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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3260B
Plant ID No.:	017-00157
Applicant:	Antero Treatment LLC (Antero)
Facility Name:	Antero Clearwater Facility
Location:	Greenwood, Doddridge County
NAICS Code:	213112 (Support Activities for Oil and Gas Operations)
Application Type:	Class II Administrative Update
Received Date:	March 9, 2017
Engineer Assigned:	Jerry Williams, P.E.
Fee Amount:	$2,000.00
Date Received:	March 9, 2017
Complete Date:	April 7, 2017
Due Date:	May 22, 2017
Applicant Ad Date	March 10, 2017
Newspaper:	*The Doddridge Independent*
UTM's:	Easting: 509.222 km Northing: 4,346.659 km Zone: 17
Description:	Combine boiler throughput requirements, addition of three (3) calcium chloride storage tanks, control device change for filtrate tank, and addition of pressurized gunbarrel tank.

DESCRIPTION OF PROPOSED CHANGES

Permit R13-3260 was issued to Antero on December 7, 2015 for the operation and construction of a water treatment facility for oil and gas operation support.

This application consists of:

- Update to the boiler fuel use language in permit R13-3260A. Currently the boilers (2E and 3E) are limited to each using 1,794.6 MMscf per year of natural gas as fuel. However, the boilers may not operate equally in actual operations and one boiler may operate more than the other. It is requested that permit condition 6.1.1 state that the

boilers together are limited to using 3,589.3 MMscf per year of natural gas on a 12 month rolling total. Additionally, it is requested that the table in permit condition 6.1.2 show the emission totals for both boilers together. The annual fuel use limit and emission totals have not changed since the permit application for R13-3260A, rather it is being requested that the values are written in the permit as a collective value rather than a per boiler value.

- For purposes of completion, it is being noted that there are three (3) proposed Calcium Chloride storage tanks (TK-6100A – TK-6100C) to be installed at the facility. These tanks will each have a capacity of 200 barrels and will store a calcium chloride brine that is a byproduct of the process at the facility. This brine will be offloaded for product use. The tanks are not expected to have any emissions and are being noted for purposes of submitting a complete equipment inventory to the WVDEP.
- The Stage 1 Filtrate Tank (TK-1130) is currently permitted to be routed to the thermal oxidizer for control of the off-gases. However, due to safety concerns, this tank cannot be routed to this control device. It is being proposed that this tank now be routed to a carbon canister for control of the off-gases. This application contains information on the adsorptive control device. Because the carbon canister has at least a 98% capture efficiency, the emission values from TK-1130 will not change due to this change in control device.
- Based on new production information, it is expected that the gas stream coming into the fuel conditioning skid will now contain liquids to be separated out and not just dry gas as was previously expected. There will be an additional gunbarrel tank (TK-GB) that will be pressurized. The flash gas from the gunbarrel tank will be used as fuel gas in a closed loop system. The liquids from the pressurized gunbarrel tank will be loaded at approximately 40 psig into pressurized trucks (LD-GB). Because the gunbarrel tank itself is pressurized, it will not have any emissions. The only emissions from the pressurized loading process is when the hose is disconnected. The emissions from the loading process are less than the modification thresholds of 6 lbs/hr and 10 tons/year.

SITE INSPECTION

A site inspection was conducted on August 12, 2016 by the writer. I met with Conrad Baston and Bryan Radabaugh of Antero. The facility was under construction and was not operating at that time. The facility has still not began operation.

Latitude: 39.26922
Longitude: -80.89310

Directions to the facility are as follows:

From Greenwood: Facility located off of US-50 on access road off of Gum Run Road (50/36)

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this application consist of the pressurized loading process of the gunbarrel tank when the hose is disconnected. A pressurized vapor recovery system will be utilized. Potential emissions result from the equalization of the loading rack connection to atmospheric pressure after the loading operation is completed. The maximum barrels per day loaded is 500. Based on the load line, and composition of the material loaded, it is estimated that the VOC emissions would be 1.92 lb/hr and 1.75 tons/year.

The total facility PTE (including fugitives) for the Antero Clearwater Facility is shown in the following table:

Pollutant	**R13-3260A PTE (tons/year)**	**R13-3260B PTE (tons/year)**	**PTE Change (tons/year)**
Nitrogen Oxides	91.94	91.94	0
Carbon Monoxide	90.01	90.01	0
Volatile Organic Compounds	79.52	81.27	1.75
Particulate Matter-10	37.27	37.27	0
Particulate Matter-2.5	29.03	29.03	0
Sulfur Dioxide	1.36	1.36	0
Total HAPs	4.61	4.61	0
Carbon Dioxide Equivalent	276,498	276,498	0.24

The total non-fugitive facility PTE for the Clearwater Facility (water treatment facility and landfill) is shown in the following table:

Pollutant	**R13-3260B PTE Water Treatment Facility (tons/year)**	**R13-3331 PTE Landfill Facility (tons/year)**	**Facility ID 017-00157 Total (tons/year)**
Nitrogen Oxides	91.94	0.27	92.21
Carbon Monoxide	90.01	0.27	90.28
Volatile Organic Compounds	60.88	0.01	60.89
Particulate Matter-10	26.08	17.55	43.63
Particulate Matter-2.5	26.08	2.13	28.21
Sulfur Dioxide	1.36	0.07	1.43
Total HAPs	4.61	<0.01	4.61
Carbon Dioxide Equivalent	276,498	30	276,528

Fugitive particulate matter emissions associated with the Clearwater Facility consist of 11.19 tons/year of PM_{10} and 2.95 tons/year of $PM_{2.5}$. Fugitive VOC emissions associated with the Clearwater Facility are 20.39 tons/year.

Maximum detailed controlled point source emissions were calculated by Antero and checked for accuracy by the writer and are summarized in the table on the next page.

Antero Treatment LLC – Antero Clearwater Facility (R13-3260B)

Emission Point ID#	Source	NO_x		CO		VOC		PM-10		PM-2.5		SO_2		Total HAPs		CO2e
		lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	ton/year
1E	Emergency Generator	25.78	6.45	16.83	4.21	2.69	0.67	0.96	0.24	0.96	0.24	0.03	0.01	0.03	0.01	900
2E, 3E	Boilers	20.05	78.42	20.34	79.57	2.20	8.61	5.51	21.54	5.51	21.54	0.32	1.27	1.02	3.97	252786
4E	Thermal Oxidizer (Controlled Tanks)	1.08	4.74	0.93	4.08	4.40	15.55	0.0001	0.0006	0.0001	0.0006	0.00001	0.00005	0.01	0.03	5939
TUL	Truck Unloading Influent Water	0	0	0	0	18.59	16.86	0	0	0	0	0	0	0.12	0.11	15015
TL	Truck Loading of Oil	0	0	0	0	16.70	8.72	0	0	0	0	0	0	0.28	0.15	2
PL	Pressurized Loading at Fuel Skid	0	0	0	0	1.92	1.75	0	0	0	0	0	0	<0.01	<0.01	0
28E	Cooling Tower	0	0	0	0	0	0	0.94	4.12	0.94	4.12	0	0	0	0	0
TKS	Process Tanks	0	0	0	0	1.97	7.90	0	0	0	0	0	0	0.01	0.05	483
TKS	Storage Tanks	0	0	0	0	0.07	0.25	0	0	0	0	0	0	0.07	0.25	0
29E	Emergency Flare	0.16	0.06	0.69	0.14	1.25	0.21	0.0006	0.0024	0.0006	0.0024	0.0000	0.0002	0.0001	0.001	82
30E	Fire Water Pump Engine	0.85	0.21	1.11	0.28	0.04	0.01	0.07	0.02	0.07	0.02	0.27	0.07	0.0035	0.0009	39
31E	Fuel Skid Heater	0.24	1.03	0.20	0.87	0.01	0.06	0.02	0.08	0.02	0.08	0.00	0.01	0.0045	0.02	617
32E	Fuel Skid Heater	0.24	1.03	0.20	0.87	0.01	0.06	0.02	0.08	0.02	0.08	0.00	0.01	0.0045	0.02	617
33E	Carbon Canister	0	0	0	0	0.01	0.03	0	0	0	0	0	0	0.00004	0.0001	0
VENT1	Fuel Skid Pig Venting	0	0	0	0	7.53	0.20	0	0	0	0	0	0	0.18	0.0047	18
Total Clearwater Point Source		**48.39**	**91.94**	**40.30**	**90.01**	**57.40**	**60.88**	**7.51**	**26.08**	**7.51**	**26.08**	**0.63**	**1.36**	**1.73**	**4.61**	**276498**
FUG	Sludge and Salt Disposal	0	0	0	0	4.66	20.39	0	0	0	0	0	0	0.0008	0.0034	0
FUG	Bulk Transfer Points	0	0	0	0	0	0	2.65	5.64	0.75	1.59	0	0	0	0	0
FUG	Fugitive Dust Emissions	0	0	0	0	0	0	1.41	5.55	0.35	1.36	0	0	0	0	0
Total Clearwater Fugitive		**0**	**0**	**0**	**0**	**4.66**	**20.39**	**4.06**	**11.19**	**1.10**	**2.95**	**0**	**0**	**0.0008**	**0.0034**	**0**
Total Clearwater Sitewide		**48.39**	**91.94**	**40.30**	**90.01**	**62.07**	**81.27**	**11.57**	**37.27**	**8.61**	**29.03**	**0.63**	**1.36**	**1.73**	**4.61**	**276498**
Landfill Facility Point Source		**0.90**	**0.27**	**0.96**	**0.27**	**0.05**	**0.01**	**7.09**	**17.55**	**0.89**	**2.13**	**0.21**	**0.07**	**0.0026**	**0.0007**	**30**
Clearwater + Landfill Point Source		**49.29**	**92.21**	**41.26**	**90.28**	**57.45**	**60.89**	**14.60**	**43.63**	**8.40**	**28.21**	**0.84**	**1.43**	**1.73**	**4.61**	**276528**

REGULATORY APPLICABILITY

No new regulations apply to this facility as a result of this Class II Administrative Update request. The regulatory analysis conducted during the review of R13-3260A still applies.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

There are negligible hazardous air pollutants (HAPs) associated with this Class II Administrative Update request. The toxicity analysis conducted during the review of R13-3260A still applies.

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health effects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals*. For a complete discussion of the known health effects of each compound refer to the IRIS database located at *www.epa.gov/iris*.

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) or 45CSR19 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment) as shown in the table listed in the Regulatory Discussion section under 45CSR14/45CSR19.

SOURCE AGGREGATION

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

"Building, Structure, Facility, or Installation" means all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control). Pollutant-emitting activities are a part of the same industrial grouping if they belong to the same "Major Group" (i.e., which have the same two (2)-digit code) as described in the Standard Industrial Classification Manual, 1987 (United States Government Printing Office stock number GPO 1987 0-185-718:QL 3).

The Antero Landfill and Antero Clearwater Facility are under common control and share the same SIC code. Therefore, the potential classification of these facilities as one stationary source with any other facility depends on the determination if these stations are considered "contiguous or adjacent properties."

"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. 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; or having a common endpoint or border. The Antero Landfill and Antero Clearwater Facility are located on contiguous or adjacent properties.

Because the facilities are considered to be on contiguous or adjacent properties, the emissions from these facilities should be aggregated in determining major source or PSD status.

MONITORING OF OPERATIONS

Antero will be required to perform the following monitoring and recordkeeping:

- Monitor and record the hours of operation of the generator
- Opacity observations of the thermal oxidizer and emergency flare
- Quarterly AVO (audio, visual, olfactory) inspections
- Thermal oxidizer and emergency flare flame must be continuously monitored
- Liquids unloaded throughput
- Oil loading throughput
- Sludge disposal
- Wetcake disposal
- Maintain records of the hours of operation for all engines
- Boiler fuel combustion
- Carbon canister monitoring
- 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
- Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit
- Maintain a record of all potential to emit (PTE) HAP calculations for the entire facility.
- Maintain records of all applicable requirements of 40CFR60 Subparts Db and IIII
- The records shall be maintained on site or in a readily available off-site location maintained by Antero for a period of five (5) years

CHANGES TO PERMIT R13-3260A

Section 1.0	Modified the control device of TK-1130 from the thermal oxidizer to a carbon canister. Added carbon canister (33E). Added calcium chloride storage tanks (TK-6100A-TK-6100C).
Section 1.1	Added carbon canister (33E). Removed TK-1130 from being controlled by thermal oxidizer.
Section 6.1	Change permit condition 6.1.1 so that the annual consumption of natural gas in the boilers is a combined total. This is due to the possibility of unequal operation of the boilers.

	Change permit condition 6.1.2 to maximum annual emissions combined for both boilers. This is due to the possibility of unequal operation of the boilers.
Section 7.0	Removed TK-1130 from being controlled by thermal oxidizer in permit condition 7.1.2.
Section 8.0	Added requirements for pressurized gunbarrel tank loading (LD-GB).
Section 10.0	Removed TK-1130 from being controlled by thermal oxidizer in permit condition 10.1.1. Changed permit conditions 10.1.3 and 10.1.4 to recognize TK-1130 being controlled by a carbon canister. Added permit condition 10.1.5 for the carbon canister controlling TK-1130. Added permit condition 10.3.5 for carbon canister recordkeeping.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that Antero meets all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the Antero Clearwater Facility should be granted a 45CSR13 Class II Administrative Update for their facility.

Jerry Williams, P.E.
Engineer

APR 24, 2017
Date