Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

May 12, 1999

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

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

Re: DEP File No. 0310045-003-AC (PSD-FL-265)
JEA Northside Generating Station
Northside Units 1 and 2 Repowering Project

Dear Mr. Bussells:

Enclosed is one copy of the Draft Permit, Technical Evaluation and Preliminary Determination, for the referenced project in Duval County. The Department's Intent to Issue Permit and the "PUBLIC NOTICE OF INTENT TO ISSUE" are also included.

The "Public Notice of Intent to Issue Permit" must be published as soon as possible in a newspaper of general circulation in the area affected. Proof of publication, i.e., newspaper affidavit, must be provided to the Department's Bureau of Air Regulation within 7 (seven) days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

Please submit any written comments you wish to have considered concerning the Department's proposed action to A. A. Linero, P.E., Administrator, New Source Review Section, at the above letterhead address. If you have any questions, please call Syed Arif at 850/921-9528.

Sincerely,

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

CHF/sa

Enclosures

In the Matter of an
Application for Permit by:

Mr. Walter P. Bussells,
Managing Director and CEO
JEA
21 West Church Street
Jacksonville, FL 32202

DEP File No. 0310045-003-AC
DRAFT Permit No. PSD-FL-265
Northside Generating Station
Repowering of Units 1 & 2
Duval County

INTENT TO ISSUE PSD PERMIT

The Florida Department of Environmental Protection (Department) gives notice of its intent to issue a permit under the requirements for the Prevention of Significant Deterioration (PSD) of Air Quality (copy of Draft PSD Permit attached) for the proposed project, detailed in the application specified above and the attached Technical Evaluation and Preliminary Determination, for the reasons stated below.

The applicant, JEA, applied on February 15, 1999, to the Department for a PSD permit to install two new coal- and petroleum coke-fired circulating fluidized bed (CFB) boilers to be connected to the existing steam turbines for Northside Generating Station Units 1 and 2 (297.5 MW each), along with associated ancillary equipment and processes including a new dual-flued, 495-foot stack, solid fuel delivery and storage facilities, limestone preparation and storage facilities (including three limestone dryers), a lime silo, aqueous ammonia storage, polishing scrubbers, electrostatic precipitators or fabric filters (baghouses), and ash removal and storage facilities.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Chapters 62-4, 62-210, and 62-212. The above actions are not exempt from permitting procedures. The Department has determined that a PSD permit and a determination of Best Available Control Technology for the control of particulate matter (TSP/PM10), oxides of nitrogen, carbon monoxide, volatile organic compounds, hydrogen fluoride, and mercury is required to conduct the work.

The Department intends to issue this PSD permit based on the belief that reasonable assurances have been provided to indicate that operation of these emission units will not adversely impact air quality, and the emissions units will comply with all appropriate provisions of Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297, F.A.C.

Pursuant to Section 403.815, F.S., and Rule 62-110.106(7)(a)1., F.A.C., you (the applicant) are required to publish at your own expense the enclosed "Public Notice of Intent to Issue PSD Permit." The notice shall be published one time only in the legal advertisement section of a newspaper of general circulation in the area affected. For the purpose of these rules, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. Where there is more than one newspaper of general circulation in the county, the newspaper used must be one of significant circulation in the area that may be affected by the permit. If you are uncertain that a newspaper meets these requirements, please contact the Department at the address or telephone number listed below.

Is your RETURN ADDRESS completed on the rev

- 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.

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

Consult postmaster for fee.

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

4a. Article Number
Z 333 618 147

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

7. Date of Delivery
MAY 14 1999

5. Received By: *(Print Name)*

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

6. Signature: *(Addressee or Agent)*
X

PS Form **3811**, December 1994 102595-97-B-0179 Domestic Return Receipt

Thank you for using Return Receipt Servi

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

Sent to Walter Brussello	
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 5-13-99	

PS Form **3800**, April 1995

0310045-003-AC
PSD-FI-245

The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400 (Telephone: 850-488-0114; Fax 850/922-6979). The Department suggests that you publish the notice within thirty days of receipt of this letter. You must provide proof of publication within seven days of publication, pursuant to Rule 62-110.106(5), F.A.C. No permitting action for which published notice is required shall be granted until proof of publication of notice is made by furnishing a uniform affidavit in substantially the form prescribed in Section 50.051, F.S., to the office of the Department issuing the permit or other authorization. Failure to publish the notice and provide proof of publication may result in the denial of the permit pursuant to Rules 62-110.106(9) & (11), F.A.C.

The Department will issue the final permit with the attached conditions unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments and requests for a public meeting concerning the proposed permit issuance action for a period of thirty (30) days from the date of publication of "Public Notice of Intent to Issue PSD permit." Written comments and requests for a public meeting should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection.

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57, F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below. Mediation is not available in this proceeding.

A person whose substantial interests are affected by the proposed permitting decision may petition for a administrative proceeding (hearing) under Sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida, 32399-3000. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under section 120.60(3) of the Florida Statutes must be filed within fourteen days of publication of the public notice or withing fourteen days of receipt of this notice of intent, whichever occurs first. Under Section 120.60(3), F.S., however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S.,or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding offer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code (F.A.C.)

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues

of material fact. If there are none, the petition must so indicate; (3) A concise statement of the ultimate facts alleged, as well as the rules and statutes which entitle the petitioner to relief; and (f) A demand for relief.

A petition that does not dispute the material facts upon which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.302, F.A.C.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

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 INTENT TO ISSUE PSD PERMIT (including the PUBLIC NOTICE, Technical Evaluation and Preliminary Determination, Draft BACT Determination, and the DRAFT PSD permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 5-13-99 to the person(s) listed:

Walter P. Bussells, JEA *
Bert Gianazza, JEA
Mike Bilello, Foster Wheeler
Darrel Graziani, Foster Wheeler
Hamilton S. Oven, Jr., DEP Siting
Scott Goorland, DEP OGC
Rita Felton-Smith, DEP NE District
Robert S. Pace, Jacksonville RESD
Gregg Worley, EPA Region IV
Ellen Porter, USFWS
Hon. John A. Delaney, Mayor, City of Jacksonville
Brian D. Teeple, Executive Director, Northeast Florida Regional Planning Council

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.

Lynn Hoper 5-13-99
(Clerk) (Date)

NOTICE TO BE PUBLISHED IN THE NEWSPAPER

PUBLIC NOTICE OF INTENT TO ISSUE PSD PERMIT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP File No. 0310045-003-AC (PSD-FL-265)
Duval County, Florida

The Department of Environmental Protection (Department) gives notice of its intent to issue a permit under the requirements for the Prevention of Significant Deterioration of Air Quality (PSD permit) to JEA. The permit is to construct 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, electrostatic precipitators or fabric filters (baghouses), and ash removal and storage facilities. A Best Available Control Technology (BACT) determination was required for particulate matter (TSP/PM10), 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.

The applicant's name and address are JEA, 21 West Church Street, Jacksonville, Florida 32202-3105. The Northside Generating Station is located at 4377 Heckscher Drive, Jacksonville, Duval County, Florida.

Particulate matter (TSP/PM10) emissions from Units 1 and 2 will be controlled by either fabric filters (baghouses) or electrostatic precipitators. Oxides of nitrogen emissions from Units 1 and 2 will be controlled through the use of a selective non-catalytic reduction (SNCR) system. Carbon monoxide and volatile organic compound emissions from Units 1 and 2 will be controlled through good combustion practices, and hydrogen fluoride and mercury emissions will be controlled the use of air quality control systems for particulate matter and sulfur dioxide. The limestone dryer emissions will be controlled through fabric filters (baghouses), low NOx burners, good combustion practices, and the use of low sulfur fuels. The materials handling operations will utilize wet suppression techniques, partial and total enclosures, conditioned materials, and fabric filters (baghouses), as appropriate, to control particulate matter (TSP/PM10) emissions.

JEA has requested emission caps on Units 1 and 2 as well as existing Unit 3 for sulfur dioxides, oxides of nitrogen, and particulate matter (TSP) to ensure a ten percent decrease below historical (1994-1995) annual emission levels once Units 1 and 2 are repowered. 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.

The net emissions increases due to the repowering of Units 1 and 2 for PSD applicability purposes are summarized below (in tons per year).

NOTICE TO BE PUBLISHED IN THE NEWSPAPER

Pollutants	Net Emissions Increases	PSD Significant Emission Rates
TSP	100	25
PM10	132	15
NO_x	871	40
CO	3,063	100
VOCs	107	40
HF	3.02	3
Hg	0.26	0.1

An air quality impact analysis was conducted. Emissions from the facility will not significantly contribute to or cause a violation of any state or federal ambient air quality standards. The maximum predicted PSD Class II increments of NO_2 and PM10 consumed by all sources in the area, including this project, will be as follows:

Averaging Time	Allowable Increment(μ/m^3)	Increment Consumed(μ/m^3)	Percent Consumed
PM10			
24-hour	30	24.4	81
Annual	17	13.8	81
NO_2			
Annual	25	1.6	6

Maximum predicted impacts are less than the applicable PSD Class I significant impact levels at the Okefenokee National Wilderness Area for PM10 and NO_2.

The Department will accept written comments and requests for a public meeting concerning the proposed permit issuance action for a period of 30 (thirty) days from the date of publication of this "Public Notice of Intent to Issue PSD permit." Written comments and requests for a public meeting should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400. Any written comments filed shall be made available for public inspection.

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to Sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen (14) days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under Section 120.60(3) of the Florida Statutes must be filed within fourteen days of publication of the public notice or within fourteen (14) days of receipt of this notice of intent, whichever occurs first. Under Section 120.60(3), however, any person who asked the Department for notice of agency action may file a petition within fourteen (14) days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, Florida Statutes, or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or

NOTICE TO BE PUBLISHED
IN THE NEWSPAPER

identification number, if known; (b) The name, address and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any which shall be the address for service purposes during the course of the proceeding; and explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material facts. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, as well as the rules and statutes which entitle the petitioner to relief; and (f) A demand for relief.

A petition that does not dispute the material facts upon which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301 of the Florida Administrative Code.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the petition taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

A complete project file is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Protection
Bureau of Air Regulation
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301
Telephone: 850/488-1344
Fax: 850/922-6979

Department of Environmental Protection
Northeast District Office
7825 Baymeadows Way, Suite 200B
Jacksonville, Florida 32256-7590
Telephone: 904/448-4300
Fax: 904/448-4366

Jacksonville Regulatory and Environmental Services Department
117 West Duval Street
Suite 225
Jacksonville, Florida 32202
Telephone: 904-630-3484
Fax: 904-630-3638

The complete project file includes the Draft Permit, the application and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, Florida Statutes. Interested persons may contact the New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114, for additional information.

TECHNICAL EVALUATION

AND

PRELIMINARY DETERMINATION

JEA

Northside Generating Station

Units 1 & 2 Repowering Project

Jacksonville, Duval County
Florida

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

State of Florida
Department of Environmental Protection
Division of Air Resources Management
Bureau of Air Regulation

May 13, 1999

1. APPLICATION INFORMATION

1.1 Applicant Name and Address

JEA
21 West Church Street
Jacksonville, Florida 32202
Authorized Representative: Walter P. Bussells, Managing Director & Chief Executive Officer

1.2 Reviewing and Process Schedule

02-15-99: Date of Receipt of Application
05-xx-99: Intent Issued

2. FACILITY INFORMATION

2.1 Facility Location

The Northside Generating Station (NGS) is located in Duval County on the north shore of the St. Johns River, approximately 10 miles west of the Atlantic Ocean and 9 miles north-east of the Jacksonville downtown area (Figure TE-1). The NGS is located adjacent to the St. Johns River Power Park (SJRPP) and is approximately 60 kilometers and 97 kilometers from the Okefenokee and Wolf Island National Wilderness Areas, respectively. Both of these areas are designated Class I PSD Areas. The UTM coordinates of this facility are Zone 17; 446.7 km E; *3,363.5 km N.*

2.2 Standard Industrial Classification Codes (SIC)

Industry Group No.	49	Electric, Gas, and Sanitary Services
Industry No.	4911	Electric Services

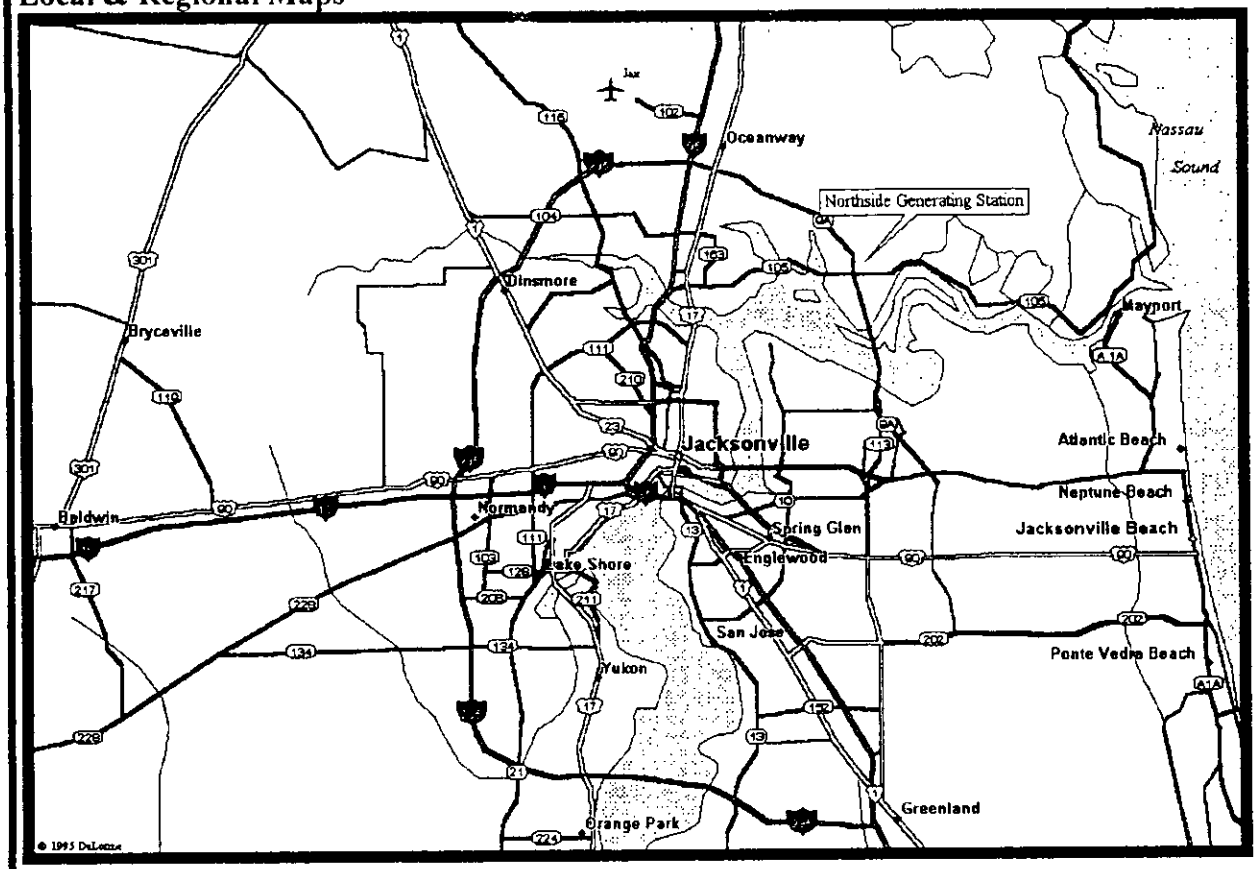
2.3 Facility Category

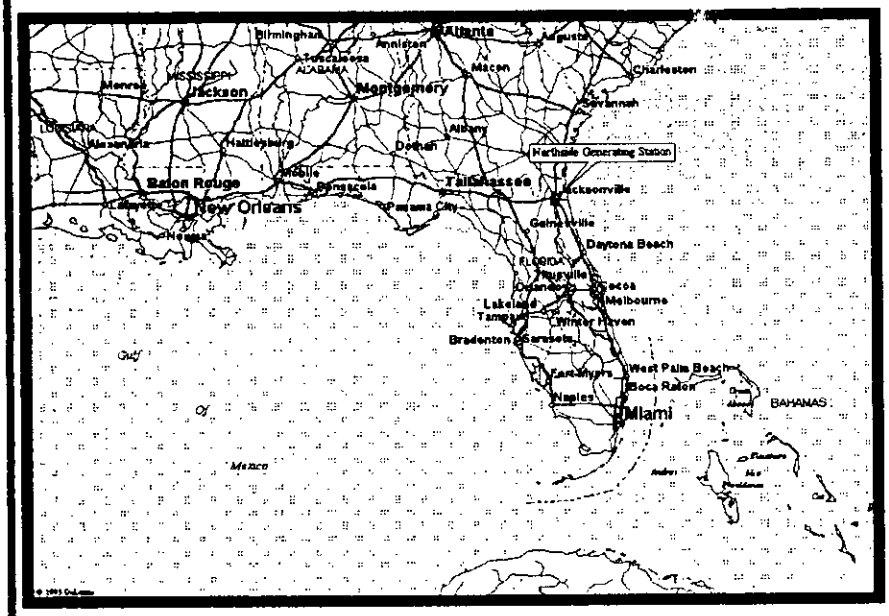
NGS and SJRPP are collectively classified as a major facility under the Prevention of Significant Deterioration (PSD) program. NGS and SJRPP are also considered a single major source under the Title V Operating Permit program and have been assigned the facility identification number 310045 in the Department database (ARMS system). NGS and SJRPP are both subject to the Acid Rain program and have been assigned ORIS Codes 0067 and 0207, respectively.

NGS is identified within an industry included in the list of the 28 Major Facility Categories per Table 62-212.400-1, F.A.C. The NGS Units 1 and 2 Repowering Project is considered a "major modification" with respect to Rule 62-212.400, Prevention of Significant Deterioration, based on potential emission increases at rates above the PSD Significant Emission Rates listed in Table 212.400-2, F.A.C., for the following parameters:

- Carbon Monoxide (CO)
- Nitrogen Oxides (NO_X)
- Particulate Matter (PM/PM_{10})
- Volatile Organic Compounds (VOC)
- Mercury (Hg)
- Total Fluorides (HF)

Figure TE-1
Local & Regional Maps





For these PSD pollutants, a determination of Best Available Control Technology (BACT) is required. The Department's evaluation of the net emission increases for purposes of the application of BACT was based solely on the available emission reductions associated with the permanent shut down of the existing Unit 1 and 2 steam generators. The Department recognized the applicant's request for 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 over existing Units 1, 2, and 3 emission levels. The requested multi-unit emissions caps are identified within the specific conditions of the PSD permit.

3. PROJECT DESCRIPTION

This permit addresses the following emissions units:

EMISSION UNIT NO.	SYSTEM	EMISSION UNIT DESCRIPTION
001	Steam Generation	NGS Existing Unit 1 - a 2,892 mmBtu per hour fossil fuel-fired steam generator. EU001 will be replaced by EU027.
002	Steam Generation	NGS Existing Unit 2 - a 2,352 mmBtu per hour fossil fuel-fired steam generator. The unit was placed on long-term reserve shutdown on March 1, 1984. EU002 will be replace by EU026.
003	Steam Generation	NGS Existing Unit 3 - a 5,260 mmBtu per hour fossil fuel-fired steam generator. EU003 will be subject to multi-unit emissions caps as part of the Repowering Project for SO_2, NO_x and PM.
023[1]	Materials Handling	SJRPP Materials Handling Operations - Handling and storage of coal, petroleum coke, and limestone (Fugitive Emissions). Base Case - Figure TE-2 includes the facilities to be located on SJRPP property associated with the NGS Repowering Project: NSPS Subpart Y Alternate 1 - Figure TE-3 includes the facilities to be located on SJRPP and St. Johns River Coal Terminal (SJRCT) property associated with the NGS Repowering Project. NSPS Subparts Y & OOO.
026	Steam Generation	NGS Repowered Unit 2 - a 2,764 mmBtu per hour circulating fluidized bed boiler. NSPS Subpart Da. EU026 will replace EU002 and will be subject to multi-unit emissions caps for SO_2, NO_x and PM.

EMISSION UNIT NO.	SYSTEM	EMISSION UNIT DESCRIPTION
027	Steam Generation	NGS Repowered Unit 1 - a 2,764 mmBtu per hour circulating fluidized bed boiler. NSPS Subpart Da. EU027 will replace EU001 and will be subject to multi-unit emissions caps for SO_2, NO_x, and PM.
028	Materials Handling	NGS Materials Handling Operations - Handling and storage of coal, petroleum coke, limestone, fly ash, bed ash, and by-products (Fugitive Emissions). Base Case - Figure TE-1 identifies the facilities to be constructed on NGS property associated with the NGS Repowering Project. NSPS Subparts Y & OOO. Alternate 1 - Figure TE-2 identifies the facilities to be constructed on NGS property associated with the NGS Repowering Project. NSPS Subparts Y & OOO.
029	Materials Handling	NGS Crusher House Base Case - 1,400 TPH & 2.42 million TPY of Coal/Petroleum Coke. NSPS Subpart Y. Alternate 1 - 1,400 TPH & 2.42 million TPY of Coal/Petroleum Coke and 1,500 TPH & 1.45 million TPY of limestone. NSPS Subparts Y & OOO.
031	Materials Handling	NGS Boiler Fuel Silos - Ten units handling 1,400 TPH & 2.42 million TPY of coal/petroleum coke. NSPS Subpart Y.
032	Materials Handling	NGS Limestone Receiving Bins - Three units handling 500 TPH & 1.45 million TPY of Limestone. NSPS Subpart OOO.
033	Materials Handling	NGS Limestone Dryers/Mills - Three 19.3 mmBtu/hr units each drying 55 TPH and 1.45 million TPY of wet limestone. NSPS Subpart OOO.
034	Materials Handling	NGS Limestone Crusher Conveyor Transfers - Three conveyors each handling 50 TPH and 1.31 million TPY of dry-crushed limestone. NSPS Subpart OOO.
035	Materials Handling	NGS Limestone Feed Silos - Two units each handling 75 TPH and 657,000 TPY of dry-crushed limestone. NSPS Subpart OOO.

EMISSION UNIT NO.	SYSTEM	EMISSION UNIT DESCRIPTION
036	Materials Handling	NGS Fly Ash Waste Bins - Two units each handling 6 TPH_{in} and 27 TPH_{out} of fly ash.
037	Materials Handling	NGS Fly Ash Transfer & Storage Systems - Two pneumatic transfer units and two storage silos, each handling 27 TPH of fly ash.
038	Materials Handling	NGS Bed Ash Transfer & Storage Systems - Two units, each handling 21 TPH of bed ash.
039	Materials Handling	NGS Fly & Bed Ash Silo Hydrators - Eight fly ash hydrators, each handling 25 TPH, and four bed ash hydrators, each handling 59 TPH.
040	Materials Handling	NGS Bed Ash Truck Loadout Systems - Two loadouts, each handling 250 TPH of dry-unhydrated bed ash
041	Materials Handling	NGS Fly Ash Truck Loadout Systems - Two loadouts, each handling 250 TPH of dry-unhydrated fly ash.
042	Materials Handling	NGS Pebble Lime Silo - One unit handling 20 TPH_{in} and 10 TPH_{out} of pebble lime.
043	Materials Handling	SJRPP Rotary Railcar Dumper - One unit handling 4,000 TPH and 7.55 million TPY.
Note (1) A separate PSD permit revision and BACT Determination are being issued to address materials handling and storage operations at SJRPP (PSD-FL-010(C)) that will support the Northside Units 1 and 2 Repowering Project.		

JEA is proposing to repower NGS using two new coal and petroleum coke fired CFB boilers and ancillary equipment. 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 generator; 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), a 495-foot dual flued stack, ash/by-product handling, storage, and processing facilities, and an electrical substation.

The CFB boilers will have a design heat input rate of 2,764 mmBtu/hr. The use of CFB boiler technology results in lower 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. 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).

Each CFB boiler will be equipped with a selective non-catalytic reduction (SNCR) system to reduce NO_x emissions to 0.09 lb/mmBtu (approximately 0.8 lb/MW - 0.9 lb/MW gross output). The use of CFB boiler technology in conjunction with SNCR is a proven technology for reducing NO_x emissions from CFB boilers. The applicant's requested 3,600 TPY multi-unit emissions cap for NO_x is included within the specific conditions of the PSD permit.

Figure TE-2
Materials Handling & Storage Operations, Base Case

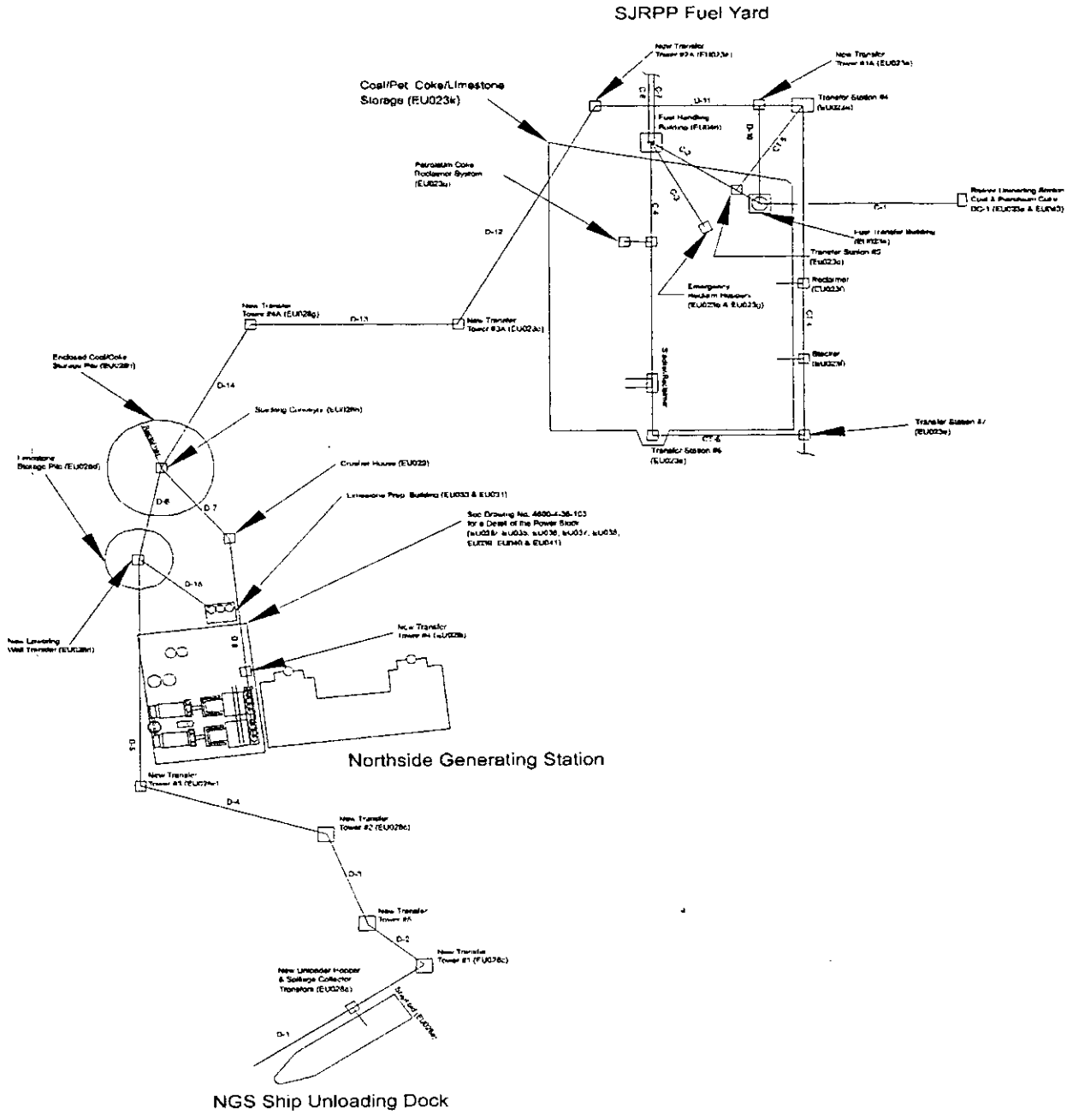
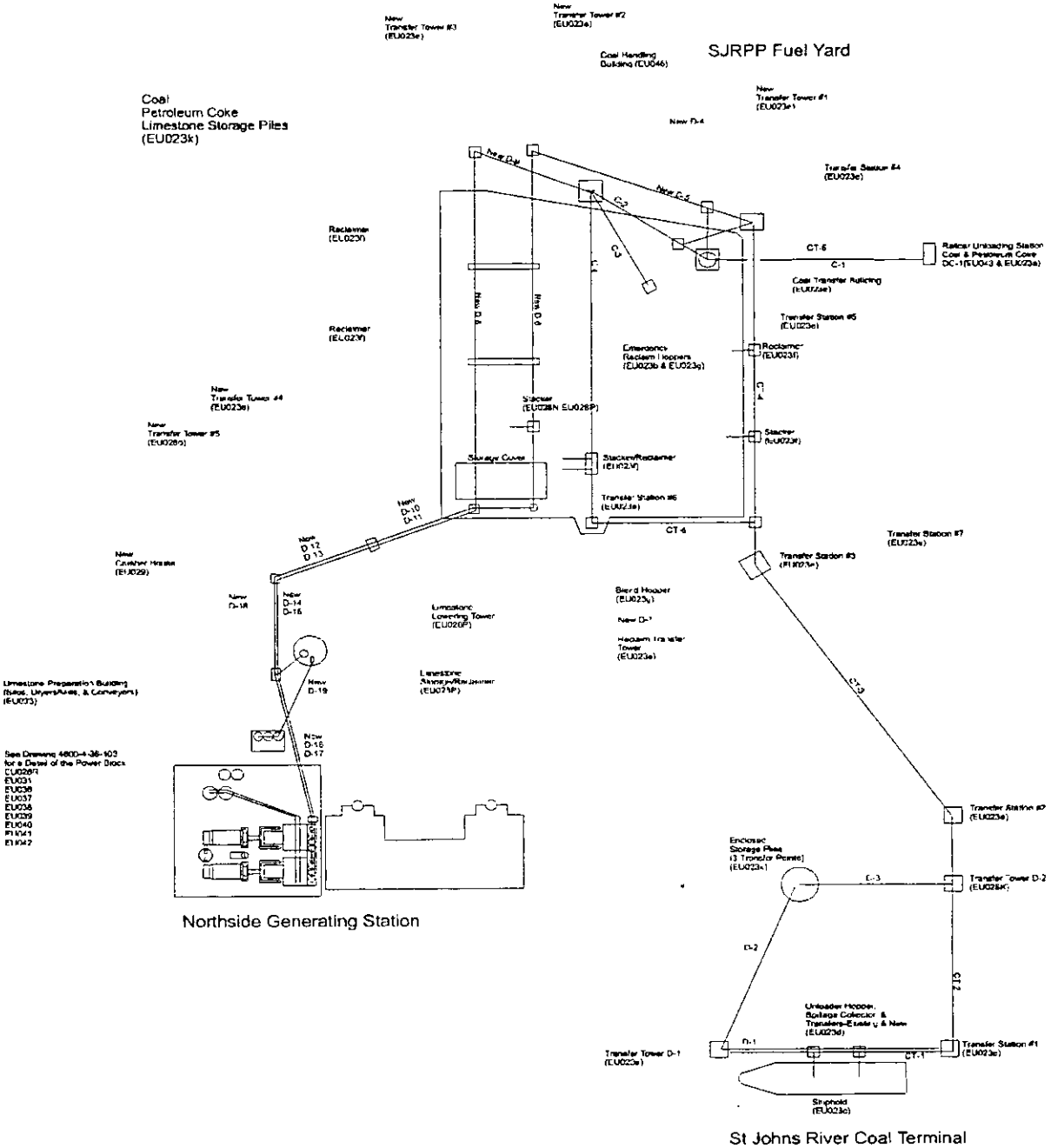


Figure TE-3
Materials Handling & Storage Operations, Alternate 1



Each CFB boiler will be equipped with an add-on AQCS to reduce SO_2 emissions to 0.15 lb/mmBtu on a 30-day rolling average and 0.2 lb/mmBtu on a 24-hour block average. JEA has evaluated and received vendor guarantees on two AQCS's for reducing emissions to these levels, a spray dryer and a fluid bed scrubber. The use of CFB boiler technology with limestone injection is proven technology for reducing SO_2 emissions. The addition of an add-on AQCS represents an advancement in the air pollution control strategies for CFB boilers. The applicant's requested 12,284 TPY multi-unit emissions cap for SO_2 is included within the specific conditions of the PSD permit.

Each CFB boiler will be equipped with an add-on AQCS to reduce particulate matter (PM & PM_{10}) emissions to 0.011 lb/mmBtu. JEA has received and evaluated vendor guarantees on both a fabric filter and an electrostatic precipitator (ESP) for reducing emissions to the proposed level with the final selection dependent upon the type of SO_2 AQCS selected (Spray Dryer/Fabric Filter or Circulating Bed Scrubber/ESP). Both AQCS's evaluated represent proven technology for reducing particulate matter (PM & PM_{10}) emissions. The applicant's requested 881 TPY multi-unit emissions cap for PM is included within the specific conditions of the PSD permit.

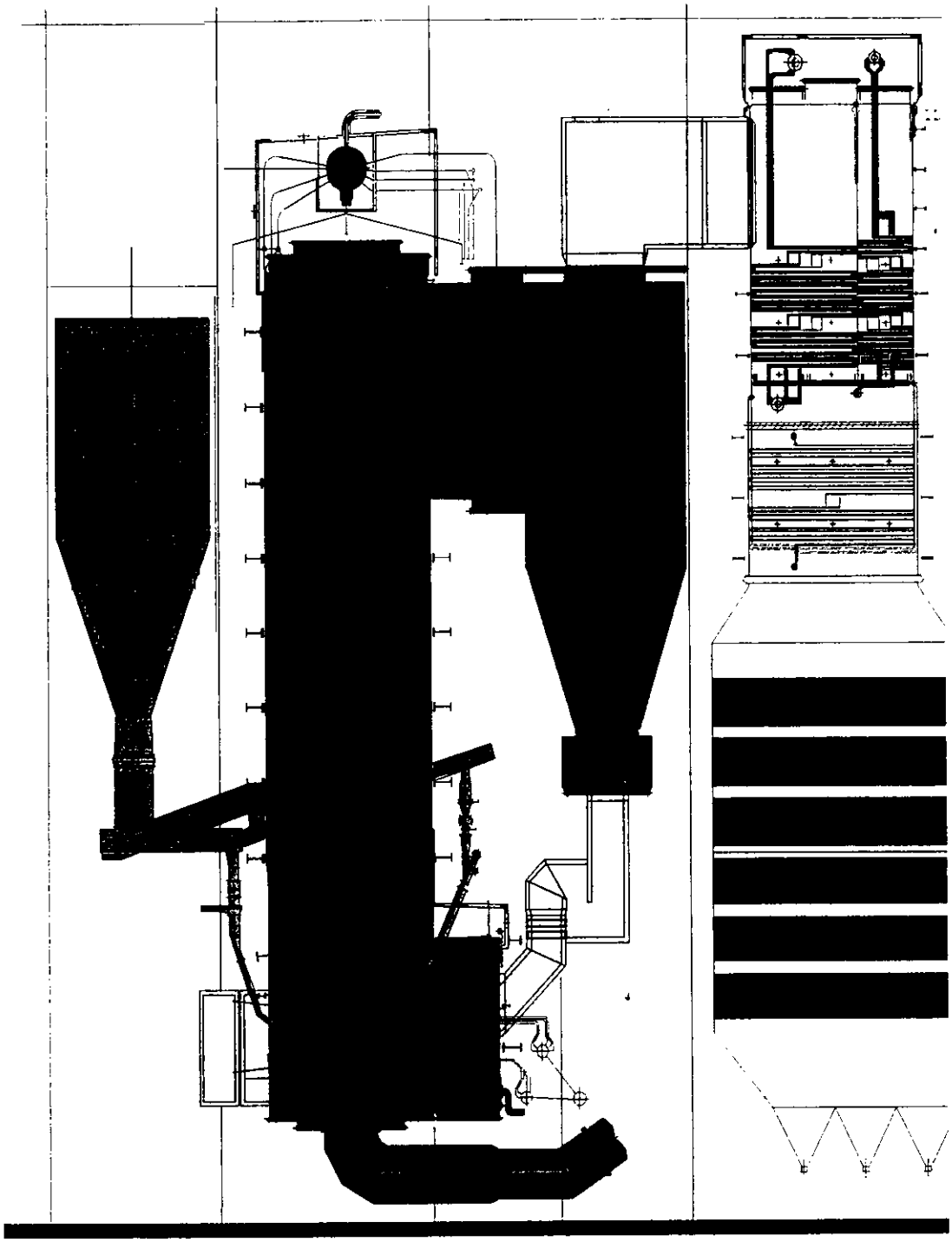
Each CFB boiler will be expected to operate as efficiently as practicable, while maximizing combustion efficiency and minimizing NO_x formation to limit CO and VOC emissions. Unit specific limits of 350 lb/hr and 14 lb/hr for CO and VOC, respectively, are included within the specific conditions of the PSD permit. These hourly caps reflect emission rates of approximately 0.13 lb/mmBtu and 0.005 lb/mmBtu.

Each CFB boiler will be equipped with add-on AQCS's for PM and SO_2 as described above which indirectly control emissions of Pb, H_2SO_4, Hg, and HF to levels of 0.07, 1.1, 0.43, and 0.03 lb/hr, respectively. In addition, the AQCS will reduce emissions of trace metals and hazardous air pollutants.

The design of the CFB boilers will allow operation over a large load range even though Repowered Units 1 and 2 are anticipated to be base loaded units. The CFB boiler vendor (Foster Wheeler USA) has guaranteed emissions down to 50% load and, based upon initial demonstrations, operation at loads as low as 25% may be achievable while still meeting performance and emission requirements. Figure TE-4 presents an overview of CFB boiler technology.

Each limestone dryer/mill will be capable of firing either natural gas or low sulfur distillate oil. NO_x emissions will be controlled using low-NOx burners. Particulate matter (PM & PM_{10}) emissions will be controlled by the use of add-on AQCS (Fabric Filter/Baghouse) to meet a limit of 0.01 grains per dry standard cubic foot (gr/dscf). CO and VOC emissions will be controlled using good combustion practices. SO_2 and H_2SO_4 emissions will be limited by the use of natural gas and low sulfur distillate oil (< 0.05% Sulfur by weight). Emissions of trace metals and other HAPs will be controlled indirectly through fuel quality, the add-on AQCS for PM, and good combustion practices.

Figure TE-4
Circulating Fluidized Bed Boiler Schematic



Each materials handling and storage operation will employ one or more control strategies to limit emissions of particulate matter to meet specific emission limitations and/or visible emissions limits. The control strategies include the following:

Control Strategy	Description
Best Operating/Design Practices	Control strategy focuses on "Pollution Prevention" by designing systems which minimize particulate matter emissions. Typical practices include reduced conveyor speeds to avoid dust entrainment, minimizing the number of transfer points, use of partial and total enclosures when practicable, material conditioning, wet suppression techniques and water sprays.
Total or Partial Enclosures	Control strategy focuses on reduction or elimination of fugitive particulate matter emissions. Depending upon the source, potential additional control strategies may be employed to further reduce unconfined emissions including; wet suppression, water sprays, and dust collection systems.
Conditioned Materials	Control strategy focuses on reduction of the particulate matter emission potential by controlling the moisture content of a material. Conditioned materials are those containing a moisture content of 3.5% by weight or more.
Wet Suppression	Control strategy focuses on the direct application of water and/or chemical wetting agents to the materials, increasing moisture content, and/or reducing emission potential.
Water Sprays	Control strategy focuses on minimizing particulate matter emitted from an operation by entrainment within water droplets or fogs sprayed into the fugitive emissions.
Dust Collection System	Control strategy is associated with the use of partial and /or total enclosures requiring removal of particulates from the enclosed area for health or safety reasons. Dust collection systems exhaust through an AQCS which may be vented to the outside atmosphere.

For fugitive particulate matter emissions from the materials handling and storage operations, the specific conditions of the PSD permits will reflect the following visible emissions limitations:

- 10% Opacity - Ship Unloading Operations (Shiphold & Receiving Hoppers); SJRPP Railcar Rotary Dumper Building; SJRPP Storage Piles; SJRPP Stackers, and Reclaimers; and SJRPP and NGS Ship Unloader and Stacker/Reclaimer Conveyors;

- 5% Opacity - SJRCT Enclosed Materials Surge Pile; NGS Fuel Storage Building; SJRPP and NGS Transfer Towers & Stations; SJRPP Fuel Transfer Building; SJRPP and NGS Covered Conveyors; NGS Limestone Lowering Well, Storage Pile and Reclaim Hopper; and the NGS Ash Hydrator Loadouts (Wet Materials).
- 0% Opacity - Limestone Dryer/Mill Building.

For the materials handling and storage operations equipped with a dust collection system and AQCS, the specific conditions of the PSD permit will reflect a 5% opacity limitation from the dust collection system exhaust. The Department is granting a stack test waiver under Rule 62-297.310(7)(c), F.A.C. for each dust collection system equipped with a baghouse based on the JEA's design specification of 0.01 gr/dscf. The waiver is only applicable to those systems which emit less than 5 TPY of particulate matter (PM/PM_{10}). In addition, any system subject to 40 CFR Part 60, Subpart OOO will be required to conduct an initial compliance test.

Based on the information presented in the application, the Repowering Project will trigger PSD review for NO_X, PM/PM_{10}, CO, VOC, Total Fluorides (HF) , and Hg since emissions will increase by more than their respective significant emissions rates. For $PM_{2.5}$, the project increases were considered significant since "any" increase triggers PSD review. However, current EPA guidance on $PM_{2.5}$ instructs reviewing agencies to use PM10 as a surrogate until additional rules are promulgated. (EPA Memorandum Regarding "Interim Implementation of NSR Requirements for $PM_{2.5}$, dated October 24, 1997).

4.0 PROCESS DESCRIPTION

The proposed Repowering Project involves several processes, including materials handling, storage, and processing; CFB boiler operation; and AQCS operation. Each of these processes is discussed below.

4.1 Materials Handling, Storage, and Processing

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. These two scenarios have been presented in Figures TE-2 and TE-3.

Figure TE-2 presented JEA's Base Case which involves the construction of a new ship unloading facility near the existing NGS fuel dock supported by the existing Rotary Railcar Unloader at SJRPP. The ship unloading facility would be capable of delivering 2.42 million tons of either coal or petroleum coke (or any combination) and 1.45 million tons of limestone per year to the 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 building and conveyed to the new 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.

Figure TE-3 presented JEA's Alternate 1 which involves the construction of an additional ship unloader, conveyors, and enclosed materials surge pile at the existing SJRCT. In addition, Alternate 1 would include the construction of new conveyors, transfers, a stacker, reclaimers, and a slight

expansion of the storage pile at SJRPP. Alternate 1 would increase the annual throughput of coal/petroleum coke at SJRPP from 5.13 million tons to 7.55 million tons per year and limestone from 0.60 million tons to 2.05 million tons per year. As with the Base Case, Alternate 1 will be supported by the existing Rotary Railcar Unloader at SJRPP. From the SJRCT, the materials would be transferred to either the existing SJRPP storage pile or the new NGS limestone storage pile by use of a conveyor system. The conveyors would transport the materials at a maximum rate of 1,500 TPH to the storage piles. From the SJRPP storage pile, coal and petroleum coke would be reclaimed and conveyed to the new 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.

Under both scenarios, limestone would be reclaimed from the NGS storage pile and conveyed to one of three Receiving Bins at a maximum rate of 500 TPH. From the Receiving Bins, the limestone is conveyed at a maximum rate of 55 TPH, wet basis, to each of three Limestone Dryers/Mills where the limestone is dried and milled. The Limestone Dryers/Mills can be fired on either natural gas or low sulfur distillate oil at a maximum rate of 19.3 mmBtu/hr per unit. The dry and milled limestone is conveyed from each dryers/mill at a rate of 50 TPH to either of two pneumatic transfer systems. The pneumatic transfer systems convey the dried and milled limestone to either of two Limestone Feed Silos (one per CFB boiler) at a maximum rate of 75 TPH.

The existing SJRPP Rotary Railcar Dumper will support NGS. Under both scenarios the potential throughput of the SJRPP Rotary Railcar Dumper will be increased from 5.13 million tons (SJRPP Requirement) to 7.55 million tons per year. Under the Base Case, coal and petroleum coke can 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 can 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 by 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 is collected within each particulate matter AQCS and 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 an average 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, each capable of processing 25 TPH of fly ash. From the hydrators, the hydrated fly ash can 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.

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.

4.2 CFB Boiler Operation

Figure TE-4 presents an overview of the operation of a CFB boiler. For the NGS Repowering Project JEA is proposing to install two CFB boilers firing coal and/or petroleum coke with maximum heat input rates of 2,764 mmBtu/hr, each. JEA proposes to inject limestone into the CFB boilers at typical rates of about 104,000 lb/hr and 145,500 lb/hr while firing coal and petroleum coke, respectively.

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 the CFB boiler the "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 offering high heat transfer rates at relatively low combustion temperatures (1,500 - 1,600°F). As fuel is added to the 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 the 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. 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 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. The primary advantages of CFB boiler technology are reduced SO_2 and NO_x emissions and fuel flexibility. 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 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 the proposed project, the applicant is going beyond BACT with the addition of an add-on SO_2 AQCS for purposes of further reducing emissions as part of a community commitment.

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. CFB boilers are capable of operating at lower temperatures while maintaining uniform furnace temperatures because the mass of the recirculated materials is significantly higher than that of the gas stream. 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, 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, Fuel NO_x is reduced. The general NO_x chemistry includes the following:

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, Fuel NO_x is reduced. The general NO_x chemistry includes the following:
Thermal NO_x

$$N_2 + O \rightarrow NO + N$$

$$N + O_2 \rightarrow NO + O$$

$$N + OH \rightarrow NO + H$$

SNCR offers additional NO_x reductions within the CFB boiler by reacting ammonia or urea with NOx to form water and molecular nitrogen. The SNCR chemistry includes the following:

Ammonia Based System

$$4NO + 4NH_3 + O_2 \rightarrow 4N_2 + 6H_20$$

Urea Based System

$$2NO + (NH_2)_2CO + \tfrac{1}{2}O_2 \rightarrow 2N_2 + 2H_2O + CO_2$$

Within the CFB boiler the ammonia or urea injected works as a reducing agent within a set temperature range or window. The acceptable temperature range for SNCR is 1,400°F to 2,000°F. Temperatures above 1,700°F and below 2,000°F are preferred. The SNCR system consists of storage and handling equipment for ammonia, equipment for mixing the chemical with a carrier (compressed air, water, or steam) and the injection system. Injection rates are typically slightly above a 1:1 mole ratio of ammonia to NO_x.

For the proposed project, the applicant has received a vendor (Foster Wheeler USA) guarantee on the performance of the CFB boilers. These guaranteed emission rates include the following:

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

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

4.3 AQCS Operation

Gaseous emissions from the CFB boilers will be vented to add-on AQCS's which will further reduce SO_2 emissions and control particulate matter (PM & PM_{10}). Within the application, JEA has presented two AQCS strategies: fluid bed scrubber/electrostatic precipitator combination, and a spray dryer absorber/fabric filter combination. The individual component of the overall AQCS's include the following:

- Circulating Fluid Bed Scrubber (CFBS)
- Electrostatic Precipitator (ESP)
- Spray Dryer Absorber (SDA)

The CFBS can be used to remove small amounts of SO_2 not captured with the CFB boiler. Figure TE-5 provides an overview of how the CFBS and the ESP could be arranged. Under this option, flue gases exiting the CFB boiler will enter the CFBS through a venturi transition. Within the CFBS chamber, a bed of hydrated lime and fly ash will be fluidized by the CFB boiler's exhaust gases. The fluidizing action will mix the exhaust gases with the hydrated lime maximizing SO_2 absorption. Humidification water is added at the chamber inlet to maintain the optimum operating temperature range for 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 CFBS is expected to achieve additional removal of the SO_2 in the flue gases exiting the CFB boiler and result in an overall reduction (CFB boiler & CFBS) of 98 percent of the SO_2. For the proposed project, the applicant has received a vendor (Environmental Elements Corporation) guarantee on the performance of the CFBS. These 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

The ESP can be used to remove particulate matter (PM/PM_{10}) from the CFB boiler exhaust gases following the CFBS. The ESP is a control device that uses electrical forces to move the particles out of the flowing gas stream and onto collector plates. The particles are given an electrical charge by forcing them to pass through a corona, a region in which gaseous ions flow. The electrical field that forces the charged particles to the walls comes from electrodes maintained at high voltage in the center of the flow lane. Once the particles are collected on the plates, they are removed from the plates without re-entraining them into the gas stream by knocking them loose from the plates, allowing the collected layer of particles to slide down 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 has received a vendor (Environmental Elements Corporation) guarantee on the performance of the ESP. These guaranteed emission rates include the following:

- Particulate Matter - 0.011 lb/mmBtu
- PM10 - 0.011 lb/mmBtu
- Lead - 0.000026 lb/mmBtu
- Mercury - 0.0000105 lb/mmBtu (CFBS & ESP)
- Opacity - 10%

The SDA can be used to remove small amounts of SO_2 not captured with the CFB boiler. Figure TE-6 provides an overview of how the SDA and the FF could be arranged. Under this option, flue gases exiting the CFB boiler will enter the top of a 50 percent capacity SDA equipped with multiple nozzles which will atomize a lime slurry into the flue gas in each SDA. The slurry will 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 SDA is

expected to achieve additional removal of the SO_2 in the flue gases exiting the CFB boiler and result in an overall reduction (CFB boiler & SDA) of 98 percent of the SO_2. For the proposed project, the applicant has received a vendor (Wheelabrator Air Pollution Control, Inc.) guarantee on the performance of the SDA.

These 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

The FF can be used to remove particulate matter (PM/PM_{10}) from the CFB boiler exhaust gases following the SDA. Particle-laden gas passes along the surface of the bags, then radially through the fabric. Particles are retained on the upstream face of the bags, while the cleaned gas stream is vented to the atmosphere. The filter is operated cyclically alternating between relatively long periods of filtering and short periods of cleaning. During cleaning, dust that has accumulated on the bags is removed from the fabric surface and deposited in a hopper for subsequent disposal.

Figure TE-5
CFBS/ESP Air Quality Control System

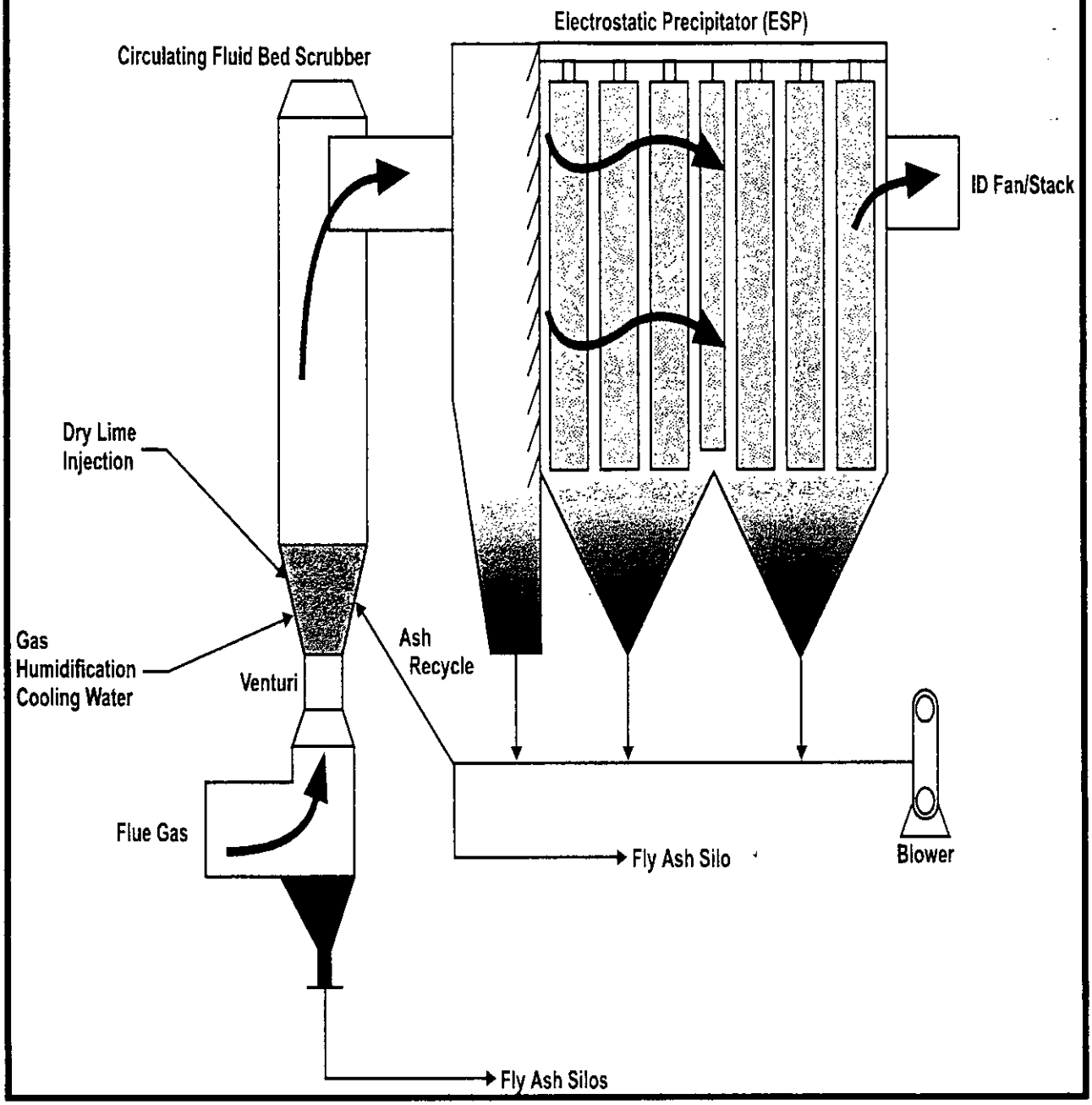
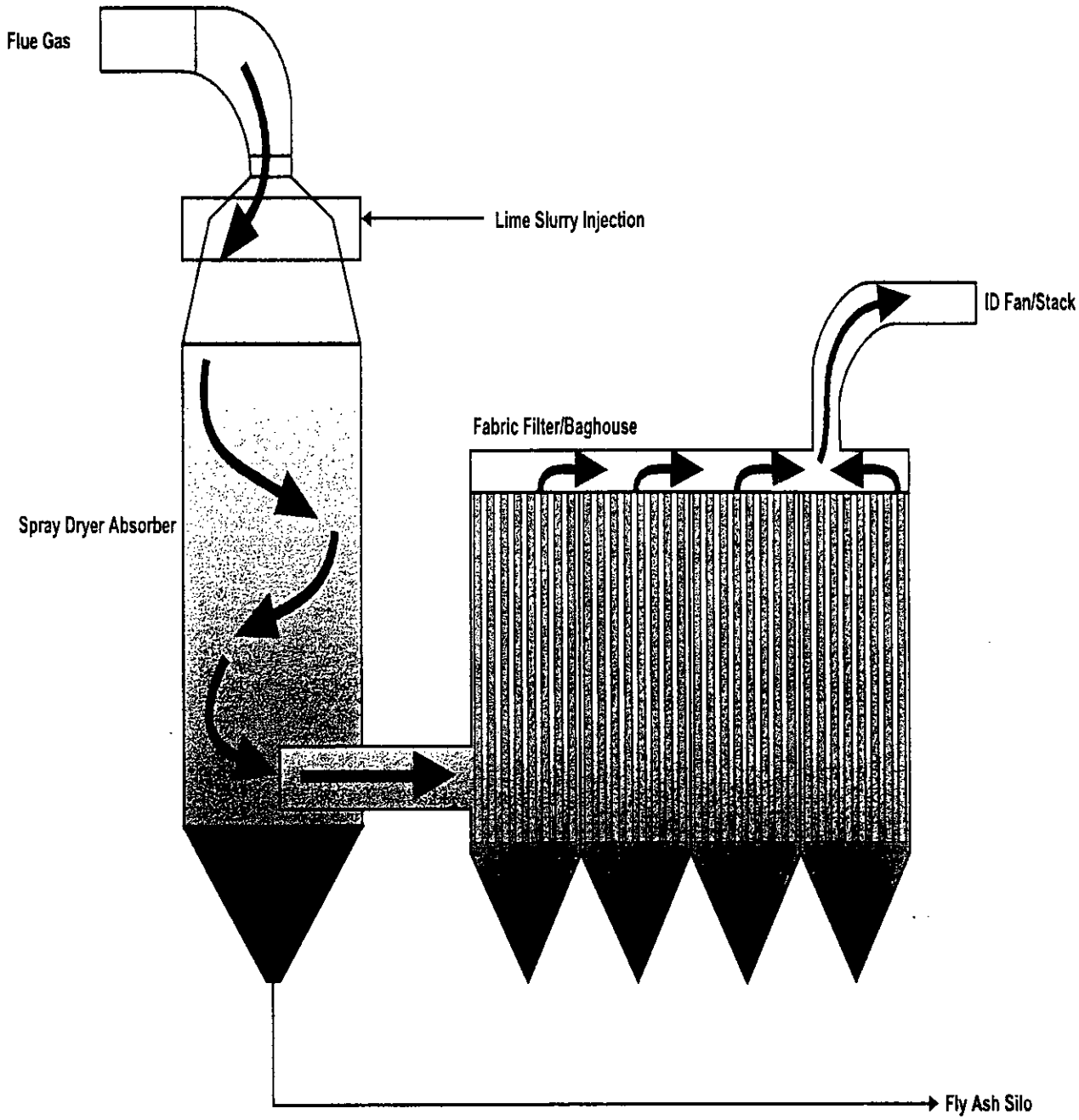


Figure TE-6
SDA/FF Air Quality Control System



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. Gas temperatures up to about 500°F, with surges to about 550°F can be accommodated routinely. Most of the energy used to operate the system appears as pressure drop across the bags and associated hardware and ducting. FF are used where high-efficiency particle collection is required. Limitations are imposed by gas characteristics (temperature and corrosivity) and particle characteristics (primarily stickiness) that affect the fabric or its operation and that cannot be economically accommodated. For the proposed project, each FF unit consists of eight compartments containing 34 rows and 36 rows of fabric filter bags in the width and depth directions, respectively. These bags provide a total cloth area of 310,771 square feet with gas-to-cloth ratios of 3.00:1 (Normal Operation) and 3.43:1(Maintenance). The FF will use a jet pulse cleaning system to remove the dust cake from the bags. For the proposed project, the applicant has received a vendor (Wheelabrator Air Pollution Control, Inc.) guarantee on the performance of the FF. These guaranteed emission rates include the following:

- Particulate Matter - 0.011 lb/mmBtu
- PM_{10} - 0.011 lb/mmBtu
- Lead - 0.000026 lb/mmBtu
- Mercury - 0.0000105 lb/mmBtu (SDA & FF)
- Opacity - 10%

5. RULE APPLICABILITY

The Repowering Project is subject to preconstruction review requirements and emission limiting standards under the provisions of Chapter 403, Florida Statutes, and Chapters 62-4, 62-204, 62-210, 62-212, 62-214, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.).

NGS is located in Duval County, an area designated as maintenance for ozone and particulate matter (Downtown Area), and attainment for all other criteria pollutants in accordance with Rule 62-204.360, F.A.C. The proposed project is subject to review under Rule 62-212.400., F.A.C., Prevention of Significant Deterioration (PSD), because the potential emission increases for CO, NO_X, PM/PM_{10}, VOC, Hg, and Total Fluorides (HF) exceed the significant emission rates given in Chapter 62-212, Table 62-212.400-2, F.A.C.

This PSD review includes a determination of Best Available Control Technology (BACT) for CO, NO_X, PM/PM_{10}, VOC, Hg, and Total Fluorides (HF). A determination of Maximum Achievable Control Technology (MACT) was not required (40 CFR 63.40(c)). An analysis of the air quality impacts from the proposed project upon soils, vegetation and visibility is required along with air quality impacts resulting from associated commercial, residential, and industrial growth.

The emissions units affected by this PSD permit shall comply with all applicable provisions of the Ordinance Code of the City of Jacksonville, Title X Environmental Affairs and the Rules of the Jacksonville Environmental Protection Board (as applicable), the Florida Administrative Code (including applicable portions of the Code of Federal Regulations incorporated therein) and, specifically, the following Chapters and Rules:

5.1 Local Regulations

Chapter/Rule	Description
Chapter 360	Environmental Regulation (as applicable)
Chapter 362	Air and Water Pollution (as applicable)
Chapter 376	Odor Control (as applicable)
Rule 1	Part VII Fees and Collection of Fees (as applicable)
Rule 1	Part VIII Investigations (as applicable)
Rule 2	Part I General Provisions (as applicable)

5.2 State Regulations

Chapter/Rule	Description
Chapter 62-4	Permits
Rule 62-204.220	Ambient Air Quality Protection
Rule 62-204.240	Ambient Air Quality Standards
Rule 62-204.260	Prevention of Significant Deterioration Increments
Rule 62-204.800	Federal Regulations Adopted by Reference
Rule 62-210.300	Permits Required
Rule 62-210.350	Public Notice and Comments
Rule 62-210.370	Reports
Rule 62-210.550	Stack Height Policy
Rule 62-210.650	Circumvention
Rule 62-210.700	Excess Emissions
Rule 62-210.900	Forms and Instructions
Rule 62-212.300	General Preconstruction Review Requirements
Rule 62-212.400	Prevention of Significant Deterioration
Rule 62-213	Operation Permits for Major Sources of Air Pollution
Rule 62-214	Requirements For Sources Subject To The Federal Acid Rain Program
Rule 62-296.320	General Pollutant Emission Limiting Standards
Rule 62-297.310	General Test Requirements
Rule 62-297.401	Compliance Test Methods
Rule 62-297.520	EPA Continuous Monitor Performance Specifications

5.3 Federal Rules

Regulation	Description
40 CFR 60	NSPS Subparts A, Da, Y, and OOO (applicable sections)
40 CFR 72	Acid Rain Permits (applicable sections)
40 CFR 73	Allowances (applicable sections)
40 CFR 75	Monitoring (applicable sections including applicable appendices)
40 CFR 77	Acid Rain Program-Excess Emissions (future applicable requirements)

6. SOURCE IMPACT ANALYSIS

6.1 Emission Limitations

The Repowering Project will result in emissions of the following PSD pollutants (Table 212.400-2): carbon monoxide, nitrogen oxides, sulfur dioxide, particulate matter (PM, PM_{10}, & $PM_{2.5}$), volatile organic compounds, lead, mercury, fluorides, and sulfuric acid mist. The applicant's proposed net increases in annual emissions are summarized in the Table below and form the basis of the source impact review. The Department's proposed permitted allowable emissions for the Repowering Project are summarized in the Draft BACT documents and Specific Conditions Nos. 12 through 25 of Draft Permit PSD-FL-265 and will be summarized in amended conditions to the SJRPP PSD Permit (PSD-FL-010(C)) .

6.2 Emission Summary

The emissions for all PSD pollutants as a result of the construction of this facility are presented in Table TE-5.

6.3 Control Technology

The applicant has proposed various control strategies to reduce emissions of the various PSD pollutants from the CFB boilers, the limestone dryers/mills, and the materials handling and storage operations. A full discussion of the available control strategies is presented in the Draft Best Available Control Technology (BACT) Determination (see Permit Appendix BD). The Draft BACT is incorporated into this evaluation by reference.

The proposed control strategies and available alternatives are listed in Table TE-6.

6.4 Air Quality Analysis

6.4.1 Introduction

The proposed project will result in a net increase in emissions of six pollutants at levels in excess of PSD significant amounts: PM/PM_{10}, CO, VOC, Hg, total fluorides (HF) and NO_2. The air quality impact analyses required by the PSD regulations for these pollutants include:

- An analysis of existing air quality;
- A significant impact analysis;
- A PSD increment analysis for PM_{10} and NO_2;
- An Ambient Air Quality Standards (AAQS) analysis for PM_{10}, CO, and NO_2; and
- An analysis of impacts on soils, vegetation, and visibility and of growth-related air quality modelling impacts.

For CO the significant impact analyses performed by the applicant predicted maximum off-site impacts less than the significance levels of 2,000 µg/m3g/m^3, 1-hour average, and 500 µg/m3g/m^3, 8-hour average. As a result, the applicant was only required to perform an Additional Impact Analysis at the PSD Class I areas.

For NO_x the significant impact analyses performed by the applicant predicted maximum off-site impacts of greater than the significance level of 1 $\mu g/m^3$, annual average, in the vicinity of the facility but less than 0.1 $\mu g/m^3$, annual average, at the PSD Class I areas. As a result, the applicant was required to perform a PSD Class II Increment Consumption Analysis, an AAQS Analysis, and an Additional Impact Analysis at the PSD Class I areas.

For PM no analyses by the applicant are required since there are no longer any AAQS's nor PSD significant impact levels or increments for the pollutant. The analysis for particulate matter is covered under the pollutant PM_{10}.

Table TE-5

NET EMISSIONS INCREASES OF PSD POLLUTANTS								
Pollutants	**Unit 1 Decreases [1]**	**Repowered Unit 1[2]**	**Repowered Unit 2[2]**	**Limestone Dryers/Mills[2]**	**Materials Handling[2]**	**Net Increase**	**PSD Significance**	**PSD REVIEW ?**
CO	-122.0	1,533	1,533	119	0	3,063	100	Yes
NO_X[3]	-1,359.7	1.090	1.090	50.7	0	871	40	Yes
SO_2[3]	-6,574.8	1,816	1,816	1.29	0	-2,941	40	No
PM[3]	-201.1	133	133	0.0022	34	99	25	Yes
PM_{10}	-143.2	133	133	0.0011	8	131	15	Yes
Ozone(VOC)	-17.1	61.3	61.3	1.39	0	107	40	Yes
Lead	-0.03187	0.3	0.3	0.000023	0	0.57	0.6	No
Mercury	-0.00243	0.13	0.13	0.00076	0	0.26	0.1	Yes
Total Fluorides (HF)	-0.78482	1.9	1.9	0.0068	0	3.02	3	Yes
Sulfuric Acid Mist	-196.8	4.8	4.8	0.0098	0	-187	7	No

NOTES:

1. Recent Actual Annual Emissions based on the two year average starting 9/96 and ending 8/98.
2. Based on proposed BACT and requested emission limits.
3. Requested multi-unit emissions caps for stack emissions from Units 1, 2, and 3: NO_x - 3,600 TPY; PM - 881 TPY; and SO_2 - 12,284 TPY

Table TE-6

Emissions Unit(s)	Pollutant	Control Strategy/Technology
CFB Boilers (Emissions Units 026 & 027)	SO_2	CFB Technology with limestone injection and an add-on AQCS (Spray Dryer or Fluid Bed Scrubber) 0.15 lb/mmBtu (30-day Rolling Average) 0.2 lb/mmBtu (24-hour Block Average).
	NO_x	CFB Technology with SNCR 0.09 lb/mmBtu (30-day Rolling Average).
	PM/PM_{10}	CFB Technology with an add-on AQCS (Fabric Filter or ESP) 0.011 lb/mmBtu (3-hour Average).
	CO/VOC	CFB Technology and Good Combustion Practices (Alternatives - Oxidation Catalyst or Thermal Oxidizer) 350 lb/hr (24-hour Block Average) for CO and 14 lb/hr (3-hour Average) for VOC.
	H_2SO_4	CFB Technology with limestone injection and an add-on SO_2 and PM AQCS 1.1 lb/hr (3-hour Average).
	Fluorides (HF)	CFB Technology with limestone injection and an add-on SO_2 AQCS 0.43 lb/hr (3-hour Average).
	Lead	CFB Technology with an add-on PM AQCS (Fabric Filter or ESP) 0.07 lb/hr (3-hour Average).
	Mercury	CFB Technology with an add-on PM & SO_2 AQCS's 0.03 lb/hr (6-hour Average).

Table TE-6

Emissions Unit(s)	Pollutant	Control Strategy/Technology
Limestone Dryers/Mills (Emissions Unit 033)	SO_2	Fuel Quality – Natural Gas and Low Sulfur Distillate Oil (0.05% by weight)
	NO_x	Low-NOx Burners
	PM/PM_{10}	Fabric Filter/Baghouse 0.01 gr/dscf
	CO/VOC	Good Combustion Practices
	H_2SO_4	Fuel Quality - Natural Gas and Low Sulfur Distillate Oil (0.05% by weight).
	Fluorides	Fuel Quality - Natural Gas and Low Sulfur Distillate Oil (0.05% by weight).
	Lead	Fuel Quality - Natural Gas and Low Sulfur Distillate Oil (0.05% by weight).
Limestone Dryers/Mills (Emissions Unit 033)	Mercury	Fuel Quality - Natural Gas and Low Sulfur Distillate Oil (0.05% by weight).
Materials Handling Operations (Emission Units 023 & 028)	PM/PM_{10}	Best Operating/Design Practices Partial or Total Enclosures Conditioned Materials Wet Suppression Water Sprays
Materials Handling Operations (Emissions Units 29, 31-43)	PM/PM_{10}	Dust Collection System Fabric Filter/Baghouse 0.01 gr/dscf & no visible emissions (5% opacity)

For PM_{10} the significant impact analyses performed by the applicant predicted maximum off-site impacts of greater than the significance levels of 5 $\mu g/m^3$, 24-hour average, and 1 $\mu g/m^3$, annual average in the vicinity of the facility but less 0.3 $\mu g/m^3$, 24-hour average, and 0.2 $\mu g/m^3$, annual average, at the PSD Class I areas. As a result, the applicant was required to perform a PSD Class II Increment Consumption Analysis, AAQS Analysis, and an Additional Impact Analysis at the PSD Class I areas.

For VOC potential emissions are above the 40 TPY significance threshold for the pollutant ozone. The applicant presented the potential increases to the Department, the U.S. EPA, and the Federal Land Manager and discussed options available to predict potential impacts associated with the emissions and formation of ozone. Based on the available information, the Department has

determined that the use of regional models which incorporate the complex chemical mechanisms for predicting ozone formation is not feasible for this project.

For Hg and HF there are no AAQS's nor PSD increments, so only an Additional Impact Analysis is required at the PSD Class I areas.

In addition to the required analyses, the applicant also provided the following additional analyses:

- Significant Impact Analysis for SO_2 and Pb.
- PSD Class II Area Increment Analysis for SO_2;
- AAQS Analysis for SO_2;
- Air Toxics Impact Analysis for Hg and HF and the HAPs expected to be emitted from the CFB boilers; and
- PSD Class I Area Increment Analysis for SO_2.

Based on the analyses performed, the Department has reasonable assurance that the proposed project, as described in this report and subject to the conditions of approval proposed herein, will not cause or significantly contribute to a violation of any AAQS or PSD increment. A discussion of the required analyses follows.

6.4.2 Analysis of Existing Air Quality and Determination of Background Concentrations

Preconstruction ambient air quality monitoring is required for all pollutants subject to PSD review unless otherwise exempted or satisfied. This monitoring requirement may be satisfied by using previously existing representative monitoring data, if available. An exemption to the monitoring requirement may be obtained if the maximum air quality impact resulting from the projected emissions increase, as determined by air quality modelling, is less than a pollutant-specific de minimis concentration. In addition, if an acceptable monitoring method for the specific pollutant has not been established by EPA, monitoring may not be required.

If preconstruction ambient monitoring is exempted, determinations of background concentrations for PSD significant pollutants with established AAQS may still be necessary for use in any required AAQS analysis. These concentrations may be established from the required preconstruction ambient air quality monitoring analysis or from previously existing representative monitoring data. These background ambient air quality concentrations are added to pollutant impacts predicted by modelling and represent the air quality impacts of sources not included in the modelling.

The table below shows that SO_2, PM_{10}, NO_2, CO, HF and Hg impacts from the project are predicted to be less than the de minimis levels; therefore, preconstruction ambient air quality monitoring is not required for these pollutants.

MAXIMUM PROJECT AIR QUALITY IMPACTS FOR COMPARISON TO THE DE MINIMUS AMBIENT LEVELS				
Pollutant	**Averaging Time**	**Maximum Predicted Impact ($\mu g/m^3$)**	**Impact Greater than De Minimis (Yes/No)**	**De Minimis Level ($\mu g/m^3$)**
SO_2	24-hr	8.4	No	13
PM_{10}	24-hr	9.6	No	10
CO	8-hr	31	No	575
NO_2	Annual	3.9	No	14
HF	24-hr	0.008	No	0.25
Hg	24-hr	0.001	No	0.25

However, previously existing representative monitoring data from SO_2, PM_{10}, NO_2 and CO monitors in North Florida were used to establish background concentrations for use in the AAQS analysis. These values are shown in the following table.

BACKGROUND CONCENTRATIONS FOR USE IN AAQS ANALYSES		
Pollutant	**Averaging Time**	**Background Concentration ($\mu g/m^3$)**
SO_2	Annual	7
	24-hr	82
	3-hr	216
PM_{10}	Annual	26
	24-hr	56
CO	8-hr	4,600
	1-hr	8,050
NO_2	Annual	28

6.4.3 Models and Meteorological Data Used in Significant Impact, PSD Increment and AAQS Analyses

The EPA-approved Industrial Source Complex Short-Term (ISCST3) dispersion model was used to evaluate the pollutant emissions from the proposed project and other existing major facilities. The model determines ground-level concentrations of inert gases or small particles emitted into the atmosphere by point, area, and volume sources. The model incorporates elements for plume rise, transport by the mean wind, Gaussian dispersion, and pollutant removal mechanisms such as deposition. The ISCST3 model allows for the separation of sources, building wake downwash, and various other input and output features. A series of specific model features, recommended by the EPA, are referred to as the regulatory options. The applicant used the EPA recommended regulatory options in each modelling scenario. Direction-specific downwash parameters were used for all sources for which downwash was considered. The stack associated with this project satisfies the good engineering practice (GEP) stack height criteria.

Initially, the applicant conducted preliminary modelling for the purpose of determining the worst case fuel/load scenarios for each applicable averaging time. Preliminary modelling runs were conducted using one year of meteorological data at three loads (100%, 75% and 50%) for both coal

and petroleum coke fuels. Thus, a total of 6 preliminary modelling runs were conducted. As a result of these runs, the applicant determined by that the 100% load produced the "worst case" predicted ground-level ambient air quality impacts for the short-term averaging periods (1-hr, 3-hr, 8-hr and 24-hr) for all pollutants.

Meteorological data used in the ISCST3 model for all modeling (except the preliminary "worst case" determination modelling) consisted of a concurrent 5-year period of hourly surface weather observations and twice-daily upper air soundings from the National Weather Service (NWS) stations at Jacksonville, Florida (surface data) and Waycross, Georgia (upper air data). The 5-year period of meteorological data was from 1984 through 1988. These NWS stations were selected for use in the study because they are the closest primary weather stations to the study area and are most representative of the project site. The surface observations included wind direction, wind speed, temperature, cloud cover, and cloud ceiling.

Because five years of data are used in ISCST3, the highest-second-high (HSH) short-term predicted concentrations were compared with the appropriate AAQS or PSD increments. For the annual averages, the highest predicted yearly average was compared with the standards. For determining the project's significant impact area in the vicinity of the facility and if there are significant impacts from the project on any PSD Class I area, both the highest short-term predicted concentrations and the highest predicted yearly averages were compared to their respective significant impact levels.

6.4.4 Significant Impact Analysis

Initially, the applicant conducted modelling using only the proposed project's worst case emission scenario for each pollutant and applicable averaging time. A total of 863 receptors were placed along the site boundary and within 10 km of the facility, which is located in a PSD Class II area. A total of 10 receptors were placed along the boundary of the Okefenokee National Wilderness Area (NWA) and a receptor was placed in the Wolf Island National Wilderness Area (NWA). Both of these areas are PSD Class I areas. They are located approximately 61 km and 102 km, respectively, from the project at their closest points. For each pollutant subject to PSD and also subject to PSD increment and/or AAQS analyses, this modelling compared maximum predicted impacts due to the project with PSD significant impact levels to determine whether significant impacts due to the project were predicted in the vicinity of the facility or in the two Class I areas. The tables below show the results of this modelling. The radius of significant impact, if any, for each pollutant and applicable pollutant averaging time is also shown in the tables below.

MAXIMUM PROJECT AIR QUALITY IMPACTS FOR COMPARISON TO THE PSD CLASS II SIGNIFICANT IMPACT LEVELS IN THE VICINITY OF THE FACILITY					
Pollutant	**Averaging Time**	**Maximum Predicted Impact ($\mu g/m^3$)**	**Significant Impact Level ($\mu g/m^3$)**	**Significant Impact (Yes/No)**	**Radius of Significant Impact (km)**
SO_2[1]	Annual	0.3	1	No	None
	24-hr	11.5	5	Yes	2.0
	3-hr	49.9	25	Yes	7.0
PM_{10}	Annual	2.1	1	Yes	4.0
	24-hr	19.2	5	Yes	1.5
CO	8-hr	46	500	No	None
	1-hr	169	2,000	No	None
NO_2	Annual	4.0	1	Yes	1.0
Pb[1]	Quarterly[2]	0.002	0.03	No	None

(1) Pollutants not subject to PSD review based on potential emission increases less than the significant emission rate thresholds of Table 62-212.400-2, F.A.C.

(2) Modelling represents maximum 24-hour annual.

MAXIMUM PROJECT IMPACT IN THE OKEFENOKEE AND WOLF ISLAND NWA'S FOR COMPARISON TO THE PSD CLASS I SIGNIFICANT IMPACT LEVELS				
Pollutant	**Averaging Time**	**Maximum Predicted Impact ($\mu g/m^3$)**	**Significant Impact (Yes/No)**	**Significant Impact (km)**
SO_2	Annual	0.0	No	0.1
	24-hr	0.6	Yes	0.2
	3-hr	3.7	Yes	1.0
PM_{10}	Annual	0.001	No	0.2
	24-hr	0.09	No	0.3
NO_2	Annual	0.0	No	0.1

As shown in the tables, the maximum predicted air quality impacts due to SO_2, PM_{10} and NO_2 emissions from the proposed project are greater than the significant impact levels in the vicinity of the facility. The maximum predicted air quality impacts due to SO_2 emissions are greater than the significant impact level in the Class I areas. Therefore, the applicant was required to do further SO_2, PM_{10} and NO_2 modelling in the vicinity of the facility, within the applicable significant impact area, to determine the impacts of the project along with all other sources in the vicinity of the facility. The significant impact area is based upon the predicted radius of significant impact. Further modelling for Class I impacts was also required for SO_2. No further modelling of any other pollutants was required. Full impact modelling is modelling that considers not only the impact of the project but the impacts of the existing facility and other major sources, including background concentrations, located within the vicinity of the project and the Class I areas.

6.4.5 *Receptor Networks for PSD Increment and AAQS Analyses*

For the AAQS and PSD Class II analyses, receptor grids normally are based on the size of the significant impact area for each pollutant. The size of the significant impact areas for the required SO_2, PM_{10} and NO_2 analyses were 7.0, 4.0 and 1.0 km radius, respectively, as discussed in the significant impact analysis section above.

Both preliminary and refined modelling runs were performed for these analyses. In the refined runs, additional receptors (11 x 11, 121 point receptor grid) spaced 100 m apart were placed over critical receptors identified during preliminary AAQS and PSD increment modelling. The results of these analyses are discussed below.

6.4.6 *PSD Increment Analysis*

The PSD increment represents the amount that new sources in an area may increase ambient ground level concentrations of a pollutant. The results of the PSD Class II increment analysis presented in the table below show that all of the maximum predicted multi-source impacts are less than the allowable Class II increments.

PSD CLASS II INCREMENT ANALYSIS				
Pollutant	**Averaging Time**	**Maximum Predicted Impact ($\mu g/m^3$)**	**Impact Greater than Allowable Increment (Yes/No)**	**Allowable Increment ($\mu g/m^3$)**
SO_2	Annual	1.9	No	20
	24-hr	77	No	91
	3-hr	382	No	512
PM_{10}	Annual	13.8	No	17
	24-hr	24.4	No	31
NO_2	Annual	1.6	No	25

The results of the PSD Class I increment analysis presented in the tables below show that all of the maximum predicted multi-source impacts are less than the allowable increments.

PSD CLASS I INCREMENT ANALYSIS FOR OKEFENOKEE AND WOLF ISLAND				
Pollutant	**Averaging Time**	**Maximum Predicted Impact ($\mu g/m^3$)**	**Impact Greater than Allowable Increment (Yes/No)**	**Allowable Increment ($\mu g/m^3$)**
SO_2	Annual(1)	N/A	N/A	2
	24-hr	2.3	No	5
	3-hr	12.9	No	25
Note: (1) Annual impacts are not applicable since project results in a net decrease in SO2 emissions on an annual basis.				

6.4.7 *AAQS Analysis*

For pollutants subject to an AAQS review, the total impact on ambient air quality is obtained by adding a "background" concentration to the maximum modelled concentration. This "background" concentration takes into account all sources of a particular pollutant that are not explicitly modelled. The results of the AAQS analysis are summarized in the table below. As shown in this table, emissions from the proposed facility are not expected to cause or significantly contribute to a violation of any AAQS.

AMBIENT AIR QUALITY IMPACTS						
Pollutant	**Averaging Time**	**Major Sources Impact ($\mu g/m^3$)**	**Background Concentration ($\mu g/m^3$)**	**Total Impact ($\mu g/m^3$)**	**Total Impact Greater than AAQS**	**Florida AAQS ($\mu g/m^3$)**
SO_2	Annual	25.9	7	32.9	No	60
	24-hr	162	82	244	No	260
	3-hr	508	216	724	No	1,300
PM_{10}	Annual	16.3	26	42.3	No	50
	24-hr	35.3	56	91.3	No	150
NO_2	Annual	17.2	28	45.2	No	100

6.5 Additional Impacts Analysis

6.5.1 Impacts on Soils, Vegetation, Wildlife, and Visibility

The maximum ground-level concentrations predicted to occur for PM_{10}, NO_x, SO_2 and CO as a result of the proposed project, including background concentrations and all other nearby sources, will be below the associated AAQS. The AAQS are designed to protect both the public health and welfare. As such, this project is not expected to have a harmful impact on soils and vegetation in the PSD Class II area. An air quality related values (AQRV) analysis was done by the applicant for the Class I areas. No significant impacts on these areas is expected.

6.5.2 Growth-Related Air Quality Impacts

There may be some temporary residential growth associated with this project, but there is little potential for new industrial development nearby as a result of it. Although it is not possible to reliably quantify the emissions and impacts resulting from this project, they are expected to be small and well-distributed throughout the area.

7. CONCLUSION

Based on the foregoing technical evaluation of the application and additional information submitted by the applicant, the Department has made a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations, provided the Department's BACT determination is implemented.

Syed Arif, P.E., Review Engineer
Cleve Holladay, Meteorologist

DRAFT

PERMITTEE:

JEA
21 West Church Street
Jacksonville, FL 32202

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

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

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 PM10), 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/PM10), 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 XX, 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.

DRAFT

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 (SO2) 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 PM10) 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.**

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(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 PM10):

(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

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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 (PM10) 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 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

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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;

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(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	0.01 gr/dscf

Limestone Dryers/Mills

PSD Pollutant	Control Technology	Projected Project Emission Levels
	Good Combustion Practices	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

BACT DETERMINATION PROCEDURE:

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

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.

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.			

Table BD-1, NSPS Limits for the CFB Boilers

Pollutant	NSPS Emission Limitation	Reduction Requirement	Projected Project Emission Levels
(2) Reported NSPS limits are for worst case SO2 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, 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.

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

Table BD-3, Circulating Fluidized Bed Boiler BACT Determinations

Pollutant	Determination	Emission Limitations	Control Technology
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:

$$CaCO_3\ (s) + Energy \rightarrow CaO\ (s) + CO_2\ (g)$$

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

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 AQCS's which will further reduce SO_2 emissions and control particulate matter (PM & PM_{10}). Within the application, JEA has presented two AQCS strategies: circulating fluidized bed scrubber/electrostatic precipitator (CFBS/ESP) combination, and a spray dryer absorber/fabric filter (SDA/FF) combination.

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 two 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.

The use of either a fabric filter or ESP on the CFB boilers to meet an emission limitation of 0.011 lb/mmBtu is considered technically feasible and equivalent to the most stringent control technology, and is therefore 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).

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 either a SDA/FF (proposed by WAPC) or a CFBS/ESP (proposed by Environmental Elements Corporation) will provide for the indirect control of fluoride from the CFB boilers. Both 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.

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 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); 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 for mercury removal by their systems of 0.03 lb/hr (1.05×10^{-5} lb/mmBtu).

The use of either the SDA/FF or CFBS/ESP will provide for the indirect control of mercury from the CFB boilers. Both 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 was evaluated as an add-on AQCS for additional mercury removal and was treated as a transfer technology. The applicant evaluated its use based on the initial WAPC proposal. Based on information provided, the applicant reported that the technology was potentially technically feasible as a transfer technology and determined that the environmental and energy impacts were not by themselves significant enough to

cause the applicant to discard the technology. The economics included a total capital cost of $680,000 and a total levelized cost of about $1,000,000 per year. Based on a 7.25% rate of return, the addition of the carbon injection system resulted in an incremental removal cost of about $9.5 million per ton of mercury removed. The technology was therefore properly rejected as excessively expensive and consistent with other Department BACT Determinations which did not require add-on mercury controls. Because of the ability of the proposed AQCS to meet the most stringent emission limitation and consideration of the economic impacts the use of either a SDA/FF or CFBS/ESP is 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% pacity
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

Materials Handling & Storage Operations - Particulate Matter

Handling & Storage Operation	Control Technologies	Proposed BACT Limits
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

Materials Handling and Storage Operations

Emissions Unit/Activity	EPA Method(s)	Duration of VE Test	Frequency	Material
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:

Approved By:

Howard L. Rhodes, Director
Division of Air Resources Management

Date:

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

TO: Clair Fancy

FROM: Syed Arif

DATE: May 10, 1999

SUBJECT: JEA Northside Generating Station
PSD-FL-265 Northside Units 1 and 2 Repowering Project

Attached is the Public Notice and draft permit modification to construct 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.

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, electrostatic precipitators or fabric filters, SNCR and ash removal and storage facilities.

A Best Available Control Technology determination was required for particulate matter, NOx, VOC, CO, HF and Hg pursuant to Rule 62-212.400, F.A.C.

I recommend your approval and signature.

SA/a

Attachments

Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

P.E. Certification Statement

Permittee:
JEA
Northside Generating Station

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

Project type: Air Construction Permit for Repowered Units 1 and 2 , coal and petroleum coke-fired circulating fluidized bed (CFB) boilers with associated ancillary equipment and processes. Nitrogen oxides (NO_x) emission will be minimized by CFB Boiler technolgy & SNCR. PM emissions will be controlled with either fabric filter or ESP. CO and VOC emissions will be minimized by good combustion practises. HF and Hg emissions will be controlled by a spray dryer absorber or a circulating fluidized bed scrubber in conjunction with fabric filter or ESP combination respectively.

I HEREBY CERTIFY *that the engineering features described in the above referenced application and subject to the proposed permit conditions provide reasonable assurance of compliance with applicable provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 62-4 and 62-204 through 62-297. However, I have not evaluated and I do not certify aspects of the proposal outside of my area of expertise (including but not limited to the electrical, mechanical, structural, hydrological, and geological features).*

Syed Arif, P.E. — 5/10/99
Registration Number: 51861

Department of Environmental Protection
Bureau of Air Regulation
New Source Review Section
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301
Phone (850) 488-0114
Fax (850) 922-6979