



west virginia department of environmental protection

Division of Air Quality
601 57th Street, SE
Charleston, WV 25304-2345
Phone: 304 926 0475 • Fax: 304 926 0479

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

ENGINEERING EVALUATION/FACT SHEET

B BACKGROUND INFORMATION

Application No.:	R13-2251D
Plant ID No.:	099-00014
Applicant:	Columbia Gas Transmission, LLC
Facility Name:	Kenova Compressor Station
Location:	Kenova
NAICS Code:	486210
Application Type:	Modification
Received Date:	December 6, 2013
Engineer Assigned:	Edward S. Andrews, P.E.
Fee Amount:	\$3500.00
Date Received:	December 9, 2013
Complete Date:	January 24, 2014
Due Date:	April 24, 2014
Applicant Ad Date:	December 5, 2013
Newspaper:	<i>The Herald-Dispatch</i>
UTM's:	Easting: 360.9 km Northing: 4,248.2 km Zone: 17
Description:	The application is for the replacement of Boiler #1 with a new natural gas fired boiler with a design heat input of 6.3 MMBtu/hr.

DESCRIPTION OF PROCESS

Columbia Gas Transmission LLC (Columbia) owns and operates the Kenova Compressor Station. Natural gas is received via pipelines and compressed and pumped into outlet station pipelines for transmission to market or downstream stations. Kenova Compressor station currently operates under a Title V Operating Permit and is considered a major source of NO_x emissions due to its potential to emit more than 100 tons per year of NO_x and CO emissions.

Columbia proposed to replace the existing natural gas fired boiler at the station. The selected replacement boiler is a Hurst Boiler Model No. S-4-G-150-15, which is a 3-pass Scotch Marine design boiler rated for 150 boiler horsepower (bhp). To achieve 150 bhp, the unit would

need a maximum design heat input of 6.3 MMBtu/hr, which will be provide by burning natural gas.

SITE INSPECTION

On January 21, 2014, Mr. Todd Shrewsbury, P.E., an engineer assigned to the Compliance and Enforcement Section of the DAQ, conducted a full-on- site inspection of the Kenova Compressor Station. During this inspection, Mr. Shrewsbury determined that the station is operating in compliance.

ESTIMATE OF EMISSION BY REVIEWING ENGINEER

The applicant used pollutant specific emissions factors from Chapter 1.4 of AP-42 and manufacturer's data to estimate emissions from the replacement boilers. The writer reproduced the estimated emissions from one replacement boiler, which are presented in the following table:

Pollutant	Emission Factor	Hourly Rate (lb/hr)	Annual Rate (TPY)
PM/PM ₁₀ /PM _{2.5} Filterable	1.9 lb/MMcf	0.01	0.04
PM Condensable Fraction	5.7 lb/MMcf	0.04	0.18
Total PM	7.6 lb/MMcf	0.05	0.22
Sulfur Dioxide (SO ₂)	0.6 lb/MMcf	0.004	0.018
Oxides of Nitrogen (NO _x)	100 lb/MMcf	0.63	2.76
Carbon Monoxide (CO)	84 lb/MMcf	0.53	2.32
Volatile Organic Compounds (VOCs)	5.5 lb/MMcf	0.03	0.13
Total Hazardous Air Pollutants (HAPs)	--	0.03	0.13
Carbon Dioxide Equivalent* (CO ₂ e)	116.98 lb/MMBtu	736.97	3,227.93

* Based on factors and global warming potentials from Tables A-1, C-1, and C-2 of Part 98 published on Federal Register on November 29, 2013.

REGULATORY APPLICABLILITY

The Kenova Compressor Station is a major source under Title V (45CSR30) and currently possesses a valid Title V Operating Permit. Under this program, new emission units have 12 months upon start-up to be incorporated in the facility's operating permit. The facility is currently classified as a major source for NO_x, CO, and CO₂e under Prevention of Significant Deterioration (PSD) and for HAPs (formaldehyde).

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The first step in determining major modification applicability is to determine which pollutants that the project is major for, which is illustrated in the following table.

Table #2 Step One of PSD Applicability			
Pollutant	New Potential from the Replacement Boiler (tpy)	Significance Threshold (tpy)	Significance Trigger (Yes/No)
PM	0.22	25	No
PM ₁₀	0.22	15	No
PM _{2.5} Direct	0.22	10	No
NO _x (precursor of Ozone and PM _{2.5})	2.76	40	No
SO ₂	0.02	40	No
CO	2.32	100	No
VOCs	0.13	40	No
CO ₂ equivalent (CO _{2e})	3,228	75,000	No

This project does not represent a “significant emission increase” (45CSR§14-2.75) for any NSR pollutant. Thus, no further review is required.

With regards to the National Ambient Air Quality Standards, Wayne County is classified as attainment for all pollutants. Thus, no further review of this application with regards to 45 CSR 19, West Virginia Non-Attainment Permitting Rule is required.

The replacement boiler is subject to Rules 2 & 10 (WV State Rules on PM and SO₂). The requirements from these rules and regulations are very minimal for natural gas fired boilers to comply with the applicable emission standards. 45 CSR §2-11.1 exempts the proposed unit from Sections 4, 5, 6, 8, and 9 of 45 CSR 2 based on size of the unit being less than 10 MMBtu/hr, which means the unit is only subject to the visible emission standard of Section 3. It is understood that visible emission from the combust natural gas has little to no potential. Further, the interpretive rule for Rule 2 (45 CSR 2A) specifically exempts units that only combust natural gas from implementing the Visible Emission Monitoring Plan Requirements of Rule 2A regardless of size of the unit. 45 CSR §10.1 exempts the proposed unit from Sections 3, 6, 7, and 8 of 45 CSR 10 based on size of the unit being less than 10 MMBtu/hr, which means there are not applicable emission standard in Rule 10 for this proposed unit.

The facility is currently classified as a major source of HAPs, which means the facility has the potential to emit 10 tons per year of a single HAP, which is formaldehyde, or 25 tpy of total HAPs. Within the application, Columbia has not elected to determine if this project would change the facility’s major source status for HAPs. Thus, the replacement boiler is subject to 40 CFR 63, Subpart DDDDD – National Emission Standard for Hazardous Air Pollutants (NESHAP) for Major Sources: Industrial Commercial, and Institutional Boilers and Process Heaters.

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This regulation establishes work practices as a means to comply with the emission standards (see Item 2 of Table 3 to Subpart DDDDD of Part 63). This tune-up requirement is applicable to the replacement boiler and must be conducted in accordance with 40 CFR §63.7540 and be conducted biennially. According to 40 CFR §63.7510(g) and §63.7515(d), the initial tune-up for the replacement boiler will be due 25 months after initial start-up of the unit. Columbia will be required to conduct subsequent tune-ups every 25 months from the previous tune-up.

Columbia prepared and submitted a complete application, paid the filing fee, and published a Class I Legal ad in *The Herald Dispatch* on December 5, 2013, which is required under Rule 13 for a modification permit. The facility currently holds a valid Title V Operating Permit and included Attachment S of the application for a significant modification of this operating permit.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The new replacement boiler will not emit any pollutants that aren't already being emitted by another emission source at the facility. Therefore, no information about the toxicity of the hazardous air pollutants (HAPs) is presented in this evaluation.

AIR QUALITY IMPACT ANALYSIS

The writer deemed that an air dispersion modeling study or analysis was not necessary, because the proposed modification does not meet the definition of a major modification of a major source as defined in 45CSR14.

MONITORING OF OPERATIONS

As noted earlier, the replacement boiler is subject to the Boiler MACT which requires biennial tune-ups for each boiler. The permit will require that the tune-up verify that the optimization of CO must be consistent with the manufacturer's specification and that the NO_x concentrations or settings are at or within the manufacturer's specifications. The facility currently is required to prove that the engine for the generator is using pipeline quality natural gas. It is recommend that the same documentation be used to prove that the boiler is using natural gas that meets the standard as situated in 45 CSR 10A as pipeline quality natural gas. No other monitoring is needed since the proposed unit is less than 10 MMBtu/hr and will be consuming only natural gas.

CHANGE TO PERMIT R13-2251C

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Permit R13-2251C is in the out dated format. Updating the format of the existing permit will eliminate the need for Conditions B.3., B.4., and B.6. The requirements for these conditions are embedded into Sections 2.0 and 3.0 of the current permit format. The specific requirements in Section A and Conditions B.1. and B.2.of Permit R13-2251C will be incorporated in Section 4.0. as noted in the following table:

Condition No. in R13-2251C	New No. in R13-2251D	Notes
A.1.	4.1.1.	No changes
A.2., B.5.	Omitted	Facility no longer cannot use the flare
A.3.	4.1.2.b.	Streamline to use the definition of Rule 10A-2.7 as compliance for Rule 10-4.1.
A.4.	4.1.2.c.	No Changes
A.5	4.1.2.a.	Omitted PM and SO ₂ because insignificant emissions due to using “Pipeline Quality Natural Gas” and linked annual emissions to the 500 hours limit in 4.1.2.c.
B.1.	4.2.1.	Omitted the flare requirements
B.2.	4.2.2	Noted to covers sulfur content of the natural gas both the engine and boiler.
B.2.	4.2.3.	Noted it only covers the hours of operation for the engine.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates the proposed modification of the facility will meet all the requirements of the application rules and regulations when operated in accordance with the permit application. Therefore, the writer recommends granting Columbia Gas Transmission, LLC a Rule 13 modification permit for their Kenova Compressor Station located in Kenova, WV.

Edward S. Andrews, P.E.
Engineer

February 14, 2014
Date

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