NORTH CAROLINA DIVISION OF AIR QUALITY

Application Review

Issue Date: August XX, 2022

Region: Washington Regional Office
County: Lenoir
NC Facility ID: 5400216
Inspector's Name: N/A
Date of Last Inspection: N/A
Compliance Code: N/A

Facility Data

Applicant (Facility's Name): Carolina Poultry Power RG3, LLC

Facility Address:
Carolina Poultry Power RG3, LLC
Brothers Road
LaGrange, NC 28551

SIC: 4911 / Electric Services
NAICS: 221112 / Fossil Fuel Electric Power Generation

Facility Classification: Before: Synthetic Minor **After:** Synthetic Minor
Fee Classification: Before: Synthetic Minor **After:** Synthetic Minor

Permit Applicability (this application only)

SIP: 2D (.0504, .0515, .0516, .0521, .0524, .0535, .0540, .0605, .0611, .1100, .1111) and 2Q (.0315, .0317 and .0711); Limitation to avoid 2D .1806
NSPS: 40 CFR Part 60, Subpart Dc
NESHAP: 40 CFR Part 63, Subpart JJJJJJ
PSD: N/A
PSD Avoidance: PM10
NC Toxics: arsenic, acrolein, benzene, chlorine, formaldehyde, hydrochloric acid, mercury and sulfuric acid
112(r): N/A
Other: NCGS 62-133.8(g) SB3 State BACT

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Rich Deming Principal (252) 800-1969 3730 N Main Street Farmville, NC 27828	Rich Deming Principal (252) 800-1969 3730 N Main Street Farmville, NC 27828	Kim Melvin Project Manager (864) 414-3059 116 Hidden Hill Road Spartanburg, NC 29301

Application Data

Application Number: 5400216.22A
Date Received: 05/05/2022
Application Type: Greenfield Facility
Application Schedule: State

Existing Permit Data
Existing Permit Number: N/A
Existing Permit Issue Date: N/A
Existing Permit Expiration Date: N/A

Review Engineer: Kurt Tidd

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

Comments / Recommendations:
Issue 10745/R00
Permit Issue Date: 08/XX/2022
Permit Expiration Date: 07/30/2030

1. Purpose of Application:

Carolina Poultry Power RG3, LLC (referred to as CPP in this review) submitted a greenfield application to build a poultry litter-to-energy facility in LaGrange, North Carolina, which will use the inherent heating value in poultry litter to generate electricity and Renewable Energy Certificates (RECs). This application was submitted for the operation of one poultry litter fuel-fired boiler (97 million Btu per hour maximum heat input) and a dry sorbent injection (lime) storage silo (2,400 cubic feet/31 tons maximum storage capacity). A Non-Hazardous Secondary Material (NHSM) fuel determination was submitted with the original permit application for CPP's Farmville facility (ID No. 7400310) to the NC Division of Air Quality (DAQ), demonstrating that the litter is not a solid waste material waste material when used as fuel in the combustion unit under the meaning of Title 40, Part 241 of the Code of Federal Regulations. The litter to be used at CPP LaGrange is expected to be the same as the litter used at the other CPP permitted facilities, and the permit application ascertains that the original approval remains applicable to this design. The NHSM approval for the Farmville facility was issued in a letter from former NC DAQ Permitting Chief, William Willets, dated 10/04/2016.

Background:
CPP was issued Synthetic Minor air permits for similar facilities located in Farmville (ID No. 7400310) and Wilson (ID No. 9800244), North Carolina. Per the application, the Farmville site began operation in late 2019 and has been collecting data on the dedicated fuel source, which is the same fuel being proposed for this CPP LaGrange site. The Wilson facility is not yet in operation.

2. Application Chronology:

Application received	05/05/2022
Acknowledgement letter	05/05/2022
Modeling/application received at AQAB	05/04/2022
Add info request for modeling	06/02/2022
Info received for modeling	06/06/2022
AQAB modeling review memo issued	06/07/2022
Draft permit sent to facility for review	07/08/2022
Permit draft approval from facility with no changes	07/12/2022
Secondary review of draft by RCO Permits	07/14/2022
Public notice of draft	07/XX/2022
Permit Issued	08/XX/2022

The Greenfield Permit Application was received at the Washington Regional Office (WaRO) on 05/05/2022. The location of this site is just north of 5437 Brothers Road, in LaGrange North Carolina. Because there's not yet an official physical address for the facility the county tax parcel ID No. 15787 is cited as the location in the permit. This application was signed by Rich Deming, Principal. This application contained a P.E. seal for the entire application and noting specifically Forms A through D by Project Integration (PI) Narrative Report Document (Kimberly E. Melvin North Carolina P.E. Seal # 025853).

The application fee of $400 was received on 05/05/2022. The zoning determination was signed on 5/17/2022 by John P. Craft, Town Manager, noting the proposed operation is consistent with applicable zoning ordinances. The signed zoning determination was electronically submitted to the WaRO on 05/23/2022, and a hard copy was received on 5/27/2022.

A Toxics Modeling Analysis was sent to Tom Anderson, marked received by Air Quality Analysis Branch (AQAB) on 05/04/2022 and assigned to Nancy Jones for review. During the review process Ms. Jones requested some revised modeling information which was submitted to AQAB on 06/06/2022. A toxics modeling analysis memorandum dated 06/07/2022 states the modeling adequately demonstrates compliance with the Acceptable Ambient Limits (AALs) on a source-by-source basis for all modeled Toxic Air Pollutants (TAPs). The toxic air pollutants included emissions of the following TAPs: acrolein, arsenic, benzene, chlorine, formaldehyde, hydrogen chloride, mercury, and sulfuric acid.

A Best Available Control Technology (BACT) analysis required by Senate Bill 3 (SB3) of the 2007 Legislative Session for new renewable energy facilities was submitted to Raleigh Central Office (RCO) Permits and assigned to Jeff Twisdale for review. The BACT determination was given a separate application number (5400216.22B) and will be issued administratively in a new permit revision. A placeholder permit condition will be included in the permit for the BACT determination.

3. New Equipment/Change in Emission and Regulatory Review:

New Equipment: The following sources and control devices will be listed in the Greenfield permit:

Emission Source ID	Emission Source Description	Control System ID	Control System Description
ES-B1 (**NSPS, NESHAP**)	poultry litter-fired boiler (97 million Btu per hour maximum heat input) equipped with a manufactured supplied integral multi-cyclone system (Ten (10), 24-inch diameter cyclones)	CD-SNCR1	selective non-catalytic reduction system with eight (8) urea injectors in series with
		CD-SI1	dry sorbent injection in series with
		CD-BF1	pulse jet baghouse (13,437 square feet of filter area)
ES-SILO	lime storage silo (31 tons storage capacity)	CD-BV1	bagfilter (196 square feet of filter area)

Process Description from the application:

Poultry Litter-fired Boiler:
CPP RG3, LaGrange proposes to install a single boiler (ID No. ES-B1, 97 million Btu per hour (MMBtu/hr) maximum heat input rating) fueled by poultry litter with an average heat value of at least 4,655 Btu per pound. This boiler is a traveling grate spreader stoker combustion system operating at 300 psig saturated steam. The boiler design has custom features for litter firing which includes a single-drum, a large two-pass membrane water wall furnace and a widely spaced water-tube evaporator design.

A NHSM fuel determination was submitted with the original CPP RG1 application for the Farmville site (Facility ID No. 7400310) to NC DAQ, demonstrating that poultry litter is not a solid waste material when used as fuel in this combustion unit under the definition of Title 40, Part 241 of the Code of Federal Regulations (40 CFR Part 241). No changes of CPP's current litter feed are associated with this application, and the original approval remains applicable to this design. DAQ is no longer providing NHSM determinations, nor is the USEPA. Instead, facilities are expected to self-qualify while following the processing criteria as required by 40 CFR 24 l.3(b)(4) and meeting the legitimacy criteria provided in 40 CFR 241.3(d)(1) to ensure the fuel qualifies.

The boiler has a manufacturer supplied integral multi-cyclone system for controlling particulate matter. The multi-cyclone consists of ten (10) twenty-four-inch diameter cyclones, is integral to the boiler design and is not considered an add-on control system although there is a specific condition for inspection and maintenance of the multi-clone in the draft permit. A conveying system will transfer bottom and fly ash to the ash loading building, where it will be loaded into trailers for removal. Dust control is accomplished via the building enclosure and ash moisture management prior to loading.

Poultry Litter Feed Stock:
The poultry litter fuel will be received via truck in a fully enclosed building with roll down doors, where it is loaded onto the material handling system. Air in the fuel hall is pulled into vent hoods that provide the combustion air for the boiler, creating a negative pressure and controlling fugitive emissions. The maximum feed rate is approximately 21,000 pounds of poultry litter per hour (10.5 tons per hour). Note: During the first year of operation in Farmville, the poultry litter used by CPP had an average heating value of 4,900 Btu per pound.

Air Pollution Control Systems:
Exhaust from the boiler will be emitted from a single stack, 80 feet tall and 4.25 feet in diameter. The boiler will be equipped with selective non-catalytic reduction for NOx control, dry sorbent injection for acid gas control, and a bagfilter for final particulate control. As noted previously, the boiler comes equipped with an integral multi-cyclone system for particulate control. Air flow through the system will be handled by a 45,731 actual cubic feet per minute (ACFM) induced draft fan located after the bagfilter.

- *Selective Non-catalytic Reduction (SNCR)*
  A semi-automatic SNCR system with eight urea injectors will be installed on the boiler and will include a storage tank with recirculation pump, process control distribution of reduction agent, and a panel for operational control. The design injection rate is approximately 12 gallons per hour at an optimal temperature range of 1,740°F to 1,960°F with injection directly into the furnace. **This system is designed to achieve 45% NOx control efficiency.**

- *Dry Sorbent Injection (DSI)*
  CPP plans to inject dry sorbent (hydrated lime) into the exhaust stream of the boiler at a rate of approximately 420 pounds per hour. The dry sorbent injection system will be located downstream from the SNCR. The flue gas temperature range at the injection point is expected to be approximately 400° F with an approximate duct diameter of 30 inches. **This system is designed to achieve 20% SO_2 control efficiency and 93% HCl control efficiency utilizing sodium bicarbonate, hydrated lime or Trona as the reagent.**

  The DSI silo will be equipped with a passive bin vent bagfilter system to capture displaced air during product off-loading for a truck. The bagfilter is a 25-bag unit with six-inch diameter bags that are 60 inches long, providing 196 square feet of filter area. Material transfer from the truck is approximately 600 cubic feet per minute, indicating an air to cloth ratio of 3:1. Under loading conditions the differential pressure across the filter will be 3 to 4 inches of water column (zero when not loading).

- *Bagfilter*
  The boiler will be equipped with a bagfilter following sorbent injection to control particulate matter emissions prior to exhaust to the atmosphere. The bagfilter will be a single chamber pulse jet baghouse with a filter area of 13,437 square feet (518 bags, 6 inches in diameter, 16 feet long). The baghouse size is incorrectly stated in Section 2.3.3. of the application, but correctly cited within the DAQ application forms and attached specifications. With a system air flow of 48,612 ACFM, the air to cloth ratio is 3.6:1. Pressure drop across the bagfilter will range from 2-7 inches of water column, with a typical drop of 5-6 inches. The bagfilter will be equipped with a bag leak detection alarm system.

Boiler Emissions:
The combustion of poultry litter in the proposed boiler will result in emissions of criteria pollutants, including particulate matter (PM), sulfur dioxide (SO_2), nitrogen oxides (NOx), carbon monoxide (CO), and volatile organic compounds (VOCs), and of hazardous air pollutants (HAPs), including hydrogen chloride (HCl). Emissions for this application were estimated using a combination of emission factors from AP-42 (woodwaste combustion in indirect heat exchangers), manufacturer-provided emissions factors, and stack testing data from sites operating poultry litter-fired boilers.

Pollutant	Potential Emissions Before Controls (tons/year)	Potential Emissions After Controls (tons/year)
PM	1290.72	12.91
PM_{10}	1290.67	12.91
NOx	178.44	98.14
CO	93.47	93.47
SO_2	118.96	95.17
VOC	7.22	7.22
Highest HAP (HCl) (Next largest HAP <2 tpy)	139.71	9.78
Total HAPs	147.55	17.54
Greenhouse Gases	96,592	96,592

Regulatory Review:

Many of the conditions for this permit are not available as "canned" conditions in the IBEAM Permit Writer. The review engineer decided to use the conditions from the two Carolina Poultry Power facilities (ID No. 7400310/Permit 10504R02 and ID No. 9800244/Permit 10689R01) prepared by the DAQ's Washington Regional Office and Raleigh Regional Office. Since this facility is owned and operated by the same entity as the Farmville (7400310) and Wilson (9800244) facilities, the use of these conditions should alleviate any confusion when evaluating applicable testing, recordkeeping, and reporting requirements, as well as ensure consistency between the three facilities' permits.

- *2D .0202: Permit Renewal and Emissions Inventory Requirement*
  At least 90 days prior to the expiration date of this permit, the Permittee shall submit a permit renewal application to DAQ. In additional to this renewal application, the Permittee shall submit the air pollution emission inventory report for pollutants emitted at this facility during the calendar year 2029.

- *2D .0504: Particulate Control Requirement, for Particulates from Wood Burning Indirect Heat Exchangers*
  This rule is applicable to the poultry litter-fired (ID No. ES-B1) The allowable emissions of particulate matter shall be calculated by the equation:

  $$E = 1.1698 * Q^{-0.2230}$$

  Where: E = the allowable emission limit for particulate matter in lb/MMBtu; and
  Q = the maximum heat input in MMBtu/hour

  The boiler has a maximum rated heat input (Q) of 97.0 MMBtu/hour; therefore, the allowable emission limit for particulate matter (E) for this source is 0.42 pounds per million Btu (lb/MMBtu). Per the application, emissions from this boiler will not exceed 0.03 lb/MMBtu (controlled).

  (2.91 lb/hr * hr/97.0 MMBtu = 0.03 lb/MMBtu)

- *2D .0515: Particulate Control Requirement, for Particulates from Miscellaneous Industrial Processes*
  This condition is applicable to the lime storage silo (2400 cubic feet/31 tons storage capacity) (ID No. ES-SILO). The allowable emissions of particulate matter shall be calculated by the equations:

  $E = 4.10 * P^{0.67}$ for P <= 30 tons/hr, or
  $E = 55 * P^{0.11} - 40$ for P > 30 tons/hr

  Where:
  E = the allowable emission limit for particulate matter in lbs/hr; and
  P = the process throughput rate in tons/hr

  Based on the emissions calculations provided in the application, the DSI silo has a maximum throughput of 86 pounds per hour (lb/hour) (0.043 tons/hour) for injection. Using the equation for P <= 30 tons/hr, the allowable emission limit for particulate matter (E) for this source is 0.5 lb/hour. In consideration of silo loading, which CPP estimates at 31,200 lb/hr (15.6 tons/hour), the emission limit is 25.8 lb/hr.

  The application notes a worst case loading uncontrolled PM emission of 11.23 lbs/hour and PM10 emission of 7.18 lbs/hour. The bagfilter provides greater than 99% control. Actual emissions are estimated at 0.11 lb PM/hour and 0.07 lb PM10/ hour. Compliance is expected with the use of the bagfilter control device.

- *2D .0516: Sulfur Dioxide Control Requirement*
  This rule is applicable to the poultry litter-fired boiler (97.0 MMBtu/hour maximum rated heat input) (ID No. ES-B1). Sulfur dioxide emissions from fuel combustion may not exceed 2.3 lb/MMBtu heat input. This rule states that the limit does not apply if there is another limit provided in an applicable NSPS or NESHAP for the source. NSPS Dc and the Boiler GACT, Subpart 6J apply to the boiler. However, neither regulation provides a sulfur dioxide limit for wood or other biomass combustion. This means that 2D .0516 is the more restrictive rule and applies to this facility.

  The uncontrolled emission factor CPP provided for SO_2 is 0.28 lb/MMBtu from a test conducted at another litter boiler. The AP-42 factor is 0.29 lb/MMBtu. The stack test value was used during other CPP facilities application reviews in North Carolina. The sulfur content of the poultry litter fuel will be confirmed during permit required testing (note that sulfur dioxide testing (ID No. 2020-160ST) conducted at the Farmville site resulted in 0.18 lb SO_2/MMBtu).

- *2D .0521: Visible Emissions Control Requirement*
  To comply with 2D .0521, the visible emissions from the DSI Silo shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute periods averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period. Compliance with this condition will be determined during inspections. 2D .0521 does not apply to the boiler because NSPS Subpart Dc contains visible emissions requirements.

- *2D .0524: NSPS Subpart Dc, New Source Performance Standards for Wood-Fired Boilers >30 mmBtu/hr Maximum Heat Input.*
  Subpart Dc applies to any steam generating unit constructed, modified, or reconstructed after June 9, 1989, and that has a maximum design heat input capacity of 29 megawatts (MW) (100 MMBtu/hour) or less, but greater than or equal to 2.9 MW (10 MMBtu/hour). Therefore, Subpart Dc applies to boiler ES-B1.

  The NSPS regulated pollutants are SO_2 and PM (filterable). However, there is no SO_2 emissions limitation provided for wood boilers in the rule. 60.43c (e) establishes a filterable particulate limit of 0.03 lb/MMBtu for wood combustion in boilers equal to or greater than 30 MMBtu/hour in size that begin construction after February 28, 2005.

  60.43c (c) sets an opacity limit of 20 percent (6-minute average), except for one 6-minute period per hour of not more than 27 percent opacity, for boilers greater than 30 MMBtu/hr.

  NSPS Dc requires initial performance testing for filterable PM and opacity (EPA methods 1-5 and 9, respectively) and submittal of the test reports within 60 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup of the facility. Periodic method 9 testing is also required.

  Other requirements for the boiler are provided in 60.48c:
  - A notification of the date construction postmarked no later than 30 days after such date.
  - A notification of the actual date of initial startup of an affected facility postmarked within 15 days after such date.

- Record and maintain records of the amount of fuel combusted during each operating day.
- All records shall be maintained for a period of two years following the dates of record.

Subpart A, 60.11 (d) states, "At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source." This requirement will be covered within General Condition No. 6 in the permit.

Subpart A, 60.11 (b) states, "Any owner or operator subject to the provisions of this part shall maintain records of the occurrence and duration of any startup, shutdown, or malfunction in the operation of an affected facility; any malfunction of the air pollution control equipment; or any periods during which a continuous monitoring system or monitoring device is inoperative." This requirement will be addressed in the control device I&M and Boiler GACT permit conditions.

- *2D .0535: Notification Requirement*
  This Rule does not apply to sources to which 15A NCAC 02D .0524, .1110, or .1111 applies unless excess emissions exceed an emission limit established in a permit issued under 15A NCAC 02Q .0700 that is more stringent than the emission limit set by 15A NCAC 02D .0524, .1110 or .1111. Therefore, this rule should only apply for toxics emissions from the boiler. The rule does apply to the DSI silo.

  The Permittee shall notify the Director or his designee of any malfunctions, breakdowns, or other abnormal conditions that result in excess emissions for more than four (4) hours. Compliance with this regulation will be determined during air quality inspections.

- *2D .0540: Fugitive Dust Control Requirement*
  The Permittee shall not cause or allow fugitive dust emissions to cause or contribute to substantive complaints or excess visible emissions beyond the property boundary. Fugitive dust is particulate from processes that do not pass through a stack or vent. At this facility, some fugitive dust may be generated by litter delivery trucks and ash trucks. If substantive complaints or excessive fugitive dust emissions are observed beyond the property boundaries for six minutes in any one hour (using Reference Method 22 in 40 CFR, Appendix A), the facility may be required to submit a fugitive dust plan as described in 2D .0540(f).

  Compliance with this condition will be determined during air quality inspections.

- *2D .0605: Testing Requirement*
  This rule requires that a permitted facility keep records of all compliance related activities. This includes test data, malfunction records, and monitoring data. The rule gives the state authority to request information from the permit holder if an emission exceedance is suspected. It is under this rule that DAQ may require stack testing to confirm emission factors or control device efficiencies.

  DAQ is requiring this facility to test the following to demonstrate compliance with limits set by 2D .0504 (particulates) and 2Q .0315 (synthetic minor limitations):

Affected Source(s)	Pollutant	Test Method
Poultry litter-fired boiler (ES-B1)	Filterable and Condensable PM	Methods 1-5 and 202
	NOx	Method 7E
	CO	Method 10
	SO_2	Method 6C
	HCl	Method 26A

A Method 202 test requirement will be added to this permit to be conducted at the same time as the filterable particulate test required by the boiler NESHAP, Subpart 6J.

The results from these tests will determine facility-wide emissions, which will contribute to compliance determination of the 2Q .0315 Synthetic Minor condition.

- *2D .0611: Fabric Filter Requirement*
  In addition to other fabric filter requirements applicable to emission sources at this facility, the Permittee shall abide by this condition for all sources with cartridge filters, baghouses, and other dry filter particulate collection devices. Inspection and maintenance are required as recommended by the equipment manufacturer and should be conducted at a minimum of once every 12-month period. Records of each event and corresponding corrections shall be kept on-site and made available to DAQ personnel upon request.

  Compliance with this condition will be determined during air quality inspections.

- *2D .0611: Multi-Cyclone Requirement*
  The Permittee shall abide by this condition for the multi-cyclone for particulate matter collection. Inspection and maintenance are required as recommended by the equipment manufacturer and should be conducted at a minimum of once every 12-month period. Records of each event and corresponding corrections shall be kept on-site and made available to DAQ personnel upon request. The multi-cyclone shall be equipped with a device to continuously measure the gauge pressure directly upstream of the multi-cyclone itself. The monitoring device shall be made accessible and maintained by the Permittee such that it is in proper working order at all times. Records of the upstream pressure shall be recorded.

  Compliance with this condition will be determined during air quality inspections.

- *2D .1100: Control of Toxic Air Pollutants*
  See Section 5.

- *2D .1111: NESHAP Subpart JJJJJJ (6J), General Available Control Technology for Industrial, Commercial, and Institutional Boilers at Area Sources*
  The Boiler GACT applies to this boiler. The boiler is considered new. It falls into the "new biomass boiler > 30 MMBtu/hour" category. The regulation sets an emissions standard of 0.03 pound particulate (filterable)/MMBtu for the boiler. The subpart requires initial performance testing and triennial testing thereafter, unless a test shows that emissions are less than half of the standard. The facility may then test on a five year frequency. The rule allows for Method 5 or Method 17 for particulate testing, but Method 17 is not recommended for saturated stacks, which CPP will likely have. Therefore, Method 17 was not listed as an option in the permit.

  Biennial tune-ups must be conducted on the boiler, but the first tune-up deadline is 25 months following startup of the new boiler. Carbon monoxide testing (with a handheld meter) before and after the tune-up is required.

  There are many recordkeeping and reporting requirements associated with this regulation. They are detailed (with regulatory references) within the permit conditions. There is no 'canned' set of 6J conditions available for new biomass boilers in IBEAM Permit Writer, so the Farmville and Wilson CPP permits are used as templates for creating the Subpart 6J conditions.

- *2D .1806: Limitation to Avoid 2D .1806 for Control and Prohibition of Odorous Emissions*
  From the R01 permit review for CPP RG1, Facility ID No. 7400310 for 2D .1806 applicability:

  > *"This rule requires the facility to implement management practices sufficient to prevent objectionable odors from the facility to move beyond the facility property boundaries. It requires maximum feasible controls be determined (under 2D .1807) and implemented if objectionable odors are noted.*
  >
  > *On 7/12/2017 Senate Bill 615 (SB15 – "The Farm Act") was signed and became effective on the same date. This law exempts facilities from the requirements of the 2D .1806 that store products that meet the following conditions:*
  >
  > *i. are grown, produced, or generated on one or more agricultural operations and*
  > *ii. are "renewable energy resources," as defined in G.S. 62-133.8(a)(8).*
  >
  > *Since the used poultry litter combusted as fuel in the boiler at CPP meets this definition, the facility is specifically exempted from the requirements of 2D .1806 by this law…*
  >
  > *The poultry litter is expected to be received pre-dried and pre-screened. The area of litter delivery will be enclosed, and fans will pull the room air into the boiler."*

  In addition, 2D .1806 was revised effective September 5, 2019. Exemptions from regulation applicability are provided under subsection (d) specifically (d)(11) states that:

"*Any facility that stores products that are grown, produced, or generated on one or more agricultural operations and that are "renewable energy resources," as defined in G.S. 62-133.8(a)(8) if the facility identifies the sources of potential odor emissions and specifies odor management practices in their permit pursuant to 15A NCAC 2Q .0300 or .0500 to minimize objectionable odor beyond the property lines*."

The fuel used by CPP RG3 meets the criteria outlined in the rule, and the maximum feasible controls outlined in 2D .1807 are no longer applicable. Therefore, the 2D .1806 avoidance condition will be included in this permit.

Similar to the Farmville CPP RG1 facility, the poultry litter fuel will be received via truck in a fully enclosed building with roll down doors, where it is loaded onto the material handling system. Air in the fuel hall is pulled into vent hoods that provide the combustion air for the boiler, creating a negative pressure and controlling fugitive emissions. No stockpiling of litter outside of the building is expected.

DAQ is not requiring a formal submittal of potential sources and odor management practices, which should be a point of emphasis at the next full compliance evaluation. Compliance is expected and will be verified during air quality inspections.

- *2Q .0315: Limitation to Avoid 2Q .0501 for Synthetic Minor Facilities*
  This facility has the potential to emit more than the following emission limits:

Pollutant	Emission Limit (Tons per consecutive 12-month period)
PM10	100
SO_2	100
NOx	100
CO	100
HCl	10

In order to avoid Title V permitting, the facility requested operation restrictions that ensure emissions do not exceed those limitations. Operation restrictions include the proper operation and maintenance of the multi-cyclone and bagfilters, continuous monitoring of urea injection (SNCR) into the boiler and dry sorbent injection (DSI) into the boiler exhaust duct against the minimum injection rates established during testing. Fuel sampling and analysis shall be conducted to demonstrate that the used poultry bedding fuel being combusted in the boiler is consistent. This shall begin with startup of the facility and continue for one full year. The monthly analysis results shall be submitted to DAQ within 30 days of the last sample analysis. Recordkeeping shall be required on a monthly basis to ensure emissions do not exceed the emission limitations above. A report shall be submitted within 30 days of each calendar year, regardless of actual emissions, containing the tons of fuel combusted per month in the calendar year and the rolling 12-month total facility-wide CO, NOx, and HCl emissions. Stack testing results (required under 2D .0605 for CO, NOx and HCl will be incorporated into the calculations once results are reviewed and approved by DAQ. Note that SO_2 will not be included in the recordkeeping and reporting requirements under the synthetic minor permit condition. CPP used the same emission factor for SO_2 in this application as it did for the Farmville and Wilson CPP facility applications, which indicates a resulting potential facility-wide controlled emission of 95.17 tons per year. However, stack testing for SO_2 on one boiler was conducted at the Farmville CPP facility (test ID No. 2020-160ST). The tested emission rate was 0.18 lb/MMBtu. Using this test result, potential controlled SO_2 emissions from this boiler would be 76.5 tons/year.. Similar sulfur dioxide stack testing results are expected for this boiler.

- *2Q .0317: Limitation to Avoid 2D .0530 Prevention of Significant Deterioration*
  This facility has the potential to emit above 250 tons per year of PM10. The facility shall operate in accordance with the restrictions set forth in condition 2Q .0315 for Limitation to Avoid 2Q .0501 in order to comply with the 250 tons per year PSD limitation.

- *2Q .0317: Avoidance Condition for Sources Subject to 40 CFR 63 (NESHAP) Subpart DDDDD (5D), for Industrial, Commercial, and Institutional Boilers and Process Heaters at Major Sources*
  Facility-wide emissions of hydrochloric acid (HCl) shall be less than 10 tons per consecutive 12-month period. The application indicates that controlled potential emissions of HCl are 9.78 tons/year. These emissions are close to the Title V applicability threshold of 10 tons per year, which could cause the facility to be categorized as major for HAPs. A condition has been added to the permit limiting actual emissions of HCl to less than 10 tons/year to avoid applicability of the Boiler Subpart 5D NESHAP. The facility shall

operate in accordance with the restrictions set forth in condition 2Q .0315 for Limitation to Avoid 2Q .0501 in order to comply with the 10 tons of HCl per year limitation. Condition 2D .0605 includes testing for HCl emissions, for which the results will provide an accurate measurement of actual HCl emissions from the boiler.

- *SB3: General Assembly of North Carolina, Session Law 2007-397, Senate Bill 3 for Renewable Energy and Energy Efficiency Portfolio Standard (REPS)*
  The Permittee will be categorized as a new renewable energy facility that delivers electric power to an electric power supplier. SB3, § 62-133.8(g) requires biomass combustion processes at a new renewable energy facility to meet Best Available Control Technology (BACT). The Permittee submitted a BACT analysis for the poultry litter-fired boiler (97 MMBtu per hour maximum permitted heat input, ID No. ES-B1) to the Division of Air Quality with the permit application. The BACT determination will be completed by DAQ Raleigh Central Office (RCO) Permitting Section under a separate application ID number (5400216.22B). Upon determination of BACT, the Division will reopen the permit administratively for inclusion of the BACT conditions. A placeholder permit condition will be included in this initial permit.

4. NSPS, NESHAPS, PSD, 112r, and Attainment Status:

NSPS: The boiler is subject to Subpart Dc (>30 million Btu per hour maximum heat input).

NESHAP: The boiler is subject to Subpart JJJJJJ (6J). There is an avoidance condition for Subpart DDDDD (5D) due to HCl emissions. A testing condition is in the permit to determine if the HCl emissions are greater than 10 tons per year of this individual HAP.

This facility is a PSD minor source for particulates. There are no pollutants for which increment tracking has been triggered in Lenoir County.

The facility is not subject to 112(r).

Lenoir County is in attainment.

5. Facility Wide Air Toxics:

Per NC General Assembly House Bill 952, toxics rules are not applicable to sources subject to rules promulgated under 40 CFR Part 63. A toxics review is not required per 2Q .0702(a)(27):

(a) A permit to emit toxic air pollutants shall not be required under this Section for:
(27) an air emission source that is any of the following:
(A) subject to an applicable requirement under 40 CFR Part 61, as amended.
*(B) an **affected source under 40 CFR Part 63**, as amended; or*
(C) subject to a case-by-case MACT permit requirement issued by the Division

Therefore, the facility is not subject to a toxics review, and no toxics permit conditions will be created and placed in the permit. However, the DAQ must assess toxics emissions to determine if there is a risk for public health per Session Law (2012-91). CPP submitted toxics emissions calculations and air dispersion modeling to assist in expedition of DAQ's review. The modeling was reviewed by Nancy Jones with the DAQ Air Quality Analysis Branch (AQAB), and the AQAB memo approving the modeling was issued on 6/07/2022.

CPP compared the emissions to the unobstructed and vertically oriented stack Toxic Air Pollutant Permitting Emission Rates (TPERs), as provided in 2Q .0711. Acrolein, arsenic, benzene, chlorine, formaldehyde, hydrochloric acid, mercury, and sulfuric acid were identified as emitted over their respective TPERs and were modeled. Benzene was the worst-case toxic, which modeled at 21% of its Acceptable Ambient Level (AAL, as provided in 2D .1107). The next highest were acrolein and hydrogen chloride at 2% of their AALs. The rest of the toxics modeled at or below 1% of their AALs. The results are provided below of the toxics modeling per the 6/07/2022 memorandum. This memo noted that the modeling adequately demonstrates compliance with the AALs on a source-by-source basis for all modeled TAPs.

TAP	Averaging Period	Max. Conc. ($\mu g/m^3$)	AAL ($\mu g/m^3$)	% of AAL
Acrolein	1-hour	1.82	80	2
Arsenic	Annual	3.1E-6	2.1E-6	<1
Benzene	Annual	0.025	0.12	21

Chlorine	1-hour	0.28	900	<1
	24-hour	0.11	37.5	<1
Formaldehyde	1-hour	2	150	1
Hydrogen Chloride	1-hour	10.47	700	2
Mercury	24-hour	6E-4	0.6	1
Sulfuric Acid	1-hour	0.13	100	<1
	24-hour	0.05	12	<1

Some emissions rates that were applied to the modeling (as cited in the AQAB memo) are slightly elevated from values calculated in the permit. The modeled emissions (as relative to the hourly/daily/yearly AALs) are provided in the table below.

Affected Source(s)	Toxic Air Pollutant	Emission Rate
poultry litter-fired boiler (ES-B1)	Acrolein	0.502 pounds per hour
	Arsenic & Compounds (107-02-8) (total mass of elemental AS, arsine and all inorganic compounds) (ASC (7778394))	0.438 pounds per year
	Benzene (71-43-2)	3,582 pounds per year
	Chlorine (7782-50-5)	2.38 pounds per day
	Formaldehyde (50-00-0)	0.553 pounds per hour
	Hydrogen chloride (hydrochloric acid) (7647-01-0)	2.893 pounds per hour
	Mercury, vapor (Component of HGC) (7439-97-6)	0.14 pounds per day
	Sulfuric acid (7664-93-9)	0.046 pounds per hour and 1.10 pounds per day

The toxics for which CPP calculated as emitted at rates less than the respective TPERs are referenced with the TPERs below.

Pollutant	Carcinogens (lb/yr)	Chronic Toxicants (lb/day)	Acute Systemic Toxicants (lb/hr)	Acute Irritants (lb/hr)
Acetaldehyde (75-07-0)				28.43
Benzo(a)pyrene (Component of 83329/POMTV & 56553/7PAH) (50-32-8)	3.044			
Beryllium Metal (unreacted) (Component of BEC) (7440-41-7)	0.378			
Cadmium Metal, elemental, unreacted (Component of CDC) (7440-43-9)	0.507			
Carbon tetrachloride (56-23-5)	618.006			
Chlorobenzene (108-90-7)		92.7		
Chloroform (67-66-3)	396.631			
DEHP (Di(2-ethylhexyl)phthalate) (117-81-7)		1.3		
Ethylene dichloride (1,2-dichloroethane) (107-06-2)	350.511			
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (57653-85-7)	0.007			
Manganese & compounds (MNC)		1.3		
Methyl chloroform (71-55-6)		505.4		257.98

Pollutant	Carcinogens (lb/yr)	Chronic Toxicants (lb/day)	Acute Systemic Toxicants (lb/hr)	Acute Irritants (lb/hr)
Methylene chloride (75-09-2)	2213.752		1.79	
Nickel metal (Component of NIC) (7440-02-0)		0.3		
Pentachlorophenol (87-86-5)		0.1	0.03	
Perchloroethylene (tetrachloroethylene) (127-18-4)	17525.534			
Phenol (108-95-2)			1.00	
Styrene (100-42-5)			11.16	
TCE (trichloroethylene) (79-01-6)	5442.140			
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (Component of CLDC & 83329/POMTV) (1746-01-6)	0.0002767			
Toluene (108-88-3)		197.96		58.97
Vinyl chloride (75-01-4)	35.051			
Xylene (mixed isomers) (1330-20-7)		113.7		68.44

6. Compliance Status:

The facility is a Greenfield; therefore, there is no compliance history. The Farmville facility is the only CPP facility currently in operation and there have been no non-compliance issues at the facility.

7. Facility Emissions Review

I have reviewed the emissions calculations provided in the permit application, and a few corrections were required:

- CPP incorrectly labeled the PM and PM10 lbs/year emissions for the DSI silo in units of tons per year and this affected the facility-wide emissions totals. I have revised Form D1 and CPP's emissions calculations spreadsheet for the silo, and I have attached them to the permit application. It should be noted that the DSI silo could be added to an Insignificant Activities Attachment to the permit, rather than be a permitted source. This may be addressed later with application 5400216.22B for the BACT determination.
- Sulfuric acid is a TAP and a particulate, but it is not a HAP. The sulfuric acid emissions were subtracted from the facility-wide HAP total and added to the PM/PM10/PM2.5 facility totals. The revision has been included in the D1 form.
- HCl emissions have been corrected on the D1 form to reflect the calculations in CPP's spreadsheets.

I have reviewed all emission factors and emissions calculations in the application. The factors and methods of calculation are similar to those selected for the Farmville and Wilson CPP facilities. This permit will require testing for numerous pollutants; therefore, the emissions for those pollutants will be re-evaluated based on the test results. CO emissions from the application show levels below the Title V threshold; however, the facility is being required to test for this pollutant to determine the actual emission/emission factor for the boiler. Depending on the quality/moisture of fuel, CO emissions can be variable. Upon the review of the results of the stack tests, actual and potential emissions will be adjusted accordingly.

Facility-Wide Emissions

Pollutant	Potential Emissions Before Controls (tons/year)	Potential Emissions After controls (tons/year)
PM	1290.72	12.91
PM_{10}	1290.67	12.91
NOx	178.44	98.14
CO	93.47	93.47
SO_2	118.96	95.17

Pollutant	Potential Emissions Before Controls (tons/year)	Potential Emissions After controls (tons/year)
VOC	7.22	7.22
Highest HAP (HCl) (Next largest HAP <2 tpy)	139.71	9.78
Total HAPs	147.55	17.54
Greenhouse Gases	96,592	96,592

Since this is a greenfield facility, actual emissions were estimated by Carolina Poultry Power RG3 to be the same as the potential controlled emissions.

8. Summary of Permit Changes:

The facility is a Greenfield, and the following stipulations have been included in the permit: 2D .0202, 2D .0504, 2D .0515, 2D .0516, 2D .0521, 2D .0524 (40 CFR 60, Subpart Dc), 2D .0535, 2D .0540, 2D .0605, 2D .0611, 2D .1111 (40 CFR 63, Subpart JJJJJJ), 2D .1806 (Avoidance), 2Q .0315, 2Q .0317 (Avoidance), and NCGS 62.133.8(g) State BACT (SB3).

9. Conclusions, Comments, and Recommendations:

I recommend issuance of Air Permit No. 10745R00.