobs	2
Glycol Units	0
Amine Units	0
Enclosed Combustor-Vapor Combustors	4

Table 2

Uncontrolled/Controlled Emissions Summary
Weigle East Wellpad
Tyler, West Virginia
Antero Resources Corporation

Emission Source	VOC		NO_x		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)
UNCONTROLLED (Fugitives, Storage Tanks, Gas Processing Unit Heaters)																								
Fugitive Emissions (Component Count, PCV and Hauling)[1]	5.2055	22.8001			130.602	572.04							2.4362	39.9531			0.5194	2.2749	0.0111	0.0483	9.20E-02	4.03E-01		
Flashing, Working and Breathing (F/W/B) Losses[2]	453.19	1,985.0			4,416.5	19,344.2											26.790	117.342	0.5108	2.2375	0.5970	2.6149		
Engine Emissions[3]	0.1014	0.3464	1.5066	6.5991	396.37	1,736.11	2.4586	10.7687	0.0020	0.0083	0.0339	0.1486	0.0325	0.1425			0.0786	0.3443	0.0054	0.0237	0.0007	0.0029	0.0702	0.3075
Gas Processing Unit Heaters Emissions[4]	0.0948	0.4150	1.7228	7.5459	2,079.64	9,108.83	1.4471	6.3385	0.0103	0.0453	0.1309	0.5735	0.1309	0.5735	8.61E-06	3.77E-05	3.24E-02	1.42E-01	3.62E-05	1.58E-04			0.0013	0.0057
TOTALS:	**458.5929**	**2008.5392**	**3.2294**	**14.1450**	**7023.1080**	**30761.2132**	**3.9058**	**17.1072**	**0.0124**	**0.0541**	**0.1649**	**0.7221**	**2.5997**	**40.6691**	**8.61E-06**	**3.77E-05**	**27.4209**	**120.1034**	**0.5274**	**2.3101**	**0.6897**	**3.0207**	**0.0715**	**0.3131**
UNCONTROLLED (Truck Loading Emissions)																								
Truck Loading Emissions[5]	15.779	33.645			1.995	29.811											0.0747	0.1591	5.92E-04	1.29E-03	0.0032	0.0067		
CONTROLLED EMISSIONS																								
Enclosed Combustor Emissions (from F/W/B losses)[6]	9.0641	39.7008	1.0097	4.4224	9125.6235	39970.2311	0.8481	3.7148	3.02E-05	1.32E-04	0.0576	0.2521	0.0767	7.05E-05	5.05E-06	2.21E-05	0.5359	2.3472	1.02E-02	4.48E-02	0.0119	0.0523	3.78E-06	1.66E-05
Controlled Fugitive Emissions from Hauling													1.2181	19.9766										
TOTALS:	**9.0641**	**39.7008**	**1.0097**	**4.4224**	**9125.6235**	**39970.2311**	**0.8481**	**3.7148**	**3.02E-05**	**1.32E-04**	**0.0576**	**0.2521**	**1.2949**	**19.9766**	**5.05E-06**	**2.21E-05**	**0.5359**	**2.3472**	**0.0102**	**0.0448**	**0.0119**	**0.0523**	**3.78E-06**	**1.66E-05**
POTENTIAL TO EMIT[7]	**14.4657**	**96.9070**	**4.2391**	**18.5673**	**11732.2386**	**51417.0156**	**4.7539**	**20.8220**	**0.0124**	**0.0542**	**0.2224**	**0.9742**	**1.4583**	**20.6926**	**1.37E-05**	**5.98E-05**	**1.1663**	**5.2676**	**0.0268**	**0.1187**	**0.1046**	**0.4648**	**0.0715**	**0.3132**

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 13 for engine emissions 4 - See Table 9 for gas processing unit heaters emission calculations 5 - 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 2800 barrels per day, VOC emissions would be 15.7791 pounds per hour when there are truck loading activities. Average hourly VOC emissions from truck loading is 7.6814 pound per hour. 6 - See Table 10 and 11 for enclosed combustor emission calculations. 7 - The hourly potential to emit is the sum of emissions from gas processing unit heaters, engine, storage tanks, fugitives and enclosed combustors. 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

Permit Summary
Weigle East Wellpad
Tyler, West Virginia
Antero Resources Corporation

Pollutant		Emissions			Threshold Exceeded?	
		Uncontrolled	Controlled	Threshold	Uncontrolled	Controlled
VOC	lbs/hr	458.5929	14.4657	6	**Yes**	**Yes**
	tons/yr	2042.1839	96.9070	10	**Yes**	**Yes**
NO_X	lbs/hr	3.2294	4.2391	6		
	tons/yr	14.1450	18.5673	10	**Yes**	**Yes**
CO	lbs/hr	3.9058	4.7539	6		
	tons/yr	17.1072	20.8220	10	**Yes**	**Yes**
SO_2	lbs/hr	0.0124	0.0124	6		
	tons/yr	0.0541	0.0542	10		
$PM_{2.5}$	lbs/hr	0.1649	0.2224	6		
	tons/yr	0.7221	0.9742	10		
PM_{10}	lbs/hr	2.5997	1.4583	6		
	tons/yr	40.6691	20.6926	10	**Yes**	**Yes**
Lead	lbs/hr	8.61E-06	1.37E-05	6		
	tons/yr	3.77E-05	5.98E-05	10		
Total HAPs	lbs/hr	27.4209	1.1663	2	**Yes**	
	tons/yr	120.2625	5.2676	5	**Yes**	**Yes**
Total TAPs	lbs/hr	0.5989	0.0983	1.14		
n-Hexane	lbs/hr	25.1272	0.8756			
	tons/yr	110.2019	3.9798			
Toluene	lbs/hr	0.7230	0.0504			
	tons/yr	3.1705	0.2243			
Ethylbenzene	lbs/hr	0.2817	0.0372			
	tons/yr	1.2366	0.1653			
Xylenes	lbs/hr	0.6897	0.1046			
	tons/yr	3.0274	0.4648			
Benzene	lbs/hr	0.5274	0.0268			
	tons/yr	2.3114	0.1187			

Enter any notes here:	1. Emissions are based on 98% Enclosed Combustor DRE operating 100% of the time.

Table 4

Fugitive Emissions
Weigle East Wellpad
Tyler, West Virginia
Antero Resources Corporation

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

Gas Weight Fraction From Analysis:	VOC frac	0.165
	Benzene frac	0.000
	Toluene	0.000
	Ethylbenzene	0.000
	Xylenes	0.000
	n-Hexane	0.011
	Methane	0.625

Gas					
Number	Component	Pollutant	Emission Factor (kg/hr of THC per component)	kg/hr	lb/yr
700	Valves	Gas VOC	0.004500	0.52	10,042.18
		Non VOC	0.004500	2.63	50,664.62
826	Connectors	VOC	0.000200	0.03	526.66
		Non-VOC	0.000200	0.14	2,657.08
182	Flanges	VOC	0.000390	0.01	226.28
		Non-VOC	0.000390	0.06	1,141.64
			Total VOCs:	0.56	10,795.12
			Total THC:	3.39	65,258.46

Light Liquid Weight Fraction From Analysis:	VOC frac	0.958
	Benzene frac	0.003
	Toluene	0.009
	Ethylbenzene	0.008
	Xylenes	0.023
	n-hexane	0.065
	Methane	0.014

Light Liquid					
Number	Component	Pollutant	Emission Factor (kg/hr of THC per component)	kg/hr	lb/yr
728	Valves	Light Liquid VOC	0.002500	1.74	33,618.44
		Light Liquid Non-VOC		0.08	1,456.60
			Total VOC:	1.74	33,618.44
			Total THC:	1.82	35,075.04

Fugitive Total Emissions			
	Annual Emissions (lb/yr)	Annual Emissions (lb/hr)	Annual Emissions (tpy)
VOC	44,413.55	5.07	22.21
Ethylbenzene		0.03	0.14
Toluene		0.03	0.15
Xylenes		0.09	0.40
n-Hexane		0.34	1.49
TAPs (Benzene)		0.01	0.05
HAPs		0.51	2.24
CO_{2e}	1,031,979.52	117.81	515.99

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.

Table 5

Pneumatic Control Valve Emissions
Weigle East Wellpad
Tyler, West Virginia
Antero Resources Corporation

Number of PCVs	56
Bleed Rate (scf/day/PCV)	6.6
Total Bleed Rate (scf/day)	369.6

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	34.08	0	0.00	0.00	0.00	0.00
Nitrogen	0.564	14.01	2.084544	0.01	0.08	0.00	0.01
Carbon Dioxide	0.1647	44.01	0.6087312	0.00	0.07	0.00	0.01
Methane	78.61509	16.04	290.5613726	0.77	12.28	0.51	2.24
Ethane	14.0689	30.07	51.9986544	0.14	4.12	0.17	0.75
Propane	4.2164	44.1	15.5838144	0.04	1.81	0.08	0.33
Isobutane	0.5041	58.12	1.8631536	0.00	0.29	0.01	0.05
n-Butane	1.0298	58.12	3.8061408	0.01	0.58	0.02	0.11
Isopentane	0.2618	72.15	0.9676128	0.00	0.18	0.01	0.03
n-Pentane	0.2553	72.15	0.9435888	0.00	0.18	0.01	0.03
2-Methylpentane	0	86.18	0	0.00	0.00	0.00	0.00
3-Methylpentane	0	86.18	0	0.00	0.00	0.00	0.00
n-Hexane	0.2484	86.18	0.9180864	0.00	0.21	0.01	0.04
Methylcyclopentane	0	84.16	0	0.00	0.00	0.00	0.00
Benzene	0	78.11	0	0.00	0.00	0.00	0.00
2-Methylhexane	0	100.2	0	0.00	0.00	0.00	0.00
3-Methylhexane	0	100.2	0	0.00	0.00	0.00	0.00
Heptane	0	100.21	0	0.00	0.00	0.00	0.00
Methylcyclohexane	0	98.186	0	0.00	0.00	0.00	0.00
Toluene	0	92.14	0	0.00	0.00	0.00	0.00
Octane	0	114.23	0	0.00	0.00	0.00	0.00
Ethylbenzene	0	106.17	0	0.00	0.00	0.00	0.00
m & p-Xylene	0	106.16	0	0.00	0.00	0.00	0.00
o-Xylene	0	106.16	0	0.00	0.00	0.00	0.00
Nonane	0	128.2	0	0.00	0.00	0.00	0.00
C10+	0	174.28	0	0.00	0.00	0.00	0.00

	lb/hr	tpy
VOC Emissions	0.1355	0.5933
Benzene Emissions	0.0000	0.0000
Toluene Emissions	0.0000	0.0000
Ethylbenzene Emissions	0.0000	0.0000
Xylene Emissions	0.0000	0.0000
n-Hexane Emissions	0.0087	0.0381
HAPs Emissions	0.0087	0.0381
TAPs Emissions	0.0000	0.0000
CO_{2e} emissions	12.7962	56.0475

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
Weigle East Wellpad
Tyler, 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	0.0347	0.1580	0.6919	2.4094	0.0000	0.0000
H2S	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Nitrogen	0.0003	0.0015	0.0065	0.3909	1.1628	5.0930
Carbon Dioxide	0.0788	0.3584	1.5696	3.4806	10.3535	45.3485
Methane	0.6829	3.1056	13.6024	58.1629	173.0159	757.8098
Ethane	15.7151	71.4661	313.0217	19.8599	59.0768	258.7563
Propane	33.9000	154.1643	675.2398	8.7716	26.0927	114.2862
Isobutane	8.5906	39.0666	171.1118	3.6630	10.8963	47.7258
n-Butane	19.1024	86.8703	380.4917	1.9048	5.6662	24.8181
Isopentane	6.3246	28.7619	125.9769	0.3678	1.0940	4.7919
n-Pentane	6.2751	28.5366	124.9905	0.3532	1.0506	4.6017
2-Methylpentane	0.6154	2.7988	12.2588	0.0157	0.0466	0.2041
3-Methylpentane	0.4224	1.9209	8.4136	0.0288	0.0856	0.3749
n-Hexane	5.3457	24.3104	106.4795	0.1078	0.3207	1.4047
Methylcyclopentane	0.1999	0.9091	3.9818	0.0401	0.1193	0.5223
Benzene	0.0546	0.2481	1.0866	0.0880	0.2618	1.1465
2-Methylhexane	0.4140	1.8828	8.2468	0.0092	0.0274	0.1202
3-Methylhexane	0.3316	1.5079	6.6045	0.0077	0.0230	0.1007
Heptane	0.6049	2.7510	12.0494	0.0146	0.0434	0.1900
Methylcyclohexane	0.3907	1.7768	7.7822	0.0526	0.1564	0.6851
Toluene	0.0747	0.3399	1.4886	0.1155	0.3435	1.5046
Octane	0.5978	2.7187	11.9079	0.0090	0.0268	0.1173
Ethylbenzene	0.0275	0.1250	0.5473	0.0412	0.1226	0.5368
m & p-Xylene	0.0328	0.1492	0.6534	0.0484	0.1441	0.6311
o-Xylene	0.0322	0.1465	0.6415	0.0511	0.1519	0.6654
Nonane	0.1300	0.5911	2.5891	0.0030	0.0090	0.0395
C10+	0.0212	0.0966	0.4230	0.0033	0.0097	0.0426
Total VOCs	83.488	379.67	1,663.0	15.696	46.6917	204.5097
Total CO_{2e}		78.00	341.6		4,335.75	18,990.6
Total TAPs (Benzene)		0.2481	1.0866		0.2618	1.1465
Toluene		0.3399	1.4886		0.3435	1.5046
Ethylbenzene		0.1250	0.5473		0.1226	0.5368
Xylenes		0.2956	1.2949		0.2960	1.2965
n-Hexane		24.310	106.479		0.3207	1.4047
Total HAPs		25.319	110.897		1.3445	5.8891
Total	100.00	454.76	1,991.9	100.00	290.301	1271.52

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

Table 7

Uncontrolled Working and Breathing Losses
Weigle East Wellpad
Tyler, West Virginia
Antero Resources Corporation

Condensate Tank Information	
Number of Tanks	10
Maximum Working Losses (lbs/hr)	18.1818
Maximum Breathing Losses (lbs/hr)	15.7315

	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Nitrogen	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Carbon Dioxide	0.0832	0.0151	0.0663	0.0131	0.0574	0.0282	0.1236
Methane	0.1779	0.0323	0.1416	0.0280	0.1226	0.0603	0.2642
Ethane	20.6403	3.7528	16.4371	3.2470	14.2220	6.9998	30.6591
Propane	36.6089	6.6562	29.1540	5.7591	25.2251	12.4153	54.3790
Isobutene	8.7073	1.5831	6.9341	1.3698	5.9997	2.9529	12.9338
n-Butane	18.9712	3.4493	15.1079	2.9845	13.0719	6.4338	28.1799
Is pentane	5.9038	1.0734	4.7016	0.9288	4.0680	2.0022	8.7696
n-Pentane	5.7851	1.0518	4.6070	0.9101	3.9862	1.9619	8.5932
2-Methylpentane	0.5523	0.1004	0.4398	0.0869	0.3805	0.1873	0.8203
3-Methylpentane	0.3788	0.0689	0.3016	0.0596	0.2610	0.1285	0.5626
n-Hexane	0.3408	0.0620	0.2714	0.0536	0.2348	0.1156	0.5062
Methylcyclopentane	0.1678	0.0305	0.1336	0.0264	0.1156	0.0569	0.2492
Benzene	0.0030	0.0005	0.0024	0.0005	0.0020	0.0010	0.0044
2-Methylhexane	0.0248	0.0045	0.0198	0.0039	0.0171	0.0084	0.0369
3-Methylhexane	0.2869	0.0522	0.2285	0.0451	0.1977	0.0973	0.4262
Heptane	0.4807	0.0874	0.3828	0.0756	0.3312	0.1630	0.7140
Methylcyclohexane	0.3173	0.0577	0.2527	0.0499	0.2186	0.1076	0.4713
Toluene	0.0088	0.0016	0.0070	0.0014	0.0061	0.0030	0.0131
Octane	0.4408	0.0801	0.3510	0.0693	0.3037	0.1495	0.6547
Ethylbenzene	0.0061	0.0011	0.0048	0.0010	0.0042	0.0021	0.0090
m & p-Xylene	0.0078	0.0014	0.0062	0.0012	0.0054	0.0027	0.0116
o-Xylene	0.0080	0.0015	0.0064	0.0013	0.0055	0.0027	0.0119
Nonane	0.0872	0.0159	0.0694	0.0137	0.0601	0.0296	0.1295
C10+	0.0113	0.0021	0.0090	0.0018	0.0078	0.0038	0.0168
Total VOCs	79.099	14.3815	62.991	12.4434	54.5022	26.8250	117.493
Total CO_{2e}		0.8236	3.6075	0.7126	3.1213	1.5363	6.729
Total TAPs (Benzene)		0.0005	0.0024	0.0005	0.0020	0.0010	0.0044
Toluene		0.0016	0.0070	0.0014	0.0061	0.0030	0.0131
Ethylbenzene		0.0011	0.0048	0.0010	0.0042	0.0021	0.0090
Xylenes		0.0029	0.0126	0.0025	0.0109	0.0054	0.0235
n-Hexane		0.0620	0.2714	0.0536	0.2348	0.1156	0.5062
Total HAPs		0.0681	0.2982	0.0589	0.2580	0.1270	0.5562
Total	100.00	18.1818	79.6362	15.7315	68.9041	33.9133	148.540

Table 7

Uncontrolled Working and Breathing Losses
Weigle East Wellpad
Tyler, West Virginia
Antero Resources Corporation

Produced Water Tank Information	
Number of Tanks	2
Maximum Working Losses (lbs/hr)	1.2945
Maximum Breathing Losses (lbs/hr)	0.0074

	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
H2S	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Nitrogen	0.0085	0.0001	0.0005	0.0000	0.0000	0.0001	0.0005
Carbon Dioxide	4.9698	0.0643	0.2818	0.0004	0.0016	0.0647	0.2834
Methane	3.5104	0.0454	0.1990	0.0003	0.0011	0.0457	0.2002
Ethane	1.0748	0.0139	0.0609	0.0001	0.0003	0.0140	0.0613
Propane	0.1174	0.0015	0.0067	0.0000	0.0000	0.0015	0.0067
Isobutane	0.0526	0.0007	0.0030	0.0000	0.0000	0.0007	0.0030
n-Butane	0.0047	0.0001	0.0003	0.0000	0.0000	0.0001	0.0003
Isopentane	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Pentane	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Methylpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Methylpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Hexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Methylcyclopentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benzene	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Methylhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Methylhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Heptane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Methylcyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Octane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ethylbenzene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m & p-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
o-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
C10+	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total VOCs	0.1754	0.0023	0.0099	0.0000	0.0001	0.0023	0.0100
Total CO_{2e}		1.2004	5.2577	0.0069	0.0300	1.2072	5.2877
Total TAPs (Benzene)		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ethylbenzene		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Xylenes		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Hexane		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total HAPs		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	100.00	1.2945	5.6699	0.0074	0.0324	1.3019	5.7023

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

Table 8

Loading Emissions
Weigle East Wellpad
Tyler, West Virginia
Antero Resources Corporation

Annual Loading	Oil Truck Loading	Water Truck Loading
RVP	4.45	1.0238
Annual Average Temp (F)	72.1	72.1
S (saturation factor)	0.6	0.6
P (true vapor pressure)	3.11	0.45
M (MW of vapor)	45.33	18.58
Collection Efficiency (%)	0	0
Loading Loss (lb/10^3 gal)*	1.98	0.12
Maximum Throughput (gallons/hr)	10,080	10,080
Average Throughput (gallons/yr)	42,924,000	515,088,000
Loading Emissions (lbs/hr)	19.95	1.18
Loading Emissions (tpy)	42.47	30.07

	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	0.00	0.00	0.0000	0.00E+00	0.00E+00
Nitrogen	0.0000	0.00	0.00	0.0085	9.99E-05	2.55E-03
Carbon Dioxide	0.0832	0.02	0.04	4.9698	5.85E-02	1.49E+00
Methane	0.1779	0.04	0.08	3.5104	4.13E-02	1.06E+00
Ethane	20.6403	4.12	8.77	1.0748	1.27E-02	3.23E-01
Propane	36.6089	7.30	15.55	0.1174	1.38E-03	3.53E-02
Isobutane	8.7073	1.74	3.70	0.0526	6.19E-04	1.58E-02
n-Butane	18.9712	3.78	8.06	0.0047	5.51E-05	1.41E-03
Isopentane	5.9038	1.18	2.51	0.0002	2.68E-06	6.86E-05
n-Pentane	5.7851	1.15	2.46	0.0002	1.85E-06	4.73E-05
2-Methylpentane	0.5523	0.11	0.23	0.0000	1.55E-08	3.96E-07
3-Methylpentane	0.3788	0.08	0.16	0.0000	6.97E-08	1.78E-06
n-Hexane	0.3408	0.07	0.14	0.0000	4.32E-09	1.10E-07
Methylcyclopentane	0.1678	0.03	0.07	0.0000	2.15E-07	5.50E-06
Benzene	0.0030	0.00	0.00	0.0001	1.50E-06	3.83E-05
2-Methylhexane	0.0248	0.00	0.01	0.0000	1.62E-10	4.14E-09
3-Methylhexane	0.2869	0.06	0.12	0.0000	1.94E-09	4.96E-08
Heptane	0.4807	0.10	0.20	0.0000	2.75E-09	7.02E-08
Methylcyclohexane	0.3173	0.06	0.13	0.0000	5.88E-08	1.50E-06
Toluene	0.0088	0.00	0.00	0.0001	9.42E-07	2.41E-05
Octane	0.4408	0.09	0.19	0.0000	3.11E-10	7.94E-09
Ethylbenzene	0.0061	0.00	0.00	0.0000	1.92E-07	4.90E-06
m & p-Xylene	0.0078	0.00	0.00	0.0000	2.04E-07	5.20E-06
o-Xylene	0.0080	0.00	0.00	0.0000	2.75E-07	7.02E-06
Nonane	0.0872	0.02	0.04	0.0000	4.92E-11	1.26E-09
C10+	0.0113	0.00	0.00	0.0000	1.63E-11	4.17E-10
Total VOCs	79.0986	15.777	33.592	0.1754	2.06E-03	5.28E-02
Total CO_{2e}		0.904	1.9238		1.0915	27.8869
Total TAPs (Benzene)		0.0006	0.0013		0.0000	0.0000
Toluene		0.0018	0.0037		0.0000	0.0000
Ethylbenzene		0.0012	0.0026		0.0000	0.0000
Xylenes		0.0032	0.0067		0.0000	0.0000
n-Hexane		0.0680	0.1447		0.0000	0.0000
Total HAPs		0.0747	0.1590		0.0000	0.0001
Total	100.0000	19.9460	42.4684	100.0000	1.1770	30.0734

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 7.1-13b
Loading emissions are vented to the atmosphere.

Table 9

Gas Processing Unit Heater Emissions
Weigle East Wellpad
Tyler, West Virginia
Antero Resources Corporation

Number of Units	14
GPU Heater Rating (MMBtu/hr)	1.50
Operating hours/year	8760
Fuel Heat Value (Btu/scf)	1,219

Pollutant	Emission Factors (lb/MMscf)	lb/hr	tpy
NOx	100	1.723	7.546
CO	84	1.447	6.339
CO_2	120,000	2067.356	9055.021
Lead	0.0005	8.61E-06	3.77E-05
N_2O	2.2	0.038	0.166
PM (Total)	7.6	0.131	0.573
SO_2	0.6	0.010	0.045
TOC	11	0.190	0.830
Methane	2.3	0.040	0.174
VOC	5.5	0.095	0.415
HAPS			
2-Methylnaphthalene	2.40E-05	4.13E-07	1.81E-06
Benzene	2.10E-03	3.62E-05	1.58E-04
Dichlorobenzene	1.20E-03	2.07E-05	9.06E-05
Fluoranthene	3.00E-06	5.17E-08	2.26E-07
Fluorene	2.80E-06	4.82E-08	2.11E-07
Formaldehyde	7.50E-02	1.29E-03	5.66E-03
Hexane	1.80E+00	3.10E-02	1.36E-01
Naphthalene	6.10E-04	1.05E-05	4.60E-05
Phenanathrene	1.70E-05	2.93E-07	1.28E-06
Toluene	3.40E-03	5.86E-05	2.57E-04

	lb/hr	tpy
TOTAL Uncontrolled VOC	0.095	0.415
TOTAL Uncontrolled HAPs	0.032	0.142
TOTAL Uncontrolled TAPs (Benzene)	0.000	0.000
TOTAL Uncontrolled TAPs (Formaldehyde)	0.001	0.006
TOTAL CO_{2e} Emissions	2,079.64	9,108.83

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

Table 10

Enclosed Combustor Emissions
Weigle East Wellpad
Tyler, West Virginia
Antero Resources Corporation

General Information	
Unit Name:	EC001, EC002, EC0003, EC004

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

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

Destruction Efficiency	
VOC percent destruction efficiency (%)	98
H_2S percent destruction efficiency (%)	98
No. of Enclosed Combustor	4

Enclosed Combustor operating hours	8760

Stream Information							
	1	2	3	4	5	6	Total
Stream Sent to Enclosed 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)	50.4	--	3,807.10	5,928.73	283.91	26.59	10,096.73
Maximum Expected Annual Volumetric Flow Rate of Stream (scf/yr)	441,504.00	--	33,350,227.96	51,935,664.66	2,487,053.74	232,911.54	88,447,361.90
Heating Content (Btu/ft3)	1,219		2,695.59	1,184.52	2,695.59	1,184.52	1,790.86

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	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	-	-	379.672	46.692	26.825	0.002	453.19
Benzene	-	-	0.248	0.262	0.001	0.000	0.511
Toluene	-	-	0.340	0.344	0.003	0.000	0.686
Ethylbenzene	-	-	0.125	0.123	0.002	0.000	0.250
Xylenes	-	-	0.296	0.296	0.005	0.000	0.597
n-Hexane	-	-	24.310	0.321	0.116	0.000	24.747
HAPs	-	-	25.319	1.345	0.127	0.000	26.790
Total Mass flow	-	-	454.762	290.301	33.913	1.302	780.278
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	-	-	1662.965	204.510	117.493	0.010	1984.978
Benzene	-	-	1.087	1.147	0.004	0.000	2.238
Toluene	-	-	1.489	1.505	0.013	0.000	3.006
Ethylbenzene	-	-	0.547	0.537	0.009	0.000	1.093
Xylenes	-	-	1.295	1.297	0.023	0.000	2.615
n-Hexane	-	-	106.479	1.405	0.506	0.000	108.390
HAP	-	-	110.897	5.889	0.556	0.000	117.342

Table 10

Enclosed Combustor Emissions
Weigle East Wellpad
Tyler, West Virginia
Antero Resources Corporation

Total Mass flow	-	-	1991.857	1271.517	148.540	5.702	3417.617

Table 10

Enclosed Combustor Emissions
Weigle East Wellpad
Tyler, West Virginia
Antero Resources Corporation

Controlled Emissions							
Hourly (lb/hr)							
	1	2	3	4	5	6	Total
Stream Sent to Enclosed Combustor	pilot(s)	added fuel stream(s)	Oil Tank Flash Emissions	Water Tank Flash Emissions	Oil Tank W/B Emissions	Water Tank W/B Emissions	-
NOx	0.005	-	0.381	0.593	0.028	0.003	1.01
CO	0.004	-	0.320	0.498	0.024	0.002	0.85
PM2.5	0.000	-	0.022	0.034	0.002	0.000	0.06
PM10	0.000	-	0.029	0.045	0.002	0.000	0.08
H2S	0.000	-	0.000	0.000	0.000	0.000	0.00
SO_2	0.000	-	0.000	0.000	0.000	0.000	0.00
CO_2	6.048	-	-	-	-	-	6.05
Total VOC	0.000	-	7.593	0.934	0.536	0.000	9.06
Benzene	0.000	-	0.005	0.005	0.000	0.000	0.01
Toluene	0.000	-	0.007	0.007	0.000	0.000	0.01
Ethylbenzene	0.000	-	0.002	0.002	0.000	0.000	0.00
Xylenes	0.000	-	0.006	0.006	0.000	0.000	0.01
n-Hexane	0.000	-	0.486	0.006	0.002	0.000	0.50
HAP	0.000	-	0.506	0.027	0.003	0.000	0.54
N_2O	0.000	-	0.008	0.013	0.001	0.000	0.02
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	pilot(s)	added fuel stream(s)	Oil Tank Flash Emissions	Water Tank Flash Emissions	Oil Tank W/B Emissions	Water Tank W/B Emissions	-
NOx	0.022	-	1.668	2.597	0.124	0.012	4.42
CO	0.019	-	1.401	2.181	0.104	0.010	3.71
PM2.5	0.001	-	0.095	0.148	0.007	0.001	0.25
PM10	0.002	-	0.127	0.197	0.009	0.001	0.34
H_2S	0.000	-	0.000	0.000	0.000	0.000	0.00
SO_2	0.000	-	0.000	0.000	0.000	0.000	0.00
CO_2	26.490	-	-	-	-	-	26.49
Total VOC	0.001	-	33.259	4.090	2.350	0.000	39.70
Benzene	0.000	-	0.022	0.023	0.000	0.000	0.04
Toluene	0.000	-	0.030	0.030	0.000	0.000	0.06
Ethylbenzene	0.000	-	0.011	0.011	0.000	0.000	0.02
Xylenes	0.000	-	0.026	0.026	0.000	0.000	0.05
n-Hexane	0.000	-	2.130	0.028	0.010	0.000	2.17
HAP	0.000	-	2.218	0.118	0.011	0.000	2.35
N_2O	0.000	-	0.037	0.057	0.003	0.000	0.10
Lead	0.000	-	0.000	0.000	0.000	0.000	0.00
Formaldehyde	0.000	-	-	-	-	-	0.00

Enclosed Combustor Total Emissions		
	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
Total VOC	9.06	39.70
NOx	1.01E+00	4.42E+00
CO	8.48E-01	3.71E+00
PM2.5	5.76E-02	2.52E-01
PM10	7.67E-02	3.36E-01
H_2S	1.61E-05	7.05E-05
SO_2	3.02E-05	1.32E-04
Benzene (TAPs)	1.02E-02	4.48E-02
Formaldehyde (TAPs)	3.78E-06	1.66E-05
HAPs	0.54	2.35
CO_2e	9125.62	39970.23
N_2O	2.22E-02	9.73E-02
Lead	5.05E-06	2.21E-05

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

Table 11

Enclosed Combustor GHG Emissions
Weigle East Wellpad
Tyler, West Virginia
Antero Resources Corporation

Enclosed Combustor CO_2 and CH_4 Emissions

Components	Mole fraction of oil flash gas constituents[a]	Volume of oil flash gas sent to enclosed combustor *scf/year*	Mole fraction of water flash gas constituents[a]	Volume of water flash gas sent to enclosed combustor *scf/year*	Mole fraction of oil tank vapors constituents[a]	Volume of oil tank vapor sent to enclosed combustor *scf/year*	Mole fraction of water tank vapors constituents[a]	Volume of water tank vapors sent to enclosed combustor *scf/year*	Component volume of gas sent to enclosed combustor *scf/year*	Number of carbon atoms	Combustion Efficiency	Combusted CO_2 Volume[b] *scf/year*	Uncombusted CO_2 and CH_4 Volume[b] *scf/year*	Volume GHGs Emitted *scf/year*
CO_2	0.001	33,350,228	0.1175	51,935,665	0.0009	2,487,054	0.021	232,912	6,136,661	1	0	--	6,136,661	575,889,154
Methane	0.020	33,350,228	5.3862	51,935,665	0.0050	2,487,054	0.041	232,912	280,439,079	1	0.98	274,830,297	5,608,782	5,608,782
Ethane	0.250	33,350,228	0.9810	51,935,665	0.3119	2,487,054	0.007	232,912	60,062,094	2	0.98	117,721,703	--	
Propane	0.368	33,350,228	0.2955	51,935,665	0.3773	2,487,054	0.000	232,912	28,540,782	3	0.98	83,909,898	--	
I-Butane	0.071	33,350,228	0.0936	51,935,665	0.0681	2,487,054	0.000	232,912	7,388,404	4	0.98	28,962,543	--	
n-Butane	0.157	33,350,228	0.0487	51,935,665	0.1483	2,487,054	0.000	232,912	8,138,301	4	0.98	31,902,140	--	
Pentane	0.083	33,350,228	0.0148	51,935,665	0.0736	2,487,054	0.000	232,912	3,738,696	5	0.98	18,319,608	--	
Hexane	0.035	33,350,228	0.0026	51,935,665	0.0067	2,487,054	0.000	232,912	1,334,146	6	0.98	7,844,781	--	
Benzene	0.000	33,350,228	0.0017	51,935,665	0.0000	2,487,054	0.000	232,912	98,088	6	0.98	576,760	--	
Heptanes	0.008	33,350,228	0.0012	51,935,665	0.0045	2,487,054	0.000	232,912	325,019	7	0.98	2,229,627	--	
Toluene	0.000	33,350,228	0.0019	51,935,665	0.0000	2,487,054	0.000	232,912	109,729	7	0.98	752,740	--	
Octane	0.004	33,350,228	0.0009	51,935,665	0.0032	2,487,054	0.000	232,912	202,320	8	0.98	1,586,190	--	
Ethyl benzene	0.000	33,350,228	0.0006	51,935,665	0.0000	2,487,054	0.000	232,912	34,129	8	0.98	267,569	--	
Xylenes	0.000	33,350,228	0.0014	51,935,665	0.0001	2,487,054	0.000	232,912	82,246	8	0.98	644,809	--	
Nonane	0.000	33,350,228	0.0000	51,935,665	0.0003	2,487,054	0.000	232,912	18,760	9	0.98	165,466	--	
Decane plus	0.000	33,350,228	0.0000	51,935,665	0.0000	2,487,054	0.000	232,912	3,914	10	0.98	38,360	--	
											Subtotal	569,752,493	--	

Pollutant	Volume Emitted *scf/year*	Density of GHG[c] *lb/scf*	Conversion Factor *lb/ton*	GWF	Emissions[c] *lbs/hr*	*(tons/yr)*
CO_2	575,889,154	0.12	2000	1	7623.50	33,390.92
CH_4	5,608,782	0.09	2000	25	59.57	260.91
				CO_2e Emissions	9,112.7	39913.58

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 60F and 14.7 psia

Table 12

Haul Road Emissions
Weigle East Wellpad
Tyler, 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)	2800
PW Production (bbl/day)	33,600
Truck Capacity (bbl)	200

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

	# of Wheels	Mean Vehicle Weight (W) (tons)	Mean Vehicle Speed (S) (mph)	Miles Per Trip (miles)	Maximum Trips per Hour	Maximum Trips per Year	Vehicle Miles Travelled (miles/hr)	Vehicle Miles Travelled (miles/year)	PM (lbs/VMT)	PM10 (lbs/VMT)
Tanker Trucks Condensate	10	40	10	0.7000	1	5110	0.7000	3577.0000	3.8175	1.7179
Tanker Trucks PW	10	40	10	0.7000	1	61320	0.7000	42924.0000	3.8175	1.7179
Pick Up Truck	4	3	10	0.2000	1	730	0.2000	146.0000	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	2.6723	13655.3026	6.8277	1.2025	6144.8862	3.0724	1.3361	6827.6513	3.4138	0.6013	3072.4431	1.5362
Tanker Trucks PW	2.6723	163863.6316	81.9318	1.2025	73738.6342	36.8693	1.3361	81931.8158	40.9659	0.6013	36869.3171	18.4347
Pick Up Truck	0.0693	50.6152	0.0253	0.0312	22.7769	0.0114	0.0347	25.3076	0.0127	0.0156	11.3884	0.0057
Total Emissions	5.4139	177,569.5495	88.7848	2.4362	79,906.2973	39.9531	2.7069	88,784.7747	44.3924	1.2181	39,953.1486	19.9766

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

Engine Emissions
Weigle East Wellpad
Tyler, West Virginia
Antero Resources Corporation

ZPP 428 2.8L Engine

Power (hp) [1]	72
No. of Engine	2
Fuel consumption (lbs/BHP-hr) [1]	0.48
Heat Content of Fuel (Btu/scf)	1218.948
Density of NG (lb/scf)	0.056
Operating Hours/year	8760

Pollutant	Emission Factors (g/hp-hr)	Emission Factors (lb/MMBtu)	lb/hr	tpy
NOx[2]	2.01		0.6381	2.7949
CO[2]	3.28		1.0413	4.5609
CO_2		110.000	165.4983	724.88
$PM_{2.5}$		9.910E-03	0.0149	0.0653
PM_{10}		9.500E-03	0.0143	0.0626
PM (Total)		9.910E-03	0.0149	0.0653
SO_2		5.880E-04	0.0009	0.0039
TOC		0.358	0.5386	2.3592
Methane		0.230	0.3460	1.5157
VOC[3]		0.0296	0.0445	0.0975
HAPS				
Benzene		1.58E-03	2.38E-03	1.04E-02
Ethylbenzene		2.48E-05	3.73E-05	1.63E-04
Formaldehyde		2.05E-02	3.08E-02	1.35E-01
Naphthalene		9.71E-05	1.46E-04	6.40E-04
Toluene		5.58E-04	8.40E-04	3.68E-03
Xylene		1.95E-04	2.93E-04	1.29E-03

ZPP 644 4.4L Engine

Power (hp) [1]	98
No. of Engine	2
Fuel consumption (lbs/BHP-hr) [1]	0.45
Heat Content of Fuel (Btu/scf)	1218.948
Density of NG (lb/scf)	0.056
Operating Hours/year	8760

Pollutant	Emission Factors (g/hp-hr)	Emission Factors (lb/MMBtu)	lb/hr	tpy
NOx[2]	2.01		0.8685	3.8042
CO[2]	3.28		1.4173	6.2078
CO_2		110.000	211.1827	924.98
$PM_{2.5}$		9.910E-03	0.0190	0.0833
PM_{10}		9.500E-03	0.0182	0.0799
PM (Total)		9.910E-03	0.0190	0.0833
SO_2		5.880E-04	0.0011	0.0049
TOC		0.358	0.6873	3.0104
Methane		0.230	0.4416	1.9340
VOC[3]		0.0296	0.0568	0.2489
HAPS				
Benzene		1.58E-03	3.03E-03	1.33E-02
Ethylbenzene		2.48E-05	4.76E-05	2.09E-04
Formaldehyde		2.05E-02	3.94E-02	1.72E-01
Naphthalene		9.71E-05	1.86E-04	8.17E-04
Toluene		5.58E-04	1.07E-03	4.69E-03
Xylene		1.95E-04	3.74E-04	1.64E-03

	lb/hr	tpy
TOTAL Uncontrolled VOC	0.101	0.346
TOTAL Uncontrolled NOx	1.507	6.599
TOTAL Uncontrolled HAPs	0.079	0.344
TOTAL Uncontrolled TAPs (Benzene)	0.005	0.024
TOTAL Uncontrolled TAPs (Formaldehyde)	0.070	0.307
TOTAL CO_{2e} Emissions	396.37	1,736.1

Enter Any Notes Here:

1. Engines were manufactured in 2013. HP ratings were obtained from manufacturer's test results submitted to EPA for Certificated of Conformity. Please see copies of engine test results and fuel curves in Appendix P.

2. Emission factors used for the 72 HP and 98 HP engines NO_x and CO emissions are the emission standards indicated on EPA's Certificate of Conformity. See EPA's Certificates of Conformity and engines confidential copies of emission test results in Appendix P.

3. Emission factors for all other contaminants including VOCs were obtained from AP-42, Section 3.2 "Natural Gas-fired Reciprocating Engines", Table 3.2-3.

Table 14

Change in Regulated Air Pollutants Emissions
Weigle East Wellpad
Tyler, West Virginia
Antero Resources Corporation

	Potential Emissions [1]		Initial Permit Application Emissions		Change in Emissions	
Pollutant	Hourly PTE	Yearly PTE	Hourly PTE	Yearly PTE	Hourly PTE	Yearly PTE
PM	2.8718	45.1145	2.8121	6.5762	0.0597	38.5383
PM10	1.4583	20.6926	2.5988	5.9643	-1.1405	14.7283
VOC	14.4657	96.9070	15.1084	70.0836	-0.6427	26.8233
CO	4.7539	20.8220	7.4167	32.4851	-2.6628	-11.6631
NOx	4.2391	18.5673	2.4255	10.6239	1.8136	7.9434
SO2	0.0124	0.0542	0.0083	0.0362	0.0041	0.0180
Pb	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000
HAPs	1.1663	5.2676	1.3877	6.1029	-0.2213	-0.8353
TAPs	0.0715	0.3132	0.0058	0.0255	0.0657	0.2876

Notes: 1) Change in emissions due: Increase in production. Construction of (3) additional wells, (3) gas production unit heaters, (1) condensate storage tank, (4) vapor recovery towers, (4) Zenith compressor engines, the addition of (2) enclosed combustors and the removal of (1) Kubota engine.

Attachment O: G70-A Emissions Summary Sheet

Emission Points Data Summary Sheet

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used [6]
		ID No.	Source	ID No.	Device Type		lb/hr	ton/yr	lb/hr	ton/yr		
EP-H001, EP-H002, EP-H003, EP-H004, EP-H005, EP-H006, EP-H007, EP-H008, EP-H009, EP-H010, EP-H011, EP-H012, EP-H013, EP-H014	Vertical Stack	H001, H002, H003, H004, H005, H006, H007, H008, H009, H010, H011, H012, H013, H014	Gas Processing Unit Heater	N/A		CO (630080)	1.45	6.34	1.45	6.34	Gas/Vapor /Solid (for PM)	MB AP-42
						NOx (10102439)	1.72	7.55	1.72	7.55		
						CO2 Equivalent N2O (10024972), CO2 (124389), CH4 (74828)	2079.64	9108.83	2079.64	9108.83		
						SO2 (7446095)	0.01	0.05	0.01	0.05		
						PM, PM10, PM2.5	0.13	0.57	0.13	0.57		
						Hexane (110543)	0.03	0.14	0.03	0.14		
						Formaldehyde (50000)	1.29E-03	0.01	1.29E-03	0.01		
						Total VOCs	0.09	0.42	0.09	0.42		
F001	N/A	F001	Fugitives	N/A		Benzene (71432)	0.01	0.05	0.01	0.05	Gas/Vapor	MB
						Toluene (108883)	0.03	0.15	0.03	0.15		
						Ethyl benzene (100414)	0.03	0.14	0.03	0.14		
						Hexane (110543)	0.34	1.49	0.34	1.49		
						o,m,p-xylenes (95476,108383,106423)	0.09	0.40	0.09	0.40		
						CO2 Equivalent CO2 (124389)), CH4	117.81	515.99	117.81	515.99		
						VOCs	5.07	22.21	5.07	22.21		
						TAPs (benzene)	0.01	0.05	0.01	0.05		
EP-L001, EP-L002	N/A	L001, L002	Loading (Condensate), Loading (Water)	N/A		VOCs	15.78	33.64	15.78	33.64	Gas/Vapor	MB
						hexane (110543)	0.07	0.14	0.07	0.14		
						CO2 Equivalent CO2 (124389), CH4	2.00	29.81	2.00	29.81		
EP-HR001	N/A	HR001	Haul Truck	N/A		PM, PM10, PM2.5	5.41	88.78	2.71	44.39	Solid	MB

Attachment O: G70-A Emissions Summary Sheet

Emission Points Data Summary Sheet

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used [6]
		ID No.	Source	ID No.	Device Type		lb/hr	ton/yr	lb/hr	ton/yr		
EC001, EC002, EC0003, EC004	N/A	TANKCOND001-010 ,TANKPW001-002 ,EC001, EC002, EC0003, EC004	Condensate Tank F/W/B ,PW Tank F/W/B ,Enclosed Combustor	N/A	Enclosed Combustor	CO (630080)	0.00E+00	0.00E+00	0.85	3.71	Gas/Vapor/ Solid (for PM)	MB
						NOx (10102439)	0.00E+00	0.00E+00	1.01	4.42		
						CO2 Equivalent N2O (10024972), CO2 (124389), CH4	4416.49	19344.24	9125.62	39970.23		
						PM, PM10, PM2.5	0.00E+00	0.00E+00	0.08	7.05E-05		
						Benzene (71432)	0.51	2.24	1.02E-02	4.48E-02		
						Toluene (108883)	0.69	3.01	0.67	2.95		
						hexane (110543)	24.75	108.39	24.25	106.22		
						VOCs	453.19	1984.98	9.06	39.70		
EP-PCV	Valve	PCV	Pneumatic CV	N/A		hexane (110543)	0.01	0.04	0.01	0.04	Gas/Vapor	MB
						CO2 Equivalent CO2 (124389)), CH4	12.80	56.05	12.80	56.05		
						VOCs	0.14	0.59	0.14	0.59		
EP-ENG001, EP-ENG002, EP-ENG003, EP-ENG004	Vertical Stack	ENG001, ENG002, ENG003, ENG004	Compressor Engine	N/A		CO (630080)	2.46	10.77	2.46	10.77	Gas/Vapor/ Solid (for PM)	MB
						NOx (10102439)	1.51	6.60	1.51	6.60		
						CO2 Equivalent N2O (10024972), CO2 (124389), CH4 (74828)	396.37	1736.11	396.37	1736.11		
						SO2 (7446095)	2.01E-03	0.01	2.01E-03	0.01		
						PM, PM10, PM2.5	0.03	0.14	0.03	0.14		
						TAPs Benzene (71432)	0.01	0.02	0.01	0.02		
						Toluene (108883)	1.91E-03	0.01	1.91E-03	0.01		
						TAPs Formaldehyde (50000)	0.07	0.31	0.07	0.31		
						Total VOCs	0.10	0.35	0.10	0.35		

Permit / Application Information Sheet
Division of Environmental Protection
West Virginia Office of Air Quality

Company:	Antero Resources Corporation			**Facility:**	Weigle East Wellpad
Region:	2	**Plant ID:**	095-00045	**Application #:**	G70-A073A
Engineer:	Kees, Roy			**Category:**	
Physical Address:	Lynn Camp Run Rd Middlebourne WV 26149			**SIC:** [1311] OIL AND GAS EXTRACTION - CRUDE PETROLEUM & NATURAL GAS **NAICS:** [211111] Crude Petroleum and Natural Gas Extraction	
County:	Tyler				
Other Parties:	ENV_MGR - Schatz, Barry 303-357-7276 Consultant - Bautista, Manuel 713-734-3090				

Information Needed for Database and AIRS
1. Need valid physical West Virginia address with zip

Regulated Pollutants

Summary from this Permit G70-A073A

Air Programs		**Applicable Regulations**
Fee Program	**Fee**	**Application Type**
	$1,500.00	MODIFICATION

Notes from Database

Activity Dates

APPLICATION RECIEVED	06/02/2015
APPLICATION FEE PAID	06/05/2015
ASSIGNED DATE	06/05/2015

NON-CONFIDENTIAL

Please note, this information sheet is not a substitute for file research and is limited to data entered into the AIRTRAX database.

Company ID: 095-00045
Company: Antero Resources Corporation
Printed: 06/05/2015
Engineer: Kees, Roy

095-00045 modif.
G70-A073A Ray

45CSR13 Administrative Update, Construction, Modification, Relocation, Temporary Permit or General Permit Registration Incomplete Application

A complete application is demonstrated when all of the information required below is properly prepared, completed and attached. The items listed below are required information which must be submitted with a 45CSR13 permit application. Any submittal will be considered incomplete if the required information is not included. The applicant must submit a complete application in order to receive a 45CSR13 permit.

- ☒ Class I legal advertisement not published in a newspaper certified to accept legal advertisements and original affidavit submitted.
- ☐ Application fee AND/OR additional application fees not included:
  - ☐ $250 Class I General Permit
  - ☐ $300 Class II Administrative Update
  - ☐ $1,000 Construction, Modification, Relocation or Temporary Permit
  - ☐ $500 Class II General Permit
  - ☐ $1,000 NSPS
  - ☐ $2,500 NESHAP
  - ☐ $2,500 45CSR27 Pollutant
  - ☐ $5,000 Major Modification
  - ☐ $10,000 Major Construction
- ☐ Original and two (2) copies of the application not submitted.
- ☐ File organization – application pages are not numbered or in correct order, application is not bound in some way, etc.
- ☐ Confidential Business Information is not properly identified.
- ☐ General application forms not completed and signed by a responsible official.
- ☐ Authority of Corporation form not included – required if application is signed by someone other than a responsible official.
- ☐ Applicant is not registered with the West Virginia Secretary of State's Office.
- ☐ Copy of current Business Registration Certificate not included.
- ☐ Process description, including equipment and emission point identification numbers, not submitted.
- ☐ Process flow diagram, including equipment and emission point identification numbers, not submitted.
- ☐ Plot plan, including equipment and emission point identification numbers, not submitted.
- ☐ Applicable technical forms not completed and submitted:
  - ☐ Emission Point Data Summary Sheets
  - ☐ Emission Unit Data Sheets
  - ☐ Air Pollution Control Device Sheets
  - ☐ Equipment List Form
- ☐ Emission calculations not included – emission factors, references, source identification numbers, etc.
- ☐ Electronic submittal diskette not included.

June 15, 2015

Antero Resources
1615 Wynkoop Street
Denver, CO 80202
Office 303.357.7310
Fax 303.357.7315

Mr. Roy Kees
Division of Air Quality
WV Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304

Dear Mr. Kees:

Re: Original Affidavit of Publication
Weigle East Wellpad – Permit No. G70-A073A

Antero Resources Corporation would like to submit the Original Affidavit of Publications from *The Tyler Star News*. This is being submitted in accordance with a permit application requirement for an oil and gas facility.

Sincerely,

Barry Schatz

Barry Schatz
Senior Environmental and Regulatory Manager

Encl.

TYLER STAR NEWS

Sistersville, WV .....June....., 2015

State of West Virginia, County of Tyler:

Personally appeared before the undersigned, a Notary Public,

Brian Clutter who, being duly sworn,

states that he is the manager of the Tyler Star News, a weekly newspaper of general circulation, published at Sistersville, County of Tyler, State of West Virginia, and that a copy of the notice attached hereto was published for.....1.....successive weeks in the Tyler Star News, beginning on the .....10.....day of .....June....., 2015 and ending on the.....10.....day of .....June....., 2015.

.....
Manager, Tyler Star News

Subscribed and sworn to before me, a Notary Public of said County, on this ..... day of ....., 2015.

..... Notary Public

My commission expires on the 4th day of January, 2016.

Printers Fee.....

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
DIANN S. WRIGHT
218 South 2nd Avenue
Paden City, West Virginia 26159
My Commission Expires Jan. 4, 2016

NO	17.6721
COx	47156.6000
CO2e	20.0701
SO	0.0542
PM2	0.9232
PM2.5	20.6926
Lead10	5.54E-05
Total HAPs	4.1010
Benzene	0.1074
Formaldehyde	0.3131
Xylenes	0.4513

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

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1227, during normal business hours.
Dated this the 1 day of June, 2015.

TSN 6/10 1817

Air Quality Permit Notice
Notice of Application
Weigle East Well Pad
Antero Resources Corporation Tyler, West Virginia

Notice is given that Antero Resources has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a General Permit Registration Modification for an Oil and Natural Gas facility located near the intersection of Co Rd 18/14 and Lemasters Bridge Road in Tyler, West Virginia.

The latitude and longitude coordinates are:
39.46623 degrees N and -80.852782 degrees W

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

Pollutants	TOTALS (tpy):
VOC	77.6580