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**west virginia** department of environmental protection

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## **ENGINEERING EVALUATION / FACT SHEET**

### **BACKGROUND INFORMATION**

Application No.: R13-2921A  
Plant ID No.: 049-00145  
Applicant: Consol Energy, Inc. (Consol)  
Facility Name: Northern West Virginia Water Treatment Plant  
Location: Marion County  
NAICS Code: 221300  
Application Type: Modification  
Received Date: February 20, 2013  
Engineer Assigned: Joe Kessler  
Fee Amount: \$1,000  
Date Received: February 22, 2013  
Complete Date: May 9, 2013  
Due Date: August 7, 2013  
Applicant Ad Date: February 25, 2013  
Newspaper: *Times West Virginian*  
UTM's: Easting: 551.9 km Northing: 4,377.4 km Zone: 17  
Description: Modification of material throughputs to address revised plant design.

In March 2011, as part of a consent decree agreement with the USEPA, the Department of Justice, and the state of West Virginia, Consol was required to “design, construct, and operate a wastewater treatment plant, landfill, and pipeline collection system . . . for treatment of the Monongahela Basin Discharges.” On July 30, 2012, Permit Number R13-2921 was issued to Consol for the construction and operation of this facility.

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

#### ***Existing Facility***

As noted above, as part of a consent decree, Consol was required to construct a wastewater treatment facility to clean the mine-water discharges of the Loveridge, Blacksville Number 2, Robinson Run, and Four States mines (collectively, the Monongahela Basin Discharges). Pursuant to the consent order, this facility is required to treat an incoming flow of 3,500 gallons per minute using pretreatment, reverse osmosis, and evaporation and/or crystallization processes.

Sources of air emissions at the facility, as identified by the applicant, are limited to particulate matter emissions from pneumatic unloading of soda ash and hydrated lime into three silos (one soda ash and two lime), load-out of evaporated salts, combustion exhaust emissions from an emergency generator, and fugitive particulate matter from haulroad activity. Consol has identified no other substantive sources of air emissions at the facility including no use of VOC-containing solvents or compounds that may be emitted.

The emergency generator is an EPA Tier 2-certified Tognum America, Inc., AKA, MTU Onsite Energy Model R1238A39 (12V2000 G45-TB 3D)) diesel-fired 780 kW-output engine paired with Marathon Electric Model 574RSL4037 Generator. The generator is limited in the existing permit to a maximum annual operation of 500 hours.

The 150 ton elevated silos (1S, 2S, and 3S) used to store soda ash and hydrated lime are loaded pneumatically by truck and controlled by individual baghouses/fabric filters on each silo. The salt load-out occurs in a direct dump from a collection bin into a truck. While not controlled, the moisture content of the salt after dewatering has been estimated to be a worst-case (emission-wise) of 3% which mitigates particulate matter emissions. Unpaved haulroads are used to transport waste sludge, salts, and other materials from the facility to an associated landfill on-site. The haulroad is controlled with a water truck.

A variety of storage tanks are used at the site with only the sulfuric acid tank capable of producing emissions of a regulated air pollutant (emissions of sulfuric acid mist are limited under 45CSR7). However, due to the low vapor pressure of sulfuric acid, no substantive emissions of sulfuric acid are expected from this tank.

### ***Proposed Modifications***

The proposed modifications - reflect updated facility design - are limited to the following:

- Increase in annual soda ash throughput from 2,373 tons per year (TPY) to 7,744 TPY;
- Decrease in annual hydrated lime (unloaded) throughput from 15,010 TPY to 14,031 TPY;
- Increase in annual sulfuric acid throughput from 106,000 gallons per year to 111,325 gallons per year;
- Removal of the permit requirement to recycle fumes from the sulfuric acid storage tank back into the tank during loading; and
- Re-calculation of the emissions from the unmodified salt load-out at a reduced moisture content (from 5% to 3%).

### **SITE INSPECTION**

On March 27, 2012 the author conducted a site inspection of the (at the time of the inspection)

proposed Northern WV Water Treatment Plant. The contacts for the inspection were Mr. Chris Daniels of Alliance Consulting, Inc. and Mr. Jim Spratt, a contractor for Consol. The facility is located in an isolated valley approximately three miles to the northwest of Mannington, WV. Significant construction had been completed on the water tanks, pipe racks, and other facilities at the time of the inspection but the emergency generator was not on-site.

The location of the source is in a relatively isolated area and there are no occupied residences visible from the site. The nearest occupied residence is estimated to be approximately one half mile to the north of the plant. The nearest community is Mannington which, as stated above, is approximately three miles to the southeast. The site is bounded on the east by Dent’s Run Road (County Route 5) and to the west by hillsides. North and south of the facility is the natural contour of the valley. Any potential nuisance (odor, noise) from the facility should be mitigated by this location.

*Directions:* [Latitude: 39.54675, Longitude: -80.39614] From Mannington, travel west approximately 1.3 miles on Buffalo Street until reaching the intersection of Buffalo St. and Dents Run Road (County Route 5). Turn right onto Dents Run Road and proceed approximately 2.3 miles to the north. The facility is located on the left.

**AIR EMISSIONS AND CALCULATION METHODOLOGIES**

In the permit application, Consol supplied an emissions estimate for the potential emission sources at the proposed facility. The following will discuss the methodology of Consol’s emissions estimate for each source modified as part of this permitting action.

***Material Handling Emissions***

Particulate matter emissions from material handling emissions were based on the following AP-42 Sections:

**Table 1: Sources of Emission Factors for Particulate Matter**

Emission Source	Emission Factor(s)	Emission Factor Source	Comments
Soda Ash Unloading	5.2 lb-PM/ton-soda ash unloaded (no PM <sub>2.5</sub> or PM <sub>10</sub> estimated)	AP-42 Section 12.3 (7/93)	Uncontrolled. Controlled emissions based on baghouse capture efficiency of 99.9%.
Salt Load-out	0.00251 lb-PM/ton-salt 0.00119 lb-PM <sub>10</sub> /ton-salt (no PM <sub>2.5</sub> estimated)	AP-42, Section 13.2.4 (11/06)	Emission factor calculation salt moisture content (3%) and average wind speed (8.1 mph).
Hydrated Lime Unloading	0.72 lb-PM/ton-lime unloaded (no PM <sub>2.5</sub> or PM <sub>10</sub> estimated)	AP-42 Section 11.2 (6/06)	Uncontrolled. Uses cement unloading as a surrogate. Controlled emissions based on baghouse capture efficiency of 99.9%.

Emissions from the above material handling sources were calculated using the specified emission factors and new maximum hourly and annual throughputs. Where no PM<sub>2.5</sub> or PM<sub>10</sub> emissions were estimated in the application, worst-case emissions of those pollutants shall be equal to the total particulate matter emissions.

## ***Sulfuric Acid Storage Tank***

Consol has proposed the use of a sulfuric acid storage tank. Based on the acid mist standards under §45-7-4.2, sulfuric acid is considered a “regulated pollutant.” However, due to the very low vapor pressure of sulfuric acid, no substantive emissions are expected from its use. To verify this, Consol calculated the potential emission from the tank using the TANKS 4.09d program as provided under AP-42, Section 7. The results of this analysis show that the annual emissions of sulfuric acid from the tank would be less than 1 pound.

## ***Facility Potential to Emit***

Based on the above estimation methodology, which is determined to be appropriate, the revised post-modification annual PTE, and the increase in PTE, of the Northern WV Water Treatment Plant is given in the following table:

**Table 2: Facility-Wide Annual Potential-to-Emit (PTE) Summary in TPY**

<b>Source</b>	<b>CO</b>	<b>NO<sub>x</sub></b>	<b>PM<sub>2.5</sub></b>	<b>PM<sub>10</sub></b>	<b>PM</b>	<b>SO<sub>2</sub></b>	<b>VOCs</b>
Emergency Generator	0.20	2.55	0.02	0.02	0.02	0.54	0.06
Material Handling <sup>(1)</sup>	0.00	0.00	0.14	0.14	0.14	0.00	0.00
Haulroads	0.00	0.00	0.45	4.52	15.31	0.00	0.00
<b><i>New Facility-Wide Totals →</i></b>	<b>0.20</b>	<b>2.55</b>	<b>0.61</b>	<b>4.68</b>	<b>15.47</b>	<b>0.54</b>	<b>0.06</b>
<b><i>Old Facility-Wide Totals →</i></b>	<b>0.20</b>	<b>2.55</b>	<b>0.61</b>	<b>4.68</b>	<b>15.47</b>	<b>0.54</b>	<b>0.06</b>
<b><i>Increase from R13-2921 →</i></b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

(1) Individual particulate matter contributions from various emission points changed as a result of this modification but the total Material handling emissions remained the same to two significant digits.

## **REGULATORY APPLICABILITY**

This section will address the potential regulatory applicability/non-applicability of substantive state and federal air quality rules relevant to the proposed modifications of Consol’s Northern WV Water Treatment Plant.

### ***45CSR7: To Prevent and Control Particulate Air Pollution from Manufacturing Process Operations***

45CSR7 has three substantive requirements potentially applicable to the particulate matter-generating operations at the water treatment plant. These are the opacity requirements under Section 3 and the mass emission standards under Section 4. Each of these sections will be discussed below.

#### ***45CSR7 Opacity Standards - Section 3***

Section 3.1 sets an opacity limit of 20% on the material handling operations. Use of the baghouses on the silos and the expected moisture content of the salt during load-out should mitigate any opacity problems from these sources.

*45CSR7 Weight Emission Standards - Section 4 (non-applicability)*

Section 4.1 of 45CSR7 requires that each manufacturing processes meet a particulate matter limit based on the weight of material processed through the source operation. However, pursuant to §45-7-10.5, a manufacturing process “shall be exempt from subsection 4.1 for source(s) of emissions that have a potential to emit less than one (1) pound per hour of particulate matter and an aggregate of less than one thousand (1,000) pounds per year for all such sources of particulate matter located at the stationary source. Each material handling source has a particulate matter emission rate of less than one pound per hour and all have an aggregate of less than 1,000 pounds per year. Therefore, the material handling sources are not subject to Section 4 of 45CSR7.

Section 4.2 of 45CSR7 requires that “[m]ineral acids shall not be released from any type source operation or duplicate source operation or from all air pollution control equipment installed on any type source operation or duplicate source operation in excess of the quantity given in Table 45-7B found at the end of this rule.” As stated above, no substantive emissions of sulfuric acid are expected from the storage tank.

***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 modification of the water treatment plant has a potential to increase emissions of a regulated pollutant at the facility (trace amounts of sulfuric acid). However, the increase is not in excess of six (6) lbs/hour and ten (10) TPY and, therefore, the proposed modification is eligible for review as a Class II Administrative Update. However, Consol submitted the permit application voluntarily as a modification and it is being reviewed as a modification.

As required under §45-13-8.3 (“Notice Level A”), Consol placed a Class I legal advertisement in a “newspaper of general circulation in the area where the source is . . . located.” The ad ran on February 25, 2013 in the *Times West Virginian* and the affidavit of publication for this legal advertisement was submitted on May 8, 2013.

***45CSR14 (Non-Applicability)***

The post-modification PTE (see Table 2 above) of Northern West Virginia Water Treatment Plant is below the levels that would define the source as “major” under 45CSR14 and, therefore, the modification evaluated herein is not subject to the provisions of 45CSR14.

***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 facility does not meet the definition of a "major source under § 112 of the Clean Air Act" as outlined under §45-30-2.26 and clarified (fugitive policy) under 45CSR30b. However, as the unmodified Emergency Generator is subject to a New Source Performance Standard (NSPS) - 40 CFR 60, Subpart III- the facility would, in most cases, be subject to Title V as a “deferred source.” However, pursuant to §60.4200(c), as a non-major source, Consol is not required to obtain a Title V permit for the facility

based on the Subpart III applicability. Therefore, the Northern WV Water Treatment Plant is not subject to 45CSR30.

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

This section provides an analysis for those regulated pollutants that may be emitted from the modified equipment/processes and that are not classified as “criteria pollutants” or Greenhouse Gases. 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. Greenhouse gases are defined primarily as Carbon Dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>), and Nitrous Oxide (N<sub>2</sub>O). 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). Any potential applicability to these programs were discussed above under REGULATORY APPLICABILITY.

### ***Sulfuric Acid***

Consol has proposed the use of sulfuric acid in the water treatment process including the use of a 9,105 gallon storage tank. Based on the acid mist standards under §45-7-4.2, sulfuric acid is considered a “regulated pollutant.” However, based on the very low vapor pressure of sulfuric acid, no substantive emissions are expected from its use. Proposed requirements for the use of sulfuric acid are given under 4.1.9. of the draft permit. Sulfuric acid is not classified as a HAP and a toxicity analysis of sulfuric acid is not provided on the Integrated Risk Information System (IRIS).

## **AIR QUALITY IMPACT ANALYSIS**

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

## **MONITORING, COMPLIANCE DEMONSTRATIONS, REPORTING, AND RECORDING OF OPERATIONS**

The following substantive monitoring, compliance demonstration, and record-keeping requirements shall be required relevant to the emission units/sources modified at the Northern West Virginia Water Treatment Plant:

- For the purposes of demonstrating continuous compliance with maximum throughput limitations set forth in Table 4.1.4 and 4.1.9(b) of the draft permit, Consol shall be required

to monitor and record the monthly and rolling twelve month throughput of each material specified under Table 4.1.4 and 4.1.9(b);

- In order to determine compliance with 45CSR7 opacity requirements, Consol shall be required to conduct visible emission checks and/or opacity monitoring and recordkeeping for all emission sources subject to an opacity limit pursuant to the requirements of 4.2.3(a), (b), and (c) of the draft permit; and
- Consol is required to comply with all applicable monitoring, compliance demonstration, and record-keeping requirements as given under 45CSR7.

Note that under Requirement 3.2 of the Draft Permit, compliance with all annual limits shall be based on a rolling twelve month total.

### **PERFORMANCE TESTING OF OPERATIONS**

No new performance testing is required as part of this modification.

### **CHANGES TO PERMIT R13-2921**

The following substantive changes were made to Permit Number R13-2921A:

- Increase in annual soda ash throughput limit from 2,373 tons per year (TPY) to 7,744 TPY in Table 4.1.4.;
- Decrease in annual hydrated lime (unloaded) throughput limit from 15,010 TPY to 14,031 TPY in Table 4.1.4.; and
- Removal of the permit requirement to recycle fumes from the sulfuric acid storage tank back into the tank during loading in 4.1.9(b); and
- Increase in annual sulfuric acid throughput limit from 106,000 gallons per year to 111,325 gallons per year in 4.1.9(c) - changed to 4.1.9(b) in the revised draft permit.

### **RECOMMENDATION TO DIRECTOR**

The information provided in the permit application indicates that compliance with all applicable state and federal regulations will be achieved. Therefore, I recommend to the Director the issuance of a Permit Number R13-2921A to Consol Energy, Inc. for the above discussed modification of the Northern West Virginia Water Treatment Plant located near Mannington, Marion County, WV.

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Joe Kessler, PE  
Engineer

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Date