



# COMMONWEALTH of VIRGINIA

## DEPARTMENT OF ENVIRONMENTAL QUALITY

TIDEWATER REGIONAL OFFICE

5636 Southern Boulevard, Virginia Beach, Virginia 23462

(757) 518-2000 Fax (757) 518-2009

www.deq.virginia.gov

Molly Joseph Ward  
Secretary of Natural Resources

David K. Paylor  
Director

Maria R. Nold  
Regional Director

## STATEMENT OF LEGAL AND FACTUAL BASIS

Commonwealth Chesapeake Company, LLC

Commonwealth Chesapeake Power Station

New Church, VA

**Permit No. TRO-40898**

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As required by 40 CFR Part 70 and 9 VAC 5 Chapter 80, Commonwealth Chesapeake Company, LLC has applied for a Title V and a Title IV Operating Permit for its New Church facility. The Department has reviewed the application and has prepared a draft Title V and Title IV Operating Permit.

Permit Writer:

\_\_\_\_\_  
Laura D. Corl  
(757) 518-2178

Date: June 19, 2015

Regional Air Permits  
Manager:

\_\_\_\_\_  
Troy D. Breathwaite

Date: June 22, 2015

Regional Director:

\_\_\_\_\_  
Maria R. Nold

Date: June 22, 2015

## I. Facility Information

### Permittee

Commonwealth Chesapeake Company, LLC  
7500 College Blvd., Suite 400  
Overland Park, KS 66210

### Responsible Official

Garrick Venteicher  
Chief Financial Officer/Treasurer

### Acid Rain Designated Representative and NO<sub>x</sub> Budget Trading Authorized Account Representative

Brock Shealy  
Senior VP Business Operations  
USEPA AAR ID number: 606904

### Facility

Commonwealth Chesapeake Power Station  
3415 White Oak Way  
New Church, VA 23415-2948

### Contact Person

Dan Runde  
Plant Manager  
757-824-3340 ext. 114

**County-Plant Identification Number:** 51-001-00030

**ORIS Code:** 55381

**NATS Facility Identification Number:** 055381

**Facility Description:** NAICS 221112 – Commonwealth Chesapeake Company LLC is a peaker power plant for the Pennsylvania-New Jersey-Maryland (PJM) high-voltage electricity grid. It is owned and operated by Tyr Energy based in Overland Park, Kansas. It is located on a 126-acre tract of land in Accomack County on the Eastern Shore of Virginia. The plant is located less than one mile from the Maryland state line in New Church, Virginia. According to their website, “PJM Interconnection is a regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia.”

The plant has seven (7) GE LM6000 PC diesel fuel-fired simple cycle combustion turbines to generate electricity. With this renewal, the facility is also being permitted to become a black start facility in order to assist PJM in restoring power to the grid in the event of a widespread grid failure. The facility will now have the capability to black start one (1) turbine using an emergency diesel generator. The black start of a single turbine will supply power to the facility so the other six (6) turbines can be brought back on line as needed in a normal fashion following a grid failure. This is a new emergency startup scenario for the facility.

The facility is a Title V major source of NO<sub>x</sub>, CO and SO<sub>2</sub> and an area source of HAP. This source is located in an attainment area for all pollutants, and is a PSD major source. The facility is currently permitted under a PSD permit issued on October 5, 2000, amended on March 8, 2006, June 2, 2015 and June 17, 2015.

## II. Compliance Status

A full compliance evaluation of this facility, including a site visit, has been conducted. In addition, all reports and other data required by permit conditions or regulations, which are submitted to DEQ, are evaluated for compliance. Based on these compliance evaluations, the facility has not been found to be in violation of any state or federal applicable requirements at this time.

### III. Emission Units and Control Device Identification

The emissions units at this facility consist of the following:

Emission Unit ID	Stack ID	Emission Unit Description	Size/Rated Capacity*	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
<b>Combustion Turbines</b>							
CT-1 thru 7	CT 1-7	GE LM6000 CT 1 thru 3. Installed 2000 CT 4 thru 7. Installed 2001	43.3 MW each at ISO conditions	GE water injection on each CT	WI 1-7	NOx	NSR Permit of 10/05/2000, amended on 3/8/06, 6/2/15 and 6/17/15.
<b>Distillate Oil Storage Tanks</b>							
T-1, 2, & 3	T 1-3	Above ground fixed roof tanks. 2000 & 2001	Each at 2.5 million gal	N/A	N/A	N/A	NSR Permit of 10/05/2000, amended on 3/8/06, 6/2/15 and 6/17/15.
T- 4 & 5	T 4 & 5	Above ground fixed roof tanks. 2001	Each at 225,000 gal	N/A	N/A	N/A	NSR Permit of 10/05/2000, amended on 3/8/06, 6/2/15 and 6/17/15.
<b>Generators</b>							
FW-ENG	-	Clark JDFP-06WR with a John Deere 6081A diesel fire pump engine (2000)	2.1 MMBtu/hr 275 BHP	N/A	N/A	N/A	
BSE-1	-	Caterpillar 3512C Emergency Diesel Generator (2014)	1.5 MW, 750 ekW, 2,206 BHP, 7.4 MMBtu/hr	N/A	N/A	N/A	NSR Permit amended on 3/8/06, 6/2/15 and 6/17/15.

#### IV. Emissions Inventory

Actual emissions from 2013 are summarized in the following tables.

Emission Unit	2013 Criteria Pollutant Emission in Tons/Year				
	NO <sub>x</sub>	SO <sub>2</sub>	CO	PM <sub>10</sub>	VOC
CT-1 thru CT-7	31.6	0.7	7.3	2.7	0.8

#### V. Changes to the Title V - PSD Significant Amendment Dated 6/2/2015 (amended 6/17/2015)

A significant amendment to the underlying PSD permit was issued on June 2, 2015, and amended on June 17, 2015, which gives the facility the ability to black start one (1) combustion turbine in the event of a grid failure. The PSD significant amendment included the addition of a Caterpillar 3512C black start emergency diesel generator to fire one (1) combustion turbine at a low operating load for up to six hours per event in order to bring the remaining combustion turbines back on line in a normal manner. The changes to the underlying PSD permit are being incorporated into this draft Title V renewal permit.

##### PSD Analysis:

The PSD significant amendment consisted of the addition of a new diesel emergency generator (Tier II) and allowing the generator to be used to black start one (1) combustion turbine in the event of a catastrophic power failure. The Pennsylvania - New Jersey - Maryland Interconnection, LLC (PJM) would be the Interconnection service to request this emergency startup. The single turbine is limited to operating in a low load mode for no more than 6 hours per occurrence. The emergency black start generator is, by definition, to operate only in times of emergency and only to black start a single turbine. It has been limited to operate for no more than 500 hours per year. The facility did not request any increase in facility wide diesel fuel throughput or annual hours of operation of the turbines. The addition of the generator at 500 hours of operation per year and 6 hours of combustion turbine run time at low load were evaluated for PSD applicability as follows:

There are two methods of evaluating for PSD, either by a past actual to future potential analysis or by past actual to future projected actual analysis. The past actual to future projected actual analysis was used for this project. The project was defined as the addition of a 1.5 MW emergency black start generator that would fire 1 of 2 designated turbines (already permitted) in a low load mode for no more than 6 hours per occurrence.

The past actual emissions of the generator are zero because the generator is a new unit. The past actual emissions of the turbine operating as defined in the project are also zero because the turbine could not previously operate in a low load mode due to a previous permit restriction limiting operation to 70% load or greater. Future projected actual emissions were calculated by estimating a projected annual frequency of black start emergencies and assuming 500 hours of generator operation per year. According to the facility, there has never been a catastrophic grid failure in this location in the 15 years that the facility has been in operation. The facility estimated that such a catastrophic loss of power might occur once every 5 years. As a conservative estimate, it has been assumed that a black start emergency will occur once per year. Future projected actual emissions are, thus, based on the assumption that a black start emergency will occur once annually.

**Future Projected Actual Emissions – Black Start Emergency Diesel Generator**

Future projected actual emissions from the operation of the Tier II emergency generator (Caterpillar 3512C) are calculated as follows:

PM, NO<sub>x</sub> and CO emissions are based on Tier II standards. SO<sub>2</sub> and VOC emissions are based on AP-42 emission factors for large engines because the engine is rated at 2,206 brake horse power (BHP). Past actual emissions for all pollutants = 0.0 tons/year.

Assumptions and limits for the generator:

The generator is a Tier II generator	
It is limited to 500 hours/year	500 hour/yr
Generator specifications:	2206 BHP
	750 kw
Conversion	453.5924 g/lb

Total generator emissions @ 500 hours/year:

Tier II	PM	0.2 g/kw hr	150 g/hr	0.3 lb/hr	0.08 ton/yr
AP-42	SO <sub>2</sub>		0.000012135 lb/hp-hr	0.03 lb/hr	0.01 ton/yr
Tier II	NO <sub>x</sub>	6.4 g/kw hr	4800 g/hr	10.6 lb/hr	2.65 ton/yr
Tier II	CO	3.5 g/kw hr	2625 g/hr	5.8 lb/hr	1.45 ton/yr
AP-42	VOC		0.000705 lb/hp-hr	1.6 lb/hr	0.39 ton/yr

For the Tier II emission factors,  $g/kw-hr \times kw = g/hr \div g/lb = lb/hr \times 500 \text{ hrs/yr} \div 2000 \text{ lb/ton} = \text{ton/yr}$

For the AP-42 emission factors,  $lb/hp-hr \times BHP = lb/hr \times 500 \text{ hrs/yr} \div 2000 \text{ lb/ton} = \text{ton/yr}$

**Future Projected Actual Emissions – One (1) Combustion Turbine, Emergency Startup/Low Load**

Assumptions and limits for the turbines:

The facility is limited to operation in low load emergency (LLE) start-up mode for no more than 6 hours per occurrence.

It is conservatively projected that LLE operation will occur no more than once per year as, to date, a grid failure has never occurred in the 15 years of the facility’s existence.

Past actual emissions for all pollutants = 0.0 tons/year

Hourly permitted emission limitations for one (1) turbine:

PM	10.3 lb/hr		0.0309 ton/yr
SO2	23.9 lb/hr		0.0717 ton/yr
NOx	85.1 lb/hr	at 6 hours per year this means the turbine	0.2553 ton/yr
CO	30 lb/hr	future projected actual	0.09 ton/yr
VOC	5.6 lb/hr	emissions are:	0.0168 ton/yr

**Project Future Projected Actual Emissions – Combined Total Project (Emergency Generator + Combustion Turbine in LLE Mode)**

	<u>Turbine emissions</u>	<u>Generator emissions</u>	<u>Future Projected Actual Emissions</u>	<u>PSD Significance Levels</u>
PM/PM10/PM2.5	0.03 ton/yr	0.08 ton/yr	0.11	25/15/10
SO2	0.07 ton/yr	0.01 ton/yr	0.08	40
NOx	0.26 ton/yr	2.65 ton/yr	2.91	40
CO	0.09 ton/yr	1.45 ton/yr	1.54	100
VOC	0.02 ton/yr	0.39 ton/yr	0.41	40

**Summary:** Based on the analysis, the difference between the future projected actual emissions and the past actual emissions (zero) for the project are less than the PSD significance levels for criteria pollutants. The project did not result in a PSD significant increase, therefore, the permit was processed as a significant amendment to the PSD permit per 9VAC5-80-1955.

## VI. Fuel Burning Equipment Requirements - CT 1-7, FW-ENG and BSE-1

The following Federal Requirements are applicable to this source:

- 40 CFR Part 60, Subpart GG Standards of Performance for Stationary Gas Turbines
- 40 CFR Part 60, Subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines
- 40 CFR Part 63, Subpart ZZZZ National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines
- 40 CFR Part 97, Subparts AAAAA-DDDDD - Cross-State Air Pollution Rule (See section IX)

The following Virginia Administrative Codes that have specific emission requirements have been determined to be applicable:

- 9 VAC 5 Chapter 50 New and Modified Stationary Sources
- 9 VAC 5 Chapter 80 Article 3: Federal Operating Permits for Acid Rain Sources
- 9 VAC 5 Chapter 80 Article 2: Permit Program Emissions Fees for Stationary Sources
- 9 VAC 5 Chapter 80 Article 4: Insignificant Activities
- 9 VAC 5 Chapter 80 Article 8: Prevention of Significant Deterioration

### A. Limitations

- Conditions 1-4 list the emission controls for the seven turbines: use of diesel fuel to control Particulate Matter, use of a low sulfur diesel to control the SO<sub>2</sub> and sulfuric acid mist, use of water injection to control thermal NO<sub>x</sub>, and good operating practices to control the CO emissions.
- Condition 5 is list of definitions for this facility. A definition section has been added to the permit for clarification.
- Condition 6 lists the only approved fuel for the turbines as diesel fuel and the ultra low sulfur diesel as the approved fuel for the black start generator.
- Condition 7 limits how much fuel can be used for the turbines and the black start generator.
- Condition 8 limits the sulfur content in the fuels.
- Condition 9 limits the turbines to operating at above 70% load except during a startup, shutdown or during a low load emergency situation.
- Condition 10 limits the number of hours the turbines can operate.
- Condition 11 limits the number of hours the black start emergency generator can operate.
- Condition 12 requires the black start emergency generator to have a non-resettable hour meter that will require monitoring.
- Condition 13 lists the hourly emission limits for turbines 1-3.
- Condition 14 lists the annual emission limits for turbines 1-3 and the black start emergency diesel generator.
- Condition 15 lists the hourly and the annual emissions for turbines 4-7.
- Condition 16 limits the opacity of each turbine to 10% while operating.
- Condition 17 lists the visible emission limits for the emergency generator and the fire pump engine.
- Condition 18 lists the maintenance requirements of the turbines.
- Condition 19 lists the fuel requirements and the emission limits required in NSPS IIII for the black start emergency generator.
- Condition 20 lists the MACT ZZZZ fuel requirements and emission limitations for the fire pump engine.

## **B. Monitoring**

Condition 21 describes the monitoring of the sulfur content and nitrogen content (from NSPS Subpart GG) of the fuel used in the turbines.

Condition 22 describes how the source must monitor the water to fuel ratio (from NSPS Subpart GG) when operating the turbines.

Condition 23 describes how the source must monitor the visible emissions of the turbines when they are operating.

Condition 24 describes how the source must monitor visible emissions of the emergency generator and the fire pump engine.

Condition 25 lists the NSPS IIII monitoring requirements for the black start emergency diesel generator.

Condition 26 lists the MACT ZZZZ monitoring requirements of the fire pump engine.

## **C. Recordkeeping**

Condition 27 requires fuel certification recordkeeping.

Condition 28 lists the NSPS IIII notification, recordkeeping and reporting requirements for the black start emergency generator.

Condition 29 lists the MACT ZZZZ recordkeeping and reporting requirements for the fire pump engine.

Condition 30 lists all the other recordkeeping requirements and requires that the records must be kept for 5 years:

- Operating hours for each turbine and combined turbines;
- Fuel oil analysis records from the testing for nitrogen and sulfur content in the fuel;
- Oil shipment records;
- Throughput of diesel used by the turbines and the black start emergency generator;
- Monthly and annual emission calculations for NO<sub>x</sub> and SO<sub>2</sub>;
- Records of the approved emission factors for all criteria pollutants;
- Records of all reports that have been submitted;
- Fuel supplier certification records;
- Monthly and annual hours of operation of the black start emergency generator;
- Records of each low load emergency situation;

Condition 31 describes the excess emission reports that must be submitted in accordance with NSPS Subpart GG.

Condition 32 lists the initial notification that the facility must meet for the new emergency startup scenario.

Condition 33 is the ongoing notification for each time the emergency operating scenario takes place.

## **D. Testing**

Condition 34 describes the testing required to show compliance with the hourly emissions limits during low load operations.

Condition 35 describes the annual stack testing that is required to show compliance with the NO<sub>x</sub> limits.

Condition 36 is the annual VEE requirement for the turbine being stack tested that year.

Condition 37 specifies that the facility must be constructed in a way to allow testing at any time in the future.

## **VII. Storage Tank Requirements**

Condition 38 limit the type of fuel that can be stored in the tanks and the emissions from the tanks.

Condition 39 lists the emission limits for VOC from the tanks.

Condition 40 requires the recordkeeping of the tanks.

## VIII. Insignificant Emission Units

The insignificant emission units are presumed to be in compliance with all requirements of the Clean Air Act as may apply. Based on this presumption, no monitoring, recordkeeping or reporting shall be required for these emission units in accordance with 9 VAC 5-80-110.

Insignificant emission units include the following:

Emission Unit No.	Emission Unit Description	Citation 9VAC5-80-720 A, B, or C	Pollutant(s) Emitted (if applicable to 9VAC5-80-720 B)	Rated Capacity (if applicable to 9VAC5-80-720 C)
Fugitive-1 (fuel oil)	Fugitive emissions associated with the unloading, processing and transfer of diesel fuel oil	9VAC5-80-720C	VOC	42 x 10 <sup>6</sup> gal/yr
Fugitive-2 (Oil/water separator)	Fugitives from oil/water separator	9VAC5-80-720C	VOC	< 500 gal
Fugitive 3 (small tanks)	Reservoirs and storage tanks for lubricants or used oil with a capacity less than 1000 gallons	9VAC5-80-720C	VOC	< 1000 gal each
Fugitive-4 (plant traffic)	Fugitive emissions related to movement of non-passenger vehicles; e.g., diesel trucks	9VAC5-80-720C	VOC	Each less than 500 gal
FPT-1	Fire pump diesel fuel tank	9VAC5-80-720C	PM / PM10 / PM2.5	< 500 gal
BSET-1	Black Start Generator diesel fuel tank	9VAC5-80-720C	VOC	<1300 gal

<sup>1</sup>The citation criteria for insignificant activities are as follows:

9 VAC 5-80-720 A - Listed Insignificant Activity, Not Included in Permit Application

9 VAC 5-80-720 B - Insignificant due to emission levels

9 VAC 5-80-720 C - Insignificant due to size or production rate

## IX. Inapplicable Requirements

The following table lists the inapplicable requirements:

Citation	Title of Citation	Description of Applicability
9VAC5 Chapter 80, Article 7 & 9VAC5 Chapter 60, Article 3	Major Hazardous Air Pollutant NSR Permitting	Not a major HAP source
40 CFR 60, Subpart KKKK	Standards of Performance for Stationary Combustion Turbines	Facility constructed prior to applicability date of 2005
40 CFR 60, Subpart Part Kb	Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984	True Vapor Pressure of diesel fuel oil is less than 3.5 kPa.
40 CFR 61	NESHAPs	No Source category listed
40 CFR 63 Subpart YYYY	MACT for Stationary Combustion Turbines	Not a major HAP source
40 CFR 64	Compliance Assurance Monitoring	CTs 1-7 do not use air pollution control equipment to destroy pollutants.
40 CFR 68	Prevention of Accidental Chemical Releases	Any chemicals on site are below threshold levels.

## X. General Conditions

The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-490 that apply to all Federal-operating permitted sources. These include requirements for submitting semi-annual monitoring reports and an annual compliance certification report. The permit also requires notification of deviations from permit requirements or any excess emissions.

### 1. Comments on General Conditions

#### a. Conditions 44-49. Permit Expiration

These conditions refers to the Board taking action on a permit application. The Board is the State Air Pollution Control Board. The authority to take action on permit application(s) has been delegated to the Regions as allowed by §2.2-604 and §10.1-1185 of the *Code of Virginia*, and the “Department of Environmental Quality Agency Policy Statement No. 2-09”.

#### b. Conditions 55-56. Failure/Malfunction Reporting

Section 9 VAC 5-20-180 requires malfunction and excess emission reporting within four hours of discovery. Section 9 VAC 5-80-250 of the Title V regulations also requires malfunction reporting; however, reporting is required within two days. Section 9 VAC 5-20-180 is from the general regulations. All affected facilities are subject to section 9 VAC 5-20-180 including Title V facilities. Section 9 VAC 5-80-250 is from the Title V regulations. Title V facilities are subject to both sections. A facility may make a single report that meets the requirements of 9 VAC 5-20-180 and 9 VAC 5-80-250. The report must be made within four daytime business hours of discovery of the malfunction.

#### c. Condition 60. Permit Modification

This general condition cites the sections that follow:

9 VAC 5-80-490 G & L. Permit content, Enforcement, Reopening of permits.

9 VAC 5-80-550. Changes to Permits.

9 VAC 5-80-660. Enforcement.

d. Conditions 74-77. Malfunction as an Affirmative Defense

The regulations contain two reporting requirements for malfunctions that coincide. The reporting requirements are listed in sections 9 VAC 5-80-250 and 9 VAC 5-20-180. The malfunction requirements are listed in General Condition 75 and General Condition 55. For further explanation see the comments on general condition 55.

## **XI. Cross State Air Pollution Rule**

This regulation, which replaces CAIR, became effective in January of 2015. A condition referencing the regulations has been added until further guidance is received.

## **XII. Acid Rain Allowances and Requirements**

This section lists the allowances under the acid rain program for each unit. Because the units were constructed after the initial evaluation period, there are no SO<sub>2</sub> allowances.

## **XIII. State Only Applicable Requirements**

The following Virginia Administrative Codes have specific requirements only enforceable by the State and have been identified as applicable by the applicant:

Odor: 9VAC5-50-310

State Toxics Rule: 9VAC5-60-320

## **XIV. Streamlined Requirements**

There are no streamlined requirements in this permit.

## **XV. Public Participation**

The proposed permit will be (was) placed on public notice in the Eastern Shore News newspaper from Saturday, May 2, 2015 to Monday, June 1, 2015.