EAST ENERGY RENEWABLES

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May 4, 2022

Regional Supervisor, Division for Air Quality
Washington Regional Office
943 Washington Square Mall
Washington, NC 27889

Subject: Carolina Poultry Power RG3 – La Grange Air Permit Application

Attention Betsy Huddleston:

Enclosed are two (2) copies of the air permit application for a new site in La Grange, North Carolina, along with a check for $400 for the application fee. We have been in dialog with the town of La Grange and the Zoning Consistency Determination letter will be coming soon.

Should you have any questions regarding this submittal please contact me at 252-800-1969 (rich@eastenergyllc.com) or Kim Melvin of Project Integration, Inc. at 864-414-3059.

Sincerely,

Rich Deming, Principal
Carolina Poultry Power, RG3 LLC

EAST ENERGY RENEWABLES

Application for Air Permit

Carolina Poultry Power RG3, LLC

La Grange, North Carolina

April 2022

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Project Integration, Inc.
116 Hidden Hill Road
Spartanburg, South Carolina 29301

Project Integration, Inc

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Section 1
Introduction

Carolina Poultry Power (CPP) intends to build a state-of-the-art poultry litter-to-energy facility in La Grange, North Carolina, which will use the inherent heating value in poultry litter to generate electricity and Renewable Energy Certificates (RECs). CPP holds a current NCDEQ Synthetic Minor air permit for a similar facility located in Farmville, NC. The NHSM approval for that site was issued in a letter from NCDEQ Chief, William Willets, dated October 14, 2016.

The Farmville site began operation in late 2019 and has continued to collect data on the dedicated fuel source. The same fuel is being proposed for La Grange, and the information being supplied with this application and the NHSM determination is based on analytical data and fuel sourcing from the Farmville site.

The La Grange site is an approximately 36-acre parcel located just north of 5473 Brothers Road.

1.1 Purpose and Scope

CPP retained Project Integration, Inc. (PI) to assist in preparing the environmental documentation for the construction permit application. The purpose of this document is to satisfy the permitting requirements necessary to modify the air permit for the proposed equipment. The application consists of the following:

- process descriptions including flow charts and manufacturer specifications,
- summary of air emissions,
- regulatory review including BACT,
- atmospheric dispersion modeling (AERMOD) and supporting documentation
- construction permit application forms (Appendix A),
- Zoning Consistency Determination (Appendix B), and

1.2 Facility Location and Contact

The facility is in the pre-construction phase and an exact physical address cannot be provided. The mailing address and contact information for the CPP facility is as follows:

Rich Deming, Principal
Carolina Poultry Power RG3, LLC
3730 N. Main Street
Farmville, NC 27828
Phone (252) 800-1969

Figure 1 –Site Location Map

Section 2
Process Description

2.1 Poultry Litter-fired Boiler (ID No. B1)

The facility proposes to install one (1) boiler system (ID No. B1; 97 million Btu per hour, 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. The Non-hazardous Secondary Material (NHSM) fuel determination is included in Appendix G, demonstrating that the litter is not a solid waste material when used as fuel in this combustion unit under the meaning of Title 40, Part 241 of the Code of Federal Regulations (40 CFR Part 241).

Complete boiler design parameters are listed on Form B1 of the permit application.

The boiler has a manufacturer supplied integral multiclone system for controlling particulate matter, consisting of ten (10) 24-inch diameter cyclones. This multiclone is integral to the boiler design and is not considered an add-on control system. 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.

2.2 Poultry Litter Feed Stock

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, thus creating a negative pressure and controlling fugitive emissions. The maximum feed rate is approximately 21,000 pounds of poultry litter per hour. The poultry litter has an average heating value of at least 4,655 Btu per pound. 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.

According to Mr. Jeff Twisdale of the Division of Air Quality, DAQ is no longer providing official NHSM determinations, nor is the US EPA. Instead, facilities are expected to evaluate the legitimacy criteria to ensure the fuel qualifies for this determination. Appendix G provides this evaluation.

2.3 Air Pollution Control Systems

The boiler will be equipped with selective non-catalytic reduction (SNCR) 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-clone system.

Critical design parameters are shown on the C Forms in the permit application. Equipment specifications and drawings can be found in Appendix F.

TABLE 1 - EQUIPMENT LISTING			
Source Description	ID No.	Control Device	ID Nos.
One (1) 97 mmBtu/hr poultry litter-fired boiler with integral multicyclone	B1	SNCR, sorbent injection, bagfilter	SNCR1, SI1, BF1
DSI Silo	Silo	Bin Vent	BV1

Flow through the boiler system will be handled by a 45,731 ACFM (at 330° F) induced draft fan located after the bagfilter. A simplified process flow diagram of the control system is shown in Figure 2 on the following page.

2.3.1 Selective Non-catalytic Reduction (SNCR)

A semi-automatic SNCR system with eight (8) urea injectors will be installed on the boiler and will include a storage tank with recirculation pump, process control distribution of reduction agent, and PLC/HMI panel for operational control. The design injection rate is approximately 12 gallons per hour at an optimal temperature range of 1740 F to 1960 F with injection directly into the furnace.

This system is designed to achieve 45% NOx control efficiency. Stack testing at the Farmville location confirmed this efficiency.

2.3.2 Dry Sorbent Injection (DSI)

Dry sorbent (hydrated lime) will be injected 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, as shown on Figure 2. The flue gas temperature range at this point is approximately 400 F with an approximate duct diameter of 30 inches.

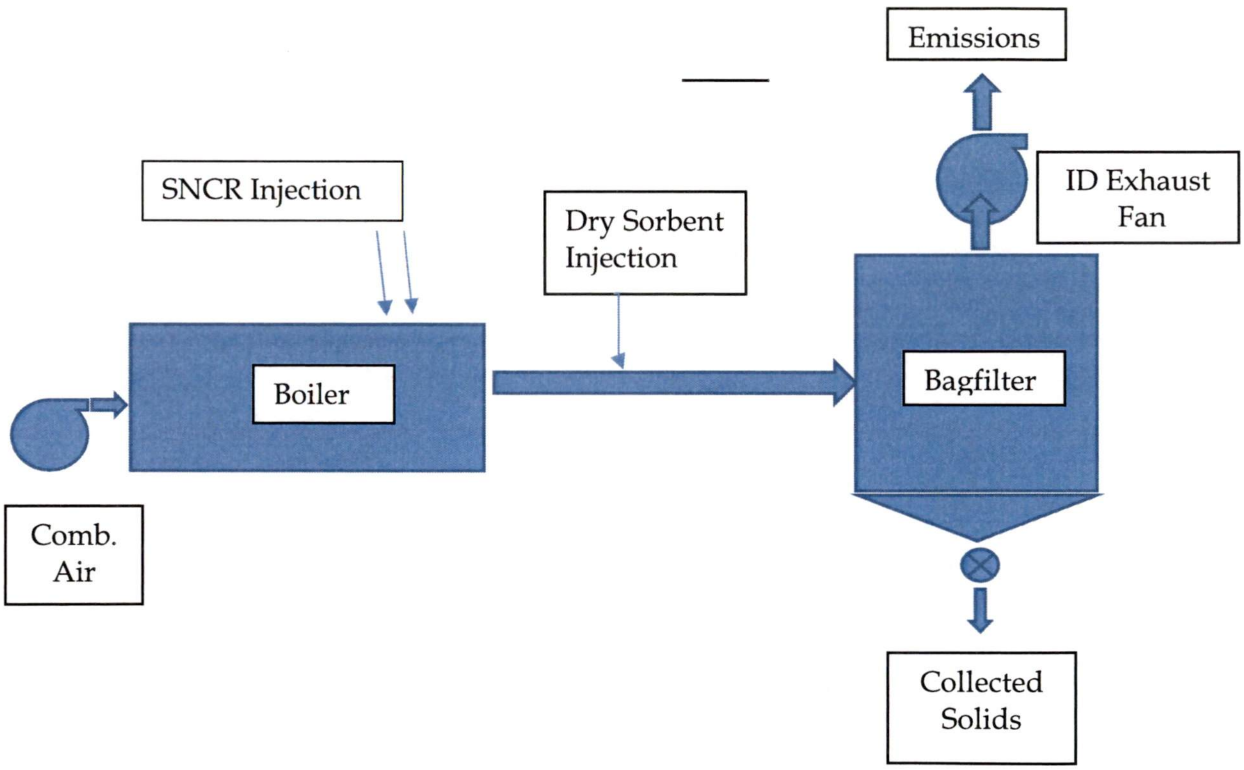
This system is designed to achieve 20% SO_2 control efficiency and 93% HCl control efficiency utilizing sodium bicarbonate, hydrated lime or Trona as the reagent. Stack testing at the Farmville location confirmed this efficiency.

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 bin vent is a 25 bag unit with 6 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).

2.3.3 Bagfilter

The boiler will be equipped with a bagfilter 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 15,808 square feet (518 bags, 6 inches in diameter, 16 feet long). The design system air flow is 48,612 acfm, and the air to cloth ratio is 3.6:1. Pressure drop across the bagfilter will range from 2 inches to 7 inches of water column, with typical pressure drop of 5 - 6 inches. The bagfilter will be equipped with a bag leak detection alarm system.

Figure 2 – PFD



Section 3
Summary of Emissions

3.1 Criteria Pollutants

The combustion of poultry litter in the proposed boiler will result in emissions of criteria pollutants, including particulate matter (PM), sulfur dioxide (SO2), nitrogen oxides (NOx), carbon monoxide (CO) and volatile organic compounds (VOCs). Emissions were estimated using a combination of emission factors from AP-42 woodwaste combustion in indirect heat exchangers, manufacturer-provided emission factors, and stack testing data from sites operating poultry litter-fired boilers. A full list and comparison of emission factors can be found in Appendix E.

Table 2 below shows the criteria pollutant emissions summary. Detailed emissions can be found on the combustion spreadsheet, located in Appendix A, directly following the B source application forms for each boiler.

Table 2 - Criteria Pollutant Emissions Summary Poultry Litter Boiler		
Pollutant	Uncontrolled Potential (tpy)	Controlled Potential (tpy)
PM-10	1274.58	12.75
SO2	118.96	95.17
NOx	178.44	98.14
CO	93.47	93.47
VOCs	7.22	7.22

Uncontrolled potential emissions of PM-10, SO2, and NOx exceed the Title V threshold of 100 tons per year. CPP is requesting federally enforceable limits be applied to maintain minor source status. Proper operation and maintenance of the proposed control systems will effectively keep emissions of all criteria pollutants below the Title V threshold. The emission spreadsheet found in Appendix A shows both the uncontrolled and controlled (Synthetic Minor) potential emissions, as discussed in detail in Section 4.9 of this report.

Control efficiencies per pollutant are based on control system design parameters found in Appendix F. Calculations are included directly following the B source application forms for each boiler.

3.2 Hazardous and Toxic Air Pollutant Emissions

The combustion of poultry litter fuel in the proposed boiler results in emissions of hazardous and toxic air pollutants (HAPs and TAPs). As with criteria pollutants, emissions were estimated using a combination of emission factors from AP-42 woodwaste combustion in indirect heat exchangers, manufacturer-provided emission factors, and stack testing data from sites operating poultry litter boilers. A full list and comparison of emission factors can be found in Appendix E.

Detailed emissions can be found on the combustion spreadsheet, located in Appendix A, directly following the B source application forms for each boiler. Also included is a combined emission spreadsheet calculation showing facility-wide emissions. Uncontrolled potential HAP emissions exceed the Title V thresholds.

Controlled total HAP emissions are estimated to be 17.7 tons per year and the greatest individual HAP emission rate is HCl at 9.8 tons per year. The HCl control efficiency is assumed to be 93%, which has been confirmed by stack testing at the Farmville site. Controlled HAP are below the Title V thresholds of 10 tons per year for individual HAPs and 25 tons per year for all HAPs combined. Emissions of certain TAPs exceed the toxic permit emission rate (TPER), and atmospheric dispersion modeling has been performed for these pollutants. A complete discussion of TAP emissions can be found in Sections 4.6 and 4.10.

3.3 Greenhouse Gas (GHG) Emissions

The combustion of poultry litter also yields greenhouse gas emissions with emission factors taken from AP-42 for woodwaste combustion. As shown on the emissions spreadsheet in Appendix A following the source application forms, carbon dioxide makes up the greatest GHG emissions at 96,592 tons per year.

Section 4
Regulatory Review

This regulatory review addresses regulations that apply to the proposed air emission sources at the facility.

4.1 15A NCAC 2D .0504 Particulates from Wood Burning Indirect Heat Exchangers

Since the poultry litter boiler has a particulate emissions limit under the Boiler GACT Rule, this regulation does not apply. See Section 4.11.

4.2 15A NCAC 2D .0516 Sulfur Dioxide Emissions from Combustion Sources

Emission of sulfur dioxide from any source of combustion that is discharged from any vent, stack, or chimney shall not exceed 2.3 pounds of sulfur dioxide per million Btu input. The AP-42 emission factor for SO2 is 0.28 pounds per million Btu, and compliance with this limit is indicated without accounting for any control efficiency.

4.3 15A NCAC 2D .0524 New Source Performance Standards

The requirements of NSPS Subpart Dc apply to boilers with a heat input rating greater than 10 million Btu per hour and less than 100 million Btu per hour that were manufactured after June 9, 1989. The proposed boiler is new, has a heat input rating of 97 million Btu per hour, and will be subject to the requirements of NSPS Subpart Dc. Compliance with all requirements is expected.

4.4 15A NCAC 2D .0530 Prevention of Significant Deterioration

Prevention of Significant Deterioration (PSD) requirements apply to major sources. This facility will be classified as Synthetic Minor, and this regulation does not apply.

4.5 15A NCAC 2D .0531 Sources in Nonattainment Areas

Non-attainment regulations apply to major sources. This facility will be classified as Synthetic Minor, and this regulation does not apply.

4.6 15A NCAC 2D .1100 Control of Toxic Air Pollutants

This regulation applies to facilities required to have a permit under 2Q .0711. As discussed in Section 4.10 below, this application includes modeling for numerous TAPs whose emissions are above the respective Toxic Permit Emission Rates (TPERs), as shown on Table 3 of this report.

This regulation outlines the Acceptable Ambient Levels (AALs) for each TAP. The complete modeling discussion is included in Section 6 of this report and shows compliance for all TAPs.

4.7 15A NCAC 2D .0521 Control and Prohibition of Visible Emissions

This regulation limits visible emissions from all sources to 20% opacity. Proper operation and maintenance of the bagfilter installed on the boiler will effectively reduce visible emissions to below this standard. Compliance is expected.

4.8 15A NCAC 2D .0522 Control and Prohibition of Odorous Emissions

This regulation requires facilities to implement management practices or install and operate odor control equipment sufficient to prevent odorous emissions from the facility from causing or contributing to objectionable odors beyond the facility's boundary. CPP proposes to implement the following management practices for minimizing odor from poultry litter to avoid the requirements of this rule.

a. When poultry litter arrives on the facility's property, it shall be in adequately covered trucks;

b. The Permittee shall utilize on-site fuel handling and management practices to minimize emissions and spillage and improve combustion conditions of the poultry litter. These practices shall include:

> i. performing loading and off-loading procedures inside a poultry litter storage area in an expeditious manner;
>
> ii. reasonably utilizing the "first in, first out" (FIFO) method for processing and using poultry litter;
>
> iii. immediately transporting loaded trucks when transferring poultry litter from storage to fuel processing; and
>
> iv. not storing any poultry litter on site for more than 90 days.

4.9 15A NCAC 2Q .0511 Synthetic Minor Facilities

Uncontrolled potential PM-10, SO2, and NOx emissions from the poultry litter-fired boiler associated with this application exceed the Title V threshold of 100 tons per year. This section outlines the Synthetic Minor limitation being requested to remain a "minor" source and avoid Title V requirements.

All criteria pollutant emissions are effectively limited to less than 100 tons per year through proper operation and maintenance of the control systems. No limit on annual throughput is needed to remain a minor source.

4.10 15A NCAC 2Q .0711 Control of Toxic Air Pollutants

This regulation defines the Toxic Permit Emission Rates (TPERs) for each TAP, above which dispersion modeling must be performed in accordance with this regulation. All TAPs from poultry litter combustion have been evaluated, as shown on Form D1 of the permit application, with seven TAPs exceeding the TPER. Table 3 shows TAP emissions from the proposed boiler, on a projected actual basis, after controls.

4.11 Senate Bill 3

Paragraph (g) "Control of Emissions" of Senate Bill 3 requires a poultry litter combustion process at any new renewable energy facility that delivers electric power to an electric power supplier to meet Best Available Control Technology (BACT). A full BACT analysis is found in Section 5 of this report.

4.12 NESHAP 40 CFR Part 63, Subpart JJJJJJ (Boiler GACT)

EPA promulgated the "area source" MACT and GACT for industrial/commercial/institutional boilers in 40 CFR 63 "National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources" on March 21, 2011 with an effective date of May 20, 2011.

The CPP facility is an "area source" as defined in Part 63 and the boiler is subject to this regulation, as discussed below. The boiler was manufactured after June 4, 2010; therefore, the boiler is considered "new" in accordance with §63.11194(b).

In addition to notification, monitoring, operation, maintenance, and reporting requirements, biomass and oil-fired boilers, with heat input equal or greater than 10 million Btu per hour, must meet a PM emission limits 0.03 pounds per million Btu. Compliance with this limit is demonstrated below and will be confirmed by source stack testing.

$$3.0 \frac{lb}{mmBtu} x \ (1 - 0.99) = 0.03 \frac{lb}{mmBtu}$$

4.13 40 CFR Part 60 Subparts CCCC and DDDD CISWI

Commercial and Industrial Solid Waste Incinerators (CISWIs) are regulated under 40 Code of Federal Regulations (CFR) Part 60, Subparts CCCC and DDDD. These rules apply standards and emissions limits to units that combust, or have combusted in the preceding six months, any "solid waste" as defined in the rule. In order to comply with the emission standards, sources typically have to install one or more control devices on CISWI units and provide continuous emission monitoring.

Non-hazardous Secondary Materials (NHSMs) are defined in 40 Code of Federal Regulations (CFR) Part 241. Fuels that meet the legitimacy criteria in this rule are not subject to the CISWI rules. The poultry litter proposed to be used at the CPP facility meets the criteria of NHSM. See Appendix G for the NHSM evaluation. Therefore, the poultry litter proposed at CPP is a fuel and not a waste.

Table 3. TAP Emissions								
Pink below is a TAP					*Yellow below means above TPER*			
		Controlled Actuals			TPER			*Model Input*
HAP/TAPs	lb/MMBtu	lb/hr	lb/d	lb/yr	lb/hr	lb/d	lb/yr	lb/hr
Acetaldehyde	8.30E-04	0.081	1.932	705.268	28.43			
Acetophenone	3.20E-09	0.000	0.000	0.003				
Acenaphthene	9.10E-07	0.000	0.002	0.773				
Acenaphthylene	5.00E-06	0.000	0.012	4.249				
Acrolein	4.00E-03	0.388	9.312	3398.880	0.08			0.388
Antimony & Compounds	1.21E-06	0.000	0.000	0.010				
Arsenic & Compounds	5.11E-05	0.000	0.001	0.434			0.194	0.00005
Benzene	4.20E-03	0.407	9.778	3568.824			11.069	0.407
Benzo(a)anthracene	6.50E-08	0.000	0.000	0.055				
Benzo(b,k)fluroanthene	1.00E-07	0.000	0.000	0.085				
Benzo(g,h,i)perylene	9.30E-08	0.000	0.000	0.079				
Benzo(a)pyrene	2.60E-06	0.000	0.006	2.209			3.044	
Beryllium metal (un-reacted	2.33E-07	0.000	0.000	0.002			0.378	
Cadmium Metal (elemental	2.33E-07	0.000	0.000	0.002			0.507	
Carbon tetrachloride	4.50E-05	0.004	0.105	38.237			618.006	
Chlorine	7.90E-04	0.077	1.839	671.279	0.95	1.6		0.077
Chlorobenzene	3.30E-05	0.003	0.077	28.041		92.7		
Chloroform	2.80E-05	0.003	0.065	23.792			396.631	
Chromium–Other compds (	2.47E-05	0.002	0.058	21.030				
Chrysene	3.80E-08	0.000	0.000	0.032				
Cobalt compounds	2.33E-06	0.000	0.005	1.984				
Dibenzo(a,h)anthracene	9.10E-09	0.000	0.000	0.008				
Dinitrophenol, 2,4-	1.80E-07	0.000	0.000	0.153				
Di(2-ethylhexyl)phthalate (I	4.70E-08	0.000	0.000	0.040		1.3		
Ethyl benzene	3.10E-05	0.003	0.072	26.341				
Ethylene dichloride (1,2-dic	2.90E-05	0.003	0.068	24.642			350.511	
Fluoroanthene	1.60E-06	0.000	0.004	1.360				
Fluorene	3.40E-06	0.000	0.008	2.889				
Formaldehyde	4.40E-03	0.427	10.243	3738.768	0.16			0.427
Hexachlorodibenzo-p-dioxir	1.79E-11	0.00000	0.00000	0.00002			0.007	
Hydrogen chloride (hydroch	3.29E-01	2.234	53.614	19569.052	0.74			2.234
Indo(1,2,3-cd)pyrene	8.70E-09	0.000	0.000	0.007				
Lead and Lead compounds	1.21E-06	0.000	0.000	0.010				
Manganese & compounds	1.07E-03	0.001	0.025	9.086		1.3		
Mercury, vapor (Include in I	4.67E-05	0.005	0.109	39.679		0.025		0.005
Methyl bromide (bromome	1.50E-05	0.001	0.035	12.746				
Methyl chloride (chloromet	2.30E-05	0.002	0.054	19.544				
Methyl chloroform (1,1,1 tr	3.10E-05	0.003	0.072	26.341		505.4		
Methyl ethyl ketone	5.40E-06	0.001	0.013	4.588				
Methylene chloride (dichlor	2.90E-04	0.028	0.675	246.419	1.79		2213.752	
Naphthalene	9.70E-05	0.009	0.226	82.423				
Nickel metal (Component o	1.89E-05	0.000	0.000	0.161		0.3		
Nitrophenol, 4-	1.10E-07	0.000	0.000	0.093				
Pentachlorophenol	5.10E-08	0.000	0.000	0.043	0.03	0.1		
Perchloroethylene (tetrachl	3.80E-05	0.004	0.088	32.289			17525.53	
Phenanthrene	7.00E-06	0.001	0.016	5.948				
Phenol	5.10E-05	0.005	0.119	43.336	1			
Phosphorus Metal, Yellow c	2.70E-05	0.003	0.063	22.942				
Polychlorinated biphenyls	8.15E-09	0.000	0.000	0.007			7.656	
Polycyclic Organic Matter	1.25E-04	0.012	0.291	106.215				
Propionaldehyde	6.10E-05	0.006	0.142	51.833				
Propylene dichloride (1,2 di	3.30E-05	0.003	0.077	28.041				
Pyrene	3.70E-06	0.000	0.009	3.144				
Selenium compounds	7.00E-06	0.001	0.016	5.952				
Sulfuric Acid	3.66E-02	0.036	0.853	311.335	0.11	0.5		0.0355
Styrene	1.90E-03	0.184	4.423	1614.468	11.16			
Tetrachlorodibenzo-p-dioxi	8.60E-12	0.000	0.000	0.00001			0.000277	
Toluene	9.20E-04	0.089	2.142	781.742	58.97	197.96		
Trichloroethylene	3.00E-05	0.003	0.070	25.492			5442.14	
Trichloroethane -1,1,1	3.00E-05	0.003	0.070	25.492				
Trichlorofluoromethane (CF	4.10E-05	0.004	0.095	34.839				
Trichlorophenol, 2,4,6-	2.20E-08	0.000	0.000	0.019				
Vinyl chloride	1.80E-05	0.002	0.042	15.295			35.051	
Xylene, o-	2.50E-05	0.002	0.058	21.243	68.44	113.7		
			TOTAL	17.700 tpy				

See addendum spreadsheets attached to the end of this application dated 7/12/2022.

Section 5
Best Available Control Technology

According to Senate Bill 3, a biomass combustion process at any new renewable energy facility that delivers electric power to an electric power supplier shall meet BACT. BACT is defined in Senate Bill 3 as follows:

> *Best Available Control Technology (BACT) means an emissions limitation based on the maximum degree a reduction in the emission of air pollutants that is achievable for a facility, taking into account energy, environmental, and economic impacts and other costs.*

The methodology used in this section follows EPA's "top-down" approach:

Step 1 – Identify All Control Technologies
Step 2 – Eliminate Technically Infeasible Options
Step 3 – Rank Remaining Control Technologies by Control Effectiveness
Step 4 – Evaluate Most Effective Control Technologies and Document Results
Step 5 – Select BACT

No control technologies have been eliminated based on cost effectiveness. Therefore, evaluation of cost per ton of pollutant is not included in this evaluation.

5.1 Total PM (filterable and condensable)

With an estimated ash content of 15 percent, filterable PM-10 emissions from the proposed boiler have been calculated using an emission factor (EF) of 3 pounds per million Btu. This is significantly higher than the EF provided in Chapter 1.6 of AP-42 entitled "Wood Residue Combustion in Boilers" of 0.337 pounds per million Btu because wood has an ash content of around 1 percent. This higher emission factor is consistent with test data from other poultry litter boiler processes.

Condensable PM was measured during the March 2020 stack test at CPP – Farmville between 0.13 and 0.17 pounds per million Btu from the three boilers. With a similar process and combustion technology being proposed at the La Grange site, similar condensable PM emissions are expected.

Control technologies for filterable and condensable particulate matter include fabric filters (baghouses), electrostatic precipitators (ESPs), wet scrubbers, and mechanical collectors and are discussed below.

5.1.1 Fabric Filters/Baghouses

Baghouses utilize fabric filtration to remove particulate matter from an exhaust gas stream. Fabric filters provide removal efficiencies in the range of 98 to 99+ percent for non-condensable particulate. The primary operational limitation for use with solid fuel-fired boilers is a fire risk, although this may be less so for poultry litter than for wood waste.

On smaller boilers (50 MM BTU/hr or less) it is customary to use a mechanical collector (cyclone) prior to the baghouse to minimize the risk of fire. This approach provides effective PM control but also increases capital and operating costs, which can make this system economically unfeasible in smaller applications.

5.1.2 Electrostatic Precipitators (ESP)

Electrostatic precipitators (ESPs) work on the principle of electrostatic attraction. In this technology, particulates in an exhaust gas stream are charged as they pass through the ESP and are removed from the exhaust gas stream by oppositely charged plates or wires on the side of the ESP. ESPs can achieve non-condensable particulate control efficiencies in the range of 98 to 99 percent removal. The capital and operating costs for ESPs are more reasonable for large boilers (100 MM BTU/hr or greater) but typically are not cost effective for smaller boiler systems as compared with other PM_{10} control technologies. Application of ESPs on poultry litter boilers have yielded unsatisfactory performance, and wet ESPs are technically infeasible due to excessive water discharge.

5.1.3 Wet Scrubbers

Venturi scrubbers remove particulate matter in a gas stream through inertial and diffusional interception. Venturi scrubbers achieve a PM-10 control efficiency of 92 to 99 percent. Scrubber efficiency is a function of pressure drop across the scrubber, and scrubbers are more likely to collect condensable particulate matter than fabric filters and ESPs. Recent practical application of venture scrubbers on poultry litter boilers, however, have shown poor collection of submicron particles and a less than 50% control efficiency. The AP-42 estimate for PM_{10} emissions with wet scrubber control of "0.066 pounds per million Btu" is not adequate for BACT and may under estimate emissions from poultry litter boilers. High water discharge requirements also make scrubbers technically infeasible.

5.1.4 Mechanical Collectors

Mechanical collectors use centrifugal forces to separate particulate matter from an exhaust gas stream. The exhaust gas flow rate is directly proportional to the operating load of the boiler. The centrifugal separation force which removes particulates from exhaust stream in a mechanical collector is directly proportional to the exhaust gas flow rate. Therefore, mechanical collectors work best when operating at their respective design (maximum) condition. Mechanical collectors include cyclones, multi-cyclones and mechanical separators and achieve PM-10 control efficiencies in the range of 65 to 95 percent.

The boiler at CPP will have an integral multiclone as a pre-control for particulate matter. Mechanical collectors achieve higher efficiency on larger particle sizes and are often used in series with other air pollution control devices as "pre-cleaners". This level of control alone would not be considered BACT, so additional add-on controls are indicated.

5.1.5 Summary

Table 4 ranks and summarizes the PM-10 options considered for this BACT review.

Table 4 - PM-10 BACT Summary				
Rank	Technology	Particulate Removal		Determination/ Limitations
		Filterable	Condensible	
1	Fabric Filter	98 to 99%	< 50%	Acceptable – Highly effective PM control with appropriate fire hazard precautions
2	ESP/WESP	up to 99%	< 50%	Technically Infeasible – High waste water discharge requirements for WESP and inadequate PM removal efficiency for ESP at high temperature
3	Mechanical Collectors	65 to 90%Medium	<30%	Acceptable but Inadequate PM10 Control as stand-alone unit
4	Venturi Scrubber	up to 99%	90 to 95%	Infeasible – Inability to discharge wastewater stream and poor control of small particle sizes

The facility proposes the use of an integral mechanical collector followed by a bagfilter system with high temperature bags over a wet scrubber system because cost and efficiency are similar and there is no wastewater disposal issue. The proposed filterable PM BACT emission limit is 0.03 pounds per million Btu. The proposed condensable PM BACT emission limit is 0.2 pounds per million Btu.

5.2 Nitrogen Oxides

CPP is using a nitrogen oxide (NOx) emission factor of 0.42 pounds per million Btu specific to this boiler application. This system will be subject to a NOx limitation under NSPS Subpart Db. For solid fuel combustion, the primary source of NOx emissions is fuel-bound N_2 (as opposed to thermal NOx or prompt NOx). It is formed when nitrogen compounds in the wood are oxidized in the combustion process.

5.2.1 Combustion Controls

NOx emissions can be reduced by controlling the combustion process in the boilers. Staged combustion or off-stoichiometric combustion is a proven technique for NOx control. Utilizing "rich" and "lean" burn areas in the fire box in conjunction with over fire air can reduce NOx emissions 20 to 30 percent.

Fossil fuel boilers can utilize steam and water injection to lower flame temperature. The boilers in this application will be fired on dried poultry litter with a moisture content of approximately 24 percent. This low moisture may increase combustion temperatures and would not be expected to reduce NOx formation. The emission factor for this application incorporates the use of combustion controls to minimize NOx emissions.

5.2.2 Selective Catalytic Reduction

The SCR process chemically reduces the NO_x molecule into molecular nitrogen and water vapor. A nitrogen-based reagent, ammonia or urea, in injected into ductwork downstream of the combustion device and mixed with the exhaust gases, which then flow into a reactor module containing a catalyst where the reagent selectively reacts with the NO_x. The dominant parameters that determine the effectiveness of NO_x removal for the SCR system are temperature, the amount of reducing reagent, the injection grid design, and the catalyst activity. Ammonia slip is a phenomenon that occurs when excess unreacted ammonia escapes the reactor vessel and is emitted from the stack. The optimal operating temperature for the reduction reaction is about 650°F to 750°F. SCR systems can reduce NOx by 80 to 90 percent.

Catalyst activity is a measure of the NO_X reduction reaction rate. Deactivation of the catalyst can be caused by:

- poisoning of active sites by the flue gas constituents,
- thermal sintering of active sites due to high temperatures,
- blinding, plugging, or fouling of active sites by ammonium sulfate salts and particulate matter (PM), and
- erosion due to high gas velocities.

SCR is widely used on large boilers (>20 MW), but is not in widespread use for smaller boilers, primarily due to cost considerations. In this application SCR technology was considered infeasible for several reasons:

- sulfur is present in the material being burned in the boiler. The SCR catalyst system promotes partial oxidation of sulfur dioxide (SO_2) from sulfur in the fuel to sulfur trioxide (SO_3). Sulfuric acid (H_2SO_4) and sulfurous acid (H_2SO_3) are formed by the reaction of SO_3 and water (H_2O) vapor in the flue gas. SO_3, H_2SO_4, and H_2SO_3 will react with excess ammonia in the catalyst bed and flue gas exhaust to form ammonium salts. The ammonium salts may condense in the flue gas, due to the wide range of operating conditions of the boilers, and may be emitted as particulates and also foul or plug the catalyst bed;
- unreacted ammonia, which is a precursor of PM_{10}, will be emitted as ammonia slip. A higher than stoichiometric ratio of ammonia reduces NO_X emissions but will increase the ammonia slip creating an emissions trade-off between NO_X and ammonia; and
- installation of an SCR system would require installation of urea or ammonia storage tanks and an extensive injection and control system to reduce NO_X emissions.

The potential for fouling or plugging the catalyst bed due to sulfur in the fuel, in addition to potential increases in PM and ammonia emissions make SCR an infeasible technology the CPP boiler.

5.2.3 Selective Non-Catalytic Reduction

Selective non-catalytic reduction (SNCR) involves the injection of urea or ammonia into the furnace exit region where the flue gas is in the range of 1,600 to 1,900°F without a catalyst as for SCR. NOx is reduced to N_2 and H_2O. NOx reductions as high as 60 to 70 percent have been achieved in some industrial applications.

The amount of oxygen, NO_X concentration, and reaction time all affect this reaction. Limiting the reaction to locations where the temperature is within the temperature envelope allows the reaction and removal efficiency to be optimized. The technology can be difficult to apply to industrial boilers that modulate frequently where the location of this temperature envelope is constantly changing. The boiler must also have geometries that allow for the installation of injector assemblies.

Excess reagent is typically injected to overcome the limitations of imperfect mixing, uneven temperature distribution, and insufficient residence time. The unreacted urea creates additional ammonia emissions known as ammonia "slip". In applications where the reagent injection occurs just downstream from a multi-clone, the high turbulence of this exhaust region improves mixing and overall NOx control.

5.2.4 Wet Scrubber

Wet scrubbers use a liquid to remove pollutants including NOx from an exhaust stream by absorption. Absorption is very effective when controlling pollutant gases present in appreciable concentration, but also is feasible for gases at dilute concentrations when the gas is highly soluble in the absorbent. Caustic and other catalysts can be added to the scrubber water to improve absorption and NOx scrubbing efficiency. Typically, multiple scrubber sections are needed to convert NO to NO2 and handle acid gas scrubbing. Handling wastewater associated with wet scrubbers can be a limitation on this type of control.

5.2.5 Summary

Table 5 ranks and summarized the NOx BACT analysis.

Table 5 - NOx BACT Summary			
Rank	Technology	Effectiveness	Determination/ Limitations
1	SNCR	40 to 70%	Acceptable – effectiveness limited by boiler configuration
2	Combustion Controls	30 to 35%	Acceptable - Less effective on fuel-bound NOx
U	SCR	80 to 90%	Unfeasible - catalyst fouling and high PM loading
U	Packed Bed Scrubber	40-50%	Acceptable - Ability to handle wastewater

CPP proposes utilizing combustion controls combined with SNCR (urea injection) to achieve an estimated NOx removal efficiency of 45%. Therefore, the proposed BACT limit for NOx emissions is shown in the following equation.

$$0.42 \frac{lb}{mmBtu} x\ (1 - 0.45) = 0.231 \frac{lb}{mmBtu}$$

This limit is also expected to demonstrate compliance with NSPS Subpart Db.

5.3 Carbon Monoxide and Volatile Organic Compounds

Carbon monoxide (CO) and volatile organic compound (VOC) emissions result from incomplete combustion of solid fuels. The AP-42 emission factor for dry wood is 0.6 pounds of CO per million Btu and 0.017 pounds VOC per million Btu. This CO EF is much higher than that measured during stack testing at facilities burning poultry litter and is not considered representative for this application. Those results measured between 0.05 and 0.056 pounds per million Btu. For this application, CPP is using the recommended EF of 0.22 pounds CO per million Btu.

CO and VOC emissions are minimized by good combustion conditions, specifically, maintaining the proper air to fuel ratio. Proper operation and maintenance, periodic combustion efficiency testing, and in-situ oxygen concentration monitoring are ways to ensure ongoing good combustion conditions.

5.3.1 Catalytic Oxidation

Catalytic oxidation is a post combustion control that reduces VOC emissions and oxidizes CO to CO2 in the presence of a catalyst (typically a precious metal that is usually deposited onto a solid honeycomb substrate). An acceptable flue gas temperature range for catalyst operation is 450°F–1,100°F. The oxidation process takes place spontaneously, without the requirement of introducing reactants (such as ammonia) into the flue gas stream. Oxidation catalysts are susceptible to deactivation due to impurities present in the exhaust gas stream. Arsenic, iron, sodium, phosphorus and silica will act as catalyst poisons causing a reduction in catalyst activity and pollutant removal efficiencies. For these reasons along with high operating costs, catalytic oxidation has been deemed impractical as a BACT control option.

5.3.2 Thermal Oxidation

Thermal oxidation oxidizes CO to CO_2 through a separate combustion process. The process destroys CO by passing the gas stream though a high temperature region. It consists of a combustion chamber, a burner, and a heat exchanger/shell that preheats the incoming air. Thermal oxidizers are usually operated at 1,500°F–1,800°F to achieve an 85 percent reduction in CO. The thermal oxidizer requires a source of supplemental fuel, typically natural gas, to raise the exhaust stream to the required oxidation temperature. The added combustion of natural gas generates NOx emissions which is an undesirable tradeoff in North Carolina where ozone chemistry is considered NOx limited and will rise proportionally with additional NOx emissions. For these reasons along with high operating costs, thermal oxidation has been deemed impractical as a BACT CO control option.

5.3.3 Good Combustion Practices

Good combustion practices are based upon proper boiler design and proper operation of the boiler. Good combustion practices mean operation of the boiler at high combustion efficiency, thereby reducing products of incomplete combustion. Good combustion practices include operation at sufficiently high combustion temperatures, adequate residence time, adequate excess air and adequate turbulence, which ensures good mixing and availability of oxygen for efficient combustion. Reducing emissions of CO can be accomplished by increasing the air available for combustion and/or the combustion temperature. Good combustion practice is the remaining viable BACT control option.

5.3.4 Summary

Table 6 ranks and summarized the CO and VOC BACT analysis.

Table 6 - CO/VOC BACT Summary			
Rank	Technology	Removal Efficiency	Determination/ Limitation
1	Good Combustion Practices	25 to 50%	Periodic Monitoring
U	Thermal Oxidation	80 to 90%	Unfeasible - Requires auxiliary fuel
U	Catalytic Oxidation	50%	Unfeasible - Subject to poisoning

CPP proposes using good combustion practices to achieve 0.017 pounds of VOC per million Btu and 0.22 pounds of CO per million Btu.

5.4 Sulfur Dioxide

Emissions of sulfur dioxide (SO2) from poultry litter combustion are estimated to be 0.28 pounds per million Btu. There are limited practical post-combustion control technologies for SO2 for small solid fuel-fired boilers. CPP proposes use of a dry sorbent system to achieve 20% SO2 control efficiency. This removal yields effective SO2 emissions of 0.224 pounds per million Btu and is the proposed BACT limitation.

5.5 Mercury

Emissions of mercury from poultry litter combustion are estimated to be 4.67×10^{-5} pounds per million Btu. This factor is based on data from other poultry litter sites and is higher than the AP-42 EF for woodwaste combustion of 3.5×10^{-6} pounds per million Btu. There are limited practical post-combustion control technologies for mercury removal for small solid fuel-fired boilers, partially due to the low concentration of mercury in the exhaust gases.

5.5.1 Dry Sorbent Injection

CPP is proposing a dry sorbent system for SO2 control, although a review of the RBLC database indicates this technology has not been demonstrated for mercury control on similar biomass fired boilers. It is not clear if the DSI system provides control benefit for mercury emissions.

5.5.2 Good Combustion Practices

Good combustion practices are based upon proper boiler design and proper operation of the boiler. Good combustion practices mean operation of the boiler at high combustion efficiency, thereby reducing products of incomplete combustion. Good combustion practices include operation at sufficiently high combustion temperatures, adequate residence time, adequate excess air and adequate turbulence, which ensures good mixing and availability of oxygen for efficient combustion. Good combustion practices along with proper biomass fuel sourcing is the selected BACT control option for mercury.

Section 6
Atmospheric Dispersion Modeling

The model selected for this analysis is AERMOD, using BEEST interface. The NC Toxics Modeling Protocol Checklist can be found in Appendix D. Based on emissions estimates included in Appendix A, numerous TAPS exceed the TPERS and require modeling to demonstrate compliance with the Acceptable Ambient Levels (AALs). These TAPs are listed below:

- Acrolein – hourly
- Arsenic & cpds - annual
- Benzene - annual
- Chlorine - daily
- Formaldehyde - hourly
- Hydrogen Chloride - hourly
- Mercury – daily
- Sulfuric acid - daily

Compliance with the AALs is discussed in the modeling summary section.

6.1 Facility Location and Site Description

The facility is located near the City of La Grange WWTP just north of 5473 Brothers Road, with an elevation of approximately 91 feet. Land use within 3 km of the facility is a mix of industrial and residential with the predominant land type being rural. Figure 1 at the beginning of this report shows the general facility location. The yellow outline on Figure 3 shows the property boundary.

Figure 3 -CPP Property Boundary

6.2 Stack Parameters and Cavity Impacts

Emissions from the boiler will be vented through a vertical stack with no rain cap, located adjacent to the bagfilter, which has a height of 48 feet. The GEP stack height is 2.5 x H or 96 feet. The proposed stack height of 80 feet and additional stack parameters are shown in Table 6.

BPIP-Prime was used to evaluate the direction-specific building dimensions for cavity impacts. The stack was determined to be affected by building downwash effects, so the model was run "including downwash".

Table 7 - Point Source Parameters

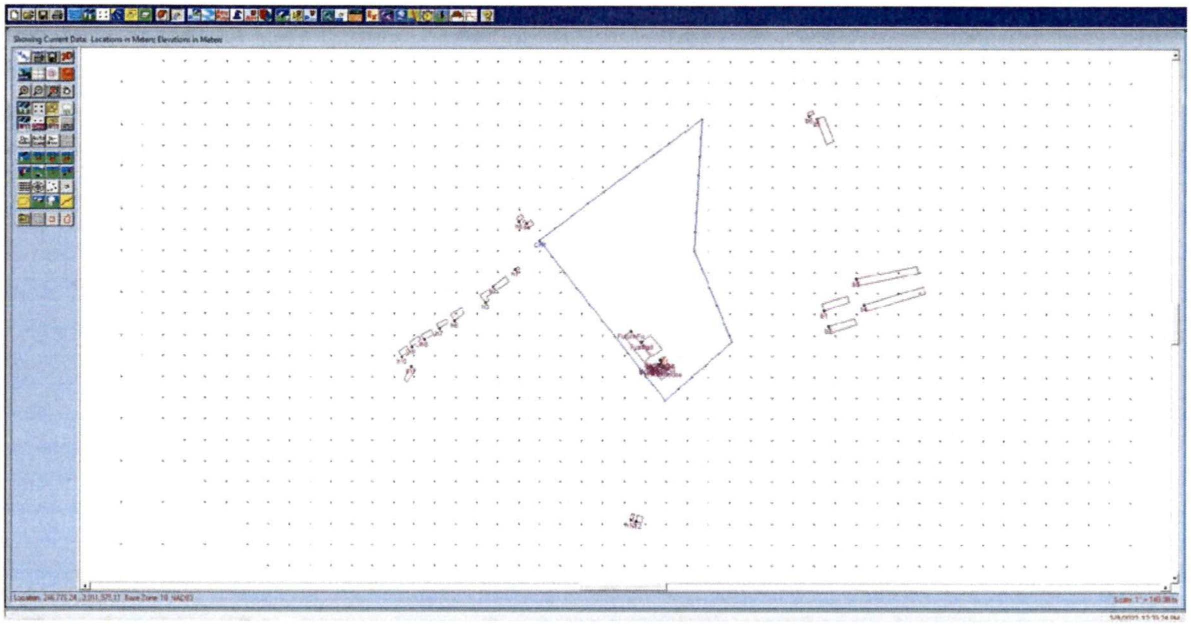
Source ID	Stack Release Type	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp. (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)
BF1	Default	Boiler 1	247496.86	3911247.12	90.65	80	330	54 - 65	4.25

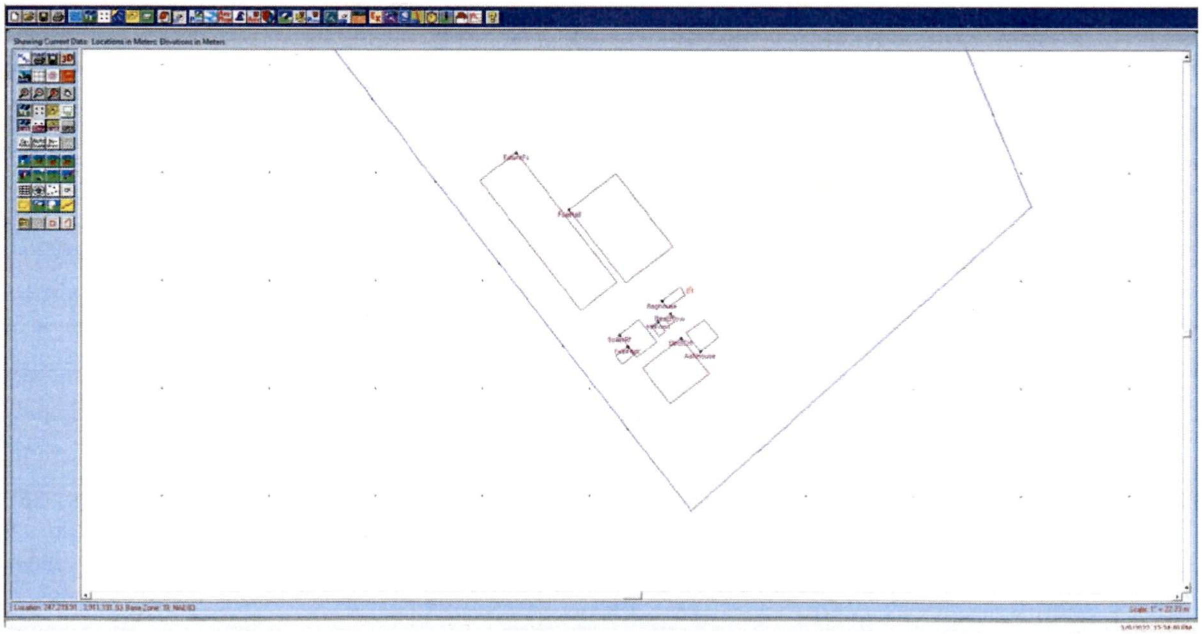
6.3 Source Locations and Modeled Emissions

Table 7 above lists the latitude and longitude for the proposed bagfilter stack, and Figure 4 shows a graphical layout of the stack with respect to the property boundary, buildings/ equipment and the receptor grid (first image gives full property boundary view and the second image is a closeup of the equipment configuration). TAP emission rates can be found on Table 3. For pollutants with hourly averaging periods, the maximum hourly emission rate was used as the hourly model input rate. For pollutants with daily averaging periods, the maximum daily emission rate was divided by 24 to obtain the hourly model input rate. For pollutants with annual averaging periods, the Synthetic Minor limited annual emission rate was divided by 8,760 to obtain the hourly model input rate.

Figure 4 shows the source, receptor and boundary layouts as defined in the model.

Figure 4 Graphical Layout





6.4 Meteorological Data

Five years of pre-processed meteorological data (2014 - 2018) were obtained from the North Carolina Division of Air Quality website. The most representative data for facilities in Lenoir County are Rocky Mount/Wilson data for surface air and Newport data for upper air.

6.5 Receptor Locations

The property boundary was defined using the fence line tool to define a close discrete receptor spacing. A fine mesh receptor grid with 50-meter spacing was set up to extend to 1000 meters. An additional "coarse" receptor grid was created to extend outward to 5 kilometers from the facility, for a total of approximately 10,000 receptors using NAD83 coordinate system.

The AerMap preprocessor was used to determine building, source, and receptor elevations from NED data files for the entire modeled area.

6.6 Summary of Results

Modeling results indicate an adequate margin of compliance for all TAPS. Benzene has the greatest relative impact at 21.2% of the AAL. The location of maximum impact for Benzene occurred approximately 150 meters to the south of the property under meteorological year data 2015. Table 8 below summarizes the highest modeled concentration for each pollutant compared to the Acceptable Ambient Level (AAL), listed in micrograms per cubic meter.

Table 8 - Modeling Results Summary

Pollutant	Averaging Period	Rank	Concentration (ug/m^3)	AAL (ug/m^3)	% AAL
Acrolein	1-hr	1st	1.82	80.00	2.3%
Arsenic	Annual	1st	0.00	0.00	0.0%
Benzene	Annual	1st	0.025	0.12	21.2%
Chlorine	24-hr	1st	0.11	37.50	0.3%
Formaldehyde	1-hr	1st	2.00	150.00	1.3%
HCL	1-hr	1st	10.47	700.00	1.5%
Mercury	24-hr	1st	0.01	0.60	1.0%
Sulfuric Acid	24-hr	1st	0.05	12.00	0.4%

Appendix A
NCDAQ Construction Permit Application Forms

FORM A

GENERAL FACILITY INFORMATION

REVISED 09/22/16 — NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate — **A**

NOTE- APPLICATION WILL NOT BE PROCESSED WITHOUT THE FOLLOWING:

- [x] Local Zoning Consistency Determination (new or modification only)
- [x] Appropriate Number of Copies of Application
- [x] Responsible Official/Authorized Contact Signature
- [x] P.E. Seal (if required)

Application Fee (please check one option below)
- [ ] Not Required
- [ ] ePayment
- [x] Check Enclosed

GENERAL INFORMATION

Legal Corporate/Owner Name:	Carolina Poultry Power RG3, LLC
Site Name:	CPP - La Grange
Site Address (911 Address) Line 1:	just north of 5473 Brothers Road
Site Address Line 2:	No official PO address yet - see Lat/Long below for exact location, and area location map in report
City: La Grange	State: NC
Zip Code: 28551	County: Lenoir

CONTACT INFORMATION

Responsible Official/Authorized Contact:	***Invoice Contact:***
Name/Title: Rich Deming, Principal	Name/Title: Tracy Calihan
Mailing Address Line 1: 3730 N. Main Street	Mailing Address Line 1: 3730 N. Main Street
Mailing Address Line 2:	Mailing Address Line 2:
City: Farmville State: NC Zip Code: 27828	City: `Farmville State: NC Zip Code: 27828
Primary Phone No.: 252-800-1969 Fax No.:	Primary Phone No.: 252-253-3300 Fax No.:
Secondary Phone No.:	Secondary Phone No.:
Email Address: rich@eastenergyrenewables.com	Email Address: tracy@eastenergyrenewables.com

Facility/Inspection Contact:	***Permit/Technical Contact:***
Name/Title: Peyton Orr, VP Operations	Name/Title: Kim Melvin
Mailing Address Line 1: (same)	Mailing Address Line 1: 116 Hidden Hill Road
Mailing Address Line 2:	Mailing Address Line 2:
City: State: Zip Code:	City: Spartanburg State: SC Zip Code: 29301
Primary Phone No.: 443-668-4132 Fax No.:	Primary Phone No.: 864-414-3059 Fax No.:
Secondary Phone No.:	Secondary Phone No.:
Email Address: Peyton@eastenergyrenewables.com	Email Address: kmelvin@pintegration.com

APPLICATION IS BEING MADE FOR

- [x] New Non-permitted Facility/Greenfield
- [ ] Modification of Facility (permitted)
- [ ] Renewal Title V
- [ ] Renewal Non-Title V
- [ ] Name Change
- [ ] Ownership Change
- [ ] Administrative Amendment
- [ ] Renewal with Modification

FACILITY CLASSIFICATION AFTER APPLICATION (Check Only One)

- [ ] General
- [ ] Small
- [ ] Prohibitory Small
- [x] Synthetic Minor
- [ ] Title V

FACILITY (Plant Site) INFORMATION

Describe nature of (plant site) operation(s): Application is made for one new poultry-litter fired boiler and associated control systems. The site will generate electricity and Renewable Energy Certificates (RECs).

	Facility ID No.
Primary SIC/NAICS Code: 4911 elect svc/ 221112 fossil fuel power generation	Current/Previous Air Permit No. Expiration Date:
Facility Coordinates: Latitude:247496.86 m E	Longitude: 3911247.12 m N

Does this application contain confidential data? [ ] YES [x] NO — *****If yes, please contact the DAQ Regional Office prior to submitting this application.*** (See Instructions)**

PERSON OR FIRM THAT PREPARED APPLICATION

Person Name: Kim Melvin	Firm Name: Project Integration, Inc.
Mailing Address Line 1: 116 Hidden Hill Road	Mailing Address Line 2:
City: Spartanburg State: SC	Zip Code: 29301 County: Spartanburg
Phone No.: 864-414-3059 Fax No.:	Email Address: kmelvin@pintegration.com

SIGNATURE OF RESPONSIBLE OFFICIAL/AUTHORIZED CONTACT

Name (typed): Rich Deming	Title: Principal
X Signature(Blue Ink):	Date: 5/4/22

Attach Additional Sheets As Necessary

FORMs A2, A3

EMISSION SOURCE LISTING FOR THIS APPLICATION - A2

112r APPLICABILITY INFORMATION - A3

REVISED 09/22/16 | **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** | **A2**

EMISSION SOURCE LISTING: New, Modified, Previously Unpermitted, Replaced, Deleted

EMISSION SOURCE ID NO.	EMISSION SOURCE DESCRIPTION	CONTROL DEVICE ID NO.	CONTROL DEVICE DESCRIPTION
Equipment To Be ADDED By This Application (New, Previously Unpermitted, or Replacement)			
ES-B1	97 mmBtu/hr poultry litter-fired boiler	SNCR1	Selective non-catalytic reduction (Urea injection)
		DSI1	Dry sorbent injection
		BH1	Bagfilter (13,437 sf)
ES-SILO	Lime storage silo (31 tons)	BV1	Bin vent filter
Existing Permitted Equipment To Be MODIFIED By This Application			
Equipment To Be DELETED By This Application			

112(r) APPLICABILITY INFORMATION | **A 3**

Is your facility subject to 40 CFR Part 68 "Prevention of Accidental Releases" - Section 112(r) of the Federal Clean Air Act? ☐ Yes ☐ No

If No, please specify in detail how your facility avoided applicability: ____________

If your facility is Subject to 112(r), please complete the following:

A. Have you already submitted a Risk Management Plan (RMP) to EPA Pursuant to 40 CFR Part 68.10 or Part 68.150?

☐ Yes ☐ No Specify required RMP submittal date: ____________ If submitted, RMP submittal date: ____________

B. Are you using administrative controls to subject your facility to a lesser 112(r) program standard?

☐ Yes ☐ No If yes, please specify: ____________

C. List the processes subject to 112(r) at your facility:

PROCESS DESCRIPTION	PROCESS LEVEL (1, 2, or 3)	HAZARDOUS CHEMICAL	MAXIMUM INTENDED INVENTORY (LBS)

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/1 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B**

EMISSION SOURCE DESCRIPTION: Poultry litter-fired boiler	EMISSION SOURCE ID NO: ES-B1
	CONTROL DEVICE ID NO(S): SNCR1, DSI1, BH1
OPERATING SCENARIO ______1______ OF ______1______	EMISSION POINT (STACK) ID NO(S): EP1

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

97 mmBtu/hr poultry litter-fired boiler. Integral controls for PM are a multiclone provided by the manufacturer. Add-on controls are SNCR, Dry Sorbent Injection, bagfilter system. See application report for complete details on boiler and control system.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

- ☑ Coal,wood,oil, gas, other burner (Form B1)
- ☐ Woodworking (Form B4)
- ☐ Manuf. of chemicals/coatings/inks (Form B
- ☐ Int.combustion engine/generator (Form B2)
- ☐ Coating/finishing/printing (Form B!
- ☐ Incineration (Form B8)
- ☐ Liquid storage tanks (Form B3)
- ☐ Storage silos/bins (Form B6)
- ☐ Other (Form B9)

START CONSTRUCTION DATE: October 2022 DATE MANUFACTURED: 2022

MANUFACTURER / MODEL NO.: Wellons Traveling Grate Spreader | OP. SCHEDULE: _24_ HR/DAY _7_ DAY/WK _5_ WK/YR

IS THIS SOURCE SUBJECT ☑ NSPS (SUBPARTS?):__Dc__________ ☐ NESHAP (SUBPARTS?):__________

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)							
PARTICULATE MATTER<10 MICRONS (PM_{10})		(see attached sheet)					
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
			(see attached sheet)					

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr
			(see attached sheet)		

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

PLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOU

Attach Additional Sheets As Necessary

See addendum spreadsheets attached to the end of the application dated 7/12/2022.

Carolina Poultry Power, RG3 **Single Boiler System**
La Grange, NC
April 2022

Boiler Specifications	
97.00	MMBtu/hr

Bagfilter Efficiency	
99.0%	PM
Dry Sorbent Efficiency	
93.0%	HCl
20%	SO2

SNCR Efficiency	
45%	NOx

Hours of Operations		
Actual/Ltd	8,760	hrs/yr
Potential	8,760	hrs/yr

	Uncontr.	Actuals			Potentials					
	EF	Controlled by SNCR, DSI, Baghouse			Uncontrolled			Controlled by SNCR, DSI, Baghouse		
	lb/MMBtu	lb/hr	lb/yr	tpy	lb/hr	lb/yr	tpy	lb/hr	lb/yr	tpy
PM	3.000	2.91	25,491.60	12.75	291.00	2,549,160.00	1274.58	2.91	25,491.60	12.75
PM10	3.000	2.91	25,491.60	12.75	291.00	2,549,160.00	1274.58	2.91	25,491.60	12.75
PM2.5	3.000	2.91	25,491.60	12.75	291.00	2,549,160.00	1274.58	2.91	25,491.60	12.75
SO2	0.280	21.73	190,337.28	95.17	27.16	237,921.60	118.96	21.73	190,337.28	95.17
NOx	0.420	22.41	196,285.32	98.14	40.74	356,882.40	178.44	22.41	196,285.32	98.14
CO	0.220	21.34	186,938.40	93.47	21.34	186,938.40	93.47	21.34	186,938.40	93.47
VOC	0.017	1.65	14,445.24	7.22	1.65	14,445.24	7.22	1.65	14,445.24	7.22
Lead	4.10E-05	0.00	34.84	0.02	0.00	34.84	0.02	0.00	34.84	0.02
GHG:										
Carbon Dioxide (CO2)	223.00	21631.00	1.89E+08	94743.78	21631.00	1.89E+08	94743.78	21631.00	1.89E+08	94743.78
Methane (CH4)	1.48	143.71	1.26E+06	629.43	143.71	1.26E+06	629.43	143.71	1.26E+06	629.43
Nitrous Oxide (N2O)	2.87	278.43	2.44E+06	1219.53	278.43	2.44E+06	1219.53	278.43	2.44E+06	1219.53
				96592.74			*96592.74*			*96592.74*

FORM B1

EMISSION SOURCE (WOOD, COAL, OIL, GAS, OTHER FUEL-FIRED BURNER)

REVISED 09/22/16 | **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** | **B1**

EMISSION SOURCE DESCRIPTION: Poultry litter-fired boiler

EMISSION SOURCE ID NO: ES-1

CONTROL DEVICE ID NO(S): SNCR1, DSI1, BH1

OPERATING SCENARIO: ____1_______ OF ____1_______

EMISSION POINT (STACK) ID NO(S): EP1

DESCRIBE USE: ☐ PROCESS HEAT ☐ SPACE HEAT ☑ ELECTRICAL GENERATION
☐ CONTINUOUS USE ☐ STAND BY/EMERGENCY ☐ OTHER (DESCRIBE): _______________________

HEATING MECHANISM: ☑ INDIRECT ☐ DIRECT

MAX. FIRING RATE (MMBTU/HOUR): 97

WOOD-FIRED BURNER

WOOD TYPE: ☐ BARK ☐ WOOD/BARK ☐ WET WOOD ☐ DRY WOOD ☑ OTHER (DESCRIBE): _Poultry Litter__

PERCENT MOISTURE OF FUEL: ___20-30_____________

☐ UNCONTROLLED ☐ CONTROLLED WITH FLYASH REINJECTION ☑ CONTROLLED W/O REINJECTION

FUEL FEED METHOD: screw conveyor

HEAT TRANSFER MEDIA: ☑ STEAM ☐ AIR ☐ OTHER (DESCRIBE) ____________________

COAL-FIRED BURNER

TYPE OF BOILER	IF OTHER DESCRIBE:			
PULVERIZED	OVERFEED STOKER	UNDERFEED STOKER	SPREADER STOKER	FLUIDIZED BED
☐ WET BED	☐ UNCONTROLLED	☐ UNCONTROLLED	☐ UNCONTROLLED	☐ CIRCULATING
☐ DRY BED	☐ CONTROLLED	☐ CONTROLLED	☐ FLYASH REINJECTION	☐ RECIRCULATING
			☐ NO FLYASH REINJECTION	

OIL/GAS-FIRED BURNER

TYPE OF BOILER: ☐ UTILITY ☐ INDUSTRIAL ☐ COMMERCIAL ☐ INSTITUTIONAL

TYPE OF FIRING: ☐ NORMAL ☐ TANGENTIAL ☐ LOW NOX BURNERS ☐ NO LOW NOX BURNER

OTHER FUEL-FIRED BURNER

TYPE(S) OF FUEL: ___Poultry litter______________ PERCEN

TYPE OF BOILER: ☐ UTILITY ☑ INDUSTRIAL ☐ COMMERCIAL ☐ INSTITUTIONAL

TYPE OF FIRING: ___Spreader Stoker___ TYPE(S) OF CONTROL(S) (IF ANY): _Multiclone___________________________

FUEL USAGE (INCLUDE STARTUP/BACKUP FUELS)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
No backup fuel			

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	SPECIFIC BTU CONTENT	SULFUR CONTENT (% BY WEIGHT)	ASH CONTENT (% BY WEIGHT)

COMMENTS:

Attach Additional Sheets As Necessary

FORM C9

CONTROL DEVICE (OTHER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **C9**

CONTROL DEVICE ID NO: SNCR1	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-1
EMISSION POINT (STACK) ID NO(S): EP1	POSITION IN SERIES OF CONTROLS: NO. 1 OF 3 UNITS
OPERATING SCENARIO:	
___1____ OF __1_____	P.E. SEAL REQUIRED (PER 2Q .0112)? ☑ YES ☐ NO

DESCRIBE CONTROL SYSTEM:
SNCR installed on each boiler to provide urea injection rate range between 12 to 16 pounds per hour, directly to boiler. See application report for additional details.

POLLUTANT(S) COLLECTED:	NOx			
BEFORE CONTROL EMISSION RATE (LB/HR):	40.74			
CAPTURE EFFICIENCY:	100 %	%	%	%
CONTROL DEVICE EFFICIENCY:	45 %	%	%	%
CORRESPONDING OVERALL EFFICIENCY:	45 %	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	22.41			

PRESSURE DROP (IN. H_20): ______ MIN ______ MAX	BULK PARTICLE DENSITY (LB/FT^3)
INLET TEMPERATURE (°F): ______ MIN ______ MAX	OUTLET TEMPERATURE (°F): ______ MIN ______ MAX
INLET AIR FLOW RATE (ACFM):	OUTLET AIR FLOW RATE (ACFM):
INLET AIR FLOW VELOCITY (FT/SEC):	OUTLET AIR FLOW VELOCITY (FT/SEC):
INLET MOISTURE CONTENT (%):	☐ FORCED AIR ☐ INDUCED AIR
COLLECTION SURFACE AREA (FT^2):	FUEL USED: / FUEL USAGE RATE:

DESCRIBE MAINTENANCE PROCEDURES:
Routine PM according to manufacturer's specifications

DESCRIBE ANY AUXILIARY MATERIALS INTRODUCED INTO THE CONTROL SYSTEM: n/a

DESCRIBE ANY MONITORING DEVICES, GAUGES, TEST PORTS, ETC:

ATTACH A DIAGRAM OF THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S): See PFD in attached report

COMMENTS:

Attach manufacturer's specifications, schematics, and all other drawings necessary to describe this control.

Attach Additional Sheets As Necessary

FORM C9

CONTROL DEVICE (OTHER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **C9**

CONTROL DEVICE ID NO: DSI1	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-1
EMISSION POINT (STACK) ID NO(S): EP1	POSITION IN SERIES OF CONTROLS: NO. 2 OF 3 UNITS
OPERATING SCENARIO:	
___1___ OF ___1___	P.E. SEAL REQUIRED (PER 2Q .0112)? ☑ YES ☐ NO

DESCRIBE CONTROL SYSTEM:
Dry sorbent sodium bicarbonate or Trona) will be injected into the exhaust stream of each boiler at a rate of approximately 508 pounds per hour. See application report for additional details.

POLLUTANT(S) COLLECTED:	SO2	HCl		
BEFORE CONTROL EMISSION RATE (LB/HR):	27.16	31.91		
CAPTURE EFFICIENCY:	100 %	100 %	%	%
CONTROL DEVICE EFFICIENCY:	20 %	93 %	%	%
CORRESPONDING OVERALL EFFICIENCY:	20 %	93 %	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	21.73	2.234		

PRESSURE DROP (IN. H_20): _____ MIN _____ MAX	BULK PARTICLE DENSITY (LB/FT^3)
INLET TEMPERATURE (°F): _____ MIN _____ MAX	OUTLET TEMPERATURE (°F): _____ MIN _____ MAX
INLET AIR FLOW RATE (ACFM):	OUTLET AIR FLOW RATE (ACFM):
INLET AIR FLOW VELOCITY (FT/SEC):	OUTLET AIR FLOW VELOCITY (FT/SEC):
INLET MOISTURE CONTENT (%):	☐ FORCED AIR ☐ INDUCED AIR
COLLECTION SURFACE AREA (FT^2):	FUEL USED: FUEL USAGE RATE:

DESCRIBE MAINTENANCE PROCEDURES:
Routine PM according to manufacturer's specifications

DESCRIBE ANY AUXILIARY MATERIALS INTRODUCED INTO THE CONTROL SYSTEM: n/a

DESCRIBE ANY MONITORING DEVICES, GAUGES, TEST PORTS, ETC:

ATTACH A DIAGRAM OF THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S): See PFD in attached report

COMMENTS:

Attach manufacturer's specifications, schematics, and all other drawings necessary to describe this control.

Attach Additional Sheets As Necessary

FORM C1

CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **C1**

CONTROL DEVICE ID NO: BF1	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-1
EMISSION POINT (STACK) ID NO(S): EP1	POSITION IN SERIES OF CONTROLS NO. 1 OF 1 UNITS
OPERATING SCENARIO:	
1 OF 1	P.E. SEAL REQUIRED (PER 2q .0112)? ☑ YES ☐ NO

DESCRIBE CONTROL SYSTEM:
Pulse jet baghouse with a filter area of 13,437 square feet (518 bags, 6 inches in diameter, 16 feet long). 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 inches to 7 inches of water column, with typical pressure drop of 5 – 6 inches. Each bagfilter will be equipped with a leak detection alarm.

POLLUTANTS COLLECTED:	PM-10			
BEFORE CONTROL EMISSION RATE (LB/HR):	291			
CAPTURE EFFICIENCY:	100 %	%	%	%
CONTROL DEVICE EFFICIENCY:	99 %	%	%	%
CORRESPONDING OVERALL EFFICIENCY:	99 %	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	2.91			

PRESSURE DROP (IN H_2O): MIN: 2 MAX: 7 GAUGE? ☑ YES ☐ NO

BULK PARTICLE DENSITY (LB/FT^3):	INLET TEMPERATURE (°F): MIN 350 MAX 450	
POLLUTANT LOADING RATE: 291 ☑ LB/HR ☐ GR/FT^3	OUTLET TEMPERATURE (°F) MIN 350 MAX 450	
INLET AIR FLOW RATE (ACFM): 48,612	FILTER OPERATING TEMP (°F): 450	
NO. OF COMPARTMENTS: 1	NO. OF BAGS PER COMPARTMENT: 608	LENGTH OF BAG (IN.): 16 ft
NO. OF CARTRIDGES:	FILTER SURFACE AREA PER CARTRIDGE (FT^2):	DIAMETER OF BAG (IN.): 6
TOTAL FILTER SURFACE AREA (FT^2): 13,437 15,808?	AIR TO CLOTH RATIO: 3.6:1	
DRAFT TYPE: ☐ INDUCED/NEGATIVE ☑ FORCED/POSITIVE	FILTER MATERIAL: ☑ Fiber glass with PTFE membrane	

DESCRIBE CLEANING PROCEDURES:

☑ AIR PULSE ☐ SONIC
☐ REVERSE FLOW ☐ SIMPLE BAG COLLAPSE
☐ MECHANICAL/SHAKER ☐ RING BAG COLLAPSE
☐ OTHER:

DESCRIBE INCOMING AIR STREAM: The bagfilter receives boiler exhaust gases after the integral multiclone and DSI systems.

PARTICLE SIZE DISTRIBUTION

SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
0-1		
1-10		
10-25		
25-50		
50-100		
>100		
	TOTAL = 100	

ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):

COMMENTS:
See attached report for PFD

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/1 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B**

EMISSION SOURCE DESCRIPTION: Lime Silo	EMISSION SOURCE ID NO: ES-SILO
	CONTROL DEVICE ID NO(S): BV1
OPERATING SCENARIO ____1____ OF ____1____	EMISSION POINT (STACK) ID NO(S): BV1

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

The DSI silo has 2400 cubic feet of storage capacity for sodium bicarbonate, hydrated lime or Trona and will be equipped with a passive bin vent (bagfilter) system to capture displaced air during product off-loading for a truck. The bin vent is a 25 bag unit with 6 inch diameter bags that are 60 inches long, providing 196 square feet of filter area.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

- ☐ Coal,wood,oil, gas, other burner (Form B1)
- ☐ Woodworking (Form B4)
- ☐ Manuf. of chemicals/coatings/inks (Form B7)
- ☐ Int.combustion engine/generator (Form B2)
- ☐ Coating/finishing/printing (Form B5
- ☐ Incineration (Form B8)
- ☐ Liquid storage tanks (Form B3)
- ☑ Storage silos/bins (Form B6)
- ☐ Other (Form B9)

START CONSTRUCTION DATE: April 2021	DATE MANUFACTURED: April 2021
MANUFACTURER / MODEL NO.:	EXPECTED OP. SCHEDULE: _24_ HR/DAY __7 DAY/WK _52_ WK/YR

IS THIS SOURCE SUBJECT ☐ NSPS (SUBPARTS?):__________ ☐ NESHAP (SUBPARTS?):__________

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)	AP-42	0.11	2.71	11.23	271.21	0.11	2.71
PARTICULATE MATTER<10 MICRONS (PM_{10})	AP-42	0.07	1.73	7.18	173.27	0.07	1.73
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)	AP-42	0.07	1.73	7.18	173.27	0.07	1.73
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
None								

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

PLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOU

Attach Additional Sheets As Necessary

FORM B6

EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B6**

EMISSION SOURCE DESCRIPTION: Lime Silo	EMISSION SOURCE ID NO: ES-SILO
	CONTROL DEVICE ID NO(S): BV1
OPERATING SCENARIO: 1 OF 1	EMISSION POINT(STACK) ID NO(S): BV1

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
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 bin vent is a 25 bag unit with 6 inch diameter bags that are 60 inches long, providing 196 square feet of filter area.

MATERIAL STORED: Trona, hydrated lime, or sodium bicarbonate				DENSITY OF MATERIAL (LB/FT3): 26 (fluidized bulk density)	
CAPACITY	CUBIC FEET: 2400			TONS: 31	
DIMENSIONS (FEET)	HEIGHT: 45	DIAMETER: 10	***(OR)***	LENGTH: WIDTH: HEIGHT:	
ANNUAL PRODUCT THROUGHPUT (TONS)		ACTUAL: 504		MAXIMUM DESIGN CAPACITY: 538	

PNEUMATICALLY FILLED		**MECHANICALLY FILLED**	**FILLED FROM**	
	BLOWER	SCREW CONVEYOR		RAILCAR
X	COMPRESSOR	BELT CONVEYOR	X	TRUCK
	OTHER:	BUCKET ELEVATOR		STORAGE PILE
		OTHER:		OTHER:

NO. FILL TUBES:

MAXIMUM ACFM: 600

MATERIAL IS UNLOADED TO:
conveying air stream to injection lances

BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO?
Rotary valve to 3 injection lances via conveying blowers

MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 600 cfm

MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 2 injection lances at 22-43 lb/hr each = 44-86 lb/hr

COMMENTS:

Attach Additional Sheets As Necessary

FORM C1

CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **C1**

CONTROL DEVICE ID NO: BV1	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-SILO
EMISSION POINT (STACK) ID NO(S):	POSITION IN SERIES OF CONTROLS NO. 1 OF 1 UNITS
OPERATING SCENARIO: 1 OF 1	P.E. SEAL REQUIRED (PER 2q .0112)? ☐ YES ☑ NO

DESCRIBE CONTROL SYSTEM:
The silo includes one bulk truck pneumatic receiving line and flanged nozzle at the top of the silo for ventilation of displaced air from the silo to the bin vent.

POLLUTANTS COLLECTED:	TSP	PM-10		
BEFORE CONTROL EMISSION RATE (LB/HR):	28.8	18.4		
CAPTURE EFFICIENCY:	100 %	100 %	%	%
CONTROL DEVICE EFFICIENCY:	99+ %	99+ %	%	%
CORRESPONDING OVERALL EFFICIENCY:	99+ %	99+ %	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	0.29	0.18		

PRESSURE DROP (IN H_2O): MIN: MAX: GAUGE? ☐ YES ☐ NO

BULK PARTICLE DENSITY (LB/FT^3):	INLET TEMPERATURE (°F): MIN MAX
POLLUTANT LOADING RATE: ☐ LB/HR ☐ GR/FT^3	OUTLET TEMPERATURE (°F) MIN MAX
INLET AIR FLOW RATE (ACFM):	FILTER OPERATING TEMP (°F):

NO. OF COMPARTMENTS: 1	NO. OF BAGS PER COMPARTMENT: 25	LENGTH OF BAG (IN.): 60
NO. OF CARTRIDGES:	FILTER SURFACE AREA PER CARTRIDGE (FT^2): 196	DIAMETER OF BAG (IN.): 6
TOTAL FILTER SURFACE AREA (FT^2):	AIR TO CLOTH RATIO: 3:1	

DRAFT TYPE: ☐ INDUCED/NEGATIVE ☐ FORCED/POSITIVE FILTER MATERIAL: ☐ WOVEN ☐ FELTED

DESCRIBE CLEANING PROCEDURES:

- ☐ AIR PULSE
- ☐ REVERSE FLOW
- ☐ MECHANICAL/SHAKER
- ☐ OTHER:
- ☐ SONIC
- ☐ SIMPLE BAG COLLAPSE
- ☐ RING BAG COLLAPSE

DESCRIBE INCOMING AIR STREAM: air displaced during pneumatic loading of the silo (unloading rate approximately 600 cfm)

PARTICLE SIZE DISTRIBUTION

SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
0-1		
1-10		
10-25		
25-50		
50-100		
>100		
	TOTAL = 100	

ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):

COMMENTS:

Attach Additional Sheets As Necessary

Replaced by Form D1 dated 7/12/22

FORM D1

FACILITY-WIDE EMISSIONS SUMMARY

REVISED 09/22/16 — **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** — **D1**

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)
AIR POLLUTANT EMITTED	tons/yr	tons/yr	tons/yr
PARTICULATE MATTER (PM)	15.46	1545.79	15.46
PARTICULATE MATTER < 10 MICRONS (PM_{10})	14.48	1447.85	14.48
PARTICULATE MATTER < 2.5 MICRONS ($PM_{2.5}$)	14.48	1447.85	14.48
SULFUR DIOXIDE (SO_2)	95.17	118.96	95.17
NITROGEN OXIDES (NOx)	98.14	178.44	98.14
CARBON MONOXIDE (CO)	93.47	93.47	93.47
VOLATILE ORGANIC COMPOUNDS (VOC)	7.22	7.22	7.22
LEAD	0.02	0.02	0.02
GREENHOUSE GASES (GHG) (SHORT TONS)	96592.74	96592.74	96592.74
OTHER			

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

		EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)
HAZARDOUS AIR POLLUTANT EMITTED	CAS NO.	tons/yr	tons/yr	tons/yr
Acetaldehyde		0.35	0.35	0.35
Acrolein		1.70	1.70	1.70
Benzene		0.36	0.36	0.36
Chlorine		0.28	0.28	0.28
Formaldehyde		1.87	1.87	1.87
HCl		0.01	0.07	0.01
Manganese & Cpds		0.00	0.45	0.00
Methylene Chloride		0.12	0.12	0.12
H2SO4		0.16	16.00	0.16
Styrene		0.81	0.81	0.81
Toluene		0.39	0.39	0.39
Total		6.05	22.41	6.05

TOXIC AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

INDICATE REQUESTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS. EMISSIONS ABOVE THE TOXIC PERMIT EMISSION RATE (TPER) IN 15A NCAC 2Q .0711 MAY REQUIRE AIR DISPERSION MODELING. USE NETTING FORM D2 IF NECESSARY.

					Modeling Required ?		
TOXIC AIR POLLUTANT EMITTED	CAS NO.	lb/hr	lb/day	lb/year	Yes	No	
See Table 3 in Report					xx		

COMMENTS:

HAP emissions - 93% control of HCl and 99% control for particualte HAPs

Attach Additional Sheets As Necessary

TABLE REVISED BY BETSY HUDDLESTON PER AGREEMENT BY KIM MELVIN 7/12/2022: CORRECT TOTALS ARE IN RED HIGHLIGHT
SULFURIC ACID IS NOT A HAP, BUT IS CONSIDERED A PARTICULATE
SILO POTENTIAL BEFORE AND AFTER CONTROL EMISSIONS WERE MISCALCULATED

Betsy Huddleston

FORM D1

FACILITY-WIDE EMISSIONS SUMMARY

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **D1**

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)	**POTENTIAL EMISSIONS** (BEFORE CONTROLS / LIMITATIONS)	**POTENTIAL EMISSIONS** (AFTER CONTROLS / LIMITATIONS)
AIR POLLUTANT EMITTED	tons/yr	tons/yr	tons/yr
PARTICULATE MATTER (PM)	15.46 12.91	1545.79 1290.72	15.46 12.91
PARTICULATE MATTER < 10 MICRONS (PM_{10})	14.48 12.91	1447.85 1290.67	14.48 12.91
PARTICULATE MATTER < 2.5 MICRONS ($PM_{2.5}$)	14.48 12.91	1447.85 1290.67	14.48 12.91
SULFUR DIOXIDE (SO_2)	95.17	118.96	95.17
NITROGEN OXIDES (NOx)	98.14	178.44	98.14
CARBON MONOXIDE (CO)	93.47	93.47	93.47
VOLATILE ORGANIC COMPOUNDS (VOC)	7.22	7.22	7.22
LEAD	0.02	0.02	0.02
GREENHOUSE GASES (GHG) (SHORT TONS)	96592.74	96592.74	96592.74
OTHER			

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

		EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)	**POTENTIAL EMISSIONS** (BEFORE CONTROLS / LIMITATIONS)	**POTENTIAL EMISSIONS** (AFTER CONTROLS / LIMITATIONS)
HAZARDOUS AIR POLLUTANT EMITTED	CAS NO.	tons/yr	tons/yr	tons/yr
Acetaldehyde		0.35	0.35	0.35
Acrolein		1.70	1.70	1.70
Benzene		1.78	1.78	1.78
Chlorine		0.36	0.36	0.36
Formaldehyde		1.87	1.87	1.87
HCl		9.78	139.71	9.78
Manganese & Cpds		0.00	0.45	0.00
Methylene Chloride		0.12	0.12	0.12
H2SO4		0.16	16.00	0.16
Styrene		0.81	0.81	0.81
Toluene		0.39	0.39	0.39
Total SEE CORRECTED HAP/TAP TABLE 3 FOR TOTALS		17.33 17.54	163.55 147.55	17.33 17.54

TOXIC AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

INDICATE REQUESTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS. EMISSIONS ABOVE THE TOXIC PERMIT EMISSION RATE (TPER) IN 15A NCAC 2Q .0711 MAY REQUIRE AIR DISPERSION MODELING. USE NETTING FORM D2 IF NECESSARY.

					Modeling Required ?		
TOXIC AIR POLLUTANT EMITTED	CAS NO.	lb/hr	lb/day	lb/year	Yes	No	
See Table 3 in Report					xx		

COMMENTS:

HAP emissions - 93% control of HCl and 99% control for particualte HAPs

Attach Additional Sheets As Necessary

FORM D5

TECHNICAL ANALYSIS TO SUPPORT PERMIT APPLICATION

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **D5**

PROVIDE DETAILED TECHNICAL CALCULATIONS TO SUPPORT ALL EMISSION, CONTROL, AND REGULATORY DEMONSTRATIONS MADE IN THIS APPLICATION. INCLUDE A COMPREHENSIVE PROCESS FLOW DIAGRAM AS NECESSARY TO SUPPORT AND CLARIFY CALCULATIONS AND ASSUMPTIONS. ADDRESS THE FOLLOWING SPECIFIC ISSUES ON SEPARATE PAGES:

A **SPECIFIC EMISSIONS SOURCE (EMISSION INFORMATION) (FORM B and B1 through B9)** - SHOW CALCULATIONS USED, INCLUDING EMISSION FACTORS, MATERIAL BALANCES, AND/OR OTHER METHODS FROM WHICH THE POLLUTANT EMISSION RATES IN THIS APPLICATION WERE DERIVED. INCLUDE CALCULATION OF POTENTIAL BEFORE AND, WHERE APPLICABLE, AFTER CONTROLS. CLEARLY STATE ANY ASSUMPTIONS MADE AND PROVIDE ANY REFERENCES AS NEEDED TO SUPPORT MATERIAL BALANCE CALCULATIONS.

B **SPECIFIC EMISSION SOURCE (REGULATORY INFORMATION)(FORM E2 - TITLE V ONLY)** - PROVIDE AN ANALYSIS OF ANY REGULATIONS APPLICABLE TO INDIVIDUAL SOURCES AND THE FACILITY AS A WHOLE. INCLUDE A DISCUSSION OUTING METHODS (e.g. FOR TESTING AND/OR MONITORING REQUIREMENTS) FOR COMPLYING WITH APPLICABLE REGULATIONS, PARTICULARLY THOSE REGULATIONS LIMITING EMISSIONS BASED ON PROCESS RATES OR OTHER OPERATIONAL PARAMETERS. PROVIDE JUSTIFICATION FOR AVOIDANCE OF ANY FEDERAL REGULATIONS (PREVENTION OF SIGNIFICANT DETERIORATION (PSD), NEW SOURCE PERFORMANCE STANDARDS (NSPS), NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS), TITLE V), INCLUDING EXEMPTIONS FROM THE FEDERAL REGULATIONS WHICH WOULD OTHERWISE BE APPLICABLE TO THIS FACILITY. SUBMIT ANY REQUIRED INFORMATION TO DOCUMENT COMPLIANCE WITH ANY REGULATIONS. INCLUDE EMISSION RATES CALCULATED IN ITEM "A" ABOVE, DATES OF MANUFACTURE, CONTROL EQUIPMENT, ETC. TO SUPPORT THESE CALCULATIONS.

C **CONTROL DEVICE ANALYSIS (FORM C and C1 through C9)** - PROVIDE A TECHNICAL EVALUATION WITH SUPPORTING REFERENCES FOR ANY CONTROL EFFICIENCIES LISTED ON SECTION C FORMS, OR USED TO REDUCE EMISSION RATES IN CALCULATIONS UNDER ITEM "A" ABOVE. INCLUDE PERTINENT OPERATING PARAMETERS (e.g. OPERATING CONDITIONS, MANUFACTURING RECOMMENDATIONS, AND PARAMETERS AS APPLIED FOR IN THIS APPLICATION) CRITICAL TO ENSURING PROPER PERFORMANCE OF THE CONTROL DEVICES). INCLUDE AND LIMITATIONS OR MALFUNCTION POTENTIAL FOR THE PARTICULAR CONTROL DEVICES AS EMPLOYED AT THIS FACILITY. DETAIL PROCEDURES FOR ASSURING PROPER OPERATION OF THE CONTROL DEVICE INCLUDING MONITORING SYSTEMS AND MAINTENANCE TO BE PERFORMED.

D **PROCESS AND OPERATIONAL COMPLIANCE ANALYSIS - (FORM E3 - TITLE V ONLY)** - SHOWING HOW COMPLIANCE WILL BE ACHIEVED WHEN USING PROCESS, OPERATIONAL, OR OTHER DATA TO DEMONSTRATE COMPLIANCE. REFER TO COMPLIANCE REQUIREMENTS IN THE REGULATORY ANALYSIS IN ITEM "B" WHERE APPROPRIATE. LIST ANY CONDITIONS OR PARAMETERS THAT CAN BE MONITORED AND REPORTED TO DEMONSTRATE COMPLIANCE WITH THE APPLICABLE REGULATIONS.

E **PROFESSIONAL ENGINEERING SEAL -** PURSUANT TO 15A NCAC 2Q .0112 "APPLICATION REQUIRING A PROFESSIONAL ENGINEERING SEAL," A PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA SHALL BE REQUIRED TO SEAL TECHNICAL PORTIONS OF THIS APPLICATION FOR NEW SOURCES AND MODIFICATIONS OF EXISTING SOURCES. (SEE INSTRUCTIONS FOR FURTHER APPLICABILITY).

I, Kimberly Melvin *attest that this application for* Carolina Poultry Power, RG3 *has been reviewed by me and is accurate, complete and consistent with the information supplied in the engineering plans, calculations, and all other supporting documentation to the best of my knowledge. I further attest that to the best of my knowledge the proposed design has been prepared in accordance with the applicable regulations. Although certain portions of this submittal package may have been developed by other professionals, inclusion of these materials under my seal signifies that I have reviewed this material and have judged it to be consistent with the proposed design. Note: In accordance with NC General Statutes 143-215.6A and 143-215.6B, any person who knowingly makes any false statement, representation, or certification in any application shall be guilty of a Class 2 misdemeanor which may include a fine not to exceed $10,000 as well as civil penalties up to $25,000 per violation.*

(PLEASE USE BLUE INK TO COMPLETE THE FOLLOWING)

NAME:	Kimberly Melvin
DATE:	04/25/22
COMPANY:	Project Integration, Inc.
ADDRESS:	116 Hidden Hill Road
TELEPHONE:	864-414-3059
SIGNATURE:	
PAGES CERTIFIED:	Entire Application Forms A through D
	PI Narrative Report Document

(IDENTIFY ABOVE EACH PERMIT FORM AND ATTACHMENT THAT IS BEING CERTIFIED BY THIS SEAL)

PLACE NORTH CAROLINA SEAL HERE

NORTH CAROLINA PROFESSIONAL SEAL 025853 ENGINEER KIMBERLY E. MELVIN

Attach Additional Sheets As Necessary

Appendix B
Zoning Consistency Determination

Zoning Consistency Determination

Facility Name	Carolina Poultry Power RG3, LLC	
Facility Street Address	just north of 5473 Brothers Road	Latitude: 247496.86 m E
Facility City	La Grange	Longitude: 3911247.12 m N
Description of Process	One new poultry-litter fired boiler and associated control systems.	
SIC/NAICS Code	4911 elect svc/ 221112 fossil fuel power generation	
Facility Contact	Rich Deming	
Phone Number	252-800-1969	
Mailing Address	3730 N. Main Street	
Mailing City, State Zip	Farmville, NC 27828	

Based on the information given above:

- [x] I have received a copy of the air permit application (draft or final) AND...

- [ ] There are no applicable zoning ordinances for this facility at this time
- [x] The proposed operation IS consistent with applicable zoning ordinances
- [ ] The proposed operation IS NOT consistent with applicable zoning ordinances (please include a copy of the rules in the package sent to the air quality office)
- [ ] The determination is pending further information and can not be made at this time
- [ ] Other: ______________________

Agency ______________________

Name of Designated Official ______________________

Title of Designated Official ______________________

Signature ______________________

Date ______________________

Please forward to the facility mailing address listed above and the air quality office at the appropriate address as checked on the back of this form.

All PSD and Title V Applications

- [ ] Attn: Supervisor
DAQ – Permitting Section
1641 Mail Service Center
Raleigh, NC 27699-1641

Local Programs

- [ ] Attn: Air Quality Director
Asheville-Buncombe Air Quality Agency
P.O. Box 2749
Asheville, NC 28802
(828) 250-6777

- [ ] Attn: Air Quality Director
Mecklenburg County Air Quality
2145 Suttle Avenue
Charlotte, NC 28208
(704) 336-5430

- [ ] Attn: Air Quality Director
Forsyth County Office of Environmental Assistance and Protection
201 N. Chestnut Street
Winston-Salem, NC 27101
(336) 703-2440

Division of Air Quality Regional Offices

- [ ] Attn: Regional Supervisor
Asheville Regional Office
2090 U.S. Highway 70
Swannanoa, NC 28778
(828) 296-4500

- [x] Attn: Regional Supervisor
Washington Regional Office
943 Washington Square Mall
Washington, NC 27889
(252) 946-6481

- [ ] Attn: Regional Supervisor
Fayetteville Regional Office
225 Green Street, Suite 714
Fayetteville, NC 28301
(910) 433-3300

- [ ] Attn: Regional Supervisor
Wilmington Regional Office
127 Cardinal Drive Extension
Wilmington, NC 28405
(910) 796-7215

- [ ] Attn: Regional Supervisor
Mooresville Regional Office
610 East Center Avenue, Suite 301
Mooresville, NC 28115
(704) 663-1699

- [ ] Attn: Regional Supervisor
Winston-Salem Regional Office
450 West Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
(336) 776-9800

- [ ] Attn: Regional Supervisor
Raleigh Regional Office
1628 Mail Service Center
Raleigh, NC 27699-1628
(919) 791-4200

Appendix C
Modeling Protocol Checklist

A.1
North Carolina Modeling Protocol Checklist

The North Carolina Modeling Protocol Checklist may be used in lieu of developing the traditional written modeling plan for North Carolina toxics and criteria pollutant modeling. The protocol checklist is designed to provide the same level of information as requested in a modeling protocol as discussed in Chapter 2 of the *Guideline for Evaluating the Air Quality Impacts of Toxic Pollutants in North Carolina*. The modeling protocol checklist is submitted with the modeling analysis.

Although most of the information requested in the modeling protocol checklist is self explanatory, additional comments are provided, where applicable, and are discussed in greater detail in the toxics modeling guidelines referenced above. References to sections, tables, figures, appendices, etc., in the protocol checklist are found in the toxics modeling guidelines.

INSTRUCTIONS: The modeling report supporting the compliance demonstration should include most of the information listed below. As appropriate, answer the following questions or indicate by check mark the information provided or action taken is reflected in your report.

FACILITY INFORMATION	
Name: Carolina Poultry Power RG3, LLC **Facility ID:** **Address:** Just north of 5473 Brothers Road La Grange, NC 28551	**Consultant (if applicable):** Project Integration, Inc. 116 Hidden Hill Road Spartanburg, SC 29301
Contact Name: Rich Deming	**Contact Name:** Kim Melvin
Phone Number: (252) 800-1969 **Email:** rich@eastenergyrenewables.com	**Phone Number:** 864-414-3059 **Email:** kmelvin@pintegration.com

GENERAL

Description of New Source or Source / Process Modification: provide a short description of the new or modified source(s) and a brief discussion of how this change affects facility production or process operation.	X
Source / Pollutant Identification: provide a table of the affected pollutants, by source, which identifies the source type (point, area, or volume), maximum pollutant emission rates over the applicable averaging period(s), and, for point sources, indicate if the stack is capped or non-vertical (C/N).	X
Pollutant Emission Rate Calculations: indicate how the pollutant emission rates were derived (e.g., AP-42, mass balance, etc.) and where applicable, provide the calculations.	X
Site / Facility Diagram: provide a diagram or drawing showing the location of all existing and proposed emission sources, buildings or structures, public right-of-ways, and the facility property (toxics) / fence line (criteria pollutants) boundaries. The diagram should also include a scale, true north indicator, and the UTM or latitude/longitude of at least one point.	X
Certified Plat or Signed Survey: a certified plat (map) from the County Register of Deeds or a signed survey must be submitted to validate property boundaries modeled.	X
Topographic Map: A topographic map covering approximately 5km around the facility must be submitted. The facility boundaries should be annotated on the map as accurately as possible.	X
Cavity Impact Analysis: No cavity analysis is required if using AERMOD. *See Section 4.2*	n/a

Background Concentrations (criteria pollutant analyses only): Background concentrations must be determined for each pollutant for each averaging period evaluated. The averaged background value used (e.g., high, high-second-high, high-third-high, etc.) is based on the pollutant and averaging period evaluated. The background concentrations ·e added to the modeled concentrations, which are then compared to the applicable air quality standard to ɔtermine compliance.	n/a
Offsite Source Inventories (criteria pollutant analyses only): Offsite source inventories must be developed and modeled for all pollutants for which onsite sources emissions are modeled in excess of the specific pollutant significant impact levels (SILs) as defined in the PSD New Source Review Workshop Manual. The DAQ AQAB must approve the inventories. An initial working inventory can be requested from the AQAB.	n/a

SCREEN LEVEL MODELING

Model: The latest version of the AERSCREEN model must be used. The use of other screening models should be approved by NCDAQ prior to submitting the modeling report.	n/a
Source / Source emission parameters: Provide a table listing the sources modeled and the applicable source emission parameters. See NC Form 3 – Appendix A.	
Merged Sources: Identify merged sources and show all appropriate calculations. See Section 3.3	
GEP Analysis: See Section 3.2 and NC Form 1 – Appendix A	
Terrain: Indicate the terrain modeled: simple (Section 4.4), and complex (Section 4.5 and NC Form 4 – Appendix A). If complex terrain is within 5 kilometers of the facility, complex terrain must be evaluated. Simple terrain must include terrain elevations if any terrain is greater than the stack base of any source modeled. Simple: ______________ Complex:______________	
Meteorology: Refer to Section 4.1 for AERSCREEN inputs.	
Receptors: AERSCREEN – use shortest distance to property boundary for each source modeled and use sufficient range to find maximum (See Section 4.1 (i) and (j)). Terrain above stack base must be evaluated.	
Modeling Results: For each affected pollutant, modeling results should be summarized, converted to the applicable averaging period (See Table 3), and presented in tabular format indicating compliance status with the applicable ,AL, SIL, or NAAQS. See NC Form S5 – Appendix A.	
.Modeling Files: Either electronic or hard copies of AERSCREEN output must be submitted.	

REFINED LEVEL MODELING

Model: The latest version of AERMOD should be used, and may be found at http://www.epa.gov/scram001/dispersion_prefrec.htm. The use of other refined models must be approved by NCDAQ prior to submitting the modeling report.	X
Source / Source emission parameters: Provide a table listing the sources modeled and the applicable source emission parameters. See NC Form 3 - Appendix A.	X
GEP Analysis: Use BPIP-Prime with AERMOD.	X
Cavity Impact Analysis: No separate cavity analysis is required when using AERMOD as long as receptors are placed in cavity susceptible areas. See Section 4.2 and 5.2.	X
Terrain: Use digital elevation data from the USGS NED database (http://seamless.usgs.gov/index.php). Use of other sources of terrain elevations or the non-regulatory Flat Terrain option will require prior approval from DAQ AQAB.	X
Coordinate System: Specify the coordinate system used (e.g., NAD27, NAD83, etc.) to identify the source, building, and receptor locations. Note: Be sure to specify in the AERMAP input file the correct base datum (NADA) to be used for identifying source input data locations. Clearly note in both the protocol checklist and the modeling report which datum was used.	X
Receptors: The receptor grid should be of sufficient size and resolution to identify the maximum pollutant impact. See Section 5.3.	X

Meteorology: Indicate the AQAB, pre-processed, 5-year data set used in the modeling demonstration: (See Section 5.5 and Appendix B) ERMOD 2014 - 2018 processing your own raw meteorology, then pre-approval from AQAB is required. Additional documentation files (e.g. AERMET stage processing files) will also be necessary. For NC toxics, the modeling demonstration requires only the last year of the standard 5 year data set (e.g., 2005) provided the maximum impacts are less than 50% of the applicable AAL(s).	X
Modeling Results: For each affected pollutant and averaging period, modeling results should be summarized and presented in tabular format indicating compliance status with the applicable AAL, SIL or NAAQS. See NC Form R5 - Appendix A.	X
Modeling Files: Submit input and output files for AERMOD. Also include BPIP-Prime files, AERMAP files, DEM files, and any AERMET input and output files, including raw meteorological data.	X

Appendix D
USGS Topo Maps

USGS science for a changing world

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The US Topo

LA GRANGE QUADRANGLE
NORTH CAROLINA
7.5-MINUTE SERIES

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid:Universal Transverse Mercator, Zone 18S
This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery............NAIP, June 2016 - November 2016
Roads............U.S. Census Bureau, 2016
Names............GNIS, 1980 - 2019
Hydrography............National Hydrography Dataset, 1899 - 2018
Contours............National Elevation Dataset, 2008
Boundaries............Multiple sources; see metadata file 2017 - 2018

Wetlands............FWS National Wetlands Inventory 1982 - 1983

UTM GRID AND 2019 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 5 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.18

QUADRANGLE LOCATION

ADJOINING QUADRANGLES
1 Northeast Goldsboro
2 Jason
3 Snow Hill
4 Southeast Goldsboro
5 Falling Creek
6 Williams
7 Seven Springs
8 Deep Run

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

LA GRANGE, NC
2019

Appendix E
Emission Factor Comparison

Appendix E
EMISSION FACTOR COMPARISON TABLE
CPP March 2022

Pollutant	Gasification Emission Factor Comparison					Emission Factor Selected for Application	Source of EF used
	AP-42 Woodwaste Combustion [1] lb/MMBtu Uncontrolled post multiclone	Hurst lb/MMBtu Uncontrolled	MD Correction[2] lb/MMBtu Uncontrolled	EPI North Carolina[3] lb/MMBtu Uncontrolled	Poultry Fuel Analysis lb/MMBtu Uncontrolled	lb/MMBtu Uncontrolled	
PSD-Regulated Pollutants							
Particulate Matter (PM)	0.367		note 7	note 7		**3.000**	**Hurst**
Particulate Matter<10 microns (PM_{10})	0.337	3.000				**3.000**	**Hurst**
Particulate Matter<2.5 microns ($PM_{2.5}$)	0.207					**3.000**	**Hurst**
Sulfur Dioxide (SO_2)	0.290		0.280	0.168		**0.280**	**MD Test**
Nitrogen Oxides (NO_x)	0.490	0.420	note4	0.259		**0.420**	**Hurst**
Carbon Monoxide (CO)	0.600	0.220	0.050	0.056		**0.220**	**Hurst**
Volatile Organic Compounds (VOC)	0.017		0.010	0.003		**0.017**	
Lead	4.80E-07			4.10E-05	1.21E-06	**4.10E-05**	**Fuel analysis**
GHG							
Carbon Dioxide (CO2)	2.23E+02					**2.23E+02**	
Methane (CH4)	1.48E+00					**1.48E+00**	
Nitrous Oxide (N2O)	2.87E+00					**2.87E+00**	
HAPs/TAPs**							
Antimony & Compounds	7.90E-08				1.21E-06	**1.21E-06**	**Fuel analysis**
Arsenic & Compounds	2.20E-07				5.11E-05	**5.11E-05**	**Fuel analysis**
Lead and Lead compounds	4.80E-07				1.21E-06	**1.21E-06**	**Fuel analysis**
Manganese & compounds	1.60E-05				1.07E-03	**1.07E-03**	**Fuel analysis**
** All other HAPs/TAPs not listed used published AP-42 Efs per Reference 1 below							

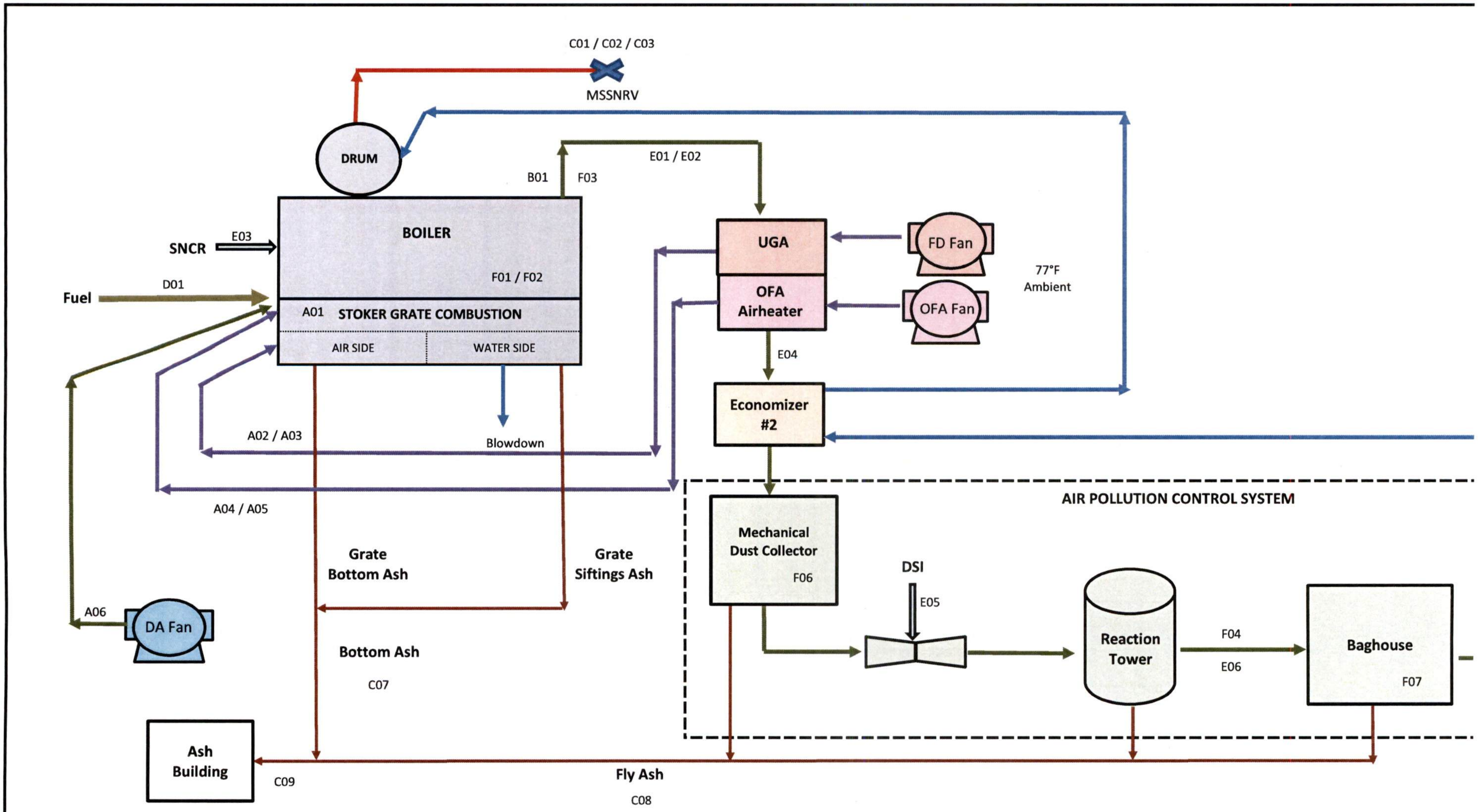
1 Uncontrolled (criteria and HAP/TAP) for wood combustion in a boiler for bark and wet wood from NCDAQ Woodwaste Combustion Spreadsheet/AP-42; Compilation of Air Pollutant Emission F

2 Test report from November 1999 on a walking stoker boiler- Eastern Correctional Institution Cogeneration Facility, Full-Scale Poultry Litter Test Burn - Maryland Environmental Service, July 2000. Data from third party poultry bedding, average of three test runs.

3 Source Test Report - Prestage Farms Incorporated, Test Dates November 15-17, 2011. Data from third party poultry bedding, average of two test runs.

4 representative of the proposed staged gasification system so the most appropriate factor was selected based on effect of effects temperatures and turbulance on select pollutants.

Appendix F
Control Systems Specifications/Drawings



BOILER			
	Ambient Air Temp (DB)	77.7	°F
	Relative Humidity	52	%
	Site Elevation	110	FASL
A01	Heat Input Fired (HIF)	97.0	MMBTU/hr
A02	Undergrate Air Flow	42,436	lb/hr
A03	Undergrate Air Temp	350	°F
A04	Overfire Air Flow	42,436	lb/hr
A05	Overfire Air Temp	250	°F
A06	Distributor Air Flow	7,380	lb/hr

MISCELLANEOUS			
C01	Boiler Out Steam Flow	68,210	lb/hr
C02	Boiler Out Steam Temp	sat	°F

Flue Gas Constituents (% vol wet basis) Boiler Exit			
B01	CO_2	10.18	%
	O_2	3.80	%
	N_2	62.48	%
	H_2O	23.50	%
	SO_2	0.05	%

Litter Fuel Analysis (as-fired - % by Weight)			
D01	Litter Fuel Fired	20,839	lb/hr
	C - Carbon	24.54	%
	H_2 - Hydrogen	5.10	%
	O_2 - Oxygen	25.65	%
	N_2 - Nitrogen	1.59	%

AIR POLLUTION CONTROL SYSTEM					
E01	Flue Gas Flow at Boiler Exit	109,906	lb/hr	F01	NOx at Grate Outlet
E02	Flue Gas Temp at Boiler Exit	680	lb/hr	F02	CO at Grate / Boiler Outlet
E03	SNCR Urea Injection	12.1	GPH	F03	NOx at Boiler Outlet
E04	Flue Gas Temp at Econ #2 Inlet	580	°F	F04	PM (filterable) Baghouse Inle
E05	Dry Sorbent Injection (Hydrated Lime)	420	lb/hr	F05	PM (filt) Baghouse Outlet
E06	Flue Gas Temp at Baghouse Inlet	385	°F	F06	SOx at Boiler Outlet
E07	Flue Gas Temp at Stack Inlet	300	°F	F07	SOx at Stack
				F06	MDC Gas-side ΔP
				F07	Baghouse Gas-side ΔP

WELLONS

roject # B-14113 Carolina Poultry Wilson, NC CPP RG2
Project # B-14114 Carolina Poultry Lagrange, NC CPP RG3

Mechanical Dust Collector Technical Description [preliminary] Rev. A

The mechanical dust collector (MDC) will be a multi-cyclone type using (10) 24" dia. collector tubes.

MDC performance is predicted as follows:

Boiler Heat Input:	97.0 MMBtu/h
Gas Flow:	109,906 lb/h
MDC ΔP:	2.8" WG

The MDC will incorporate the following features:

- heavy duty collection inlet and outlet tubes
- cast Iron conical discharge boots on the collection tubes
- accessible design for inspection and maintenance with individual tube rows for maximum accessibility
- alleyways and be totally accessible for future inspections and repairs
- dust collector operates at optimal collection efficiency when the pressure drop across it is between 2.5" to 4.0" WG
- casing: 1/4" A36 with appropriate stiffening for+/- 25" WG
- ash hopper(s): 1/4" A36 with appropriate stiffening for +/- 25" WG (1 wide X 1 deep)
- bottom tube sheet: 3/8" A36
- top tube sheet: 1/4" A36
- inlet tubes: 24" dia. ductile iron pipe/bolt-in
- outlet tubes: 16" dia. ductile iron pipe/bolt-in
- inlet vanes: hardened cast iron/drop-in
- conical discharge boots: cast iron
- outlet hoods: 3/16" A588
- outlet turning vanes: 3/16" A588
- housing access doors: (2) 18" X 24" cast iron with quick clamps
- ash hopper access doors: (1) 18" X 24" cast iron with quick clamps and safety chains

WELLONS

Project # B-14113 Carolina Poultry Wilson, NC CPP RG2
Project # B-14114 Carolina Poultry Lagrange, NC CPP RG3

SNCR System Technical Data [preliminary]

Rev. A

The SNCR NOx reduction system is summarized as follows:

- (1) Urea Storage Tank
- (1) Urea Truck Unloading Station
- (1) Urea Circulation / Water Boost Pump Skid
- (1) SNCR Metering / Mixing Pump Skid
- (1) Injection Distribution Module
- (8) SNCR Injectors

The basis for the SNCR system design:

Conditions:		**28% H20 Litter**
Reagent Type		UREA
Ideal Gas Temp at SNCR Injection Location	F	1850
Design Flue Gas Flow Rate	LB/HR	109,906
Target NOx Reduction	%	50
Inlet NOx @ 3% 02	LB/MMBTU	0.46
Outlet NOx @ 3% 02	LB/MMBTU	0.23
Excess Air	%	30
Reagent Injection Expected Operation	GPH	12
Dilution Water Flow**	GPM	4
Atomizing Air Flow Total	SCFM	120
Operating Injectors/ Unit	#	8

**DILUTION WATER QUALITY REQUIREMENTS are listed below:

< 150 ppm Hardness as CaC03
< 100 ppm M Alkalinity as CaC03
< 60 ppm Silica as Si02
< 1000 Micromhos Conductivity
< 8.3 pH
< 1 ppm Iron as Fe
< 1 ppm Phosphate as P
< 0.3 ppm Manganese as Mn
< 200 ppm Sulfate as S04

SNCR Process Description - (Urea Based System)

SNCR is a process in which an aqueous urea reagent is injected into the combustion gases in the upper furnace reacting with the NOx from the combustion process to form nitrogen and water vapor. Urea is readily available and requires no special safety precautions for handling.

Fundamental thermodynamic and kinetic studies of the NOx-urea reaction chemistry took place during the period 1976-1981 under the sponsorship of the Electric Power
Research Institute (EPRI) who patented this work. Whereas the investigation indicated multiple chemical reactions and some traces of by-products, the predominant overall reaction is:

$$CO(NH2)2 + 2NOx + Y2O2 = 2N2 + CO2 + 2H2O$$

Urea + Nitrogen Oxide + Oxygen = Nitrogen + Carbon Dioxide + Water indicate that greater reagent quantities must be injected to achieve desired removal efficiency. Most of the excess reagents degrade to nitrogen and carbon dioxide; some trace quantities of ammonia and carbon monoxide may form.

The relationship between NOx removal efficiency and reagent utilization has been tied together by a variable known as the Normalized Stoichiometric Ratio (NSR).

The NSR is defined as follows:

$$NSR = \frac{\text{Actual Molar Ratio of Reagent to Inlet NOx}}{\text{Stoichiometric Molar Ratio of Reagent to Inlet NOx}}$$

The relationship between reagent utilization NSR and NOx removal efficiency is as follows:

$$\text{Reagent Utilization, \%} = \frac{\text{NOx Removal Efficiency, \%}}{NSR}$$

The following equipment is included in the SNCR system:

(1) Truck Unloading Station

- Unloads Regent from Truck to Tank
- Free standing, stainless steel construction
- Standard unloading hose coupling
- Sized per local codes
- Manual Shut off valve
- Flange connection to tank piping

(1) Urea Storage Tank

- One (1) Urea Storage Tank; 8,500-gallon capacity
- Material: Poly plastic
- Orientation: Vertical
- 24" Manway
- Pressure rating: atmospheric *(vented tank)*
- Double wall construction
- In wall leak detection and alarm
- Ladder for Top Access
- Top handrail
- 2" foam insulation with FRP protective covering
- Heat Blanket system to maintain a temperature of 50° F at a minimum
- ambient temperature of 20° F

(1) Valves, Ports and Instrumentation

- Level Transmitter and Indicator
- Leak Indicator
- Manual Outlet / Drain Valve
- Top Level Transmitter Fittings
- Top Fill Fitting
- Top Vent Fitting
- Side Pump Supply Fitting
- Top Pump Return Fitting
- Side Drain Fitting
- Spare Fitting

(1) Urea Circulation Skid

- urea circulation and water boost skids maintain urea circulation

WELLONS

Project # B-14113 Carolina Poultry Wilson, NC CPP RG2
Project # B-14114 Carolina Poultry LaGrange, NC CPP RG3

DRY SORBENT INJECTION SYSTEM & BAGHOUSE [preliminary] Rev. A

To control PM and control acid gas emissions, each boiler will have one (1) dry sorbent injection (DSI) system with a single feed train, one (1) reaction tower and one (1) pulse-jet fabric filter baghouse.

DSI System Description

Dry sorbent material (hydrated lime) will be injected into the gas stream in the reaction tower through one (1) independent loss in-weight (LIW) feed system designed for the highest possible accuracy available.

A screw feeder is used to meter hydrated lime (HL). The screw feeder is mounted on four (4) load cells which provide data to the control system that controls the screw speed via a VFD. HL injection rate from the screw feeder to the blow through adaptor is continuously monitored and is adjusted accordingly. The HL feed train uses a blow through adaptor to introduce the lime into a conveying air stream. A positive displacement blower provides the conveying air through a stainless-steel conveying tube to the injection lances.

HL sorbent is stored in a silo with a single feed train, sorbent feed equipment, pneumatic tubing for transport to the injection point, injection lances, conveying blowers and all necessary instrumentation. The silo includes one bulk truck pneumatic receiving line and flanged nozzle at the top of the silo for ventilation of displaced air from the silo to the bin vent.

The HL silo is filled using a 4" fill line from a pneumatic truck and includes hopper fluidizing nozzles for promoting material flow. A bin vent with fan allows the displaced air to leave the silo during filling and fluidizer activation. The level is monitored with a continuous level probe and two (2) level switches mounted on the side. The roof and level switches are accessed via a caged ladder with access to the mezzanine level.

The conveying line is 304 SS tubing with long radius elbows and Morris coupling connections. The smooth ID of the stainless-steel tubing aids in the prevention of HL buildup in the conveying line.

Pulse-Jet Baghouse Description

The baghouse will consist of two (2) insulated and cladded modules. A walk-in plenum is provided to allow for weather protection during maintenance access to remove the bags and cages.

PROCESS CONDITIONS

Application	28% H20 Litter	Units
Heat Input Fired	97.0	MMBtu/hr
Gas Mass Flow	109,906	lb/h
Temperature	385	F
02	3.84	% vol. wet
H20	22.82	%vol. wet
CO2	10.23	% vol. wet
N2	63.07	% vol. wet
S02	0.05	% vol. wet
MW of Wet Flue Gas	27.63	lb/mole
Inlet Dust Load upstream DSI	1,387	lb/h
SOx flow upstream DSI	1.01	lb/MMBtu
HCl flow upstream DSI	1.06	lb/MMBtu

ENVIRONMENTAL DESIGN CONDITIONS

Location:	Wilson, NC
Elevation:	95 FASL
Annual High Temperature:	98 °F
Annual Low Temperature:	32 °F

STRUCTURAL DESIGN CONDITIONS

Max. Gas Pressure	+/- 25	in.w.c.
Basic Wind Speed	Per code	
Exposure	Outdoors	
Seismic Zone	0	
Platform live load	100	lb/ft2
Dust Density, structural basis	55	PCF
Dust Density, Volumetric basis	30	PCF

CONSTRUTION CODES

National Electrical Code	NEC
International Building Code	IBC
American Welding Society	AMWS
American Society for Testing & Mat	ASTM
American Institute of Steel	AISC
National Fire Protection Association	NFPA

The following is a preliminary summary of the DSI/reactor tower/baghouse and associated equipment:

Dry Sorbent Injection System:

- One (1) 3,250 ft3 silo with skirt enclosure
- One (1) silo discharge rotary valve
- One (1) gravimetric screw feeder mounted on (4) load cells
- One (1) positive displacement blower
- One (1) reagent feed rotary valve with blow-through adaptor
- 304 SS tubing for connection of lances to feeding equipment

Reactor Tower:

Reactor Tower Type	Cylindrical
Reactor Tower Diameter	10’
Reactor Tower Venturi Diameter	3’-4”
Reactor Tower Straight Wall	34’
Materials of Construction:	
Reaction Tower Casing	3/16” Carbon steel
Structural steel	Carbon Steel

Hydrated Lime Silo:	One (1)
Type	Full Skirt Support Welded Silo
Materials of Construction	Carbon Steel
Diameter	12’
Nominal eave height from base	49’-5”
Straight wall height	24’-3”
Hopper Slope Angle	70°
Estimated Usable Capacity	3,250 ft^3

Flanged Outlet	12' dia. Flange to one (1) 12" dia. Flanged outlets
Fluidizer Nozzles	In order to promote material flow in the silo hopper, LDX utilizes air fluidizing nozzles in an annulus array in the hopper.
Accessories	Pulse-jet bin vent with fan, fill line, roof handrail, bin activator
Insulation and Cladding	No
Access	• Fall arrest ladder • Mezzanine level to access discharge rotary valve • Industrial walk-in double door in skirt • Roof deck perimeter guardrail
Hopper Slide Gate:	
Quantity	One (1)
Type	Manual
Construction	Aluminum frame w/304SS in contact with the reagent. Includes removable blade and faceplate.

One (1) hydrated lime loss-in-weight feed system with conveyance line and injection lances.

Expected HL injection rate for 78% removal of S02 and 98% removal of HCI:	420 lb/hr
Sorbent Purity	93% ca(OH)2
Silo Discharge Rotary Valve:	
Quantity	One (1)
Size	12"x12
Metering Screw Conveyor:	
Quantity	One (1)
Turndown	10:1
Pneumatic Conveying Blower:	
Quantity	One (1)
Type	Positive displacement

Pulse-Jet Baghouse:

Type	Modular
Filter Type	High Pressure Pulse-Jet
Cleaning Mode	On-line

Number of Modules	2
Total Number of Bags	518
Total Cloth Area	13,437 ft2
Air-to-Cloth Ratio	3.61
Dust Collector Pressure Drop	6 in. H^2O
Clean Air Plenum:	
Type	Walk-in plenum
Filter Access	Top Access
Filter Bags:	
Quantity	518
Size	6" nom. dia.16 feet
Material	Fiberglass with PTFE membrane
Cages:	
Material	Carbon Steel

Baghouse Cleaning System:

Cleaning Manifold	6" dia. header, one (1) per module with rigid pipe nipple connection of Dustex® pulse valve. Each manifold equipped with a pressure regulator.
Blowpipe	1.5" dia. Schedule 10 pipe with nozzle
Pulse Valves	(38) 1.5 in Turbo/Dustex® diaphragm valves
Solenoid Valves	(38) direct mounted electric solenoid valves
Timer Cards	Each module includes a Solid-State timer for control of pulse duration and interval. This timer equipment is pre-wired in a NEMA 4 enclosure and tested in the shop prior to shipment and contains an integrated dP transmitter for monitoring module dP.
Hoppers:	
Quantity per Module/Compartment	One (1)
Configuration	Semi-trough

Hopper Accessories:

Access Door	One (1) 24" x 24"
Vibrators	Provisions for future
Strike Plate	One (1) per hopper
Level Probe	One (1) per hopper
Poke Holes	Two (2) 4" Ø per hipper
Hopper Heaters	None

Baghouse Inlet:

Type	Rectangular Side Entry
Design Velocity	2,200 FPM

DSI/Baghouse Controls:

The baghouse control system is a fully automated control system capable of cleaning the unit based on differential pressure across the entire baghouse system.

- Auto-Mode/ on-line cleaning: The system is provided with on-line cleaning as the primary operation mode. All rows are cleaned in the module and a null time period for dust settling is not provided. This sequence occurs until all modules are cleaned. This practice reduces less filter cake than off-line cleaning due to less bag deflection with differential pressure present and the ability to dean only one row of bags at a time.
- Manual Mode: When the system is placed in manual mode, all components can be controlled from the operator interface.

Adjustment of the differential cleaning setpoint is available to operators via HMI in the face of the control panel. In addition, a time-based cleaning sequence is available if something associated with the differential pressure signal is not working properly.

The DSI control system is designed to be fully automated through connection to the boiler controls to receive a "feed set point" signal for determination of reagent demand.

The controls operate on a loss-in-weight principal. The reagent flows from the silo through a slide gate into a screw feeder hopper. The screw feeder meters the reagent and discharges into a rotary valve which provides an air lock between the pneumatic conveying air and the injection system. The reagent is introduced into the pneumatic conveying line until a low setpoint is met. The low-level signal triggers the start of the silo discharge rotary valve to fill the screw feeder hopper.

Appendix G
NHSM Determination

Processing of Discarded NHSM

The proposed poultry litter fuel will meet the regulatory definition of "processing" in 40 CFR 241.2. CPP proposes to significantly improve the fuel combustion properties of the used poultry litter to produce an engineered fuel to be used in the gasification/boiler system. The used poultry bedding that CPP proposes to burn is generated from poultry houses owned by poultry growers in the region.

CPP will employ sizing and blending techniques to improve fuel characteristics, as validated through an established sampling and testing program. Mechanical screening will remove large materials, and magnetic separation will remove ferrous metal substances from the litter. The above mechanisms will be used to produce an engineered fuel that meet the definition of "processing" to qualify as a NHSM.

Valuable Commodity

The proposed poultry litter fuel will meet the legitimacy criterion of being managed as a "valuable commodity" as defined in 40 CFR 241. 3(d)(l)(i). Poultry litter will be unloaded from trailers into an enclosed fuel storage area. This fuel haul is designed to control moisture uptake by the fuel, and is consistent with typical management of wood chips and other biomass fuels. Combustion air will be drawn from the fuel hall enclosure, which is also consistent with the management of other biomass fuels. The above management and handling measures indicate that the proposed fuel will be managed as a "valuable commodity."

Heating Value

The proposed poultry litter fuel has a meaningful heating value, which meets the legitimacy criterion defined in 40 CFR 241.3(d)(1)(ii). The US EPA has indicated that materials with a heat content of at least 5,000 Btu/lb presumptively satisfy this criterion. During the first year of operation at the Farmville plant, CPP collected and analyzed poultry litter fuel for moisture content and heating value. This 12-month data is included in Attachment A and shows an average heating value of 4,979 Btu/lb.

Although this average is slightly lower than the EPA threshold of 5,000 Btu/lb, the gasification boilers will be self-sustaining and will not require supplementary fuels to cost-effectively recover meaningful energy from the poultry litter. Operational data from the Farmville plant confirms that CPP will recover energy at a cost that is comparable to the cost of generating energy using a traditional fuel. In this way, the legitimacy criterion of meaningful heating value is met.

Contaminant Comparison

The proposed poultry litter fuel has contaminant levels comparable in concentration to or lower than those in traditional fuels for which the combustion unit is designed to burn, such as coal or wood. With identical fuel sourcing, CPP is presenting the Toxic Characteristic Leaching Procedure (TCLP) data from the Farmville plant.

Table 1 on the following page summarizes the TCLP data in comparison to RCRA Hazardous Waste thresholds.

Table 2 on the subsequent page provides the contaminant comparison data between poultry litter, coal and wood/biomass fuels. For all contaminants, poultry litter is comparable or less than those for traditional fuels for this type of boiler, thereby meeting the legitimacy criteria for NHSM.

Table 1. TCLP Summary Data		
RCRA Characteristics	**Poultry Litter TCLP**	**RCRA Threshold**
Ignitability - Flash Point	>200°F	140°F
Corrosivity - pH @ 21.0°C	7.2	pH ≤2 or ≥12.5
Reactive Cyanides	ND	
Reactive Sulfides	ND	
Metals	**Litter TCLP (mg/L)**	**RCRA Threshold (mg/L)**
Arsenic	0.13	5.0
Barium	<0.25	100.0
Cadmium	<0.005	1.0
Chromium	0.035	5.0
Lead	<0.025	5.0
Mercury	<0.00020	0.2
Selenium	<0.10	1.0
Silver	<0.025	5.0
Organics	**Litter TCLP (mg/L)**	**RCRA Threshold (mg/L)**
1,4-Dichlorobenzene	<0.198	7.5
2,4-Dinitrotoluene	<0.050	0.13
Hexachloro-1,3-butadiene	<0.050	0.5
Hexachlorobenzene	<0.050	0.13
Hexachloroethane	<0.050	3
2-Methylphenol (o-Cresol)	<0.050	200
3&4-Methylphenol (m&p-Cresol)	<0.050	200
Nitrobenzene	<0.050	2
Pentachlorophenol	<0.050	100
Pyridine	<0.050	5
2, 4, 5-Trichlorophenol	<0.050	400
2, 4, 6-Trichlorophenol	<0.050	2
Benzene	<0.198	0.5
2-Butanone (MEK)	<0.396	200
Carbon Tetrachloride	<0.198	0.5
1, 2-Dichloroethane	<0.198	0.5
1, 1-Dichloroethene	<0.198	0.7
Tetrachloroethene	<0.198	0.7
Trichloroethylene	<0.198	0.5
Vinyl chloride	<0.198	0.2

Table 2. Contaminant Comparison			
Pollutants	**Coal**	**Wood and Biomass Materials**	**CPP Litter**
Heat Value (Btu/lb)	8,500 – 14,000	4,500 – 9,000	4,256-5,268
Antimony	ND - 10	ND – 26	0.59
Arsenic	ND - 174	ND – 298	3.3
Barium	N/M	N/M	<0.25
Beryllium	ND - 206	ND – 10	<0.069
Cadmium	ND –19	ND - 17	0.11
Chromium	ND - 168	ND – 340	3.5
Cobalt	ND - 30	ND – 213	<0.34
Lead	ND - 148	ND – 340	1.1
Manganese	ND - 512	ND – 15800	905
Mercury	ND - 3.1	ND – 1.1	<0.00020
Nickel	ND - 730	ND – 175	24
Selenium	ND - 74.3	ND – 9.0	1.8
Silver	N/M	N/M	<0.34
Zinc	N/M	N/M	914
Halogens			
Chlorine	ND – 9,080	ND – 5,400	8,278
Fluorine	ND – 178	ND - 300	
Nitrogen (N)	13600-54000	200-39500	26300-32700
Sulfur (S)	740-61300	ND-8700	5500-7600

Attachment A
Poultry Litter Fuel Analysis Data

CPP - Farmville
Poultry Litter Fuel Feed
Analytical Results

Monthly Composite Data		
Month	Moisture Content %	Heating Value Btu/Lb
October 2019	24.3%	5057
November 2019	30.0%	5366
December 2019	33.8%	4818
January 2020	30.8%	4868
February 2020	26.8%	4867
March 2020	30.3%	4623
April 2020	31.5%	4537
May 2020	29.3%	4971
June 2020	25.4%	5468
July 2020	29.1%	4900
August 2020	26.8%	5226
September 2020	28.3%	5049
12-Month Average		4979

Attachment B
TCLP Analytical Data

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

June 13, 2016

Mr. Sam McLamb
Broad Energy Solutions
825 C Merriman Ave, #377
Asheville, NC 28804

RE: Project: Farmville 5/20
Pace Project No.: 92299721

Dear Mr. McLamb:

Enclosed are the analytical results for sample(s) received by the laboratory on June 01, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Chris Derouen
christopher.derouen@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: Farmville 5/20
Pace Project No.: 92299721

New Orleans Certification IDs

California Env. Lab Accreditation Program Branch: 11277CA
Florida Department of Health (NELAC): E87595
Illinois Environmental Protection Agency: 0025721
Kansas Department of Health and Environment (NELAC): E-10266
Louisiana Dept. of Environmental Quality (NELAC/LELAP): 02006
Pennsylviania Dept. of Env Protection (NELAC): 68-04202
Texas Commission on Env. Quality (NELAC): T104704405-09-TX
U.S. Dept. of Agriculture Foreign Soil Import: P330-10-00119
Commonwealth of Virginia (TNI): 480246

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: Farmville 5/20
Pace Project No.: 92299721

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92299721001	**CCP20160520**	EPA 6010	SH1	12	PASI-A
		EPA 6010	SH1	7	PASI-A
		EPA 7470	ANB	1	PASI-A
		EPA 7471	ANB	1	PASI-A
		EPA 9023	DG	1	PASI-N
		EPA 8270	BPJ	17	PASI-C
		EPA 8260	DLK	14	PASI-C
		ASTM D2974-87	KDF	1	PASI-C
		EPA 1010	MLS	1	PASI-A
		EPA 9045	TEP	1	PASI-A
		SW-846 7.3.3.2	PAS	1	PASI-PA
		SW-846 7.3.4.2	PAS	1	PASI-PA

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ANALYTICAL RESULTS

Project: Farmville 5/20
Pace Project No.: 92299721

Sample: CCP20160520 **Lab ID: 92299721001** Collected: 05/20/16 00:00 Received: 06/01/16 14:06 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**0.59**	mg/kg	0.34	1	06/02/16 17:50	06/03/16 22:01	7440-36-0	
Arsenic	**3.3**	mg/kg	0.69	1	06/02/16 17:50	06/03/16 22:01	7440-38-2	
Beryllium	ND	mg/kg	0.069	1	06/02/16 17:50	06/03/16 22:01	7440-41-7	
Cadmium	**0.11**	mg/kg	0.069	1	06/02/16 17:50	06/03/16 22:01	7440-43-9	
Chromium	**3.5**	mg/kg	0.34	1	06/02/16 17:50	06/03/16 22:01	7440-47-3	
Cobalt	ND	mg/kg	0.34	1	06/02/16 17:50	06/03/16 22:01	7440-48-4	
Lead	**1.1**	mg/kg	0.34	1	06/02/16 17:50	06/03/16 22:01	7439-92-1	
Manganese	**905**	mg/kg	1.7	5	06/02/16 17:50	06/04/16 14:15	7439-96-5	
Nickel	**24.0**	mg/kg	0.34	1	06/02/16 17:50	06/04/16 14:11	7440-02-0	
Selenium	**1.8**	mg/kg	0.69	1	06/02/16 17:50	06/03/16 22:01	7782-49-2	
Silver	ND	mg/kg	0.34	1	06/02/16 17:50	06/03/16 22:01	7440-22-4	
Zinc	**914**	mg/kg	3.4	5	06/02/16 17:50	06/04/16 14:15	7440-66-6	
6010 MET ICP, TCLP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A Leachate Method/Date: EPA 1311; 06/07/16 20:00 Initial pH: 7.6; Final pH: 6.2							
[illegible]enic	**0.13**	mg/L	0.050	1	06/08/16 20:45	06/09/16 12:47	7440-38-2	
[illegible]ium	ND	mg/L	0.25	1	06/08/16 20:45	06/09/16 12:47	7440-39-3	
[illegible]dmium	ND	mg/L	0.0050	1	06/08/16 20:45	06/09/16 12:47	7440-43-9	
Chromium	**0.035**	mg/L	0.025	1	06/08/16 20:45	06/09/16 12:47	7440-47-3	
Lead	ND	mg/L	0.025	1	06/08/16 20:45	06/09/16 12:47	7439-92-1	
Selenium	ND	mg/L	0.10	1	06/08/16 20:45	06/09/16 12:47	7782-49-2	
Silver	ND	mg/L	0.025	1	06/08/16 20:45	06/09/16 12:47	7440-22-4	
7470 Mercury, TCLP	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Leachate Method/Date: EPA 1311; 06/07/16 20:00 Initial pH: 7.6; Final pH: 6.2							
Mercury	ND	mg/L	0.00020	1	06/09/16 11:00	06/09/16 14:17	7439-97-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.0043	1	06/02/16 09:45	06/02/16 13:43	7439-97-6	
9023 Ext. Organic Halides EOX	Analytical Method: EPA 9023 Preparation Method: EPA 9023							
Extractable Organic Halogens	ND	mg/kg	54.9	1	06/03/16 09:37	06/03/16 11:44		
8270 MSSV TCLP Sep Funnel	Analytical Method: EPA 8270 Preparation Method: EPA 3510 Leachate Method/Date: EPA 1311; 06/02/16 14:30							
2,4-Dinitrotoluene	ND	ug/L	50.0	1	06/09/16 14:00	06/13/16 13:26	121-14-2	
Hexachloro-1,3-butadiene	ND	ug/L	50.0	1	06/09/16 14:00	06/13/16 13:26	87-68-3	
Hexachlorobenzene	ND	ug/L	50.0	1	06/09/16 14:00	06/13/16 13:26	118-74-1	
Hexachloroethane	ND	ug/L	50.0	1	06/09/16 14:00	06/13/16 13:26	67-72-1	
2-Methylphenol(o-Cresol)	ND	ug/L	50.0	1	06/09/16 14:00	06/13/16 13:26	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	50.0	1	06/09/16 14:00	06/13/16 13:26		
Nitrobenzene	ND	ug/L	50.0	1	06/09/16 14:00	06/13/16 13:26	98-95-3	
Pentachlorophenol	ND	ug/L	100	1	06/09/16 14:00	06/13/16 13:26	87-86-5	
[illegible]idine	ND	ug/L	50.0	1	06/09/16 14:00	06/13/16 13:26	110-86-1	
[illegible],5-Trichlorophenol	ND	ug/L	50.0	1	06/09/16 14:00	06/13/16 13:26	95-95-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Farmville 5/20
Pace Project No.: 92299721

Sample: CCP20160520 **Lab ID: 92299721001** Collected: 05/20/16 00:00 Received: 06/01/16 14:06 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV TCLP Sep Funnel	Analytical Method: EPA 8270 Preparation Method: EPA 3510 Leachate Method/Date: EPA 1311; 06/02/16 14:30							
2,4,6-Trichlorophenol	ND	ug/L	50.0	1	06/09/16 14:00	06/13/16 13:26	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	75	%	12-102	1	06/09/16 14:00	06/13/16 13:26	4165-60-0	
2-Fluorobiphenyl (S)	81	%	13-107	1	06/09/16 14:00	06/13/16 13:26	321-60-8	
Terphenyl-d14 (S)	99	%	21-132	1	06/09/16 14:00	06/13/16 13:26	1718-51-0	
Phenol-d6 (S)	26	%	10-110	1	06/09/16 14:00	06/13/16 13:26	13127-88-3	
2-Fluorophenol (S)	40	%	10-110	1	06/09/16 14:00	06/13/16 13:26	367-12-4	
2,4,6-Tribromophenol (S)	99	%	27-108	1	06/09/16 14:00	06/13/16 13:26	118-79-6	
8260 MSV TCLP	Analytical Method: EPA 8260 Leachate Method/Date: EPA 1311; 06/03/16 10:20							
Benzene	ND	ug/L	198	39.6		06/03/16 12:46	71-43-2	
2-Butanone (MEK)	ND	ug/L	396	39.6		06/03/16 12:46	78-93-3	
Carbon tetrachloride	ND	ug/L	198	39.6		06/03/16 12:46	56-23-5	
Chlorobenzene	ND	ug/L	198	39.6		06/03/16 12:46	108-90-7	
Chloroform	ND	ug/L	198	39.6		06/03/16 12:46	67-66-3	
-Dichlorobenzene	ND	ug/L	198	39.6		06/03/16 12:46	106-46-7	
-Dichloroethane	ND	ug/L	198	39.6		06/03/16 12:46	107-06-2	
1,1-Dichloroethene	ND	ug/L	198	39.6		06/03/16 12:46	75-35-4	
Tetrachloroethene	ND	ug/L	198	39.6		06/03/16 12:46	127-18-4	
Trichloroethene	ND	ug/L	198	39.6		06/03/16 12:46	79-01-6	
Vinyl chloride	ND	ug/L	198	39.6		06/03/16 12:46	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	111	%	70-130	39.6		06/03/16 12:46	17060-07-0	1g
Toluene-d8 (S)	100	%	67-135	39.6		06/03/16 12:46	2037-26-5	
4-Bromofluorobenzene (S)	96	%	70-130	39.6		06/03/16 12:46	460-00-4	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**10.1**	%	0.10	1		06/03/16 09:47		
1010 Flashpoint,Closed Cup	Analytical Method: EPA 1010							
Flashpoint	**>200**	deg F	70.0	1		06/08/16 10:58		
9045 pH Soil	Analytical Method: EPA 9045							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		06/07/16 10:00		H6
733C S Reactive Cyanide	Analytical Method: SW-846 7.3.3.2							
Cyanide, Reactive	ND	mg/kg	2.2	1		06/06/16 19:34		
735S Reactive Sulfide	Analytical Method: SW-846 7.3.4.2							
Sulfide, Reactive	ND	mg/kg	22.2	1		06/06/16 15:10		

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QUALITY CONTROL DATA

Project: Farmville 5/20
Pace Project No.: 92299721

QC Batch: MERP/9562
Analysis Method: EPA 7470
QC Batch Method: EPA 7470
Analysis Description: 7470 Mercury TCLP
Associated Lab Samples: 92299721001

METHOD BLANK: 1751815 Matrix: Water
Associated Lab Samples: 92299721001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	ND	0.00020	06/09/16 14:03	

LABORATORY CONTROL SAMPLE: 1751816

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.0025	0.0024	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1751817 1751818

Parameter	Units	92299479001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Mercury	mg/L	ND	.0025	.0025	0.0024	0.0024	96	95	75-125	1	

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QUALITY CONTROL DATA

Project: Farmville 5/20
Pace Project No.: 92299721

QC Batch: MERP/9529 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 92299721001

METHOD BLANK: 1746617 Matrix: Solid
Associated Lab Samples: 92299721001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.0050	06/02/16 13:27	

LABORATORY CONTROL SAMPLE: 1746618

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.083	0.084	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1746619 1746620

Parameter	Units	92299337001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Mercury	mg/kg	0.084	.083	.061	0.15	0.19	74	173	75-125	27	M1,R1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Farmville 5/20
Pace Project No.: 92299721

QC Batch: MPRP/21893 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 92299721001

METHOD BLANK: 1747238 Matrix: Solid
Associated Lab Samples: 92299721001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.50	06/03/16 21:10	
Arsenic	mg/kg	ND	1.0	06/03/16 21:10	
Beryllium	mg/kg	ND	0.10	06/03/16 21:10	
Cadmium	mg/kg	ND	0.10	06/03/16 21:10	
Chromium	mg/kg	ND	0.50	06/03/16 21:10	
Cobalt	mg/kg	ND	0.50	06/03/16 21:10	
Lead	mg/kg	ND	0.50	06/03/16 21:10	
Manganese	mg/kg	ND	0.50	06/03/16 21:10	
Nickel	mg/kg	ND	0.50	06/04/16 13:41	
Selenium	mg/kg	ND	1.0	06/03/16 21:10	
Silver	mg/kg	ND	0.50	06/03/16 21:10	
Zinc	mg/kg	ND	1.0	06/03/16 21:10	

LABORATORY CONTROL SAMPLE: 1747239

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	50	51.9	104	80-120	
Arsenic	mg/kg	50	49.4	99	80-120	
Beryllium	mg/kg	50	48.8	98	80-120	
Cadmium	mg/kg	50	54.1	108	80-120	
Chromium	mg/kg	50	51.7	103	80-120	
Cobalt	mg/kg	50	52.2	104	80-120	
Lead	mg/kg	50	52.0	104	80-120	
Manganese	mg/kg	50	49.1	98	80-120	
Nickel	mg/kg	50	49.4	99	80-120	
Selenium	mg/kg	50	51.2	102	80-120	
Silver	mg/kg	25	24.7	99	80-120	
Zinc	mg/kg	50	52.1	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1747240 1747241

Parameter	Units	92299591001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Antimony	mg/kg	ND	54.8	48.3	30.8	27.7	56	57	75-125	10	M1
Arsenic	mg/kg	ND	54.8	48.3	39.0	35.7	71	73	75-125	9	M1
Beryllium	mg/kg	0.38	54.8	48.3	50.9	46.5	92	96	75-125	9	
Cadmium	mg/kg	0.25	54.8	48.3	55.6	51.3	101	106	75-125	8	
Chromium	mg/kg	32.5	54.8	48.3	95.2	92.5	115	124	75-125	3	

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QUALITY CONTROL DATA

Project: Farmville 5/20
Pace Project No.: 92299721

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1747240 1747241

Parameter	Units	92299591001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Cobalt	mg/kg	2.8	54.8	48.3	55.2	50.6	96	99	75-125	9	
Lead	mg/kg	19.0	54.8	48.3	72.4	129	97	228	75-125	56	M1,R1
Manganese	mg/kg	200	54.8	48.3	256	202	103	5	75-125	24	M1,R1
Nickel	mg/kg	2.4	54.8	48.3	51.9	46.3	90	91	75-125	11	
Selenium	mg/kg	2.6	54.8	48.3	35.3	32.5	60	62	75-125	8	M1
Silver	mg/kg	ND	27.3	24.2	25.7	23.4	94	97	75-125	9	
Zinc	mg/kg	13.7	54.8	48.3	68.4	73.3	100	123	75-125	7	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Farmville 5/20
Pace Project No.: 92299721

QC Batch: MPRP/21951
QC Batch Method: EPA 3010A
Associated Lab Samples: 92299721001

Analysis Method: EPA 6010
Analysis Description: 6010 MET TCLP

METHOD BLANK: 1751693 Matrix: Water
Associated Lab Samples: 92299721001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/L	ND	0.050	06/09/16 12:11	
Barium	mg/L	ND	0.25	06/09/16 12:11	
Cadmium	mg/L	ND	0.0050	06/09/16 12:11	
Chromium	mg/L	ND	0.025	06/09/16 12:11	
Lead	mg/L	ND	0.025	06/09/16 12:11	
Selenium	mg/L	ND	0.10	06/09/16 12:11	
Silver	mg/L	ND	0.025	06/09/16 12:11	

LABORATORY CONTROL SAMPLE: 1751694

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/L	2.5	2.6	105	80-120	
Barium	mg/L	2.5	2.5	102	80-120	
Cadmium	mg/L	2.5	2.6	104	80-120	
Chromium	mg/L	2.5	2.6	105	80-120	
Lead	mg/L	2.5	2.5	99	80-120	
Selenium	mg/L	2.5	2.6	105	80-120	
Silver	mg/L	1.2	1.3	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1751695 1751696

Parameter	Units	92299479001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Arsenic	mg/L	ND	2.5	2.5	2.6	2.6	104	102	75-125	2	
Barium	mg/L	0.72	2.5	2.5	3.3	3.3	104	103	75-125	1	
Cadmium	mg/L	ND	2.5	2.5	2.6	2.6	105	103	75-125	2	
Chromium	mg/L	ND	2.5	2.5	2.6	2.6	105	103	75-125	2	
Lead	mg/L	ND	2.5	2.5	2.6	2.5	101	99	75-125	2	
Selenium	mg/L	ND	2.5	2.5	2.7	2.6	106	104	75-125	2	
Silver	mg/L	ND	1.2	1.2	1.3	1.3	104	102	75-125	1	

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QUALITY CONTROL DATA

Project: Farmville 5/20
Pace Project No.: 92299721

QC Batch: MPRP/4318 Analysis Method: EPA 9023
QC Batch Method: EPA 9023 Analysis Description: 9023 Extractable Organic Halides EOX
Associated Lab Samples: 92299721001

METHOD BLANK: 231116 Matrix: Solid
Associated Lab Samples: 92299721001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Extractable Organic Halogens	mg/kg	ND	49.8	06/03/16 10:13	

LABORATORY CONTROL SAMPLE: 231117

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Extractable Organic Halogens	mg/kg	931	905	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 231118 231119

Parameter	Units	30184552002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Extractable Organic Halogens	mg/kg	ND	939	969	884	906	93	92	75-125	2	

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QUALITY CONTROL DATA

Project: Farmville 5/20
Pace Project No.: 92299721

QC Batch: MSV/37118 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV TCLP
Associated Lab Samples: 92299721001

METHOD BLANK: 1747893 Matrix: Water
Associated Lab Samples: 92299721001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1-Dichloroethene	ug/L	ND	5.0	06/03/16 12:05	
1,2-Dichloroethane	ug/L	ND	5.0	06/03/16 12:05	
1,4-Dichlorobenzene	ug/L	ND	5.0	06/03/16 12:05	
2-Butanone (MEK)	ug/L	ND	10.0	06/03/16 12:05	
Benzene	ug/L	ND	5.0	06/03/16 12:05	
Carbon tetrachloride	ug/L	ND	5.0	06/03/16 12:05	
Chlorobenzene	ug/L	ND	5.0	06/03/16 12:05	
Chloroform	ug/L	ND	5.0	06/03/16 12:05	
Tetrachloroethene	ug/L	ND	5.0	06/03/16 12:05	
Trichloroethene	ug/L	ND	5.0	06/03/16 12:05	
Vinyl chloride	ug/L	ND	5.0	06/03/16 12:05	
1,2-Dichloroethane-d4 (S)	%	108	70-130	06/03/16 12:05	
4-Bromofluorobenzene (S)	%	96	70-130	06/03/16 12:05	
uene-d8 (S)	%	99	67-135	06/03/16 12:05	

LABORATORY CONTROL SAMPLE: 1747894

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethene	ug/L	50	58.4	117	66-135	
1,2-Dichloroethane	ug/L	50	50.4	101	67-128	
1,4-Dichlorobenzene	ug/L	50	52.0	104	78-130	
2-Butanone (MEK)	ug/L	100	105	105	61-144	
Benzene	ug/L	50	51.1	102	80-125	
Carbon tetrachloride	ug/L	50	50.8	102	69-131	
Chlorobenzene	ug/L	50	52.6	105	81-122	
Chloroform	ug/L	50	54.1	108	73-127	
Tetrachloroethene	ug/L	50	40.0	80	78-122	
Trichloroethene	ug/L	50	49.1	98	78-122	
Vinyl chloride	ug/L	50	59.0	118	58-137	
1,2-Dichloroethane-d4 (S)	%			106	70-130	
4-Bromofluorobenzene (S)	%			99	70-130	
Toluene-d8 (S)	%			99	67-135	

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QUALITY CONTROL DATA

Project: Farmville 5/20
Pace Project No.: 92299721

QC Batch: OEXT/43048 | Analysis Method: EPA 8270
QC Batch Method: EPA 3510 | Analysis Description: 8270 TCLP MSSV
Associated Lab Samples: 92299721001

METHOD BLANK: 1754034 | Matrix: Water
Associated Lab Samples: 92299721001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,5-Trichlorophenol	ug/L	ND	50.0	06/13/16 12:03	
2,4,6-Trichlorophenol	ug/L	ND	50.0	06/13/16 12:03	
2,4-Dinitrotoluene	ug/L	ND	50.0	06/13/16 12:03	
2-Methylphenol(o-Cresol)	ug/L	ND	50.0	06/13/16 12:03	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	50.0	06/13/16 12:03	
Hexachloro-1,3-butadiene	ug/L	ND	50.0	06/13/16 12:03	
Hexachlorobenzene	ug/L	ND	50.0	06/13/16 12:03	
Hexachloroethane	ug/L	ND	50.0	06/13/16 12:03	
Nitrobenzene	ug/L	ND	50.0	06/13/16 12:03	
Pentachlorophenol	ug/L	ND	100	06/13/16 12:03	
Pyridine	ug/L	ND	50.0	06/13/16 12:03	
2,4,6-Tribromophenol (S)	%	93	27-108	06/13/16 12:03	
2-Fluorobiphenyl (S)	%	81	13-107	06/13/16 12:03	
2-Fluorophenol (S)	%	39	10-110	06/13/16 12:03	
Nitrobenzene-d5 (S)	%	79	12-102	06/13/16 12:03	
Phenol-d6 (S)	%	25	10-110	06/13/16 12:03	
Terphenyl-d14 (S)	%	92	21-132	06/13/16 12:03	

LABORATORY CONTROL SAMPLE & LCSD: 1754035 | 1754036

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,5-Trichlorophenol	ug/L	500	488	501	98	100	39-108	3	30	
2,4,6-Trichlorophenol	ug/L	500	514	513	103	103	40-104	0	30	
2,4-Dinitrotoluene	ug/L	500	484	507	97	101	42-109	5	30	
2-Methylphenol(o-Cresol)	ug/L	500	307	316	61	63	31-110	3	30	
3&4-Methylphenol(m&p Cresol)	ug/L	500	270	280	54	56	30-110	4	30	
Hexachloro-1,3-butadiene	ug/L	500	387	401	77	80	10-110	4	30	
Hexachlorobenzene	ug/L	500	437	448	87	90	39-121	3	30	
Hexachloroethane	ug/L	500	312	328	62	66	10-110	5	30	
Nitrobenzene	ug/L	500	401	403	80	81	32-101	1	30	
Pentachlorophenol	ug/L	1000	1040	1020	104	102	18-108	2	30	
Pyridine	ug/L	500	210	183	42	37	10-110	14	30	
2-Fluorobiphenyl (S)	%				89	88	13-107			
2-Fluorophenol (S)	%				44	43	10-110			
Nitrobenzene-d5 (S)	%				87	85	12-102			
Phenol-d6 (S)	%				31	29	10-110			
Terphenyl-d14 (S)	%				92	88	21-132			

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QUALITY CONTROL DATA

Project: Farmville 5/20
Pace Project No.: 92299721

QC Batch: PMST/9098
QC Batch Method: ASTM D2974-87
Associated Lab Samples: 92299721001

Analysis Method: ASTM D2974-87
Analysis Description: Dry Weight/Percent Moisture

SAMPLE DUPLICATE: 1746941

Parameter	Units	35246927001 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	27.6	26.7	3	

SAMPLE DUPLICATE: 1746942

Parameter	Units	92299721001 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	10.1	10.6	4	

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QUALITY CONTROL DATA

Project: Farmville 5/20
Pace Project No.: 92299721

QC Batch: WET/45392
QC Batch Method: EPA 1010
Analysis Method: EPA 1010
Analysis Description: 1010 Flash Point, Closed Cup
Associated Lab Samples: 92299721001

SAMPLE DUPLICATE: 1750573

Parameter	Units	92297725001 Result	Dup Result	RPD	Qualifiers
Flashpoint	deg F	128	133		

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QUALITY CONTROL DATA

Project: Farmville 5/20
Pace Project No.: 92299721

QC Batch: WET/45315 Analysis Method: EPA 9045
QC Batch Method: EPA 9045 Analysis Description: 9045 pH
Associated Lab Samples: 92299721001

SAMPLE DUPLICATE: 1748012

Parameter	Units	92299721001 Result	Dup Result	RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	H6

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QUALITY CONTROL DATA

Project: Farmville 5/20
Pace Project No.: 92299721

QC Batch: WETA/23807
QC Batch Method: SW-846 7.3.3.2
Analysis Method: SW-846 7.3.3.2
Analysis Description: 733C Reactive Cyanide
Associated Lab Samples: 92299721001

METHOD BLANK: 1087143
Matrix: Solid
Associated Lab Samples:

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Reactive	mg/kg	ND	0.99	06/06/16 19:18	

SAMPLE DUPLICATE: 1087144

Parameter	Units	30185352002 Result	Dup Result	RPD	Qualifiers
Cyanide, Reactive	mg/kg	ND	ND		

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QUALITY CONTROL DATA

Project: Farmville 5/20
Pace Project No.: 92299721

QC Batch: WETA/23808
QC Batch Method: SW-846 7.3.4.2
Analysis Method: SW-846 7.3.4.2
Analysis Description: 734S Reactive Sulfide
Associated Lab Samples: 92299721001

METHOD BLANK: 1087147
Matrix: Solid
Associated Lab Samples:

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfide, Reactive	mg/kg	ND	9.9	06/06/16 15:10	

SAMPLE DUPLICATE: 1087148

Parameter	Units	30185352002 Result	Dup Result	RPD	Qualifiers
Sulfide, Reactive	mg/kg	ND	ND		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALIFIERS

Project: Farmville 5/20
Pace Project No.: 92299721

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-N	Pace Analytical Services - New Orleans
PASI-PA	Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

1g	8260 results are from a total analysis which show that analytes are not present or that they are present but at such low levels that the appropriate regulatory levels could not possibly be exceeded, per Section 1.2 of Method 1311.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Farmville 5/20
Pace Project No.: 92299721

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92299721001	**CCP20160520**	EPA 3050	MPRP/21893	EPA 6010	ICP/19621
92299721001	**CCP20160520**	EPA 3010A	MPRP/21951	EPA 6010	ICP/19662
92299721001	**CCP20160520**	EPA 7470	MERP/9562	EPA 7470	MERC/9198
92299721001	**CCP20160520**	EPA 7471	MERP/9529	EPA 7471	MERC/9161
92299721001	**CCP20160520**	EPA 9023	MPRP/4318	EPA 9023	MPRP/4320
92299721001	**CCP20160520**	EPA 3510	OEXT/43048	EPA 8270	MSSV/12381
92299721001	**CCP20160520**	EPA 8260	MSV/37118		
92299721001	**CCP20160520**	ASTM D2974-87	PMST/9098		
92299721001	**CCP20160520**	EPA 1010	WET/45392		
92299721001	**CCP20160520**	EPA 9045	WET/45315		
92299721001	**CCP20160520**	SW-846 7.3.3.2	WETA/23807		
92299721001	**CCP20160520**	SW-846 7.3.4.2	WETA/23808		

Page 2 of 2 for Internal Use ONLY

Sample Condition Upon Receipt

Client Name: Broad energy

Project WO# : 92299721

92299721

Courier: ☐ Commercial ☐ Fed Ex ☐ UPS ☐ USPS ☐ Pace ☐ Other:_____ ☑ Client

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☐ No

Date/Initials Person Examining Contents: RDT 6/1/16

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other:_____

Thermometer:
☐ IR Gun #5 SN:15527198 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Correction Factor: 0.0°C **Cooler Temp Corrected (°C):** NA **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C

USDA Regulated Soil (☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

				Comments/Discrepancy:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☑ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	4.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☐ Yes	☑ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	7.
Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	9.
-Includes Date/Time/ID/Analysis Matrix: SOLID				
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☑ N/A	10. HNO3 pH<2
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☐ Yes	☐ No	☑ N/A	HCl pH<2 H2SO4 pH<2 NaOH pH>12
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	☐ Yes	☐ No	☑ N/A	NaOH/ZnOAc pH>9
Samples checked for dechlorination?	☐ Yes	☐ No	☑ N/A	11.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☐ No	☑ N/A	12.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	13.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	
Pace Trip Blank Lot # (if purchased):_____				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Sample Discrepancy: _____

Project Manager SCURF Review: _____ **Date:** 6/2/16

Project Manager SRF Review: _____ **Date:** 6/2/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

1984354

Section A Required Client Information:

Company:	Broad Energy Solutions
Address:	825 C Merrimon Ave #377 Asheville, NC 28804
Email To:	smclamb@broadenergysolutions.com
Phone:	828-707-5354
Fax:	
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Sam McLamb
Copy To:	Rich Deming rich@prg-llc.com
Purchase Order No.:	
Project Name:	Farmville
Project Number:	

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

NPDES / GROUND WATER / DRINKING WATER / UST / RCRA / OTHER

Site Location STATE:

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	TIME	COMPOSITE END/GRAB DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	6010	6010 TCLP	7470 TCLP	7470	8270 TCLP	8260 TCLP	Flashpoint	pH	Reactive Cyanide	Sulfide	EOX		Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92299721
1	CCP 20160520			5/20/16																												001
2																																
3																																
4																																
5																																
6																																
7																																
8																																
9																																
10																																
11																																
12																																

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	[signature]	6/1/16	14:06	[signature]	6/1/16	14:06	NA	N	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE	[signature]
PRINT Name of SAMPLER:	
SIGNATURE of SAMPLER:	DATE Signed (MM/DD/YY):

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

RECEIVED
By ETH WaRO at 5:25 pm, May 23, 2022

Zoning Consistency Determination

Facility Name	Carolina Poultry Power RG3, LLC
Facility Street Address	just north of 5473 Brothers Road — Latitude: 247496.86 m E
Facility City	La Grange — Longitude: 3911247.12 m N
Description of Process	One new poultry-litter fired boiler and associated control systems.
SIC/NAICS Code	4911 elect svc/ 221112 fossil fuel power generation
Facility Contact	Rich Deming
Phone Number	252-800-1969
Mailing Address	3730 N. Main Street
Mailing City, State Zip	Farmville, NC 27828

Based on the information given above:

- [x] I have received a copy of the air permit application (draft or final) AND...

- [ ] There are no applicable zoning ordinances for this facility at this time
- [x] The proposed operation IS consistent with applicable zoning ordinances
- [ ] The proposed operation IS NOT consistent with applicable zoning ordinances (please include a copy of the rules in the package sent to the air quality office)
- [ ] The determination is pending further information and can not be made at this time
- [ ] Other:

Agency	TOWN OF LA GRANGE, NC
Name of Designated Official	JOHN P. CRAFT
Title of Designated Official	TOWN MANAGER
Signature	[signature]
Date	5/17/2022

Please forward to the facility mailing address listed above and the air quality office at the appropriate address as checked on the back of this form.

Courtesy of the Small Business Environmental Assistance Program
sb.ncdenr.gov 877-623-6748

Carolina Poultry Power, RG3 **Single Boiler System**

La Grange, NC

April 2022

Boiler Specifications	
97.00	MMBtu/hr

Bagfilter Efficiency	
99.0%	PM
Dry Sorbent Efficiency	
93.0%	HCl
20%	SO2

SNCR Efficiency	
45%	NOx

Hours of Operations		
Actual/Ltd	8,760	hrs/yr
Potential	8,760	hrs/yr

	Uncontr.	Actuals			Potentials					
	EF	Controlled by SNCR, DSI, Baghouse			Uncontrolled			Controlled by SNCR, DSI, Baghouse		
	lb/MMBtu	lb/hr	lb/yr	tpy	lb/hr	lb/yr	tpy	lb/hr	lb/yr	tpy
PM	3.000	2.91	25,491.60	12.75	291.00	2,549,160.00	1274.58	2.91	25,491.60	12.75
PM10	3.000	2.91	25,491.60	12.75	291.00	2,549,160.00	1274.58	2.91	25,491.60	12.75
PM2.5	3.000	2.91	25,491.60	12.75	291.00	2,549,160.00	1274.58	2.91	25,491.60	12.75
SO2	0.280	21.73	190,337.28	95.17	27.16	237,921.60	118.96	21.73	190,337.28	95.17
NOx	0.420	22.41	196,285.32	98.14	40.74	356,882.40	178.44	22.41	196,285.32	98.14
CO	0.220	21.34	186,938.40	93.47	21.34	186,938.40	93.47	21.34	186,938.40	93.47
VOC	0.017	1.65	14,445.24	7.22	1.65	14,445.24	7.22	1.65	14,445.24	7.22
Lead	4.10E-05	0.00	34.84	0.02	0.00	34.84	0.02	0.00	34.84	0.02
GHG:										
Carbon Dioxide (CO2)	223.00	21631.00	1.89E+08	94743.78	21631.00	1.89E+08	94743.78	21631.00	1.89E+08	94743.78
Methane (CH4)	1.48	143.71	1.26E+06	629.43	143.71	1.26E+06	629.43	143.71	1.26E+06	629.43
Nitrous Oxide (N2O)	2.87	278.43	2.44E+06	1219.53	278.43	2.44E+06	1219.53	278.43	2.44E+06	1219.53
				96592.74			*96592.74*			*96592.74*

ADD SULFURIC ACID PM to PM/PM10/PM2.5 TOTALS
+0.16 TPY Controlled
+16 TPY Uncontrolled
(Assumes 99% control)

Betsy Huddleston 7/12/2022

Table 3. TAP Emissions

Pink below is a TAP   *Yellow below means above TPER*

		Controlled Actuals			TPER			*Model Input*	
HAP/TAPs	**lb/MMBtu**	**lb/hr**	**lb/d**	**lb/yr**	**lb/hr**	**lb/d**	**lb/yr**	**lb/hr**	
Acetaldehyde	8.30E-04	0.081	1.932	705.268	28.43				
Acetophenone	3.20E-09	0.000	0.000	0.003					
Acenaphthene	9.10E-07	0.000	0.002	0.773					
Acenaphthylene	5.00E-06	0.000	0.012	4.249					
Acrolein	4.00E-03	0.388	9.312	3398.880	0.08			0.388	
Antimony & Compounds	1.21E-06	0.000	0.000	0.010					
Arsenic & Compounds	5.11E-05	0.000	0.001	0.434			0.194	0.00005	
Benzene	4.20E-03	0.407	9.778	3568.824			11.069	0.407	
Benzo(a)anthracene	6.50E-08	0.000	0.000	0.055					
Benzo(b,k)fluroanthene	1.00E-07	0.000	0.000	0.085					
Benzo(g,h,i)perylene	9.30E-08	0.000	0.000	0.079					
Benzo(a)pyrene	2.60E-06	0.000	0.006	2.209			3.044		
Beryllium metal (un-reacted	2.33E-07	0.000	0.000	0.002			0.378		
Cadmium Metal (elemental	2.33E-07	0.000	0.000	0.002			0.507		
Carbon tetrachloride	4.50E-05	0.004	0.105	38.237			618.006		
Chlorine	7.90E-04	0.077	1.839	671.279	0.95	1.6		0.077	
Chlorobenzene	3.30E-05	0.003	0.077	28.041		92.7			
Chloroform	2.80E-05	0.003	0.065	23.792			396.631		
Chromium–Other compds (	2.47E-05	0.002	0.058	21.030					
Chrysene	3.80E-08	0.000	0.000	0.032					
Cobalt compounds	2.33E-06	0.000	0.005	1.984					
Dibenzo(a,h)anthracene	9.10E-09	0.000	0.000	0.008					
Dinitrophenol, 2,4-	1.80E-07	0.000	0.000	0.153					
Di(2-ethylhexyl)phthalate (I	4.70E-08	0.000	0.000	0.040		1.3			
Ethyl benzene	3.10E-05	0.003	0.072	26.341					
Ethylene dichloride (1,2-dic	2.90E-05	0.003	0.068	24.642			350.511		
Fluoroanthene	1.60E-06	0.000	0.004	1.360					
Fluorene	3.40E-06	0.000	0.008	2.889					
Formaldehyde	4.40E-03	0.427	10.243	3738.768	0.16			0.427	
Hexachlorodibenzo-p-dioxi	1.79E-11	0.00000	0.00000	0.00002			0.007		
Hydrogen chloride (hydroch	3.29E-01	2.234	53.614	19569.052	0.74			2.234	
Indo(1,2,3-cd)pyrene	8.70E-09	0.000	0.000	0.007					
Lead and Lead compounds	1.21E-06	0.000	0.000	0.010					
Manganese & compounds	1.07E-03	0.001	0.025	9.086		1.3			
Mercury, vapor (Include in	4.67E-05	0.005	0.109	39.679		0.025		0.005	
Methyl bromide (bromome	1.50E-05	0.001	0.035	12.746					
Methyl chloride (chloromet	2.30E-05	0.002	0.054	19.544					
Methyl chloroform (1,1,1 tr	3.10E-05	0.003	0.072	26.341		505.4			
Methyl ethyl ketone	5.40E-06	0.001	0.013	4.588	93.19	155.8			**NOT A HAP**
Methylene chloride (dichlo	2.90E-04	0.028	0.675	246.419	1.79		2213.752		
Naphthalene	9.70E-05	0.009	0.226	82.423					
Nickel metal (Component o	1.89E-05	0.000	0.000	0.161		0.3			
Nitrophenol, 4-	1.10E-07	0.000	0.000	0.093					
Pentachlorophenol	5.10E-08	0.000	0.000	0.043	0.03	0.1			
Perchloroethylene (tetrach	3.80E-05	0.004	0.088	32.289			17525.53		
Phenanthrene	7.00E-06	0.001	0.016	5.948					
Phenol	5.10E-05	0.005	0.119	43.336	1				
Phosphorus Metal, Yellow c	2.70E-05	0.003	0.063	22.942					
Polychlorinated biphenyls	8.15E-09	0.000	0.000	0.007			7.656		
Polycyclic Organic Matter	1.25E-04	0.012	0.291	106.215					
Propionaldehyde	6.10E-05	0.006	0.142	51.833					
Propylene dichloride (1,2 d	3.30E-05	0.003	0.077	28.041					
Pyrene	3.70E-06	0.000	0.009	3.144					
Selenium compounds	7.00E-06	0.001	0.016	5.952					
Sulfuric Acid	3.66E-02	0.036	0.853	311.335	0.11	0.5		0.0355	**NOT A HAP**
Styrene	1.90E-03	0.184	4.423	1614.468	11.16				
Tetrachlorodibenzo-p-dioxi	8.60E-12	0.000	0.000	0.00001			0.000277		
Toluene	9.20E-04	0.089	2.142	781.742	58.97	197.96			
Trichloroethylene	3.00E-05	0.003	0.070	25.492			5442.14		
Trichloroethane -1,1,1	3.00E-05	0.003	0.070	25.492					
Trichlorofluoromethane (CF	4.10E-05	0.004	0.095	34.839					
Trichlorophenol, 2,4,6-	2.20E-08	0.000	0.000	0.019					
Vinyl chloride	1.80E-05	0.002	0.042	15.295			35.051		
Xylene, o-	2.50E-05	0.002	0.058	21.243	68.44	113.7			
			TOTAL	17.700 tpy		**NEW TOTAL (MINUS NON-HAPS) = 17.7-0.158 =17.54 tons**			

Carolina Poultry Power **Lime Silo Emissions**
La Grange, NC
April 2022

Silo Specifications	
2400	cu ft
600	acfm

Material Handling		
26	lb/cu ft	bulk fluidized
62,400	lb	full silo
2	hr	unloading time
31200	lb/hr	unloading rate
15.6	tph	

DSI Reagent Usage		
86	lb/hr	2 inject @ 43 lb/hr
8760	hr/yr	No limit on hours
753,360	lb/yr	
376.68	tpy	
12.07	Silo fills per year	

PM Emissions - uncontrolled		
	TSP	PM-10
EF lb/ton	0.72	0.46
lb/hr	11.232	7.176
lbs/yr	271.21	173.27

PM Emissions - controlled			
	TSP	PM-10	
EF lb/ton	0.00099	0.00034	
Cont. Eff	99%	99%	bin vent
lb/hr	0.11232	0.07176	
lbs/yr	2.71	1.73	
lbs/yr	2.71	1.73	

Form B Data	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS)		POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS)	
	lb/hr	lbs/yr	lb/hr	lbs/yr	lb/hr	lbs/yr
TSP	0.11	2.71	11.23	271.21	0.11	2.71
PM10	0.07	1.73	7.18	173.27	0.07	1.73
PM2.5	0.07	1.73	7.18	173.27	0.07	1.73

TABLES REVISED BY BETSY HUDDLESTON
7/12/2022
APPLICANT MISTAKENLY LABELLED TONS/YR WHEN
CALCULATIONS WERE FOR LBS/YR