



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-2915A
Plant ID No.: 033-00013
Applicant: Dominion Transmission, Inc.
Facility Name: Sardis Compressor Station
Location: Harrison County
NAICS Code: 486210
Application Type: Modification
Received Date: August 13, 2014; .
Engineer Assigned: Steven R. Pursley, PE
Fee Amount: \$3,500
Date Received: August 19, 2014
Complete Date: February 18, 2015
Due Date: May 19, 2015
Applicant Ad Date: October 17, 2014
Newspaper: *The Exponent Telegram*
UTM's: Easting: 552.89 km Northing: 4,355.61 km Zone: 17
Description: Replacement of an existing flare with an enclosed flare.

DESCRIPTION OF PROCESS

The Sardis Compressor Station (SCS) is a natural gas compressor station used to compress gas for Dominions pipeline system in West Virginia. The purpose of the SCS is to recompress natural gas within the pipeline system to facilitate transportation of natural gas to the Hastings Extraction Plant. As part of operations at the SCS , Dominion utilizes a glycol dehydration unit. The purpose of the dehydration unit is to remove moisture and impurities from the inlet natural gas stream. Water is removed from the rich natural gas stream via physical absorption while it flows countercurrent to circulating triethylene glycol (TEG) in a contactor. The rich TEG is sent to a flash tank to reduce volatile hydrocarbons. Vapors from the flash tank are primarily vented back to station suction and reclaimed. If the station suction pressure is too high, the vapors from the flash tank can be directly vented to the flare, used as fuel in the reboiler or vented to a waste tank if they are unable

to be completely consumed as fuel gas. Vapors from the reboiler pass through a still column that is controlled by the flare.

Dominion proposes to replace the control device (flare) for the existing dehydration unit with a new enclosed flare. As part of the control device replacement, a blowcase will be installed between the still column and enclosed flare on the glycol dehydration unit. The blow-case serves to enhance the efficiency of the enclosed flare and will not debottleneck the glycol dehydration unit.

The new replacement flare will be a Questor Technologies Q250 enclosed flare with a 95% control efficiency.

SITE INSPECTION

An inspection of the facility was performed on April 10, 2013 by Lou Ann Lee of DAQs North Central Regional Office. The facility was found to be in compliance. To get to the facility take I-79 north from Charleston to exit 119 and take US Route 50 West for 5.9 miles. Then, exit right on County Route 5035 and go 0.4 miles. Next, turn right on Wilsonburg Road and go 0.7 miles. Then, turn right on County Route 9 and go 5.1 miles. At the DTI sign, turn right and proceed 0.5 miles to the station.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions of NO_x, CO and SO₂ are based on vendor specifications. Emissions of PM is based on AP-42. VOC emissions were based on GRI-GLYCalc. Emissions from the new enclosed flare will be limited to the following:

	lb/hr	tpy
NO _x	1.23	5.39
CO	0.07	0.32
VOCs	7.34	32.15
PM/PM ₁₀ /PM _{2.5}	0.30	1.31
SO ₂	--	--
HAPs	1.05	4.61

Emissions from the old flare are based on Engineering Evaluation R13-2915 and were as follows:

	tpy
NO _x	0.57
CO	1.75
VOCs	30.00
PM/PM ₁₀ /PM _{2.5}	--
SO ₂	--
HAPs	4.48

The emissions change due to this modification will be as follows:

	tpy
NO _x	4.82
CO	-1.43
VOCs	2.15
PM/PM ₁₀ /PM _{2.5}	1.31
SO ₂	--
HAPs	0.13

REGULATORY APPLICABILITY

The modification is subject to the following state and federal rules:

45CSR6: *To Prevent and Control Particulate Air Pollution from Combustion of Refuse*

Dominion has proposed an enclosed combustor for controlling emissions from the Dehy still vent and flash tank. The vapor combustor meets the definition of an “incinerator” under 45CSR6 and is, therefore, subject to the requirements therein. The substantive requirements applicable to the vapor combustor are discussed below.

45CSR6 Emission Standards for Incinerators - Section 4.1

Section 4.1 limits PM emissions from incinerators to a value determined by the following formula:

$$\text{Emissions (lb/hr)} = F \times \text{Incinerator Capacity (tons/hr)}$$

Where, the factor, F, is as indicated in Table I below:

Table I: Factor, F, for Determining Maximum Allowable Particulate Emissions

<u>Incinerator Capacity</u>	<u>Factor F</u>
A. Less than 15,000 lbs/hr	5.43
B. 15,000 lbs/hr or greater	2.72

While particulate matter emissions from the combustor are expected to be nominal, for a conservative estimate, Dominion calculated potential particulate matter emissions from the unit based on an emission factor taken from AP-42, Section 1.4. Using this emission factor, the hourly particulate matter emission rate from the combustor is 0.3 lbs/hr. Attachment L of the permit application indicates that the maximum amount of waste to be sent to the flare is 474 pounds per hour. Per the equation above, the aggregate particulate matter limit of the combustor is 1.29 lbs/hr. As the hourly particulate matter emission rate from the combustor is 0. lbs/hr, the unit is in compliance with this emission limit.

45CSR6 Opacity Limits for - Section 4.3, 4.4

Pursuant to Section 4.3, and subject to the exemptions under 4.4, the combustor has a 20% limit on opacity during operation. As the primary constituent in the vapors combusted in the unit shall be clean burning methane/ethane, particulate matter emissions from the combustor are expected to be nominal. Therefore, the vapor combustor should easily meet this requirement.

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 modification of the Sardis Compressor Station is subject to substantive requirements of state rules and, therefore, pursuant to §45-13-2.24a, the enclosed flare is defined as a “stationary source” under 45CSR13. Pursuant to §45-13-5.1, “[n]o person shall cause, suffer, allow or permit the construction . . . and operation of any stationary source to be commenced without . . . obtaining a permit to construct.” Therefore, Dominion is required to obtain a permit registration under 45CSR13 for the modification and operation of the flare.

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 October 17, 2015 in the *Exponent Telegram* and the affidavit of publication was received by the DAQ on January 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 Sardis Compressor Station is subject to the requirements Title V because the facility wide emissions of NO_x exceed 100 tons per year. The facility currently operates under Title V permit R30-03300013-2011.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the Sardis Compressor Station that are not classified as “criteria pollutants.” Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NO_x), Ozone, Particulate Matter (PM), Particulate Matter less than 10 microns (PM₁₀), Particulate Matter less than 2.5 microns (PM_{2.5}), and Sulfur Dioxide (SO₂). 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 programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) standards promulgated under 40 CFR 61 (NESHAPS) and 40 CFR 63 (MACT). Any potential applicability to these programs were discussed above under REGULATORY APPLICABILITY.

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. Dominion included the following HAPs as emitted in substantive amounts in their emissions estimate: Benzene, n-Hexane, Toluene, Ethylbenzene and Xylene. The following table lists each HAP’s carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

HAPs	Type	Known/Suspected Carcinogen	Classification
n-Hexane	VOC	No	Inadequate Data
Benzene	VOC	Yes	Category A - Known Human Carcinogen
Toluene	VOC	No	Inadequate Data
Ethylbenzene	VOC	No	Category D - Not Classifiable
Xylene	VOC	No	Inadequate Data

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

Since this is not a major modification, as defined in 45CSR14, no modeling was performed.

MONITORING OF OPERATIONS

No monitoring above what is already required by R13-2915 is deemed necessary.

CHANGES TO PERMIT R13-2915

The following changes were made to R13-2915:

- * Table 1.0 was updated.
- * All references in section 7.0 to Flare FL02 were changed to FL03.
- * The emission limits in condition 7.1.2 were updated.
- * The description of the flare in condition 7.1.4 was updated.

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 R13-2915A for the modification of a natural gas compressor station near Sardis, Harrison County, be granted to Dominion Transmission, Inc.

Steven R. Pursley, PE
Engineer

March 18, 2015

Fact Sheet R13-2915A
Dominion Transmission, Inc.
Sardis Compressor Station