INTERNAL PERMITTING DOCUMENT TRACKING MANIFEST

Company Name **Antero Midstream LLC**

Permitting Action Number R13-3354 Total Days 35 DAQ Days 10

Permitting Action:

- ❍ Permit Determination
- ❍ General Permit
- ❍ Administrative Update
- ❍ Temporary
- ❍ Relocation
- ✓ Construction
- ❍ Modification
- ❍ PSD (Rule 14)
- ❍ NNSR (Rule 19)

Documents Attached:

- ✓ Engineering Evaluation/Memo
- ✓ Draft Permit
- ✓ Notice
- ❍ Denial
- ❍ Final Permit/General Permit Registration
- ❍ Completed Database Sheet
- ❍ Withdrawal
- ❍ Letter
- ❍ Other *(specify)*

Date	From	To	Action Requested
2/10/2017	Jerry	Bev	Please review and approve for notice
2/15	Bev	Jerry	Go to Notice
2/15	Jerry	Sandie	Approved for Notice

NOTE: Retain a copy of this manifest for your records when transmitting your document(s).

Engineer	Jerry Williams, P.E.
Email Address	jerry.williams@wv.gov
Company Name	Antero Midstream LLC
Company ID	017-00163
Facility Name	South Canton Compressor Station
Permit Number	R13-3354
County	Doddridge
Newspaper	*The Doddridge Independent*
Company Email and "Attention To:"	Ward McNeilly wmcneilly@anteroresources.com
Environmental Contact Email Address	Barry Schatz bschatz@anteroresources.com Michele Steyskal msteyskal@kleinfelder.com
Regional Office (if applicable)	NA
New or Modified Source?	new
Construction, Modification, or Relocation?	construction
Type of Facility	natural gas compressor station
"Located" or "To Be Located"?	To be located
Place where I can find electronic versions of your notice, engineering evaluation, and draft permit	Q:\AIR_QUALITY\J_Willi\Permit Applications Under Review\Antero Midstream LLC\R13-3354 South Canton Compressor Station

AIR QUALITY PERMIT NOTICE

Notice of Intent to Approve

On January 6, 2017, Antero Midstream LLC applied to the WV Department of Environmental Protection, Division of Air Quality (DAQ) for a permit to construct and operate a natural gas compressor facility (South Canton Compressor Station) located on Nutter Fork Road, West Union, Doddridge County, WV at latitude 39.334203 and longitude -80.803337. A preliminary evaluation has determined that all State and Federal air quality requirements will be met by the proposed facility. The DAQ is providing notice to the public of its preliminary determination to issue the permit as R13-3354.

The following potential emissions will be authorized by this permit action: Particulate Matter less than 10 microns, 10.58 tons per year (TPY); Nitrogen Oxides, 101.47 TPY; Carbon Monoxide, 90.52 TPY; Sulfur Dioxide, 0.56 TPY; Volatile Organic Compounds, 155.70 TPY; Formaldehyde, 6.29 TPY; Total Hazardous Air Pollutants, 18.41 TPY; Carbon Dioxide Equivalents, 166,561 TPY.

Written comments or requests for a public meeting must be received by the DAQ before 5:00 p.m. on (Day of Week, Month, Day, Year). A public meeting may be held if the Director of the DAQ determines that significant public interest has been expressed, in writing, or when the Director deems it appropriate.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed construction will meet all state and federal air quality requirements. The purpose of the public review process is to accept public comments on air quality issues relevant to this determination. Only written comments received at the address noted below within the specified time frame, or comments presented orally at a scheduled public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

Jerry Williams, P.E.
WV Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
Telephone: 304/926-0499, ext. 1223
FAX: 304/926-0478

Additional information, including copies of the draft permit, application and all other supporting materials relevant to the permit decision may be obtained by contacting the engineer listed above. The draft permit and engineering evaluation can be downloaded at:

www.dep.wv.gov/daq/Pages/NSRPermitsforReview.aspx

west virginia department of environmental protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone (304) 926-0475 • FAX: (304) 926-0479

Jim Justice, Governor
Austin Caperton, Cabinet Secretary
www.dep.wv.gov

ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3354
Plant ID No.:	017-00163
Applicant:	Antero Midstream LLC (Antero)
Facility Name:	South Canton Compressor Station
Location:	West Union, Doddridge County
NAICS Code:	221210 (Natural Gas Distribution)
Application Type:	Construction
Received Date:	January 6, 2017
Engineer Assigned:	Jerry Williams, P.E.
Fee Amount:	$4,500.00
Date Received:	January 6, 2017
Complete Date:	January 31, 2017
Due Date:	May 1, 2017
Applicant Ad Date:	January 13, 2017
Newspaper:	*The Doddridge Independent*
UTM's:	Easting: 516.949 km Northing: 4,353.883 km Zone: 17
Latitude:	39.334203
Longitude:	-80.803337
Description:	Construction and operation of a natural gas compressor station.

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-3354:

Gas from surrounding pipelines enters the facility through receivers and associated slug catcher. From there, the gas is metered and routed through a scrubber and filter separator. Any produced liquids from the scrubber or separator are sent to a 500 bbl settling tank (T04). Gas from the filter separator is sent to one (1) of twelve (12) 2,500 hp Caterpillar G3608 lean burn compressor engines (C-100 - C-1200). The twelve (12) compressor engines are controlled with oxidation catalysts (1C -12C). Fuel gas for the compressor engines will be treated prior to the engines by a fuel conditioning skid with a 0.5 MMBTU/hr heater (FUEL1). Produced fluids are routed to the settling tank and gas goes to one of the three (3) TEG dehydrators.

Each TEG dehydrator (DEHY1 – DEHY3) contains a flash gas tank and 1.5 MMBtu/hr reboiler. Each dehydrator has a design rate of 150 million standard cubic feet per day. It is being requested that two alternative operating scenarios (AOS) for the dehydrators be permitted at this time, but only one will be implemented.

The first scenario, AOS1, will consist of a flare (FLARE1) as follows.

Within the dehydrator unit, vent gas from the flash gas tank (DFLSH1 - DFLSH3) is routed to the reboiler (DREB1 - DREB3) and used as fuel. In the case where the flash tank gas cannot be used by the reboiler due to excess gas or the reboiler being offline, the gas will be sent to the VRUs (VRU-100 and VRU-200) via the storage tanks (T01 - T07) and thus controlled by 98%. Emissions from each reboiler are routed to the atmosphere. The dehydrator still vents are controlled by a flare with at least 98% control efficiency (FLARE1). Each still vent is also equipped with a BTEX condenser unit.

The second scenario, AOS2, will consist of three (3) thermal oxidizers (TO-1 - TO-3) as follows.

Within the dehydrator unit, both vent gas from the flash gas tank (DFLSH1 - DFLSH3) and vent gas from the still vents will be routed to a thermal oxidizer (TO-1 - TO-3) with a control efficiency of 98%. Each dehydrator will have a dedicated thermal oxidizer, but will not be equipped with a BTEX condenser unit. Emissions from each reboiler are routed to the atmosphere.

In either AOS, produced fluids from the dehydrators (DEHY1 - DEHY3) are routed to the settling tank (T04). The dry gas from the dehydration process is either routed to a fuel gas scrubber, metered, and routed to the compressors as fuel gas or metered and sent to plant discharge.

All produced fluids enter one (1) 500 bbl settling tank (T03) where the fluids settle out as either condensate or produced water. The produced water goes to three (3) 400 bbl produced water tanks (T01 – T03) and the condensate goes to three (3) 400 bbl condensate tanks (T05 – T07). Flashing only occurs at the settling tank as the fluids stabilize in the settling tank before going to the other storage tanks. All seven (7) tanks are connected to a vapor recovery unit (VRU-100) where tank vapors are collected and recycled back into the gas system right before the initial filter scrubber. A second vapor recovery unit (VRU-200) is also connected to the tanks as a backup unit. The produced fluids are trucked out via tanker trucks as needed (LDOUT1). The anticipated production is 300 bbl per day of condensate and 90 bbl per day of produced water.

The facility will likely operate off of grid electricity; however, one (1) natural gas engine generator rated at 649 hp will supply power to the facility (GEN1) in the case the grid power is down or not available. The generator will be permitted at 8,760 hours per year of operation for maximum operational flexibility.

Fugitive emissions from component leaks and emissions from pigging venting or blowdown events (VENT1) also occur.

There will also be small storage tanks located at the facility. A list of the tanks and their capacity is in the table listed below.

Tank ID	Storage Tank Description	Storage Tank Capacity (gal)
TK-100	Compressor Skid Oily Water Tank	2,000
TK-101	Used Oil Tank	4,000
TK-102	TEG Make-Up Tank	1,000
TK-103	Compressor Coolant Tank	2,000
TK-104	Engine Lube Oil Tank	2,000
TK-105	Compressor Lube Oil Tank	2,000

SITE INSPECTION

A site inspection was conducted on January 18, 2017 by Doug Hammell of the DAQ Enforcement Section. According to Mr. Hammell, the site is suitable for the proposed facility. The closest home is approximately 800 feet away but is in the process of being acquired by Antero and will be removed. There is a gated residential community approximately 0.5 miles from the proposed facility. No site work has taken place.

Directions as given in the permit application are as follows:

From the intersection of U.S. 50 and WV-18 near West Union, head north (northwest) on WV-18N for 0.5 miles. Take a right on Main Street and then a left on Davis Street. In 0.2 miles at the round-a-bout, keep to the right to stay on Davis Street. After 0.2 miles, turn right onto WV-18N/ Sisterville Pike and drive 5.1 miles. Turn right on Nutter Fork (Rte. 28) and drive 0.8 miles. The facility is on the left.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this facility consist of the equipment listed in the following table and fugitive emissions. Fugitive emissions for the facility are based on calculation methodologies presented in EPA Protocol for Equipment Leak Emission Estimates and 40CFR98 Subpart W. The following table indicates which methodology was used in the emissions determination:

Emission Unit ID#	Process Equipment	Calculation Methodology
C-100 – C-1200	2,500 hp Caterpillar G3608 Reciprocating Internal Combustion Engine (RICE) w/ Oxidation Catalyst	Manufacturer's Data, EPA AP-42 Emission Factors
GEN1	649 hp PSI Industrial NG Generator	EPA Certification, EPA AP-42 Emission Factors
FUEL1	0.5 MMBTU/hr Fuel Conditioning Heater	EPA AP-42 Emission Factors
DEHY1 – DEHY3	150 mmscfd TEG Dehydrator Still Vent w/ Flare or Thermal Oxidizer	GRI-GlyCalc 4.0
DREB1 – DREB3	1.5 MMBtu/hr TEG Dehydrator Reboiler	EPA AP-42 Emission Factors
DFLSH1 – DFLSH3	Dehydrator Flash Tank controlled by Reboiler or Thermal Oxidizer	Engineering Estimate
T01 – T03	400 bbl (16,800 gal) Condensate Storage Tanks	EPA Tanks 4.09d
T04	500 bbl (21,000 gal) Condensate/Produced Water Settling Tank	EPA Tanks 4.09d and ProMax Simulation (Flashing)
T05 – T07	400 bbl (16,800 gal) Produced Water Storage Tanks	EPA Tanks 4.09d
TK-100	2,000 gal Compressor Skid Oily Water Tank	Negligible
TK-101	4,000 gal Used Oil Tank	Negligible
TK-102	1,000 gal TEG Make-Up Tank	Negligible
TK-103	2,000 gal Compressor Coolant Tank	Negligible
TK-104	2,000 gal Engine Lube Oil Tank	Negligible
TK-105	2,000 gal Compressor Lube Oil Tank	Negligible
LDOUT1	390 bbl/day (16,380 gal/day) Product Loadout Rack	EPA AP-42 Emission Factors
FLARE1	4.8 MMBTU/hr Flare Control Device	EPA AP-42 Emission Factors/ Engineering Estimate
TO-1	6.0 MMBTU/hr Thermal Oxidizer Control Device	EPA AP-42 Emission Factors/ Engineering Estimate
TO-2	6.0 MMBTU/hr Thermal Oxidizer Control Device	EPA AP-42 Emission Factors/ Engineering Estimate
TO-3	6.0 MMBTU/hr Thermal Oxidizer Control Device	EPA AP-42 Emission Factors/ Engineering Estimate
VRU-100	Vapor Recovery Unit #1	Electric Driven
VRU-200	Vapor Recovery Unit #2	Electric Driven

The following table indicates the control device efficiencies that are required for this facility:

Emission Unit	Pollutant	Control Device	Control Efficiency
2,500 hp Caterpillar G3608 RICE w/ Oxidation Catalyst (C-100 – C-1200)	Carbon Monoxide	Oxidation Catalyst	0.16 g/bhp-hr
	Volatile Organic Compounds		0.27 g/bhp-hr
	Formaldehyde		0.02 g/bhp-hr
150 mmscfd TEG Dehydrator Still Vents (DEHY1 – DEHY3)	Volatile Organic Compounds	Flare (AOS1)	98 %
	Hazardous Air Pollutants		98 %
150 mmscfd TEG Dehydrator Still Vents (DEHY1 – DEHY3)	Volatile Organic Compounds	Thermal Oxidizers (AOS2)	98 %
	Hazardous Air Pollutants		98 %
150 mmscfd TEG Dehydrator Flash Tanks (DFLSH1 – DFLSH3)	Volatile Organic Compounds	Recycled Reboiler/ Condenser w VRU backup	98 %
	Hazardous Air Pollutants		98 %
Product Tanks (T01 – T07)	Volatile Organic Compounds	Vapor Recovery Units	98 %
	Hazardous Air Pollutants		98 %

The total facility PTE (including fugitives) would occur under AOS2. The operating conditions for AOS2 for the South Canton Compressor Station is shown in the following table:

Pollutant	R13-3354 PTE (tons/year)
Nitrogen Oxides	101.47
Carbon Monoxide	90.52
Volatile Organic Compounds	155.70
Particulate Matter-10	10.58
Sulfur Dioxide	0.56
Formaldehyde	6.29
Total HAPs	18.41
Carbon Dioxide Equivalent	166,561

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 following two (2) pages.

Antero Midstream LLC – South Canton Compressor Station AOS1 (R13-3354)

Emission Point ID#	Source	NO_x		CO		VOC		PM-10		SO_2		Formaldehyde		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	Compressor Engine #1	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
2E	Compressor Engine #2	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
3E	Compressor Engine #3	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
4E	Compressor Engine #4	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
5E	Compressor Engine #5	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
6E	Compressor Engine #6	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
7E	Compressor Engine #7	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
8E	Compressor Engine #8	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
9E	Compressor Engine #9	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
10E	Compressor Engine #10	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
11E	Compressor Engine #11	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
12E	Compressor Engine #12	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
13E	NG Engine Generator	1.43	6.27	2.86	12.53	1.00	4.39	0.11	0.47	0.003	0.01	0.11	0.50	0.18	0.78	2841
30E	Fuel Conditioning Heater	0.05	0.21	0.04	0.18	0.0027	0.01	0.0037	0.02	0.00029	0.0013	0.00004	0.00002	0.0009	0.004	257
16E	Dehydrator Reboiler	0.15	0.64	0.12	0.54	0.01	0.04	0.01	0.05	0.001	0.004	0.0001	0.0005	0.003	0.01	771
19E	Dehydrator Reboiler	0.15	0.64	0.12	0.54	0.01	0.04	0.01	0.05	0.001	0.004	0.0001	0.0005	0.003	0.01	771
22E	Dehydrator Reboiler	0.15	0.64	0.12	0.54	0.01	0.04	0.01	0.05	0.001	0.004	0.0001	0.0005	0.003	0.01	771
31E	Flare Combustion	0.33	1.46	1.78	7.80	3.93	17.16	0.0005	0.002	0.00004	0.00016	0	0	0.39	1.65	3415
26E	Settling Storage Tank	0	0	0	0	1.64	7.18	0	0	0	0	0	0	0.04	0.17	53
23E-25E	Condensate Storage Tanks	0	0	0	0	0.06	0.28	0	0	0	0	0	0	0.002	0.01	0
27E-29E	Produced Water Storage Tanks	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00	0
35E	Product Loadout Rack	0	0	0	0	59.72	12.45	0	0	0	0	0	0	1.41	0.29	93
BD	Compressor Blowdowns	0	0	0	0	NA	8.44	0	0	0	0	0	0	NA	0.17	791
SSM	Startup/Shutdown Events	0	0	0	0	NA	5.28	0	0	0	0	0	0	NA	0.11	495
PIG	Pigging Events	0	0	0	0	NA	7.42	0	0	0	0	0	0	NA	0.15	694
Total Point Source		**22.09**	**96.77**	**15.64**	**68.49**	**85.55**	**146.72**	**2.19**	**9.62**	**0.13**	**0.56**	**1.44**	**6.29**	**5.40**	**18.20**	**158680**
Fugitive	Component Leaks	0	0	0	0	2.04	8.94	0	0	0	0	0	0	0.04	0.19	177
Fugitive	Dust	0	0	0	0	0	0	0.21	0.90	0	0	0	0	0	0	0
Total Fugitive		**0**	**0**	**0**	**0**	**2.04**	**8.94**	**0.21**	**0.90**	**0**	**0**	**0**	**0**	**0.04**	**0.19**	**177**
Total Sitewide		**22.09**	**96.77**	**15.64**	**68.49**	**87.59**	**155.66**	**2.40**	**10.52**	**0.13**	**0.56**	**1.44**	**6.29**	**5.44**	**18.39**	**158857**

Antero Midstream LLC – South Canton Compressor Station AOS2 (R13-3354)

Emission Point ID#	Source	NO_x		CO		VOC		PM-10		SO_2		Formaldehyde		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	Compressor Engine #1	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
2E	Compressor Engine #2	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
3E	Compressor Engine #3	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
4E	Compressor Engine #4	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
5E	Compressor Engine #5	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
6E	Compressor Engine #6	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
7E	Compressor Engine #7	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
8E	Compressor Engine #8	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
9E	Compressor Engine #9	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
10E	Compressor Engine #10	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
11E	Compressor Engine #11	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
12E	Compressor Engine #12	1.65	7.24	0.88	3.86	1.60	7.00	0.17	0.75	0.01	0.04	0.11	0.48	0.28	1.24	12311
13E	NG Engine Generator	1.43	6.27	2.86	12.53	1.00	4.39	0.11	0.47	0.003	0.01	0.11	0.50	0.18	0.78	2841
30E	Fuel Conditioning Heater	0.05	0.21	0.04	0.18	0.0027	0.01	0.0037	0.02	0.00029	0.0013	0.00004	0.00002	0.0009	0.004	257
16E	Dehydrator Reboiler	0.15	0.64	0.12	0.54	0.01	0.04	0.01	0.05	0.001	0.004	0.0001	0.0005	0.003	0.01	771
19E	Dehydrator Reboiler	0.15	0.64	0.12	0.54	0.01	0.04	0.01	0.05	0.001	0.004	0.0001	0.0005	0.003	0.01	771
22E	Dehydrator Reboiler	0.15	0.64	0.12	0.54	0.01	0.04	0.01	0.05	0.001	0.004	0.0001	0.0005	0.003	0.01	771
16E	Thermal Oxidizer	0.47	2.05	2.27	9.95	1.31	5.72	0.0005	0.002	0.00004	0.00016	0	0	0.13	0.55	3706
17E	Thermal Oxidizer	0.47	2.05	2.27	9.95	1.31	5.72	0.0005	0.002	0.00004	0.00016	0	0	0.13	0.55	3706
18E	Thermal Oxidizer	0.47	2.05	2.27	9.95	1.31	5.72	0.0005	0.002	0.00004	0.00016	0	0	0.13	0.55	3706
26E	Settling Storage Tank	0	0	0	0	1.64	7.18	0	0	0	0	0	0	0.04	0.17	53
23E-25E	Condensate Storage Tanks	0	0	0	0	0.06	0.28	0	0	0	0	0	0	0.002	0.01	0
27E-29E	Produced Water Storage Tanks	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00	0
35E	Product Loadout Rack	0	0	0	0	59.72	12.45	0	0	0	0	0	0	1.41	0.29	93
BD	Compressor Blowdowns	0	0	0	0	NA	8.44	0	0	0	0	0	0	NA	0.17	791
SSM	Startup/Shutdown Events	0	0	0	0	NA	5.28	0	0	0	0	0	0	NA	0.11	495
PIG	Pigging Events	0	0	0	0	NA	7.42	0	0	0	0	0	0	NA	0.15	694
Total Point Source		**23.17**	**101.47**	**20.67**	**90.52**	**85.56**	**146.76**	**2.21**	**9.68**	**0.13**	**0.56**	**1.44**	**6.29**	**5.40**	**18.22**	**166384**
Fugitive	Component Leaks	0	0	0	0	2.04	8.94	0	0	0	0	0	0	0.04	0.19	177
Fugitive	Dust	0	0	0	0	0	0	0.21	0.90	0	0	0	0	0	0	0
Total Fugitive		**0**	**0**	**0**	**0**	**2.04**	**8.94**	**0.21**	**0.90**	**0**	**0**	**0**	**0**	**0.04**	**0.19**	**177**
Total Sitewide		**23.17**	**101.47**	**20.67**	**90.52**	**87.60**	**155.70**	**2.42**	**10.58**	**0.13**	**0.56**	**1.44**	**6.29**	**5.44**	**18.41**	**166561**

REGULATORY APPLICABILITY

The following rules apply to this modification:

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

The purpose of 45CSR2 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 input of the reboilers (DREB1 – DREB3) and heater (FUEL1) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR2.

Antero would also be subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six minute block average.

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) flare (FLARE1) and three (3) thermal oxidizers (TO1 – TO3) at the facility. These units are subject to section 4, emission standards for incinerators. These units have negligible hourly particulate matter emissions. Therefore, these units should demonstrate compliance with this section. The facility will demonstrate compliance by maintaining records of the amount of natural gas consumed by these units and the hours of operation. The facility will also monitor the flame of the flare and record any malfunctions that may cause no flame to be present during operation.

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

The purpose of 45CSR10 is to establish emission limitations for sulfur dioxide which are discharged from fuel burning units. 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 input of the reboilers (DREB1 – DREB3) and heater (FUEL1) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR10.

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)

The proposed construction has potential to emit in excess of six (6) lbs/hour and ten (10) TPY of a regulated pollutant and, therefore, pursuant to §45-13-2.24, meets the definition of a "stationary source" under 45CSR13. Pursuant to §45-13-5.1, "[n]o person shall cause, suffer, allow or permit the construction, modification, relocation and operation of any stationary source to be commenced without . . . obtaining a permit to construct." Therefore, Antero is required to obtain a permit under 45CSR13 for the construction of the facility.

As required under §45-13-8.3 ("Notice Level A"), Antero placed a Class I legal advertisement in a "newspaper of general circulation in the area where the source is . . . located." Additionally, Antero paid the appropriate application fee.

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

45CSR16 applies to this source by reference of 40CFR60, Subparts JJJJ and OOOOa. These requirements are discussed under that rule below.

45CSR30 (Requirements for Operating Permits)

Antero is subject to 45CSR30. The South Canton Compressor Station has the potential to emit more than major regulatory threshold for NO_x and VOC. Due to this facility's potential to emit over 100 tons per year of criteria pollutant, Antero is required to have an operating permit pursuant to Title V of the Federal Clean Air Act as amended and 45CSR30.

Antero is required to pay the appropriate annual operating fees and submit an annual Certified Emissions Statement.

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

40CFR60 Subpart JJJJ establishes emission standards for applicable SI ICE.

The 2,500 hp Caterpillar G3608 RICEs (C-100 – C-1200) were manufactured after the July 1, 2007 date for engines with a maximum rated power capacity greater than or equal to 500 hp. These engines will be subject to the following emission limits: NOx – 1.0 g/hp-hr (5.51 lb/hr); CO – 2.0 g/hp-hr (11.02 lb/hr); and VOC – 0.7 g/hp-hr (3.86 lb/hr). Based on the manufacturer's specifications for these engines, the emission standards will be met.

These engines are not certified by the manufacturer to meet the emission standards listed in 40CFR60 Subpart JJJJ. Therefore, 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.

The 649 hp PSI Industrial generator engine (GEN-1) was manufactured after the July 1, 2007 date for engines with a maximum rated power capacity greater than or equal to 500 hp. This engine will be subject to the following emission limits: NOx – 1.0 g/hp-hr (1.43 lb/hr); CO – 2.0 g/hp-hr (2.86 lb/hr); and VOC – 0.7 g/hp-hr (1.00 lb/hr). Based on the manufacturer's specifications for these engines, the emission standards will be met.

This engine does possess an EPA Certificate of Conformity to meet the emission standards listed in 40CFR60 Subpart JJJJ. Therefore, as long as this engine is operated in a certified manner, Antero is not required to conduct performance testing on this unit.

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.

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

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

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 South Canton Compressor Station. Therefore, all requirements regarding centrifugal compressors under 40 CFR 60 Subpart OOOOa 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 reciprocating internal combustion engines located at the South Canton Compressor Station that were constructed after September 18, 2015. Therefore, the requirements regarding reciprocating compressors under 40 CFR 60 Subpart OOOOa will apply. Antero will be required to perform the following:

- Replace the reciprocating compressor rod packing at least every 26,000 hours of operation or 36 months or installation of a rod packing emissions collection system.

- 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.

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.

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 CFR 60 Subpart OOOOa would not 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 OOOOa defines a storage vessel as a unit that is constructed primarily of non-earthen 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.

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. 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 storage vessels located at the South Canton Compressor Station are controlled by a VRU which will reduce the potential to emit to less than 6 tpy of VOC. Therefore, Antero is not required by this section to further reduce VOC emissions by 95%. Antero is claiming a control efficiency of 98% for the VRU. In able to claim a control efficiency greater than 95%, Antero is required to meet additional design/function requirements. Antero will be required to perform three (3) of the following additional requirements:

- *Additional sensing equipment.*
- *Properly designed bypass system.*
- *Appropriate gas blanket.*
- *A compressor that is suitable and has the ability to vary the drive speed.*

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 §§60.5400a, 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 §§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 South Canton 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 (H_2S) 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 South Canton Compressor Station. Therefore, all requirements regarding sweetening units under 40 CFR 60 Subpart OOOOa would not apply.

h. Pneumatic Pumps

The pneumatic pump requirements apply only to natural gas processing facilities and well sites. Therefore, all requirements regarding pneumatic pumps under 40 CFR 60 Subpart OOOOa would not apply to the South Canton Compressor Station.

i. Collection of fugitive emission components.

The rule requires quarterly leak monitoring at natural gas compressor stations. 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.

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 South Canton 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 flowrate of natural gas to demonstrate a continuous exemption status.

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 (C-100 – C-1200) at the South Canton Compressor Station are subject to the area source requirements for non-emergency spark 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 JJJJ. These requirements were outlined above. The proposed engine meets these standards.

Because these engines are not certified by the manufacturer, Antero will be required to perform an initial performance test within 180 days from startup, and subsequent testing every 8,760 hours or 3 years, whichever comes first.

The following rules do not apply to the facility:

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 South Canton Compressor Station is located in Doddridge County, which is an unclassified county for all criteria pollutants, therefore the South Canton Compressor Station 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 not included in the major source determination because it is not listed as one of the source categories in Table 1. Therefore, the fugitive emissions are not included in the PTE below.

Pollutant	**PSD (45CSR14) Threshold (tpy)**	**NANSR (45CSR19) Threshold (tpy)**	**South Canton PTE (tpy)**	**45CSR14 or 45CSR19 Review Required?**
Carbon Monoxide	250	NA	90.52	No
Nitrogen Oxides	250	NA	101.47	No
Sulfur Dioxide	250	NA	0.56	No
Particulate Matter 2.5	250	NA	9.68	No
Ozone (VOC)	250	NA	146.76	No

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

40CFR60 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 thank. However, it does not apply to storage vessels that are used for petroleum or condensate storage prior to custody transfer.

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 South Canton Compressor Station is not a natural gas processing facility, therefore, Antero is not subject to this rule.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds 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 South Canton Compressor Station is classified as an area source of hazardous air pollutants. Listed below is a description of the primary hazardous air pollutants for this facility.

Acetaldehyde
Acetaldehyde is mainly used as an intermediate in the synthesis of other chemicals. It is common in the environment and may be formed in the body from the breakdown of ethanol. Acute (short-term) exposure to acetaldehyde results in effects including irritation of the eyes, skin, and respiratory tract. Symptoms of chronic (long-term) intoxication of acetaldehyde resemble those of alcoholism. Acetaldehyde is considered a probable human carcinogen (Group B2) based on human cancer studies and animal studies that have shown nasal tumors in rats and laryngeal tumors in hamsters.

Acrolein
Acrolein is primarily used as an intermediate in the synthesis of acrylic acid and as a biocide. It may be formed from the breakdown of certain pollutants in outdoor air or from the burning of organic matter including tobacco, or fuels such as gasoline or oil. It is toxic to humans following inhalation, oral or dermal exposures. Acute (short-term) inhalation exposure may result in upper respiratory tract irritation and congestion. No information is available on its reproductive, developmental, or carcinogenic effects in humans, and the existing animal cancer data are considered inadequate to make a determination that acrolein is carcinogenic to humans.

Benzene
Benzene is found in the air from emissions from burning coal and oil, gasoline service stations, and motor vehicle exhaust. Acute (short-term) inhalation exposure of humans to benzene may cause drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritation, and, at high levels, unconsciousness. Chronic (long-term) inhalation exposure has caused various disorders in the blood, including reduced numbers of red blood cells and aplastic anemia, in occupational settings. Reproductive effects have been reported for women exposed by inhalation to high levels, and adverse effects on the developing fetus have been observed in animal tests. Increased incidence of leukemia (cancer of the tissues that form white blood cells) have been observed in humans occupationally exposed to benzene. EPA has classified benzene as a Group A, human carcinogen.

Formaldehyde
Formaldehyde is used mainly to produce resins used in particle board products and as an intermediate in the synthesis of other chemicals. Exposure to formaldehyde may occur by breathing contaminated indoor air, tobacco smoke, or ambient urban air. Acute (short-term) and chronic (long-term) inhalation exposure to formaldehyde in humans can result in respiratory symptoms, and eye, nose, and throat irritation. Limited human studies have reported an association between formaldehyde exposure and lung and nasopharyngeal cancer. Animal inhalation studies have reported an increased incidence of nasal squamous cell cancer. EPA considers formaldehyde a probable human carcinogen (Group B1).

Methanol
Methanol is released to the environment during industrial uses and naturally from volcanic gases, vegetation, and microbes. Exposure may occur from ambient air and during the use of solvents. Acute (short-term) or chronic (long-term) exposure of humans to methanol by inhalation or ingestion may result in blurred vision, headache, dizziness, and nausea. No information is available on the reproductive, developmental, or carcinogenic effects of methanol in humans. Birth defects have been observed in the offspring of rats and mice exposed to methanol by inhalation. EPA has not classified methanol with respect to carcinogenicity.

Methanol is primarily used as an industrial solvent for inks, resins, adhesives, and dyes. It is also used as a solvent in the manufacture of cholesterol, streptomycin, vitamins, hormones, and other pharmaceuticals. Methanol is also used as an antifreeze for automotive radiators, an ingredient of gasoline (as an antifreezing agent and octane booster), and as fuel for picnic stoves. Methanol is also an ingredient in paint and varnish removers. Methanol is also used as an alternative motor fuel.

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) 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 Source Determination Rule for the oil and gas industry was published in the Federal Register on June 3, 2016 and became effective on August 2, 2016. EPA defined the term "adjacent" and stated that equipment and activities in the oil and gas sector that are under common control will be considered part of the same source if they are located on the same site or on sites that share equipment and are within ¼ mile of each other.

The South Canton Compressor Station will operate under SIC code 4923 (Natural Gas Distribution). There are other compressor stations operated by Antero that share the same two-

digit major SIC code of 49 for natural gas distribution. However, this compressor station is not located on "contiguous or adjacent" property.

"Contiguous or Adjacent" determinations are made on a case by case basis. There is a natural gas production facility (Addie Pad) operating under SIC code 1311, located 0.1 miles from the proposed facility that is under common control of Antero. Therefore, this facility would be considered adjacent.

Because there are no facilities that are under common control, located on contiguous or adjacent properties and operating under the same standard industrial classification code, the emissions from the South Canton Compressor Station 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:

- Monitor and record quantity of natural gas consumed for all engines and combustion sources.
- Monitor all applicable requirements of 40CFR60 Subparts JJJJ and OOOOa and 40CFR63 Subparts HH and ZZZZ.
- Monitor the presence of the flare pilot flame with a thermocouple or equivalent.

Antero will be required to perform the following recordkeeping:

- Maintain records of the amount of natural gas consumed and hours of operation for all engines and combustion sources.
- 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 the visible emission opacity tests conducted per the permit.
- Maintain a record of all potential to emit (PTE) HAP calculations for the entire facility. These records shall include the natural gas compressor engines and ancillary equipment.
- Maintain records of all applicable requirements of 40CFR60 Subparts JJJJ and OOOOa and 40CFR63 Subparts HH and ZZZZ.
- Maintain records of the flare design evaluation.
- 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 South Canton Compressor Station should be granted a 45CSR13 construction permit for their facility.

Jerry Williams, P.E.
Engineer

FEB 07, 2017
Date

West Virginia Department of Environmental Protection

Jim Justice
Governor

Division of Air Quality

Austin Caperton
Cabinet Secretary

Permit to Construct

R13- 3354

This permit is issued in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§22-5-1 et seq.) and 45 C.S.R. 13 – Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation. The permittee identified at the above-referenced facility is authorized to construct the stationary sources of air pollutants identified herein in accordance with all terms and conditions of this permit.

Issued to:

Antero Midstream LLC
South Canton Compressor Station
017-00163

William F. Durham
Director

Issued: Draft

DRAFT

Facility Location:	Nutter Fork Road, West Union, Doddridge County, West Virginia
Mailing Address:	1615 Wynkoop Street, Denver, CO 80202
Facility Description:	Natural gas compressor station
NAICS Codes:	221210
UTM Coordinates:	516.949 km Easting • 4,353.883 km Northing • Zone 17
Permit Type:	Construction
Description of Change:	Construction and operation of a natural gas compressor station.

Any person whose interest may be affected, including, but not necessarily limited to, the applicant and any person who participated in the public comment process, by a permit issued, modified or denied by the Secretary may appeal such action of the Secretary to the Air Quality Board pursuant to article one [§§22B-1-1 et seq.], Chapter 22B of the Code of West Virginia. West Virginia Code §§22-5-14.

As a result of the granting of this permit, the source is a major source subject to 45CSR30. The Title V (45CSR30) application will be due within twelve (12) months after the date of the commencement of the operation or activity (activities) authorized by this permit.

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Table of Contents

1.0. Emission Units 5

1.1. Control Devices 7

2.0. General Conditions 8
2.1. Definitions 8
2.2. Acronyms 8
2.3. Authority 9
2.4. Term and Renewal 9
2.5. Duty to Comply 9
2.6. Duty to Provide Information 9
2.7. Duty to Supplement and Correct Information 10
2.8. Administrative Update 10
2.9. Permit Modification 10
2.10 Major Permit Modification 10
2.11. Inspection and Entry 10
2.12. Emergency 10
2.13. Need to Halt or Reduce Activity Not a Defense 11
2.14. Suspension of Activities 11
2.15. Property Rights 11
2.16. Severability 12
2.17. Transferability 12
2.18. Notification Requirements 12
2.19. Credible Evidence 12

3.0. Facility-Wide Requirements 13
3.1. Limitations and Standards 13
3.2. Monitoring Requirements 13
3.3. Testing Requirements 13
3.4. Recordkeeping Requirements 15
3.5. Reporting Requirements 15

4.0. Source-Specific Requirements 17
4.1. Limitations and Standards 17

5.0. Source-Specific Requirements (Engines, Generator) 18
5.1. Limitations and Standards 18
5.2. Monitoring Requirements 19
5.3. Testing Requirements 19
5.4. Recordkeeping Requirements 19
5.5. Reporting Requirements 19

6.0. Source-Specific Hazardous Air Pollutant Requirements (Natural Gas Dehydration Units Not Subject to MACT Standards and being controlled by a Flare Control Device (AOS1) or Thermal Oxidizer Control Devices (AOS2)) 20
6.1. Limitations and Standards 20
6.2. Monitoring Requirements 23
6.3. Testing Requirements 23
6.4. Recordkeeping Requirements 24
6.5. Reporting Requirements 25

DRAFT

7.0. Source-Specific Requirements (Reboilers, Heater) 25
7.1. Limitations and Standards 25
7.2. Monitoring Requirements 25
7.3. Testing Requirements 25
7.4. Recordkeeping Requirements 26
7.5. Reporting Requirements 26

8.0. Source-Specific Requirements (Storage Tanks) 26
8.1. Limitations and Standards 26
8.2. Monitoring Requirements 28
8.3. Recordkeeping Requirements 29
8.4. Reporting Requirements 31

9.0. Source-Specific Requirements (Product Loadout Rack) 31
9.1. Limitations and Standards 31
9.2. Monitoring Requirements 31
9.3. Recordkeeping Requirements 31
9.4. Reporting Requirements 32

10.0. Source-Specific Requirements (40CFR60 Subpart JJJJ Requirements, C-100 – C-1200) 32
10.1. Limitations and Standards 32
10.2. Emission Standards for Owners and Operators 33
10.3. Other Requirements for Owners and Operators 33
10.4. Compliance Requirements for Owners and Operators 34
10.5. Testing Requirements for Owners and Operators 35
10.6. Notification, Reports, and Records for Owners and Operators 37

11.0. Source-Specific Requirements (40CFR60 Subpart OOOOa Requirements, Reciprocating Compressor Engines (C-100 – C-1200)) 39
11.1. Limitations and Standards 39
11.2. Initial Compliance Demonstration 39
11.3. Continuous Compliance Demonstration 40
11.4. Notification, Recordkeeping, and Reporting Requirements 40

12.0. Source-Specific Requirements (40CFR60 Subpart OOOOa Requirements, Fugitive Emission Components) 41
12.1. Limitations and Standards 41
12.2. Initial Compliance Demonstration 46
12.3. Continuous Compliance Demonstration 46
12.4. Notification, Recordkeeping and Reporting Requirements 47

13.0. Source-Specific Requirements (40CFR63 Subpart ZZZZ Requirements, C-100 – C-1200) 50
13.1. Limitations and Standards 50

14.0. Source-Specific Requirements (Blowdown, Compressor Startup and Pigging Operations) 50
14.1. Limitations and Standards 50
14.2. Recordkeeping Requirements 51
14.3. Reporting Requirements 51

CERTIFICATION OF DATA ACCURACY 52

DRAFT

1.0. Emission Units

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
C-100	1E	Caterpillar G3608 Compressor Engine	2017	2,500 hp	Ox Cat (1C)
C-200	2E	Caterpillar G3608 Compressor Engine	2017	2,500 hp	Ox Cat (2C)
C-300	3E	Caterpillar G3608 Compressor Engine	2017	2,500 hp	Ox Cat (3C)
C-400	4E	Caterpillar G3608 Compressor Engine	2017	2,500 hp	Ox Cat (4C)
C-500	5E	Caterpillar G3608 Compressor Engine	2017	2,500 hp	Ox Cat (5C)
C-600	6E	Caterpillar G3608 Compressor Engine	2017	2,500 hp	Ox Cat (6C)
C-700	7E	Caterpillar G3608 Compressor Engine	2017	2,500 hp	Ox Cat (7C)
C-800	8E	Caterpillar G3608 Compressor Engine	2017	2,500 hp	Ox Cat (8C)
C-900	9E	Caterpillar G3608 Compressor Engine	2017	2,500 hp	Ox Cat (9C)
C-1000	10E	Caterpillar G3608 Compressor Engine	2017	2,500 hp	Ox Cat (10C)
C-1100	11E	Caterpillar G3608 Compressor Engine	2017	2,500 hp	Ox Cat (11C)
C-1200	12E	Caterpillar G3608 Compressor Engine	2017	2,500 hp	Ox Cat (12C)
GEN1	13E	PSI Industrial NG Generator	2017	649 hp	None
DEHY1	13C/16C	TEG Dehydration Unit Still Vent	2017	150 mmscfd	Flare (13C) or TO-1 (16C)
DFLSH1	16E/16C	Dehydrator Flash Tank	2017	150 mmscfd	DREB1 (16E) or TO-1 (16C)
DREB1	16E	TEG Dehydration Unit Reboiler	2017	1.5 MMBtu/hr	None
DEHY2	13C/17C	TEG Dehydration Unit Still Vent	2017	150 mmscfd	Flare (13C) or TO-2 (17C)
DFLSH2	19E/17C	Dehydrator Flash Tank	2017	150 mmscfd	DREB2 (19E) or TO-2 (17C)
DREB2	19E	TEG Dehydration Unit Reboiler	2017	1.5 MMBtu/hr	None
DEHY3	13C/18C	TEG Dehydration Unit Still Vent	2017	150 mmscfd	Flare (13C) or TO-3 (18C)
DFLSH3	22E/18C	Dehydrator Flash Tank	2017	150 mmscfd	DREB3 (22E) or TO-3 (18C)
DREB3	22E	TEG Dehydration Unit Reboiler	2017	1.5 MMBtu/hr	None

DRAFT

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
T01	14C/15C	Condensate Storage Tank	2017	400 bbl (16,800 gal)	VRU-100[1], VRU-200[1]
T02	14C/15C	Condensate Storage Tank	2017	400 bbl (16,800 gal)	VRU-100[1], VRU-200[1]
T03	14C/15C	Condensate Storage Tank	2017	400 bbl (16,800 gal)	VRU-100[1], VRU-200[1]
T04	14C/15C	Condensate/Produced Water Settling Tank	2017	500 bbl (21,000 gal)	VRU-100[1], VRU-200[1]
T05	14C/15C	Produced Water Storage Tank	2017	400 bbl (16,800 gal)	VRU-100[1], VRU-200[1]
T06	14C/15C	Produced Water Storage Tank	2017	400 bbl (16,800 gal)	VRU-100[1], VRU-200[1]
T07	14C/15C	Produced Water Storage Tank	2017	400 bbl (16,800 gal)	VRU-100[1], VRU-200[1]
FUEL1	30E	Fuel Conditioning Heater	2017	0.5 MMBTU/hr	None
LDOUT1	35E	Production Liquids Truck Load Out	2017	390[2] bbl/day	None
FLARE1	31E	Flare Control Device	2017	4.8 MMBTU/hr	NA
TO-1	32E	Thermal Oxidizer Control Device	2017	6.0 MMBTU/hr	NA
TO-2	33E	Thermal Oxidizer Control Device	2017	6.0 MMBTU/hr	NA
TO-3	34E	Thermal Oxidizer Control Device	2017	6.0 MMBTU/hr	NA
TK-100	TK-100	Compressor Skid Oily Water Tank	2017	2,000 gal	None
TK-101	TK-101	Used Oil Tank	2017	4,000 gal	None
TK-102	TK-102	TEG Make-Up Tank	2017	1,000 gal	None
TK-103	TK-103	Compressor Coolant Tank	2017	2,000 gal	None
TK-104	TK-104	Engine Lube Oil Tank	2017	2,000 gal	None
TK-105	TK-105	Compressor Lube Oil Tank	2017	2,000 gal	None

1 – Working, Breathing, and Flashing losses routed to Vapor Recovery Unit for recirculation back into the process.
2 – 300 bbl/day Condensate and 90 bbl/day Produced Water

DRAFT

1.1. Control Devices

Emission Unit	Pollutant	Control Device	Control Efficiency
2,500 hp Caterpillar G3608 RICE w/ Ox Cat (C-100 – C-1200)	Carbon Monoxide	Oxidation Catalyst	0.16 g/bhp-hr
	Volatile Organic Compounds		0.27 g/bhp-hr
	Formaldehyde		0.02 g/bhp-hr
150 mmscfd TEG Dehydrator Still Vents (DEHY1 – DEHY3)	Volatile Organic Compounds	Flare (AOS1)	98 %
	Hazardous Air Pollutants		98 %
150 mmscfd TEG Dehydrator Still Vents (DEHY1 – DEHY3)	Volatile Organic Compounds	Thermal Oxidizers (AOS2)	98 %
	Hazardous Air Pollutants		98 %
150 mmscfd TEG Dehydrator Flash Tanks (DFLSH1 – DFLSH3)	Volatile Organic Compounds	Recycled Reboiler/ Condenser w VRU backup	98 %
	Hazardous Air Pollutants		98 %
Product Tanks (T01 – T07)	Volatile Organic Compounds	Vapor Recovery Units	98 %
	Hazardous Air Pollutants		98 %

DRAFT

2.0. General Conditions

2.1. Definitions

2.1.1. All references to the "West Virginia Air Pollution Control Act" or the "Air Pollution Control Act" mean those provisions contained in W.Va. Code §§ 22-5-1 to 22-5-18.

2.1.2. The "Clean Air Act" means those provisions contained in 42 U.S.C. §§ 7401 to 7671q, and regulations promulgated thereunder.

2.1.3. "Secretary" means the Secretary of the Department of Environmental Protection or such other person to whom the Secretary has delegated authority or duties pursuant to W.Va. Code §§ 22-1-6 or 22-1-8 (45CSR§30-2.12.). The Director of the Division of Air Quality is the Secretary's designated representative for the purposes of this permit.

2.2. Acronyms

CAAA	Clean Air Act Amendments
CBI	Confidential Business Information
CEM	Continuous Emission Monitor
CES	Certified Emission Statement
C.F.R. *or* CFR	Code of Federal Regulations
CO	Carbon Monoxide
C.S.R. *or* CSR	Codes of State Rules
DAQ	Division of Air Quality
DEP	Department of Environmental Protection
dscm	Dry Standard Cubic Meter
FOIA	Freedom of Information Act
HAP	Hazardous Air Pollutant
HON	Hazardous Organic NESHAP
HP	Horsepower
lbs/hr	Pounds per Hour
LDAR	Leak Detection and Repair
M	Thousand
MACT	Maximum Achievable Control Technology
MDHI	Maximum Design Heat Input
MM	Million
MMBtu/hr *or* mmbtu/hr	Million British Thermal Units per Hour
MMCF/hr *or* mmcf/hr	Million Cubic Feet per Hour
NA	Not Applicable
NAAQS	National Ambient Air Quality Standards
NESHAPS	National Emissions Standards for Hazardous Air Pollutants
NO_X	Nitrogen Oxides
NSPS	New Source Performance Standards
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter less than 2.5 µm in diameter
PM_{10}	Particulate Matter less than 10µm in diameter
Ppb	Pounds per Batch
Pph	Pounds per Hour
Ppm	Parts per Million
Ppmv or ppmv	Parts per Million by Volume
PSD	Prevention of Significant Deterioration
Psi	Pounds per Square Inch
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
TAP	Toxic Air Pollutant
TPY	Tons per Year
TRS	Total Reduced Sulfur
TSP	Total Suspended Particulate
USEPA	United States Environmental Protection Agency
UTM	Universal Transverse Mercator
VEE	Visual Emissions Evaluation
VOC	Volatile Organic Compounds
VOL	Volatile Organic Liquids

DRAFT

2.3. Authority

This permit is issued in accordance with West Virginia air pollution control law W.Va. Code §§ 22-5-1. et seq. and the following Legislative Rules promulgated thereunder:

2.3.1. 45CSR13 – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation*;

2.4. Term and Renewal

2.4.1. This Permit shall remain valid, continuous and in effect unless it is revised, suspended, revoked or otherwise changed under an applicable provision of 45CSR13 or any other applicable legislative rule;

2.5. Duty to Comply

2.5.1. The permitted facility shall be constructed and operated in accordance with the plans and specifications filed in Permit Application R13-3354 and any modifications, administrative updates, or amendments thereto. The Secretary may suspend or revoke a permit if the plans and specifications upon which the approval was based are not adhered to;
[45CSR§§13-5.11 and -10.3.]

2.5.2. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the West Virginia Code and the Clean Air Act and is grounds for enforcement action by the Secretary or USEPA;

2.5.3. Violations of any of the conditions contained in this permit, or incorporated herein by reference, may subject the permittee to civil and/or criminal penalties for each violation and further action or remedies as provided by West Virginia Code 22-5-6 and 22-5-7;

2.5.4. Approval of this permit does not relieve the permittee herein of the responsibility to apply for and obtain all other permits, licenses, and/or approvals from other agencies; i.e., local, state, and federal, which may have jurisdiction over the construction and/or operation of the source(s) and/or facility herein permitted.

2.6. Duty to Provide Information

The permittee shall furnish to the Secretary within a reasonable time any information the Secretary may request in writing to determine whether cause exists for administratively updating, modifying, revoking, or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Secretary copies of records to be kept by the permittee. For information claimed to be confidential, the permittee shall furnish such records to the Secretary along with a claim of confidentiality in accordance with 45CSR31. If confidential information is to be sent to USEPA, the permittee shall directly provide such information to USEPA along with a claim of confidentiality in accordance with 40 C.F.R. Part 2.

DRAFT

2.7. Duty to Supplement and Correct Information

Upon becoming aware of a failure to submit any relevant facts or a submittal of incorrect information in any permit application, the permittee shall promptly submit to the Secretary such supplemental facts or corrected information.

2.8. Administrative Update

The permittee may request an administrative update to this permit as defined in and according to the procedures specified in 45CSR13.
[45CSR§13-4.]

2.9. Permit Modification

The permittee may request a minor modification to this permit as defined in and according to the procedures specified in 45CSR13.
[45CSR§13-5.4.]

2.10 Major Permit Modification

The permittee may request a major modification as defined in and according to the procedures specified in 45CSR14 or 45CSR19, as appropriate.
[45CSR§13-5.1]

2.11. Inspection and Entry

The permittee shall allow any authorized representative of the Secretary, upon the presentation of credentials and other documents as may be required by law, to perform the following:

a. At all reasonable times (including all times in which the facility is in operation) enter upon the permittee's premises where a source is located or emissions related activity is conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times (including all times in which the facility is in operation) any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit;

d. Sample or monitor at reasonable times substances or parameters to determine compliance with the permit or applicable requirements or ascertain the amounts and types of air pollutants discharged.

2.12. Emergency

2.12.1. An "emergency" means any situation arising from sudden and reasonable unforeseeable events beyond the control of the source, including acts of God, which situation requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission limitation under the permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by

DRAFT

improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.

2.12.2. Effect of any emergency. An emergency constitutes an affirmative defense to an action brought for noncompliance with such technology-based emission limitations if the conditions of Section 2.12.3 are met.

2.12.3. The affirmative defense of emergency shall be demonstrated through properly signed, contemporaneous operating logs, or other relevant evidence that:

a. An emergency occurred and that the permittee can identify the cause(s) of the emergency;

b. The permitted facility was at the time being properly operated;

c. During the period of the emergency the permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards, or other requirements in the permit; and

d. The permittee submitted notice of the emergency to the Secretary within one (1) working day of the time when emission limitations were exceeded due to the emergency and made a request for variance, and as applicable rules provide. This notice must contain a detailed description of the emergency, any steps taken to mitigate emissions, and corrective actions taken.

2.12.4. In any enforcement proceeding, the permittee seeking to establish the occurrence of an emergency has the burden of proof.

2.12.5 The provisions of this section are in addition to any emergency or upset provision contained in any applicable requirement.

2.13. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it should have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. However, nothing in this paragraph shall be construed as precluding consideration of a need to halt or reduce activity as a mitigating factor in determining penalties for noncompliance if the health, safety, or environmental impacts of halting or reducing operations would be more serious than the impacts of continued operations.

2.14. Suspension of Activities

In the event the permittee should deem it necessary to suspend, for a period in excess of sixty (60) consecutive calendar days, the operations authorized by this permit, the permittee shall notify the Secretary, in writing, within two (2) calendar weeks of the passing of the sixtieth (60) day of the suspension period.

2.15. Property Rights

This permit does not convey any property rights of any sort or any exclusive privilege.

DRAFT

2.16. Severability

The provisions of this permit are severable and should any provision(s) be declared by a court of competent jurisdiction to be invalid or unenforceable, all other provisions shall remain in full force and effect.

2.17. Transferability

This permit is transferable in accordance with the requirements outlined in Section 10.1 of 45CSR13. **[45CSR§13-10.1.]**

2.18. Notification Requirements

The permittee shall notify the Secretary, in writing, no later than thirty (30) calendar days after the actual startup of the operations authorized under this permit.

2.19. Credible Evidence

Nothing in this permit shall alter or affect the ability of any person to establish compliance with, or a violation of, any applicable requirement through the use of credible evidence to the extent authorized by law. Nothing in this permit shall be construed to waive any defense otherwise available to the permittee including, but not limited to, any challenge to the credible evidence rule in the context of any future proceeding.

DRAFT

3.0. Facility-Wide Requirements

3.1. Limitations and Standards

3.1.1. **Open burning.** The open burning of refuse by any person, firm, corporation, association or public agency is prohibited except as noted in 45CSR§6-3.1.
[45CSR§6-3.1.]

3.1.2. **Open burning exemptions.** The exemptions listed in 45CSR§6-3.1 are subject to the following stipulation: Upon notification by the Secretary, no person shall cause, suffer, allow or permit any form of open burning during existing or predicted periods of atmospheric stagnation. Notification shall be made by such means as the Secretary may deem necessary and feasible.
[45CSR§6-3.2.]

3.1.3. **Asbestos.** The permittee is responsible for thoroughly inspecting the facility, or part of the facility, prior to commencement of demolition or renovation for the presence of asbestos and complying with 40 C.F.R. § 61.145, 40 C.F.R. § 61.148, and 40 C.F.R. § 61.150. The permittee, owner, or operator must notify the Secretary at least ten (10) working days prior to the commencement of any asbestos removal on the forms prescribed by the Secretary if the permittee is subject to the notification requirements of 40 C.F.R. § 61.145(b)(3)(i). The USEPA, the Division of Waste Management, and the Bureau for Public Health - Environmental Health require a copy of this notice to be sent to them.
[40CFR§61.145(b) and 45CSR§34]

3.1.4. **Odor.** No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.
[45CSR§4-3.1] ***[State Enforceable Only]***

3.1.5. **Permanent shutdown.** A source which has not operated at least 500 hours in one 12-month period within the previous five (5) year time period may be considered permanently shutdown, unless such source can provide to the Secretary, with reasonable specificity, information to the contrary. All permits may be modified or revoked and/or reapplication or application for new permits may be required for any source determined to be permanently shutdown.
[45CSR§13-10.5.]

3.1.6. **Standby plan for reducing emissions.** When requested by the Secretary, the permittee shall prepare standby plans for reducing the emissions of air pollutants in accordance with the objectives set forth in Tables I, II, and III of 45CSR11.
[45CSR§11-5.2.]

3.2. Monitoring Requirements

[Reserved]

3.3. Testing Requirements

3.3.1. **Stack testing.** As per provisions set forth in this permit or as otherwise required by the Secretary, in accordance with the West Virginia Code, underlying regulations, permits and orders, the permittee shall conduct test(s) to determine compliance with the emission limitations set forth in this permit and/or established or set forth in underlying documents. The Secretary, or his duly authorized representative, may at his option witness or conduct such test(s). Should the Secretary exercise his option to conduct such test(s), the operator shall provide all necessary sampling

DRAFT

connections and sampling ports to be located in such manner as the Secretary may require, power for test equipment and the required safety equipment, such as scaffolding, railings and ladders, to comply with generally accepted good safety practices. Such tests shall be conducted in accordance with the methods and procedures set forth in this permit or as otherwise approved or specified by the Secretary in accordance with the following:

a. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with 40 C.F.R. Parts 60, 61, and 63 in accordance with the Secretary's delegated authority and any established equivalency determination methods which are applicable. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4. or 45CSR§13-5.4 as applicable.

b. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with applicable requirements which do not involve federal delegation. In specifying or approving such alternative testing to the test methods, the Secretary, to the extent possible, shall utilize the same equivalency criteria as would be used in approving such changes under Section 3.3.1.a. of this permit. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4. or 45CSR§13-5.4 as applicable.

c. All periodic tests to determine mass emission limits from or air pollutant concentrations in discharge stacks and such other tests as specified in this permit shall be conducted in accordance with an approved test protocol. Unless previously approved, such protocols shall be submitted to the Secretary in writing at least thirty (30) days prior to any testing and shall contain the information set forth by the Secretary. In addition, the permittee shall notify the Secretary at least fifteen (15) days prior to any testing so the Secretary may have the opportunity to observe such tests. This notification shall include the actual date and time during which the test will be conducted and, if appropriate, verification that the tests will fully conform to a referenced protocol previously approved by the Secretary.

d. The permittee shall submit a report of the results of the stack test within sixty (60) days of completion of the test. The test report shall provide the information necessary to document the objectives of the test and to determine whether proper procedures were used to accomplish these objectives. The report shall include the following: the certification described in paragraph 3.5.1.; a statement of compliance status, also signed by a responsible official; and, a summary of conditions which form the basis for the compliance status evaluation. The summary of conditions shall include the following:

    1. The permit or rule evaluated, with the citation number and language;
    2. The result of the test for each permit or rule condition; and,
    3. A statement of compliance or noncompliance with each permit or rule condition.

[WV Code § 22-5-4(a)(14-15) and 45CSR13]

DRAFT

3.4. Recordkeeping Requirements

3.4.1. **Retention of records.** The permittee shall maintain records of all information (including monitoring data, support information, reports, and notifications) required by this permit recorded in a form suitable and readily available for expeditious inspection and review. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation. The files shall be maintained for at least five (5) years following the date of each occurrence, measurement, maintenance, corrective action, report, or record. At a minimum, the most recent two (2) years of data shall be maintained on site. The remaining three (3) years of data may be maintained off site, but must remain accessible within a reasonable time. Where appropriate, the permittee may maintain records electronically (on a computer, on computer floppy disks, CDs, DVDs, or magnetic tape disks), on microfilm, or on microfiche.

3.4.2. **Odors.** For the purposes of 45CSR4, the permittee shall maintain a record of all odor complaints received, any investigation performed in response to such a complaint, and any responsive action(s) taken.
[45CSR§4. *State Enforceable Only.*]

3.5. Reporting Requirements

3.5.1. **Responsible official.** Any application form, report, or compliance certification required by this permit to be submitted to the DAQ and/or USEPA shall contain a certification by the responsible official that states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

3.5.2. **Confidential information.** A permittee may request confidential treatment for the submission of reporting required by this permit pursuant to the limitations and procedures of W.Va. Code § 22-5-10 and 45CSR31.

3.5.3. **Correspondence.** All notices, requests, demands, submissions and other communications required or permitted to be made to the Secretary of DEP and/or USEPA shall be made in writing and shall be deemed to have been duly given when delivered by hand, or mailed first class or by private carrier with postage prepaid to the address(es), or submitted in electronic format by email as set forth below or to such other person or address as the Secretary of the Department of Environmental Protection may designate:

DAQ:
Director
WVDEP
Division of Air Quality
601 57th Street
Charleston, WV 25304-2345

DAQ Compliance and Enforcement[1]:
DAQAirQualityReports@wv.gov

US EPA:
Associate Director
Office of Air Enforcement and Compliance Assistance (3AP20)
U.S. Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

[1]For all self-monitoring reports (MACT, GACT, NSPS, etc.), stack tests and protocols, Notice of Compliance Status Reports, Initial Notifications, etc.

DRAFT

3.5.4. **Operating Fee**

3.5.4.1. In accordance with 45CSR30 – Operating Permit Program, the permittee shall submit a certified emissions statement and pay fees on an annual basis in accordance with the submittal requirements of the Division of Air Quality. A receipt for the appropriate fee shall be maintained on the premises for which the receipt has been issued, and shall be made immediately available for inspection by the Secretary or his/her duly authorized representative.

3.5.4.2. In accordance with 45CSR30 – Operating Permit Program, enclosed with this permit is a Certified Emissions Statement (CES) Invoice, from the date of initial startup through the following June 30. Said invoice and the appropriate fee shall be submitted to this office no later than 30 days prior to the date of initial startup. For any startup date other than July 1, the permittee shall pay a fee or prorated fee in accordance with Section 4.5 of 45CSR22. A copy of this schedule may be found attached to the Certified Emissions Statement (CES) Invoice.

3.5.5. **Emission inventory.** At such time(s) as the Secretary may designate, the permittee herein shall prepare and submit an emission inventory for the previous year, addressing the emissions from the facility and/or process(es) authorized herein, in accordance with the emission inventory submittal requirements of the Division of Air Quality. After the initial submittal, the Secretary may, based upon the type and quantity of the pollutants emitted, establish a frequency other than on an annual basis.

DRAFT

4.0. Source-Specific Requirements

4.1. Limitations and Standards

4.1.1. **Record of Monitoring.** The permittee shall keep records of monitoring information that include the following:

a. The date, place as defined in this permit, and time of sampling or measurements;
b. The date(s) analyses were performed;
c. The company or entity that performed the analyses;
d. The analytical techniques or methods used;
e. The results of the analyses; and
f. The operating conditions existing at the time of sampling or measurement.

4.1.2. **Minor Source of Hazardous Air Pollutants (HAP).** HAP emissions from the facility shall be less than 10 tons/year of any single HAP or 25 tons/year of any combination of HAPs. Compliance with this Section shall ensure that the facility is a minor HAP source.

4.1.3. **Operation and Maintenance of Air Pollution Control Equipment.** The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.
[45CSR§13-5.11.]

4.1.4. **Record of Malfunctions of Air Pollution Control Equipment.** For all air pollution control equipment listed in Section 1.0, the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:

a. The equipment involved.
b. Steps taken to minimize emissions during the event.
c. The duration of the event.
d. The estimated increase in emissions during the event.

For each such case associated with an equipment malfunction, the additional information shall also be recorded:

e. The cause of the malfunction.
f. Steps taken to correct the malfunction.
g. Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.

4.1.5. Only those emission units/sources as identified in Table 1.0, with the exception of any *de minimis* sources as identified under Table 45-13B of 45CSR13, are authorized at the permitted facility.

DRAFT

5.0. Source-Specific Requirements (Engines, Generator)

5.1. Limitations and Standards

5.1.1. Maximum emissions from each of the 2,500 hp natural gas fired reciprocating engines equipped with oxidation catalyst, Caterpillar G3608 (C-100 – C-1200) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	1.65	7.24
Carbon Monoxide	0.88	3.86
Volatile Organic Compounds (excludes formaldehyde)	1.49	6.52
Formaldehyde	0.11	0.48

5.1.2. Maximum emissions from the 649 hp natural gas fired generator, PSI Industrial (GEN1) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	1.43	6.27
Carbon Monoxide	2.86	12.53
Volatile Organic Compounds	1.00	4.39

5.1.3. The emission limitations specified in permit conditions 5.1.1 – 5.1.2 shall apply at all times except during periods of start-up and shut-down provided that the duration of these periods does not exceed 30 minutes per occurrence. The permittee shall operate the engines in a manner consistent with good air pollution control practices for minimizing emissions at all times, including periods of start-up and shut-down. The emissions from start-up and shut-down shall be included in the twelve (12) month rolling total of emissions. The permittee shall comply with all applicable start-up and shut-down requirements in accordance with 40 CFR Part 60, Subpars JJJJ and 40 CFR Part 63, Subpart ZZZZ.

5.1.4 Requirements for Use of Oxidation Catalyst Reduction Devices (1C-12C))

a. Lean-burn natural gas compressor engines (C-100 – C-1200) equipped with oxidation catalyst air pollution control devices shall be fitted with a closed-loop automatic air/fuel ratio feedback controller to ensure emissions of regulated pollutants do not exceed the emission limit listed in permit condition 5.1.1 for any engine/oxidation catalyst combination under varying load. The closed-loop, automatic air/fuel ratio controller shall control a fuel metering valve to ensure a lean-rich mixture.

b. For natural gas compressor engines (C-100 – C-1200), the permittee shall monitor the temperature to the inlet of the catalyst and in accordance with manufacturer's specifications; a high temperature alarm shall shut off the engine before thermal deactivation of the catalyst occurs. If the engine shuts off due to high temperature, the permittee shall also check for thermal deactivation of the catalyst before normal operations are resumed.

DRAFT

c. The permittee shall follow a written operation and maintenance plan that provides the periodic and annual maintenance requirements.

d. No person shall knowingly:

1. Remove or render inoperative any air pollution or auxiliary air pollution control device installed subject to the requirements of this permit;
2. Install any part or component when the principal effect of the part or component is to bypass, defeat or render inoperative any air pollution control device or auxiliary air pollution control device installed subject to the requirements of this permit; or
3. Cause or allow engine exhaust gases to bypass any catalytic reduction device.

5.2. Monitoring Requirements

5.2.1. Oxidization Catalyst Control Devices (1C-12C)

a. The permittee shall regularly inspect, properly maintain and/or replace catalytic reduction devices and auxiliary air pollution control devices to ensure functional and effective operation of the engine's physical and operational design. The permittee shall ensure proper operation, maintenance and performance of catalytic reduction devices and auxiliary air pollution control devices by:

1. Maintaining proper operation of the automatic air/fuel ratio controller or automatic feedback controller.
2. Following operating and maintenance recommendations of the catalyst element manufacturer.

5.3. Testing Requirements

5.3.1. See Facility-Wide Testing Requirements Section 3.3 and Testing Requirements of Sections 10.5, 11.2, and 11.3.

5.4. Recordkeeping Requirements

5.4.1. To demonstrate compliance with section 5.1.4 the permittee shall maintain records of all catalytic reduction device maintenance. Said records shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

5.5. Reporting Requirements

5.5.1. See Facility-Wide Reporting Requirements Section 3.5 and Reporting Requirements of Sections 10.6 and 11.4.

DRAFT

6.0. Source-Specific Hazardous Air Pollutant Requirements (Natural Gas Dehydration Units Not Subject to MACT Standards and being controlled by a Flare Control Device (AOS1) or Thermal Oxidizer Control Devices (AOS2))

Two (2) alternative operating scenarios (AOS) for the dehydrators will be permitted, but only one (1) shall be implemented. The permittee shall notify the DAQ per permit condition 2.18 of the selected control device. Furthermore, the permittee shall submit a Class I administrative update permit application to remove the unselected control device language.

AOS1, will consist of a flare (FLARE1) as follows.

Within the dehydrator unit, vent gas from the flash gas tank (DFLSH1 - DFLSH3) is routed to the reboiler (DREB1 - DREB3) and used as fuel. In the case where the flash tank gas cannot be used by the reboiler due to excess gas or the reboiler being offline, the gas will be sent to the VRUs (VRU-100 and VRU-200) via the storage tanks (T01 - T07) and thus controlled by 98%. Emissions from each reboiler are routed to the atmosphere. The dehydrator still vents are controlled by a flare with at least 98% control efficiency (FLARE1). Each still vent is also equipped with a BTEX condenser unit.

AOS2, will consist of three (3) thermal oxidizers (TO-1 - TO-3) as follows.

Within the dehydrator unit, both vent gas from the flash gas tank (DFLSH1 - DFLSH3) and vent gas from the still vents will be routed to a thermal oxidizer (TO-1 - TO-3) with a control efficiency of 98%. Each dehydrator will have a dedicated thermal oxidizer, but will not be equipped with a BTEX condenser unit. Emissions from each reboiler are routed to the atmosphere.

6.1. Limitations and Standards

6.1.1. **Maximum Throughput Limitation.** The maximum dry natural gas throughput to the TEG dehydration units/still columns (RSV-1, RSV-2) shall not exceed 110 million standard cubic feet per day (mmscfd) for each unit. Compliance with the Maximum Throughput Limitation shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the monthly throughput at any given time during the previous twelve consecutive calendar months.

6.1.2. Maximum emissions from the flare (31E) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Volatile Organic Compounds	3.93	17.16
Benzene	0.08	0.33
Total HAP	0.40	1.75

6.1.3. The flare subject to this section shall be designed and operated in accordance with the following:

a Flare shall be non-assisted.

b. Flare shall be designed for and operated with no visible emissions, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

c. Flare shall be operated, with a flame present at all times whenever emissions may be vented to them, except during SSM (Startup, Shutdown, Malfunctions) events.

DRAFT

d. A flare shall be used only where the net heating value of the gas being combusted is 11.2 MJ/scm (300 Btu/scf) or greater if the flare is steam-assisted or air-assisted; or where the net heating value of the gas being combusted is 7.45 MJ/scm (200 Btu/scf) or greater if the flares is non-assisted. The net heating value of the gas being combusted in a flare shall be calculated using the following equation:

$$H_T = K\sum_{i=1}^{n} C_i H_i$$

Where:

H_T=Net heating value of the sample, MJ/scm; where the net enthalpy per mole of off gas is based on combustion at 25 °C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20 °C.

K=Constant=

$$1.740\times10^{-7}\left(\frac{1}{ppmv}\right)\left(\frac{g\text{-mole}}{\text{scm}}\right)\left(\frac{\text{MJ}}{\text{kcal}}\right)$$

where the standard temperature for (g-mole/scm) is 20 °C.

C_i=Concentration of sample component i in ppmv on a wet basis, which may be measured for organics by Test Method 18, but is not required to be measured using Method 18 (unless designated by the Director).

H_i=Net heat of combustion of sample component i, kcal/g-mole at 25 °C and 760 mm Hg. The heats of combustion may be determined using ASTM D2382–76 or 88 or D4809–95 if published values are not available or cannot be calculated.

n=Number of sample components.

e. Nonassisted flares shall be designed for and operated with an exit velocity less than 18.3 m/sec (60 ft/sec), except as provided by 6.1.3.f and 6.1.3.g of this section. The actual exit velocity of a flare shall be determined by dividing by the volumetric flow rate of gas being combusted (in units of emission standard temperature and pressure), by the unobstructed (free) cross-sectional area of the flare tip, which may be determined by Test Method 2, 2A, 2C, or 2D in appendix A to 40 CFR part 60, as appropriate, but is not required to be determined using these Methods (unless designated by the Director).

f. Nonassisted flares designed for and operated with an exit velocity, as determined by the method specified in 6.1.3.e. of this section, equal to or greater than 18.3 m/sec (60 ft/sec) but less than 122 m/sec (400 ft/sec), are allowed if the net heating value of the gas being combusted is greater than 37.3 MJ/scm (1,000 Btu/scf).

g. Nonassisted flares designed for and operated with an exit velocity, as determined by the method specified in 6.1.3.e. of this section, less than the velocity V_{max}, as determined by the calculation specified in this paragraph, but less than 122 m/sec (400 ft/sec) are allowed. The maximum permitted velocity, V_{max}, for flares complying with this paragraph shall be determined by the following equation:

$$\text{Log}_{10}(V_{max})=(H_T+28.8)/31.7$$

Where:

V_{max}=Maximum permitted velocity, m/sec.

28.8=Constant.

31.7=Constant.

H_T=The net heating value as determined in 6.1.3.d of this section

6.1.4. The permittee is not required to conduct a flare compliance assessment for concentration of sample (i.e. Method 18) and tip velocity (i.e. Method 2) until such time as the Director requests a flare compliance assessment to be conducted in accordance with section 6.3.2, but the permittee is required to conduct a flare design evaluation in accordance with section 6.4.2. Alternatively, the

DRAFT

permittee may elect to demonstrate compliance with the flare design criteria requirements of section 6.1.3 by complying with the compliance assessment testing requirements of section 6.3.2.

6.1.5. Recycled reboilers controlling the Dehydrator Flash Tanks shall be designed and operated in accordance with the following:

a. The vapors/overheads from the flash tanks shall be routed through a closed vent system to the reboiler at all times when there is a potential that vapors (emissions) can be generated from the flash tank.

b. The reboiler shall only be fired with vapors from the flash tank, and natural gas may be used as supplemental fuel.

c. The vapors/overheads from the flash tank shall be introduced into the flame zone of the reboiler.

d. When the flash tank gas cannot be used by the reboiler due to excess gas or the reboiler is offline, the gas shall be sent to the vapor recovery units (VRU-100 and VRU-200) via the storage tanks to achieve a minimum control efficiency of 98%.

6.1.6. *Thermal Oxidizers (TO1 – TO3).* If the permittee utilizes a thermal oxidizer device, the permittee shall comply with the design and operating requirements below:

a. Vapors that are being controlled by the thermal oxidizers shall be routed to the thermal oxidizers at all times;

b. Thermal oxidizers shall be operated with a flame present at all times, as determined by the methods specified in permit condition 6.2.1;

c. Thermal oxidizers shall be operated according to the manufacturer's specifications for residence time and minimum combustion chamber temperature;

d. Thermal oxidizers shall be operated at all times when emissions are vented to them;

e. To ensure compliance with permit condition 6.1.6(d), the permittee shall monitor in accordance with section 6.2.1 of this permit.

f. Thermal oxidizers shall be designed for and operated with no visible emissions as determined by the methods specified in permit condition 6.3.1 except for periods not to exceed a total of 5 minutes during any 2 consecutive hours; and,

g. The permittee shall monitor the thermal oxidizer(s) to ensure that they are operated and maintained in conformance with their designs.

6.1.7. Maximum emissions from each of the thermal oxidizers (TO-1-TO-3) shall not exceed the following limits:

Pollutant	**Maximum Hourly Emissions (lb/hr)**	**Maximum Annual Emissions (ton/year)**
Volatile Organic Compounds	1.31	5.72
Benzene	0.08	0.33
Total HAP	0.40	1.75

DRAFT

6.2. Monitoring Requirements

6.2.1. To demonstrate compliance with the pilot flame requirements of permit conditions 6.1.3.c and 6.1.6.b, the presence of a pilot flame shall be continuously monitored using a thermocouple or any other equivalent device to detect the presence of a flame when emissions are vented to it. The pilot shall be equipped such that it sounds an alarm, or initiates notification via remote alarm to the nearest field office, when the pilot light is out.

6.2.2. The permittee shall monitor the throughput of dry natural gas fed to the dehydration system on a monthly basis for each glycol dehydration unit.

6.3. Testing Requirements

6.3.1. In order to demonstrate compliance with the flare opacity requirements of permit conditions 6.1.3.b and 6.1.6.f the permittee shall conduct a Method 22 opacity test for at least two hours. This test shall demonstrate no visible emissions are observed for more than a total of 5 minutes during any 2 consecutive hour period using 40CFR60 Appendix A Method 22. The permittee shall conduct this test within one (1) year of permit issuance or initial startup whichever is later. The visible emission checks shall determine the presence or absence of visible emissions. At a minimum, the observer must be trained and knowledgeable regarding the effects of background contrast, ambient lighting, observer position relative to lighting, wind, and the presence of uncombined water (condensing water vapor) on the visibility of emissions. This training may be obtained from written materials found in the References 1 and 2 from 40 CFR part 60, appendix A, Method 22 or from the lecture portion of 40 CFR part 60, appendix A, Method 9 certification course.

6.3.2. The Director may require the permittee to conduct a flare compliance assessment to demonstrate compliance with section 6.1.3. This compliance assessment testing shall be conducted in accordance with Test Method 18 for organics and Test Method 2, 2A, 2C, or 2D in appendix A to 40 CFR part 60, as appropriate, or other equivalent testing approved in writing by the Director. Also, Test Method 18 may require the permittee to conduct Test Method 4 in conjunction with Test Method 18.

6.3.3. In order to demonstrate compliance with the minor source status of hazardous air pollutants required by 4.1.2, upon request of the Director, the permittee shall demonstrate compliance with the HAP emissions thresholds using GLYCalc Version 3.0 or higher. The permittee shall sample in accordance with GPA Method 2166 and analyze the samples utilizing the extended GPA Method 2286 as specified in the GRI-GLYCalc V4 Technical Reference User Manual and Handbook.

6.3.4. Determination of glycol dehydration benzene emissions. In order to demonstrate that the benzene emissions are less than 1 tpy, the permittee shall determine the actual average benzene emissions using the procedure in the paragraph below. Emissions shall be determined either uncontrolled, or with federally enforceable controls in place.

The owner or operator shall determine actual average benzene or BTEX emissions using the model GRI-GLYCalc™, Version 3.0 or higher, and the procedures presented in the associated GRI-GLYCalc™ Technical Reference Manual. Inputs to the model shall be representative of actual operating conditions of the glycol dehydration unit and may be determined using the procedures documented in the Gas Research Institute (GRI) report entitled "Atmospheric Rich/Lean Method for Determining Glycol Dehydrator Emissions" (GRI-95/0368.1).
[§ 63.772 (b)(2)]

DRAFT

6.4. Recordkeeping Requirements

6.4.1. For the purpose of demonstrating compliance with section 6.1.3.c, 6.1.6.b and 6.2.1, the permittee shall maintain records of the times and duration of all periods which the pilot flame was absent.

6.4.2 For the purpose of demonstrating compliance with section 6.1.4 and 6.3.2, the permittee shall maintain a record of the flare design evaluation. The flare design evaluation shall include, net heat value calculations, exit (tip) velocity calculations, and all supporting concentration calculations and other related information requested by the Director.

6.4.3 For the purpose of demonstrating compliance with the requirements set forth in sections 6.1.3 and 6.3.3., the permittee shall maintain records of testing conducted in accordance with 6.3.3.

6.4.4. The permittee shall document and maintain the corresponding records specified by the on-going monitoring requirements of 6.2 and testing requirements of 6.3.

6.4.5. For the purpose of demonstrating compliance with section 6.1.3.b, the permittee shall maintain records of the visible emission opacity tests conducted per Section 6.3.1.

6.4.6. For the purpose of demonstrating compliance with the minor source status of hazardous air pollutants required by section 4.1.2, the permittee shall maintain a record of all potential to emit (PTE) HAP calculations for the entire affected facility. These records shall include the natural gas compressor engines and ancillary equipment.

6.4.7. The permittee shall maintain a record of the dry natural gas throughput through the dehydration system to demonstrate compliance with section 6.1.1.

6.4.8. To demonstrate that the permittee is exempt from the requirements of § 63.764 (d) if the actual average emissions of benzene from the glycol dehydration unit process vent to the atmosphere is less than 0.90 megagram per year (1 tpy), as determined by the procedures specified in § 63.772(b)(2) and section 6.3.4 of this permit, records of the actual average benzene emissions (in terms of benzene emissions per year) shall be maintained.
[§ 63.764(e)]

6.4.9. All records required under Section 6.4 shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

DRAFT

6.5. Reporting Requirements

6.5.1 If permittee is required by the Director to demonstrate compliance with section 6.3.3, then the permittee shall submit a testing protocol at least thirty (30) days prior to testing and shall submit a notification of the testing date at least fifteen (15) days prior to testing. The permittee shall submit the testing results within sixty (60) days of testing and provide all supporting calculations and testing data.

6.5.2. Any deviation(s) from the allowable visible emission requirement for any emission source discovered during observations using 40CFR Part 60, Appendix A, Method 9 or 22 shall be reported in writing to the Director of the Division of Air Quality as soon as practicable, but in any case within ten (10) calendar days of the occurrence and shall include at least the following information: the results of the visible determination of opacity of emissions, the cause or suspected cause of the violation(s), and any corrective measures taken or planned.

6.5.3. Any deviation(s) from the flare or thermal oxidizer design and operation criteria in permit conditions 6.1.3 and 6.1.6 shall be reported in writing to the Director of the Division of Air Quality as soon as practicable, but in any case within ten (10) calendar days of discovery of such deviation.

7.0. Source-Specific Requirements (Reboilers, Heater)

7.1. Limitations and Standards

7.1.1. Maximum Design Heat Input. The maximum design heat input (MDHI) shall not exceed the following:

Emission Unit ID#	Emission Unit Description	MDHI (MMBTU/hr)
RBV-1	Glycol Dehydration Reboiler	1.5
RBV-2	Glycol Dehydration Reboiler	1.5
FUEL1	Fuel Conditioning Heater	0.5

7.1.2. No person shall cause, suffer, allow or permit emission of smoke and/or particulate matter into the open air from any fuel burning unit which is greater than ten (10) percent opacity based on a six minute block average.
[45CSR§2-3.1.]

7.2. Monitoring Requirements

7.2.1. At such reasonable times as the Secretary may designate, the permittee shall conduct Method 9 emission observations for the purpose of demonstrating compliance with Section 7.1.2. Method 9 shall be conducted in accordance with 40 CFR 60 Appendix A.

7.3. Testing Requirements

7.3.1. Compliance with the visible emission requirements of section 7.1.2 shall be determined in accordance with 40 CFR Part 60, Appendix A, Method 9 or by using measurements from continuous opacity monitoring systems approved by the Director. The Director may require the installation, calibration, maintenance and operation of continuous opacity monitoring systems and may establish policies for the evaluation of continuous opacity monitoring results and the determination of compliance with the visible emission requirements of section 7.1.2. Continuous opacity monitors shall not be required on fuel burning units which employ wet scrubbing systems for emission control.
[45CSR§2-3.2.]

DRAFT

7.4. Recordkeeping Requirements

7.4.1. The permittee shall maintain records of all monitoring data required by Section 7.2.1 documenting the date and time of each visible emission check, the emission point or equipment/source identification number, the name or means of identification of the observer, the results of the check(s), whether the visible emissions are normal for the process, and, if applicable, all corrective measures taken or planned. The permittee shall also record the general weather conditions (i.e. sunny, approximately 80°F, 6 - 10 mph NE wind) during the visual emission check(s). Should a visible emission observation be required to be performed per the requirements specified in Method 9, the data records of each observation shall be maintained per the requirements of Method 9.

7.5. Reporting Requirements

7.5.1. Any deviation(s) from the allowable visible emission requirement for any emission source discovered during observations using 40CFR Part 60, Appendix A, Method 9 or 22 shall be reported in writing to the Director of the Division of Air Quality as soon as practicable, but in any case within ten (10) calendar days of the occurrence and shall include at least the following information: the results of the visible determination of opacity of emissions, the cause or suspected cause of the violation(s), and any corrective measures taken or planned.

8.0. Source-Specific Requirements (Storage Tanks)

8.1. Limitations and Standards

8.1.1. The permittee shall route all VOC and HAP emissions from the Storage Tanks (T01 – T07) to a vapor recovery system (VRU-100 and VRU-200), prior to release to the atmosphere. The vapor recovery system shall be designed to achieve a minimum guaranteed control efficiency of 98% for volatile organic compound (VOC) and hazardous air pollutants (HAP) emissions. Emissions from these tanks will be collected and compressed by the vapor recovery units (VRU-100 and VRU-200) whereby the vapors are sufficiently compressed to be introduced into the inlet gas line and processed with the inlet gas.

8.1.2. *Operation and Maintenance of Air Pollution Control Equipment.* The permittee shall, to the extent practicable, install, maintain, and operate the vapor recovery units (VRU-100 and VRU-200) and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.
[45CSR§13-5.11.]

8.1.3. The maximum annual throughput of product to the storage tanks shall not exceed the following:

Storage Tank ID	Storage Tank Size (bbl)	Product Stored	Maximum Annual Throughput (gal/yr)
T01, T02, T03	400 each	Condensate	4,599,000 (combined)
T04	500	Settling Tank (Condensate/ Produced Water)	5,978,700
T05, T06, T07	400 each	Produced Water	1,379,700 (combined)

DRAFT

8.1.4. Maximum emissions from the Settling Tank (T04) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Volatile Organic Compounds	1.64	7.18

8.1.5. In addition to the vapor recovery units (VRU-100 and VRU-200), the permittee shall utilize three (3) of the following requirements:

a. Install additional sensing equipment to monitor the run status of the vapor recovery units (VRU-100 and VRU-200).
b. Install a by-pass system which operates automatically whereby discharge is re-routed back to the inlet of the vapor recovery units (VRU-100 and VRU-200) until the appropriate pressure is built up for the compressor to turn on.
c. Install a blanket gas and have automatic throttling valves to ensure oxygen does not enter the tanks.
d. Install a compressor that has the ability to vary the drive.

8.1.6. Emissions from the Storage Tanks (T01-T07) that are recovered and routed to the vapor recovery units (VRU-100 and VRU-200) shall be designed and operated as specified in the paragraphs (a) through (c).

a. The cover and all openings on the cover (e.g., access hatches, sampling ports, pressure relief valves and gauge wells) shall form a continuous impermeable barrier over the entire surface area of the liquid in the storage vessel.

b. Each cover opening shall be secured in a closed, sealed position (e.g., covered by a gasketed lid or cap) whenever material is in the unit on which the cover is installed except during those times when it is necessary to use an opening as follows:

(i) To add material to, or remove material from the unit (this includes openings necessary to equalize or balance the internal pressure of the unit following changes in the level of the material in the unit);

(ii) To inspect or sample the material in the unit;

(iii) To inspect, maintain, repair, or replace equipment located inside the unit; or

(iv) To vent liquids, gases, or fumes from the unit through a closed-vent system designed and operated in accordance with the requirements 8.1.7 of this section to a control device.

c. Each Storage Tank (T01-T07) thief hatch shall be weighted and properly seated. You must select gasket material for the hatch based on composition of the fluid in the storage vessel and weather conditions.
[45CSR§13-5.11]

8.1.7. The facility shall comply with the closed vent system requirements for the Storage Tanks (T01-T07) as noted below.

a. You must design the closed vent system to route all gases, vapors, and fumes emitted from the material in the Storage Tanks (T01-T07) to the vapor recovery units (VRU-100 and VRU-200).

DRAFT

b. You must design and operate a closed vent system with no detectable emissions, as determined using olfactory, visual and auditory inspections.

c. You must meet the requirements specified in paragraphs (i) and (ii) of this section if the closed vent system contains one or more bypass devices that could be used to divert all or a portion of the gases, vapors, or fumes from entering the control device or to a process.

(i) Except as provided in paragraph (ii) of this section, you must comply with either paragraph (A) or (B) of this section for each bypass device.

A. You must properly install, calibrate, maintain, and operate a flow indicator at the inlet to the bypass device that could divert the stream away from the control device or process to the atmosphere that sounds an alarm, or initiates notification via remote alarm to the nearest field office, when the bypass device is open such that the stream is being, or could be diverted away from the control device or process to the atmosphere.

B. You must secure the bypass device valve installed at the inlet to the bypass device in the non-diverting position using a car-seal or a lock-and-key type configuration.

(ii) Low leg drains, high point bleeds, analyzer vents, open-ended valves or lines, and safety devices are not subject to the requirements of paragraph (i) of this section.
[45CSR§13-5.11]

8.2. Monitoring Requirements

8.2.1. The permittee shall monitor the throughput to the storage vessels (T01-T07) on a monthly basis.

8.2.2. To demonstrate compliance with section 8.1.1, the permittee shall monitor the vapor recovery units (VRU-100 and VRU-200) in accordance with the plans and specifications and manufacturer's recommendations.

8.2.3. To demonstrate compliance with the closed vent system requirements of Sections 8.1.6 and 8.1.7, the permittee shall:

a. Initial requirements. Conduct an initial visual, olfactory, and auditory inspection for defects that could result in air emissions within 180 days of start-up. Defects include, but are not limited to, visible cracks, holes, or gaps in piping; loose connections; liquid leaks; or broken or missing caps or other closure devices.

i. The annual inspection shall include the bypass inspection, conducted according to paragraph (c) of this section.

ii. In the event that a leak or defect is detected, you must repair the leak or defect as soon as practicable. Grease or another applicable substance must be applied to deteriorating or cracked gaskets to improve the seal while awaiting repair.

iii. Delay of repair of a closed vent system for which leaks or defects have been detected is allowed if the repair is technically infeasible without a shutdown, or if you determine that emissions resulting from immediate repair would be greater than the fugitive emission likely to result from delay of repair. You must complete repair of such equipment by the end of the next shutdown.

b. Continuous requirements. Conduct an annual visual, olfactory, and auditory inspection for defects that could result in air emissions. Defect include, but are not limited to, visible cracks,

DRAFT

holes, or gaps in piping, loose connections; liquid leaks; or broken or missing caps or other closure devices.

i. The annual inspection shall be conducted within 365 calendar days from the date of the previous inspection or earlier.
ii. The annual inspection shall include the bypass inspection, conducted according to paragraph (c) of this section.

c. Bypass inspection. Visually inspect the bypass valve during the initial and annual inspection for the presence of the car seal or lock-and-key type configuration to verify that the valve is maintained in the non-diverting position to ensure that the vent stream is not diverted through the bypass device. If an alternative method is used, conduct the inspection of the bypass as described in the operating procedures.

d. Unsafe to inspect requirements. You may designate any parts of the closed vent system as unsafe to inspect if the requirements in paragraphs (i) and (ii) of this section are met. Unsafe to inspect parts are exempt from the inspection requirements of paragraphs (a) and (b) of this section.

i. You determine that the equipment is unsafe to inspect because inspecting personnel would be exposed to an imminent or potential danger as a consequence of complying with the requirements.

ii. You have a written plan that requires inspection of the equipment as frequently as practicable during safe-to-inspect times.

e. Difficult to inspect requirements. You may designate any parts of the closed vent system as difficult to inspect, if the requirements in paragraphs (i) and (ii) of this section are met. Difficult to inspect parts are exempt from the inspection requirements of paragraphs (a) and (b) of this section.

i. You determine that the equipment cannot be inspected without elevating the inspecting personnel more than 2 meters above a support surface.

ii. You have a written plan that requires inspection of the equipment at least once every 5 years.

[45CSR§13-5.11]

8.3. Recordkeeping Requirements

8.3.1. All records required under Section 8.3 shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

8.3.2. *Record of Maintenance of VRU.* The permittee shall maintain accurate records of the vapor recovery units (VRU-100 and VRU-200) equipment inspection and/or preventative maintenance procedures.

8.3.3. *Record of Malfunctions of VRU.* The permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the vapor recovery units (VRU-100 and VRU-200) during which excess emissions occur. For each such case, the following information shall be recorded:

a. The equipment involved.

b. Steps taken to minimize emissions during the event.

c. The duration of the event.

d. The estimated increase in emissions during the event.

For each such case associated with an equipment malfunction, the additional information shall also be recorded:

e. The cause of the malfunction.

f. Steps taken to correct the malfunction.

g. Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.

8.3.4. To demonstrate compliance with section 8.1.3 and 8.1.4, the permittee shall maintain a record of the aggregate throughput for the storage tanks on a monthly and rolling twelve month total. Said records shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

8.3.5. The permittee shall maintain a copy all design records of the process, maintenance records of equipment and any downtime hours associated with the vapor recovery units (VRU-100 and VRU-200).

8.3.6. The permittee shall maintain records of the additional monitoring required in Section 8.1.5 to demonstrate compliance with the 98% control efficiency claimed and the Section 8.1.1.

8.3.7. To demonstrate compliance with the closed vent monitoring requirements, the following records shall be maintained.

i. The initial compliance requirements;

ii. Each annual visual inspection conducted to demonstrate continuous compliance, including records of any repairs that were made as results of the inspection;

iii. Bypass requirements.

a. Each inspection or each time the key is checked out or a record each time the alarm is sounded;

b. Each occurrence that the control device was bypassed. If the device was bypassed, the records shall include the date, time, and duration of the event and shall provide the reason the event occurred. The record shall also include the estimate of emissions that were released to the environment as a result of the bypass.

iv. Any part of the system that has been designated as "unsafe to inspect" in accordance with 8.2.3.d or "difficult to inspect" in accordance with 8.2.3.e.

[45CSR§13-5.11]

DRAFT

8.4. Reporting Requirements

8.4.1. Upon request by the Director, the permittee shall report deviations within a requested time from of any occurrences when the control device was operated outside of the parameters defined in the monitoring plan.

8.4.2. The permittee shall notify the Director of any downtime of the vapor recovery units (VRU-100 and VRU-200 in excess of 2%, based on the 12 month rolling total, in writing to the Director of the Division of Air Quality as soon as practicable, but within ten (10) calendar days of the discovery and shall include, at a minimum, the following information: the dates and durations of each downtime event, the cause or suspected causes for each downtime event, any corrective measures taken or planned for each downtime event.

9.0. Source-Specific Requirements (Product Loadout Rack)

9.1. Limitations and Standards

9.1.1. The maximum quantity of condensate that shall be loaded shall not exceed 4,599,000 gallons per year. Compliance with the Maximum Yearly Operation Limitation shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the condensate throughput at any given time during the previous twelve consecutive calendar months.

9.1.2. The maximum quantity of produced water that shall be loaded shall not exceed 1,379,700 gallons per year. Compliance with the Maximum Yearly Operation Limitation shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the produced water throughput at any given time during the previous twelve consecutive calendar months.

9.1.3. The permittee shall install, maintain, and operate all above-ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to prevent any substantive fugitive escape of regulated air pollutants. Any above-ground piping, valves, pumps, etc. that shows signs of excess wear and that have a reasonable potential for substantive fugitive emissions of regulated air pollutants shall be replaced.

9.1.4. The Condensate Truck Loading and Produced Water Truck Loading shall be operated in accordance with the plans and specifications filed in Permit Application R13-3354.

9.2. Monitoring Requirements

9.2.1. See Facility-Wide Monitoring Requirements Section 3.2.

9.3. Recordkeeping Requirements

9.3.1. All records required under Section 9.3 shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

9.3.2. To demonstrate compliance with section 9.1.1 and 9.1.2, the permittee shall maintain a record of the aggregate throughput for the product loadout rack (EPLOR) on a monthly and rolling twelve month total. Said records shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for

DRAFT

expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

9.4. Reporting Requirements

9.4.1. See Facility-Wide Reporting Requirements Section 3.5.

10.0. Source-Specific Requirements (40CFR60 Subpart JJJJ Requirements, C-100 – C-1200)

10.1. Limitations and Standards

10.1.1. The provisions of this subpart are applicable to owners, and operators of stationary spark ignition (SI) internal combustion engines (ICE) as specified below. For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

a. Owners and operators of stationary SI ICE that commence construction after June 12, 2006, where the stationary SI ICE are manufactured:

1. On or after July 1, 2007, for engines with a maximum engine power greater than or equal to 500 HP (except lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP);

2. *Reserved;*

3. on or after July 1, 2008, for engines with a maximum engine power less than 500 HP; or

4. *Reserved.*

b. Owners and operators of stationary SI ICE that commence modification or reconstruction after June 12, 2006.

[40CFR§60.4230(a)]

10.1.2. The provisions of this subpart are not applicable to stationary SI ICE being tested at an engine test cell/stand. **[40CFR§60.4230(b)]**

10.1.3. If you are an owner or operator of an area source subject to this subpart, you are exempt from the obligation to obtain a permit under 40 CFR part 70 or 40 CFR part 71, provided you are not required to obtain a permit under 40 CFR 70.3(a) or 40 CFR 71.3(a) for a reason other than your status as an area source under this subpart. Notwithstanding the previous sentence, you must continue to comply with the provisions of this subpart as applicable. **[40CFR§60.4230(c)]**

10.1.4. Stationary SI ICE may be eligible for exemption from the requirements of this subpart as described in 40 CFR part 1068, subpart C (or the exemptions described in 40 CFR parts 90 and 1048, for engines that would need to be certified to standards in those parts), except that owners and operators, as well as manufacturers, may be eligible to request an exemption for national security. **[40CFR§60.4230(e)]**

10.1.5. Owners and operators of facilities with internal combustion engines that are acting as temporary replacement units and that are located at a stationary source for less than 1 year and that have been properly certified as meeting the standards that would be applicable to such engine under the appropriate nonroad engine provisions, are not required to meet any other provisions under this subpart with regard to such engines. **[40CFR§60.4230(f)]**

DRAFT

10.2. Emission Standards for Owners and Operators

10.2.1. Owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 75 KW (100 HP) (except gasoline and rich burn engines that use LPG) must comply with the emission standards in Table 1 to this subpart for their stationary SI ICE. For owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 100 HP (except gasoline and rich burn engines that use LPG) manufactured prior to January 1, 2011 that were certified to the certification emission standards in 40 CFR part 1048 applicable to engines that are not severe duty engines, if such stationary SI ICE was certified to a carbon monoxide (CO) standard above the standard in Table 1 to this subpart, then the owners and operators may meet the CO certification (not field testing) standard for which the engine was certified. **[40CFR§60.4233(e)]**

10.2.2. Owners and operators of stationary SI ICE that are required to meet standards that reference 40 CFR 1048.101 must, if testing their engines in use, meet the standards in that section applicable to field testing, except as indicated in paragraph (e) of this section. **[40CFR§60.4233(h)]**

10.2.3. Owners and operators of stationary SI ICE must operate and maintain stationary SI ICE that achieve the emission standards as required in §60.4233 over the entire life of the engine. **[40CFR§60.4234]**

10.3. Other Requirements for Owners and Operators

10.3.1. After July 1, 2010, owners and operators may not install stationary SI ICE with a maximum engine power of less than 500 HP that do not meet the applicable requirements in §60.4233. **[40CFR§60.4236(a)]**

10.3.2. After July 1, 2009, owners and operators may not install stationary SI ICE with a maximum engine power of greater than or equal to 500 HP that do not meet the applicable requirements in §60.4233, except that lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP that do not meet the applicable requirements in §60.4233 may not be installed after January 1, 2010. **[40CFR§60.4236(b)]**

10.3.3. For emergency stationary SI ICE with a maximum engine power of greater than 19 KW (25 HP), owners and operators may not install engines that do not meet the applicable requirements in §60.4233 after January 1, 2011. **[40CFR§60.4236(c)]**

10.3.4. In addition to the requirements specified in §§60.4231 and 60.4233, it is prohibited to import stationary SI ICE less than or equal to 19 KW (25 HP), stationary rich burn LPG SI ICE, and stationary gasoline SI ICE that do not meet the applicable requirements specified in paragraphs (a), (b), and (c) of this section, after the date specified in paragraph (a), (b), and (c) of this section. **[40CFR§60.4236(d)]**

10.3.5. The requirements of this section do not apply to owners and operators of stationary SI ICE that have been modified or reconstructed, and they do not apply to engines that were removed from one existing location and reinstalled at a new location. **[40CFR§60.4236(e)]**

10.3.6. Starting on January 1, 2011, if the emergency stationary SI internal combustion engine that is greater than or equal to 130 HP and less than 500 HP that was built on or after January 1, 2011, does not meet the standards applicable to non-emergency engines, the owner or operator must install a non-resettable hour meter. **[40CFR§60.4237(b)]**

DRAFT

10.4. Compliance Requirements for Owners and Operators

10.4.1. If you are an owner or operator of a stationary SI internal combustion engine and must comply with the emission standards specified in §60.4233(d) or (e), you must demonstrate compliance according to one of the methods specified in paragraphs (b)(1) and (2) of this section.

a. Purchasing an engine certified according to procedures specified in this subpart, for the same model year and demonstrating compliance according to one of the methods specified in paragraph (a) of this section.

b. Purchasing a non-certified engine and demonstrating compliance with the emission standards specified in §60.4233(d) or (e) and according to the requirements specified in §60.4244, as applicable, and according to paragraphs (b)(2)(i) and (ii) of this section.

1. If you are an owner or operator of a stationary SI internal combustion engine greater than 25 HP and less than or equal to 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test to demonstrate compliance.
2. If you are an owner or operator of a stationary SI internal combustion engine greater than 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test and conduct subsequent performance testing every 8,760 hours or 3 years, whichever comes first, thereafter to demonstrate compliance.

[40CFR§60.4243(b)]

10.4.2. If you are an owner or operator of a stationary SI internal combustion engine that must comply with the emission standards specified in §60.4233(f), you must demonstrate compliance according paragraph (b)(2)(i) or (ii) of this section, except that if you comply according to paragraph (b)(2)(i) of this section, you demonstrate that your non-certified engine complies with the emission standards specified in §60.4233(f). **[40CFR§60.4243(c)]**

10.4.3. Emergency stationary ICE may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. There is no time limit on the use of emergency stationary ICE in emergency situations. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. Emergency stationary ICE may operate up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity. For owners and operators of emergency engines, any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as permitted in this section, is prohibited. **[40CFR§60.4243(d)]**

10.4.4. Owners and operators of stationary SI natural gas fired engines may operate their engines using propane for a maximum of 100 hours per year as an alternative fuel solely during emergency operations, but must keep records of such use. If propane is used for more than 100 hours per year in an engine that is not certified to the emission standards when using propane, the owners and

DRAFT

operators are required to conduct a performance test to demonstrate compliance with the emission standards of §60.4233. **[40CFR§60.4243(e)]**

10.4.5. If you are an owner or operator of a stationary SI internal combustion engine that is less than or equal to 500 HP and you purchase a non-certified engine or you do not operate and maintain your certified stationary SI internal combustion engine and control device according to the manufacturer's written emission-related instructions, you are required to perform initial performance testing as indicated in this section, but you are not required to conduct subsequent performance testing unless the stationary engine is rebuilt or undergoes major repair or maintenance. A rebuilt stationary SI ICE means an engine that has been rebuilt as that term is defined in 40 CFR 94.11(a). **[40CFR§60.4243(f)]**

10.4.6. It is expected that air-to-fuel ratio controllers will be used with the operation of three-way catalysts/non-selective catalytic reduction. The AFR controller must be maintained and operated appropriately in order to ensure proper operation of the engine and control device to minimize emissions at all times. **[40CFR§60.4243(g)]**

10.4.7. If you are an owner/operator of an stationary SI internal combustion engine with maximum engine power greater than or equal to 500 HP that is manufactured after July 1, 2007 and before July 1, 2008, and must comply with the emission standards specified in sections 60.4233(b) or (c), you must comply by one of the methods specified in paragraphs (h)(1) through (h)(4) of this section.

a. Purchasing an engine certified according to 40 CFR part 1048. The engine must be installed and configured according to the manufacturer's specifications.

b. Keeping records of performance test results for each pollutant for a test conducted on a similar engine. The test must have been conducted using the same methods specified in this subpart and these methods must have been followed correctly.

c. Keeping records of engine manufacturer data indicating compliance with the standards.

d. Keeping records of control device vendor data indicating compliance with the standards.

[40CFR§60.4243(h)]

10.5. Testing Requirements for Owners and Operators

10.5.1. Owners and operators of stationary SI ICE who conduct performance tests must follow the procedures in paragraphs (a) through (f) of this section.

a. Each performance test must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and according to the requirements in §60.8 and under the specific conditions that are specified by Table 2 to this subpart. **[40CFR§60.4244(a)]**

b. You may not conduct performance tests during periods of startup, shutdown, or malfunction, as specified in §60.8(c). If your stationary SI internal combustion engine is non-operational, you do not need to startup the engine solely to conduct a performance test; however, you must conduct the performance test immediately upon startup of the engine. **[40CFR§60.4244(b)]**

c. You must conduct three separate test runs for each performance test required in this section, as specified in §60.8(f). Each test run must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and last at least 1 hour. **[40CFR§60.4244(c)]**

d. To determine compliance with the NO_X mass per unit output emission limitation, convert the concentration of NO_X in the engine exhaust using Equation 1 of this section:

$$ER = \frac{C_d \times 1.912 \times 10^{-3} \times Q \times T}{HP - hr} \quad \text{(Eq. 1)}$$

Where:
ER = Emission rate of NO_X in g/HP-hr.

C_d= Measured NO_X concentration in parts per million by volume (ppmv).

1.912×10^{-3} = Conversion constant for ppm NO_X to grams per standard cubic meter at 20 degrees Celsius.

Q = Stack gas volumetric flow rate, in standard cubic meter per hour, dry basis.

T = Time of test run, in hours.

HP-hr = Brake work of the engine, horsepower-hour (HP-hr).

[40CFR§60.4244(d)]

e. To determine compliance with the CO mass per unit output emission limitation, convert the concentration of CO in the engine exhaust using Equation 2 of this section:

$$ER = \frac{C_d \times 1.164 \times 10^{-3} \times Q \times T}{HP - hr} \quad \text{(Eq. 2)}$$

Where:
ER = Emission rate of CO in g/HP-hr.

C_d= Measured CO concentration in ppmv.

1.164×10^{-3} = Conversion constant for ppm CO to grams per standard cubic meter at 20 degrees Celsius.

Q = Stack gas volumetric flow rate, in standard cubic meters per hour, dry basis.

T = Time of test run, in hours.

HP-hr = Brake work of the engine, in HP-hr.

[40CFR§60.4244(e)]

f. For purposes of this subpart, when calculating emissions of VOC, emissions of formaldehyde should not be included. To determine compliance with the VOC mass per unit output emission limitation, convert the concentration of VOC in the engine exhaust using Equation 3 of this section:

$$ER = \frac{C_d \times 1.833 \times 10^{-3} \times Q \times T}{HP - hr} \quad \text{(Eq. 3)}$$

Where:
ER = Emission rate of VOC in g/HP-hr.

C_d= VOC concentration measured as propane in ppmv.

DRAFT

1.833×10^{-3} = Conversion constant for ppm VOC measured as propane, to grams per standard cubic meter at 20 degrees Celsius.

Q = Stack gas volumetric flow rate, in standard cubic meters per hour, dry basis.

T = Time of test run, in hours.

HP-hr = Brake work of the engine, in HP-hr.

[40CFR§60.4244(f)]

g. If the owner/operator chooses to measure VOC emissions using either Method 18 of 40 CFR part 60, appendix A, or Method 320 of 40 CFR part 63, appendix A, then it has the option of correcting the measured VOC emissions to account for the potential differences in measured values between these methods and Method 25A. The results from Method 18 and Method 320 can be corrected for response factor differences using Equations 4 and 5 of this section. The corrected VOC concentration can then be placed on a propane basis using Equation 6 of this section.

$$RF_i = \frac{C_{Mi}}{C_{Ai}} \qquad \text{(Eq. 4)}$$

Where:
RF_i= Response factor of compound i when measured with EPA Method 25A.

C_{Mi}= Measured concentration of compound i in ppmv as carbon.

C_{Ai}= True concentration of compound i in ppmv as carbon.

$$C_{icorr} = RF_i \times C_{imeas} \qquad \text{(Eq. 5)}$$

Where:
C_{icorr}= Concentration of compound i corrected to the value that would have been measured by EPA Method 25A, ppmv as carbon.

C_{imeas}= Concentration of compound i measured by EPA Method 320, ppmv as carbon.

$$C_{Peq} = 0.6098 \times C_{icorr} \qquad \text{(Eq. 6)}$$

Where:
C_{Peq}= Concentration of compound i in mg of propane equivalent per DSCM.

[40CFR§60.4244(g)]

10.6. Notification, Reports, and Records for Owners and Operators

10.6.1. Owners or operators of stationary SI ICE must meet the following notification, reporting and recordkeeping requirements.

a. Owners and operators of all stationary SI ICE must keep records of the information in paragraphs (a)(1) through (4) of this section.

DRAFT

1. All notifications submitted to comply with this subpart and all documentation supporting any notification.
2. Maintenance conducted on the engine.
3. If the stationary SI internal combustion engine is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards and information as required in 40 CFR parts 90 and 1048.
4. If the stationary SI internal combustion engine is not a certified engine or is a certified engine operating in a non-certified manner and subject to §60.4243(a)(2), documentation that the engine meets the emission standards.

[40CFR§60.4245(a)]

b. For all stationary SI emergency ICE greater than or equal to 500 HP manufactured on or after July 1, 2010, that do not meet the standards applicable to non-emergency engines, the owner or operator of must keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. For all stationary SI emergency ICE greater than or equal to 130 HP and less than 500 HP manufactured on or after July 1, 2011 that do not meet the standards applicable to non-emergency engines, the owner or operator of must keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. For all stationary SI emergency ICE greater than 25 HP and less than 130 HP manufactured on or after July 1, 2008, that do not meet the standards applicable to non-emergency engines, the owner or operator of must keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. The owner or operator must document how many hours are spent for emergency operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation. **[40CFR§60.4245(b)]**

c. Owners and operators of stationary SI ICE greater than or equal to 500 HP that have not been certified by an engine manufacturer to meet the emission standards in §60.4231 must submit an initial notification as required in §60.7(a)(1). The notification must include the information in paragraphs (c)(1) through (5) of this section.

1. Name and address of the owner or operator;
2. The address of the affected source;
3. Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;
4. Emission control equipment; and
5. Fuel used.

[40CFR§60.4245(c)]

d. Owners and operators of stationary SI ICE that are subject to performance testing must submit a copy of each performance test as conducted in §60.4244 within 60 days after the test has been completed. **[40CFR§60.4245(d)]**

DRAFT

11.0. Source-Specific Requirements (40CFR60 Subpart OOOOa Requirements, Reciprocating Compressor Engines (C-100 – C-1200))

11.1. Limitations and Standards

11.1.1. You must comply with the standards in paragraphs (a) through (d) of this section for each reciprocating compressor affected facility.

a. You must replace the reciprocating compressor rod packing according to either paragraph (a)(1) or (2) of this section, or you must comply with paragraph (a)(3) of this section.

1. On or before the compressor has operated for 26,000 hours. The number of hours of operation must be continuously monitored beginning upon initial startup of your reciprocating compressor affected facility, or the date of the most recent reciprocating compressor rod packing replacement, whichever is later.

2. Prior to 36 months from the date of the most recent rod packing replacement, or 36 months from the date of startup for a new reciprocating compressor for which the rod packing has not yet been replaced.

3. Collect the methane and VOC emissions from the rod packing using a rod packing emissions collection system that operates under negative pressure and route the rod packing emissions to a process through a closed vent system that meets the requirements of §60.5411a(a) and (d).

b. You must demonstrate initial compliance with standards that apply to reciprocating compressor affected facilities as required by §60.5410a(c).

c. You must demonstrate continuous compliance with standards that apply to reciprocating compressor affected facilities as required by §60.5415a(c).

d. You must perform the reporting as required by §60.5420a(b)(1) and (4) and the recordkeeping as required by §60.5420a(c)(3), (6) through (9), and (17), as applicable.

[40CFR§60.5385a]

11.2. Initial Compliance Demonstration

11.2.1. You must determine initial compliance with the standards for each affected facility using the requirements in paragraph (c) of this section. The initial compliance period begins on August 2, 2016 or upon initial startup, whichever is later, and ends no later than one year after the initial startup date for your affected facility or no later than one year after August 2, 2016. The initial compliance period may be less than one full year.

a. *NA.*

b. *NA.*

c. To achieve initial compliance with the standards for each reciprocating compressor affected facility you must comply with paragraphs (c)(1) through (4) of this section.

1. If complying with §60.5385a(a)(1) or (2), during the initial compliance period, you must continuously monitor the number of hours of operation or track the number of months since the last rod packing replacement.

DRAFT

2. If complying with §60.5385a(a)(3), you must operate the rod packing emissions collection system under negative pressure and route emissions to a process through a closed vent system that meets the requirements of §60.5411a(a) and (d).

3. You must submit the initial annual report for your reciprocating compressor as required in §60.5420a(b)(1) and (4).

4. You must maintain the records as specified in §60.5420a(c)(3) for each reciprocating compressor affected facility.

[40CFR§60.5410a]

11.3. Continuous Compliance Demonstration

11.3.1. For each reciprocating compressor affected facility complying with §60.5385a(a)(1) or (2), you must demonstrate continuous compliance according to paragraphs (1) through (3) of this section. For each reciprocating compressor affected facility complying with §60.5385a(a)(3), you must demonstrate continuous compliance according to paragraph (4) of this section.

1. You must continuously monitor the number of hours of operation for each reciprocating compressor affected facility or track the number of months since initial startup or the date of the most recent reciprocating compressor rod packing replacement, whichever is later.

2. You must submit the annual reports as required in §60.5420a(b)(1) and (4) and maintain records as required in §60.5420a(c)(3).

3. You must replace the reciprocating compressor rod packing on or before the total number of hours of operation reaches 26,000 hours or the number of months since the most recent rod packing replacement reaches 36 months.

4. You must operate the rod packing emissions collection system under negative pressure and continuously comply with the cover and closed vent requirements in §60.5416a(a) and (b). **[40CFR§60.5415a]**

11.4. Notification, Recordkeeping, and Reporting Requirements

11.4.1. You must submit the notifications according to paragraphs (a)(1) and (2) of this section if you own or operate one or more of the affected facilities specified in §60.5365a that was constructed, modified or reconstructed during the reporting period.
[40CFR§60.5420a(a)]

11.4.2. Reporting requirements. You must submit annual reports containing the information specified in paragraphs (b)(1) and (4) of this section to the Administrator and performance test reports as specified in paragraph (b)(9) of this section. You must submit annual reports following the procedure specified in paragraph (b)(11) of this section. The initial annual report is due no later than 90 days after the end of the initial compliance period as determined according to §60.5410a. Subsequent annual reports are due no later than same date each year as the initial annual report. If you own or operate more than one affected facility, you may submit one report for multiple affected facilities provided the report contains all of the information required as specified in paragraphs (b)(1) and (4) of this section. Annual reports may coincide with title V reports as long as all the required elements of the annual report are included. You may arrange with the Administrator a common schedule on which reports required by this part may be submitted as long as the schedule does not extend the reporting period.

(1) The general information specified in paragraphs (1)(i) through (iv) of this section.

(i) The company name, facility site name associated with the affected facility, US Well ID or US Well ID associated with the affected facility, if applicable, and address of the affected facility. If an address is not available for the site, include a description of the site location and provide the latitude and longitude coordinates of the site in decimal degrees to an accuracy and precision of five (5) decimals of a degree using the North American Datum of 1983.

(ii) An identification of each affected facility being included in the annual report.

(iii) Beginning and ending dates of the reporting period.

(iv) A certification by a certifying official of truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

(4) For each reciprocating compressor affected facility, the information specified in paragraphs (i) through (ii) of this section.

(i) The cumulative number of hours of operation or the number of months since initial startup or since the previous reciprocating compressor rod packing replacement, whichever is later. Alternatively, a statement that emissions from the rod packing are being routed to a process through a closed vent system under negative pressure.

(ii) Records of deviations specified in paragraph (c)(3)(iii) of this section that occurred during the reporting period.

[40CFR§60.5420a]

11.4.3. To demonstrate compliance with permit condition 12.1.1.d, the permittee shall maintain the reporting as reporting as required by §60.5420a(b)(1) and (4) and the recordkeeping as required by §60.5420a(c)(3), (6) through (9), and (17), as applicable.

12.0. Source-Specific Requirements (40CFR60 Subpart OOOOa Requirements, Fugitive Emission Components)

12.1. Limitations and Standards

12.1.1. For each affected facility under §60.5365a(j), you must reduce GHG (in the form of a limitation on emissions of methane) and VOC emissions by complying with the requirements of paragraphs (a) through (j) of this section. These requirements are independent of the closed vent system and cover requirements in §60.5411a.

(a) You must monitor all fugitive emission components, as defined in §60.5430a, in accordance with paragraphs (b) through (g) of this section. You must repair all sources of fugitive emissions in accordance with paragraph (h) of this section. You must keep records in accordance with paragraph (i) of this section and report in accordance with paragraph (j) of this section. For purposes of this section, fugitive emissions are defined as: Any visible emission from a fugitive emissions component observed using optical gas imaging or an instrument reading of 500 ppm or greater using Method 21.

(b) You must develop an emissions monitoring plan that covers the collection of fugitive emissions components at well sites and compressor stations within each company-defined area in accordance with paragraphs (c) and (d) of this section.

(c) Fugitive emissions monitoring plans must include the elements specified in paragraphs (c)(1) through (8) of this section, at a minimum.

(1) Frequency for conducting surveys. Surveys must be conducted at least as frequently as required by paragraphs (f) and (g) of this section.

(2) Technique for determining fugitive emissions (i.e., Method 21 at 40 CFR part 60, appendix A-7, or optical gas imaging).

(3) Manufacturer and model number of fugitive emissions detection equipment to be used.

(4) Procedures and timeframes for identifying and repairing fugitive emissions components from which fugitive emissions are detected, including timeframes for fugitive emission components that are unsafe to repair. Your repair schedule must meet the requirements of paragraph (h) of this section at a minimum.

(5) Procedures and timeframes for verifying fugitive emission component repairs.

(6) Records that will be kept and the length of time records will be kept.

(7) If you are using optical gas imaging, your plan must also include the elements specified in paragraphs (c)(7)(i) through (vii) of this section.

(i) Verification that your optical gas imaging equipment meets the specifications of paragraphs (c)(7)(i)(A) and (B) of this section. This verification is an initial verification and may either be performed by the facility, by the manufacturer, or by a third party. For the purposes of complying with the fugitives emissions monitoring program with optical gas imaging, a fugitive emission is defined as any visible emissions observed using optical gas imaging.

(A) Your optical gas imaging equipment must be capable of imaging gases in the spectral range for the compound of highest concentration in the potential fugitive emissions.

(B) Your optical gas imaging equipment must be capable of imaging a gas that is half methane, half propane at a concentration of 10,000 ppm at a flow rate of ≤60g/hr from a quarter inch diameter orifice.

(ii) Procedure for a daily verification check.

(iii) Procedure for determining the operator's maximum viewing distance from the equipment and how the operator will ensure that this distance is maintained.

(iv) Procedure for determining maximum wind speed during which monitoring can be performed and how the operator will ensure monitoring occurs only at wind speeds below this threshold.

(v) Procedures for conducting surveys, including the items specified in paragraphs (c)(7)(v)(A) through (C) of this section.

(A) How the operator will ensure an adequate thermal background is present in order to view potential fugitive emissions.

(B) How the operator will deal with adverse monitoring conditions, such as wind.

(C) How the operator will deal with interferences (e.g., steam).

DRAFT

(vi) Training and experience needed prior to performing surveys.

(vii) Procedures for calibration and maintenance. At a minimum, procedures must comply with those recommended by the manufacturer.

(8) If you are using Method 21 of appendix A-7 of this part, your plan must also include the elements specified in paragraphs (c)(8)(i) and (ii) of this section. For the purposes of complying with the fugitive emissions monitoring program using Method 21 a fugitive emission is defined as an instrument reading of 500 ppm or greater.

(i) Verification that your monitoring equipment meets the requirements specified in Section 6.0 of Method 21 at 40 CFR part 60, appendix A-7. For purposes of instrument capability, the fugitive emissions definition shall be 500 ppm or greater methane using a FID-based instrument. If you wish to use an analyzer other than a FID-based instrument, you must develop a site-specific fugitive emission definition that would be equivalent to 500 ppm methane using a FID-based instrument (e.g., 10.6 eV PID with a specified isobutylene concentration as the fugitive emission definition would provide equivalent response to your compound of interest).

(ii) Procedures for conducting surveys. At a minimum, the procedures shall ensure that the surveys comply with the relevant sections of Method 21 at 40 CFR part 60, appendix A-7, including Section 8.3.1.

(d) Each fugitive emissions monitoring plan must include the elements specified in paragraphs (d)(1) through (4) of this section, at a minimum, as applicable.

(1) Sitemap.

(2) A defined observation path that ensures that all fugitive emissions components are within sight of the path. The observation path must account for interferences.

(3) If you are using Method 21, your plan must also include a list of fugitive emissions components to be monitored and method for determining location of fugitive emissions components to be monitored in the field (e.g. tagging, identification on a process and instrumentation diagram, etc.).

(4) Your plan must also include the written plan developed for all of the fugitive emission components designated as difficult-to-monitor in accordance with paragraph (g)(3)(i) of this section, and the written plan for fugitive emission components designated as unsafe-to-monitor in accordance with paragraph (g)(3)(ii) of this section.

(e) Each monitoring survey shall observe each fugitive emissions component, as defined in §60.5430a, for fugitive emissions.

(f)(1) You must conduct an initial monitoring survey within 60 days of the startup of production, as defined in §60.5430a, for each collection of fugitive emissions components at a new well site or by June 3, 2017, whichever is later. For a modified collection of fugitive emissions components at a well site, the initial monitoring survey must be conducted within 60 days of the first day of production for each collection of fugitive emission components after the modification or by June 3, 2017, whichever is later.

(2) You must conduct an initial monitoring survey within 60 days of the startup of a new compressor station for each new collection of fugitive emissions components at the new compressor station or by June 3, 2017, whichever is later. For a modified collection of

DRAFT

fugitive components at a compressor station, the initial monitoring survey must be conducted within 60 days of the modification or by June 3, 2017, whichever is later.

(g) A monitoring survey of each collection of fugitive emissions components at a well site or at a compressor station must be performed at the frequencies specified in paragraphs (g)(1) and (2) of this section, with the exceptions noted in paragraphs (g)(3) and (4) of this section.

(1) A monitoring survey of each collection of fugitive emissions components at a well site within a company-defined area must be conducted at least semiannually after the initial survey. Consecutive semiannual monitoring surveys must be conducted at least 4 months apart.

(2) A monitoring survey of the collection of fugitive emissions components at a compressor station within a company-defined area must be conducted at least quarterly after the initial survey. Consecutive quarterly monitoring surveys must be conducted at least 60 days apart.

(3) Fugitive emissions components that cannot be monitored without elevating the monitoring personnel more than 2 meters above the surface may be designated as difficult-to-monitor. Fugitive emissions components that are designated difficult-to-monitor must meet the specifications of paragraphs (g)(3)(i) through (iv) of this section.

(i) A written plan must be developed for all of the fugitive emissions components designated difficult-to-monitor. This written plan must be incorporated into the fugitive emissions monitoring plan required by paragraphs (b), (c), and (d) of this section.

(ii) The plan must include the identification and location of each fugitive emissions component designated as difficult-to-monitor.

(iii) The plan must include an explanation of why each fugitive emissions component designated as difficult-to-monitor is difficult-to-monitor.

(iv) The plan must include a schedule for monitoring the difficult-to-monitor fugitive emissions components at least once per calendar year.

(4) Fugitive emissions components that cannot be monitored because monitoring personnel would be exposed to immediate danger while conducting a monitoring survey may be designated as unsafe-to-monitor. Fugitive emissions components that are designated unsafe-to-monitor must meet the specifications of paragraphs (g)(4)(i) through (iv) of this section.

(i) A written plan must be developed for all of the fugitive emissions components designated unsafe-to-monitor. This written plan must be incorporated into the fugitive emissions monitoring plan required by paragraphs (b), (c), and (d) of this section.

(ii) The plan must include the identification and location of each fugitive emissions component designated as unsafe-to-monitor.

(iii) The plan must include an explanation of why each fugitive emissions component designated as unsafe-to-monitor is unsafe-to-monitor.

(iv) The plan must include a schedule for monitoring the fugitive emissions components designated as unsafe-to-monitor.

DRAFT

(5) The requirements of paragraph (g)(2) of this section are waived for any collection of fugitive emissions components at a compressor station located within an area that has an average calendar month temperature below 0°Fahrenheit for two of three consecutive calendar months of a quarterly monitoring period. The calendar month temperature average for each month within the quarterly monitoring period must be determined using historical monthly average temperatures over the previous three years as reported by a National Oceanic and Atmospheric Administration source or other source approved by the Administrator. The requirements of paragraph (g)(2) of this section shall not be waived for two consecutive quarterly monitoring periods.

(h) Each identified source of fugitive emissions shall be repaired or replaced in accordance with paragraphs (h)(1) and (2) of this section. For fugitive emissions components also subject to the repair provisions of §§60.5416a(b)(9) through (12) and (c)(4) through (7), those provisions apply instead to those closed vent system and covers, and the repair provisions of paragraphs (h)(1) and (2) of this section do not apply to those closed vent systems and covers.

(1) Each identified source of fugitive emissions shall be repaired or replaced as soon as practicable, but no later than 30 calendar days after detection of the fugitive emissions.

(2) If the repair or replacement is technically infeasible, would require a vent blowdown, a compressor station shutdown, a well shutdown or well shut-in, or would be unsafe to repair during operation of the unit, the repair or replacement must be completed during the next compressor station shutdown, well shutdown, well shut-in, after an unscheduled, planned or emergency vent blowdown or within 2 years, whichever is earlier.

(3) Each repaired or replaced fugitive emissions component must be resurveyed as soon as practicable, but no later than 30 days after being repaired, to ensure that there are no fugitive emissions.

(i) For repairs that cannot be made during the monitoring survey when the fugitive emissions are initially found, the operator may resurvey the repaired fugitive emissions components using either Method 21 or optical gas imaging within 30 days of finding such fugitive emissions.

(ii) For each repair that cannot be made during the monitoring survey when the fugitive emissions are initially found, a digital photograph must be taken of that component or the component must be tagged for identification purposes. The digital photograph must include the date that the photograph was taken, must clearly identify the component by location within the site (e.g., the latitude and longitude of the component or by other descriptive landmarks visible in the picture).

(iii) Operators that use Method 21 to resurvey the repaired fugitive emissions components are subject to the resurvey provisions specified in paragraphs (h)(3)(iii)(A) and (B) of this section.

(A) A fugitive emissions component is repaired when the Method 21 instrument indicates a concentration of less than 500 ppm above background or when no soap bubbles are observed when the alternative screening procedures specified in section 8.3.3 of Method 21 are used.

(B) Operators must use the Method 21 monitoring requirements specified in paragraph (c)(8)(ii) of this section or the alternative screening procedures specified in section 8.3.3 of Method 21.

(iv) Operators that use optical gas imaging to resurvey the repaired fugitive emissions components, are subject to the resurvey provisions specified in paragraphs (h)(3)(iv)(A) and (B) of this section.

(A) A fugitive emissions component is repaired when the optical gas imaging instrument shows no indication of visible emissions.

(B) Operators must use the optical gas imaging monitoring requirements specified in paragraph (c)(7) of this section.

(i) Records for each monitoring survey shall be maintained as specified §60.5420a(c)(15).

(j) Annual reports shall be submitted for each collection of fugitive emissions components at a well site and each collection of fugitive emissions components at a compressor station that include the information specified in §60.5420a(b)(7). Multiple collection of fugitive emissions components at a well site or at a compressor station may be included in a single annual report.

12.2. Initial Compliance Demonstration

12.2.1. You must determine initial compliance with the standards for each affected facility using the requirements in paragraphs (a) through (j) of this section. The initial compliance period begins on August 2, 2016, or upon initial startup, whichever is later, and ends no later than 1 year after the initial startup date for your affected facility or no later than 1 year after August 2, 2016. The initial compliance period may be less than one full year.
[40 C.F.R. § 60.5410a]

12.2.2. To achieve initial compliance with the fugitive emission standards for each collection of fugitive emissions components at a well site and each collection of fugitive emissions components at a compressor station, you must comply with paragraphs (j)(1) through (5) of this section.

(1) You must develop a fugitive emissions monitoring plan as required in §60.5397a(b)(c), and (d).

(2) You must conduct an initial monitoring survey as required in §60.5397a(f).

(3) You must maintain the records specified in §60.5420a(c)(15).

(4) You must repair each identified source of fugitive emissions for each affected facility as required in §60.5397a(h).

(5) You must submit the initial annual report for each collection of fugitive emissions components at a well site and each collection of fugitive emissions components at a compressor station compressor station as required in §60.5420a(b)(1) and (7).
[40 C.F.R. § 60.5410a(j)]

12.3. Continuous Compliance Demonstration

12.3.1. For each collection of fugitive emissions components at a well site and each collection of fugitive emissions components at a compressor station, you must demonstrate continuous compliance with the fugitive emission standards specified in §60.5397a according to paragraphs (h)(1) through (4) of this section.

(1) You must conduct periodic monitoring surveys as required in §60.5397a(g).

(2) You must repair or replace each identified source of fugitive emissions as required in §60.5397a(h).

(3) You must maintain records as specified in §60.5420a(c)(15).

(4) You must submit annual reports for collection of fugitive emissions components at a well site and each collection of fugitive emissions components at a compressor station as required in §60.5420a(b)(1) and (7).

[40 C.F.R. § 60.5415a(h)]

12.4. Notification, Recordkeeping and Reporting Requirements

12.4.1. You must submit the notifications according to paragraphs (a)(1) and (2) of this section if you own or operate one or more of the affected facilities specified in §60.5365a that was constructed, modified or reconstructed during the reporting period.

(1) If you own or operate an affected facility that is the group of all equipment within a process unit at an onshore natural gas processing plant, or a sweetening unit at an onshore natural gas processing plant, you must submit the notifications required in §60.7(a)(1), (3), and (4). If you own or operate a well, centrifugal compressor, reciprocating compressor, pneumatic controller, pneumatic pump, storage vessel, or collection of fugitive emissions components at a well site or collection of fugitive emissions components at a compressor station, you are not required to submit the notifications required in §60.7(a)(1), (3), and (4).

[40 C.F.R. § 60.5420a(a)]

12.4.2. *Reporting requirements.* You must submit annual reports containing the information specified in paragraphs (b)(1) through (8) and (12) of this section and performance test reports as specified in paragraph (b)(9) or (10) of this section, if applicable. You must submit annual reports following the procedure specified in paragraph (b)(11) of this section. The initial annual report is due no later than 90 days after the end of the initial compliance period as determined according to §60.5410a. Subsequent annual reports are due no later than same date each year as the initial annual report. If you own or operate more than one affected facility, you may submit one report for multiple affected facilities provided the report contains all of the information required as specified in paragraphs (b)(1) through (8) of this section. Annual reports may coincide with title V reports as long as all the required elements of the annual report are included. You may arrange with the Administrator a common schedule on which reports required by this part may be submitted as long as the schedule does not extend the reporting period.

(1) The general information specified in paragraphs (b)(1)(i) through (iv) of this section for all reports.

(i) The company name, facility site name associated with the affected facility, US Well ID or US Well ID associated with the affected facility, if applicable, and address of the affected facility. If an address is not available for the site, include a description of the site location and provide the latitude and longitude coordinates of the site in decimal degrees to an accuracy and precision of five (5) decimals of a degree using the North American Datum of 1983.

(ii) An identification of each affected facility being included in the annual report.

(iii) Beginning and ending dates of the reporting period.

(iv) A certification by a certifying official of truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

(7) For the collection of fugitive emissions components at each well site and the collection of fugitive emissions components at each compressor station within the company-defined area, the records of each monitoring survey including the information specified in paragraphs (b)(7)(i) through (xii) of this section. For the collection of fugitive emissions components at a compressor station, if a monitoring survey is waived under §60.5397a(g)(5), you must include

DRAFT

in your annual report the fact that a monitoring survey was waived and the calendar months that make up the quarterly monitoring period for which the monitoring survey was waived.

(i) Date of the survey.
(ii) Beginning and end time of the survey.
(iii) Name of operator(s) performing survey. If the survey is performed by optical gas imaging, you must note the training and experience of the operator.
(iv) Ambient temperature, sky conditions, and maximum wind speed at the time of the survey.
(v) Monitoring instrument used.
(vi) Any deviations from the monitoring plan or a statement that there were no deviations from the monitoring plan.
(vii) Number and type of components for which fugitive emissions were detected.
(viii) Number and type of fugitive emissions components that were not repaired as required in §60.5397a(h).
(ix) Number and type of difficult-to-monitor and unsafe-to-monitor fugitive emission components monitored.
(x) The date of successful repair of the fugitive emissions component.
(xi) Number and type of fugitive emission components placed on delay of repair and explanation for each delay of repair.
(xii) Type of instrument used to resurvey a repaired fugitive emissions component that could not be repaired during the initial fugitive emissions finding.

[40 C.F.R. § 60.5420a(b)]

12.4.3. *Recordkeeping requirements.* You must maintain the records identified as specified in §60.7(f) and in paragraphs (c)(1) through (16) of this section. All records required by this subpart must be maintained either onsite or at the nearest local field office for at least 5 years. Any records required to be maintained by this subpart that are submitted electronically via the EPA's CDX may be maintained in electronic format.

(15) For each collection of fugitive emissions components at a well site and each collection of fugitive emissions components at a compressor station, the records identified in paragraphs (c)(15)(i) through (iii) of this section.

(i) The fugitive emissions monitoring plan as required in §60.5397a(b), (c), and (d).

(ii) The records of each monitoring survey as specified in paragraphs (c)(15)(ii)(A) through (I) of this section.

(A) Date of the survey.

(B) Beginning and end time of the survey.

(C) Name of operator(s) performing survey. You must note the training and experience of the operator.

(D) Monitoring instrument used.

(E) When optical gas imaging is used to perform the survey, one or more digital photographs or videos, captured from the optical gas imaging instrument used for conduct of monitoring, of each required monitoring survey being performed. The digital photograph must include the date the photograph was taken and the latitude and longitude of the collection of fugitive emissions components at a well site or collection of fugitive emissions components at a compressor station imbedded within or stored with the digital file. As an alternative to imbedded latitude and longitude within the digital file, the digital photograph or video may consist of an image of the monitoring survey being performed

DRAFT

with a separately operating GPS device within the same digital picture or video, provided the latitude and longitude output of the GPS unit can be clearly read in the digital image.

(F) Fugitive emissions component identification when Method 21 is used to perform the monitoring survey.

(G) Ambient temperature, sky conditions, and maximum wind speed at the time of the survey.

(H) Any deviations from the monitoring plan or a statement that there were no deviations from the monitoring plan.

(I) Documentation of each fugitive emission, including the information specified in paragraphs (c)(15)(ii)(I)(1) through (12) of this section.

(1) Location.

(2) Any deviations from the monitoring plan or a statement that there were no deviations from the monitoring plan.

(3) Number and type of components for which fugitive emissions were detected.

(4) Number and type of difficult-to-monitor and unsafe-to-monitor fugitive emission components monitored.

(5) Instrument reading of each fugitive emissions component that requires repair when Method 21 is used for monitoring.

(6) Number and type of fugitive emissions components that were not repaired as required in §60.5397a(h).

(7) Number and type of components that were tagged as a result of not being repaired during the monitoring survey when the fugitive emissions were initially found as required in §60.5397a(h)(3)(ii).

(8) If a fugitive emissions component is not tagged, a digital photograph or video of each fugitive emissions component that could not be repaired during the monitoring survey when the fugitive emissions were initially found as required in §60.5397a(h)(3)(ii). The digital photograph or video must clearly identify the location of the component that must be repaired. Any digital photograph or video required under this paragraph can also be used to meet the requirements under paragraph (c)(15)(ii)(E) of this section, as long as the photograph or video is taken with the optical gas imaging instrument, includes the date and the latitude and longitude are either imbedded or visible in the picture.

(9) Repair methods applied in each attempt to repair the fugitive emissions components.

(10) Number and type of fugitive emission components placed on delay of repair and explanation for each delay of repair.

(11) The date of successful repair of the fugitive emissions component.

(12) Instrumentation used to resurvey a repaired fugitive emissions component that could not be repaired during the initial fugitive emissions finding.

(iii) For the collection of fugitive emissions components at a compressor station, if a monitoring survey is waived under §60.5397a(g)(5), you must maintain records of the average calendar

DRAFT

month temperature, including the source of the information, for each calendar month of the quarterly monitoring period for which the monitoring survey was waived.
[40 C.F.R. § 60.5420a(c)]

13.0. Source-Specific Requirements (40CFR63 Subpart ZZZZ Requirements, C-100 – C-1200)

13.1. Limitations and Standards

13.1.1. The permittee must comply with the applicable operating limitations in this section no later than October 19, 2013.
[40 C.F.R. § 63.6595(a)]

13.1.2. *Stationary RICE subject to Regulation under 40 CFR Part 60.* An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines. No further requirements apply for such engines under this part.

The permittee meets the criteria of paragraph (c)(1), which is for a new or reconstructed stationary RICE located at an area source. The permittee must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart JJJJ.
[40 C.F.R. § 63.6590(c)]

14.0. Source-Specific Requirements (Blowdown, Compressor Startup and Pigging Operations)

14.1. Limitations and Standards

14.1.1. The maximum number of blowdown events per year shall not exceed 936, with an estimated 2,020 scf per event. Compliance shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the blowdown events at any given time during the previous twelve consecutive calendar months.

14.1.2. The maximum number of compressor startup events per year shall not exceed 936, with an estimated 1,050 scf per event. Compliance shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the blowdown events at any given time during the previous twelve consecutive calendar months.

14.1.3. The maximum number of low pressure pigging events per year shall not exceed 395, with an estimated 516 scf per event. Compliance shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the low pressure pigging events at any given time during the previous twelve consecutive calendar months.

14.1.4. The maximum number of high pressure pigging events per year shall not exceed 520, with an estimated 2,801 scf per event. Compliance shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the high pressure pigging events at any given time during the previous twelve consecutive calendar months.

DRAFT

14.2. Recordkeeping Requirements

14.2.1. All records required under section 14.2 of this permit shall be shall be kept in accordance with permit condition 3.4.1.

14.2.2. To demonstrate compliance with permit conditions 14.1.1 – 14.1.4, the permittee shall maintain a record of the blowdown and pigging events and estimated volume per event (scf) on a monthly and rolling twelve month total.

14.3. Reporting Requirements

14.3.1. Any exceedance of permit conditions 14.1.1 – 14.1.4 must be reported in writing to the Director of the DAQ as soon as practicable, but within ten (10) calendar days, of the occurrence and shall include, at a minimum, the following information: the date of the exceedance, the estimate of VOC emissions released to the atmosphere as a result of the exceedance and any corrective measures taken or planned.

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CERTIFICATION OF DATA ACCURACY

I, the undersigned, hereby certify that, based on information and belief formed after reasonable inquiry, all information contained in the attached _____, representing the period beginning _____ and ending _____, and any supporting documents appended hereto, is true, accurate, and complete.

Signature[1] (please use blue ink) _____ Responsible Official or Authorized Representative _____ Date

Name & Title (please print or type) _____ Name _____ Title

Telephone No. _____ Fax No. _____

---

[1] This form shall be signed by a "Responsible Official." "Responsible Official" means one of the following:

a. For a corporation: The president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:

(i) the facilities employ more than 250 persons or have a gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), or

(ii) the delegation of authority to such representative is approved in advance by the Director;

b. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;

c. For a municipality, State, Federal, or other public entity: either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of U.S. EPA); or

d. The designated representative delegated with such authority and approved in advance by the Director.

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January 31, 2017

Antero Midstream Partners LP

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

RECEIVED
FEB 02 2017
WV DEP / DIV OF AIR QUALITY

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

Dear Mr. Williams:

Re: Original Affidavit of Publication
South Canton Compressor Station – Permit No. R13-3354

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

Sincerely,

Luz Slauter
Midstream Environmental & Regulatory Manager

Encl.

ID # 017-00163
Reg R13-3354
Company Antero Midstream
Facility South Canton Initials

NON-CONFIDENTIAL

The Doddridge Independent

The Doddridge Independent

PUBLISHER'S CERTIFICATE

I, Michael D. Zorn, Publisher of The Doddridge Independent, A newspaper of general circulation published in the town of West Union, Doddridge County, West Virginia, do hereby certify that:

Air Quality Permit Notice

Notice of Application
South Canton Compressor Station

Notice is given that Antero Midstream LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for an initial 45CSR13 construction permit application for a natural gas compressor station located 3 miles north of West Union in Doddridge County, West Virginia. The latitude and longitude coordinates are: 39.33420N, 80.80334W.

was published in The Doddridge Independent 1 time commencing on Friday, January 13, 2017 and Ending on Friday, January 13, 2017 at the request of:

Betsy McLaughlin
Antero Resources Corporation

Given under my hand this Tuesday, January 17, 2017

The publisher's fee for said publication is:

$ 44.25 1st Run/$ 0 Subsequent Runs
This Legal Ad Total: $ 44.25

Michael D. Zorn
Publisher of The Doddridge Independent

Subscribed to and sworn to before me on this date: 1 / 17 / 17

Notary Public in and for Doddridge County

My Commission expires on The 17th day of May 20 19

LEGAL ADVERTISEMENT

Air Quality Permit Notice

Notice of Application
South Canton Compressor Station

Notice is given that Antero Midstream LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for an initial 45CSR13 construction permit application for a natural gas compressor station located 3 miles north of West Union in Doddridge County, West Virginia. The latitude and longitude coordinates are: 39.33420N, 80.80334W.

Regulated Air Pollutant	Modified Potential Emissions (tons/yr)
Nitrogen Oxides (NOx)	101.47
Carbon Monoxide (CO)	90.52
Volatile Organic Compounds (VOC)	149.90
Sulfur Dioxide (SO2)	0.56
Particulate Matter less than 10 micrometers (PM10)	10.58
Particulate Matter less than 2.5 micrometers (PM2.5)	9.77
Total Hazardous Air Pollutants (HAPs)	20.98
Benzene	0.66
Toluene	1.03
Ethylbenzene	0.080
Xylenes	0.30
Formaldehyde	6.29
n-Hexane	2.02
Acetaldehyde	5.02
Acrolein	3.11
Methanol	1.56
Carbon Dioxide Equivalent (CO2e)	166,561

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

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.

Dated the 30th day of December 2016.

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

1/13

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WV DEP / DIV OF AIR QUALITY

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
PAMELA R. STINESPRING
P.O. BOX 61
WEST UNION, WV 26456
My Commission Expires May 17, 2019

Williams, Jerry

From: Elizabeth McLaughlin <emclaughlin@anteroresources.com>
Sent: Wednesday, February 1, 2017 12:42 PM
To: Williams, Jerry
Subject: RE: Antero Midstream- South Canton CS Updated Emissions
Attachments: 3608_Antero_South_Canto_2-1-17.pdf

Jerry,

Please see the attached updated EMIT spec sheet. Everything should match up with the permit application now. Please let me know if you need anything else.

Thanks,
Betsy

From: Elizabeth McLaughlin
Sent: Wednesday, February 01, 2017 8:57 AM
To: 'Williams, Jerry'
Subject: RE: Antero Midstream- South Canton CS Updated Emissions

Jerry,

Sorry about that. We only talked about CO while discussing this the other day so we only requested that the catalyst manufacturer update the CO emissions. I will reach out to them to see if we can get an updated spec sheet to include the higher HCHO as well.

Thanks,
Betsy

From: Williams, Jerry [mailto:Jerry.Williams@wv.gov]
Sent: Wednesday, February 01, 2017 5:47 AM
To: Elizabeth McLaughlin
Subject: RE: Antero Midstream- South Canton CS Updated Emissions

ID # 017-00163
Reg 1213-3374
Company Antero Midstream
Facility South Canton Initials JW

Betsy,

The Emit spec sheet you sent me yesterday has a VOC (excluding formaldehyde) rate of 0.27 g/bhp-hr (1.49 lb/hr) and a HCOH rate of 0.01 g/hp-hr (0.06 lb/hr) for a combined VOC (including formaldehyde) emission rate of 0.28 g/hp-hr (1.543 lb/hr).

However, the updated emission spreadsheets you sent me indicate a VOC (including formaldehyde) emission rate of 0.29 g/hp-hr (1.60 lb/hr) and a formaldehyde emission rate of 0.02 g/hp-hr (0.11 lb/hr). These numbers exceed the PTE of the EMIT spec sheet. Please provide an explanation of the difference.

Thanks
Jerry

From: Elizabeth McLaughlin [mailto:emclaughlin@anteroresources.com]
Sent: Tuesday, January 31, 2017 5:51 PM

NON-CONFIDENTIAL

To: Williams, Jerry <Jerry.Williams@wv.gov>
Subject: Antero Midstream- South Canton CS Updated Emissions

Jerry,

Please see the attached updated compressor engine emissions, as well as updated facility total emissions. Per our conversation, these updates now include HCHO in the VOC totals.

Please let me know if you need anything else.

Thanks,

Betsy McLaughlin
Air Quality Specialist

1615 Wynkoop Street
Denver, CO 80202
O: 303.357.6839
C: 303.396.9465

Prepared For:
Barry Schatz
Antero

Date: February 1, 2017

APPLICATION INFORMATION

DRIVER

Make:	Caterpillar
Model:	G3608 A4
Horsepower:	2500
RPM:	1000
Compression Ratio:	7.6
Exhaust Flow Rate:	16056
Exhaust Temperature:	827
Reference:	EM1410-03-001
Fuel:	Custom
Annual Operating Hours:	8760

UNCONTROLLED EMISSIONS DATA

	g/bhp-hr	lb/hr	Tons/Year
NO_x:	0.30	1.65	7.24
CO:	2.62	14.44	63.25
THC:	4.49	24.75	108.39
NMHC:	1.26	6.94	30.42
NMNEHC:	0.41	2.26	9.90
HCHO:	0.16	0.88	3.86
Oxygen:	11.60%		

CATALYST ELEMENT

Model:	RT-3615-H
Catalyst Type:	Oxidation, Premium
Substrate Type:	Brazed
Element Size:	Rectangle, 36" x 15" x 3.5"
Element Quantity:	5

POST CATALYST EMISSIONS DATA

	g/bhp-hr	lb/hr
NO_x:	Unaffected By Oxidation Catalyst	
CO	< 0.16	0.88
VOC	< 0.27	1.49
HCHO	< 0.02	0.11

EMIT Technologies, Inc.
772 Airfield Lane
Sheridan, WY. 82801

WARRANTY

EMIT Technologies,Inc. warrants that the goods supplied will be free from defects in workmanship by EMIT Technologies, Inc. for a period of one (1) year from date of shipment. EMIT Technologies, Inc. will not be responsible for any defects which result from improper use, neglect, failure to properly maintain or which are attributable to defects, errors or omissions in any drawings, specifications, plans or descriptions, whether written or oral, supplied to EMIT Technologies, Inc. by Buyer.

Catalyst performance using an EMIT Air/Fuel ratio controller is dependent upon properly defined set-points, variable with engine and fuel gas composition. Air/fuel ratio controller performance is guaranteed, but not limited, to fuel gas with an HHV content of 1400 BTU/SCF.

Catalyst performance will be guaranteed for a period of 1 year from installation, or 8760 operating hours, whichever comes first. The catalyst shall be operated with an automatic air/fuel ratio controller. The performance guarantee shall not cover the effects of excessive ash masking due to operation at low load, improper engine maintenance, or inappropriate lubrication oil. The performance guarantee shall not cover the effects of continuous engine misfires (cylinder or ignition) exposing the catalyst to excessive exothermic reaction temperatures.

Unless otherwise stated the exhaust temperature operating range at the converter inlet is 600°F minimum for oxidation catalyst and 750°F for NSCR catalyst and 1250°F maximum.

If a high temperature shut down switch is not installed, thermal deactivation of catalyst at temperatures above 1300 °F is not covered.

The catalyst conversion efficiencies (% reduction) will be guaranteed for engine loads of 50 to 100 percent.

Engine lubrication oil shall contain less than 0.6% ash (by weight) with a maximum allowable specific oil consumption of 0.01 gal/bhp-hr. The maximum ash loading on the catalyst shall be limited to 350 g/m3. Phosphorous and zinc additives are limited to 0.03% (by weight).

The catalyst must not be exposed to the following known poisoning agents, including: iron, nickel, sodium, chromium, arsenic, zinc, lead, phosphorous, silicon, potassium, magnesium, copper, tin, and mercury. Total poison concentrations in the gas are limited to 0.3 ppm.

Shipment - Promised shipping dates are approximate and are not guaranteed and are from the point of manufacture. EMIT Technologies,Inc. will not be liable for any loss, damage or delay in manufacture or delivery resulting from any cause beyond its control including, but not limited to a period equal to the time lost by reason of that delay. All products will be crated as per best practice to prevent any damage during shipment. Unless otherwise specified, Buyer will pay for any special packing and shipping requirements. Acceptance of goods by common carrier constitutes delivery to Buyer. EMIT Technologies,Inc. shall not be responsible for goods damaged or lost in transit.

Terms: Credit is extended to purchaser for net 30 time period. If payment is not received in the net 30 timeframe, interest on the unpaid balance will accrue at a rate of 1.5% per month from the invoice date.

Order Cancellation Terms: Upon cancellation of an order once submittal of a Purchase Order has occurred, the customer will pay a 25% restocking fee for Catalyst Housings, Catalyst Elements, and Air/Fuel Ratio Controllers; 50% restocking fee for Cooler Top Solutions,Exhaust System Accessories, and other Custom Built Products; 100% of all associated shipping costs incurred by EMIT; 100% of all project expenses incurred by EMIT for Field Services.

Williams, Jerry

From: Elizabeth McLaughlin <emclaughlin@anteroresources.com>
Sent: Tuesday, January 31, 2017 5:51 PM
To: Williams, Jerry
Subject: Antero Midstream- South Canton CS Updated Emissions
Attachments: DEN16O50645 - South Canton CS Emissions_rev1.pdf

Jerry,

Please see the attached updated compressor engine emissions, as well as updated facility total emissions. Per our conversation, these updates now include HCHO in the VOC totals.

Please let me know if you need anything else.

Thanks,

Betsy McLaughlin
Air Quality Specialist

1615 Wynkoop Street
Denver, CO 80202
O: 303.357.6839
C: 303.396.9465

ID # 017-00163
Reg R13-3354
Company Antero Midstream
Facility South Canton Initials JV

NON-CONFIDENTIAL

Compressor Engine Emission Calculations

Company:	**Antero Midstream LLC**
Facility Name:	**South Canton Compressor Station**
Facility Location:	**Doddridge County, West Virginia**
Source Description:	**Compressor Engines**
Emission Point IDs:	**1E through 12E**

Source Information-Per Engine

Emission Unit ID:	C-100 through C-1200	
Engine Make/Model	Caterpillar G3608	
Service	Compression	
Controls - Y or N / Type	Y	Oxidation
Site Horsepower Rating[1]	2,500	hp
Fuel Consumption (BSFC)[1]	6,850	Btu/(hp-hr)
Heat Rating[2]	17.13	MMBtu/hr
Fuel Consumption[2,3]	144.54	MMscf/yr
Fuel Consumption[1]	16,500	scf/hr
Fuel Heating Value	1,231	Btu/scf
Operating Hours	8,760	hrs/yr

Notes:

1. Values from Caterpillar specification sheet
2. Calculated values
3. Annual fuel consumption is 100% of maximum fuel consumption at 100% load.

Potential Emissions per Engine

	Uncontrolled					*Controlled*					
Pollutant	**Emission Factor**		**Estimated Emissions[2]**			**Emission Factor**		**Estimated Emissions[2]**			**Source of Emissions Factors**
	(lb/MMBtu)	(g/bhp-hr)	(lb/hr)	(lb/yr)	(tpy)	(lb/MMBtu)	(g/bhp-hr)	(lb/hr)	(lb/yr)	(tpy)	
NO_x[1,4]	---	0.30	1.65	---	7.24	---	0.30	1.65	---	7.24	Manufacturer's Specs - uncontrolled and controlled
CO[1,4]	---	2.62	14.44	---	63.25	---	0.16	0.88	---	3.86	Manufacturer's Specs - uncontrolled, see note 6 - controlled
VOC[1,4]	---	0.57	3.14	---	13.76	---	0.29	1.60	---	7.00	Manufacturer's Specs - uncontrolled, see note 6 - controlled
SO_2	5.88E-04	---	0.010	---	0.044	5.88E-04	---	0.010	---	0.044	AP-42, Chapter 3.2, Table 3.2-2
$PM_{2.5}/PM_{10}$	9.99E-03	---	0.17	---	0.75	9.99E-03	---	0.17	---	0.75	AP-42, Chapter 3.2, Table 3.2-2
Total PM	9.98E-03	---	0.17	---	0.75	9.98E-03	---	0.17	---	0.75	AP-42, Chapter 3.2, Table 3.2-2
1,3-Butadiene	2.67E-04	---	0.0046	40.05	0.020	1.36E-04	---	0.0023	20.38	0.010	AP-42, Chapter 3.2, Table 3.2-2 - uncontrolled, see note 5 - controlled
2-Methylnaphthalene	3.32E-05	---	0.00057	4.98	0.0025	3.32E-05	---	0.00057	4.98	0.0025	AP-42, Chapter 3.2, Table 3.2-2
2,2,4-Trimethylpentane	2.50E-04	---	0.0043	37.50	0.019	1.27E-04	---	0.0022	19.08	0.010	AP-42, Chapter 3.2, Table 3.2-2 - uncontrolled, see note 5 - controlled
Acenaphthene	1.25E-06	---	0.000021	0.19	0.000094	1.25E-06	---	0.000021	0.19	0.000094	AP-42, Chapter 3.2, Table 3.2-2
Acenaphthylene	5.53E-06	---	0.000095	0.83	0.00041	5.53E-06	---	0.000095	0.83	0.00041	AP-42, Chapter 3.2, Table 3.2-2
Acetaldehyde	8.36E-03	---	0.14	1,254	0.63	4.25E-03	---	0.073	638.1	0.32	AP-42, Chapter 3.2, Table 3.2-2 - uncontrolled, see note 5 - controlled
Acrolein	5.14E-03	---	0.088	771.1	0.39	2.62E-03	---	0.045	392.3	0.20	AP-42, Chapter 3.2, Table 3.2-2 - uncontrolled, see note 5 - controlled
Benzene	4.40E-04	---	0.0075	66.01	0.033	2.24E-04	---	0.0038	33.58	0.017	AP-42, Chapter 3.2, Table 3.2-2 - uncontrolled, see note 5 - controlled
Benzo(b)fluoranthene	1.66E-07	---	0.0000028	0.025	0.000012	1.66E-07	---	0.0000028	0.025	0.000012	AP-42, Chapter 3.2, Table 3.2-2
Benzo(e)pyrene	4.15E-07	---	0.0000071	0.062	0.000031	4.15E-07	---	0.0000071	0.062	0.000031	AP-42, Chapter 3.2, Table 3.2-2
Benzo(g,h,i)perylene	4.14E-07	---	0.0000071	0.062	0.000031	4.14E-07	---	0.0000071	0.062	0.000031	AP-42, Chapter 3.2, Table 3.2-2
Biphenyl	2.12E-04	---	0.0036	31.80	0.016	1.08E-04	---	0.0018	16.18	0.008	AP-42, Chapter 3.2, Table 3.2-2 - uncontrolled, see note 5 - controlled
Chrysene	6.93E-07	---	0.000012	0.10	0.000052	6.93E-07	---	0.000012	0.10	0.000052	AP-42, Chapter 3.2, Table 3.2-2
Ethylbenzene	3.97E-05	---	0.00068	5.96	0.0030	2.02E-05	---	0.00035	3.03	0.0015	AP-42, Chapter 3.2, Table 3.2-2 - uncontrolled, see note 5 - controlled
Fluoranthene	1.11E-06	---	0.000019	0.17	0.000083	1.11E-06	---	0.000019	0.17	0.000083	AP-42, Chapter 3.2, Table 3.2-2
Fluorene	5.67E-06	---	0.00010	0.85	0.00043	5.67E-06	---	0.00010	0.85	0.00043	AP-42, Chapter 3.2, Table 3.2-2
Formaldehyde[1]	---	0.16	0.88	7,725	3.86	---	0.020	0.11	965.6	0.48	Manufacturer's Specs - uncontrolled, see note 6 - controlled
Methanol	2.50E-03	---	0.043	375.0	0.19	1.27E-03	---	0.022	190.8	0.10	AP-42, Chapter 3.2, Table 3.2-2 - uncontrolled, see note 5 - controlled
Methylene Chloride	2.00E-05	---	0.00034	3.00	0.0015	1.02E-05	---	0.00017	1.53	0.0008	AP-42, Chapter 3.2, Table 3.2-2 - uncontrolled, see note 5 - controlled
n-Hexane	1.11E-03	---	0.019	166.5	0.083	5.65E-04	---	0.010	84.7	0.042	AP-42, Chapter 3.2, Table 3.2-2 - uncontrolled, see note 5 - controlled
Naphthalene	7.44E-05	---	0.0013	11.16	0.0056	3.79E-05	---	0.00065	5.68	0.0028	AP-42, Chapter 3.2, Table 3.2-2 - uncontrolled, see note 5 - controlled
PAH	2.69E-05	---	0.00046	4.04	0.0020	2.69E-05	---	0.00046	4.04	0.0020	AP-42, Chapter 3.2, Table 3.2-2
Phenanthrene	1.04E-05	---	0.00018	1.56	0.00078	1.04E-05	---	0.00018	1.56	0.00078	AP-42, Chapter 3.2, Table 3.2-2
Phenol	2.40E-05	---	0.00041	3.60	0.0018	1.22E-05	---	0.00021	1.83	0.0009	AP-42, Chapter 3.2, Table 3.2-2 - uncontrolled, see note 5 - controlled
Pyrene	1.36E-06	---	0.000023	0.20	0.00010	1.36E-06	---	0.000023	0.20	0.00010	AP-42, Chapter 3.2, Table 3.2-2
Tetrachloroethane	2.48E-06	---	0.000042	0.37	0.00019	1.26E-06	---	0.000022	0.19	0.00009	AP-42, Chapter 3.2, Table 3.2-2 - uncontrolled, see note 5 - controlled
Toluene	4.08E-04	---	0.0070	61.21	0.031	2.08E-04	---	0.0036	31.14	0.016	AP-42, Chapter 3.2, Table 3.2-2 - uncontrolled, see note 5 - controlled
Vinyl Chloride	1.49E-05	---	0.00026	2.24	0.0011	7.58E-06	---	0.00013	1.14	0.00057	AP-42, Chapter 3.2, Table 3.2-2 - uncontrolled, see note 5 - controlled
Xylenes	1.84E-04	---	0.0032	27.60	0.014	9.36E-05	---	0.0016	14.04	0.0070	AP-42, Chapter 3.2, Table 3.2-2 - uncontrolled, see note 5 - controlled
Other HAPs[2]	2.62E-04	---	0.0045	39.26	0.020	2.62E-04	---	0.0045	39.26	0.020	AP-42, Chapter 3.2, Table 3.2-2
Total HAPS			1.21	10,634	5.32			0.28	2,472	1.24	
Pollutant	**Emission Factor**		**Estimated Emissions[2]**			**Emission Factor**		**Estimated Emissions[2]**			**Source of Emissions Factors**
	(kg/MMBtu)	(g/bhp-hr)	(lb/hr)	(lb/yr)	(tpy)	(kg/MMBtu)	(g/bhp-hr)	(lb/hr)	(lb/yr)	(tpy)	
CO_2[1]	---	429	2,364	---	10,356	---	429	2,364	---	10,356	Manufacturer's Specs
CH_4[1,4]	---	3.23	17.80	---	77.97	---	3.23	17.80	---	77.97	Manufacturer's Specs - uncontrolled; THC minus NMHC emission factor
N_2O	0.0001	---	0.0038	---	0.017	0.0001	---	0.0038	---	0.017	40 CFR Part 98, Subpart C, Table C-2
CO_2e[2]	---	---	2,811	---	12,311	---	---	2,811	---	12,311	40 CFR Part 98, Subpart A, Table A-1, effective January 2014

Notes:

4. Annual Emissions are based on engines operating with 100% fuel of total fuel usage
5. Those HAPs that are also VOCs are assumed to be controlled by the same efficiency by the oxidation catalyst.
6. Due to variable load conditions, the catalyst reduction efficiencies used are typical based on expected operating conditions.

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Emissions Summary Total

Company:	**Antero Midstream LLC**
Facility Name:	**South Canton Compressor Station**
Facility Location:	**Doddridge County, West Virginia**

UNCONTROLLED POTENTIAL EMISSION SUMMARY

Source	NOx		CO		VOC		SO_2		PM-10		HAPs		Formaldehyde		CO_2e
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	tpy
Engines															
Compressor Engine 1	1.65	7.24	14.44	63.25	3.14	13.76	0.010	0.044	0.17	0.75	1.21	5.32	0.88	3.86	12,311
Compressor Engine 2	1.65	7.24	14.44	63.25	3.14	13.76	0.010	0.044	0.17	0.75	1.21	5.32	0.88	3.86	12,311
Compressor Engine 3	1.65	7.24	14.44	63.25	3.14	13.76	0.010	0.044	0.17	0.75	1.21	5.32	0.88	3.86	12,311
Compressor Engine 4	1.65	7.24	14.44	63.25	3.14	13.76	0.010	0.044	0.17	0.75	1.21	5.32	0.88	3.86	12,311
Compressor Engine 5	1.65	7.24	14.44	63.25	3.14	13.76	0.010	0.044	0.17	0.75	1.21	5.32	0.88	3.86	12,311
Compressor Engine 6	1.65	7.24	14.44	63.25	3.14	13.76	0.010	0.044	0.17	0.75	1.21	5.32	0.88	3.86	12,311
Compressor Engine 7	1.65	7.24	14.44	63.25	3.14	13.76	0.010	0.044	0.17	0.75	1.21	5.32	0.88	3.86	12,311
Compressor Engine 8	1.65	7.24	14.44	63.25	3.14	13.76	0.010	0.044	0.17	0.75	1.21	5.32	0.88	3.86	12,311
Compressor Engine 9	1.65	7.24	14.44	63.25	3.14	13.76	0.010	0.044	0.17	0.75	1.21	5.32	0.88	3.86	12,311
Compressor Engine 10	1.65	7.24	14.44	63.25	3.14	13.76	0.010	0.044	0.17	0.75	1.21	5.32	0.88	3.86	12,311
Compressor Engine 11	1.65	7.24	14.44	63.25	3.14	13.76	0.010	0.044	0.17	0.75	1.21	5.32	0.88	3.86	12,311
Compressor Engine 12	1.65	7.24	14.44	63.25	3.14	13.76	0.010	0.044	0.17	0.75	1.21	5.32	0.88	3.86	12,311
Fuel Conditioning Heater	0.049	0.21	0.041	0.18	0.0027	0.012	0.00029	0.0013	0.0037	0.016	0.00092	0.0040	0.000037	0.00016	257
Generator															
Natural Gas Generator	1.43	6.27	2.86	12.53	1.00	4.39	0.0032	0.014	0.11	0.47	0.18	0.78	0.11	0.50	2,841
Dehydrator															
TEG Dehydrator 1	---	---	---	---	65.28	285.93	---	---	---	---	6.25	27.39	---	---	14,701
TEG Dehydrator 2	---	---	---	---	65.28	285.93	---	---	---	---	6.25	27.39	---	---	14,701
TEG Dehydrator 3	---	---	---	---	65.28	285.93	---	---	---	---	6.25	27.39	---	---	14,701
Reboiler 1	0.15	0.64	0.12	0.54	0.0081	0.035	0.00088	0.0039	0.011	0.049	0.0028	0.012	0.00011	0.00048	771
Reboiler 2	0.15	0.64	0.12	0.54	0.0081	0.035	0.00088	0.0039	0.011	0.049	0.0028	0.012	0.00011	0.00048	771
Reboiler 3	0.15	0.64	0.12	0.54	0.0081	0.035	0.00088	0.0039	0.011	0.049	0.0028	0.012	0.00011	0.00048	771
Flare - AOS 1															
Flare 1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Thermal Oxidizers-AOS 2															
Thermal Oxidizer 1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Thermal Oxidizer 2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Thermal Oxidizer 3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Hydrocarbon Loading															
Truck Loadout	---	---	---	---	59.72	12.45	---	---	---	---	1.41	0.29	---	---	93
Venting Emissions															
Compressor Blowdown Emissions	---	---	---	---	---	8.44	---	---	---	---	---	0.17	---	---	791
Startup and Shutdown Emissions	---	---	---	---	---	5.28	---	---	---	---	---	0.11	---	---	495
Pigging Emissions	---	---	---	---	---	7.42	---	---	---	---	---	0.15	---	---	694
Fugitive Emissions															
Component Leak Emissions	---	---	---	---	2.04	8.94	---	---	---	---	0.044	0.19	---	---	177
Haul Road Dust Emissions	---	---	---	---	---	---	---	---	0.21	0.90	---	---	---	---	---
Storage Tanks															
Produced Water Tanks	---	---	---	---	0.00019	0.00083	---	---	---	---	7.60E-07	3.33E-06	---	---	0.06
Settler Tank	---	---	---	---	81.96	359.0	---	---	---	---	1.93	8.46	---	---	2,626
Condensate Tanks	---	---	---	---	3.15	13.79	---	---	---	---	0.08	0.33	---	---	11
Total Facility PTE under AOS 1 =	**21.76**	**95.32**	**176.55**	**773.31**	**381.44**	**1,442.72**	**0.13**	**0.56**	**2.40**	**10.52**	**36.98**	**156.52**	**10.70**	**46.85**	**202,130**
Total Facility PTE under AOS 2 =	**21.76**	**95.32**	**176.55**	**773.31**	**381.44**	**1,442.72**	**0.13**	**0.56**	**2.40**	**10.52**	**36.98**	**156.52**	**10.70**	**46.85**	**202,130**

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Emissions Summary Total

Company:	**Antero Midstream LLC**
Facility Name:	**South Canton Compressor Station**
Facility Location:	**Doddridge County, West Virginia**

CONTROLLED POTENTIAL EMISSION SUMMARY

Source	NOx		CO		VOC		SO_2		PM-10		HAPs		Formaldehyde		CO_2e
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	tpy
Engines															
Compressor Engine 1	1.65	7.24	0.88	3.86	1.60	7.00	0.010	0.044	0.17	0.75	0.28	1.24	0.11	0.48	12,311
Compressor Engine 2	1.65	7.24	0.88	3.86	1.60	7.00	0.010	0.044	0.17	0.75	0.28	1.24	0.11	0.48	12,311
Compressor Engine 3	1.65	7.24	0.88	3.86	1.60	7.00	0.010	0.044	0.17	0.75	0.28	1.24	0.11	0.48	12,311
Compressor Engine 4	1.65	7.24	0.88	3.86	1.60	7.00	0.010	0.044	0.17	0.75	0.28	1.24	0.11	0.48	12,311
Compressor Engine 5	1.65	7.24	0.88	3.86	1.60	7.00	0.010	0.044	0.17	0.75	0.28	1.24	0.11	0.48	12,311
Compressor Engine 6	1.65	7.24	0.88	3.86	1.60	7.00	0.010	0.044	0.17	0.75	0.28	1.24	0.11	0.48	12,311
Compressor Engine 7	1.65	7.24	0.88	3.86	1.60	7.00	0.010	0.044	0.17	0.75	0.28	1.24	0.11	0.48	12,311
Compressor Engine 8	1.65	7.24	0.88	3.86	1.60	7.00	0.010	0.044	0.17	0.75	0.28	1.24	0.11	0.48	12,311
Compressor Engine 9	1.65	7.24	0.88	3.86	1.60	7.00	0.010	0.044	0.17	0.75	0.28	1.24	0.11	0.48	12,311
Compressor Engine 10	1.65	7.24	0.88	3.86	1.60	7.00	0.010	0.044	0.17	0.75	0.28	1.24	0.11	0.48	12,311
Compressor Engine 11	1.65	7.24	0.88	3.86	1.60	7.00	0.010	0.044	0.17	0.75	0.28	1.24	0.11	0.48	12,311
Compressor Engine 12	1.65	7.24	0.88	3.86	1.60	7.00	0.010	0.044	0.17	0.75	0.28	1.24	0.11	0.48	12,311
Fuel Conditioning Heater	0.049	0.21	0.041	0.18	0.0027	0.012	0.00029	0.0013	0.0037	0.016	0.00092	0.0040	0.000037	0.00016	257
Generator															
Natural Gas Generator	1.43	6.27	2.86	12.53	1.00	4.39	0.00	0.01	0.11	0.47	0.18	0.78	0.11	0.50	2,841
Dehydrator															
TEG Dehydrator 1	---	---	---	---	1.31	5.72	---	---	---	---	0.13	0.55	---	---	305
TEG Dehydrator 2	---	---	---	---	1.31	5.72	---	---	---	---	0.13	0.55	---	---	305
TEG Dehydrator 3	---	---	---	---	1.31	5.72	---	---	---	---	0.13	0.55	---	---	305
Reboiler 1	0.15	0.64	0.12	0.54	0.0081	0.035	0.00088	0.0039	0.011	0.049	0.0028	0.012	0.00011	0.00048	771
Reboiler 2	0.15	0.64	0.12	0.54	0.0081	0.035	0.00088	0.0039	0.011	0.049	0.0028	0.012	0.00011	0.00048	771
Reboiler 3	0.15	0.64	0.12	0.54	0.0081	0.035	0.00088	0.0039	0.011	0.049	0.0028	0.012	0.00011	0.00048	771
Flare - AOS 1															
Flare 1	0.33	1.46	1.78	7.80	0.00033	0.0015	0.000036	0.00016	0.00046	0.0020	0.00011	0.00050	---	---	2,500
Thermal Oxidizers-AOS 2															
Thermal Oxidizer 1	0.47	2.05	2.27	9.95	0.0033	0.015	0.00036	0.0016	0.0046	0.020	0.0011	0.0050	---	---	3,401
Thermal Oxidizer 2	0.47	2.05	2.27	9.95	0.0033	0.015	0.00036	0.0016	0.0046	0.020	0.0011	0.0050	---	---	3,401
Thermal Oxidizer 3	0.47	2.05	2.27	9.95	0.0033	0.015	0.00036	0.0016	0.0046	0.020	0.0011	0.0050	---	---	3,401
Hydrocarbon Loading															
Truck Loadout	---	---	---	---	59.72	12.45	---	---	---	---	1.41	0.29	---	---	93
Venting Emissions															
Compressor Blowdown Emissions	---	---	---	---	---	8.44	---	---	---	---	---	0.17	---	---	791
Startup and Shutdown Emissions	---	---	---	---	---	5.28	---	---	---	---	---	0.11	---	---	495
Pigging Emissions	---	---	---	---	---	7.42	---	---	---	---	---	0.15	---	---	694
Fugitive Emissions															
Component Leak Emissions	---	---	---	---	2.04	8.94	---	---	---	---	0.044	0.19	---	---	177
Haul Road Dust Emissions	---	---	---	---	---	---	---	---	0.21	0.90	---	---	---	---	---
Storage Tanks															
Produced Water Tanks	---	---	---	---	3.78E-06	1.66E-05	---	---	---	---	1.52E-08	6.66E-08	---	---	0.0017
Settler Tank	---	---	---	---	1.64	7.18	---	---	---	---	0.039	0.17	---	---	53
Condensate Tanks	---	---	---	---	0.063	0.28	---	---	---	---	0.0015	0.007	---	---	0.23
Total Facility PTE under AOS 1 =	**22.09**	**96.77**	**15.64**	**68.49**	**87.59**	**155.66**	**0.13**	**0.56**	**2.40**	**10.52**	**5.44**	**18.39**	**1.44**	**6.29**	**158,857**
Total Facility PTE under AOS 2 =	**23.17**	**101.47**	**20.67**	**90.52**	**87.60**	**155.70**	**0.13**	**0.56**	**2.42**	**10.58**	**5.44**	**18.41**	**1.44**	**6.29**	**166,561**

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Williams, Jerry

From: Williams, Jerry
Sent: Tuesday, January 31, 2017 2:38 PM
To: 'wmcneilly@anteroresources.com'; Barry Schatz
Cc: McKeone, Beverly D
Subject: WV DAQ NSR Permit Application Complete for Antero Midstream, LLC - South Canton Compressor Station

RE: Application Status: Complete
Antero Midstream, LLC - South Canton Compressor Station
Permit Application R13-3354
Plant ID No. 017-00163

Mr. McNeilly,

Your application for a construction permit for a natural gas compressor station was received by this Division on January 6, 2017 and assigned to the writer for review. Upon review of said application, it was determined that the application was incomplete and additional information was requested. The requested information has been received, therefore, the statutory review period commenced on January 31, 2017.

In the case of this application, the agency believes it will take approximately 90 days to make a final permit determination.

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

Should you have any questions, please contact Jerry Williams at (304) 926-0499 ext. 1223 or reply to this email.

Jerry Williams, P.E.
Engineer
WVDEP – Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
(304) 926-0499 ext. 1223
jerry.williams@wv.gov

Please consider the environment before printing this email.

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Williams, Jerry

From: Elizabeth McLaughlin <emclaughlin@anteroresources.com>
Sent: Tuesday, January 31, 2017 12:56 PM
To: Williams, Jerry
Subject: Antero Midstream- South Canton Affidavit
Attachments: Antero Midstream- South Canton Affidavit.pdf

Dear Mr. Williams:

Re: Original Affidavit of Publication
South Canton Compressor Station- Permit No. R13-3354

Antero Midstream would like to submit the Original Affidavit of Publication (original sent via FedEx) from *The Doddridge Independent*. This is being submitted in accordance with a permit application requirement for an oil and gas facility.

Thanks,

Betsy McLaughlin
Air Quality Specialist

Antero

1615 Wynkoop Street
Denver, CO 80202
O: 303.357.6839
C: 303.396.9465

ID # 017-00163
Reg R13-3354
Company Antero Midstream
Facility South Canton Initials JW

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January 31, 2017

Antero Midstream Partners LP

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

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

Dear Mr. Williams:

Re: Original Affidavit of Publication
South Canton Compressor Station – Permit No. R13-3354

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

Sincerely,

Luz Slauter
Midstream Environmental & Regulatory Manager

Encl.

The Doddridge Independent

The Doddridge Independent
PUBLISHER'S CERTIFICATE

I, Michael D. Zorn, Publisher of The Doddridge Independent, A newspaper of general circulation published in the town of West Union, Doddridge County, West Virginia, do hereby certify that:

Air Quality Permit Notice

Notice of Application
South Canton Compressor Station

Notice is given that Antero Midstream LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for an initial 45CSR13 construction permit application for a natural gas compressor station located 3 miles north of West Union in Doddridge County, West Virginia. The latitude and longitude coordinates are: 39.33420N, 80.80334W.

was published in The Doddridge Independent
1 time commencing on Friday, January 13, 2017 and
Ending on Friday, January 13, 2017 at the request of:

Betsy McLaughlin
Antero Resources Corporation

Given under my hand this Tuesday, January 17, 2017

The publisher's fee for said publication is:
$ 44.25 1st Run/$ 0 Subsequent Runs
This Legal Ad Total: $ 44.25

Michael D. Zorn
Publisher of The Doddridge Independent

Subscribed to and sworn to before me on
this date: 1 / 17 / 17

Notary Public in and for Doddridge County

My Commission expires on
The 17th day of MAY 20 19

LEGAL ADVERTISEMENT

Air Quality Permit Notice

Notice of Application
South Canton Compressor Station

Notice is given that Antero Midstream LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for an initial 45CSR13 construction permit application for a natural gas compressor station located 3 miles north of West Union in Doddridge County, West Virginia. The latitude and longitude coordinates are: 39.33420N, 80.80334W.

Regulated Air Pollutant	Modified Potential Emissions (tons/yr)
Nitrogen Oxides (NOx)	101.47
Carbon Monoxide (CO)	90.52
Volatile Organic Compounds (VOC)	149.80
Sulfur Dioxide (SO2)	0.56
Particulate Matter less than 10 micrometers (PM10)	10.58
Particulate Matter less than 2.5 micrometers (PM2.5)	9.77
Total Hazardous Air Pollutants (HAPs)	20.98
Benzene	0.66
Toluene	1.03
Ethylbenzene	0.080
Xylenes	0.30
Formaldehyde	6.29
n-Hexane	2.02
Acetaldehyde	5.02
Acrolein	3.11
Methanol	1.56
Carbon Dioxide Equivalent (CO2e)	166,561

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

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.

Dated the 30th day of December 2016.

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

1/13

Williams, Jerry

From: Elizabeth McLaughlin <emclaughlin@anteroresources.com>
Sent: Monday, January 30, 2017 5:31 PM
To: Williams, Jerry
Cc: Barry Schatz
Subject: South Canton CS Catalyst Spec Sheets
Attachments: 3608_Antero_South_Canto_1-27-17.pdf

Jerry,

Please see the attached updated EMIT catalyst spec sheets for the South Canton Compressor Station. I contacted the newspaper and they had forgotten to send me the affidavit so they mailed that out to me on Friday. I will send that along as soon as I receive it. Please let me know if you need anything else or have any additional questions

Thanks,

Betsy McLaughlin
Air Quality Specialist

Antero Resources

1615 Wynkoop Street
Denver, CO 80202
O: 303.357.6839
C: 303.396.9465

ID # 017-00163
Reg 1213-3354
Company Antero Midstream
Facility South Canton Initials JW

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Prepared For:
Barry Schatz
Antero

Date: January 27, 2017

APPLICATION INFORMATION

DRIVER

Make:	Caterpillar
Model:	G3608 A4
Horsepower:	2500
RPM:	1000
Compression Ratio:	7.6
Exhaust Flow Rate:	16056
Exhaust Temperature:	827
Reference:	EM1410-03-001
Fuel:	Custom
Annual Operating Hours:	8760

UNCONTROLLED EMISSIONS DATA

	g/bhp-hr	lb/hr	Tons/Year
NO_x:	0.30	1.65	7.24
CO:	2.62	14.44	63.25
THC:	4.49	24.75	108.39
NMHC:	1.26	6.94	30.42
NMNEHC:	0.41	2.26	9.90
HCHO:	0.16	0.88	3.86
Oxygen:	11.60%		

CATALYST ELEMENT

Model:	RT-3615-H
Catalyst Type:	Oxidation, Premium
Substrate Type:	Brazed
Element Size:	Rectangle, 36" x 15" x 3.5"
Element Quantity:	5

POST CATALYST EMISSIONS DATA

	g/bhp-hr	lb/hr
NO_x:	Unaffected By Oxidation Catalyst	
CO	< 0.16	0.88
VOC	< 0.27	1.49
HCHO	< 0.01	0.06

EMIT Technologies, Inc.
772 Airfield Lane
Sheridan, WY. 82801

WARRANTY

EMIT Technologies,Inc. warrants that the goods supplied will be free from defects in workmanship by EMIT Technologies, Inc. for a period of one (1) year from date of shipment. EMIT Technologies, Inc. will not be responsible for any defects which result from improper use, neglect, failure to properly maintain or which are attributable to defects, errors or omissions in any drawings, specifications, plans or descriptions, whether written or oral, supplied to EMIT Technologies, Inc. by Buyer.

Catalyst performance using an EMIT Air/Fuel ratio controller is dependent upon properly defined set-points, variable with engine and fuel gas composition. Air/fuel ratio controller performance is guaranteed, but not limited, to fuel gas with an HHV content of 1400 BTU/SCF.

Catalyst performance will be guaranteed for a period of 1 year from installation, or 8760 operating hours, whichever comes first. The catalyst shall be operated with an automatic air/fuel ratio controller. The performance guarantee shall not cover the effects of excessive ash masking due to operation at low load, improper engine maintenance, or inappropriate lubrication oil. The performance guarantee shall not cover the effects of continuous engine misfires (cylinder or ignition) exposing the catalyst to excessive exothermic reaction temperatures.

Unless otherwise stated the exhaust temperature operating range at the converter inlet is 600°F minimum for oxidation catalyst and 750°F for NSCR catalyst and 1250°F maximum.

If a high temperature shut down switch is not installed, thermal deactivation of catalyst at temperatures above 1300 °F is not covered.

The catalyst conversion efficiencies (% reduction) will be guaranteed for engine loads of 50 to 100 percent.

Engine lubrication oil shall contain less than 0.6% ash (by weight) with a maximum allowable specific oil consumption of 0.01 gal/bhp-hr. The maximum ash loading on the catalyst shall be limited to 350 g/m3. Phosphorous and zinc additives are limited to 0.03% (by weight).

The catalyst must not be exposed to the following known poisoning agents, including: iron, nickel, sodium, chromium, arsenic, zinc, lead, phosphorous, silicon, potassium, magnesium, copper, tin, and mercury. Total poison concentrations in the gas are limited to 0.3 ppm.

Shipment - Promised shipping dates are approximate and are not guaranteed and are from the point of manufacture. EMIT Technologies,Inc. will not be liable for any loss, damage or delay in manufacture or delivery resulting from any cause beyond its control including, but not limited to a period equal to the time lost by reason of that delay. All products will be crated as per best practice to prevent any damage during shipment. Unless otherwise specified, Buyer will pay for any special packing and shipping requirements. Acceptance of goods by common carrier constitutes delivery to Buyer. EMIT Technologies,Inc. shall not be responsible for goods damaged or lost in transit.

Terms: Credit is extended to purchaser for net 30 time period. If payment is not received in the net 30 timeframe, interest on the unpaid balance will accrue at a rate of 1.5% per month from the invoice date.

Order Cancellation Terms: Upon cancellation of an order once submittal of a Purchase Order has occurred, the customer will pay a 25% restocking fee for Catalyst Housings, Catalyst Elements, and Air/Fuel Ratio Controllers; 50% restocking fee for Cooler Top Solutions,Exhaust System Accessories, and other Custom Built Products; 100% of all associated shipping costs incurred by EMIT; 100% of all project expenses incurred by EMIT for Field Services.

Williams, Jerry

From: Williams, Jerry
Sent: Friday, January 27, 2017 9:48 AM
To: 'wmcneilly@anteroresources.com'; 'Barry Schatz'
Cc: McKeone, Beverly D
Subject: WV DAQ Permit Application Incomplete for Antero Midstream LLC - South Canton Compressor Station

RE: Application Status: Incomplete
Antero Midstream LLC - South Canton Compressor Station
Permit Application No. R13-3354
Plant ID No. 017-00163

Mr. McNeilly,

Your application for a construction permit for a natural gas compressor station was received by this Division on January 6, 2017 and assigned to the writer for review. Upon initial review of said application, it has been determined that the application as submitted is incomplete based on the following items:

1. Failure to submit affidavit of publication for Class I legal advertisement.
2. The Caterpillar engine specification sheet for engines C-100 – C-1200 included with your permit application indicates a CO emission factor of 2.62 g/bhp-hr. The oxidation catalyst manufacturer (EMIT Technologies) indicates that the uncontrolled CO emissions are 3.01 g/bhp-hr and the controlled emissions are 0.10 g/bhp-hr. However, the emission calculations show an uncontrolled CO rate of 2.62 g/bhp-hr and a controlled rate of 0.16 g/bhp-hr. Please provide a specification sheet from the catalyst manufacturer that has an uncontrolled emission rate that matches that of the engine manufacturer (2.62 g/hp-hr). Furthermore, please provide controlled emission calculations that match the emission rate guaranteed by the catalyst manufacturer.

I spoke with Barry Schatz concerning these issues late last week.

Please address the above deficiencies in writing within fifteen (15) days of the receipt of this email. Application review will not commence until the application has been deemed to be technically complete. Failure to respond to this request in a timely manner may result in the denial of the application.

Should you have any questions, please contact Jerry Williams at (304) 926-0499 ext. 1223 or reply to this email.

Jerry Williams, P.E.
Engineer
WVDEP – Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
(304) 926-0499 ext. 1223
jerry.williams@wv.gov

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dep

Please consider the environment before printing this email.

Adkins, Sandra K

From: Adkins, Sandra K
Sent: Monday, January 9, 2017 10:23 AM
To: 'wmcneilly@anteroresources.com'; 'bschatz@anteroresources.com'; 'msteyskal@kleinfelder.com'
Cc: McKeone, Beverly D; Williams, Jerry
Subject: WV DAQ Permit Application Status for Antero Midstream LLC; South Canton Station

RE: Application Status
Antero Midstream LLC
South Canton Station
Facility ID No. 017-00163
Application No. R13-3354

Mr. McNeilly,

Your application for a construction permit for the South Canton Compressor Station was received by this Division on January 6, 2017, and was assigned to Jerry Williams. The following item was not included in the initial application submittal:

Original affidavit for Class I legal advertisement not submitted.

This item is necessary for the assigned permit writer to continue the 30-day completeness review.

Within 30 days, you should receive a letter from Jerry stating the status of the permit application and, if complete, given an estimated time frame for the agency's final action on the permit.

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

Should you have any questions, please contact the assigned engineer, Jerry Williams, at 304-926-0499, extension 1223.

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Title V Major Source 017-00163 R13-3354 New ID# R13# Construction Jerry

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

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

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

Williams, Jerry

From: Ward, Beth A
Sent: Wednesday, January 11, 2017 12:10 PM
To: Williams, Jerry
Subject: ANTERO MIDSTREAM LLC PERMIT APPLICATION FEE

This is the receipt for payment received from:

ANTERO MIDSTREAM LLC, SOUTH CANTON STATION, CHECK NUMBER 1526, CHECK DATE 12/09/2016, $4,500.00
R13-3354 ID# 017-00163

OASIS CR 1700073542

THANK YOU!

Beth Ward

WV DEPARTMENT OF ENVIRONMENTAL PROTECTION
BTO FISCAL
601 57TH STREET SE
CHARLESTON, WV 25304
(304) 926-0499 EXT 1846
beth.a.ward@wv.gov

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