

Fact Sheet



For Final Permitting Action Under 45CSR30 and Title V of the Clean Air Act

Permit Number: **R30-09500074-2020**
Application Received: **May 3, 2019**
Plant Identification Number: **03-54-09500074**
Permittee: **Antero Midstream LLC**
Facility Name: **Middlebourne III Compressor Station**
Mailing Address: **1615 Wynkoop Street**
Denver, CO 80202

Physical Location: Wick, Tyler County, West Virginia
UTM Coordinates: 503.135 km Easting • 4363.005 km Northing • Zone 17
Directions: From Wick, West Virginia, at the intersection of Hog Run Road and Wick Road, head east on Wick Road for 0.85 miles and turn left into the facility entrance.

Facility Description

The Middlebourne III Compressor Station separates, compresses, and dries gas off the inlet pipeline stream. The station includes twelve (12) compressor engines with oxidation catalysts, one (1) emergency generator, three (3) 150 MMscfd dehydrators with three (3) reboilers and three (3) flash tanks, three (3) 400-bbl condensate tanks, three (3) 400-bbl produced water tanks, one (1) 500-bbl settling tank, one (1) 0.5 MMBtu/hr fuel conditioning heater, one (1) flare, two (2) vapor recovery units (VRU), liquid loadout operations, fugitive component emissions, and six (6) auxiliary storage tanks.

Emissions Summary

Plantwide Emissions Summary [Tons per Year]		
Regulated Pollutants	Potential Emissions	2018 Actual Emissions
Carbon Monoxide (CO)	81.85	8.25
Nitrogen Oxides (NO _x)	96.61	46.72
Particulate Matter (PM _{2.5})	10.06	3.01
Particulate Matter (PM ₁₀)	10.06	3.17
Total Particulate Matter (TSP)	11.86	3.17
Sulfur Dioxide (SO ₂)	0.67	0.23
Volatile Organic Compounds (VOC)	177.52	52.41

PM₁₀ is a component of TSP.

Hazardous Air Pollutants	Potential Emissions	2018 Actual Emissions
Benzene	0.52	0.11
Toluene	0.98	0.30
Ethylbenzene	0.08	0.04
Xylenes	0.32	0.06
n-Hexane	2.90	0.23
Acetaldehyde	4.96	1.28
Acrolein	3.05	0.79
Methanol	1.48	0.38
Formaldehyde	5.82	2.05
Other HAPS	0.88	0.12
Total HAPS	20.99	5.37

Some of the above HAPs may be counted as PM or VOCs.

Title V Program Applicability Basis

This facility has the potential to emit 177.52 tons per year of VOC. Due to this facility's potential to emit over 100 tons per year of criteria pollutant, Antero Midstream LLC is required to have an operating permit pursuant to Title V of the Federal Clean Air Act as amended and 45CSR30.

Legal and Factual Basis for Permit Conditions

The State and Federally-enforceable conditions of the Title V Operating Permits are based upon the requirements of the State of West Virginia Operating Permit Rule 45CSR30 for the purposes of Title V of the Federal Clean Air Act and the underlying applicable requirements in other state and federal rules.

This facility has been found to be subject to the following applicable rules:

Federal and State:	45CSR2	Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers.
	45CSR6	Open burning prohibited.
	45CSR11	Standby plans for emergency episodes.
	45CSR13	Construction permit.
	45CSR16	Standards of Performance for New Stationary Sources Pursuant to 40 CFR Part 60.
	WV Code 22-5-4 (a) (14)	The Secretary can request any pertinent information such as annual emission inventory reporting.
	45CSR30	Operating permit requirement.
	45CSR34	Emission Standards for Hazardous Air Pollutants
	40 C.F.R. Part 60, Subpart JJJJ	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE).
	40 C.F.R. Part 60, 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.
	40 C.F.R. Part 61	Asbestos inspection and removal
	40 C.F.R. Part 63, Subpart HH	National Emission Standards for Hazardous Air Pollutants for Oil and Natural Gas Production Facilities.
	40 C.F.R. Part 63, Subpart ZZZZ	National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines.
	40 C.F.R. Part 82, Subpart F	Ozone depleting substances
State Only:	45CSR4	No objectionable odors.
	45CSR17	To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage And Other Sources Of Fugitive Particulate Matter

Each State and Federally-enforceable condition of the Title V Operating Permit references the specific relevant requirements of 45CSR30 or the applicable requirement upon which it is based. Any condition of the Title V permit that is enforceable by the State but is not Federally-enforceable is identified in the Title V permit as such.

The Secretary's authority to require standards under 40 C.F.R. Part 60 (NSPS), 40 C.F.R. Part 61 (NESHAPs), and 40 C.F.R. Part 63 (NESHAPs MACT) is provided in West Virginia Code §§ 22-5-1 *et seq.*, 45CSR16, 45CSR34 and 45CSR30.

Active Permits/Consent Orders

Permit or Consent Order Number	Date of Issuance	Permit Determinations or Amendments That Affect the Permit (<i>if any</i>)
R13-3347B	March 31, 2020	

Conditions from this facility's Rule 13 permit(s) governing construction-related specifications and timing requirements will not be included in the Title V Operating Permit but will remain independently enforceable under the applicable Rule 13 permit(s). All other conditions from this facility's Rule 13 permit(s) governing the source's operation and compliance have been incorporated into this Title V permit in accordance with the "General Requirement Comparison Table," which may be downloaded from DAQ's website.

Determinations and Justifications

This is the initial Title V permit for Antero Midstream LLC's Middlebourne III Compressor Station.

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

The individual maximum design heat inputs of the reboilers (DREB1 – DREB3) and heater (FUEL1) are below 10 MMBTU/hr. Therefore, these units are exempt from 45CSR2 Sections 4, 5, 6, 8 and 9 per 45CSR§2-11.1.

Antero is subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six minute block average. Antero shall conduct Method 9 emission observations for the purpose of demonstrating compliance with opacity requirements in 45CSR2. Requirements 7.2.1, 7.4.2 and 7.5.1 (based on the requirements of the underlying permit R13-3347B 8.2.1, 8.4.2 and 8.5.1) to specify the monitoring, recordkeeping, and reporting to demonstrate compliance with 10% opacity limit were not specified in R13-3347B for FUEL1, but were added under 45CSR§30-5.1.c in the Title V permit.

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

Antero Middlebourne III facility has one (1) flare (FLARE1). The flare is subject to 45CSR6 section 4, emission standards for incinerators which includes hourly particulate matter limits and opacity. This flare has negligible hourly particulate matter emissions (0.0005 lb/hr) during normal operation when a flame is present. Therefore, this unit should demonstrate compliance with the 45CSR§6-4.1 hourly particulate matter limit and the 45CSR§6-4.3 20% opacity requirement by operating the flare with a flame present at all times (condition 6.1.3.c) and with no visible emissions (condition 6.1.3.b). The facility will demonstrate compliance with conditions 6.1.3.b and 6.1.3.c by continuously monitoring the pilot flame of the flare and recording the times and duration of all periods which the pilot flame was absent (conditions 6.2.1 and 6.4.1); and by conducting opacity tests to demonstrate there are no visible emissions (condition 6.3.1).

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

The individual maximum design heat inputs of the reboilers (DREB1 – DREB3) and heater (FUEL1) are below 10 MMBTU/hr. Therefore, these units are exempt from 45CSR10 Sections 3, 6, 7 and 8 per 45CSR§10-10.1.

40CFR60 Subpart JJJJ Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

Below is the 40 C.F.R. 60 Subpart JJJJ applicability table for the engines C-100 – C-1200:

Engine	Design Capacity	Ignition	Use/Type	Year installed	Source of HAPs
C-100 – C-1200	2,500 bhp	Spark (SI)	Non-Emergency, Lean Burn 4 Stroke	2017 (new)	Area source

The 2,500 hp Caterpillar G3608 engines (C-100 – C-1200) were manufactured after the July 1, 2007 (applicability date for engines with a maximum rated power capacity greater than or equal to 500 hp). These engines are subject to the emission standards from 40 C.F.R. §60.4233(e) and Table 1 (condition 10.1.1). They also have emission limits in condition 4.1.1 based on the manufacturer’s specifications for these engines (underlying R13-3347B condition 5.1.1). These limits for engines C-100 – C-1200 are compared in the table below:

Pollutant	R13-3347B Maximum Hourly Emissions (lb/hr)	40 C.F.R. 60 Subpart JJJJ Table 1 Emission Standards (lb/hr)
Nitrogen Oxides	1.65	5.51
Carbon Monoxide	0.88	11.02
Volatile Organic Compounds (excludes formaldehyde)	1.49	3.86

Therefore, compliance with the 40 C.F.R. 60 Subpart JJJJ Table 1 Emission Standards for engines C-100 – C-1200 will be demonstrated if compliance with the Maximum Hourly Emissions in condition 4.1.1 is demonstrated.

Since engines C-100 – C-1200 are not certified by the manufacturer to meet the emission standards listed in 40 C.F.R. 60 Subpart JJJJ, Antero will be required to conduct an initial performance test and conduct subsequent performance testing every 8,760 hours or three (3) years, whichever comes first, to demonstrate compliance. This testing is also used to show compliance with emission limits of condition 4.1.1.

Requirements of 40 C.F.R. 60 Subpart JJJJ are included in Section 10.0. Permit R13-3347B included several conditions of 40 C.F.R. 60 Subpart JJJJ that were not applicable (11.1.1 through 11.1.5, 11.2.2, 11.3.2, 11.4.1.a and b.1, 11.6.1.b). Therefore, the Title V permit only includes the 40 C.F.R. 60 Subpart JJJJ requirements that are applicable to the engines at the facility.

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. 40 C.F.R. 60 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 (SO₂) emissions from affected facilities that commence construction, modification or reconstruction after September 18, 2015. The effective date of this rule is August 2, 2016.

A source is subject to 40 C.F.R. 60 Subpart OOOOa if they operate one or more of the affected facilities below:

- a. Each well affected facility, which is a single well that conducts a well completion operation following hydraulic fracturing or refracturing.

There are no wells at this facility. Therefore, all requirements regarding gas well affected facilities under 40 C.F.R. 60 Subpart OOOOa would not apply.

- b. Each centrifugal compressor affected facility, which is a single centrifugal compressor using wet seals. 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 Middlebourne III Compressor Station. Therefore, all requirements regarding centrifugal compressors under 40 C.F.R.60 Subpart OOOOa would not apply.

- c. Each reciprocating compressor affected facility, which is a single reciprocating compressor. 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 reciprocating internal combustion engines located at the Middlebourne III Compressor Station that were constructed after September 18, 2015 (engines C-100 – C-1200). Therefore, the requirements regarding reciprocating compressors under 40 C.F.R. 60 Subpart OOOOa will apply. Antero will be required to perform the following:

- Antero has indicated that they will comply with 40 C.F.R. §60.5385a by replacing the reciprocating compressor rod packing at least every 26,000 hours of operation or 36 months.
- Demonstrate initial compliance by continuously monitoring the number of hours of operation or track the number of months since the last rod packing replacement.
- Submit the appropriate start up notifications.
- Submit the initial annual report for the reciprocating compressors.
- Maintain records of hours of operation since last rod packing replacement, records of the date and time of each rod packing replacement, and records of deviations in cases where the reciprocating compressor was not operated in compliance.

Requirements of 40 C.F.R. 60 Subpart OOOOa for reciprocating compressor engines C-100 – C-1200 are included in Section 11.0.

- d. Pneumatic Controllers

- Each pneumatic controller affected facility not located at a natural gas processing plant, which is a single continuous bleed natural gas-driven pneumatic controller operating at a natural gas bleed rate greater than 6 scfh.
- Each pneumatic controller affected facility located at a natural gas processing plant, which is a single continuous bleed natural gas-driven pneumatic controller.

All pneumatic controllers at the facility will be air driven. Therefore, there are no applicable pneumatic controllers which commenced construction after September 18, 2015. Therefore, all requirements regarding pneumatic controllers under 40 C.F.R. 60 Subpart OOOOa would not apply.

- e. Each storage vessel affected facility, which is a single storage vessel with the potential for VOC emissions equal to or greater than 6 tpy.

According to the 40 C.F.R. 60 Subpart OOOOa §60.5365a(e), the potential for VOC emissions must be calculated using a generally accepted model or calculation methodology, based on the maximum average daily throughput for a 30-day period of production prior to the applicable emission determination deadline specified in this subsection. The determination may take into account requirements under a legally and practically enforceable limit in an operating permit or other requirement established under a federal or state authority.

The Middlebourne III Compressor Station's Storage Vessels (T01-T07) are controlled by vapor recovery units (VRU) with a minimum guaranteed control efficiency of 98% for VOC and HAP emissions (condition 8.1.1). "Storage vessel affected facility" status determination for tank T04 (the largest storage vessel at the compressor station) was made under 40 C.F.R. §60.5365a(e)(1), following the startup of the facility (in August, 2017) and taking into account the legally and practically enforceable limit for the VRU in the permit R13-3347 (condition 9.1.1, TV permit condition 8.1.1), issued on March 20, 2017. The determination was based on the first 30 days of production, and Promax 4.0 Software Model Output was used to calculate the PTEs. Vapors from the T04, recovered and routed back to a process through a VRU, were not accounted for in the determination. From the determination, the T04 PTE for VOC was estimated at 0.4372 tpy (below the threshold of 6 tpy). Therefore, T04 is not considered an affected facility under this subpart.

- 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 40 C.F.R. §§60.5400a, 60.5401a, 60.5402a, 60.5421a and 60.5422a 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 40 C.F.R. §§60.5400a, 60.5401a, 60.5402a, 60.5421a and 60.5422a 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 Middlebourne III Compressor Station 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 (H₂S) in the acid gas (expressed as sulfur) are required to comply with recordkeeping and reporting requirements specified in §60.5423a(c) but are not required to comply with §§60.5405a through 60.5407a and paragraphs 60.5410a(g) and 60.5415a(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 §§60.5405a through 60.5407a, 60.5410a(g), 60.5415a(g), and 60.5423a of this subpart.

There are no sweetening units at the Middlebourne III Compressor Station. Therefore, all requirements regarding sweetening units under 40 C.F.R. 60 Subpart OOOOa would not apply.

h. Pneumatic Pumps

The pneumatic pump requirements apply only to natural gas processing plants and well sites. Therefore, all requirements regarding pneumatic pumps under 40 C.F.R. 60 Subpart OOOOa would not apply to the Middlebourne III Compressor Station.

i. Collection of fugitive emission components.

The rule requires quarterly leak monitoring at natural gas compressor stations. Therefore, the requirements regarding leak monitoring under 40 C.F.R. 60 Subpart OOOOa will apply. In addition to optical gas imaging (OGI), the rule allows owners/operators to use Method 21 with a repair threshold of 500 ppm as an alternative for finding and repairing leaks. Method 21 is an EPA method for determining VOC emissions from process equipment. The method utilizes a portable VOC monitoring instrument. Requirements of 40 C.F.R. 60 Subpart OOOOa for Collection of fugitive emission components are included in Section 12.0.

40CFR63 Subpart HH (National Emission Standards for Hazardous Air Pollutants for Oil and Natural Gas Production Facilities)

Subpart HH establishes national emission limitations and operating limitations for HAPs emitted from oil and natural gas production facilities located at major and area sources of HAP emissions. The glycol dehydration units at the Middlebourne III Compressor Station are subject to the area source requirements for glycol dehydration units. However, because the facility is an area source of HAP emissions and the actual average benzene emissions from the glycol dehydration units are below 0.90 megagram per year (1.0 tons/year) it is exempt from all requirements of Subpart HH except to maintain records of actual average benzene emissions.

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

The engines (C-100 – C-1200) at the Middlebourne III Compressor Station are subject to the area source requirements for non-emergency spark ignition engines. The applicable requirement for new stationary spark ignition RICEs located at an area source of HAPs is to meet the standards of 40 C.F.R. 60 Subpart JJJJ. This requirement is included in Section 13.0, and applicable requirements of 40 C.F.R. 60 Subpart JJJJ are included in Section 10.0.

Non-Applicability Determinations

The following requirements have been determined not to be applicable to the subject facility due to the following:

45CSR10 - To Prevent and Control Air Pollution from the Emissions of Sulfur Oxides

The individual maximum design heat inputs of the reboilers (DREB1 – DREB3) and heater (FUEL1) are below 10 MMBTU/hr. Therefore, these units are exempt from sections 3 (weight emission standard), 6 (registration), 7 (permits), and 8 (testing, monitoring, recordkeeping, reporting) of 45CSR10 per 45CSR§10-10.1.

40CFR60 Subpart Kb - Standards of Performance for VOC Liquid Storage Vessels

40 C.F.R. 60 Subpart Kb does apply to storage vessels with a capacity greater than or equal to 75 cubic meters (19,812.9 gal). The Settling Tank (T04) is a 21,000 gallon tank. However, 40 C.F.R. 60 Subpart Kb does not apply to storage vessels that are used for petroleum or condensate storage prior to custody transfer per 40 C.F.R. §60.110b(b)(4).

40CFR60 Subpart KKK - Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants

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 Middlebourne III Compressor Station is not a natural gas processing facility; therefore, the facility is not subject to this rule.

40CFR60 Subpart KKKK - Standards of Performance for Stationary Combustion Turbines

40CFR60 Subpart KKKK applies to stationary combustion turbines (with heat input at peak load equal to or greater than 10.7 gigajoules (10 MMBtu) per hour) that commenced construction, modification or reconstruction after February 18, 2005. 10 MMBtu per hour equals to 3,935 hp per hour, and the microturbine GEN1 at the Middlebourne III Compressor Station has design capacity of just 1,073 hp. Therefore, it is not subject to this subpart.

Request for Variances or Alternatives

None.

Insignificant Activities

Insignificant emission unit(s) and activities are identified in the Title V application.

Comment Period

Beginning Date: April 8, 2020
Ending Date: May 8, 2020

Point of Contact

All written comments should be addressed to the following individual and office:

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Procedure for Requesting Public Hearing

During the public comment period, any interested person may submit written comments on the draft permit and may request a public hearing, if no public hearing has already been scheduled. A request for public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. The Secretary shall grant such a request for a hearing if he/she concludes that a public hearing is appropriate. Any public hearing shall be held in the general area in which the facility is located.

Response to Comments (Statement of Basis)

Not applicable.