



**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

Joe Manchin, III, Governor  
Randy C. Huffman, Cabinet Secretary  
www.wvdep.org

**ENGINEERING EVALUATION / FACT SHEET**

**BACKGROUND INFORMATION**

Application No.: G60-C080  
Plant ID No.: 079-00014  
Applicant: AC&S, Inc.  
Facility Name: Nitro Facility  
Location: Putnam County  
NAICS Code: 325320  
Application Type: Construction  
Received Date: September 15, 2015  
Engineer Assigned: Caraline Griffith  
Fee Amount: \$1,500  
Date Received: September 17, 2015  
Complete Date: October 5, 2015  
Due Date: November 20, 2015  
Applicant Ad Date: September 14, 2015  
Newspaper: *The Charleston Gazette*  
UTM's: Easting: 426.1 km Northing: 4,254.1 km Zone: 17  
Description: This is an After-the-Fact permit for the installation and operation of an emergency generator at AC&S, Inc.'s Nitro Facility.

**PROCESS DESCRIPTION**

AC&S, Inc. installed a generator at its Raw Materials Warehouse in Nitro, WV for emergency electricity if a power outage occurs. The generator was manufactured in May 2006 and purchased in September 2006. In the case of a power outage, the generator is used to power boilers and keep pipes from freezing in the winter.

The make and model of the generator is a Caterpillar D40-4. The emission factors for this engine were applied based on peak emission rates and the maximum power rating. As with any internal combustion engine, pollutants are generally emitted through the exhaust, with some total organic compounds escaping from the crankcase as a result of blowby as well as evaporative losses from the carburetor. The exhaust exits to the atmosphere through an emission point E-GEN-01.

## SITE INSPECTION

On September 23, 2015 Todd Shrewsbury and I inspected the AC&S, Inc. Nitro Facility Caterpillar D40-4 diesel emergency engine where we met with a technician named Victor and the GHS Manager, Eric Miller. At the time of inspection the total number of hours of operation was 146. The serial numbers matched on the specification sheets to the number on the engine itself. There was no catalyst. Regular maintenance was being done (oil changes, belt changes, etc.). AC&S, Inc. was informed that they need to keep a log of each time they test the engine, which they stated was once a month for about 1.5 – 2 hours. It is also manually operated.

Directions to the facility:

Take Exit 45 (Nitro) off I-64. Turn left onto Route 25. Travel 1.2 miles and turn right on Plant Road. Travel 0.7 miles and turn left at the water tower at AC&S guardhouse.

## ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The emission estimates for each of these pollutants were calculated using AP-42 Chapter 3.3. The maximum horsepower for the Caterpillar D40-4 engine is 72.6 HP.

Emission ID	Emission Unit Description	Pollutant	lb/hr	TPY
E-GEN-01	Caterpillar D40-4	NOx	0.82	0.21
		CO	0.18	0.05
		VOC	0.07	0.02
		SO2	0.05	0.01
		PM10	0.06	0.02
		Formaldehyde	2.18E-04	5.0E-05
		Benzene	1.72E-04	4.0E-05
		Toluene	7.56E-05	2.0E-05
		Xylene	5.27E-05	1.0E-05
		Propylene	4.77E-04	1.2E-04
		Acetaldehyde	1.42E-04	4.0E-05
		Total PAHs	3.10E-05	1.0E-05

## REGULATORY APPLICABILITY

**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

AC&S, Inc. has demonstrated compliance with 45CSR13 by submitting a complete G60-C general permit registration application, placing a legal advertisement in the *Charleston Gazette* on September 14, 2015, and paying the applicable fees.

## **45CSR22** Air Quality Management Fee Program

This facility is a minor source and not subject to 45CSR30. AC&S, Inc. is required to keep their Certificate to Operate current. They paid the \$500 fee associated with a G60-C general permit registration application and a \$1000 NSPS fee.

## **40CFR60 Subpart IIII** (Standards of Performance for Stationary Compression Ignition Internal Combustion Engines)

Subpart IIII sets forth emission limits, fuel requirements, installation requirements, and monitoring requirements based on the year of installation of the subject emergency generator.

The Caterpillar D40-4 diesel engine installed at this Nitro facility was manufactured on May 17, 2006 and installed September 26, 2006 and is a certified engine, therefore the engine is subject to this rule. AC&S, Inc. must meet all emissions standards in 40CFR60 Table 1 which limits NO<sub>x</sub> emissions to 9.2 g/kW-hr which is 1.1 lb/hr or 0.27 TPY. The Caterpillar D40-4 NO<sub>x</sub> emissions do not exceed this limit. The diesel fuel used in this engine must meet all requirements in 40CFR60.4207(a)(b)(e). AC&S, Inc. must show compliance by operate and maintain the engine and control device according to manufacturer standards, change only emissions-related settings as permitted by the manufacturer, and meet all requirements as they apply to this facility. AC&S, Inc. must also demonstrate compliance by keeping records of performance test results for each pollutant, keeping records of engine manufacturing data and control device vendor data indicating compliance with standards, and conducting an initial performance test to demonstrate compliance with the emission standards. They must also comply with the usage regulations and limitations in 40CFR60 Subpart IIII.

## TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

Small amounts of non-criteria regulated hazardous air pollutants such as benzene, toluene, and formaldehyde may be emitted when natural gas is combusted in reciprocating engines, combusted in the fuel burning units, or combusted in one of the combustion type air pollution control devices.

All natural gas production facilities that are issued a G70-A general permit registration by the Director will be limited to those that are classified as minor sources of hazardous air pollutants. Minor sources of hazardous air pollutants are defined as those that have a potential to emit of less than 10 tons per year of any hazardous air pollutant or less than 25 tons per year of any combination of hazardous air pollutants.

Listed below is information regarding each of the possible hazardous air pollutants emitted at this facility:

### **Benzene:**

Benzene is found in the air from emissions from burning coal and oil, gasoline service stations, and motor vehicle exhaust. Acute (short-term) inhalation exposure of humans to benzene may cause drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritation, and, at high levels, unconsciousness. Chronic (long-term) inhalation exposure has caused various

disorders in the blood, including reduced numbers of red blood cells and aplastic anemia, in occupational settings. Reproductive effects have been reported for women exposed by inhalation to high levels, and adverse effects on the developing fetus have been observed in animal tests. Increased incidence of leukemia (cancer of the tissues that form white blood cells) have been observed in humans occupationally exposed to benzene. EPA has classified benzene as a Group A, human carcinogen.

**Formaldehyde:**

Formaldehyde is used mainly to produce resins used in particle board products and as an intermediate in the synthesis of other chemicals. Exposure to formaldehyde may occur by breathing contaminated indoor air, tobacco smoke, or ambient urban air. Acute (short-term) and chronic (long-term) inhalation exposure to formaldehyde in humans can result in respiratory symptoms, and eye, nose, and throat irritation. Limited human studies have reported an association between formaldehyde exposure and lung and nasopharyngeal cancer. Animal inhalation studies have reported an increased incidence of nasal squamous cell cancer. EPA considers formaldehyde a probable human carcinogen (Group B1).

**Toluene:**

The acute toxicity of toluene is low. Toluene may cause eye, skin, and respiratory tract irritation. Short-term exposure to high concentrations of toluene (e.g., 600 ppm) may produce fatigue, dizziness, headaches, loss of coordination, nausea, and stupor; 10,000 ppm may cause death from respiratory failure. Ingestion of toluene may cause nausea and vomiting and central nervous system depression. Contact of liquid toluene with the eyes causes temporary irritation. Toluene is a skin irritant and may cause redness and pain when trapped beneath clothing or shoes; prolonged or repeated contact with toluene may result in dry and cracked skin. Because of its odor and irritant effects, toluene is regarded as having good warning properties. The chronic effects of exposure to toluene are much less severe than those of benzene. No carcinogenic effects were reported in animal studies. Equivocal results were obtained in studies to determine developmental effects in animals. Toluene was not observed to be mutagenic in standard studies.

**Xylene:**

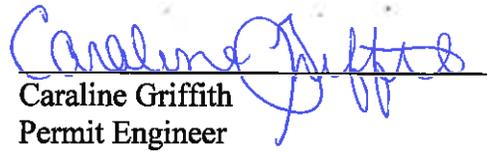
Commercial or mixed xylene usually contains about 40-65% *m*-xylene and up to 20% each of *o*-xylene and *p*-xylene and ethyl benzene. Xylenes are released into the atmosphere as fugitive emissions from industrial sources, from auto exhaust, and through volatilization from their use as solvents. Acute (short-term) inhalation exposure to mixed xylenes in humans results in irritation of the eyes, nose, and throat, gastrointestinal effects, eye irritation, and neurological effects. Chronic (long-term) inhalation exposure of humans to mixed xylenes results primarily in central nervous system (CNS) effects, such as headache, dizziness, fatigue, tremors, and incoordination; respiratory, cardiovascular, and kidney effects have also been reported. EPA has classified mixed xylenes as a Group D, not classifiable as to human carcinogenicity. Mixed xylenes are used in the production of ethylbenzene, as solvents in products such as paints and coatings, and are blended into gasoline.

AIR QUALITY IMPACT ANALYSIS

Modeling was not required for this source due to the fact that the facility is not considered a "major source" according to 45CSR 14 or 45CSR19.

RECOMMENDATION TO DIRECTOR

General Permit G60-C meets all the requirements of applicable regulations when all of the applicable control devices are functioning properly. Therefore, it is recommended that General Permit G60-C should be issued.

  
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Caraline Griffith  
Permit Engineer

10/15/14  
\_\_\_\_\_  
Date