



**west virginia department of environmental protection**

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

Earl Ray Tomblin, Governor  
Randy C. Huffman, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

**ENGINEERING EVALUATION / FACT SHEET**

**BACKGROUND INFORMATION**

Application No.: R13-0075H  
Plant ID No.: 053-00009  
Applicant: Appalachian Power Company  
Facility Name: Mountaineer Plant  
Location: New Haven  
NAICS Code: 221112  
Application Type: Modification  
Received Date: March 20, 2015  
Engineer Assigned: Steven R. Pursley, PE  
Fee Amount: \$1,000.00, \$2,500  
Date Received: March 30, 2015, April 21, 2015  
Complete Date: April 23, 2015  
Due Date: July 22, 2015  
Applicant Ad Date: April 7, 2015  
Newspaper: *Point Pleasant Register*  
UTM's: Easting: 419.04 km      Northing: 4,314.7 km      Zone: 17  
Description: Applicant is requesting a voluntary heat input capacity limit (10% of total capacity) on an annual basis to meet the definition of a limited use boiler per 40 CFR 63 Subpart DDDDD.

**DESCRIPTION OF PROCESS**

Appalachian Power Company's Mountaineer plant utilizes two (2) 600 mmbtu oil fired auxiliary boilers to provide steam during start ups, shut downs and maintenance outages. These boilers are subject to 40 CFR 63 Subpart DDDDD (boiler MACT for major sources). They have a compliance date of January 31, 2016 for existing sources. The rule includes a category for limited use boilers. Boilers in this category have no numeric emission limits and are not subject to any stack testing requirements. To be eligible, the source must obtain a federally enforceable permit to limit the units annual capacity factor to 10% or less. This is the purpose of this permitting action.

**SITE INSPECTION**

No site inspection of the facility was performed for this permitting action. However, the writer has performed site inspections at the facility before and is familiar with both the operation of and location of the facility. The facility is located between WV Route 62 and the Ohio River just east of New Haven West Virginia. To get to the facility from Charleston take I-77 north to Ripley (exit 138). Then follow State Route 62 (old US route 33) approximately 23 miles. The facility is on the right.

**ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER**

Emissions from each of the two auxiliary boilers as currently permitted are as follows (based on engineering evaluation R13-0075C:

Pollutant	Hourly Emissions (lb/hr)	Annual Emissions (ton/year)
Nitrogen Oxides	113	495
Sulfur Dioxide	401	1757
Carbon Monoxide	28	123
PM <sub>10</sub>	6	27
Volatile Organic Compounds	1	5

This means that combined emissions from the two boilers are as follows:

Pollutant	Hourly Emissions (lb/hr)	Annual Emissions (ton/year)
Nitrogen Oxides	226	990
Sulfur Dioxide	802	3512
Carbon Monoxide	56	246
PM <sub>10</sub>	12	54
Volatile Organic Compounds	2	10

Emission calculations submitted with this application were based on AP-42. Hourly emissions are based on maximum design heat input. Annual emissions are based on the 10% capacity factor. Emissions in the new permit will be limited to the following:

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Per Boiler

Pollutant	Hourly Emissions (lb/hr)	Annual Emissions (ton/year)
Nitrogen Oxides	99.67	43.65
Sulfur Dioxide	353.82	154.97
Carbon Monoxide	24.92	10.91
PM <sub>10</sub>	4.98	2.18
Volatile Organic Compounds	1.00	0.44

Total

Pollutant	Hourly Emissions (lb/hr)	Annual Emissions (ton/year)
Nitrogen Oxides	199.34	87.3
Sulfur Dioxide	707.64	309.94
Carbon Monoxide	49.84	21.82
PM <sub>10</sub>	9.96	4.36
Volatile Organic Compounds	2.00	0.88

This results in a net **decrease** in potential emissions of the following:

Pollutant	Hourly Emissions (lb/hr)	Annual Emissions (ton/year)
Nitrogen Oxides	26.66	902.7
Sulfur Dioxide	94.36	3,202.06
Carbon Monoxide	6.16	224.18
PM <sub>10</sub>	2.04	49.64
Volatile Organic Compounds	0	9.12

## REGULATORY APPLICABILITY

The following state and federal rules apply to the auxiliary boilers.

### STATE RULES

#### **45CSR2: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers.**

The auxiliary boilers meet the definition of “fuel burning units” under 45CSR2 and are, therefore, subject to the applicable requirements therein. Each substantive requirement is discussed below:

##### *45CSR2 Opacity Standard - Section 3.1*

Pursuant to 45CSR2, Section 3.1, the fuel burning units are subject to an opacity limit of 10%. Proper maintenance and operation of the oil fired units should keep the opacity of the units well below 10% during normal operations. The facility already has an approved Rule 2 monitoring plan which should ensure compliance.

##### *45CSR2 Weight Emission Standard - Section 4.1.b*

The allowable particulate matter (PM) emission rate for each auxiliary boiler, identified as a Type “b” fuel burning unit, per 45CSR2, Section 4.1.b, is the product of 0.09 and the total design heat input of the auxiliary boiler in million Btu per hour. The maximum design heat input of each auxiliary boiler will be 600 mmBtu/Hr. Using the above equation, the 45CSR2 PM emission limit of each auxiliary boiler would be 54.0 lb/hr. This limit represents filterable PM only and does not include condensable PM. The exemption of condensable PM is located within the 45CSR2 Appendix - which establishes compliance test procedures - by not requiring measurement of the condensable PM.

The maximum potential hourly PM emissions from each auxiliary boiler is estimated to be 4.98 lb/hr. This emission rate is less than 10% of the 45CSR2 limit.

#### **45CSR10: To Prevent and Control Air Pollution from the Emission of Sulfur Oxides**

45CSR10 has requirements limiting SO<sub>2</sub> emissions from “fuel burning units”. The auxiliary boilers are defined as a “fuel burning units”. The applicable requirements are discussed below:

##### *45CSR10 Fuel Burning Units - Section 3*

The allowable sulfur dioxide (SO<sub>2</sub>) emission rate for each auxiliary boiler, identified as a Type "b" fuel burning unit, per 45CSR10, Section 3.3.f (note that Mason county is in the Priority III region), is the product of 3.2 and the total design heat input of the auxiliary boiler in million Btu per hour. The maximum design heat input of each auxiliary boiler is 600 mmbtu/hr. Using the above equation, the 45CSR10 SO<sub>2</sub> emission limit of each auxiliary boiler is 1920 lb/hr.

The maximum potential hourly SO<sub>2</sub> emissions from each auxiliary boiler is estimated to be 353.82 lb/hr. This emission rate is less than 18% of the 45CSR10 limit. The facility already has an approved Rule 10 monitoring plan which should ensure compliance.

**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**

Appalachian Power Company applied for this permit modification on a voluntary basis, pursuant to §45-13-5.5.

As required under §45-13-8.3 ("Notice Level A"), Appalachian Power placed a Class I legal advertisement in a "newspaper of general circulation in the area where the source is . . . located." The ad ran on April 7, 2015 in *The Point Pleasant Register* and the affidavit of publication for this legal advertisement was submitted on April 20, 2015.

**45CSR30: Requirements for Operating Permits**

45CSR30 provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act. The Mountaineer Plant is an existing major source with an issued Title V permit.

**FEDERAL RULES**

**40 CFR 63 Subpart DDDDD: National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial and Institutional Boilers and Process Heaters.**

Subpart DDDDD includes requirements for several different subcategories of boilers. With the issuance of this permit, both auxiliary boilers will be classified as "Limited Use" boilers. The main requirement applicable to limited use boilers is the obligation to perform an initial tune up. Subsequently, a tune up will be required every 5 years.

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## **NON APPLICABILITY DETERMINATIONS**

40 CFR 60, Subpart Db: Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units.

The auxiliary boilers are not subject to 40 CFR 60 Subpart Db because they were constructed before June 19, 1984 (they were constructed in 1974).

## **TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS**

The only HAPs emitted by the auxiliary boilers are those normally associated with fuel oil combustion. Since the purpose of this permitting action is only to limit the capacity factor of the two auxiliary boilers, annual emissions of HAPs will decrease.

## **AIR QUALITY IMPACT ANALYSIS**

Since this is a minor modification to an existing major stationary source, no modeling was performed.

## **MONITORING OF OPERATIONS**

In addition to the monitoring already required in R13-0075G, the permittee will be required to monitor and record the following:

- \* Records of the monthly fuel feed rate and fuel heat content of the two auxiliary boilers.

## **CHANGES TO PERMIT R13-0075G**

The following changes were made to R13-0075G:

- \* The permit was put into the most recent boilerplate.
- \* Conditions 4.1.3 and 4.1.4 were changed to add tables that will reduce annual emissions beginning January 31, 2016.
- \* Condition 4.1.5 was changed from a maximum 1% sulfur content limit to a maximum sulfur content limit of 0.5% to be consistent with emission calculations.

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- \* Condition 4.1.5.1 was added to limit the two auxiliary boilers to an annual capacity factor of 10%.
- \* Conditions 4.1.22, 4.1.23 and 4.1.24 were added.
- \* Condition 4.2.2 was changed to add a requirement to monitor monthly fuel feed rate and fuel heat content.
- \* Conditions 4.4.4 through 4.4.9 were added.

#### RECOMMENDATION TO DIRECTOR

Information supplied in the application indicates that compliance with all applicable regulations will be achieved. Therefore it is the recommendation of the writer that permit R13-0075H to limit two auxiliary boilers at the Mountaineer Plant near New Haven be granted to Appalachian Power Co.

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Steven R. Pursley, PE  
Engineer

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June 29, 2015

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