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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3331
Plant ID No.:	017-00157
Applicant:	Antero Treatment LLC (Antero)
Facility Name:	Antero Landfill
Location:	Greenwood, Doddridge County
NAICS Code:	213112 (Support Activities for Oil and Gas Operations)
Application Type:	Construction
Received Date:	July 1, 2016
Engineer Assigned:	Jerry Williams, P.E.
Fee Amount:	$2,000.00
Date Received:	July 1, 2016
Complete Date:	July 27, 2016
Due Date:	October 25, 2016
Applicant Ad Date	July 15, 2016 (DI), July 20, 2016 (PN)
Newspaper:	*The Doddridge Independent, The Pennsboro News*
UTM's:	Easting: 508.045 km Northing: 4,346.105 km Zone: 17
Description:	Landfill to handle salt waste from the Antero Clearwater Facility.

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-3331:

Salt waste from the Clearwater Facility is transported by haul trucks to the Antero Landfill (the Landfill) (UPMAIN). At the Landfill, the salt waste is unloaded (UNLOAD1) into the mixing building where it can be stored, mixed with native soil, and/or moved to the working cell. Soil will be unloaded (UNLOAD3) in the mixing building from the landfill stockpiles. The salt waste will consist of either sodium chloride (NaCl) or calcium chloride (CaCl), with the CaCl portion mixed with native soil prior to placing the waste in the working cell due to its high moisture content (MIXING). Although the mixing building plans to operate 24 hours per day and 365 days per year, the salt waste may be stored in the mixing building during periods of

inclement weather because the salt waste (NaCl and CaCl) has a high affinity for moisture and needs to stay as dry as possible as it already has a high moisture content itself. Salt waste (salt or salt mixed with soil) is loaded from the mixing building into trucks (LOAD1) and taken to the working cell by haul trucks (UPWKFACE). The emissions from material handing within the material building are controlled by 70% due to the building being a full enclosure. Any material handling that contains salt or a mix of salt and soil will not be watered for control due to the salt's affinity for moisture. The unpaved road from the Clearwater Facility to the Landfill will be watered for dust control. The unpaved road may be graded at times for maintenance (GRADER). The other temporary unpaved roads from the mixing building to the working cell and around the working areas will be watered up to the point that they enter the actual active working cell. It is estimated that two-thirds of the length of the temporary unpaved roads will be watered for dust control. Although some of the material handling will be salt, all of the material handling emissions were calculated with the lower moisture content of soil so as to be conservative as some of the salt is mixed with soil.

Once the salt waste reaches the working cell, it is unloaded (UNLOAD2) where it is then spread and/or compacted in the daily cell by a dozer (COMP). Wind erosion of the active working cell will occur as well as inactive areas that are waiting for waste or to be seeded (WIND1 and WIND2). Weather permitting, geosynthetic rain covers, called Reinforced Landfill Covers (RLC), may be used in daily cover operations rather than daily cover soil. Additionally, during the nine non-winter months of the year, other areas that are exposed will be covered with a RLC so as to not create emissions from wind erosion. During the three winter months, the exposed acreage cannot be covered with the RLC due to the potential for snow cover. Although the snow cover will act as dust suppressant, it is not likely a continual cover; thus, for three months of the year there is additional exposed acreage that can create wind erosion emissions (WIND4). The working cells will be covered with the daily, intermediate, and final covers (UNLOAD4, UNLOAD5, UNLOAD6) as needed and then seeded as quickly as possible. The working cell will operate 12 hours per day and 365 days per year. For times of the year when there are less than 12 hours of daylight, portable light plants will be used that are powered by diesel engines (ENG001 and ENG002). None of the activities that occur at the active working cell will be watered for dust control due to the salt.

Native soil stockpiles or other active areas will be used as sources of native soil to be moved to the mixing building or working cell for cover soils. Soil may be loaded at the native soil areas to be moved (UPSOILRD) to the mixing building (LOAD2), or soil may be loaded for daily cover (LOAD3), intermediate cover (LOAD4), or final cover (LOAD5) and moved to the working cell (UPDCOVER, UPICOVER, UPFCOVER). Wind erosion of the native soil stockpiles will occur (WIND3). The native soil areas will not be watered because the soil used for mixing or cover cannot be wet when mixed or covering the salt.

Additional emissions from passenger vehicles, water trucks, and fuel trucks on the unpaved roads will occur. Travel from dozers and excavators or loaders will also create particulate matter emissions.

Lastly, an emergency diesel generator will be located on site for use only when the grid power goes down to power the leachate tank pump and maintain the necessary leachate level. Leachate resulting from the Landfill operations may be piped from the leachate tank to the influent stream of the Clearwater Facility to be treated.

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 closest residence is approximately 1,300 feet from the proposed facility. No construction had occurred.

Latitude: 39.264245
Longitude: -80.906745

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). Entrance for Antero Landfill will be through the Clearwater Treatment Facility.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this application consist of particulate matter dust emissions and the combustion emissions from two (2) light plant engines (18E, 19E). Fugitive particulate matter dust emissions also occur from road travel to and within the landfill, equipment travel within landfill and grader operations. Fugitive particulate matter emissions were estimated using USEPA AP-42 emission factors. The following table indicates which methodology was used in the emissions determination:

Emission Point ID#	Process Equipment	Calculation Methodology
1E	Salt Waste Unloading in Mixing Building	EPA AP-42 Emission Factors
2E	Waste Loading at Mixing Building	EPA AP-42 Emission Factors
3E	Waste Unloading at Working Cell	EPA AP-42 Emission Factors
4E	Soil Loading at Native Stock Piles	EPA AP-42 Emission Factors
5E	Soil Unloading at Mixing Building	EPA AP-42 Emission Factors
6E	Daily Soil Cover Loading at Stock Piles	EPA AP-42 Emission Factors
7E	Daily Soil Cover Unloading at Working Cell	EPA AP-42 Emission Factors
8E	Intermediate Soil Cover Loading at Stock Piles	EPA AP-42 Emission Factors
9E	Intermediate Soil Cover Unloading at Working Cell	EPA AP-42 Emission Factors
10E	Final Soil Cover Loading at Stock Piles	EPA AP-42 Emission Factors
11E	Final Soil Cover Unloading at Working Cell	EPA AP-42 Emission Factors
12E	Daily Active Wind Erosion	EPA AP-42 Emission Factors
13E	Daily Inactive Wind Erosion	EPA AP-42 Emission Factors
14E	Stockpile Wind Erosion	EPA-450/3-88-008 "Control of Open Fugitive Dust Sources"
15E	Winter Wind Erosion	EPA AP-42 Emission Factors
16E	Cover Soil Compaction	EPA AP-42 Emission Factors
17E	Mixing Salt and Soil	EPA AP-42 Emission Factors
18E	12.2 hp Light Plant Engine 1	Manufacturer's Data, EPA AP-42 Emission Factors

19E	12.2 hp Light Plant Engine 2	Manufacturer's Data, EPA AP-42 Emission Factors
20E	85 hp Emergency Generator	Manufacturer's Data, EPA AP-42 Emission Factors

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

Pollutant	**R13-3260 PTE Water Treatment Facility (tons/year)**	**R13-3331 PTE Landfill Facility (tons/year)**	**Facility ID 017-00157 Total (tons/year)**
Nitrogen Oxides	94.86	0.27	95.13
Carbon Monoxide	95.41	0.27	95.68
Volatile Organic Compounds	44.94	0.01	44.95
Particulate Matter-10	26.94	17.55	44.49
Particulate Matter-2.5	22.27	2.13	24.40
Sulfur Dioxide	1.82	0.07	1.89
Total HAPs	3.90	<0.01	3.91
Carbon Dioxide Equivalent	301,969	30	301,999

Fugitive particulate matter emissions associated with the landfill operations consist of 40.89 tons/year of PM_{10} and 4.00 tons/year of $PM_{2.5.}$

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 Landfill (R13-3331)

Emission	Source	NO_x		CO		VOC		PM-10		PM-2.5		SO_2		Total HAPs		CO2e
Point ID#		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	Salt Waste Unloading in Mixing Bldg	0	0	0	0	0	0	0.004	0.016	0.001	0.003	0	0	0	0	0
2E	Waste Loading at Mixing Building	0	0	0	0	0	0	0.009	0.019	0.001	0.003	0	0	0	0	0
3E	Waste Unloading at Working Cell	0	0	0	0	0	0	0.028	0.062	0.004	0.009	0	0	0	0	0
4E	Soil Loading at Native Stock Piles	0	0	0	0	0	0	0.004	0.008	0.001	0.001	0	0	0	0	0
5E	Soil Unloading at Mixing Building	0	0	0	0	0	0	0.001	0.002	0.000	0.000	0	0	0	0	0
6E	Daily Soil Cover Loading at Stock Piles	0	0	0	0	0	0	0.008	0.018	0.001	0.003	0	0	0	0	0
7E	Daily Soil Cover Unl at Working Cell	0	0	0	0	0	0	0.008	0.018	0.001	0.003	0	0	0	0	0
8E	Intermediate Soil Cover Loading at SP	0	0	0	0	0	0	0.015	0.005	0.002	0.001	0	0	0	0	0
9E	Inter Soil Cover Unl at Working Cell	0	0	0	0	0	0	0.015	0.005	0.002	0.001	0	0	0	0	0
10E	Final Soil Cover Loading at Stock Piles	0	0	0	0	0	0	0.094	0.011	0.014	0.002	0	0	0	0	0
11E	Final Soil Cover Unl at Working Cell	0	0	0	0	0	0	0.094	0.011	0.014	0.002	0	0	0	0	0
12E	Daily Active Wind Erosion	0	0	0	0	0	0	1.46	6.39	0.22	0.96	0	0	0	0	0
13E	Daily Inactive Wind Erosion	0	0	0	0	0	0	0.30	1.32	0.05	0.20	0	0	0	0	0
14E	Stockpile Wind Erosion	0	0	0	0	0	0	0.40	1.73	0.06	0.26	0	0	0	0	0
15E	Winter Wind Erosion	0	0	0	0	0	0	2.42	2.61	0.36	0.39	0	0	0	0	0
16E	Cover Soil Compaction	0	0	0	0	0	0	1.90	4.15	0.05	0.10	0	0	0	0	0
17E	Mixing Salt and Soil	0	0	0	0	0	0	0.26	1.15	0.04	0.17	0	0	0	0	0
18E	Light Plant Engine 1	0.14	0.05	0.13	0.05	0.01	0.00	0.01	0.00	0.01	0.00	0.02	0.01	0.0003	0.0001	4
19E	Light Plant Engine 2	0.14	0.05	0.13	0.05	0.01	0.00	0.01	0.00	0.01	0.00	0.02	0.01	0.0003	0.0001	4
20E	Backup Generator	0.62	0.16	0.70	0.17	0.03	0.01	0.06	0.01	0.06	0.01	0.16	0.04	0.0020	0.0005	22
Total Landfill 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**
Fugitive	Other Operations	0	0	0	0	0	0	2.04	1.11	0.05	0.03	0	0	0	0	0
Fugitive	Road Travel to Landfill	0	0	0	0	0	0	3.06	13.43	0.31	1.34	0	0	0	0	0
Fugitive	Road Travel within Landfill	0	0	0	0	0	0	32.48	22.33	3.25	2.23	0	0	0	0	0
Fugitive	Equipment Travel within Landfill	0	0	0	0	0	0	5.68	4.02	0.57	0.40	0	0	0	0	0
Total Landfill Fugitive		**0**	**0**	**0**	**0**	**0**	**0**	**43.26**	**40.89**	**4.18**	**4.00**	**0**	**0**	**0**	**0**	**0**
Total Landfill Site Wide		**0.90**	**0.27**	**0.96**	**0.27**	**0.05**	**0.01**	**50.35**	**58.44**	**5.07**	**6.13**	**0.21**	**0.07**	**0.00**	**0.00**	**30**
Water Treatment Facility Point Source		33.62	94.86	28.23	95.41	26.57	44.94	6.52	26.94	5.39	22.27	0.51	1.82	1.02	3.90	301969
Landfill + Water Treatment Facility Point Source		**34.52**	**95.13**	**29.19**	**95.68**	**26.62**	**44.95**	**56.87**	**85.38**	**10.46**	**28.40**	**0.72**	**1.89**	**1.02**	**3.90**	**301999**

REGULATORY APPLICABILITY

The following rules apply to the landfill:

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)

A 45CSR13 construction permit applies to this source due to the fact that Antero exceeds the regulatory emission threshold for criteria pollutants of 6 lbs/hr and 10 tons/year of a regulated air pollutant (PM_{10}) and are subject to a substantive requirement of an emission control rule (40CFR60 Subpart IIII).

Antero paid the appropriate application fee and published the required legal advertisement for a construction permit application.

45CSR16 (Standards of Performance for New Stationary Sources Pursuant to 40 CFR Part 60)

45CSR16 applies to this source by reference of 40CFR60, Subpart IIII. These requirements are discussed under that rule below.

45CSR17 (To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter)

The purpose of this rule is to prevent and control particulate matter air pollution from materials handling, preparation, storage and other sources of fugitive particulate matter. No person shall cause, suffer, allow or permit fugitive particulate matter to be discharged beyond the boundary lines of the property on which the discharge originates or at any public or residential location, which causes or contributes to statutory air pollution. The fugitive particulate matter controls required in R13-3331 meet the requirements of this rule.

45CSR30 (Requirements for Operating Permits)

The source (Clearwater Treatment and Antero Landfill) is a nonmajor source subject to 45CSR30. This facility is a deferred Title V source. Section 2.26 states that the fugitive emissions of a stationary source shall not be considered in determining whether it is a major stationary source for the purposes of §302(j) of the Clean Air Act, unless the source belongs to one of the following categories listed in that rule. This facility is not one of the listed sources. Therefore, the fugitive emissions do not count towards 45CSR30 major source status.

40CFR60 Subpart IIII (Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE))

Subpart IIII sets forth non-methane hydrocarbon (NMHC), hydrocarbon (HC), nitrogen oxides (NO_x), carbon monoxide (CO), and particulate matter (PM) emission limits, fuel requirements, installation requirements, and monitoring requirements based on the year of installation of the subject internal combustion engine.

The two (2) 12.2 HP diesel fired light plant engines (18E, 19E) are subject to this subpart. These units are required to meet the §1039.101 Tier 4 exhaust standards of 7.13 g/kw-hr (5.3 g/hp-hr) for NMHC+NO_x, 6.6 g/kw-hr (4.9 g/hp-hr) for CO, 0.38 g/kw-hr (0.3 g/hp-hr) for VOC and 0.4 g/kw-hr (0.3 g/hp-hr) for PM. The units meet these standards.

The 85 HP diesel fired emergency generator (20E) is also subject to this subpart. The unit is required to meet the §89.112 Tier 3 exhaust standards of 4.47 g/kw-hr (3.3 g/hp-hr) for NMHC+NO_x, 5.0 g/kw-hr (3.7 g/hp-hr) for CO, 0.23 g/kw-hr (0.2 g/hp-hr) for VOC and 0.4 g/kw-hr (0.3 g/hp-hr) for PM. The unit meets this standard.

40CFR63 Subpart ZZZZ (National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines)

Subpart ZZZZ establishes national emission limitations and operating limitations for HAPs emitted from stationary RICE located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations. The engines at the Antero Landfill are subject to the area source requirements for emergency and non-emergency compression ignition engines.

The applicability requirements for new stationary RICEs located at an area source of HAPs, is the requirement to meet the standards of 40CFR60 Subpart IIII. These requirements were outlined above. The proposed engines meet these standards.

The following rules do not apply to the landfill:

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

There are no indirect heat exchangers at the landfill.

45CSR7 (To Prevent and Control Particulate Matter Air Pollution from Manufacturing Processes and Associated Operations)

45CSR7 defines a "manufacturing process" as any action, operation or treatment, embracing chemical, industrial or manufacturing efforts, and employing, for example, heat treating furnaces, by-product coke plants, core-baking ovens, mixing kettles, cupolas, blast furnaces, open hearth furnaces, heating and reheating furnaces, puddling furnaces, sintering plants, electric steel furnaces, ferrous and non-ferrous foundries, kilns, stills, driers, crushers, grinders, roasters, and equipment used in connection therewith and all other methods or forms of manufacturing or processing that may emit smoke, particulate matter or gaseous matter. The landfill does not meet the definition of a "manufacturing process" under 45CSR7, therefore, this rule does not apply.

45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants)

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

The Antero Landfill is located in Doddridge County, which is an unclassified county for all criteria pollutants, therefore it is not applicable to 45CSR19.

As shown in the following table, Antero is not a major source subject to 45CSR14 or 45CSR19 review. According to 45CSR14 Section 2.43.e, fugitive emissions are included in the major source determination because it is listed as one of the source categories in Table 1 (fossil fuel boilers (or combination thereof) totaling more than 250 MMBTU/hr heat input that is located at the Clearwater Treatment Facility (R13-3260)). The boilers at the Clearwater Treatment Facility are viewed as "nested sources" in the analysis of 45CSR14. During the 45CSR14 analysis of R13-3260, it was determined that the Clearwater Treatment Facility was not subject to this rule. The Antero Landfill is not a listed source and the emissions associated with this facility do not change the prior decision.

40CFR60 Subpart Cc (Emission Guidelines and Compliance Times for Municipal Waste Landfills)

The Antero Landfill is not a municipal solid waste landfill per the definition in §60.31c. No gas will be entering or released from the facility since the facility will only handle soil and salts. Because the facility is not a municipal solid waste landfill, this rule does not apply.

40CFR60 Subpart WWW (Standards of Performance for Municipal Solid Waste Landfills)

The Antero Landfill is not a municipal solid waste landfill per the definition in §60.751. No gas will be entering or released from the facility since the facility will only handle soil and salts. Because the facility is not a municipal solid waste landfill, this rule does not apply.

40CFR60 Subpart OOOOa (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced after September 18, 2015)

EPA published its New Source Performance Standards (NSPS) and air toxics rules for the oil and gas sector on August 16, 2012. EPA published amendments to the Subpart on September 23, 2013 and June 3, 2016. 40CFR60 Subpart OOOOa establishes emission standards and compliance schedules for the control of the pollutant greenhouse gases (GHG). The greenhouse gas standard in this subpart is in the form of a limitation on emissions of methane from affected facilities in the crude oil and natural gas source category that commence construction, modification or reconstruction after September 18, 2015. This subpart also 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 September 18, 2015. The effective date of this rule is August 2, 2016.

The Antero Landfill is not a natural gas production, transmission or distribution facility. Therefore, this rule would not apply.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

There will be a negligible amount of hazardous air pollutants (0.0007 tons/year) emitted from the combustion of natural gas in the two (2) 12.2 hp diesel light plant engines and one (1) 85 hp emergency generator. Therefore, due to the negligible concentrations emitted, detailed toxicological information is not included in this evaluation.

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 Clearwater Treatment 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 Clearwater Treatment 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:

- Maintain salt waste throughput to landfill
- Maintain records of the hours of operation for all engines
- Maintain truck trips, haulroads and fugitive minimization data
- 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 records of all applicable requirements of 40CFR60 Subpart 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

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 Landfill should be granted a 45CSR13 construction permit for their facility.

Jerry Williams, P.E.
Engineer

Date