

**NORTH CAROLINA
DIVISION OF AIR QUALITY
Air Permit Review**

Region: Fayetteville Regional Office
County: Robeson
NC Facility ID: 7800166
Inspector's Name: James Moser
Date of Last Inspection: 04/23/2009
Compliance Code: 3 / Compliance - inspection

Permit Issue Date:

Facility Data			Permit Applicability (this application only)
Applicant (Facility's Name): Lumberton Energy, LLC Facility Address: Lumberton Energy, LLC S.R. 2202 Lumberton, NC 28359 SIC: 4911 / Electric Services NAICS: 221112 / Fossil Fuel Electric Power Generation Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V			SIP: 2D .2400 NSPS: NESHAP: PSD: PSD Avoidance: NC Toxics: 112(r): Other:
Contact Data			Application Data
Facility Contact	Authorized Contact	Technical Contact	Application Number: 7800166.09B Date Received: 03/13/2009 Application Type: Modification Application Schedule: TV-Significant Existing Permit Data Existing Permit Number: 05543/T16 Existing Permit Issue Date: 07/28/2009 Existing Permit Expiration Date: 12/31/2012
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Review Engineer: Rahul Thaker Review Engineer's Signature: _____		Date: March 10, 2010	Comments / Recommendations: Issue 05543/T17 Permit Issue Date: Permit Expiration Date:

1. Purpose of Application

Division of Air Quality (DAQ) issued an air permit 05543T15 on February 15, 2008 for installation of ROFA (rotating opposed fire air system) NOx reduction technology and ROTAMIX (rotating mixing system) SO₂ reduction technology using lime/limestone [one each on two boilers, ID Nos. ES-1A and ES-1B], lime/limestone storage silo (ID No. ES-7), and bagfilter (ID No. CD-7), using the procedures in 2Q .0300 "Construction and Operation Permit". This permit required the Permittee to submit a permit application within 12 months of commencement of operation of the above equipment, using the procedures in 2Q .0500 "Title V Procedures".

Thus, Lumberton Energy, LLC ("Lumberton Energy" or "Permittee") has submitted an application to satisfy the 2Q .0500 requirements for the above equipment [Application No. 7800166.09B]

Separately, the Permittee has submitted an application pursuant to 2D .2400 "Clean Air Interstate Rules (CAIR)" [Application No. 7800166.09A]. This CAIR application has been consolidated into the above Title V application.

2. Facility Description

The facility is a steam and electric power generation facility. It used to supply steam to a nearby Almac plant until sometime in 2006. As per the last inspection report dated 4/28/09, the Almac is now producing steam using its own boilers. The facility is also a standby source to provide electric power to Progress Energy. It is not in operation since the first-half of 2009. The facility has been classified under the Standard Industrial Classification (SIC) code 4911 "Electrical Services".

3. Application Chronology

Refer to "Comprehensive Application Report" for complete details.

4. Statement of Compliance

The applicant has certified through the submittal of E5 form that the facility is in compliance with all applicable requirements. Also, as per the above referred inspection report, "Lumberton Power appeared to be in compliance."

5. Permit History

- Air permit 05543T14 was issued on January 22, 2008, in accordance with 2Q .0513 "Permit Renewal Expiration".
- Air permit 05543T15 was issued on February 15, 2008, in accordance with 2Q .0300 "Construction and Operation Permit".
- Air permit 05543T16 was issued on July 28, 2009, in accordance with 2Q .0524 "Ownership Change".

6. Permit Modification/Changes

6.1 ROFA (rotating opposed fire air system) NO_x reduction technology and ROTAMIX (rotating mixing system) SO₂ reduction technology using lime/limestone [one each on two boilers, ID Nos. ES-1A and ES-1B]

Lumberton Energy has installed the ROFA and ROTAMIX control systems on the coal-fired boilers (ID Nos. ES-1A and ES-1B) for reducing emissions of NO_x and SO₂, respectively.

These boilers are overfeed stoker-fired, each with a maximum heat input rate of 215 million Btu/hr. Particulate emissions from these boilers are also controlled by permitted pulse-jet baghouses.

A typical ROFA installation will have a booster fan to supply the high velocity air to the ROFA boxes. There will be several ROFA boxes that will be placed at different levels of the boiler. These boxes will be placed asymmetrically on opposite sides of the boiler. Each ROFA box will have a damper to control the amount of high velocity air going into the box. The design of the ROFA box and the placement of each ROFA box are determined through the use of computational fluid dynamics. As stated above, ROFA reduces NO_x by improving the combustion process in the boiler.

The ROTAMIX technology is developed for optimum reduction of SO₂ using sorbent injection, such as lime/limestone, through specifically designed nozzles. Smaller amount of chemical(s) are needed to obtain the same amount of reduction in SO₂ because of the mixing action provided by the high velocity air. Some reduction in mercury emissions is also expected.

The Permittee had performed stack tests on these boilers in March and April, 2008, pursuant to the air permit 05543T15. The following Table summarizes the stack test results:

POLLUTANT	ROFA and ROTAMIX SYSTEMS NOT IN OPERATION	ROFA and ROTAMIX SYSTEMS IN OPERATION	INCREASE (I) OR DECREASE (D) IN EMISSIONS	PERCENT CHANGE
	Emission Rate in lb/million Btu	Emission Rate in lb/million Btu		
PM (Filterable Only)	0.008	0.009	I	12.5
NOx	0.30	0.19	D	36.7
SO ₂	0.79	0.37	D	53.2
CO	0.033	0.053	I	60.1

The applicable regulations for boilers (ES-1A and ES-1B) are as follows:

2D .0503 “Particulates from Fuel Burning Indirect Heat Exchangers”

Each boiler is subject to an emission limit of 0.23 lb/million Btu heat input.

As stated above, the air permit 05543T15 required a stack testing for the boilers to determine emission rate of PM and sorbent injection rate (lime/limestone) while operating the ROFA and ROTAMIX systems. The testing condition also restricted increases in PM and PM10 below 24.3 tons/yr and 14.3 tons/yr, respectively, so that the project (installation of ROFA and ROTAMIX systems) remains “minor” for PSD.

As shown in the Table above, the Permittee had determined emissions change in PM (filterable only) while operating with or without these emissions reduction systems. Also, the limestone injection rate during the testing was observed to be 2,585 lbs/hr per each boiler.

The change in emissions for PM (filterable only) were only 0.001 lb/million Btu, which results into an emission increase of approximately 1.9 tons/yr for two boilers (i.e., 0.001 lb/million Btu x 215 million Btu/hr x 2 x 8,760 hours/yr x ton/2000 lbs). It should also be noted here that PM10 stack testing results were not accepted by DAQ. Because the compliance margin is large (1.9 tons/yr v/s 14.3 tons/yr), though the emission rate of condensable particulates is not available, DAQ deems the increase in emissions for PM and PM10 due to this project much less than the 14.3 tons/yr and 24.3 tons/yr, respectively. Thus, DAQ deems that the Permittee has complied with the stack-testing requirement and hence, will remove the stack testing condition.

The current permit includes annual inspection and maintenance requirement for each baghouse and pressure drop monitoring across each baghouse. It also requires associated record keeping and reporting requirements. These requirements are adequate and meet the requirements in 2Q .0508(f). Hence, no change to the monitoring, record keeping, and reporting requirements will be made.

2D .0516 “Sulfur Dioxide Emissions from Combustion Sources”

Each boiler is subject to 2.3 lbs/million Btu heat input emission limit. The current permit includes continuous emissions monitoring and associated record keeping and reporting requirements for SO₂ emissions. These requirements are adequate and meet the requirements in 2Q .0508(f). Hence, no change in monitoring, record keeping, and reporting requirements will be made.

2D .0521 “Control of Visible Emissions”

Each boiler is subject to 20 percent opacity limit. The current permit includes continuous opacity monitoring and associated record keeping and reporting requirements for visible emissions. These requirements are adequate and

meet the requirements in 2Q .0508(f). Therefore, no change to the monitoring, record keeping, and reporting requirements will be made.

2D .0501(e) “Compliance with Emission Control Standards”

The current permit includes the following emissions limits:

- Particulate matter emissions from each boiler (ID Nos. ES-1A and 1B) shall not exceed 6.02 pounds per hour.
- Sulfur dioxide emissions from each boiler (ID Nos. ES-1A and 1B) shall not exceed 322.5 pounds per hour.
- Nitrogen oxide emissions from each boiler (ID Nos. ES-1A and 1B) shall not exceed 141.9 pounds per hour.
- Carbon monoxide emissions from each boiler (ID Nos. ES-1A and 1B) shall not exceed 120.4 pounds per hour.
- The maximum sulfur content of any coal received and burned in each boiler (ID Nos. ES-1A and 1B) shall not exceed 1.0 percent by weight.

The permit condition includes sulfur content monitoring, continuous emissions monitoring for SO₂ and NO_x, inspection and maintenance requirements for bagfilters, and associated record keeping and reporting requirements.

The current permit also includes the following an alternate operating scenario for SO₂ only when operating with ROTAMIX SO₂ reduction system: limit of 322.5 pounds per hour for each boiler.

In the alternate scenario for SO₂, continuous emissions monitoring and associated record keeping and reporting requirements have been included.

As discussed above, the Permittee has demonstrated compliance with the emissions limits of PM₁₀, SO₂, NO_x, and CO, while operating with ROFA and ROTAMIX systems.

It needs to be emphasized here that coal sulfur content limit in the current permit is not needed to assure compliance with the SO₂ NAAQS and hence, as requested by the Permittee, it will be removed from the revised permit along with its sulfur monitoring requirement. Also, with the removal of coal sulfur content limit, the alternate operating scenario for SO₂ becomes redundant. Hence, the alternate operating scenario for SO₂ will be removed. Finally, each boiler will be required to continue complying with the SO₂ emission limit of 322.5 lbs/hr using CEMs.

2D .0530 “Prevention of Significant Deterioration”

The current permit includes the following emissions limits:

- Particulate matter emissions from each boiler (ID Nos. ES-1A and 1B) shall not exceed 0.028 pounds per million Btu heat input.
- Sulfur dioxide emissions from each boiler (ID Nos. ES-1A and 1B) shall not exceed 1.50 pounds per million Btu heat input.
- Nitrogen oxide emissions from each boiler (ID Nos. ES-1A and 1B) shall not exceed 0.66 pounds per million Btu heat input.
- Carbon monoxide emissions from each boiler (ID Nos. ES-1A and 1B) shall not exceed 0.56 pounds per million Btu heat input.
- The maximum sulfur content of any coal received and burned in each boiler (ID Nos. ES-1A and 1B) shall not exceed 1.0 percent by weight.

This PSD permit condition includes coal sulfur content monitoring, continuous emissions monitoring for both SO₂ and NO_x, inspection and maintenance requirements for bagfilters, and associated record keeping and reporting requirements.

The current permit also includes the following an alternate operating scenario for SO₂ only when operating with ROTAMIX SO₂ reduction system: limit of 1.50 pounds per million Btu heat input for each boiler.

In the alternate scenario for SO₂, continuous emissions monitoring and associated record keeping and reporting requirements have been included.

As discussed above, the permit required a direct SO₂ monitoring in the form of lb/million Btu and therefore, the permit will be revised to remove the unnecessary sulfur content limit and associated sulfur-monitoring requirement. Thus, the alternate operating scenario for SO₂ becomes redundant. Hence, the alternate operating scenario for SO₂ will be removed. Finally, each boiler will be required to continue complying with the above SO₂ emission limit of 1.5 lb/million Btu using CEMs.

2D .0614 "Compliance Assurance Monitoring"

For any large pollutant specific emission unit (PSEU) (i.e., after control emission rate greater than major source threshold) undergoing "significant modification" of the Title V permit requires that the owner or operator submit a compliance assurance monitoring (CAM) plan. However, if the Title V permit specifies for the large PSEU a continuous compliance determination method (CCDM) such as CEMs, then that large PSEU is exempt from requiring a CAM plan.

The after control emission rate for SO₂ and NO_x only, for each boiler, exceeds the 100 tons threshold. So, each boiler is deemed a "large PSEU" for these pollutants. The ROFA technology is considered a "combustion control" and thus, a "passive" control measure. So, CAM plan for ROFA is not required. In addition, the current permit requires the monitoring for NO_x using CEMs under the applicable requirements of 2D .0501(e) and .0530. This CEMs requirement is deemed "CCDM". So, the CAM plan for NO_x cannot be required for each boiler.

The ROTAMIX technology is considered an "active" control device. In addition, the current permit requires the monitoring for SO₂ using CEMs under the applicable requirements of 2D .0501(e) and .0530. This monitoring using CEMs for NO_x emissions is deemed as "CCDM". Hence, CAM plan for SO₂ is also not required.

It should be noted here that the current permit includes a CAM plan for two baghouses associated with the boilers for PM₁₀ emissions. It defines excursion as a "3-hour block average value of opacity greater than 12 percent." However, the permit condition fails to include any actions to be taken by the Permittee upon occurrence of an excursion. Hence, the monitoring condition will be revised to include the following requirements for excursion:

For any excursion, the Permittee shall initiate an inspection of the control equipment and/or the COMS and initiate the repairs as necessary. The following corrective actions shall be taken as soon as practical:

- i. Identify cause of excursion.
- ii. Initiate actions to correct the cause of any excursions identified in step i above. Repair equipment that is not operating properly.
- iii. Initiate work order for baghouse inspection and repair as needed for any equipment that cannot be repaired during operation.
- iv. Document nature and cause of excursions in operations log.
- v. Improve preventative maintenance procedures as necessary in accordance with CAM QIP (if one exists).
- vi. Provide notification to DAQ in accordance with reporting requirements in the permit.

2D .1417 “Emission Allocations for Large Combustion Sources”

This regulation has been repealed. Thus, the previous requirement included in the current permit will be removed.

2D .2400 “Clean Air Interstate Rule”

On November 17, 2009, EPA approved North Carolina’s CAIR rules. Refer to 74 FR 62496, November 30, 2009. These NC rules are codified into Section 2D .2400.

The purpose of this Section (i.e., 2D .2400) is to implement the federal CAIR and thereby reduce the interstate transportation of the fine particulate matter and ozone.

The applicable CAIR rules, as specified in the CAIR Permit Application (which is to be attached to the permit), includes the emission and monitoring requirements shown below for the following affected CAIR sources:

PERMITTED SOURCE ID No.	CAIR ID No.
ES-Unit 1A	Unit 1
ES-Unit 1B	Unit 2

2D .2403 “Nitrogen Oxide Emissions”

This Section specifies the total annual NO_x allocations and includes the compliance, emissions measurements recording and reporting, excess emissions, and liability requirements.

2D .2405 “Nitrogen Oxide Emissions During Ozone Season”

This section specifies the NO_x allocations during the ozone season and includes the compliance, emissions measurements recording and reporting, excess emissions and liability requirements.

2D .2404 “Sulfur Dioxide Emissions”

This section specifies the annual SO₂ allocations and includes the compliance, emissions measurements recording and reporting, excess emissions and liability requirements.

2Q .0700 “Toxic Air Pollutant Procedures”

The current permit allows burning of various non-traditional fuels (such as wastewater basin/evaporation pit sludge, activated carbon filters, boiler cleaning solution, regenerated spent cation/anion resins, tire-derived fuel, pelletized paper, flyash briquettes, etc.), includes monitoring of each fuel (date of usage, feed rate, etc.) and the associated reporting.

No change to this permit condition is required. It is a state-only enforceable requirement.

6.2 Lime/limestone storage silo and associated baghouse

The size of silo is 7,768 ft³. Using the density of 100 lbs/ft³, the capacity of storage silo will be approximately 388 tons. The maximum annual product throughput is 22,653 tons.

The baghouse is a pulse-jet reverse flow type, made of single felt polyester filter material. The inlet flow rate and the filter surface area are 900 acfm and 230 ft², respectively, thus making the air-to-cloth ratio of 3.90 to 1.

The Permittee has estimated after control PM/PM10 emission rate of 1.13 tons/yr. This emission rate is based upon a maximum product throughput of 22,653 tons/yr, assumed loss of 5%, and a control efficiency of 99.9%.

The silo is subject to the requirements in 2D .0515 and .0521.

15A NCAC 2D .0515 “Particulates from Miscellaneous Industrial Processes”

The allowable emission rates for particulate matter from any stack, vent, or outlet, resulting from any industrial process for which no other emission control standards are applicable, shall not exceed the level calculated with the equation $E = 4.10(P)^{0.67}$, calculated to three significant figures for process rates less than or equal to 30 tons per hour.

Based upon the limestone process rate (limestone filling rate into the silo) of 25 tons/hr, the allowable PM emission rate (filterable only) can be estimated as 35.4 lbs/hr. The potential PM emission rate is 0.26 lb/hr (or 1.13 ton/yr) as stated above. Hence, compliance with this requirement is expected.

Current permit includes inspection and maintenance requirement for the associated baghouse. Specifically, requirements for monthly visual inspection of the system ductwork and material collection unit for leaks, and annual internal inspection of baghouse have been included. In addition, requirements to keep log book for baghouse maintenance activities and semiannual reporting of all monitoring and record keeping activities have also been included. These requirements are adequate and comply with Title V program. No change to this condition, is hence, warranted.

15A NCAC 2D .0521 “Control of Visible Emissions”

This silo is subject to 20 percent opacity limit, as per the current permit.

The Permittee is required to observe the visible emissions from the silo on a monthly basis to determine whether the emissions are above "normal" and to establish "normal" for the visible emissions within 30 days of start-up. As per the FRO (Jim Moser), the Permittee has not yet established the “normal” for visible emissions and hence, this requirement will remain in the permit.

Finally, the current permit includes the requirements for record keeping for results of the monthly observations in a logbook and reporting of observations in a summary form semi-annually.

7. NSPS, NESHAPS, Attainment Status, NSR, 112(r), and CAM

NSPS

Not Applicable.

NESHAPS

Not Applicable.

Attainment Status and NSR

Robeson County is in attainment of all NAAQS. PSD is an applicable program for attainment pollutants. Major sources and major modifications for any attainment pollutant in this county are subject to the review under PSD.

Refer to Section 6.1 above for more details.

112(r)

The facility is not subject to the requirements of Section 112(r) of CAA.

CAM

Refer to Section 6.1 above for more details.

8. Facility Wide Air Toxics

The current permit includes toxic pollutant emission rate (TPER) limits for nickel and cadmium in accordance with 2Q .0711. This permit revision does not trigger any review under NC’s air toxics program. No change to the existing permit condition is required. It is a state-only enforceable requirement.

9. Facility Emissions Review

The following Table includes facility wide emissions summary after this modification. Actual emissions have been taken from the 2008 emission inventory while potential emissions data are copied from the application.

Pollutant	Actual Emissions	Potential Emissions
	tons/year	tons/year
Particulate (TSP)	3.5	58
Particulate (PM-10)	2.1	56
Particulate (PM-2.5)	0.9	14
Carbon Monoxide	5.4	1,055
Nitrogen Oxides	58.3	746
Sulfur Dioxide	177.8	989
Volatile Organic Compounds	0.6	2
Single largest HAP (HCl)	9.8	139
Total HAP	10.2	> 139

10. Stipulation Review

The following changes were made to the Lumberton Energy, LLC Air Permit No. 05543T16:

Old Page No. [Air Permit No. 05543T16]	New Page No. [Air Permit No. 05543T17]	Condition No.	Changes
3	3	Section 1 Table	Revise the source descriptor for ROFA and ROTAMIX to state that these systems can operate as-needed.
4	4	2.1 A Table	Remove sulfur content limit and alternate operating scenario for SO ₂ for both 2D .0501(e) and 2D .0530 requirements.
8 and 9	-	2.1 A.4.e., h. and j.	Remove sulfur content limit and associated monitoring and reporting requirements.
9 and 10	-	2.1 A.4. aa. through ee.	Remove alternate operating scenario for SO ₂ .
10	-	2.1 A.5. e. and h.	Remove sulfur content limit and associated monitoring requirement.
11 and 12	-	2.1 A.5. aa. through ee.	Remove alternate operating scenario for SO ₂ .
12	10	2.1 A.6.	Change the label to Section 2.1 A.7.
13	-	2.1 A.7.	Remove this repealed requirement.

14	9	2.1 A.8.	Label it as Section 2.1 A.6. and modify this requirement to include actions required upon occurrence of any excursion.
-	19	Section 2.4	Include this new CAIR requirement.
31 and 32	29 and 30	Section 3	Revise General Condition NN and add a new OO Condition. Revise the list of acronyms.

11. Public Notice / EPA and Affected States Review

Pursuant to 15A NCAC 2Q .0521, a notice of the draft Title V Operating Permit will be published in a newspaper of general circulation in the area where the facility is located, to provide for a 30-day comment period, with an opportunity for a public hearing. Copies of the draft (proposed) permit, review and public notice will be sent to EPA for their 45-day review, to persons on the Title V mailing list, and to the Permittee for review.

12. Conclusions, Comments, and Recommendations

PE seal and review for any control devices are not required, because the Permittee is not proposing any new control device or a modification to any existing device.

The requirement of a local zoning consistency is not applicable, because, the Permittee is not proposing a new facility or an expansion to an existing facility.

The draft permit was e-mailed to Jim Moser of FRO on March 1, 2010 for review and comment. Jim responded on March 9th via email that he did not have any comment on the draft permit or the associated review.

The draft permit was also e-mailed to the company on March 1, 2010 for review and comments. The company provided comments verbally on March 9th with a correction on facility name in the Section 2.4 of the draft permit. This error will be corrected in the revised permit.

Finally, this engineer recommends issuing the final permit upon conclusion of review period.