STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NOTICE OF FINAL PERMIT

In the Matter of an
Application for Permit

Mr. Walter P. Bussells
JEA
21 West Church Street
Jacksonville, Florida 32202-3139

DEP File No. 0310045-003-AC
PSD-FL-265

Enclosed is the FINAL Permit Number PSD-FL-265 for the construction of two new coal- and petroleum coke-fired circulating fluidized bed boilers and associated ancillary equipment and processes at the existing Northside Generating Station in Duval County. This permit is issued pursuant to Chapter 403, Florida Statutes and in accordance with Rule 62-212.400., F.A.C. - Prevention of Significant Deterioration(PSD).

Any party to this order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, F.S., by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Legal Office; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 (thirty) days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

C.H. Fancy, P.E., Chief
Bureau of Air Regulation

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF FINAL PERMIT (including the FINAL permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 7-14-99 to the person(s) listed:

Mr. Walter P. Bussells, JEA *
Mr. Gregg Worley, EPA
Mr. John Bunyak, NPS
Mr. Chris Kirts, DEP
Mr. Hamilton S. Oven, PPS

Mr. Scott Goorland, DEP-OGC
Mr. Robert S. Pace, RESD
Mr. Mike Bilello, Foster Wheeler
Hon. John A. Delaney, Mayor, City of Jacksonville
Mr. Brian D. Teeple, Exc. Director, NE FL RPC

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to §120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

(Clerk) (Date) 7-14-99

FINAL DETERMINATION

JEA Northside Units 1 and 2 Repowering Project
Permit No. 0310045-003-AC (PSD-FL-265)

An Intent to Issue an Air Construction Permit for JEA, Northside Generating Station, Northside Units 1 and 2 Repowering Project, located at 4377 Heckscher Drive, Jacksonville, Duval County, Florida, was distributed on May 12, 1999. The Public Notice of Intent to Issue Air Construction Permit was published in the Florida Times-Union on May 18, 1999. Copies of the draft construction permit were available for public inspection at the Department offices in Jacksonville and Tallahassee.

The National Park Service, the U.S. Environmental Protection Agency and the public submitted no comments. Two comments on the proposed air construction permit were submitted by the applicant in response to the public notice and notice to the parties.

A summary of the two comments received and the Department's responses to those comments are provided in the following paragraphs:

Comment 1: JEA submitted a comment on June 2, 1999, requesting that the word "only" be inserted in Specific Condition 40 to be consistent with other similar conditions and to prevent any possible ambiguity caused by its omission.

Response: Condition 40 is revised as follows:

> Mercury: Initial compliance tests <u>only</u> shall be performed on Unit 2 using EPA Methods 29, 101 or 101A to determine compliance with the mercury emission limit in Condition 22 while firing coal and while firing petroleum coke.

Comment 2: JEA submitted a comment on June 14, 1999, and revised the air permit application to include an alternative sulfur dioxide air quality control system offered by ABB Environmental Services. JEA recently learned of this ABB system available for the control of sulfur dioxide emissions that utilizes a somewhat different configuration although the basic technologies are conventional with proven capabilities. The ABB system comes with the same emission guarantees as the technologies previously described in the original air permit application.

Response: The Department approves the use of the ABB air quality control system for sulfur dioxide emissions described in JEA's June 14 submittal. No changes are required to the air permit, but the following changes are being made to the Department's Best Available Control Technology (BACT) determination to recognize the Department's approval of the ABB system:

Is your RETURN ADDRESS completed on the reverse side?

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Walter P. Bussels
JEA
21 W. Church St.
Jacksonville, Fl
32202-3139

4a. Article Number
Z 333 618 197

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
7-20-99

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X D. [illegible]

PS Form **3811**, December 1994 102595-98-B-0229 Domestic Return Receipt

Thank you for using Return Receipt Service.

Z 333 618 197

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to Walter Bussels	
Street & Number JEA	
Post Office, State, & ZIP Code Jax Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 7-14-99 031.0045-003-AC PSD-Fl-265	

PS Form **3800**, April 1995

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NOTICE OF FINAL PERMIT

In the Matter of an
Application for Permit

Mr. Walter P. Bussells
JEA
21 West Church Street
Jacksonville, Florida 32202-3139

DEP File No. 0310045-003-AC
PSD-FL-265

Enclosed is the FINAL Permit Number PSD-FL-265 for the construction of two new coal- and petroleum coke-fired circulating fluidized bed boilers and associated ancillary equipment and processes at the existing Northside Generating Station in Duval County. This permit is issued pursuant to Chapter 403, Florida Statutes and in accordance with Rule 62-212.400., F.A.C. - Prevention of Significant Deterioration(PSD).

Any party to this order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, F.S., by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Legal Office; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 (thirty) days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

C.H. Fancy, P.E., Chief
Bureau of Air Regulation

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF FINAL PERMIT (including the FINAL permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 7-14-99 to the person(s) listed:

Mr. Walter P. Bussells, JEA *
Mr. Gregg Worley, EPA
Mr. John Bunyak, NPS
Mr. Chris Kirts, DEP
Mr. Hamilton S. Oven, PPS
Mr. Scott Goorland, DEP-OGC
Mr. Robert S. Pace, RESD
Mr. Mike Bilello, Foster Wheeler
Hon. John A. Delaney, Mayor, City of Jacksonville
Mr. Brian D. Teeple, Exe. Director, NE FL RPC

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to §120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Kim Johnson 7-14-99
(Clerk) (Date)

FINAL DETERMINATION

JEA Northside Units 1 and 2 Repowering Project
Permit No. 0310045-003-AC (PSD-FL-265)

An Intent to Issue an Air Construction Permit for JEA, Northside Generating Station, Northside Units 1 and 2 Repowering Project, located at 4377 Heckscher Drive, Jacksonville, Duval County, Florida, was distributed on May 12, 1999. The Public Notice of Intent to Issue Air Construction Permit was published in the Florida Times-Union on May 18, 1999. Copies of the draft construction permit were available for public inspection at the Department offices in Jacksonville and Tallahassee.

The National Park Service, the U.S. Environmental Protection Agency and the public submitted no comments. Two comments on the proposed air construction permit were submitted by the applicant in response to the public notice and notice to the parties.

A summary of the two comments received and the Department's responses to those comments are provided in the following paragraphs:

Comment 1: JEA submitted a comment on June 2, 1999, requesting that the word "only" be inserted in Specific Condition 40 to be consistent with other similar conditions and to prevent any possible ambiguity caused by its omission.

Response: Condition 40 is revised as follows:

> Mercury: Initial compliance tests <u>only</u> shall be performed on Unit 2 using EPA Methods 29, 101 or 101A to determine compliance with the mercury emission limit in Condition 22 while firing coal and while firing petroleum coke.

Comment 2: JEA submitted a comment on June 14, 1999, and revised the air permit application to include an alternative sulfur dioxide air quality control system offered by ABB Environmental Services. JEA recently learned of this ABB system available for the control of sulfur dioxide emissions that utilizes a somewhat different configuration although the basic technologies are conventional with proven capabilities. The ABB system comes with the same emission guarantees as the technologies previously described in the original air permit application.

Response: The Department approves the use of the ABB air quality control system for sulfur dioxide emissions described in JEA's June 14 submittal. No changes are required to the air permit, but the following changes are being made to the Department's Best Available Control Technology (BACT) determination to recognize the Department's approval of the ABB system:

Is your RETURN ADDRESS completed on the reverse side?

- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Walter P. Busada
JEA
21 W. Church St.
Jacksonville, Fl
32202-3139

4a. Article Number
Z 333 618 197

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
7-20-99

5. Received By: (Print Name)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature: (Addressee or Agent)
X D. Gnes

PS Form 3811, December 1994 102595-98-B-0229 Domestic Return Receipt

Thank you for using Return Receipt Service.

Z 333 618 197

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail (See reverse)

Sent to Walter Busada	
Street & Number JEA	
Post Office, State, & ZIP Code Jax Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 7-14-99 03100045-003-AC PSD-Fl-265	

PS Form 3800, April 1995

Descriptions of AQCS's

- Gaseous emissions from the CFB boilers will be vented to add-on air quality control systems (AQCS's) which will further reduce SO_2 emissions and control particulate matter (PM & PM_{10}), as well as mercury and fluoride emissions. Within the application, JEA has presented three AQCS strategies: (1) circulating fluidized bed scrubber/electrostatic precipitator (CFBS/ESP) combination (proposed by Environmental Elements Corporation), (2) a spray dryer absorber/fabric filter (SDA/FF) (proposed by WAPC), and (3) a circulating fluidized bed scrubber with a fabric filter (proposed by ABB Environmental Services).

Particulate Matter

- All three options for the CFB boilers to reduce SO_2 emissions included particulate matter (PM_{10}/TSP) guarantees of 0.011 lb/mmBtu. The circulating fluidized bed scrubber is considered a "newer" technology with reportedly lower capital and operating costs over the more conventional spray dryer absorber/fabric filter. The proposed combinations have been successfully demonstrated on other projects.

- Particulate Matter (PM/PM_{10}) emissions of 0.011 lb/mmBtu from the CFB boilers are less than or equal to other BACT determinations for similar sized CFB boilers. The use of a SDA/FF, CFBS/ESP, or CFBS/FF as an add-on AQCS is considered to be the most stringent control technology available and therefore constitutes BACT.

Fluoride

- The use of a SDA/FF, a CFBS/ESP, or a CFBS/FF will provide for the indirect control of fluoride from the CFB boilers. All three AQCS's included a fluoride guarantee of 1.57×10^{-4} lb/mmBtu which is lower than the most stringent emission limitation for a coal fired CFB boiler and represents BACT.

- Total Fluoride (HF) emissions of 0.43 lb/hr, on a 3-hour average, from the CFB boilers is lower than other BACT determinations for similar sized CFB boilers. The use of a SDA/FF, CFBS/ESP, or CFBS/FF as add-on AQCS's is considered to be the most stringent control technology available and therefore constitutes BACT.

Mercury

- For CFB boilers, the most stringent control technology for mercury emissions has been the use of an add-on PM AQCS and CFB boiler technology to reduce mercury emissions to levels of 1.45×10^{-5} lb/mmBtu. The available control options include the following:
  - Spray Dryer/Fabric Filter;

- Fluidized Bed Scrubber/Electrostatic Precipitator (ESP);
- Fluidized Bed Scrubber/Fabric Filter; and
- Carbon Injection System

- The mercury contents of the coal, petroleum coke, and limestone have been estimated at 1.70×10^{-7} lb/lb, 3.0×10^{-8} lb/lb, and 1.0×10^{-8} lb/lb, respectively. The worst-case coal scenario results in uncontrolled mercury emissions of 1.74×10^{-5} lb/mmBtu. The worst-case petroleum coke scenario results in uncontrolled mercury emissions of 1.47×10^{-5} lb/mmBtu. These values represent worst case release rates which were presented by the applicant's CFB boiler vendor to the AQCS vendors. The AQCS vendors provided proposals and guarantees that mercury emissions from their systems will not exceed 0.03 lb/hr (1.05×10^{-5} lb/mmBtu). The use of either the SDA/FF, CFBS/ESP, or CFBS/FF will provide for the indirect control of mercury from the CFB boilers. All three AQCS's proposed included mercury guarantees of 1.05×10^{-5} lb/mmBtu which is more stringent than the most stringent emission limitation and represents BACT. The use of a carbon injection system designed to further control Hg emissions was evaluated based on a vendor quote by the applicant. Total capital costs of $680,000, annualized costs of $1,000,000 per year, and incremental costs of about 9.5×10^{6} per ton to control Hg emissions were estimated. The $9.5 million per ton incremental cost is excessive and is consistent with other Department determinations which did not require add-on AQCS's for Hg. Because of the ability of the proposed AQCS to meet the most stringent emission limitation and consideration of the economic impacts the use of a SDA/FF, CFBS/ESP, or CFBS/FF is BACT.

- Mercury (Hg) emissions of 0.03 lb/hr, on a 3-hour average, from the CFB boilers is lower than other BACT determinations for similar sized CFB boilers. The use of either a SDA/FF, CFBS/ESP, or CFBS/FF as add-on AQCS's is considered to be the most stringent control technology available and therefore constitutes BACT.

The final action of the Department is to issue the permit with the changes noted above.

Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

PERMITTEE:

JEA
21 West Church Street
Jacksonville, FL 32202

Authorized Representative:
Walter P. Bussells
Managing Director and Chief Executive Officer

FID No.	0310045
PSD No.	PSD-FL-265
SIC No.	4911
Project	Northside Repowering
Expires:	October 1, 2003

PROJECT AND LOCATION:

Permit for the construction of Repowered Units 1 and 2, coal and petroleum coke-fired circulating fluidized bed (CFB) boilers with associated ancillary equipment and processes, Northside Generating Station, located at 4377 Heckscher Drive, Jacksonville, Duval County, Florida.

UTM: Zone 17, 446.7 km E; 3365.1 km N

STATEMENT OF BASIS:

This construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and the Florida Administrative Code (F.A.C.) Chapters 62-4, 62-204, 62-210, 62-212, 62-296 and 62-297. The above named permittee is authorized to modify the facility in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department of Environmental Protection (Department).

Attached appendices and Tables made a part of this permit:

Appendix BD	BACT Determination
Appendix GC	Construction Permit General Conditions

Howard L. Rhodes, Director
Division of Air Resources
Management

FACILITY DESCRIPTION

JEA is authorized to install two new coal- and petroleum coke-fired circulating fluidized bed (CFB) boilers and associated ancillary equipment and processes at the existing Northside Generating Station in Duval County, Florida. These new boilers will be connected to the existing steam turbines for Units 1 and 2 (297.5 MW each). A new, dual-flued 495-foot stack will be added to the facility for Repowered Units 1 and 2, along with solid fuel delivery and storage facilities, limestone preparation and storage facilities (including three limestone dryers), a lime silo, aqueous ammonia storage, polishing scrubbers, precipitators or baghouses, ash removal and storage facilities, and an electrical substation.

Existing Unit 2 boiler will be permanently shut down upon issuance of this permit, and existing Unit 1 boiler will be permanently shut down upon its repowering. Other existing units at the plant consist of: Unit 3, a pre-NSPS boiler with a nominal rating of 564 MW fired by natural gas, landfill gas, No. 6 residual fuel oil, and used oil; four pre-NSPS distillate fuel oil fired combustion turbines with a nominal rating of 52.5 MWs each; and one auxiliary boiler fired by natural gas, LP gas, No. 2 distillate fuel oil, No. 6 residual fuel oil, and used oil.

The Northside Generating Station and the adjoining St. Johns River Power Park (SJRPP) are considered to be a single air emission "facility" for air permitting purposes.

EMISSION UNITS

ARMS Emission Unit No.	System	Emission Unit Description
026	Power & Steam Generation	NGS – Circulating Fluidized Bed Boiler No. 2
027	Power & Steam Generation	NGS – Circulating Fluidized Bed Boiler No. 1
028	Materials Handling	NGS – Materials Handling & Storage Operations
029	Materials Handling	NGS – Crusher House
031	Materials Handling	NGS – Boiler Fuel Silos
032	Materials Handling	NGS – Limestone Receiving Bins
033	Materials Handling	NGS – Limestone Dryers/Mills
034	Materials Handling	NGS – Limestone Crusher Conveyor Transfers
035	Materials Handling	NGS – Limestone Feed Silos
036	Materials Handling	NGS – Fly Ash Waste Bins
037	Materials Handling	NGS – Fly Ash Transfer & Storage Systems
038	Materials Handling	NGS – Bed Ash Transfer & Storage Systems
039	Materials Handling	NGS – Fly & Bed Ash Silo Hydrators
040	Materials Handling	NGS – Bed Ash Truck Loadout Systems
041	Materials Handling	NGS – Fly Ash Truck Loadout Systems
042	Materials Handling	NGS – Pebble Lime Silo

REGULATORY CLASSIFICATION

The Northside Generating Station and SJRPP are classified as a single "major" facility and a single Title V Source. Air pollutant emissions are over 100 tons per year (TPY) for carbon monoxide, oxides of nitrogen, sulfur dioxide, particulate matter (PM and PM_{10}), volatile organic compounds; 25 TPY for total hazardous air pollutants; and 10 TPY for hydrochloric acid.

This type of facility (fossil-fuel-fired steam generator) is on the list of the 28 Major Facility Categories in Table 62-212.400-1. Because the facility's emissions are greater than 100 TPY for the pollutants listed

above, the facility is also a Major Facility with respect to Rule 62-212.400, F.A.C. In accordance with Chapters 62-212, F.A.C., and the Significant Emission Rates in Table 212.400-2, F.A.C., Prevention of Significant Deterioration (PSD) review is required for the Northside Units 1 and 2 Repowering Project for the following pollutants: oxides of nitrogen, particulate matter (PM/PM_{10}), carbon monoxide, volatile organic compounds, hydrogen fluoride, and mercury.

Various emission units and activities within this facility are subject to the following federal New Source Performance Standards: 40 CFR 60 Subparts A, Da, Y, and OOO.

This facility is also subject to the federal Acid Rain Program under Title IV of the Clean Air Act.

A separate PSD permit revision is being issued to address materials handling operations at SJRPP (PSD-FL-010) that will support the Northside Units 1 and 2 Repowering Project.

PERMIT SCHEDULE

- May 13, 1999 Distribute Intent to Issue Permit
- March 17, 1999 Application Deemed Complete
- February 15, 1999 Received Application

RELEVANT DOCUMENTS

The documents listed below are the basis of the permit. They are specifically related to this permitting action. These documents are on file with the Department.

- Application (as received on February 15, 1999)
- Application revisions (as received on May 4, 1999)

ADMINISTRATIVE

1. Regulating Agencies: All documents related to applications for permits to operate, construct or modify an emission unit(s) should be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection (DEP or Department) located at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, and phone number (850) 488-0114. All documents related to reports, tests, and notifications should be submitted to the Jacksonville Regulatory and Environmental Services Department (RESD), 117 W. Duval Street, Suite 225, Jacksonville, Florida 32202-4111, (904) 630-3484.

2. General Conditions: The owner and operator is subject to and shall operate under the attached General Permit Conditions G.1 through G.15 listed in Appendix GC of this permit. General Permit Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. [Rule 62-4.160, F.A.C.]

3. Terminology: The terms used in this permit have specific meanings as defined in the corresponding chapters of the Florida Administrative Code.

4. Forms and Application Procedures: The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. [Rule 62-210.900, F.A.C.]

5. Application for Title V Permit: An application for a Title V operating permit must be submitted to the Department's Bureau of Air Regulation, with a copy to RESD, 90 days prior to expiration of this permit, but not later than 180 days after commencing operation. [Chapter 62-213, F.A.C.]

6. New or Additional Conditions: Pursuant to Rule 62-4.080(1), F.A.C., for good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080(1), F.A.C.]

7. Annual Reports: Pursuant to Rule 62-210.370(3), F.A.C., Annual Operating Reports, the permittee is required to submit annual reports on the actual operating rates and emissions from this facility. Annual operating reports shall be sent to RESD by March 1st of each year.

8. Stack Testing Facilities: Stack sampling facilities shall be installed in accordance with Rule 62.297.310(6), F.A.C.

9. Construction: Approval to construct shall become invalid if construction is not commenced within 18 months after issuance of the construction permit, if construction is discontinued for a period of 18 months or more, or if construction is not completed within five years. The Department may extend the 18-month periods upon a satisfactory showing that an extension is justified. [40 CFR 52.21(r)(2)]

10. BACT Determination: In conjunction with extensions of the 18 month periods to commence or continue construction, or an extension of the permit expiration date, the permittee may be required to demonstrate the adequacy of any previous determination of best available control technology for the source. [40 CFR 52.21(j)(4)]

11. Permit Extension: This permit shall expire on October 1, 2003. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation at least 60 days before the expiration of the permit [Rule 62-4.090, F.A.C.]

12. Semiannual Reports: Semiannual excess emission reports, required under 40 CFR 60.7 (c) (64 Fed. Reg. 7458 (Feb. 12, 1999)) shall be submitted to RESD.

13. Modifications: The permittee shall give written notification to the Department when there is any modification to this facility. This notice shall be submitted sufficiently in advance of any critical date involved to allow sufficient time for review, discussion, and revision of plans, if necessary. Such notice shall include, but not be limited to, information describing the precise nature of the change; modifications to any emission control system; production capacity of the facility before and after the change; and the anticipated completion date of the change. [Chapters 62-210 and 62-212, F.A.C.]

14. Notifications of Modifications: All persons who commented in writing on the proposed PSD permit shall be notified, at their last known addresses, of any request made by JEA to revise the PSD permit or subsequent Title V permit for Northside Units 1, 2, and 3, other than for administrative permit corrections. If a decision is made to revise the permit in a substantive manner, an additional notice shall also be provided to such persons (and to the general public through a newspaper notice) of the opportunity to request an administrative hearing. [Request of applicant; Chapter 62-212, F.A.C.]

15. Acid Rain Program: The facility shall comply with all the regulations and requirements of the Federal Acid Rain Program as outlined in 40 CFR 72.

APPLICABLE STANDARDS AND REGULATIONS

1. Applicable Regulations: Unless otherwise indicated in this permit, the construction and operation of the subject emission units shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of Chapter 403, F.S. and Florida Administrative Code Chapters 62-4, 62-103, 62-204, 62-210, 62-212, 62-213, 62-214, 62-296 and 62-297. The subject emission units at Northside are also subject to following requirements of the Code of Federal Regulations Section 40, Part 60 (1998 version), adopted by reference in the Florida Administrative Code Rule 62-204.800 (as applicable):

(a) Subpart A, General Provisions, Sections 60.7, 60.8, 60.11, 60.12, 60.13, and 60.19;

(b) Subpart Da, Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978 (Northside Units 1 and 2);

(c) Subpart Y, Standards of Performance for Coal Preparation Plants (coal handling at Northside, excluding open storage piles); and

(d) Subpart OOO, Standards of Performance for Nonmetallic Mineral Processing Plants (limestone handling at Northside, except for open storage piles and truck unloading).

Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements or regulations. [Rule 62-210.300, F.A.C.]

GENERAL OPERATION REQUIREMENTS

2. Capacity: The maximum heat input rates to Northside Units 1 and 2 shall not exceed 2764 mmBtu/hr, per unit. The maximum heat input rates to the three limestone dryers shall not exceed 57.9 mmBtu/hr, for all three units combined. These rates are included only for purposes of determining capacity during compliance stack tests. Continuous compliance with these rates is not required; capacity during compliance testing shall be determined based on fuel flow data and the as-fired heat content of the fuel. **[Rule 62-210.200(228), F.A.C.]**

[Permitting note: The permittee and the Department agree that the CEMS used for the federal Acid Rain Program (40 CFR Part 75) conservatively overestimates heat input ratings. The monitoring data for heat input is therefore not appropriate for purposes of compliance, including annual compliance certifications.]

3. Maximum Allowable Hours: Northside Units 1 and 2 and the materials handling operations may operate continuously (i.e., 8760 hours per year). **[Rule 62-210.200(228), F.A.C.]**

4. Fuels: Only coal, petroleum coke, No. 2 fuel oil (maximum sulfur content of 0.05 percent by weight), and natural gas, shall be fired in Units 1 and 2. Only No. 2 fuel oil (maximum sulfur content of 0.05 percent by weight) and natural gas shall be fired in the three limestone dryers. **[Rule 62-210.200(228), F.A.C.]**

5. Unconfined Particulate Emissions: During the construction period, unconfined particulate matter emissions shall be minimized by dust suppressing techniques such as covering, seeding, and application of water or chemicals to the affected areas, as necessary. After construction and during operation, the following measures shall be taken, in addition to requirements for materials handling

operations specifically addressed herein, to minimize unconfined particulate matter emissions: maintenance of paved areas as needed, regular mowing of grass and care of vegetation, limiting access to plant property by unnecessary vehicles, storage of bagged chemical products in weather-tight buildings (except for fertilizer), and prompt cleanup of spilled powdered chemical products. **[Rule 62-296.320(4)(c), F.A.C.]**

6. Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, JEA shall notify RESD as soon as possible, but at least within one (1) working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; the steps being taken to correct the problem and prevent future recurrence; and where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit and the regulations. **[Rule 62-4.130, F.A.C.]**

7. Operating Procedures: Operating procedures shall include good operating practices and proper training of all operators and supervisors. The good operating practices shall meet the guidelines and procedures as established by the equipment manufacturers. All operators (including supervisors) of air pollution control devices shall be properly trained in plant specific equipment. **[Rule 62-4.070(3), F.A.C.]**

8. Circumvention: The owner or operator shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. **[Rule 62-210.650, F.A.C.]**

CONTROL TECHNOLOGY - CFB BOILERS

9. Sulfur Dioxide Control: Sulfur dioxide (SO_2) and acid gases shall be controlled by the injection of limestone into the CFB boiler beds. Residual sulfur dioxide and acid gases shall be further controlled by the use of add-on air quality control systems for Units 1 and 2 to meet limits of 0.2 lb/mmBtu, 24-hr block average, and 0.15 lb/mmBtu, 30-day rolling average. The permittee shall provide design specifications to the Department at least 90 days prior to installation of the devices. **[Applicant Request]**

10. Oxides of Nitrogen Control: A selective non-catalytic reduction (SNCR) system designed to meet a limit of 0.09 lb/mmBtu, 30-day rolling average, shall be used on Units 1 and 2 for control of oxides of nitrogen (NOx) emissions. **[Rule 62-212.400, F.A.C.]**

11. Particulate Matter Control: Particulate matter (PM and PM_{10}) shall be controlled by the use of high efficiency, add-on air quality control devices (either fabric filters or electrostatic precipitators) on Units 1 and 2 that are designed to meet a limit of 0.011 lb/mmBtu. The permittee shall identify the devices selected and shall provide design specifications to the Department at least 90 days prior to installation of the devices. **[Rule 62-212.400, F.A.C.]**

EMISSION LIMITS AND STANDARDS

The following shall apply upon completion of the initial compliance tests, certification tests, and performance specification tests, as applicable and per pollutant, for each of the repowered Units 1 and 2, except as noted:

12. Best Available Control Technology: The following is a summary of the BACT determinations by DEP of the Repowered Units 1 and 2, and other limits requested by the applicant, as noted.

Table 1. Emission Limits for Units 1 and 2

Pollutant	Emission Limits– Per Unit
Visible emissions	10 percent opacity, 6-minute block average
SO_2 [2]	0.2 lb/mmBtu, 24-hour block average[2, 3] 0.15 lb/mmBtu, 30-day rolling average [2]
NO_x [1]	0.09 lb/mmBtu, 30-day rolling average[4]
PM/PM_{10} [1]	0.011 lb/mmBtu, 3-hour average [1]
CO [1]	350 lbs/hour, 24-hour block average [1,3]
VOCs [1]	14 lbs/hour, 3-hour average [1]
Pb [2]	0.07 lb/hour, 3-hour average [2]
H_2SO_4 [2]	1.1 lbs/hour, 3-hour average [2]
HF [1]	0.43 lb/hour, 3-hour average [1]
Hg [1]	0.03 lb/hour, 6-hour average [1]

[1]BACT determination.

[2]Requested by applicant.

[3]24-hour block averages are calculated from midnight to midnight.

[4]Equivalent to approximately 0.8-0.9 lb/MWhr (gross energy output).

13. Visible Emissions: Visible emissions from Units 1 and 2 shall not exceed 10 percent opacity, 6-minute block average, excluding periods of startup, shutdown, and malfunction. **[Rule 62-212.400, F.A.C.]**

14. Sulfur Dioxide:

(a) Sulfur dioxide (SO_2) emissions from Units 1 and 2 shall not exceed 0.20 lb/mmBtu (24-hour block average) nor 0.15 lb/mmBtu (30-day rolling average). **[Applicant request.] The equivalent emissions, being provided for informational purposes only, are 553 lbs/hour (24-hour block average), 415 lbs/hour (30-day rolling average), and 1,816 tons per year, per unit.**

(b) Sulfur dioxide from Units 1, 2, and 3 combined shall not exceed 12,284 tons during any consecutive 12-month period on a rolling basis. This condition shall become effective on the first day of the month following successful completion of the initial performance testing of Repowered Unit 2, and compliance shall be based upon at least 12 months of operation after the effective date. **[Applicant request.]**

(c) Sulfur dioxide emissions from existing Unit 1 shall not exceed 0.14 lb/mmBtu (24-hour block average), effective upon startup of Repowered Unit 2. **[Applicant request.]**

15. Oxides of Nitrogen:

(a) Oxides of nitrogen (NO_x) emissions from Units 1 and 2 shall not exceed 0.09 lb/mmBtu on a 30-day rolling average basis. **[Rule 62-212.400, F.A.C.] The equivalent emissions, being provided for informational purposes only, are 249 lbs/hour (30-day rolling average) and 1,090 tons per year, per unit.**

(b) Oxides of nitrogen emissions from Units 1, 2, and 3 combined shall not exceed 3,600 tons during any consecutive 12-month period on a rolling basis. This condition shall become effective on the first day of the month following successful completion of the initial performance testing of Repowered Unit 2, and compliance shall be based upon at least 12 months of operation after the effective date. **[Applicant request.]**

16. Particulate Matter (PM and PM_{10}):

(a) Particulate matter (PM) emissions from Units 1 and 2 shall not exceed 0.011 lb/mmBtu (3-hour average). **[Rule 62-212.400, F.A.C.] The equivalent emissions, being provided for informational purposes only, are 30 lbs/hour (3-hour average) and 133 tons per year, per unit.**

(b) Particulate matter-10 microns or smaller (PM 10) emissions from Units 1 and 2 shall not exceed 0.011 lb/mmBtu (3-hour average). **[Rule 62-212.400, F.A.C.] The equivalent emissions, being provided for informational purposes only, are 30 lbs/hour (3-hour average) and 133 tons per year, per unit.**

(c) Stack emissions of particulate matter (PM) from Units 1, 2, and 3 combined shall not exceed 881 tons during any consecutive 12-month period on a rolling basis. This condition shall become effective on the first day of the month following successful completion of the initial performance testing of Repowered Unit 2, and compliance shall be based upon at least 12 months of operation after the effective date. **[Applicant request.]**

17. Carbon Monoxide: Carbon monoxide (CO) emissions shall not exceed 350 lbs/hour, 24-hour block average, nor 1533 tons per year from either Unit 1 or 2. **[Annual limit—applicant request.]**

18. Volatile Organic Compounds: Volatile organic compound (VOC) emissions shall not exceed 14 lbs/hour (3-hour average), nor 61.5 tons per year from either Unit 1 or 2. **[Annual limit—applicant request.]**

19. Lead: Lead (Pb) emissions shall not exceed 0.07 lb/hour (3-hour average), from either Unit 1 or 2. **[Applicant request.]**

20. Sulfuric Acid Mist: Sulfuric acid mist (H_2SO_4) emissions shall not exceed 1.1 lbs/hour (3-hour average), from either Unit 1 or 2. **[Applicant request]**

21. Hydrogen Fluoride: Hydrogen fluoride (HF) emissions shall not exceed 0.43 lb/hour (3-hour average), from either Unit 1 or 2. **[Rule 62-212.400, F.A.C.]**

22. Mercury: Mercury (Hg) emissions shall not exceed 0.03 lb/hour (6-hour average), from either Unit 1 or 2. **[Rule 62-212.400, F.A.C.]**

MATERIALS HANDLING OPERATIONS

23. Throughput rates: The materials handling and usage rates for coal, petroleum coke, and limestone at Northside shall not exceed the following (for Northside Units 1 and 2 combined), assuming a moisture content of 5.5% or less:

Material	Handling/Usage Rate Tons Per Year
Coal/Petroleum Coke	2.42 million
Limestone	1.45 million

24. Standards: The materials handling sources at Northside shall be regulated as follows, and the emission limits and standards shall apply upon completion of the initial compliance tests for each of the units or activities.

(a) The following materials handling sources shall be equipped with fabric filter controls and visible emissions shall not exceed 5 percent opacity:

Crusher house (EU29)
Boiler fuel silos (EU31)
Limestone receiving bins (EU32)
Limestone crusher conveyor transfers (EU34)
Limestone feed silos (EU35)
Fly ash waste bins (EU36)
Fly ash transfer and storage systems (EU37)
Bed ash transfer and storage systems (EU38)
Bed ash truck loadout systems (EU40)
Fly ash truck loadout systems (EU41)
Pebble lime silo (EU42)

(b) The following materials handling sources shall use wet suppression, water spray, coverings, and/or conditioned materials to control particulate emissions as needed, and visible emissions shall not exceed 5 percent opacity:

Transfer towers (EU28c, EU28g, EU28i, EU28o and EU28q)
Coal and petroleum coke storage building (EU28h)
Stacker/reclaimers (EU28)
Limestone lowering well (EU28d)
Conveyors (EU28)
Ash hydrator loadouts (EU28r)

(c) The following materials handling sources shall use wet suppression, water spray, partial enclosures, and/or conditioned materials to control particulate emissions as needed, and visible emissions shall not exceed 10 percent opacity:

Northside dock ship unloading operations – shiphold and receiving hoppers (EU28a)
Northside dock receiving conveyor (EU28a)
Limestone storage pile (EU28p)
Limestone reclaim hopper (EU28p)

(d) The fly ash and bed ash silo hydrators (EU39) shall use a venturi scrubber and visible emissions shall not exceed 5 percent opacity.

(e) The limestone dryer/mill building shall have no visible emissions (other than from a baghouse vent).

(f) The maximum particulate matter emissions from the following operations shall not exceed 0.01 grains per dry standard cubic foot:

Limestone receiving bins (EU32)
Limestone crusher conveyor transfers (EU34)
Limestone feed silos (EU34)

LIMESTONE DRYERS

25. Limestone dryers: The maximum emissions from each of the three limestone dryers shall not exceed the following limits, which are established as BACT by the Department. These limits shall become effective upon completion of the initial compliance tests:

Pollutants	Limits
Visible Emissions	5% Opacity
Sulfur Dioxide	Maximum 0.05% sulfur No. 2 distillate oil
Particulate Matter	0.01 grains per dry standard cubic foot

EXCESS EMISSIONS

26. Authorized Emissions: Notwithstanding other emission limits and standards established by this permit, excess emissions resulting from startup, shutdown, or malfunction shall be permitted provided that best operational practices are adhered to and the duration of excess emissions shall be minimized but in no case exceed twelve (12) hours in any 24-hour period for a startup on Units 1 and 2 (which shall not be started up at the same time) or two (2) hours in any 24-hour period for other reasons and for all other units and operations unless specifically authorized by DEP or RESD for longer duration. The permittee shall submit a written procedure summarizing the current best operational practices to be followed and the anticipated emissions for startup and shutdown conditions within one year after initial startup of Unit 2, and shall update this document every 5 years (at operating permit renewal). The twelve (12) hours duration of excess emissions may be

reduced through a permit revision based on the operating experience on Units 1 and 2. **[Rule 62-210.700, F.A.C.]**

27. Non-authorized Emissions: Excess emissions which are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented during startup, shutdown or malfunction shall be prohibited pursuant to **Rule 62-210.700, F.A.C**

28. Excess Emissions Report: If excess emissions occur due to malfunctions for a period of more than two hours, the owner or operator shall notify RESD within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may require a written summary report of the incident. Pursuant to the New Source Performance Standards, excess emissions shall also be reported in accordance with 40 CFR 60.7, Subpart A. **[Rules 62-4.130 and 62-210.700(6), F.A.C.]**

COMPLIANCE DETERMINATION

29. Initial Performance Tests and CEMS Certifications: Compliance with the allowable emission limiting standards shall be determined within 60 days after achieving the maximum production rate at which each unit will be operated, but not later than 180 days of initial operation, and periodically thereafter as indicated in this permit. Initial compliance tests shall be performed on Units 1 and 2 while firing either coal or petroleum coke as indicated below, and on the limestone dryers while firing fuel oil. Annual compliance tests shall be performed during every federal fiscal year (October 1 - September 30) pursuant to Rule 62-297.340, F.A.C., on Units 1 and 2 while firing either coal or petroleum coke as indicated below. No stack tests are required if continuous emissions monitoring systems are used to demonstrate compliance pending EPA approval, otherwise initial performance tests shall be conducted as described above. Certification tests (or performance evaluations, as applicable) for all Continuous Emissions Monitoring System (CEMS) required by this permit must be completed within 60 days after achieving the maximum production rate at which each unit will be operated but not later than 90 days of initial operation, and prior to the initial stack tests for that unit.

    Note: No methods other than the ones identified below may be used for compliance testing unless prior DEP or RESD approval is received in writing. DEP or RESD may request a special compliance test pursuant to Rule 62-297.340(2), F.A.C., when, after investigation (such as complaints, increased visible emissions, or questionable maintenance of control equipment), there is reason to believe that any applicable emission standard is being violated.

30. Visible Emissions (Opacity):

    (a) Compliance with the visible emissions limit in Condition 13 shall be demonstrated with continuous opacity monitors installed, certified, operated, and maintained in accordance with 40 CFR Part 75, based on 6-minute block averages and excluding periods of startup, shutdown, and malfunction.

(b) Compliance with the visible emissions limit in Condition 25 for the limestone dryers shall be demonstrated using EPA Method 9 initially and once within every five years thereafter. The limestone dryers shall fire fuel oil during the initial compliance tests. In subsequent years, the testing shall be conducted annually if fuel oil has been fired for more than 400 hours during the previous federal fiscal year; otherwise, the testing shall be conducted once within every five years, even if the testing is conducted while firing natural gas.

31. Sulfur Dioxide:

(a) Compliance with sulfur dioxide (SO_2) emissions limits in Conditions 14(a) and 14 (c) shall be demonstrated with Continuous Emissions Monitoring Systems (CEMS's) installed, certified, operated and maintained in accordance with 40 CFR Part 75, based on 24-hour block and 30-day rolling averages, as applicable, and excluding periods of startup, shutdown, and malfunction. When monitoring data are not available, substitution for missing data shall be handled as required by the federal Acid Rain Program. Emissions recorded in parts per million shall be converted to lb/mmBtu using an appropriate F-factor for purposes of determining compliance with the emission limits in Conditions 14(a) and 14(c).

(b) Compliance with the annual SO_2 emission limit in Condition 14(b) shall be determined based on SO_2 data from the CEMS's. Emissions during periods of startup, shutdown, and malfunction shall be considered in determining the total annual emissions. [Applicant request.]

32. Oxides of Nitrogen:

(a) Compliance with the oxides of nitrogen (NOx) emissions limit in Condition 15(a) shall be demonstrated with a CEMS's installed, certified, operated and maintained in accordance with 40 CFR Part 75, based on a 30-day rolling average and excluding periods of startup, shutdown and malfunction. When monitoring data are not available, substitution for missing data shall be handled as required by the federal Acid Rain Program to calculate the 30-day rolling average.

(b) Compliance with the annual NOx emissions limit in Condition 15(b) shall be determined by summing the products of hourly NOx emission rate and heat input rate data from the CEMS's. Emissions during periods of startup, shutdown, and malfunction shall be considered in determining the total emissions. [Applicant request.]

33. Particulate Matter:

(a) Initial compliance tests only shall be performed on Units 1 and 2 using EPA Methods 5, 5B, 8, 17, or 29 to determine compliance with the particulate matter (PM) limits in Condition 16(a) while firing petroleum coke, and an additional initial compliance test shall be performed on Unit 2 while firing coal. Quarterly tests shall be conducted for the first two years (eight quarters), then annually thereafter while firing petroleum coke. If petroleum

coke has been fired for less than 100 hours during the previous quarter or less than 400 hours during the previous federal fiscal year, the testing may be performed while firing coal.

(b) Initial and annual compliance tests shall be performed on Units 1 and 2 using EPA Methods 201 or 201A, to determine compliance with the particulate matter-10 microns or smaller (PM_{10}) limits in Condition 16(b) while firing petroleum coke, and an additional initial test shall be performed on Unit 2 while firing coal. If petroleum coke has been fired for less than 400 hours during the previous federal fiscal year, the annual testing may be performed while firing coal.

(c) Compliance with the annual particulate matter (PM) emissions limit in Condition 16(c) shall be determined using the following formula. This formula shall be used for each fuel consumed by each of Units 1, 2 and 3, and the resulting PM emissions summed to obtain a 12-month total for Units 1, 2, and 3. [Applicant request.]

PM Emissions = (Fuel Usage[a]) x (Emission Factor[b]) x unit conversion factors

[a]The "Fuel Usage" shall be measured by calibrated fuel flow meters (±5 percent accuracy) and recorded daily when a unit is operated.

[b]An "Emissions Factor" of [(9.19 x weight percent sulfur content) + 3.22] pounds per thousand gallons (lbs/10^3 gal) shall be used for fuel oil burned in existing Units 1 and 3. The weight percent sulfur content shall be determined based on an analysis of a representative sample of the fuel oil being consumed. The analysis shall be performed using either ASTM D2622-92, ASTM D4294-90, both ASTM D4057-88 and ASTM D129-91, or the latest edition. An "Emissions Factor" of 5 pounds per million cubic feet (lb/MCF) shall be used for natural gas burned in existing Units 1 and 3. For Repowered Units 1 and 2, the "Emissions Factor" shall be based on particulate matter stack test results using EPA Methods 5, 5B, 8, 17, or 29 for the individual units, and shall apply to the quantities of fuel consumed in the individual units during the period immediately following the stack tests for the respective units until subsequent stack tests are completed.

(d) Initial compliance tests only shall be performed on the limestone dryers to determine compliance with the particulate matter limit in Condition 25 using EPA Method 5.

34. Carbon Monoxide:

(a) Compliance with the short-term carbon monoxide (CO) limit in Condition 17 shall be demonstrated with CEMS's installed, calibrated, operated, and maintained in accordance with 40 CFR Part 60, Appendix B based on a 24-hour block average and excluding periods of startup, shutdown, and malfunction.

(b) Compliance with the annual CO limit in Condition 17 shall be demonstrated by summing the products of hourly CO emission rate and heat input rate data from the CEMS's. Emissions during periods of startup, shutdown, and malfunction shall be considered in determining the total emissions. [Applicant request.]

35. Valid Data: For the continuous monitoring systems required under Conditions 31(a), 32(a), and 34(a), the permittee shall determine compliance based on CEMS data at the end of each operating day (midnight to midnight), new 24-hour block and 30-day average emission rates shall be calculated from the arithmetic average of all valid hourly emission rates during the previous 24-hours or 30 operating days, as appropriate. Valid hourly emission rates shall not include periods of startup, shutdown, or malfunction as defined in Rule 62-210.200 where emissions exceed the standards in Table 1. These excess emission periods shall be reported as required in Section II, Condition 13. A valid hourly emission rate shall be calculated for each hour in which at least two concentrations are obtained at least fifteen (15) minutes apart.

36. Volatile Organic Compounds: Initial compliance tests shall be performed on Units 1 and 2 using EPA Method 18, 25, or 25A to determine compliance with the volatile organic compound (VOC) emission limit in Condition 18 while firing petroleum coke, and an additional initial test shall be performed on Unit 2 while firing coal. Compliance testing shall also be conducted once within every five years thereafter while firing petroleum coke or coal. Compliance with the CO limits based on CEMS data shall be used as surrogates to indicate compliance with the VOC limits.

37. Lead: Initial compliance tests only shall be performed on Unit 2 using EPA Method 12 or 29 to determine compliance with the lead emission limit in Condition 19 while firing coal and while firing petroleum coke.

38. Sulfuric Acid Mist: Initial compliance tests only shall be performed on Unit 2 using EPA Method 8 to determine compliance with the sulfuric acid mist emission limit in Condition 20 while firing petroleum coke and while firing coal. In addition, compliance with the SO_2 limits based on CEMS data shall be used as a surrogate to indicate compliance with the sulfuric acid mist limit.

39. Hydrogen Fluoride: Initial compliance tests only shall be performed on Unit 2 using EPA Method 13A or 13B to determine compliance with the hydrogen fluoride emission limit in Condition 21 while firing coal and while firing petroleum coke.

40. Mercury: Initial compliance tests only shall be performed on Unit 2 using EPA Methods 29, 101, or 101A to determine compliance with the mercury emission limit in Condition 22 while firing coal and while firing petroleum coke.

41. Materials Handling Operations: Visible emissions tests shall be conducted on the material handling operations to determine compliance with applicable limits, as follows:

Emissions Units at Northside	EPA Method(s)	Duration of VE Test	Frequency	Material
Shiphold (EU 28a)	9	30 min	I only	C or PC
Ship Unloader & Spillage Conveyors (EU 28a)	9	3 hr	I only	C & LS
Conveyors (EU 28)	9	3 hr	I only	C & LS
Transfer Towers (EU 28c, 28g, 28i, 28q)	9	3 hr	I only	C & LS
Fuel Storage Building (EU28h)	9	30 min	I only	C or PC
Fuel Storage Pile - Stacking & Reclaiming (EU28)	9	30 min	I only	C or PC
Limestone Storage Pile (EU28p)	9	30 min	I only	LS
Hydrator Truck Loadout – 1 per silo @ Discharge (EU28r)	9	30 min	I only	Bed & Fly Ash
NSPS - OOO				
Limestone Receiving Bins – Baghouse Exhaust (EU32)	9-VE 5-PM	IVE - 60 min RVE - 30 min	Meth 9: I & R Meth 5: I only	LS
Limestone Crusher Conveyor Transfer - Baghouse Exhaust (EU34)	9-VE 5-PM	IVE - 60 min RVE - 30 min	Meth 9: I & R Meth 5: I only	LS
Limestone Feed Silos - Baghouse Exhaust (EU35)	9-VE 5-PM	IVE - 60 min RVE - 30 min	Meth 9: I & R Meth 5: I only	LS
Limestone Dryer Building	22	IVE - 75 min	I only	LS
NSPS – Y				
Crusher House - Baghouse Exhaust (EU29)	9	IVE - 3 hr RVE - 30 min	I & R	C
Boiler Feed Silos - Baghouse Exhaust (EU31)	9	IVE - 3 hr RVE - 30 min	I & R	C
Other				
Fly Ash Waste Bin - Baghouse Exhaust (EU36)	9	IVE - 30 min RVE - 30 min	I & R	Ash
Fly Ash Silos - Baghouse Exhaust (EU37)	9	IVE - 30 min RVE - 30 min	I & R	Ash
Bed Ash Silos - Baghouse Exhaust (EU38)	9	IVE - 30 min RVE - 30 min	I & R	Ash
Fly Ash Hydrators - Scrubber Exhaust (15 min/hydrator) (EU39)	9	IVE - 60 min RVE - 60 min	I & R	Ash
Bed Ash Hydrators - Scrubber Exhaust (15 min/hydrator) (EU39)	9	IVE - 30 min RVE - 30 min	I & R	Ash
Fly Ash Truck Loadout – Baghouse Exhaust (EU41)	9	IVE - 30 min RVE - 30 min	I & R	Ash
Bed Ash Truck Loadout – Baghouse Exhaust (EU40)	9	IVE - 30 min RVE - 30 min	I & R	Ash
Pebble Lime Silo - Baghouse Exhaust (EU42)	9	IVE - 30 min RVE - 30 min	I & R	Ash

C – Coal
I – Initial R - Renewal (once every 5 years)
IVE – Initial Visible Emissions Test, RVE - Renewal Visible Emissions Test
LS – Limestone; PC-Petroleum Coke

42. Testing Notifications and Capacity: RESD shall be notified, in writing, at least 30 days prior to the initial compliance tests and at least 15 days before annual compliance test(s). Testing of emissions shall be conducted with the emissions unit operation at permitted capacity. Permitted capacity is defined as 90-100 percent of the maximum heat input rate allowed by the permit, as determined using fuel flow data and the as-fired heat content of the fuel. If it is impracticable to test at permitted capacity, the unit may be tested at less than permitted capacity. In this case, subsequent operation is limited to 110 percent of the value reached during the test until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purposes of additional compliance testing to regain the permitted capacity. Compliance test results shall be submitted to RESD no later than 45 days after completion of the last test run. **[Rule 62-297.310, F.A.C.]**

43. Sulfur Content: Vendor or other fuel sampling and analysis data (using applicable ASTM methods) shall be used to determine that the sulfur content of No. 2 fuel oil used in Units 1 and 2 and in the limestone dryers does not exceed 0.05 percent by weight. **[Rule 62-210.200(228), F.A.C.]**

NOTIFICATION, REPORTING AND RECORDKEEPING

44. Records: All measurements, records, and other data required to be maintained by JEA shall be retained for at least five (5) years following the date on which such measurements, records, or data are recorded. These records shall be made available to DEP and RESD representatives upon request. **[Rule 62-4.070(3), F.A.C.]**

45. Compliance Stack Test Reports: A test report indicating the results of the required compliance tests shall be filed with RESD as soon as practical, but no later than 45 days after the last sampling run is completed. **[Rule 62-297.310(8), F.A.C.]**. The test report shall provide sufficient detail on the tested emission unit and the procedures used to allow RESD to determine if the test was properly conducted and if the test results were properly computed. At a minimum, the test report shall provide the applicable information listed in **Rule 62-297.310(8), F.A.C.**

46. Certification Testing of Monitors: As required under the federal Acid Rain Program, the Acid Rain Monitoring Plan for Northside shall be revised to address the new Continuous Emissions Monitoring Systems (CEMS's) for sulfur dioxide, oxides of nitrogen, and visible emissions (opacity) for Repowered Northside Units 1 and 2. The permittee shall provide a copy of this revised plan, as well as model and serial numbers for each of the monitors, to RESD within 45 days after completion of all certification tests. In addition, the permittee shall provide notification that the carbon monoxide CEMS's meet the performance specifications in 40 CFR Part 60, Appendix B (as applicable), and also provide model and serial numbers to RESD within 45 days after completion of the performance specification tests.

47. NSPS Notifications: The permittee shall provide all notices required under 40 CFR Sections 60.7 and 60.8 (as revised 64 Fed. Reg. 7458, Feb. 12, 1999) to RESD, for each unit subject to an NSPS, including:

    (a) Notification of the date of construction, postmarked no later than 30 days after such date;

    (b) Notification of the anticipated date of initial startup, postmarked not more than 60 days nor less than 30 days prior to such date; and

(c) Notification of the actual date of initial startup, postmarked within 15 days after such date.

(d) Notification of any performance test at least 30 days prior to the test and at least 7 days prior notice if a test postponed due to a delay or otherwise by mutual agreement between the permittee and RESD.

48. Quarterly Compliance Reports for Annual Limits: The permitee shall provide reports quarterly to RESD certifying compliance with the 12-month rolling limits on SO_2, NOx and PM (TSP) for Northside Units 1, 2, and 3 set forth in Conditions 14(b), 15(b), and 16(b). The reports shall be submitted within 45 days after the last day of each calendar quarter. **[Applicant request.]**

MONITORING REQUIREMENTS

49. Continuous Emissions Monitoring Systems: The permittee shall install, calibrate, operate, and maintain Continuous Emission Monitoring Systems (CEMS's) in the stack to measure and record the sulfur dioxide, oxides of nitrogen, carbon monoxide, and visible emissions from Units 1 and 2. An emission level above a BACT limit, considering the 6-minute, 24-hour and 30-day rolling average periods, as applicable, shall be reported to RESD pursuant to Rule 62-4.160(8), F.A.C. The continuous emission monitoring systems shall comply with the certification, performance specifications, and quality assurance, and other applicable requirements of 40 CFR Part 75 and 40 CFR Part 60 (Appendix B), as indicated above. Periods of startup, shutdown, and malfunction shall be monitored, recorded, and reported as excess emissions when emission levels exceed the limits in Table 1 following the format of 40 CFR 60.7 (As revised, 64 Fed Reg. 7458 (Feb. 12, 1999)).

50. Determination of Process Variables:

(a) The permittee shall operate and maintain equipment or instruments necessary to determine process variables, such as process weight input or heat input, when such data are needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.

(b) Equipment or instruments used to directly or indirectly determine such process variables, including devices such as belt scales, weight hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value. **[Rule 62-297.310(5), F.A.C]**

APPENDIX BD

BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

JEA Northside Generating Station
Permit No. 0310045-003-AC (PSD-FL-265)
Jacksonville, Duval County, Florida

BACKGROUND

The applicant, JEA (formerly known as the Jacksonville Electric Authority), proposes to repower its Northside Generating Station (NGS) with the installation of two new coal and petroleum coke fired Circulating Fluidized Bed (CFB) boilers and ancillary equipment. NGS is located at 4377 Heckscher Drive, Jacksonville, Duval County. The proposed project will result in "significant increases" with respect to Table 62-212.400-2, Florida Administrative Code (F.A.C.) for emissions of nitrogen oxides (NO_x), particulate matter (PM and PM_{10}), carbon monoxide (CO), volatile organic compounds (VOC), total fluorides (HF), and mercury (Hg). The project is therefore subject to review for the Prevention of Significant Deterioration (PSD) and a determination of Best Available Control Technology (BACT) in accordance with Rules 62-212.400, F.A.C. for these pollutants.

The CFB boilers will be connected to the Existing Unit 1 and 2 steam turbines. The Repowering Project will retain NGS's generating capacity which currently consists of: two 297.5 MW steam turbine-electrical generators (Existing Units 1 & 2); one 564 MW steam turbine-electrical generator; and four 52.5 MW combustion turbine-generators. The ancillary equipment will include coal, petroleum coke, and limestone handling, storage, and processing facilities, a pebble lime silo, the air quality control systems (AQCS), ammonia storage and use, a 495-foot dual flued stack, ash/by-product handling, storage, and processing facilities, and an electrical substation.

Descriptions of the process, project, air quality effects, and rule applicability are given in the Technical Evaluation and Preliminary Determination dated May 13, 1999, accompanying the Department's Intent to Issue. This BACT determination addresses only the activities within the NGS property boundary. Activities associated with the Repowering Project within the property boundary of the St. Johns River Power Park (SJRPP) are addressed within a separate BACT determination and revision to the SJRPP PSD permit (PSD-FL-010(C)).

DATE OF RECEIPT OF A BACT APPLICATION:

The application was received on February 15, 1999 and included a BACT proposal prepared by the applicant's consultant, Foster Wheeler Environmental Corporation.

REVIEW GROUP MEMBERS:

Syed Arif, P.E., Review Engineer

BACT DETERMINATION REQUESTED BY THE APPLICANT:

CFB Boilers

PSD Pollutant	Control Technology	Projected Project Emission Levels
PM_{10}/TSP	CFB Boiler Technology Fabric Filter or Electrostatic Precipitator	0.011 lb/mmBtu (3-hour average) 10% opacity
NO_x	CFB Boiler Technology & SNCR	0.09 lb/mmBtu (30-day rolling average)
CO	Good Combustion Practices	350 lb/hr (24-hour block average)
VOC	Good Combustion Practices	14 lb/hr (3-hour average)
HF	CFB Boiler Technology SO2 & PM AQCS's	0.43 lb/hr (3-hour average)
Hg	CFB Boiler Technology SO_2 & PM AQCS's	0.03 lb/hr (6-hour average)

Limestone Dryers/Mills

PSD Pollutant	Control Technology	Projected Project Emission Levels
PM_{10}/TSP	Add-On AQCS - Fabric Filter Good Combustion Practices	0.01 gr/dscf 5% opacity
NO_x	Low NO_x Burners	N/A
CO	Good Combustion Practices	N/A
VOC	Good Combustion Practices	N/A
HF	Fuel Quality - Use of Natural Gas and/or Low Sulfur Distillate Oil (0.05% Sulfur)	N/A
Hg	Fuel Quality - Use of Natural Gas and/or Low Sulfur Distillate Oil (0.05% Sulfur)	N/A

Materials Handling & Storage Operations - Particulate Matter

Handling & Storage Operation	Control Technologies	Projected Project Emission Levels
Ship Unloading Operations		
Shiphold	1, 4 & 6	10% Opacity
Receiving Hoppers	1, 3, 4 & 6	10% Opacity
Receiving Conveyor	1, 4 & 6	10% Opacity
Conveyors	1, 4 & 6	5% Opacity
Transfer Towers	1, 2, 4 & 6	5% Opacity
Stackers/Reclaimers		
Enclosed Fuel Pile	1, 3, 4 & 6	5% Opacity
Limestone Lowering Well	1, 3, 4 & 6	5% Opacity
Limestone Reclaim Hopper	1, 3 & 6	10% Opacity
Storage Piles		
Enclosed Fuel Pile	1, 3, 4 & 6	5% Opacity
Limestone Pile	1, 3 & 6	10% Opacity
Bed and Fly Ash Hydrator Loadouts	1, 3, 4 & 6	5% Opacity
Crusher House	1, 4 & 5	5% Opacity
Boiler Fuel Silos	4 & 5	5% Opacity
Limestone Receiving Bins	1, 4 & 5	5% Opacity
Limestone Crusher Conveyor Transfers	4 & 5	5% Opacity
Limestone Feed Silos	4 & 5	5% Opacity
Bed Ash Transfer and Storage Systems	4 & 5	5% Opacity
Bed Ash Truck Loadout Systems	4 & 5	5% Opacity
Fly Ash Waste Bins	4 & 5	5% Opacity
Fly Ash Transfer and Storage Systems	4 & 5	5% Opacity
Fly Ash Truck Loadout Systems	4 & 5	5% Opacity
Bed and Fly Ash Hydrators	4 & 7	5% Opacity
Pebble Lime Silo	4 & 5	5% Opacity

Control Strategies:
1. Conditioned Materials
2. Wet Suppression, as needed
3. Water Sprays, as needed
4. Enclosures (Total, Partial, Covers, & Wind Screens)
5. Fabric Filter
6. Best Operating Practices
7. Venturi Scrubber

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

BACT DETERMINATION PROCEDURE:

In accordance with Chapter 62-212, F.A.C., this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department of Environmental Protection (Department), on a case-by-case basis taking into account energy, environmental and economic impacts and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that, in making the BACT determination, the Department shall give consideration to:

- Any Environmental Protection Agency determination of BACT pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 - Standards of Performance for New Stationary Sources or 40 CFR Part 61 - National Emission Standards for Hazardous Air Pollutants.
- All scientific, engineering, and technical material and other information available to the Department.
- The emission limiting standards or BACT determination of any other state.
- The social and economic impacts of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine, for the emission unit in question, the most stringent control available for a similar or identical emission unit or emission unit category. If it is shown that this level of control is technically or economically infeasible for the emission unit in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic impacts.

For the proposed project, the applicable New Source Performance Standards (NSPS) include the following:

- 40 CFR Part 60, Subpart Da - Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978.
- 40 CFR Part 60, Subpart Y - Standards of Performance for Coal Preparation Plants.
- 40 CFR Part 60, Subpart OOO - Standards of Performance for Nonmetallic Mineral Processing Plants

No National Emission Standards for Hazardous Air Pollutants (NESHAPs) exist for fossil-fuel fired steam generators; coal, petroleum coke, limestone, fly ash, and bed ash materials handling systems; nor any limestone dryer/mill. A determination of the Maximum Achievable Control Technology (MACT) was not required based on 40 CFR Part 63.40(c) which provides an exemption for electric steam generating units, nor for the limestone dryers/mills or materials handling and storage operations which are not major emitters of HAPs.

STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES:

The CFB boilers are subject to 40 CFR Part 60, Subpart Da which establishes potential combustion concentrations, emission limitations, and percent reduction requirements for all electric utility steam generating units constructed, reconstructed or modified after September 18, 1978. The applicable emission limitations for the proposed project include the recently revised Subpart Da output-based limit of 1.6 lb NO_X/MW-hr (gross output) effective November 16, 1998. The proposed BACT levels and requested emission limits are considered more stringent than the NSPS requirements of Subpart Da and are presented in Table BD-1.

The materials handling and storage operations, with the exception of the open storage piles, are subject to 40 CFR Part 60, Subpart Y when handling coal. For these operations, Subpart Y prohibits visible emissions of 20 percent opacity or greater from any coal processing and conveying equipment, coal storage system (except open storage), or coal transfer and loading systems. The applicant has proposed visible emissions limitations of 5 and 10 percent opacity on the various operations, as appropriate. The proposed BACT levels are more stringent than the existing NSPS requirements of Subpart Y.

Table BD-1, NSPS Limits for the CFB Boilers

Pollutant	NSPS Emission Limitation	Reduction Requirement	Projected Project Emission Levels
Particulate Matter	0.03 lb/mmBtu	99% (7.0 lb/mmBtu)	0.011 lb/mmBtu
Visible Emissions	20% Opacity	N/A	10% Opacity
Sulfur Dioxide[1]			
Coal	0.9 lb/mmBtu	90%(9.0 lb/mmBtu)[2]	0.15 lb/mmBtu[3]
Petroleum Coke	N/A	N/A	0.15 lb/mmBtu[3]
Natural Gas/Distillate Oil	0.20 lb/mmBtu	0%	0.05 lb/mmBtu
Nitrogen Oxides[3]	1.6 lb/MW-hr	N/A	0.09 lb/mmBtu[4]

Notes:
(1) NSPS SO_2 emission limitation is based on a 30-day rolling average.
(2) Reported NSPS limits are for worst case SO_2 fuels. Emission limitation varies depending upon fuel quality and establishes a 90% reduction and 1.2 lb/mmBtu limitation or 70% reduction when emissions are below 0.60 lb/mmBtu.
(3) Requested SO_2 emission limitation on a 30-day rolling average, in addition the applicant has requested a 0.2 lb/mmBtu, 24-hour block average emission limitation.
(4) NSPS NO_x emission limitation is based on a 30-day rolling average and is equivalent to approximately 0.8 lb/MW-hr, gross output.

The materials handling and storage operations, with the exception of the open storage piles and truck dumping operations, are also subject to 40 CFR Part 60, Subpart OOO when handling limestone. For these operations, the proposed BACT levels are more stringent than the existing NSPS requirements of Subpart OOO which are presented in Table BD-2.

Table BD-2. NSPS Limits for the Limestone Handling Operations

Operation	NSPS Emission Limitations	Projected Project Emission Levels
Limestone Receiving Bins	0.05g/dscm (0.022gr/dscf) 7% opacity	0.01gr/dscf 5% opacity
Limestone Dryer/Mill Building Vents & Exhaust, excluding AQCS exhaust	No Visible Emissions 0% Opacity	No Visible Emissions 0% Opacity
Limestone Dryers/Mills	0.05 g/dscm (0.022 gr/dscf) 7% opacity	0.01gr/dscf 5% opacity
Limestone Crusher/Conveyor Transfers	0.05 g/dscm (0.022 gr/dscf) 7% opacity	0.01gr/dscf 5% opacity
Limestone Feed Silos	0.05 g/dscm (0.022 gr/dscf) 7% opacity	0.01gr/dscf 5% opacity
Limestone Conveyors, Transfer Points, and Enclosures	10% Opacity	5% opacity

Note: The proposed use of a fabric filters with a maximum allowed grain loading of 0.01 gr/dscf (0.023 g/dscm) is more stringent than the existing NSPS limitation.

DETERMINATIONS BY EPA AND STATES:

Table BD-3 contains information on recent BACT/RACT/LAER determinations by EPA and the states for comparable CFB boiler projects. The information was generated using the EPA's RACT/BACT/LAER Clearinghouse database.

Table BD-3, Circulating Fluidized Bed Boiler BACT Determinations

Pollutant	Determination	Emission Limitations	Control Technology
PM (PM_{10}/TSP)	PA-0132 York County Energy	0.011 lb/mmBtu	Fabric Filter (FF)
	PA-0134 Northampton Gen. Co.	0.01 lb/mmBtu	FF
	Fl-Cedar Bay Cogeneration Facility	0.018 lb/mmBtu	FF
NO_x	HI-0009 Applied Energy Services	0.11 lb/mmBtu	CFB Technology/SNCR
	MD-0022 AES Warrior Run	0.1 lb/mmBtu	CFB Technology/SNCR
	Fl-Cedar Bay Cogeneration Facility	0.17 lb/mmBtu	CFB Technology/SNCR
CO	MA-0011 Taunton Energy Center	0.13 lb/mmBtu	Combustion Controls
	OH-0231 Toledo Edison Co.	0.13 lb/mmBtu	Combustion Controls
	Fl-Cedar Bay Cogeneration Facility	0.175 lb/mmBtu	Combustion Controls
VOC	PA-0132 York County Energy	0.004 lb/ mmBtu	Combustion Controls
	PA-0134 Northampton Gen. Co.	0.005 lb/mmBtu	Combustion Controls
	Fl-Cedar Bay Cogeneration Facility	0.015 lb/mmBtu	Combustion Controls
HF	IA-0025 Archer Daniels Midland	1.36×10^{-3} lb/mmBtu	CaO Injection/FF
	WI-0036 Wisconsin Electric Power	7.20×10^{-3} lb/mmBtu	ESP
	Fl-Cedar Bay Cogeneration Facility	7.44×10^{-4} lb/mmBtu	LS Injection/FF
Hg	VA-0190 Bear Island Paper Co.	1.45×10^{-5} lb/mmBtu	Fuel Quality
	WI-0041 Fort Howard Corporation	7.92×10^{-5} lb/mmBtu	Fuel Quality
	Fl-Cedar Bay Cogeneration Facility	2.89×10^{-5} lb/mmBtu	Fuel Quality

Boiler Sizes
- VA-0190 Bear Island Paper Co. - 690 mmBtu/hr
- IA-0025 Archer Daniels Midland - 551.5 mmBtu/hr
- WI-0041 Fort Howard Corporation - 505 mmBtu/hr
- WI-0036 Wisconsin Electric Power - 825 mmBtu/hr
- MA-0011 Taunton Energy Center - 1,604.4 mmBtu/hr
- OH-0231 Toledo Edison Co. - 1,746 mmBtu/hr
- HI-0009 Applied Energy Services - 2,150 mmBtu/hr
- MD-0022 AES Warrior Run - 2,070 MMbTU/HR
- PA-0132 York County Energy - 2,500 mmBtu/hr
- PA-0134 Northampton Gen. Co. - 1,146 mmBtu/hr
- Fl-Cedar Bay Cogeneration Facility - 1,063 mmBtu/hr

BACKGROUND ON CIRCULATING FLUIDIZED BED BOILERS

CFB boiler technology is significantly different from conventional boiler (Pulverized Coal, Stoker, or Cyclone Boilers) technology and offers reduced emissions of SO_2 and NO_x associated with the injection and use of limestone as part of the bed matrix and the relatively low temperatures at which the fuels burn. CFB boiler technology is considered a "Clean Coal Technology" by the U.S. Department of Energy (DOE) and U.S. Environmental Protection Agency (EPA).

Within a CFB boiler a "bed" consisting of a mixture of fuel, limestone, char and ash is suspended in an upwardly flowing gas stream at temperatures high enough to support combustion. Combustion takes place within the bed providing high heat transfer rates at relatively low combustion temperatures (1,500 - 1,600°F). As fuel is added to a CFB Boiler it is quickly heated above its ignition point, ignites and becomes part of the burning bed. The fuel particles are entrained within the bed until they are removed by either the gas stream (air & combustion gases) or with the bed ash. The fuel particles become entrained within the gas stream once their size falls below a given value where its terminal and gas velocities are equal. Once the gas velocity exceeds the terminal velocity, the particles are blown from the bed, collected by a particle separator and returned to the boiler to complete the combustion process. The residence time of the fuel particles is determined by the collection efficiency of the particle separator with smaller particles being exhausted to the CFB boiler's AQCS's.

The development of CFB boiler technology has been driven, in part, by the need to reduce SO_2 and NO_x emissions while burning high sulfur fuels without the use of add-on AQCS's. For reducing SO_2 emissions, limestone is added to the bed where it undergoes calcination and reacts with the SO_2 in the gas stream to form calcium sulfate ($CaSO_4$). The chemistry of the SO_2 reaction includes the following:

$$CaCO_3\,(s) + \text{Energy} \rightarrow CaO\,(s) + CO_2\,(g)$$

$$SO_2\,(g) + \tfrac{1}{2}O_2\,(g) + CaO\,(s) \rightarrow CaSO_4\,(s) + \text{Energy}$$

Depending upon the calcium to sulfur (Ca/S) mole ratio within the bed, SO_2 removal rates as high as 95 percent can be achieved.

For controlling NO_x emissions, CFB boiler technology offers lower operating temperatures and staged combustion to reduce both Thermal and Fuel NO_x. In addition, use of selective noncatalytic reduction (SNCR) within the CFB boiler can further reduce NO_x emissions. Because Thermal NO_x is a high temperature process (2,700°F) CFB boiler operation at temperatures between 1,500°F and 1,600°F significantly reduces NO_x production. In addition, Fuel NO_x is reduced by staging combustion within the CFB boiler, accomplished by injecting less than stoicheometric amounts of air through the distributor plate and the remaining air above the bed.

SNCR offers additional NO_x reductions within the CFB boiler by reacting ammonia or urea with NO_x to form water and molecular nitrogen. Within the CFB boiler the ammonia or urea injected works as a reducing agent within an acceptable temperature range of 1,400°F to 2,000°F. Overall, SNCR can reduce NO_x emissions by as much as 70 percent depending upon initial NO_x concentrations and ammonia injection rates.

The proposed CFB boilers will each have a design heat input rate of 2,764 mmBtu/hr utilizing limestone injection at typical rates of about 104,000 lb/hr and 145,500 lb/hr while firing coal and petroleum coke, respectively. The use of CFB boilers to repower Units 1 and 2 represents a scale-up of the technology for utility use. CFB boilers are considered a "Clean Coal Technology" by the U.S. Department of Energy (DOE) and U.S. Environmental Protection Agency (EPA). For the proposed project, the applicant has received vendor (Foster Wheeler USA) guarantees on the performance of the CFB boilers and emissions. Guaranteed emission rates include the following:

- Nitrogen Oxides - 0.09 lb/mmBtu
- Carbon Monoxide - 0.22 lb/mmBtu and 350 lb/hr
- Volatile Organic Compounds - 0.01 lb/mmBtu and 14 lb/hr

By-products from a CFB boiler include fly ash and bed ash. Fly ash is exhausted from the CFB boiler and collected within an add-on AQCS. Bed ash is removed directly from the CFB boiler and conveyed to either a storage silo or hydrating pond. Both the fly ash and bed ash have potential commercial use.

Gaseous emissions from the CFB boilers will be vented to add-on air quality control systems (AQCS's) which will further reduce SO2 emissions and control particulate matter (PM & PM10), as well as mercury and fluoride emissions. Within the application, JEA has presented three AQCS strategies: (1) circulating fluidized bed scrubber/electrostatic precipitator (CFBS/ESP) combination (proposed by Environmental Elements Corporation), (2) a spray dryer absorber/fabric filter (SDA/FF) (proposed by WAPC), and (3) a circulating fluidized bed scrubber with a fabric filter(CFBS/FF) proposed by ABB Environmental Services.

For the CFBS/ESP combination, CFB boiler flue gases will first enter the CFBS followed by the ESP. Within the CFBS, a bed of hydrated lime and fly ash will be fluidized by the CFB boiler's exhaust gases and the mixing will maximize SO_2 absorption. Reacted lime, unreacted lime, fly ash, and the scrubbed flue gas are vented to an ESP to remove 99.9 plus percent of the particulate matter. A portion of the materials collected by the ESP are recirculated back to the CFBS to ensure efficient use of the lime. The ESP uses electrical forces to move the particles out of the flowing gas stream and onto collector plates. Once the particles are collected on the plates they are removed and collected into a hopper from which they are either recirculated to the CFBS or conveyed to the fly ash waste bin. For the proposed project, the applicant received a vendor (Environmental Elements Corporation) guarantee on the performance of the CFBS/ESP. The guaranteed emission rates include the following:

- Sulfur Dioxide - 0.15 lb/mmBtu
- Sulfuric Acid Mist - 0.0004 lb/mmBtu
- Hydrogen Fluoride - 0.000157 lb/mmBtu
- Particulate Matter - 0.011 lb/mmBtu
- PM_{10} - 0.011 lb/mmBtu
- Lead - 0.000026 lb/mmBtu
- Mercury - 0.0000105 lb/mmBtu (CFBS & ESP)
- Opacity - 10%

For the SDA/FF combination, flue gases exiting the CFB boiler will enter the top of the SDA which is equipped with multiple nozzles. The nozzles will atomize a lime slurry into the flue gas in each SDA and absorb SO_2 and HF from the flue gas while the heat from the flue gas evaporates the slurry water. The evaporating water cools the flue gases from about 275°F to approximately 30° to 35° above the adiabatic saturation temperature of the flue gas. The cooling of the flue gases condenses the various heavy metals including mercury and lead. The fly ash, dried SDA reaction products and scrubbed flue gases are vented to a FF to remove 99.9 plus percent of the particulate matter. The FF can collect particle sizes ranging from submicron to several hundred microns in diameter at efficiencies generally in excess of 99 or 99.9 percent. The dust cake collected on the fabric is primarily responsible for such high efficiency. The FF will use a jet pulse cleaning system to remove the dust cake from the bags. For the proposed project, the applicant received a vendor (Wheelabrator Air Pollution Control, Inc.) guarantee on the performance of the SDA/FF identical to that of the CFBS/ESP combination.

BACKGROUND ON LIMESTONE DRYERS/MILLS

Limestone used in the CFB boilers is required to be dried and milled prior to injection. The limestone will be processed using three (3) dryer/mill units. Each unit will be capable of processing 55 TPH of wet rock (8-12% moisture) and delivering 50 TPH of dried and milled limestone to the conveyor system which transports the materials to the feed silos. The Limestone Dryers/Mills will be fired on either natural gas or low sulfur distillate oil at a maximum rate of 19.3 mmBtu/hr per unit. The dryer/mill vendor (Pennsylvania Crusher Corporation) provided the following emissions data:

- Particulate Matter (PM/PM_{10}) - 0.01 gr/dscf
- Nitrogen Oxides (NOx) - 0.2 lb/mmBtu
- Carbon Monoxide (CO) - 50 ppmv
- Volatile Organic Compounds (VOC) - 0.02 lb/mmBtu

Each dryer/mill will fire natural gas or low sulfur distillate oil (0.05% Sulfur by weight) to control emissions of SO_2, H_2SO_4, and trace metals (Hg & HF). In addition, each dryer/mill be equipped with a fabric filter for reducing particulate matter (PM/PM_{10}) emissions and low-NO_x burners to reduce NO_x emissions in combination with good combustion practices to minimize CO and VOC emissions.

BACKGROUND ON MATERIALS HANDLING OPERATIONS

The proposed project will involve the handling, storage, and processing of coal, petroleum coke, limestone, pebble lime, fly ash, and bottom ash. Within the application, JEA has identified two scenarios associated with the handling, storage and processing of coal, petroleum coke and limestone.

JEA's Base Case involves the construction of a new ship unloading facility near the existing NGS fuel dock supported by the existing Rotary Railcar Dumper at SJRPP. The ship unloading facility would be capable of delivering 2.42 million tons of coal and petroleum coke and 1.45 million tons of limestone per year to NGS. From the NGS ship unloading facility, the materials would be transferred to either the limestone storage pile or the enclosed fuel storage pile by use of a conveyor system. The conveyors would transport the materials at a maximum

rate of 1,500 TPH. Coal and petroleum coke would be reclaimed from within the enclosed storage pile and conveyed to the new Crusher House at a maximum rate of 700 TPH. Within the Crusher House the coal and petroleum coke are crushed and sized at a maximum rate of 1,400 TPH (700 TPH/crusher) and transferred to the boiler feed silos (ten total, five per CFB boiler) by either of two 700 TPH conveyors.

JEA's Alternate 1 involves the construction of additional equipment at SJRCT including a second ship unloader, additional conveyors and transfer points and an enclosed surge pile as well as additional conveyors and transfer points, stackers and reclaimers, and slightly expanding the existing storage pile at SJRPP. From the SJRPP storage pile, coal and petroleum coke would be reclaimed and conveyed to the NGS Crusher House at a maximum rate of 700 TPH. Within the Crusher House the coal and petroleum coke are crushed and sized at a maximum rate of 1,400 TPH (700 TPH/crusher) and transferred to the boiler feed silos (ten total, five per CFB boiler) by either of two 700 TPH conveyors.

The existing SJRPP Rotary Railcar Dumper will support the NGS Repowering Project under both scenarios, increasing the potential throughput of the SJRPP Rotary Railcar Dumper from 5.13 million tons (SJRPP Requirement) to 7.55 million tons per year. Under the Base Case, coal and petroleum coke will be delivered to the enclosed NGS fuel storage pile at a maximum rate of 1,500 TPH on a new conveyor system connecting SJRPP and NGS. Under Alternate 1, coal and petroleum coke will be delivered to the existing SJRPP storage pile at a maximum rate of 4,000 TPH, reclaimed and conveyed to NGS at a maximum rate of 1,500 TPH on a new conveyor system.

Pebble Lime will be delivered to NGS and pneumatically conveyed from the tanker truck into a storage silo at a maximum rate of 20 TPH and 175,200 TPY. The pebble lime is later hydrated and pumped to the add-on AQCS for the CFB boilers to control SO_2 emissions.

Fly ash emitted by the CFB boilers and collected within each particulate matter AQCS will be pneumatically transferred to a corresponding waste bin at an average rate of 27 TPH. From the waste bin, the fly ash is pneumatically conveyed to either of two fly ash silos at a rate of 27 TPH. From the silos, the fly ash can be either hydrated or transferred directly to a tanker truck. Each silo will be equipped with four hydrators capable of processing 25 TPH of fly ash each. From the hydrators, the hydrated fly ash will be loaded directly into dump trucks. Transfer of dry fly ash directly into a tanker truck is accomplished at rates as high as 250 TPH with emissions vented to a fabric filter.

Bed ash discharged from the CFB boilers is transferred to a corresponding bed ash silo at an average rate of 21 TPH. From the silos, the bed ash can be either hydrated or transferred directly to a tanker truck. Each silo will be equipped with two hydrators each capable of processing 59 TPH of fly ash. From the hydrators, the hydrated bed ash can be loaded directly into dump trucks. Transfer of dry bed ash directly into a tanker truck is accomplished at rates as high as 250 TPH with emissions vented to a fabric filter.

CONTROL TECHNOLOGIES:

PARTICULATE MATTER (PM_{10}/TSP) CONTROL TECHNOLOGIES

Particulate matter emissions will be generated by the CFB Boilers, the limestone dryers/mills, and the materials handling and storage operations. Review of the available control technologies is presented for each emissions unit classification.

CFB Boilers

Particulate matter emissions are generated as a result of inert materials within the fuel, the bed media (fuel, ash, and limestone) and the incomplete combustion of the fuel in the form of unburned carbon. For CFB boilers, the most stringent control technology for particulate matter has been the use of an add-on AQCS to reduce emissions to levels of 0.011 lb/mmBtu (One unit was restricted to 0.01 lb/mmBtu but that limit is less stringent than the 0.011 lb/mmBtu because of rounding (0.01 = 0.014)). The available control options include cyclone separators, wet scrubbers, fabric filters and electrostatic precipitators (ESP). As part of the BACT evaluation the applicant's CFB boiler vendor evaluated three options for controlling particulate matter emissions.

The evaluations were supported by AQCS vendor proposals and guarantees for each at 0.011 lb/mmBtu. These evaluations included the following:

- The use of a fabric filter in conjunction with a spray dryer absorber (SDA) was proposed for the direct control of particulate matter and sulfur dioxide (SO_2) from the CFB boilers. The AQCS's were proposed by Wheelabrator Air Pollution Control (WAPC) Inc. and included a particulate matter (PM_{10}/TSP) guarantee of 0.011 lb/mmBtu. The overall AQCS proposed by WAPC included use of a dry scrubbing system incorporating two (2) spray dryers and a fabric filter for each CFB boiler. Use of a fabric filter on a CFB boiler and use of a fabric filter in combination with a spray dryer is a proven technology and available from other vendors such as ABB Environmental Services.

- The use of the ESP in conjunction with a circulating fluidized bed scrubber was proposed as a second option for the direct control of particulate matter and SO_2 emissions from the CFB boilers. The AQCS was proposed by Environmental Elements Corporation and included a particulate matter (PM_{10}/TSP) guarantee of 0.011 lb/mmBtu. The circulating fluidized bed scrubber is considered a "newer" technology with reportedly lower capital and operating costs over the more conventional spray dryer absorber/fabric filter. The proposed combination has been successfully demonstrated on other projects including the Black Hills Power & Light's Neil Simpson Station where it is meeting a permit limit of 0.02 lb/mmBtu with measured levels of 0.009 and 0.007 lb/mmBtu after initial commissioning and one year of operation, respectively.

- All three options for the CFB boilers to reduce SO_2 emissions included particulate matter (PM_{10}/TSP) guarantees of 0.011 lb/mmBtu.

- Particulate Matter (PM/PM_{10}) emissions of 0.011 lb/mmBtu from the CFB boilers are less than or equal to other BACT determinations for similar sized CFB boilers. The use of a SDA/FF, CFBS/ESP, or CFBS/FF as an add-on AQCS is considered to be the most stringent control technology available and therefore constitutes BACT.

Limestone Dryers/Mills

Particulate matter emissions are generated as a result of the fuel combustion and the limestone milling operation. For rock dryers/mills, the most stringent control technology has been the use of add-on AQCS to reduce emissions to levels of 0.02 gr/dscf. As part of the BACT evaluation, the applicant's CFB boiler vendor identified a fabric filter as the most stringent control technology for controlling particulate matter emissions.

The use of a fabric filter for the direct control of particulate matter from the limestone dryers/mills was proposed by Pennsylvania Crusher Corporation and included a particulate matter guarantee of 0.01 gr/dscf. The applicant's proposed use of a fabric filter with a guaranteed grain loading of 0.01gr/dscf is the most stringent control technology and the most stringent emission limitation, and is therefore BACT.

Materials Handling and Storage Operations

Particulate matter emissions generated from materials handling and storage operations are typically controlled by one or more strategies. Typical strategies include but are not limited to the following:

1. Handling and storing bulk materials in a wet or semi-wet condition. These materials are considered "conditioned materials" and will typically have moisture contents greater than 3.5 percent.

2. Direct application of water and/or chemicals to bulk materials for purposes of increasing moisture content and/or stabilizing small particles is considered a "Wet Suppression" technique.

3. Indirect application of water to materials for purposes of knocking down fugitive dust once it is released from the operation is considered the use of "Water Sprays."

4. Total or partial enclosures, or wind breaks/guards to reduce or eliminate particulate emissions or causes of such emissions.

5. Best operating practices includes design features and operating practices to reduce or eliminate the causes of fugitive dust emissions.

6. Dust collection systems which collect and control particulate emissions from partial or totally enclosed operations with the use of an add-on AQCS.

The most stringent control technology is the total enclosure of the emissions unit or activity which is generating the particulate matter. However, in some cases this approach is not practical based on either economic or safety reasons and the available control strategies must be implemented.

For dry materials handling activities which are totally or partially enclosed and require industrial ventilation (Dust Collection System) for health or safety reasons, which accordingly and are vented to the outside, the use of an add-on AQCS is typically required as BACT. The most stringent control technology applied to dust collection systems is the use of a fabric filter. The most stringent emission limitation associated with materials handling operation AQCS's is a grain loading of 0.01 gr/dscf and a 5% opacity standard. The applicant has proposed that the following emissions units at NGS be equipped with dust collection systems equipped with fabric filters meeting the 0.01 gr/dscf and a 5% opacity limitation:

- Emissions Unit 29 - Crusher House
- Emissions Unit 31 - Boiler Fuel Silos
- Emissions Unit 32 - Limestone Receiving Bins
- Emissions Unit 34 - Limestone Crusher Conveyor Transfers
- Emissions Unit 35 - Limestone Feed Silos
- Emissions Unit 36 - Fly Ash Waste Bins
- Emissions Unit 37 - Fly Ash Transfer and Storage Systems
- Emissions Unit 38 - Bed Ash Transfer and Storage Systems
- Emissions Unit 40 - Bed Ash Truck Loadout Systems
- Emissions Unit 41 - Fly Ash Truck Loadout Systems
- Emissions Unit 42 - Pebble Lime Silo

For the bed ash and fly ash hydrators (Emissions Unit 39), use of a fabric filter is not feasible due to the high water vapor content within the exhaust gas stream. Use of high efficiency venturi scrubbers was therefore proposed. The most stringent control technology applied to the hydrators is the use of a high efficiency venturi scrubber. The most stringent emission limitation associated with the hydrators is a 5% opacity standard as requested by the applicant.

For the materials handling and storage operations (Emissions Unit 28) which do not require ventilation for health or safety reasons, the applicant has proposed the use of control strategies 1-5 listed above, or combinations thereof. Implementation of the control strategies will ensure that the 5% opacity limitation is met from the operations. The following emissions units/activities will implement the associated control strategies as needed to meet a 5% opacity limitation:

- Transfer Towers - Emissions Units 28c, 28g, 28i, 28o & 28q
- Enclosed Fuel Storage Pile Operations - Emissions Unit 28h
- Limestone Lowering Well - Emissions Unit 28d
- Fly & Bed Ash Hydrator Loadouts - Emissions Unit 28r

For the conveyors, the applicant has proposed the use of conditioned materials, best operating practices and covers to eliminate particulate matter emissions. Implementation of the control strategies will ensure that visible emissions do not exceed 5 percent opacity from the operations.

For the Limestone Storage Pile and Reclaim Hopper (Emissions Unit 28p), the applicant has proposed the use of conditioned materials and water sprays on the pile and hopper, as needed, to control particulate matter emissions. Implementation of the control strategies will ensure that visible emissions do not exceed 10 percent opacity from the operations.

For the Ship Unloading Operations (Emissions Unit 28a), the applicant has proposed the use of conditioned materials and partial enclosures of the shiphold and water sprays on the ship unloading hopper to control particulate matter emissions. Implementation of the control strategies will ensure that visible emissions do not exceed 10 percent opacity from the operations.

For the Ship Unloader Conveyor D-1, the applicant has proposed the use of conditioned materials and wind screens to control particulate matter emissions. Implementation of the control strategies will ensure that visible emissions do not exceed 10 percent opacity from the operations.

Information provided by the applicant indicated the economic impact associated with the use of additional dust collection systems equipped with a fabric filter would require an additional capital investment of about $83,600 and annual operating costs of about $37,900 per system. The economics were based on the individual transfer operations (<2 transfer points) with transfer rates 1,500 TPH and 2.42 million TPY of coal and petroleum coal, and 3.9 TPY of particulate matter emissions. With potential reductions of 99 percent over the proposed controls, use of a dust collection system and fabric filter resulted in an estimated incremental cost of about $9,770 per ton. The $9,770/ton incremental cost is excessive by comparison with the Department's Indiantown BACT Determinations which reported costs of $9,244/ton as excessive. Therefore, BACT for the individual transfer operations is the use of conditioned materials, partial enclosures, water sprays, and/or wet suppression, as needed.

NITROGEN OXIDES (NO_x) CONTROL TECHNOLOGIES

NO_x is emitted from CFB boilers and the limestone dryers during the combustion process. The formation of NO_x occurs through one of three primary mechanisms which include the following:

- Thermal NO_x;
- Fuel NO_x; and
- Prompt NO_x.

Thermal NO_x refers to the mechanism by which NO_x is formed through the dissociation of molecular nitrogen and oxygen in the combustion air into their atomic states and through various reactions produce NO_x. At temperatures above 2,200 °F, thermal NO_x production is significant and increases exponentially as temperatures increase further. The primary factors impacting thermal NO_x production include temperature, oxygen and nitrogen concentrations, and the residence time within the combustion zone. These same factors impact complete combustion of the fuels.

Fuel NO_x refers to the mechanism by which NO_x is formed through the reduction and oxidation of nitrogen contained within the chemical structure of the fuel. This nitrogen is known as fuel bound nitrogen (FBN) and for solid and liquid fuels can be significant enough to make Fuel NO_x the primary mechanism.

Prompt NO_x refers to the mechanism by which NO_x is formed under fuel rich conditions through the formation of intermediate species and their eventual oxidation. The formation of prompt NO_x has a weak temperature dependence that can become strong under fuel rich conditions. Prompt NO_x typically contributes the smallest magnitude to the total overall NO_x emissions of the three formation methods discussed.

By understanding the mechanisms and chemical reactions which produce NO_x emissions, control strategies can be developed. These strategies include precombustion controls, combustion techniques, and post combustion techniques.

CFB Boilers

For CFB boilers, available control technologies which have been commercially demonstrated include the following:

- Precombustion Controls;
- Combustion Controls; and
- Selective Noncatalytic Reduction (SNCR).

Precombustion controls focus on fuel quality, specifically the maximum FBN within a given fuel. Information presented within the application indicated the use of coal with an estimated FBN content of 1.3 percent by weight

and petroleum coke with an estimated FBN content of 1.7 percent by weight. These values have been used by JEA for design purposes based on available fuels.

Combustion controls focus on reducing the production of both Thermal and Fuel NO_x by reducing combustion temperatures and limiting available oxygen. With operating bed temperatures between 1,500 °F and 1,600 °F, the amount of Thermal NO_x formed within a CFB boiler is less than that of conventional units (i.e., Stoker, Cyclone or Pulverized Coal Unit) making Thermal NO_x only a minor factor in overall NO_x emissions. In addition to their low operating temperature, CFB boilers can be designed to suppress Fuel NO_x by use of staged combustion. This is accomplished by directing less than a theoretical amount of combustion air through the distributor plate and adding the remaining combustion air above the dense bed. As a result, the FBN decomposes into molecular nitrogen rather than forming NO_x.

Selective non-catalytic reduction (SNCR) is a post combustion control technology involving the injection of either ammonia or urea into specific temperature regions of the CFB boiler. The ammonia or urea reacts with the NO_x to produce nitrogen and water. The effectiveness of the SNCR depends on the temperature where the reagents are injected; the mixing of the reagent within the combustion gases; the residence time of the reagent within the temperature window; and the ratio of reagent to NO_x. SNCR can reduce NO_x emissions by 50 to 70 percent over uncontrolled levels.

For CFB boilers of the size class proposed by the applicant, NO_x emissions as low as 0.11 lb/mmBtu have be achieved through precombustion controls, combustion controls, and SNCR. The applicant reported and the Department noted BACT and LAER determinations on smaller CFB boilers as low as 0.039 lb/mmBtu. The Department considered the size variations between the smaller units and the proposed unit and agreed with the applicant that the smaller units were not representative of the larger units proposed and thus can be excluded from the BACT evaluation. For the proposed CFB boilers, the applicant has received a vendor guarantee of 0.09 lb/mmBtu through the use of precombustion controls, combustion controls, and SNCR. This control strategy represents the most stringent control technology and the proposed emission limit is representative of the most stringent emission limitation for a CFB boiler of this size, and is therefore BACT.

While the use of SNCR is BACT and the most stringent control technology, the applicant evaluated the use of selective catalytic reduction (SCR) as a post combustion control technology to further reduce NO_x emissions. The applicant reported that its use would add significant capital costs to the project. In addition, there are uncertainties associated with its use as a transfer technology and it has never been demonstrated on a CFB boiler which raise technical feasibility issues. To avoid catalyst poisoning with the calcium in the limestone/bed media, the SCR would need to be installed after the SO_2 and PM AQCS and a reheat system incorporated to raise the flue gas temperature which would result in additional costs and impacts. Based on the identification of SNCR as BACT and uncertainties and costs of adding SCR as a transfer technology, the use of SCR was correctly rejected by the applicant.

Limestone Dryers/Mills

For the limestone dryers/mills, combustion controls focusing on reduction of Thermal NO_x are considered the most stringent control technology. For the dryers/mills, the vendor has provided a NO_x emissions estimate based on a rate of 0.2 lb/mmBtu which can be achieved through combustion controls using low-NOx burners. The use of combustion controls constitutes BACT for the limestone dryers/mills.

CARBON MONOXIDE (CO) CONTROL TECHNOLOGIES

Carbon monoxide (CO) emissions will be generated by the CFB Boilers and the limestone dryers/mills as a result of the incomplete combustion of the fuels. Review of the available control technologies is presented for each emissions unit classification.

CFB Boilers

The only control strategy currently used for controlling CO emissions from utility steam generators, including CFB boilers, are combustion controls. Combustion controls include the following:

- High Temperatures;
- Sufficient Excess Air;

- Sufficient Residence Times; and
- Perfect Air/Fuel Mixing.

For somewhat smaller CFB boilers, compared to the size proposed by the applicant, CO emissions as low as 0.13 lb/mmBtu at full loads can be achieved through combustion controls. For each CFB boiler, the applicant has proposed an emission limit of 350 lb/hr (~0.13 lb/mmBtu @ Full Load) which has been guaranteed by the boiler vendor, to apply at all times other than during startup, shutdown, and malfunction conditions. For the CFB boilers, data provided by the applicant reveals higher CO emission rates at lower loads. The requested single mass emission limitation was proposed by the applicant in-lieu of 0.22 lb/mmBtu, which is "worst case" at lower loads, and covers operations over the load range. Based on the high degree of NO_x control and given the generally inverse relationship between CO and NO_x emission rates, the relatively low mass emission rate of 350 lb/hr for CO constitutes BACT.

At the request of the Department, the applicant investigated the use of transfer technologies including a thermal oxidizer and an oxidation catalyst. The Department's intent was to evaluate the availability of such add-on AQCS for use on steam generators and, if possible, further reduce CO emissions from the proposed CFB boilers. The applicant conducted the requested investigation but found that neither technology was technically or economically feasible for CFB boilers of the size contemplated. Technical feasibility of the catalyst required its location downstream of the add-on AQCS's, installation of a natural gas-fired reheat system, and use of a heat recovery system to minimize costs. Based on the US. Environmental Protection Agency's Cost Control Manual, the installation of such a system would increase the total capital cost of the project by $2.6 million, with an annualized cost of $21.8 million per year and a levelized cost of about $19,990 per ton to further limit CO and VOC emissions. The addition of add-on controls would therefore reduce emissions, but at costs significantly higher than values which have been previously determined by the Department to be excessive.

For CFB boilers, the use of good combustion practices to minimize NO_x formation while maximizing combustion efficiency is recognized as the most stringent control technology for CO emissions. The proposed emission rates have been guaranteed by the CFB boiler manufacturer and constitute BACT.

Limestone Dryers/Mills

Carbon monoxide (CO) would be emitted from the limestone dryers/mills as a result of incomplete combustion of the fuels fired. The only control strategy currently used for controlling CO emissions from rock dryers, including limestone dryers/mills, is good combustion techniques. For limestone dryers/mills, CO emissions at 50 ppmv can be achieved through combustion controls. Combustion controls constitute BACT for the limestone dryers/mills.

VOLATILE ORGANIC COMPOUNDS (VOC) CONTROL TECHNOLOGIES

Volatile organic compound (VOC) emissions will be generated by the CFB Boilers and the limestone dryers/mills as a result of the incomplete combustion of the fuels as is CO. Review of the available control technologies is presented for each emissions unit classification.

CFB Boilers

Control strategies associated with VOC are the same as for CO.

For CFB boilers, VOC emissions as low as 0.004 lb/mmBtu through good combustion practices have been reported on a unit with a higher NOx emission rate of 0.125 lb/mmBtu. For each CFB boiler, the applicant has proposed emissions limit of 14 lb/hr (~0.005 lb/mmBtu @ Full Load). As with CO emissions, the use of good combustion practices to minimize NO_x formation while maximizing combustion efficiency is recognized as the most stringent control technology for CO emissions. The add-on controls as discussed for CO could reduce emissions but at costs significantly higher than values which have been previously determined by the Department to be excessive. The proposed emission rates have been guaranteed by the CFB boiler manufacturer and constitute BACT.

Limestone Dryers/Mills

VOCs are emitted from the limestone dryers/mills as a result of incomplete combustion of the fuels fired. The only control strategy currently used for controlling VOC emissions from rock dryers, including limestone dryers/mills, is good combustion techniques which represents the most stringent control technology. For limestone dryers/mills, VOC emissions at 0.02 lb/mmBtu can be achieved through combustion controls. Combustion controls constitute BACT for the limestone dryers/mills.

TOTAL FLUORIDE CONTROL TECHNOLOGIES

Total fluoride, expected to be emitted as hydrogen fluoride (HF), will be generated from the CFB boilers and Limestone Dryers/Mills as a result of trace amounts of fluoride within the fuels and limestone. Review of the available control technologies is presented for each emissions unit classification.

CFB Boiler

For CFB boilers, the most stringent control technology has been the use of an add-on PM AQCS and CFB boiler technology to reduce total fluorides emissions to levels of 1.36×10^{-3} lb/mmBtu. The available control options include the following:

- Spray Dryer Absorber/Fabric Filter; or
- Circulating Fluidized Bed Scrubber/Electrostatic Precipitator (ESP).
- Circulating fluidized bed scrubber with a fabric filter (proposed by ABB Environmental Services).

The fluoride contents of the coal, petroleum coke, and limestone were estimated as 0.0001 lb/lb, 0.000031 lb/lb, and 0.000001 lb/lb, respectively. The worst-case coal scenario results in uncontrolled fluoride emissions of 3.89×10^{-3} lb/mmBtu. The worst-case petroleum coke scenario results in uncontrolled fluoride emissions of 1.78×10^{-3} lb/mmBtu. These values represent worst case release rates which were presented by the applicant's CFB boiler vendor to the AQCS vendors. The AQCS vendors provided proposals and guarantees for fluoride removal by their systems of 0.43 lb/hr (1.57×10^{-4} lb/mmBtu).

The use of a SDA/FF, a CFBS/ESP, or a CFBS/FF will provide for the indirect control of fluoride from the CFB boilers. All three AQCS's included a fluoride guarantee of 1.57 x 10-4 lb/mmBtu which is lower than the most stringent emission limitation for a coal fired CFB boiler and represents BACT.

Total Fluoride (HF) emissions of 0.43 lb/hr, on a 3-hour average, from the CFB boilers are lower than other BACT determinations for similar sized CFB boilers. The use of a SDA/FF, CFBS/ESP, or CFBS/FF as add-on AQCS's is considered to be the most stringent control technology available and therefore constitutes BACT.

Limestone Dryers/Mills

For the limestone dryers/mills, the applicant has proposed fuel quality, the firing of natural gas and low sulfur distillate oil, as BACT which is considered the most stringent control technology. Both natural gas and low sulfur distillate oil contain insignificant amounts of fluoride and the Department considers their use as BACT.

MERCURY (Hg) CONTROL TECHNOLOGIES

Mercury emissions will be generated from the CFB boilers and Limestone Dryers/Mills. The mercury emitted from these operations is associated with trace amounts contained within the fuels and limestone used within each operation. Review of the available control technologies is presented for each emissions unit classification.

CFB Boilers

For CFB boilers, the most stringent control technology for mercury emissions has been the use of an add-on PM AQCS and CFB boiler technology to reduce mercury emissions to levels of 1.45 x 10-5 lb/mmBtu. The available control options include the following:

- Spray Dryer/Fabric Filter;
- Fluidized Bed Scrubber/Electrostatic Precipitator (ESP);

- Fluidized Bed Scrubber/Fabric Filter; and
- Carbon Injection System

The mercury contents of the coal, petroleum coke, and limestone have been estimated at 1.70 x 10-7 lb/lb, 3.0 x 10-8 lb/lb, and 1.0 x 10-8 lb/lb, respectively. The worst-case coal scenario results in uncontrolled mercury emissions of 1.74 x 10-5 lb/mmBtu. The worst-case petroleum coke scenario results in uncontrolled mercury emissions of 1.47 x 10-5 lb/mmBtu. These values represent worst case release rates which were presented by the applicant's CFB boiler vendor to the AQCS vendors. The AQCS vendors provided proposals and guarantees that mercury emissions from their systems will not exceed 0.03 lb/hr (1.05 x 10-5 lb/mmBtu). The use of either the SDA/FF, CFBS/ESP, or CFBS/FF will provide for the indirect control of mercury from the CFB boilers. All three AQCS's proposed included mercury guarantees of 1.05 x 10-5 lb/mmBtu which is more stringent than the most stringent emission limitation and represents BACT. The use of a carbon injection system designed to further control Hg emissions was evaluated based on a vendor quote by the applicant. Total capital costs of $680,000, annualized costs of $1,000,000 per year, and incremental costs of about $9.5 x 106 per ton to control Hg emissions were estimated. The $9.5 million per ton incremental cost is excessive and is consistent with other Department determinations which did not require add-on AQCS's for Hg. Because of the ability of the proposed AQCS to meet the most stringent emission limitation and consideration of the economic impacts the use of a SDA/FF, CFBS/ESP, or CFBS/FF is BACT.

Mercury (Hg) emissions of 0.03 lb/hr, on a 3-hour average, from the CFB boilers is lower than other BACT determinations for similar sized CFB boilers. The use of either a SDA/FF, CFBS/ESP, or CFBS/FF as add-on AQCS's is considered to be the most stringent control technology available and therefore constitutes BACT.

Limestone Dryers/Mills

For the limestone dryers/mills, the applicant has proposed fuel quality, the firing of natural gas and low sulfur distillate oil, as BACT which is considered the most stringent control technology. Both natural gas and low sulfur distillate oil contain insignificant amounts of mercury and the Department considers their use as BACT.

DEPARTMENT BACT DETERMINATION

Following are the BACT limits determined for the JEA Repowering Project. The emission limits as well as the applicable averaging times, are given in the permit Specific Conditions Nos. 12-22, 24, and 25.

CFB Boilers

PSD Pollutant	Control Technology	Proposed BACT Limit(s)
CO	Good Combustion Practices	350 lb/hr (24-hour block average)
NO_x	CFB Boiler Technology Selective Non-Catalytic Reduction (SNCR)	0.09 lb/mmBtu (30-day rolling average)
PM_{10}/TSP	CFB Boiler Technology Add-On Air Quality Control System (AQCS) Fabric Filter or Electrostatic Precipitator	0.011 lb/mmBtu (3-hour average) 10% opacity
VOC	Good Combustion Practices	14 lb/hr (3-hour average) (whichever is less)
Hg	CFB Boiler Technology SO_2 & PM AQCS's	0.03 lb/hr (6-hour average)
HF	CFB Boiler Technology SO_2 & PM AQCS's	0.43 lb/hr (3-hour average)

Limestone Dryers/Mills

PSD Pollutant	Control Technology	Proposed BACT Limit(s)
CO	Combustion Controls	Work Practice - Good Combustion Practices
NO_x	Low NO_x Burners	Work Practice - Good Combustion Practices
PM_{10}/TSP	Add-On AQCS - Fabric Filter	0.01 gr/dscf - Gas/Oil 5% Opacity
VOC	Good Combustion Practices	Work Practice - Good Combustion Practices
Hg	Fuel Quality - Use of Natural Gas and/or Low Sulfur Distillate Oil (0.05% Sulfur)	Work Practice - Use of Natural Gas and Low Sulfur Distillate Oil
HF	Fuel Quality - Use of Natural Gas and/or Low Sulfur Distillate Oil (0.05% Sulfur)	Work Practice - Use of Natural Gas and Low Sulfur Distillate Oil

Materials Handling & Storage Operations - Particulate Matter

Handling & Storage Operation	Control Technologies	Proposed BACT Limits
Ship Unloading Operations		
Shiphold	1, 4 & 6	10% Opacity
Receiving Hoppers	1, 3, 4 & 6	10% Opacity
Receiving Conveyors	1, 4 & 6	10% Opacity
Conveyors	1, 4 & 6	5% Opacity
Transfer Towers	1, 2, 4 & 6	5% Opacity
Stackers/Reclaimers		
Enclosed Fuel Pile	1, 3, 4 & 6	5% Opacity
Limestone Lowering Well	1, 3, 4 & 6	5% Opacity
Limestone Reclaim Hopper	1, 3 & 6	10% Opacity
Storage Piles		
Enclosed Fuel Pile	1, 3, 4 & 6	5% Opacity
Limestone Pile	1, 3 & 6	10% Opacity
Bed and Fly Ash Hydrator Loadouts	1, 3, 4 & 6	5% Opacity
Limestone Receiving Bins	1, 4 & 5	5% Opacity
Limestone Crusher Conveyor Transfers	4 & 5	5% Opacity
Limestone Feed Silos	4 & 5	5% Opacity
Bed Ash Transfer and Storage Systems	4 & 5	5% Opacity
Bed Ash Truck Loadout Systems	4 & 5	5% Opacity
Fly Ash Waste Bins	4 & 5	5% Opacity
Fly Ash Transfer and Storage Systems	4 & 5	5% Opacity
Fly Ash Truck Loadout Systems	4 & 5	5% Opacity
Bed & Fly Ash Hydrators	4 & 7	5% Opacity
Pebble Lime Silo	4 & 5	5% Opacity
Crusher House	4 & 5	5% Opacity
Boiler Fuel Silos	4 & 5	5% Opacity

Control Strategies:

1. Conditioned Materials
2. Wet Suppression, as needed
3. Water Sprays, as needed
4. Enclosures (Total, Partial, Covers, & Wind Screens)
5. Dust Collection System - AQCS
6. Best Operating Practices
7. Venturi Scrubbers

RATIONALE FOR DEPARTMENT'S DETERMINATION

- JEA has obtained guarantees from Foster Wheeler USA to meet the Department's BACT NO_x, CO, and VOC limits on the CFB boilers.
- JEA has obtained guarantees through Foster Wheeler USA from the AQCS's vendors to meet the Department's BACT particulate matter (PM/PM_{10}), opacity, HF, and Hg limits on the CFB boilers.
- JEA has obtained guarantees through Foster Wheeler USA from the AQCS's vendors to meet the requested SO_2, H_2SO_4 and Pb limits on the CFB boilers.
- The CFB boilers, based on the vendor guarantees, can comply with the applicable NSPS of 40 CFR Part 60, Subpart Da.
- The CFB boilers, based on the vendor guarantees, can comply with the Department's BACT determination which is as stringent as or more stringent than the NSPS and other recent BACT determinations applicable to similar sized units.
- NO_x emissions of 0.09 lb/mmBtu from the CFB boilers are lower than other BACT determinations for similar sized CFB boilers. The use of precombustion and combustion controls in conjunction with SNCR is considered to be the most stringent control technology available. The BACT determination is equivalent to approximately 0.8 to 0.9 lb/MW-hr (gross output) versus the NSPS effective on November 16, 1998 which requires that new Da units meet a limit of 1.6 lb/MW-hr (gross output).
- CO and VOC emissions of 350 lb/hr and 14 lb/hr, respectively, at all loads are equivalent to values determined as BACT for similar units at full load operation. Combustion controls are sufficient to achieve these low levels with the CFB boiler firing coal and petroleum coke and therefore constitute BACT.
- Particulate Matter (PM/PM_{10}) emissions of 0.011 lb/mmBtu from the CFB boilers are less than or equal to other BACT determinations for similar sized CFB boilers. The use of either a SDA/FF or CFBS/ESP as an add-on AQCS is considered to be the most stringent control technology available and therefore constitutes BACT.
- Total Fluoride (HF) and mercury (Hg) emissions of 0.43 lb/hr and 0.03 lb/hr, both on a 3-hour average, respectively, from the CFB boilers are lower than other BACT determinations for similar sized CFB boilers. The use of either a SDA/FF or CFBS/ESP as add-on AQCS's is considered to be the most stringent control technology available and therefore constitutes BACT.
- SO_2 emissions of 0.15 lb/mmBtu (30-day rolling average) and 0.2 lb/mmBtu (24-hour block average) ensure that the net emissions increase associated with the Repowering Project is below the Significant Emissions Rates of Table 62-212.400-2, F.A.C. These emission limitations will be made federally enforceable within the PSD permit as requested.
- H_2SO_4 emissions of 1.1 lb/hr on a 3-hour average ensure that the net emissions increase associated with the Repowering Project is below the Significant Emissions Rates of Table 62-212.400-2, F.A.C. The emission limitation will be made federally enforceable within the PSD permit as requested.
- Pb emissions of 0.07 lb/hr on a 3-hour average ensure that the net emissions increase associated with the Repowering Project is below the Significant Emissions Rates of Table 62-212.400-2, F.A.C. The emission limitation will be made federally enforceable within the PSD permit as requested.
- Particulate Matter (PM/PM_{10}) emissions of 0.01 gr/dscf from the limestone dryers/mills are lower than other BACT determinations and lower than the NSPS limitation of 40 CFR Part 60, Subpart OOO. The use of fabric filter as an add-on AQCS is the most stringent control technology available and therefore constitutes BACT.
- A 5% opacity limitation for the limestone dryers/mills is lower than other BACT determinations and lower than the NSPS limitation of 40 CFR Part 60, Subpart OOO. The use of a fabric filter as an add-on AQCS is the most stringent control technology available and therefore constitutes BACT.

- The reported NO_x, CO, and VOC emission rates from the limestone dryers/mills are consistent with other rock dryer/mill combinations, and therefore represent BACT. The use of good combustion practices is the most stringent control technology available and therefore constitutes BACT.
- Visible emissions of 10 percent or less from the ship unloading operations (Shiphold & Receiving Hopper), and the ship unloading conveyors are as stringent as or more stringent than other BACT determinations made by the Department for materials handling operations. The handling of conditioned materials, the use of partial enclosures and wind screens and best operating practices are the most stringent control technologies available and therefore constitutes BACT.
- Visible emissions of 10 percent or less from the limestone storage pile and reclaim hopper are as stringent as or more stringent than other BACT determinations made by the Department for open storage piles. The handling of conditioned materials, water sprays, dust suppression, and best operating practices are the most stringent control technologies available and therefore constitutes BACT.
- Visible emissions of 5 percent or less from the limestone lowering well is as stringent as or more stringent than other BACT determinations made by the Department for open storage piles. The handling of conditioned materials, water sprays, dust suppression, and best operating practices are the most stringent control technologies available and therefore constitutes BACT.
- A 5% opacity standard from the transfer points, covered conveyors, and enclosed storage pile is as stringent as or more stringent than other BACT determinations made by the Department for materials handling operations. The handling of conditioned materials, partial enclosures, covers, wet suppression and best operating practices are BACT.
- A 5% opacity standard from the Crusher House and Boiler Feed Silos is as stringent as or more stringent than the NSPS requirements of 40 CFR Part 60, Subpart Y and other BACT determinations. The use of enclosures, a dust collection system, and a fabric filter represents the most stringent control technology available and therefore constitutes BACT.
- A 5% opacity standard from the Limestone Receiving Bins, Limestone Crusher Conveyor Transfers, and the Limestone Feed Silos is as stringent as or more stringent than the NSPS requirements of 40 CFR Part 60, Subpart OOO and other BACT determinations. The use of enclosures, a dust collection system, and a fabric filter represents the most stringent control technology available and therefore constitutes BACT.
- A 5% opacity standard from the Pebble Lime Silo, Fly Ash Waste Bins, Fly Ash Transfer and Storage Systems, Bed Ash Transfer and Storage Systems, Fly Ash Truck Loadout Systems, and Bed Ash Truck Loadout Systems is as stringent as or more stringent than other recent BACT determinations. The use of enclosures, a dust collection system, and a fabric filter represents the most stringent control technology available and therefore constitutes BACT.
- A 5% opacity standard from the Fly Ash and Bed Ash Hydrators is as stringent as or more stringent than other recent BACT determinations. The enclosures of the operation and use of a venturi scrubber represents the most stringent control technology available and therefore constitutes BACT.
- For the individual transfer points, BACT for particulate matter (PM/PM_{10}) was determined to be the use of conditioned materials, partial enclosures, and wet suppression, as needed. The use of dust collection systems equipped with fabric filters to further control particulate matter (PM/PM_{10}) emissions was evaluated based on the US. Environmental Protection Agency's Cost Control Manual and additional information from a baghouse vendor by the applicant. Total capital costs of $83,600, annualized costs of $37,900 per year, and incremental costs of about $9,700 per ton to control particulate matter emissions were estimated for each transfer point. The $9,770/ton incremental cost is excessive in comparison with the Department's Indiantown BACT Determinations which reported costs of $9,244/ton as excessive.
- For the CFB boilers, BACT for NO_x was determined to be the use of CFB boiler technology and SNCR. The use of SCR to further reduce NO_x emissions was evaluated by the applicant based on the US. Environmental Protection Agency's Alternative Controls Techniques (ACT) document for utility boilers. The applicant reported

that its use would add significant capital costs to the project. In addition, there are uncertainties associated with its use as a transfer technology and it has never been demonstrated on a CFB boiler which raise technical feasibility issues. Furthermore, to avoid catalyst poisoning with the calcium in the limestone/bed media, the SCR would need to be installed after the SO_2 and PM AQCS and a reheat system incorporated to raise the flue gas temperature, which would result in additional costs and impacts. Based on the identification of SNCR as BACT and uncertainties and costs of adding SCR as a transfer technology, the use of SCR was correctly rejected by the applicant.

- For the CFB boilers. BACT for CO and VOC was determined to be the use of good combustion practices. The use of an oxidation catalyst designed to further control CO and VOC emissions was evaluated based on the US. Environmental Protection Agency's Cost Control Manual by the applicant. Total capital costs of $2.6 million, annualized costs of $21.8 million per year, and incremental costs of about $19,990 per ton to control CO and VOC emissions were estimated. The $19,990/ton incremental cost is excessive compared with other Department determinations which reported costs of $4,000 to $10,000/ton as excessive.
- For the CFB boilers, BACT for Hg was determined to be the use of either the SDA/FF or CFBS/ESP add-on AQCS's. The use of a carbon injection system designed to further control Hg emissions was evaluated based on a vendor quote by the applicant. Total capital costs of $680,000, annualized costs of $1,000,000 per year, and incremental costs of about $9.5 x 10^6 per ton to control Hg emissions were estimated. The $9.5 million per ton incremental cost is excessive and is consistent with other Department determinations which did not require add-on AQCS's for Hg.

COMPLIANCE PROCEDURES

CFB BOILERS	
POLLUTANT	**COMPLIANCE PROCEDURE**
Visible Emissions	Continuous Opacity Monitoring System (COMS), installed, certified, operated, and maintained in accordance with 40 CFR Part 75, on six-minute block averages, excluding start-up, shutdown, and malfunction.
Particulate Matter (Total)	EPA Methods 5, 5B, 8, 17 or 29 based on a 3-hour average.
Particulate Matter (PM_{10})	EPA Methods 201 or 201A based on a 3-hour average.
Nitrogen Oxides	Continuous Emissions Monitoring System (CEMS) installed, certified, operated, and maintained in accordance with 40 CFR Part 75, based on a 30-day rolling average, excluding start-up, shutdown, and malfunction.
Carbon Monoxide	CEMS installed, calibrated, operated, and maintained in accordance with 40 CFR Part 60, Appendix B based on a 24-hour block average, excluding start-up, shutdown, and malfunction.
Volatile Organic Compounds	EPA Methods 18, 25, or 25A based on a 3-hour average
Hydrogen Fluoride	EPA Method 13A or 13B based on a 3-hour average.
Mercury	EPA Methods 29, 101, or 101A based on a 6-hour average.
Testing requirements and frequencies as specified in the PSD permit.	

Limestone Dryers/Mills

POLLUTANT	COMPLIANCE PROCEDURE
Visible Emissions	EPA Method 9 based on an initial 3-hour average (NSPS Requirements) and 30-minute average there-after.
Particulate Matter (Total)	EPA Method 5 based on an initial 3-hour average and EPA Method 9 thereafter.

Materials Handling and Storage Operations

Emissions Unit/Activity	EPA Method(s)	Duration of VE Test	Frequency	Material
Shiphold (EU 28a)	9	30 min	I only	C or PC
Ship Unloader Hopper & Spillage Conveyors (EU28a)	9	3 hr	I only	C & LS
Conveyors (EU 28)	9	3 hr	I only	C & LS
Transfer Towers (EU 28c. 28g. 28i. 28q)	9	3 hr	I only	C & LS
Fuel Storage Building (EU28h)	9	30 min	I only	C or PC
Fuel Storage Pile - Stacking & Reclaiming (EU28)	9	30 min	I only	C or PC
Limestone Storage Pile (EU28p)	9	30 min	I only	LS
Hydrator Truck Loadout – 1 per silo @ Discharge (EU28r)	9	30 min	I only	Bed & Fly Ash
NSPS - OOO				
Limestone Receiving Bins – Baghouse Exhaust (EU32)	9-VE 5-PM	IVE - 60 min RVE - 30 min	Meth 9: I & R Meth 5: I only	LS
Limestone Crusher Conveyor Transfer - Baghouse Exhaust (EU34)	9-VE 5-PM	IVE - 60 min RVE - 30 min	Meth 9: I & R Meth 5: I only	LS
Limestone Feed Silos - Baghouse Exhaust (EU35)	9-VE 5-PM	IVE - 60 min RVE - 30 min	Meth 9: I & R Meth 5: I only	LS
Limestone Dryer Building	22	IVE - 75 min	I only	LS
NSPS – Y				
Crusher House - Baghouse Exhaust (EU29)	9	IVE - 3 hr RVE - 30 min	I & R	C
Boiler Feed Silos - Baghouse Exhaust (EU31)	9	IVE - 3 hr RVE - 30 min	I & R	C
Other				
Fly Ash Waste Bin - Baghouse Exhaust (EU36)	9	IVE - 30 min RVE - 30 min	I & R	Ash
Fly Ash Silos - Baghouse Exhaust (EU37)	9	IVE - 30 min RVE - 30 min	I & R	Ash
Bed Ash Silos - Baghouse Exhaust (EU38)	9	IVE - 30 min RVE - 30 min	I & R	Ash
Fly Ash Hydrators - Scrubber Exhaust (15 min/hydrator) (EU39)	9	IVE - 60 min RVE - 60 min	I & R	Ash
Bed Ash Hydrators - Scrubber Exhaust (15 min/hydrator) (EU39)	9	IVE - 30 min RVE - 30 min	I & R	Ash
Fly Ash Truck Loadout – Baghouse Exhaust (EU41)	9	IVE - 30 min RVE - 30 min	I & R	Ash
Bed Ash Truck Loadout – Baghouse Exhaust (EU40)	9	IVE - 30 min RVE - 30 min	I & R	Ash
Pebble Lime Silo - Baghouse Exhaust (EU42)	9	IVE - 30 min RVE - 30 min	I & R	Ash

C – Coal
I – Initial R - Renewal (once every 5 years)
IVE – Initial Visible Emissions Test. RVE - Renewal Visible Emissions Test
LS – Limestone
PC – Petroleum Coke

BACT EXCESS EMISSIONS APPROVAL

Pursuant to the Rule 62-210.700 F.A.C., the Department through this BACT determination will allow excess emissions as follows: Valid hourly emission rates shall not include periods of startup, shutdown, or malfunction as defined in Rule 62-210.200 F.A.C., where emissions exceed the applicable standards. These excess emissions periods shall be reported as required in Specific Condition 28 of the Permit [Rules 62-4.070 F.A.C., 62-210.700 F.A.C and applicant request].

Excess emissions may occur for a period of up to 12 hours during any start-up, shutdown or malfunction provided the best operating practices are applied. For purposes of complying with the "Best Operating Practices" JEA shall submit a written procedure summarizing the start-up and shutdown procedures and anticipated emissions. These procedures, included within the initial application, shall be updated and submitted to the Department within one year of the initial start-up of Repowered Unit 2 reflecting actual procedures, and updated every five years on a schedule corresponding with the Title V Operating Permit renewal for the facility.

DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:

Syed Arif, P.E., Review Engineer, New Source Review Section
Department of Environmental Protection
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended By:

C. H. Fancy, P.E., Chief
Bureau of Air Regulation

Date: 7/15/99

Approved By:

Howard L. Rhodes, Director
Division of Air Resources Management

Date: 7/14/99

APPENDIX GC

GENERAL PERMIT CONDITIONS [F.A.C. 62-4.160]

G.1 The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

G.2 This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings or exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

G.3 As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

G.4 This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

G.5 This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

G.6 The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

G.7 The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

(a) Have access to and copy and records that must be kept under the conditions of the permit;
(b) Inspect the facility, equipment, practices, or operations regulated or required under this permit, and,
(c) Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

G.8 If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

(a) A description of and cause of non-compliance; and
(b) The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

G.9 In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extend it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

G.10 The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

G.11 This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

G.12 This permit or a copy thereof shall be kept at the work site of the permitted activity.

G.13 This permit also constitutes:

(a) Determination of Best Available Control Technology *(X)*
(b) Determination of Prevention of Significant Deterioration *(X)*; and
(c) Compliance with New Source Performance Standards *(X)*.

G.14 The permittee shall comply with the following:

(a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

(b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

(c) Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements;
2. The person responsible for performing the sampling or measurements;
3. The dates analyses were performed;
4. The person responsible for performing the analyses;
5. The analytical techniques or methods used; and
6. The results of such analyses.

G.15 When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

Memorandum

Florida Department of Environmental Protection

BAR

TO: Howard L. Rhodes

THRU: Clair Fancy
Al Linero 7/9

FROM Syed Arif 7/9

DATE: July 9, 1999

SUBJECT: JEA Circulating Fluidized Bed Boilers
DEP File No. 0310045-003-AC; PSD-FL-265

Attached for approval and signature is a construction permit number 0310045-003-AC, PSD-FL-265 for two new coal- and petroleum coke-fired circulating fluidized bed (CFB) boilers at JEA's Northside Generating Station in Jacksonville, Florida. The CFB boilers will be connected to the Existing Unit 1 and 2 steam turbines. The Repowering Project will retain Northside Generating Station's generating capacity which currently consists of two 297.5 MW steam turbine-electrical generator, one 564 MW steam turbine-electrical generator and four 52.5 MW combustion turbine-generators. At applicant's request, the Department included federally enforceable, multi-unit emissions caps for Repowered Units 1 and 2 and existing Unit 3 to enable a reduction of annual SO_2, NO_x, and particulate matter (PM) emissions by 10 percent compared to existing Units 1, 2, and 3 emission levels. Therefore, in the future, emissions of these three parameters from Units 1, 2, and 3 combined will be less than before the repowering while electrical output from Units 1, 2, and 3 will be about two and a half times greater than historical levels as a result of the repowering.

A Technical Evaluation and Preliminary Determination was issued, and the facility was required to do a public notice. A Best Available Control Technology determination was required for particulate matter (TSP/PM_{10}), oxides of nitrogen (NO_x), volatile organic compounds(VOC), carbon monoxide (CO), hydrogen fluoride (HF), and mercury (Hg) pursuant to Rule 62-212.400, F.A.C.

TSP/PM_{10} emissions from Units 1 and 2 will be controlled by either fabric filters (baghouses) or electrostatic precipitators. NO_x emissions from Units 1 and 2 will be controlled through the use of a selective non-catalytic reduction system. CO and VOC emissions from Units 1 and 2 will be controlled through good combustion practices, and HF and Hg emissions will be controlled through the use of air quality control systems for PM and SO_2.

The project modification provides reasonable assurance that all the requirements of the permit and BACT determination will be complied with. I recommend your approval and signature.

AAL/sa