NORTH CAROLINA DIVISION OF AIR QUALITY

Application Review

Issue Date: TBD

Region: Mooresville Regional Office
County: Cleveland
NC Facility ID: 2300372
Inspector's Name: Denise Hayes
Date of Last Inspection: 02/19/2019
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): Cleveland County Generating Facility

Facility Address:
Cleveland County Generating Facility
240 Battleground Road
Kings Mountain, NC 28086

SIC: 4911 / Electric Services
NAICS: 221119 / Other Electric Power Generation

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP: 02D .0530
NSPS:
NESHAP:
PSD: PM, SO_2
PSD Avoidance:
NC Toxics:
112(r):
Other:

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Ryan Frazier SPC Environmental Compliance (205) 992-0050 3535 Colonnade Parkway Birmingham, AL 35243	Jesse English Plant Manager (704) 278-6601 5755 NC 801 Highway Salisbury, NC 28147	Scott McMillan SPC Environmental Compliance (205) 992-0057 3535 Colonnade Parkway Birmingham, AL 35243

Application Data

Application Number: 2300372.19A
Date Received: 04/12/2019
Application Type: Modification
Application Schedule: TV-Significant

Existing Permit Data
Existing Permit Number: 09881/T06
Existing Permit Issue Date: 07/09/2018
Existing Permit Expiration Date: 06/30/2023

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2017	2.69	137.66	6.20	40.80	39.78	4.68	3.14 [Formaldehyde]
2016	2.43	129.82	5.80	37.53	36.19	4.36	2.91 [Formaldehyde]
2015	4.00	174.00	7.74	48.16	47.62	5.66	3.69 [Formaldehyde]
2014	2.50	122.10	5.44	34.81	33.79	4.06	2.69 [Formaldehyde]
2013	2.80	46.10	1.95	13.21	12.26	1.51	1.04 [Formaldehyde]

Review Engineer: Russell Braswell

Review Engineer's Signature: **Date:**

Comments / Recommendations:
Issue 09881/T07
Permit Issue Date: TBD
Permit Expiration Date: June 30, 2023 (no change)

1. Purpose of Application:

Cleveland County Generating Facility ("CCGF", "the facility") operates a power plant in Cleveland County, North Carolina under Title V Air Quality Permit 09881T07. The facility consists of four simple-cycle oil/gas-fired combustion turbines. The facility is a Major Source for PSD, and the permit includes BACT limits for NOx, CO, VOC, and PM. In addition, the permit includes a BACT limit for SO_2 under 15A NCAC 02D .0530(h).

CCGF submitted this application in order to make changes to the PM BACT limit in the permit, and to remove the permit condition for 02D .0530(h). The application was submitted as a one-step significant modification. CCGF claims that this action is not a major modification under PSD.

2. Discussion:

a. Change in natural gas sulfur content:

The initial Title V permit (issued September 10, 2009) included six gas/oil-fired turbines. At that time, it was determined that Best Available Control Technology ("BACT") was determined to be a combination of work practices, low-NOx burners, water injection, and pipeline-quality natural gas. Since the initial permit was issued, minor revisions have been made to the permit. As currently written, the permit limits the use of oil in the turbines to 2,129,000 million BTUs (1,000 full-load equivalent hours) per year per turbine, and limits the combined operation of all turbines at the site to 26,520,000 million BTUs (12,000 full-load equivalent hours) per year, The BACT for particulates specifically requires natural gas with a sulfur content less than 0.2 grains per 100 standard cubic feet (gr/100scf).

At the time the initial Title V permit was issued, natural gas delivered to the facility complied with the sulfur content limit. On February 27, 2019, CCGF noted that the natural gas delivered to the facility no longer complied with the sulfur content limit (0.2 required, 0.28 delivered). CCGF has only one supplier of natural gas and has no control over the content and quality of natural gas delivered to the facility. Fuel sulfur content contributes to particulate formation in the exhaust. In addition, all sulfur in the fuel is assumed to be converted to SO_2.[1] Therefore, the higher sulfur natural gas can be expected to cause PM and SO_2 emissions greater than what was originally calculated for this facility.

CCGF claims that the existing facility can still comply with the requirements of PSD while burning natural gas with a higher sulfur content. The application points out that the original Title V permit included six turbines, but only four were installed. CCGF has since removed the remaining two turbines from the permit.

CCGF submitted technical specifications for the combustion turbines. Based on a worst-case scenario of 1.0 gr/100scf, each turbine will emit at maximum 9.8 pounds of particulate per hour while burning natural gas. The original permit used an emission factor of 9.1 pounds per hour. The change in maximum potential hourly particulate emissions from the facility while burning natural gas can be calculated:

[1] See AP-42 Chapter 3.1, Table 2a, published April 2000.

Figure 1: Particulate emission calculations[2]

PM/PM10 Emission Comparison Calculation

Original Permit			Current Permit with Proposed Revision		
Number of Turbines	6		Number of Turbines	4	
Fuel Oil	69	lb/hr	Fuel Oil	69	lb/hr
Natural Gas	9.1	lb/hr	Natural Gas	9.8	lb/hr
Dual Fuel Limit (Daily)			Dual Fuel Limit (Daily)		
Fuel Oil	7	hours per day per turbine	Fuel Oil	7	hours per day per turbine
Natural Gas	17	hours per day per turbine	Natural Gas	17	hours per day per turbine
Dual Fuel Limit (Annual)			Dual Fuel Limit (Annual)		
Fuel Oil	1000	hours per year per turbine	Fuel Oil	1000	hours per year per turbine
Natural Gas	1000	hours per year per turbine	Natural Gas	2000	hours per year per turbine
Natural Gas Only (Daily)	24	hours per day per turbine	Natural Gas Only (Daily)	24	hours per day per turbine
Natural Gas Only (Annual)	2000	hours per year per turbine	Natural Gas Only (Annual)	3000	hours per year per turbine
Fuel Oil Only (Daily)	9	hours per day per turbine	Fuel Oil Only (Daily)	9	hours per day per turbine

Short-Term

Original Permit			Current Permit with Proposed Revision		
		lb/day			lb/day
Dual Fuel		(6 Turbines)	Dual Fuel		(4 Turbines)
	FO	2,898.00		FO	1,932.00
	NG	928.20		NG	666.40
	Total	**3,826.20**		Total	**2,598.40**
Natural Gas		**1,310.40**	Natural Gas		**940.80**
Fuel Oil		**3,726.00**	Fuel Oil		**2,484.00**

Annual

Original Permit				Current Permit with Proposed Revision			
		TPY	TPY			TPY	TPY
Dual Fuel		(per turbine)	(6 Turbines)	Dual Fuel		(per turbine)	(4 Turbines)
	FO	34.50	207.00		FO	34.50	138.00
	NG	4.55	27.30		NG	9.80	39.20
			234.30				**177.20**
Natural Gas		9.1	**54.60**	Natural Gas		14.7	**58.80**

[2] These calculations were performed by the applicant and included in the permit application.

As shown in Figure 1, in the gas-only scenario, allowing the use of natural gas with a sulfur content up to 1.0 gr/100scf while firing the maximum allowable 12,000 hours per year will increase potential emissions by 4.2 tpy. However, in the dual-fuel scenario, potential emissions decrease by 57.1 tpy.

The existing permit also limits each turbine to a PM emission rate of 0.0083 lb/MMBtu while firing natural gas and an overall PM emission rate of 3,862.2 pounds per day. This permit action will not change either of these limits. The turbines will still comply with these limits while firing natural gas with a sulfur content up to 1.0 gr/100scf.

Based on the above discussion, NC DAQ agrees with the applicant that this facility can still comply with the requirements of PSD while firing natural gas with a sulfur content up to 1.0 gr/100scf.

b. BACT determinations in the RACT/BACT/LAER Clearinghouse ("RBLC"):

The RBLC is a database maintained by the US EPA and is useful for examining BACT determinations made for similar facilities, emission sources, and pollutants. A search of the RBLC for similar emission sources (i.e. PM controls for natural gas-fired simple cycle combustion turbines, heat input capacity greater than 25 MW) shows that several recent BACT determinations only require the use of good combustion practices and "clean fuel" or "pipeline-quality natural gas" for PM control. These BACT determinations do not include any specific sulfur content limit. For examples, see RBLC entries LA-0331, CA-1251, and TX-0833.

Based on other entries in the RBLC, including a specific sulfur content limit for natural gas is not the normal practice, and therefore removing this limit from the permit is reasonable.

Note that "pipeline-quality natural gas" is not the same as "pipeline natural gas" as defined in 40 CFR 72.2. That definition only applies to the Acid Rain Program.

c. Modification under PSD:

The four existing turbines at the facility are PSD-affected sources, so any change regarding these sources could potentially be a major modification under PSD. 40 CFR 52.21(b)(2)(i) defines a *major modification* as "any physical change in or change in the method of operation of a major stationary source that would result in a significant emissions increase..." Given that CCGF is not making any physical change to any sources at the facility and will not change any method of operation at the facility, the proposed action will not qualify as a major modification.

d. Applicability of 15A NCAC 02D .0530(h):

This rule requires a BACT determination for NOx and SO_2 for new natural gas-fired electric generating utilities for which cost recovery is sought under NCGS 62-133.6. This rule does not apply to a source for a pollutant if a BACT determination was already required for that pollutant. For CCGF, this rule applied only for SO_2 because a BACT determination was already required for NOx.

As the rule is currently written, it does not apply to this facility because the facility does not seek cost recovery. Therefore, references to this rule will be removed from the Title V permit. This change to the permit will not cause any physical change or change in the method of operation at the facility. Removing this rule from the permit is not expected to have any effect on actual emissions of SO_2 from this facility because the facility does not operate any control devices for SO_2 and does not have any control over the sulfur content of natural gas delivered to the facility.

3. Public Notice/EPA and Affected State(s) Review

A notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Consistent with 15A NCAC 02Q .0525, the EPA will have a concurrent 45-day review period. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a copy of each permit application, each proposed permit and each final permit pursuant shall be provided to EPA. Also, pursuant to 02Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected State at or before the time notice is provided to the public under 02Q .0521 above. South Carolina is an affected state, and Mecklenburg County is an affected local program.

4. Recommendations

Issue Permit 09881T07.

Attachment 1 to Review of application 2300372.19A
Cleveland County Generating Facility

Table of Changes to Permit 09881T06

Page*	Condition*	Changes
Throughout	n/a	• Updated permit numbers/dates • Removed references to 02D .0530(h) • Updated authorized contact
11	2.2 A.1	• Changed hourly PM emission limit from 9.1 to 9.8 based on application • Removed natural gas sulfur content limit. The limit is now only the use of pipeline-quality natural gas. • Noted that performance testing has been completed.
n/a	2.2 A.2 (former)	• Removed this section because 02D .0530(h) does not apply to this facility.
16	3.	• Updated General Conditions to v5.3.

* This refers to the current permit, unless otherwise stated.

Attachment 2 to Review of application 2300372.19A
Cleveland County Generating Facility

Comments Received on Initial Drafts of Permit 09881T07

- Denise Hayes, by email on June 26, 2019

  1. Section 2.1 A.3 has two paragraph c.

     Response: Fixed.

  2. Section 2.2 A.1.c should be replaced with generic testing language because the facility has completed the required testing.

     Response: I agree. I have included the specific test number in the permit for future reference.

- Scott McMillan, by email on July 1, 2019

  1. Section 2.a of the application review doesn't correctly state the operating limits for the turbines.

     Response: Fixed.

  2. The permit should not reference "pipeline quality natural gas" to prevent being confused with the definition of "pipeline natural gas" in 40 CFR 72.2.

     Response: I discussed this matter with William Willets, Chief of Permitting Section for DAQ. We agreed that the definition of "pipeline natural gas" in 40 CFR 72.2 is not relevant for PSD permitting purposes. I spoke with Scott McMillan by phone call on August 20, 2019 and discussed this issue further. He agreed with keeping "pipeline-quality natural gas" in the permit, provided the application review mention that this is separate from the definition in 40 CFR 72.2.

- Mark Cuilla, by email on July 24, 2019

  The email pointed out several typos in the draft permit

  Response: Fixed.