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west virginia department of environmental protection

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Earl Ray Tomblin, Governor  
Randy C. Huffman, Cabinet Secretary  
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## ENGINEERING EVALUATION / FACT SHEET

### BACKGROUND INFORMATION

Application No.: R13-2839B  
Plant ID No.: 109-00019  
Applicant: Dominion Transmission, Inc. (Dominion)  
Facility Name: Loup Creek Station  
Location: Wyoming County  
NAICS Code: 48621  
Application Type: Modification  
Received Date: June 6, 2012  
Engineer Assigned: Joe Kessler  
Fee Amount: \$2000  
Date Received: June 11, 2012  
Complete Date: July 5, 2012  
Due Date: October 3, 2012  
Applicant Ad Date: June 13, 2012  
Newspaper: *Independent Herald*  
UTM's: Easting: 449.31 km Northing: 4,176.86 km Zone: 17  
Description: Installation of an oxidation catalyst on the 4-Stroke Lean Burn (4SLB) Caterpillar G3516 Compressor Engine (001-04) so as to comply with 40 CFR 63, Subpart ZZZZ.

Currently, the Loup Creek Station contains grandfathered equipment and equipment contained in two different active permits: R13-2324B and R13-2839A. A history of the permits shall be given below:

- R13-2324 was issued on September 29, 1999 to replace a grandfathered emergency generator with a larger Waukesha engine.
- R13-2324A was issued on October 22, 2001 to replace a grandfathered compressor engine with the Caterpillar G3516 engine that is being retrofitted with the oxidation catalyst in the permitting action evaluated herein.
- R13-2324B (Class I Administrative Update) was issued on November 20, 2001 to revise record-keeping requirements associated with the Caterpillar G3516 engine .

- R13-2839 was issued on July 12, 2010 for the replacement of a glycol dehydration unit and flare.
- R13-2839A was issued on February 28, 2011 for the replacement of the Waukesha emergency generator permitted under R13-2324 with a Caterpillar generator (002-02).

Based on the removal of the emergency generator permitted under R13-2324, the Caterpillar G3516 engine shall be, in this permitting action, placed under Permit R13-2839B and Permit R13-2324B shall be superceded.

### **DESCRIPTION OF PROCESS/MODIFICATIONS**

Loup Creek Station is an existing compressor facility that services a natural gas pipeline. The purpose of the facility is to recompress natural gas flowing through a pipeline for transportation. The station consists of four (4) natural gas fired reciprocating compressor engines, one reciprocating emergency generator, one (1) dehydrator reboiler, one (1) dehydration unit with flare, and storage tanks of various sizes. Dominion is now proposing to retrofit one compressor engine with an oxidation catalyst. The engine (Identification Number 001-04) is a 4SLB Caterpillar Model G3516 1,085 Horsepower (HP) Compressor Engine. No other changes were proposed for the facility or the engine. The oxidation catalyst is being installed to bring the engine into compliance with the requirements of 40 CFR 63, Subpart ZZZZ.

### **SITE INSPECTION**

Due to the nature of the modification, the writer did not conduct a site inspection. According to information in the DAQ database, the last full on-site inspection occurred on March 28, 2012 by Mr. Todd Shrewsbury of the Compliance/Enforcement Section. The facility was given a status code of "30 - In Compliance" as a result of the inspection.

### **AIR EMISSIONS AND CALCULATION METHODOLOGIES**

Potential emissions from the 4SLB Caterpillar Model G3516 1,085 HP Compressor Engine were based on emission factors provided by the engine/oxidation catalyst manufacturer and as given in AP-42, Section 3.2 (7/00). Hourly emissions, where applicable, were based on maximum design heat input of the engine of 8.04 mmBtu/hr. Annual emissions were based on 8,760 hours of operation per year. The following table details the potential-to-emit (PTE) of the compressor engine:

**Table 1: Post-Modification Compressor Engine PTE**

Pollutant	Emission Factor	Source	Hourly (lb/hr)	Annual (ton/yr)
CO <sup>(1)</sup>	0.50 lb/hr	Oxidation Catalyst Specification Sheet	0.50	2.19
NO <sub>x</sub>	1.50 g/hp-hr	Engine Specification Sheet	3.80	16.60
PM <sub>2.5</sub> <sup>(2)</sup>	9.98 x 10 <sup>-3</sup> lb/mmBtu	AP-42, Table 3.2-2	0.08	0.35
PM <sub>10</sub> <sup>(2)</sup>	9.98 x 10 <sup>-3</sup> lb/mmBtu	AP-42, Table 3.2-2	0.08	0.35
PM <sup>(2)</sup>	9.98 x 10 <sup>-3</sup> lb/mmBtu	AP-42, Table 3.2-2	0.08	0.35
SO <sub>2</sub>	5.88 x 10 <sup>-4</sup> lb/mmBtu	AP-42, Table 3.2-2	< 0.01	0.02
VOC	0.50 g/hp-hr	Engine Specification Sheet	1.27	5.60
CH <sub>4</sub>	0.23 lb/mmBtu	AP-42, Table 3.2-2	1.85	8.10
CO <sub>2</sub>	110.00 lb/mmBtu	AP-42, Table 3.2-2	884.40	3,873.67
CO <sub>2</sub> e <sup>(3)</sup>	n/a	n/a	n/a	4,043.77

- (1) Only emission limit changing as a result of this permitting action.
- (2) Filterable + Condensable.
- (3) Based on multiplying the mass amount of emissions for each of the six greenhouse gases by the gas's associated global warming potential published at Table A-1 to Subpart A of 40 CFR Part 98 - Global Warming Potentials. Used to determine major source status of facilities under 45CSR14.

Based on the emission limit in the previous iteration of the permit, the only change in PTE as a result of the modification evaluated herein is a reduction of 17.81 TPY of CO emissions from Engine 001-04.

## **REGULATORY APPLICABILITY**

This section will address the potential regulatory applicability/non-applicability of substantive state and federal air quality rules relevant to the modified compressor engine.

### ***45CSR2 and 45CSR10 (non-applicability)***

Pursuant to the definition of “fuel burning unit” under 45CSR2 and 45CSR10 (“producing heat or power by indirect heat transfer”), the sections of those rules applicable to “fuel burning units” do not apply to the compressor engine.

### ***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***

Pursuant to §45-13-2.17(f)(1), the definition of “modification” under 45CSR13 excludes the “[i]nstallation or replacement of air pollution control equipment, provided that . . . no new air

pollutant discharge results from its installation.” Therefore, Dominion was not required to obtain a permit under 45CSR13 for this proposed installation of the oxidation catalyst. However, Dominion voluntarily submitted a modification permit application to enforce the installation and operation of the oxidation catalyst.

Therefore, as required under §45-13-8.3 (“Notice Level A”), Dominion placed a Class I legal advertisement in a “newspaper of general circulation in the area where the source is . . . located.” The ad ran on June 13, 2012 in the *Independent Herald* and the affidavit of publication for this legal advertisement was submitted on June 22, 2012.

#### ***45CSR14 Major Modification Non-Applicability***

Loup Creek Station, according to the PTE given in the (R30-01300002-2011) Title V Fact Sheet, is an existing major source. However, the PTE associated with the retrofitted compressor engine is (see Table 1 above), for all pollutants, less than the “significant” thresholds (§45-14-2.74) that would define the installation as a “major modification” under 45CSR14. Therefore, review pursuant to 45CSR14 is not required.

#### ***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 Loup Creek Compressor Station, defined under Title V as a “major source,” was last issued a Title V permit (R30-10900019-2012) on January 10, 2012. Proposed changes evaluated herein must also be incorporated into the facility's Title V operating permit. Commencement of the operations authorized by this permit shall be determined by the appropriate timing limitations associated with Title V permit revisions per 45CSR30.

#### ***40 CFR 60 Subpart JJJJ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (non-applicability)***

Pursuant to §60.4230(a)(4), an owner or operator of an engine is subject to Subpart JJJJ only if the engine in question was ordered or modified after June 12, 2006. According to the Title V permit, Engine 001-04 was installed in 2001. Further, the addition of an oxidation catalyst does not constitute a modification - no increase in the hourly emissions of any pollutant resulted - under Subpart JJJJ. Therefore, the engine is not subject to the requirements of Subpart JJJJ.

#### ***40 CFR 63 Subpart ZZZZ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines.***

The compressor engine appears to be subject to the area source requirements of 40 CFR 63, Subpart ZZZZ. However, the DAQ has not been delegated authority from USEPA to enforce the area source requirements of this rule. Dominion has voluntarily submitted a permit application to install an oxidation catalyst to meet the requirements of Subpart ZZZZ. The proposed CO emission limit in Table 10.1.1 of the draft permit reflects the use of this oxidation catalyst pursuant to the permit application. Therefore, the permit will include language enforcing the requirements of

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Subpart ZZZZ for this engine. This language in no way represents DAQ assuming any delegation responsibilities for Subpart ZZZZ. The language is being used as reasonable and convenient means to enforce the CO emission limitation which is based on the use of an oxidation catalyst.

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

This section provides an analysis for those regulated pollutants that may be emitted from the proposed selenium treatment plant and that are not classified as “criteria pollutants.” Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NO<sub>x</sub>), Ozone, Particulate Matter (PM), Particulate Matter less than 10 microns (PM<sub>10</sub>), Particulate Matter less than 2.5 microns (PM<sub>2.5</sub>), and Sulfur Dioxide (SO<sub>2</sub>). These pollutants have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect the public health and welfare. Other pollutants of concern, although designated as non-criteria and without national concentration standards, are regulated through various federal and programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) limits promulgated under 40 CFR 61 (NESHAPS) and 40 CFR 63 (MACT). As discussed above, the Engine 001-04 is being retrofitted with an oxidation catalyst pursuant to the requirements of 40 CFR 63, Subpart ZZZZ. This retrofit is designed to reduce the emissions of HAPs from the engine.

### **AIR QUALITY IMPACT ANALYSIS**

The proposed construction does not meet the definition of a “major stationary source” pursuant to 45CSR14 and, therefore, an air quality impact (computer modeling) analysis was not required. Additionally, based on the nature of the proposed modification, modeling was not required under 45CSR13, Section 7.

### **MONITORING, COMPLIANCE DEMONSTRATIONS, RECORD-KEEPING, AND REPORTING REQUIREMENTS**

The substantive monitoring, compliance demonstration, and record-keeping requirements applicable to Engine 001-04 is limited to those under 40 CFR 63, Subpart ZZZZ which includes the compliance demonstration requirements to:

- Maintain the catalyst so that the pressure drop across the catalyst does not change by more than 2 inches of water at 100 percent load plus or minus 10 percent from the pressure drop across the catalyst that was measured during the initial performance test; and
- Maintain the temperature of the engine exhaust so that the catalyst inlet temperature is greater than or equal to 450 degrees Fahrenheit and less than or equal to 1,350 degrees Fahrenheit.

### **PERFORMANCE TESTING OF OPERATIONS**

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The following substantive performance testing requirements shall be required:

- Dominion shall, when required by the Director, conduct or have conducted test(s) to determine compliance with the emission limitations or emission control requirements established in the draft permit and/or applicable regulations.
- Dominion shall be required to comply with all applicable performance testing requirements as given under 40 CFR 63, Subpart ZZZZ including the requirement to:
  - Conduct any initial performance test or other initial compliance demonstration according to Tables 4 and 5 of Subpart ZZZZ that apply within 180 days after the compliance date that is specified for the engine in §63.6595 and according to the provisions in §63.7(a)(2).

### **CHANGES TO PERMIT R13-2555A**

Substantive changes to Permit Number R13-2839A are limited to the following:

- Inclusion of Engine 001-04 information in Table 1.0 and Table 1.1; and
- Addition of requirements relating to Engine 001-04 under Section 10.0.

### **RECOMMENDATION TO DIRECTOR**

The information provided in the permit application indicates that compliance with all applicable regulations will be achieved. Therefore, I recommend to the Director the issuance of a Permit Number R13-2839B to Dominion Transmission, Inc. for the installation of an oxidation catalyst on Engine 001-04 at the Loup Creek Station located near Kopperston, Wyoming County, WV.

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Joe Kessler, PE  
Engineer

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Date

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