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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3129
Plant ID No.:	017-00065
Applicant:	Antero Resources Corporation (Antero)
Facility Name:	Erwin Hilltop Pad
Location:	New Milton, Doddridge County
NAICS Code:	211111
Application Type:	Construction
Received Date:	September 10, 2013
Engineer Assigned:	Jill Harris
Fee Amount:	$2,000.00
Date Received:	September 11, 2012
Complete Date:	October 29, 2013
Due Date:	December 16, 2013
Applicant Ad Date:	September 17, 2013
Newspaper:	The Herald Record
UTM's:	Easting: 525.118 km Northing: 4,336.609 km Zone: 17
Description:	Construction permit for a natural gas production facility.

DESCRIPTION OF PROCESS

A mixture of condensate and entrained gas from the wells enters the Erwin Hilltop Pad through a number of low pressure separators where the gas phase is separated from the liquid phase. Heater treaters are used in conjunction with the separators to help separate the gas from the liquid phases. These heaters are fueled by a slip stream of the separated gas. The separated gas from the low pressure separators will be metered and sent to the sales gas pipeline. The separated condensate and water from the separators flow to their respective storage tanks.

The Erwin Hilltop Pad has eight (8) tanks on site to store condensate and two (2) tanks to store produced water prior to removal from the site. Condensate and produced water are transported offsite on an as needed basis via tanker trucks. Truck loading connections are in place to pump condensate and produced water from the storage tanks into tanker trucks. Emissions from the truck loading operations are vented to the atmosphere.

Emissions from the Erwin Hilltop Pad's emissions sources were calculated using the extended analysis of the condensate and produced water from Tom's Fork No. 1H, one of the wells in the Erwin Hilltop Pad. The flashing, working and breathing losses from the tanks are sent to a flare. The flare is designed to achieve a VOC destruction efficiency (DRE) of 98 percent.

SITE INSPECTION

Doug Hammell from DAQ's Enforcement Section visited the site on October 23, 2013. The closest residence and building are approximately 1,200 feet away, Northwest. The site is an after the fact construction site. The drilling operations have been completed and the combustor for the storage tanks was installed onsite. Pictures of the facility are available in the file.

Directions from US Route 50: Turn onto WV – 18S for approximately 5.4 miles. Turn right onto access road to facility and travel approximately 0.4 miles.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The following indicates which methodology was used in the emissions determination for each proposed piece of processing equipment:

Natural Gas Heaters (H001 - H008):

There are eight (8) 1.0 MMBtu/hr (rated) heater treaters installed with the gas production unit to separate the condensate, water and gases. Emissions from the natural gas heaters occur from the combustion of natural gas within the heater treaters. Emissions from the heater treaters were

calculated using AP-42, Chapter 1.4 Tables 1.4-1, 1.4-2, 1.4-3 and a heating value of natural gas of 1,219 Btu/scf.

Fugitive Emissions (F001 & PCV):

Fugitive emission calculations were based on component counts at the facility. The potential emissions were estimated using the oil and gas production operations average emission factors in Table 2-4 of the Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017, November 1995). The composition of the materials in contact with these components was estimated using a sample of the separator liquids and gases. All the pneumatic valves are low bleed valves and each valve has a bleed rate less than 0.275 scf/hour. There are total of 40 pneumatic valves onsite.

Storage Tanks (TANKCOND001-008 & TANKPW001-002):

Storage tank emissions, which include flashing, breathing and working losses, were calculated using Promax 3.2 Simulation Software. Emissions are based on a condensate sample taken from the Tom's Fork No. 1H well located at the Erwin Hilltop Pad. Flashing emissions for produced water were estimated using 1% from the produced water output from the Promax 3.2 Simulation Software.

Vapor Combustor (FL001):

Condensate and produced water tank emissions are captured and routed to the flare for control. The flare has a control efficiency of 98% for the working, breathing and flashing emissions from the tanks. The flare utilizes an auxiliary pilot to combust the waste gases from the storage tanks. The potential emissions from the combustion of the waste gases include nitrogen dioxide, carbon monoxide and particulate matter, which were calculated using AP-42 section 1.4.

Bulk Liquid Transfer Operations (L001 & L002):

Truck loading operations generate emissions from the displacement of VOCs while loading condensate or produced water. The emissions were calculated using AP-42 Section 5.2-4 and ProMax3.2 Simulation Software. Emissions from each method are similar, so the ProMax3.2 is assumed to be accurate in estimating emissions. Listed below are the parameters used to calculate emissions from the loading operations.

Table 1: Input Parameters for Bulk Liquid Transfer Operations (L001 & L002)

Parameter	Condensate Truck Loading	Produced Water Truck Loading
S (saturation factor)	0.6	0.6
P (true vapor pressure, psia)	8.49	0.49
M (Molecular Weight Vapor	41.95	18.44
T (Temperature Bulk Liquid ^{o}F)	75.94	75.94
Collection Efficiency	0	0
Loading Loss lb/10^3 gal	4.97	0.13
Maximum Throughput gal/hr	10,080	10,080
Average Throughput gal/yr	858,480	10,301,760
Loading Loss tpy	2.13	0.65

Table 2: Antero Resources Corporation – Erwin Hilltop Pad (R13-3129) Facility Potential to Emit

Pollutant	Heaters (H001 – H008)		Fugitive Emissions (F001, HR001)		Tank Truck Loading Losses (L001-L002)		Flare Operations (FL001)		Facility PTE	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Carbon Monoxide (CO)	0.551	2.4139	--	--	--	--	0.0353	0.1545	0.5863	2.5684
Sulfur Dioxide (SO2)	0.0039	0.0172	--	--	--	--	7.56E-06	3.31E-05	0.0039	0.0172
Oxides of Nitrogen (NOx)	0.6561	2.8737	--	--	--	--	0.0420	0.1839	0.6981	3.0576
Particulate Matter less than 10 microns (PM10)	0.0499	0.2184	0.4877	2.1360	--	--	0.0032	0.0140	0.5408	2.3684
Particulate Matter less than 2.5 mirons (PM2.5)	--	--	--	--	--	--	0.0024	0.0105	0.0024	0.0105
Volatile Organic Compounds (VOCs)	0.0361	0.1581	3.0039	13.1571	36.0597	2.1879	0.5203	2.2790	39.620	17.7821
Carbon Dioxide Equivalent (CO2e)	792.1195	3,469.4834	64.8611	284.0915	30.2217	1.2869	117.8436	516.1551	1,005.0459	4,271.0169
Hazardous Air Pollutants (HAPs)	0.0124	0.0541	0.2803	1.2275	1.3776	0.2254	0.0174	0.0762	1.6877	1.5832
Benzene	1.38E-05	6.03E-05	0.0035	0.0152	0.0014	0.0001	0.000	0.0002	0.0049	0.0156
Ethylbenzene	--	--	--	--	--	--	--	--	--	--
n-Hexane	--	--	--	--	--	--	--	--	--	--
Toluene	--	--	--	--	--	--	--	--	--	--
Xylene (mixed)	--	--	--	--	--	--	--	--	--	--
Formaldehyde	0.0005	0.0022	--	--	--	--	0.000	0.000	0.0005	0.0022

REGULATORY APPLICABILITY

The following rules apply to the facility:

45CSR2 (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers)

The purpose of 45CSR2 (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers) is to establish emission limitations for smoke and particulate matter which are discharged from fuel burning units.

45CSR2 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 4 (weight emission standard), 5 (control of fugitive particulate matter), 6 (registration), 8 (testing, monitoring, recordkeeping, reporting) and 9 (startups, shutdowns, malfunctions). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date.

The individual heat inputs of all of the proposed fuel burning units (H001 - H008) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR2. However, Antero would be subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six minute block average. The facility will demonstrate compliance with the rule by conducting Method 9 test at the request of the Director.

45CSR4 (To Prevent and Control the Discharge of Air Pollutants Into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors)

This rule is designed to prevent and control the discharge of pollutants into the open air which causes or contributes to an objectionable odor or odors.

No person shall be considered in violation of this rule unless notified that he is discharging an air pollutant or air pollutants which causes or contributes to an objectionable odor.

45CSR6 (To Prevent and Control Air Pollution from the Combustion of Refuse)

The purpose of this rule is to prevent and control air pollution from combustion of refuse.

Antero has one (1) vapor combustor at the Erwin Hilltop Pad. The vapor combustor is subject to section 4, emission standards for incinerators.

Emissions (lb/hr) = F x Incinerator Capacity (tons/hr)

Where, the factor, F, is as indicated in Table I below:

Table I: Factor, F, for Determining Maximum Allowable Particulate Emissions.

Incinerator Capacity	Factor F

A. Less than 15,000 lbs/hr 5.43
B. 15,000 lbs/hr or greater 2.72

The estimated total flow rate to the vapor combustor is 27.75 lb/hr or 0.0139 tons/hr.

Allowable Emissions (lb/hr) = 5.43 x 0.0139 tons/hr = 0.08 lb/hr

Hourly particulate matter emissions from the flare are estimated to be 0.003 lb/hr. Therefore, the facility's vapor combustor should demonstrate compliance with this section if the vapor combustor is maintained and operated according to the manufacturer's guidance. The facility will demonstrate compliance by maintaining records of the amount of natural gas consumed by the vapor combustor and the hours of operation. The facility will also monitor the flame of the vapor combustor and record any malfunctions that may cause no flame to be present during operation. Monthly visual emission checks will also be conducted of the vapor combustor.

45CSR13 (Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation)

45CSR13 applies to this source due to the fact that Antero is defined as a "stationary source" under 45CSR13 Section 2.24.b, which states that an owner or operator discharges or has the potential to discharge more than six (6) pounds per hour and ten (10) tons per year, or has the potential to discharge more than 144 pounds per calendar day of any regulated air pollutant. Antero's uncontrolled volatile organic compounds (VOC) emissions exceed 45CSR13 permit thresholds. In addition, the facility is proposing to install a flare at the facility, which is subject to a substantive requirement (45CSR6). Antero has published the required Class I legal advertisement notifying the public of their permit application, and paid the appropriate application fee (construction). The Class I legal advertisement was published on September 17, 2013 in *The Herald Record (Doddridge County Publication)*.

45CSR22 (Air Quality Management Fee Program)

This facility is a minor source and not subject to 45CSR30. Antero is required to keep their Certificate to Operate current.

40CFR60 Subpart OOOO (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution)

EPA published in the Federal Register new source performance standards (NSPS) and air toxics rules for the oil and gas sector on August 16, 2012. 40CFR60 Subpart OOOO establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO_2) emissions from affected facilities that commence construction, modification or reconstruction after August 23, 2011. The following affected sources which commence construction, modification or reconstruction after August 23, 2011 are subject to the applicable provisions of this subpart:

a. Each gas well affected facility, which is a single natural gas well.

There are eight (8) gas wells that currently exist at the Erwin Hilltop Pad. The wells were drilled after August 23, 2011. Therefore, these wells are considered affected facilities under this subpart.

The facility is subject is to the standards in section §60.5375 and the notification, reporting and recordkeeping requirements of section §60.5420. See Permit R13-3129 for specific details.

b. Each centrifugal compressor affected facility, which is a single centrifugal compressor using wet seals that is located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment. For the purposes of this subpart, your centrifugal compressor is considered to have commenced construction on the date the compressor is installed (excluding relocation) at the facility. A centrifugal compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

There are no centrifugal compressors at the Erwin Hilltop Pad. Therefore, all requirements regarding centrifugal compressors under 40 CFR 60 Subpart OOOO would not apply.

c. Each reciprocating compressor affected facility, which is a single reciprocating compressor located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment. For the purposes of this subpart, your reciprocating compressor is considered to have commenced construction on the date the compressor is installed (excluding relocation) at the facility. A reciprocating compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

There are no reciprocating compressors at the Erwin Hilltop Pad. Therefore, all requirements regarding reciprocating compressors under 40 CFR 60 Subpart OOOO would not apply.

d. Pneumatic Controllers

- Each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller operating at a natural gas bleed rate greater than 6 scfh which commenced construction after August 23, 2011, and is located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment and not located at a natural gas processing plant.

- Each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller which commenced

construction after August 23, 2011, and is located at a natural gas processing plant.

Each pneumatic controller at the facility has a bleed rate less than 6 scfh. They have a bleed rate of 0.275 scf/hr/pneumatic controller. Therefore, there are no applicable requirements regarding pneumatic controllers under 40 CFR 60 Subpart OOOO that would apply.

e. Each storage vessel affected facility, which is a single storage vessel, located in the oil and natural gas production segment, natural gas processing segment or natural gas transmission and storage segment.

40CFR60 Subpart OOOO defines a storage vessel as a unit that is constructed primarily of nonearthen materials (such as wood, concrete, steel, fiberglass, or plastic) which provides structural support and is designed to contain an accumulation of liquids or other materials. The following are not considered storage vessels:

- Vessels that are skid-mounted or permanently attached to something that is mobile (such as trucks, railcars, barges or ships), and are intended to be located at a site for less than 180 consecutive days. If the source does not keep or are not able to produce records, as required by §60.5420(c)(5)(iv), showing that the vessel has been located at a site for less than 180 consecutive days, the vessel described herein is considered to be a storage vessel since the original vessel was first located at the site.

- Process vessels such as surge control vessels, bottoms receivers or knockout vessels.

- Pressure vessels designed to operate in excess of 204.9 kilopascals and without emissions to the atmosphere.

This rule requires that the permittee determine the VOC emission rate for each storage vessel affected facility utilizing a generally accepted model or calculation methodology within 30 days of startup, and minimize emissions to the extent practicable during the 30 day period using good engineering practices. For each storage vessel affected facility that emits more than 6 tpy of VOC, the permittee must reduce VOC emissions by 95% or greater within 60 days of startup. The compliance date for applicable storage vessels is October 15, 2013.

The storage vessels at the facility were constructed after August 23, 2011. The facility is considered to have Group 2 Storage Vessels. The facility has determined the potential emissions from the storage tanks and the uncontrolled emissions are greater than 6 tpy. The storage vessels located at the Erwin Hilltop Pad are controlled by a vapor combustor (Cimarron 48" HV ECD) and as a result emit less than 6 tpy of VOC (each storage tank). Therefore, Antero is not required by this section to further reduce VOC emissions by 95%, since this subpart will take into account federal enforceable controls in Permit R13-3129.

f. The group of all equipment, except compressors, within a process unit is an affected facility.

- Addition or replacement of equipment for the purpose of process improvement that is accomplished without a capital expenditure shall not by itself be considered a modification under this subpart.

- Equipment associated with a compressor station, dehydration unit, sweetening unit, underground storage vessel, field gas gathering system, or liquefied natural gas unit is covered by §§60.5400, 60.5401, 60.5402, 60.5421 and 60.5422 of this subpart if it is located at an onshore natural gas processing plant. Equipment not located at the onshore natural gas processing plant site is exempt from the provisions of §§60.5400, 60.5401, 60.5402, 60.5421 and 60.5422 of this subpart.

- The equipment within a process unit of an affected facility located at onshore natural gas processing plants and described in paragraph (f) of this section are exempt from this subpart if they are subject to and controlled according to subparts VVa, GGG or GGGa of this part.

The Erwin Hilltop Pad is not a natural gas processing plant. Therefore, Leak Detection and Repair (LDAR) requirements for onshore natural gas processing plants would not apply.

g. Sweetening units located at onshore natural gas processing plants that process natural gas produced from either onshore or offshore wells.

- Each sweetening unit that processes natural gas is an affected facility; and

- Each sweetening unit that processes natural gas followed by a sulfur recovery unit is an affected facility.

- Facilities that have a design capacity less than 2 long tons per day (LT/D) of hydrogen sulfide (H_2S) in the acid gas (expressed as sulfur) are required to comply with recordkeeping and reporting requirements specified in §60.5423(c) but are not required to comply with §§60.5405 through 60.5407 and paragraphs 60.5410(g) and 60.5415(g) of this subpart.

- Sweetening facilities producing acid gas that is completely reinjected into oil-or-gas-bearing geologic strata or that is otherwise not released to the atmosphere are not subject to §§60.5405 through 60.5407, 60.5410(g), 60.5415(g), and 60.5423 of this subpart.

There are no sweetening units at the Erwin Hilltop Pad. Therefore, all requirements regarding sweetening units under 40 CFR 60 Subpart OOOO would not apply.

The following rules and regulations do not apply.

45CSR10 (To Prevent and Control Air Pollution from the Emissions of Sulfur Oxides) ***(Non-Applicable)***

45CSR10 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 3 (weight emission standard), 6 (registration), 7 (permits), and 8 (testing, monitoring, recordkeeping, reporting). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date.

The individual heat inputs of all of the proposed fuel burning units (H001 - H008) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR10.

40CFR60 Subpart 60.18 (General Control Device and Work Practice Requirements) ***(Non-Applicable)***

40CFR60 Subpart 60.18 contains requirements for control devices when they are used to comply with applicable subparts of 40CFR60 and 40CFR61. Antero's Erwin Hilltop Pad has an existing enclosed vapor combustor, a Cimarron 48" HV ECD. The purpose to the vapor combustor is to control emissions from the tanks that are routed to it. In addition, 40CFR60 Subpart 60.18 refers to flares, but does mention enclosed vapor combustors. EPA doesn't consider vapor combustors to meet the design specification, i.e. configuration, for 40CFR60 Subpart 60.18.

40CFR60 Subpart Kb (Standards of Performance for VOC Liquid Storage Vessels) ***(Non-Applicable)***

40CFR60 Subpart Kb does not apply to storage vessels with a capacity less than 75 cubic meters (19,812.9 gallons). The condensate tanks that Antero has proposed to install are 16,800 gallons each (400 bbls). The produced water tanks that Antero has proposed to install are 15,288 gallons each (364 bbls). Therefore, Antero would not be subject to this rule.

40CFR60 Subpart KKK (Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants) ***(Non-Applicable)***

40CFR60 Subpart KKK applies to onshore natural gas processing plants that commenced construction after January 20, 1984, and on or Before August 23, 2011. The Erwin Hilltop Pad was constructed after August 23, 2011 and is not a natural gas processing plant, therefore, Antero would not be subject to this rule. Also, 40CFR60 Subpart OOOO has replaced this regulation.

40CFR60 Subpart JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE)) ***(Non-Applicable)***

There are no SI ICEs at the Erwin Hilltop Well Pad. Therefore, Antero would not be subject to this rule.

45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants) ***(Non-Applicable)***

45CSR19 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment) ***(Non-Applicable)***

The Erwin Hilltop Pad is located in Doddridge County which is an attainment county for all pollutants.

As shown in the table below, Antero is not subject to 45CSR14 or 45CSR19 review.

Table 3: PSD & NANSR Applicability

Pollutant	**PSD (45CSR14) Threshold (tpy)**	**NANSR (45CSR19) Threshold (tpy)**	**Erwin Hilltop Pad PTE (tpy)**	**45CSR14 or 45CSR19 Review Required?**
Carbon Monoxide	250	NA	2.57	No
Nitrogen Oxides	250	NA	3.06	No
Sulfur Dioxide	250	NA	0.017	No
Particulate Matter 2.5	250	NA	0.01	No
Ozone (VOC)	250	NA	17.78	No
Greenhouse Gas (CO_2e)	100,000	NA	4,271.02	No

45CSR30 (Requirements for Operating Permits) ***(Non-Applicable)***

This rule provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act. All fees collected pursuant to this rule shall be expended solely to cover all reasonable direct and indirect costs required to administer the Title V operating permit program and accounted for in accordance with this rule.

The facility is not defined as a major stationary source per section 2.26 of this rule. Therefore, EQT Production Company is not subject to 45CSR30.

Table 4: 45CSR30 Threshold

Pollutant	Title V (45CSR30) Threshold (tpy)	Erwin Hilltop (tpy)	45CSR30 Review Required
Carbon Monoxide	100	2.5684	No
Nitrogen Oxides	100	3.0577	No
Sulfur Dioxides	100	0.0173	No
Particulate Matter2.5	100	0.0105	No
Total Particulate Matter	100	2.3684	No
Ozone (VOC)	100	17.7821	No
Total Hazardous Air Pollutants	25	1.5831	No
Benzene	10	0.0155	No
n-Hexane	10	0.00	No
Toluene	10	0.00	No
Xylene	10	0.00	No
Trimethylpentane (2,2,4-)	10	0.00	No
Formaldehyde	10	0.0022	No
Greenhouse Gas (CO2e)	100,000	4,271.0169	No

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

There will be small amounts of various non-criteria regulated pollutants emitted from the combustion of natural gas. Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NOx), Ozone, Particulate Matter (PM), Particulate Matter less than 10 microns (PM10), Particulate Matter less than 2.5 microns (PM2.5), and Sulfur Dioxide (SO2). These pollutants have National Ambient Air Quality Standards (NAAQs) set forth for each that are designed to protect the public health and welfare. Other pollutants of concern, although designated as non-criteria and without national concentration standards, are regulated through various federal programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) standards promulgated under 40 CFR 61 (NESHAPs – National Emission Standards for Hazardous Air Pollutants) and 40 CFR 63 (MACT – Maximum Available Control Technology). Any potential applicability to these programs was discussed above in the Regulatory Applicability section.

There are trace amounts of the non-criteria pollutants emitted by Antero's Erwin Hilltop Pad fall under the definition of Hazardous Air Pollutants (HAPs). HAPs are identified under Section 112 (b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. The following HAPs listed below are HAPs that are emitted from the Erwin Hilltop Pad in quantifiable amounts ($\geq$ 0.01 tpy). This table describes the individual HAP's carcinogenic risk as listed in the Integrated Risk Information System (IRIS), which is maintained and updated by EPA.

Table 5: Erwin Hilltop Pad HAPs and Carcinogenic Risk

HAPs	Type	Known/Suspected Carcinogen	Classification
n-Hexane	VOC	No	Inadequate Data
Benzene	VOC	Yes	Category A - Known Human Carcinogen
Toluene	VOC	No	Inadequate Data
Xylenes	VOC	No	Inadequate Data
Ethylbenzene	VOC	No	Classification D – Not Classifiable as a Human Carcinogen

AIR QUALITY IMPACT ANALYSIS

Modeling was not required of this source due to the fact that the facility is not subject to 45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants) as seen in the table listed in the Regulatory Discussion Section.

SOURCE AGGREGATION

"Building, structure, facility, or installation" is defined as all the pollutant emitting activities which belong to the same industrial grouping, are located on one or more contiguous and adjacent properties, and are under the control of the same person.

The Erwin Hilltop Pad is located in Doddridge County and will be operated by Antero, who is the owner and operator. Several different entities are involved in the production, gathering, and transmission of gas. The Operators are the parties who drill and operate the wells. The Shippers are the owners of the gas who may or may not be the same entity as the Operator. There are also parties who own and operate the gathering system pipelines and compression station, called Gatherers. In addition, there are parties that own and operate the gas processing plants.

1. The Erwin Hilltop Pad will operate under SIC code 1311 (Crude Petroleum and Natural Gas Extraction). There are surrounding wells and compressor stations operated by Antero that share the same two-digit major SIC code of 13 for oil and gas exploration and production. Therefore, the Erwin Hilltop Pad does share the same SIC code as other related sources.

2. "Contiguous or Adjacent" determinations are made on a case by case basis. These determinations are proximity based, and it is important to focus on this and whether or not it meets the common sense notion of a plant. The terms "contiguous" or "adjacent" are not defined by USEPA. Contiguous has a dictionary definition of being in actual contact; touching along a boundary or at a point. Adjacent has a dictionary definition of not distant; nearby; having a common endpoint or border.

   Based on the common sense notion of a plant and the fact that facility boundary of the closest Antero facility operating under SIC code 1311 is the Richard Garry which is approximately 4,490 feet away from the Erwin Hilltop Pad facility boundary, the Erwin Hilltop Pad is not considered to be contiguous or adjacent to other Antero operations.

3. According to Antero, no functional dependency exists in that the operation of one (1) well is not dependent on the operation of any other Antero well. Once gas enters the gathering line downstream from Antero's well pad and metering devices, control of the gas and any associated facilities is beyond Antero's ownership and control because the gathering lines, compression facilities, and processing plants are owned and operated by separate legal entities.

Because the facilities are not considered to be on contiguous or adjacent properties and are not fully under control of the same person, the emissions from the Erwin Hilltop Pad should not be aggregated with other facilities in determining major source or PSD status.

MONITORING OF OPERATIONS

Antero will be required to perform the following monitoring associated with this permit application:

1. Monitor and record quantity of natural gas consumed for all combustion sources.
2. Monitor the presence of the pilot flame with a thermocouple or equivalent.
3. Monitor opacity from all fuel burning units.
4. Monitor the tanks to ensure that all vapors are sent to the vapor combustor.
6. Monitor the amount of condensate and produced water produced (throughput to tanks).

Antero will be required to perform the following recordkeeping associated with this modification application:

1. Maintain records of the amount of natural gas consumed in each combustion source.
2. Maintain records of testing conducted in accordance with the permit. Said records shall be maintained on-site or in a readily accessible off-site location
3. Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit.
4. Maintain records of the visible emission opacity tests conducted per the permit.
5. Maintain a record of all potential to emit (PTE) HAP calculations for the entire facility.
6. The records shall be maintained on site or in a readily available off-site location maintained by for a period of five (5) years.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates Antero's Erwin Hilltop Pad should meet all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that this location should be granted a 45CSR13 construction permit for this proposed permitting action.

Jill Harris, P.E.
Engineer

Date