Progress Energy

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November 9, 2006

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Jeffery F. Koerner, P.E.
Bureau of Air Regulation – Air Permitting North
Florida Department of Environmental Protection
2600 Blair Stone Rd.
Tallahassee, Florida 32399-2400

RE: REQUEST FOR ADDITIONAL INFORMATION
PROJECT NO. 0170004-016-AC (PSD-FL-383)
FLUE GAS DESULFURIZATION PROJECT

Dear Mr. Koerner:

On September 5, 2006, Progress Energy Florida (PEF) submitted an application for an air construction permit regarding the following projects for Units 4 and 5 at the existing Crystal River Power Plant: install low-NOx burners, add flue gas desulfurization systems, add alkali injection systems, upgrade the existing electrostatic precipitator, add a carbon burnout unit, authorize additional coal blends (Powder River Basin Coal and petroleum coke), revise the specified maximum heat input rate from 6,665 to 7,200 MMBtu/hour, and authorize a fuel additive. The project is subject to PSD review for emissions of carbon monoxide, particulate matter, sulfuric acid mist, and volatile organic compounds. On October 4, 2006, PEF received a Request for Additional Information (RAI) from the Department. The Department's comments, and PEF's responses, are provided below in the order in which they were received. As some of the responses consist of new information, the appropriate revised pages of the application form, as well as the R.O. and P.E. certifications are attached.

Potential and Baseline Emissions

Comment 1 - For Units 4 and 5, the application identifies the potential emissions as well as the allowable and baseline emissions. In the application pages (Field 3), potential annual emissions are calculated based on an 85% capacity factor for each unit. To be used in the calculation of potential emissions, the annual capacity factor must be federally enforceable. Is the application requesting a federally-enforceable restriction on the annual capacity factor or an equivalent limit on the annual heat input rate? If so, then the pollutant is "synthetically limited" and Field 4 should be changed to "yes". Please comment and revise as necessary. (See Section F of the application for Units 4 and 5.)

Response - No limits or restrictions were proposed for capacity factor for either unit. Units 4 and 5 are base load units and are high in the system wide dispatch order for PEF. Historical capacity factors for these units have typically ranged to as high as 85 percent, which is the value that was used to estimate future actual emissions. Therefore, the ton per year estimates have been moved from Field 3 to Field 9a in the attached revised application forms (Attachment 1). The unit modifications sought by this permit application will have no material effect on the units' utilization. As such, if there are any future capacity factor increases or decreases, they would be due to system wide demand. Therefore, in accordance with Rule 62-212.300(1) (e), PEF proposes to track and submit to the Department, on an calendar-year basis for a period of ten years from the date the project is completed, information demonstrating that the modification did not result in significant emissions increases for the non-PSD pollutants. The emissions computation and reporting will be based on the requirements of Rule 62-210.370 F.A.C. The basis for evaluating an emission increase is on a tons-per-calendar-year basis.

Progress Energy Florida, Inc.
Crystal River Steam Plant
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Comment 2 - Please check Tables A-1 through A-10. It appears that baseline PM_{10} emissions have been estimated as 67% of the total baseline PM emissions; however, the notes on several tables indicate that PM_{10} emissions are assumed to be equal to PM emissions. In addition, the emission factor for baseline SAM emissions is shown as 0.001 lb/MMBtu. What is the reference for this factor? The SAM Engineering Study in Appendix A-1 suggests an actual emissions factor of: (18.7 lb/hour) (hour/6845 MMBtu) = 0.0027 lb/MMBtu. Please explain the difference.

Response - Historically, PM_{10} emissions have been reported in the annual AOR submittals as approximately 67 percent of total PM emissions. However, for a worst-case assessment in this analysis, it was assumed that all PM from the boilers was PM_{10}. With respect to SAM, the emission factor of 0.001 lb/MMBtu reflects a calculated value that has historically been used in PEF's annual TRI reporting and when required by the AORs. This value was the best information for this purpose available at that time and had been used in the absence of actual stack test data. However, since a stack test was recently conducted, specifically to gather data for this application, it was felt that this data was the most representative and was used in the application to estimate both baseline and projected future emissions.

Low-NO_X Burners (LNB)

Comment 3 - The burner specifications identify the maximum heat input rate as 6,800 MMBtu per hour based on the maximum coal firing rate (MCR). The application requests a maximum heat input rate of 7,200 MMBtu per hour. Please explain the difference and identify the maximum heat input rate for any 1-hour period. In addition, the performance guarantees in the LNB specifications identify the following: maximum N0x emissions of 0.41 lb/MMBtu, maximum CO emissions of 200 ppm, excess oxygen levels of not less than 2/5% (dry volumetric), and unburned carbon in the fly ash of no greater than 5%. Identify the CO emissions guarantee in terms of lb/MMBtu and show the conversion noting any assumptions. (See Appendix B-2, page SP-168301-6.)

Response – PEF anticipates that maximum hourly heat input rates will be as high as the maximum 7,200 MMBtu/hr heat input limit that was requested. However, on a continuous, long-term average basis, the heat input value that served as the design criteria for this project was 6,800 MMBtu/hr. That's why the maximum hourly and annual emissions in the air application were based on 7,200 MMBtu/hr and 6,800 MMBtu/hr, respectively. The vendor's CO emission guarantee is in terms of both concentration and emission rate and is 200 ppm and 0.2 lb/MMBtu, respectively. The conversion between the two is as follows:

The conversion is based on EPA Method 19 using equation 19-1

$E(\text{pollutant lb/MMBtu}) = CdFd(20.9/(20.9-\%O_2))$

Where Cd = lb/scf

1 ppmd CO = 1,150E-6 g/m^3 = 7.179E-8 lb/scf

Cd = 200 x 7.179E-8 = 1.436E-5 lb/scf

Fd = 9,780 scf/MMBtu (Table 19-2)

E(CO) = 1.436E-5 lb/scf x 9,780 scf/MMBtu x (20.9/(20.9 - 6))

E(CO) = **0.197 lb/MMBtu**

This assumes 6 percent O_2 in the stack gas.

Comment 4 - The PSD report indicates that recent CO BACT determinations for new units range from 0.1 to 0.2 lb/MMBtu, with a median average of 0.15 lb/MMBtu. Because the project includes the installation of new burners, please explain why new burners cannot be selected to achieve CO emission levels comparable to the lower range of the recent BACT determinations. (See Section 4.3.1.3.)

Response – The achievable CO emission levels, while a function of burner design, are also dependent on the overall boiler design. Upgrades in the design of many boiler components are inherent in the BACT determinations recently issued for newer boilers. In fact, many of these are likely supercritical PC designs. It's

not reasonable to expect the same emission level to be achieved by boilers that are close to 25 years old (i.e., Units 4 and 5), even though new burners will be installed.

Comment 5 - The PSD report includes the following statement regarding CO/VOC emissions, "... the overall mass emission rate is relatively constant over the entire boiler range from initial startup to full load. Therefore, the allowable emission limit representing BACT should reflect the constant mass output equal to a full load emission rate of 7200 MMBtu/hr per unit." Tables 2-2 and 2-3 do not appear to support this statement. Please explain and provide supporting information. (See Section 4.3.1.3.)

Response – Combustion characteristics and burner profiles vary by vendor and design. A characteristic of some designs is that emissions of CO and NOx will increase on a concentration basis (ppm) with a decrease in unit load. When this occurs, the overall mass emissions (lb/hr) may stay relatively constant over the entire load range. The vendor specifications provided previously in Appendix B-2 were based on full load operation. In response to the Department's comment, additional clarification from the vendor has provided assurance that the CO concentration will not increase at lower loads and, therefore, mass emissions (lb/hr) can be expected to reflect the values provided in Tables 2-2 and 2-3 of the initial application. Specifically, the lb/hr values will decrease with a decrease in unit load. Therefore, PEF requests that the CO limit be permitted as 0.2 lb/MMBtu, as determined by annual EPA Reference Method 10 testing.

Wet Electrostatic Precipitator (WESP) / Alkali Injection Systems

Comment 6 - In general, the cost estimates follow the recommendations of EPA's OAQPS Cost Manual. Please provide supporting information for: the $80 million purchased equipment cost for the WESP; and the $2.4 million engineering estimate for "maintenance materials" in the direct annual operating costs. The OAQPS Cost Manual (Section 3.4.1.2 Operating Materials) states, "Operating materials are generally not required for ESPs. An exception is the use of gas preconditioning agents for dust resistivity control." Please explain the costs associated with this estimate or revise the cost estimate accordingly.

Response – The cost effectiveness for a WESP was based on additional information obtained from Alstom Power Systems. The cost of purchased equipment and installation provided by Alstom was $40 million per unit after the FGD system. This purchased equipment and installation cost was then used with EPA factors in the OAQPS Cost Control Manual for ESPs (Section 6; Particulate Matter Controls) to determine indirect costs and the total capital investment (TCI). The maintenance materials in the Direct Operating Costs (DOC) are an engineering estimate. EPA's Cost Control Manual Section 3.4.1.3 clearly indicates that using 1 percent is appropriate for maintenance materials for a "dry" ESP. Clearly, WESPs would have more maintenance issues due to handling of a wet collection stream and maintenance cost would likely be higher. Therefore, engineering judgment was used to arrive at the 3 percent factor.

Comment 7 - If a WESP were installed, there would be a co-environmental benefit of additional particulate matter removal as stated in Section 4.3.3.2. Please quantify the reductions in particulate matter and revise the cost effectiveness calculation to include both the removal of SAM and particulate matter.

Response – The primary purpose for a WESP is the removal of acid mists. While there would be some additional minor collection of PM it would not likely substantially reduce emissions from the rate of 0.03 lb/MMBtu being proposed. Moreover, the SAM reduction is 0.0558 lb/MMBtu (see Table B-1), which is considerably higher than any minor PM reduction which would be achieved from the proposed PM BACT emission rate of 0.03 lb/MMBtu. Therefore, the cost effectiveness of the WESP for both SAM and PM would not substantially change.

Comment 8 - In Appendix B, Table B-1 summarizes the SAM emissions at various points in the systems being evaluated. In the row identified as "ESP (Ammonia Injection and ash)", there is a 23% reduction for the WESP. Please identify the mechanism for this reduction. Should this reduction also be applied to the case for ammonia injection?

Response – The 23 percent reduction reflects the reduction of SAM in the ESP for the case *without* ammonia injection. As indicated in Footnote f, the factor used in the Southern Company Method for estimating SAM reflects a 23 percent reduction for ESPs.

Comment 9 - Provide a list of similar recent projects that were subject to BACT determinations for SAM emissions. What are the BACT limits and effective control efficiencies for these projects? The application proposes 0.012 lb/MMBtu as BACT for SAM emissions based on 85% reduction with alkali injection. However, the application also indicates that the proposed alkali injection system could achieve 90% reductions when "new and clean", but 85% was proposed due to equipment degradation such as plugged nozzles. This appears to be a maintenance issue. Please discuss.

Response – The use of alkali injection technology is a relatively new technology that will require a complex injection grid and nozzles to distribute the sorbent within a high velocity, elevated temperature gas stream. Typical guarantees for alkali injection systems are 90 percent removal of SAM. However, the lack of long-term operating experience suggested the use of 85 percent removal of SAM to account for operational uncertainties (e.g., nozzle pluggage). Moreover, *the overall SAM removal after the air heater would be 89.5 percent* using an emission limit of 0.012 lb/MMBtu. Regarding maintenance, as with any of the plant systems, the manufacturer recommendations as well as operating experience will be used to develop periodic maintenance actions on the injection system. This will assure proper future operation of the injection system.

Comment 10 - Describe the types of mist eliminators that will be included with the FGD systems. Can this design be improved to capture more than 30% control for the remaining SAM emissions? Provide supporting information.

Response – The mist eliminators will be horizontally oriented (vertical gas flow) and will consist of a two-stage system designed to minimize solids deposition and to minimize entrained moisture and solids carryover downstream of the absorber. The first stage will be a two-pass chevron design and act as a bulk entrainment separator. The second stage will be a two-pass chevron design (with finer blade spacing) and act as a fine entrainment separator. The purpose of the mist eliminators is to remove entrained water and absorber solids from the gas stream exiting the absorber. They cannot be made to remove a significant portion of sulfuric acid mist.

Electrostatic Precipitator (ESP) Upgrades

Comment 11 - Based on the best available information, please provide PM_{10} emission rate estimates for Units 4 and 5. In the application, do the particulate matter emissions rates reflect "condensables"? If not, please revise to include condensables. Also, provide PM_{10} emissions data collected for any of the units at the Crystal River Plant.

Response - PEF doesn't currently have site-specific data for PM_{10} or PM condensables. As you may know, the annual PM testing conducted at Crystal River utilizes EPA Reference Method 5, which is designed to collect all filterable PM. No EPA Reference Method 202 testing has been conducted to determine PM condensables, as there has never been a requirement or a need to do so. As indicated previously in the response to Comment 2, for purposes of AOR submittals, PEF has estimated PM_{10} emissions as a percentage of the filterable PM collected by Method 5.

As part of the effort to develop PEF's BART protocol, which was submitted to the Department on October 3, 2006, PM speciation was provided for Crystal River Units 1 and 2, including condensables. The species categories for Crystal River were determined from the speciation profile for Utility Coal Boiler with an ESP, provided in Table 1.1-5 in AP-42. The different size categories were determined from particle size distribution for Utility Coal Boilers with an ESP provided in Table 1.1-6 in AP-42. However, it should be noted (see Attachment 2) that a significant portion of the condensables (80 percent) is SAM, which has already been accounted for as a separate pollutant.

Comment 12 - The application indicates that the ESP will be rebuilt to a top-rapping unit, which will increase the collection area by approximately 10%. The design removal efficiency will increase from 99.82% to 99.91%. As BACT, the application proposes to reduce the current permit limit from 0.1 lb/MMBtu to 0.03 lb/MMBtu based on the rebuilt ESP. Current ESP designs can achieve emissions rates below 0.01 lb/MMBtu. For Units 4 and 5, the Department's database generally shows tested emission rates below approximately 0.02 lb/MMBtu. With improvements to the existing ESP, it is reasonable to expect that performance will improve. For the previous 5 years of operation, provide the following information for Units 4 and 5: actual emissions rates (normal and soot blow) determined by stack testing; heat input rates during tests; and the number of active ESP fields during the test. Describe any operational or physical changes during this period that could have impacted emissions (i.e., fuel changes, ESP improvements, etc.).

Response – The following are the most recent five years test data:

Unit 4

Test Year	Normal Operation (lb/MMBtu)	Heat Input (MMBtu/hr)
2002	0.013	6,837
2003	0.010	6,544
2004	0.029	6,577
2005	0.010	6,427
2006	0.020	6,293

Unit 5

Test Year	Normal Operation (lb/MMBtu)	Heat Input (MMBtu/hr)
2002	0.013	6,837
2003	0.023	6,302
2004	0.055	6,367
2005	0.020	6,512
2006	0.004	6,526

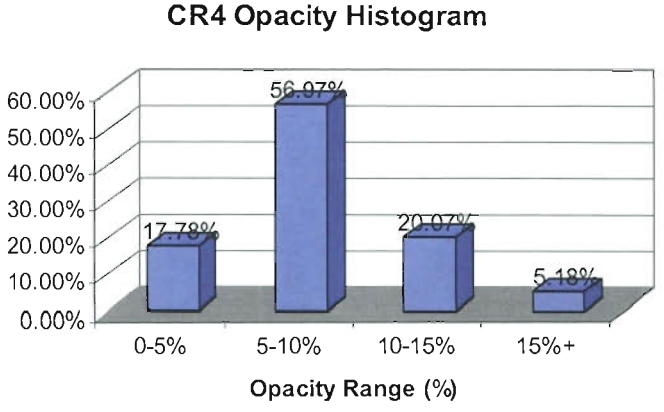
Note: Particulate testing is done during "normal" conditions, which includes soot blowing. PEF did not maintain records on the number of ESP fields in service during testing prior to 2006. For the 2006 tests, both units had 96 percent of the ESP fields in service. There have been no operational or physical changes during this period that could have impacted emissions (i.e., fuel changes, ESP improvements, etc.).

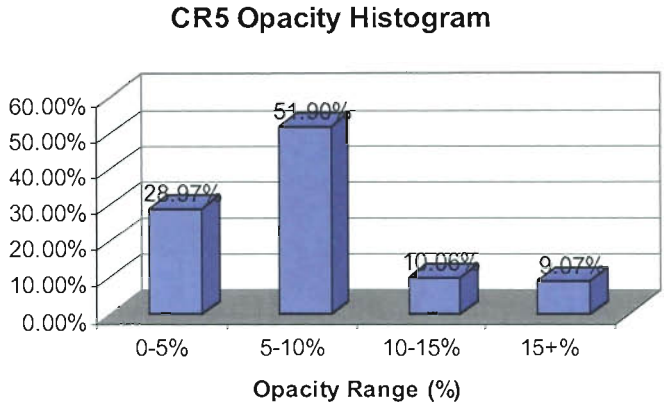
Comment 13 - For a recent coal project, EPA Region 4 provided the following comment, "The draft permit does not require use of a PM CEMS to assess compliance with the filterable PM/PM_{10} emissions limit. Since a PM CEMS can be used with a wet plume, we recommend that a PM CEMS be required to demonstrate compliance with the filterables limit." Please discuss the installation of a PM CEMS for this project. Identify units at other Progress Energy facilities (including other states) that include PM CEMS.

Response - As part of the Consent Decree entered into between TECO and EPA, they were required to install a PM CEM. The one selected used Beta technology, from MSI. After significant testing it was TECO's opinion (presented to both EPA and DEP) that the instrument provided unsatisfactory correlation to field test data. TECO maintains that these instruments are not practical for valid measurement. There are no Progress Energy facilities, either in Florida or other states, that use PM CEMS.

Comment 14 - Recent BACT determinations for units controlled by ESPs include opacity standards of 10%. What are the actual opacity levels for Units 4 and 5 using the existing ESPs?

Response – The following histograms show the percentage of six minutes averages for a range of opacity levels:





The data is from January 1, 2006 through October 11, 2006 and include all recorded opacity data.

New Carbon Burnout (CBO) Unit

Comment 15 - The application indicates that the maximum heat input rate for the CBO unit is 95 MMBtu per hour. The Department understands that the proposed CBO unit is a Model 1500 with a bed size of 1500 square feet. Please verify. Will the exhaust from the CBO unit be ducted to a dedicated stack (Unit 4 or 5) or be ducted to both stacks (Units 4 and 5)? Please explain and provide a process flow diagram.

Response – Yes, the proposed CBO fluidized bed combustor (FBC) is the Model 1500, with a nominal 1,500 ft^2 fluidized bed. The maximum heat input capacity is 95.6 MMBtu/hr. Finally, the exhaust from the CBO unit will be ducted to either Unit 4 or Unit 5, but never both at the same time. This will allow the waste heat to be utilized in either boiler in the event the other one is not in operation. A schematic is included in this response package (Figure 2-1A in Attachment 3) that includes process flows to and from the CBO unit.

Comment 16 - In a November 10, 2003 memorandum, EPA Region 4 indicates a similar CBO unit is subject to NSPS Subpart Dc, which requires at least continuous fuel monitoring and reporting. Please comment and update the application as necessary. The document also indicates that addition of the CBO unit is a physical change of the existing coal-fired units. Please provide supporting details to show that the physical change is not a "modification" as defined by the NSPS provisions.

Response – The Department is correct regarding applicability of NSPS subpart Dc – the CBO will be a new affected facility under that regulation. The Department also is correct that the CBO is subject to the fuel recordkeeping provision of 40 CFR § 60.48c(g). However, the letter incorrectly refers to this as "continuous fuel monitoring and reporting." The requirement is as follows: "The owner or operator of each affected facility shall record and maintain records of the amounts of each fuel combusted during each day." Revised application forms are included in this response package to clarify the applicability of the NSPS requirements (Attachment 1).

Finally, the Department requests supporting information to show that the addition of the CBO is not a modification to the Crystal River coal units for NSPS purposes. Presumably, the permit writer is referring to NSPS Subpart Da, because the only other pertinent NSPS is Subpart D, which is addressed in item 17. The basis for non-applicability of Subpart Da is as follows: a physical change is a modification under 40 CFR § 60.14 only if it is a physical change "to an existing facility." As described in the EPA letter cited by Mr. Koerner, the affected facility under NSPS Subpart Da is the "electric utility steam generating unit," which is defined narrowly at 40 CFR § 60.41a. The CBO does not fall within the scope of the affected facility under this narrow definition. Thus, while the CBO is a physical change to the Crystal River coal units, it is not a modification under Subpart Da because it is not a physical change to the "electric utility steam generating unit."

Comment 17 - In Section 4.2 of the PSD report, the application indicates that the proposed project does not constitute a modification to existing Units 4 and 5, which are subject to NSPS Subpart D. However, in a January 20, 2006 memorandum regarding Tampa Electric Company's Big Bend Carbon Burnout Project, EPA Region 4, states, "The opinion of the Region 4 Air Permits Section is that the fluidized bed combustor within the carbon burnout project can be viewed as a physical change of the existing Big Bend Units 3 and 4 subject to the additional considerations below. Units 3 and 4 meet the regulatory definition of an electric utility steam generating unit (EUSGU)." Provide supporting information to show that the project will not result in a

"modification" with regard to the applicable NSPS Subpart D provisions.

Response - The Department's letter requests supporting information to show that the addition of the CBO is not a modification to the Crystal River coal units for the purposes of NSPS Subpart D. A modification can occur only at an "existing facility," which is defined at 40 CFR § 60.2 as "any apparatus of the type for which a standard is promulgated in this part, and the construction or modification of which was commenced before the date of proposal of that standard." [Emphasis added.]. In other words, once a unit is an affected facility under a particular NSPS regulation, subsequent changes to that unit cannot be modifications for the purposes of that same regulation. Because Crystal River Units 4 and 5 are already affected facilities under Subpart D, they are not existing facilities under that rule, and no changes to those units are modifications under that rule.

The Department's letter quotes a statement from paragraph A.1 of the January 2006 Jim Little memorandum. We believe that the requested information pertains to NSPS Subpart D, which is addressed above. However, since the Department refers to electric utility steam generating units, which term is not used in Subpart D, the Department may actually be inquiring about Subpart Da. If so, it should be noted that the Jim Little memorandum deals specifically with the New Source Review (NSR) program, as evidenced by the first sentence of the letter. The term electric utility steam generating unit is defined differently in the NSR programs vis-a-vis the NSPS Subpart Da. Also, and at least as importantly, EPA's conclusions regarding NSR applicability hinge on the CBO being a part of the existing coal unit "emissions units." Due to the differences in definitions in the two programs, this is not in conflict with the earlier EPA determination that the CBO is not a part of the "affected facility" for the purposes of Subpart Da.

Alternate Fuel Blends – Powder River Basin (PRB) Coal and Petroleum Coke

Comment 18 - In Air Permit No. 0170004-012-AC, the Department authorized a temporary trial burn of the current bituminous coal with up to 30% Powder River Basin (PRB) sub-bituminous coal by weight. As the application indicates, the coal blend actually tested during the trial burn consisted of only 18% PRB coal by weight. Tests showed increased CO emissions and marginal impacts for other pollutants. Is authorization for PRB requested immediately or after installation of the SCR, FGD, alkali injection systems, and ESP improvements? Would the requested coal blend be fired in any other units? How would the coal blends be separated?

Response - Authorization to fire sub-bituminous coals is requested immediately. In addition, this request is for sub-bituminous coals and should not be limited to PRB fuels. The requested coal blend will only be fired in Units 4 and 5. Finally, with respect to how the coal blends will be separated, Units 4 and 5 have a distinct and separate coal pile from the other units at the site.

Comment 19 - The application requests authorization to fire a coal blend of up to 30% petroleum coke by weight with a maximum sulfur content of 6% for the petroleum coke. Will petroleum coke be blended with PRB coal? Will petroleum coke be blended with blends of bituminous coal/PRB coal? At what rates? Is authorization for a coal blend with petroleum coke requested immediately or after installation of the SCR, FGD, alkali injection systems, and ESP improvements? Would the requested coal blend be fired in any other units at the plant? If not, how would the coal blends be separated? The Department may require a temporary trial burn to gather emissions and operational data. Please comment.

Response – It's anticipated that petroleum coke would be blended with sub-bituminous coal, as all approved coals could provide suitable blending scenarios with petroleum coke. Petroleum coke will serve mainly as a supplemental fuel option and would be purchased only when there is an economic advantage to do so. As such, the coals that would be blended with petroleum coke will be comprised of the fuel portfolio at that time. Rates will be dependent upon the main coal constituents comprising the blend. Authorization for blends of petroleum coke is requested after installation of the SCR, FGD, alkali injection systems, and ESP improvements. The requested coal blends would only be fired in Units 4 and 5. With respect to how the coal blends would be separated, as stated previously, Units 4 and 5 have a distinct and separate coal pile from the other units.

The Department has indicated that they may require a temporary trial burn to gather emissions and operational data and has requested PEF's comments on this approach. In response, PEF would likely complete performance test burns with petroleum coke blends as part of our normal evaluation process. It is not conceivable that we would test all possible combinations - we would likely extrapolate data acquired during testing of a couple of blend scenarios that look optimal at the time. Once baseline test data is established, predictive modeling can be conducted to evaluate performance and environmental impacts.

Request to Revise the Maximum Heat input Rate from 6,665 to 7,200 MMBtu/hour

Comment 20 - The application requests an 8% increase in the maximum heat input rate from 6,665 MMBtu per hour to 7,200 MMBtu per hour. The application indicates that Units 4 and 5 have always been capable of achieving the requested value, but did not pursue a change to the maximum heat input rate specified in the Title V permit because of the current permitting note. Progress Energy understood that the permitting note was originally included not as a continuous limit, but to ensure that testing was conducted at, "... the worst case (maximum) operating levels."

a. During the original Title V permitting process, EPA objected to several proposed utility permits because the unit capacity had not been identified. As mentioned, the issue was resolved by applicants identifying "... the worst case (maximum) operating levels ..." under which emissions testing would occur. Describe the method Progress Energy used for Units 4 and 5 to identify the "maximum" operating levels for the 3-hour emissions tests.

Response – PEF has reviewed project files at the time of the original TV permit application and issuance. PEF has not been able to find correspondence that references this issue (i.e.., establishing the "worst case" operating levels) or records establishing a "maximum" operating level for Units 4 or 5. In fact, what is recalled is that the heat input number in the permit would be a nominal value and, per the permitting note, would be used to establish maximum capacity for compliance testing purposes. PEF was aware that, at that time, if a change in the heat input figure was requested, the Department would have required an application for a construction permit to implement the change. As the permitting note was issued with the initial TV permit, PEF did not find it necessary to request the change in the heat input rating at that time. The historical method of calculating heat input is the same as the method that is proposed for future compliance, and is summarized below.

Heat Input Measurement

Coal is conveyed to 6 bunker storage silos (per unit) housed in the boiler building direct from railcars, direct from barges, or from the plant coal storage piles. The coal from the 6 bunker storage silos is then conveyed on a short conveyor to 6 coal mills. The ground coal from the coal mill is then blown into the boiler and combusted. The 6 short conveyors between the coal bunker storage silo and the coal mill have belt scales that measure the weight of coal conveyed. The 6 belt scales are added together and give a thousand pounds per hour value (see column 2 of Attachment 4). This value is multiplied by the monthly average heating value of the coal (in Btu per pound – column 3) to give the heat input to the boiler (column 4 of Attachment 4).

b. Does Progress Energy consider the request to identify a higher heat input rate as an "increase on paper" only? Because of the many changes (burners, fuels, etc.) requested, it is important to document the current capabilities of the existing units. Based on fuel feed rate and fuel analysis method requested, provide five actual operating data sets for Units 4 and 5 over the last 5 years showing continuous operation at 6,800 MMBtu per hour (at least 24-hours) and peak operation at 7,200 MMBtu per hour (at least 1-hour). For Units 4 and 5, provide the original "contract data sheets" indicating the boiler, fuel, and operating specifications.

Response – The original boiler and fuel design specifications are included as Attachment 5 to this response package. In addition, data documenting the units' operating capacity is also included. These actual measured heat input values are provided for the years 2003 through 2006 (the data contained in the plant's PI data system is only available back to 2003) and is in the range of the new limits being requested. Further, PEF requests that compliance with the requested revised heat input limit be determined on a 30 day rolling average basis.

Air Quality Modeling Analysis

Comment 21 - Currently, Units 4 and 5 are limited by NSPS Subpart D to an SO_2 emissions standard of 1.2 lb/MMBtu based on any 3-hour average. The application requests an allowable emissions limit for SO_2 of 0.27 lb/MMBtu based on a 30-day rolling average. Please provide a table of the maximum SO_2 emission rates (lb/hour, lb/MMBtu and grams/second) used in the air quality modeling analyses for each averaging period (3-hour, 24-hour, and annual). Show how these emissions rates were calculated. Short term emissions limits may be necessary to ensure compliance with the PSD increments and ambient air quality standards.

Response – The SO_2 emission rate modeled was 0.27 lb/MMBtu for all averaging periods. Based on this rate, Tables 2-2 and 2-3 provided the corresponding lb/hr values that were modeled for various unit loads. Based on the modeled impacts at this emission rate, the 24-hour averaging period was determined to be the limiting

averaging time.

Comment 22 - The electronic modeling files were not included with the application, but were received on September 28, 2006 (AERMOD) and October 3, 2006 (CALPUFF). Therefore, the Department will request additional information regarding the air quality modeling before November 2, 2006.

Response – The Department's comment is noted. Based on a conversation with the Department on November 7, 2006, no additional information with respect to the modeling analysis will be requested.

Miscellaneous

Comment 23 - The application indicates that a process flow diagram is provided in Figure 2-1; however, this is a site plan. Provide a detailed process flow diagram for each unit identifying the boiler and equipment, fuel feeds, pollution controls, injection points, CBO unit, stacks, CEMS, exhausts, and solid/liquid discharges. (See Field 1 in Section I of the application form.)

Response – The requested process flow diagram is included in this package as Figure 2-1A (Attachment 3).

Comment 24 - The application requests authorization to use a fuel additive to improve unit performance and reduce emissions as well as LOI. The Department intends to allow for a temporary trial period to conduct tests to validate emissions impacts. Please comment.

Response – The Department's comment is noted.

Comment 25 - The application proposes to install a new stack with two liners having a larger exit diameter, which will decrease the exhaust velocity and is intended to reduce stack rain-out. Will the existing stacks remain or be dismantled? Is there any scenario where the existing stacks would be used as bypass stacks? Will new CEMS be installed or will the existing CEMS be removed from the existing stacks and installed/certified on the new stack/liners? If so, describe how the CEMS will be modified to monitor the lower emissions levels.

Response – Progress Energy does not plan to duct flue gas to the existing stacks once the FGD is put into service. It has not been determined whether the existing stacks will be demolished. PEF will install and calibrate CEMS in the new stack to meet CFR Part 75 monitoring requirements. The current plan is to install new CEMS equipment. The CEMS monitoring ranges will meet Part 75 requirements.

Comment 26 - In the portion of the application regarding burner specifications, it is stated that natural gas in not available at the site. Page 18 of the emissions unit section identifies natural gas as an available fuel and the Title V permit identifies natural gas as a startup fuel. Is natural gas available at this site? Is natural gas fired in Units 4 and 5? (See Appendix B-2, pages SP-168301-5 and 6.)

Response - Natural gas is currently not available at the Crystal River site. Natural gas is not fired at Crystal River Units 4 or 5. PEF would like to leave natural gas as an option in the permit in case this fuel becomes available in the future.

Comment 27 - Section F of the application indicates a 5-year monitoring period for SO_2, but the PSD report indicates that NOx and SO_2 emissions will be reported for a 10-year period. The Department agrees that a 10-year reporting period is required. Please correct as necessary.

Response - The Department's comment is noted and the correction has been made.

PEF understands that the Department will resume processing our application after receipt of this requested information. Rule 62-4.050(3), F.A.C. requires that all applications for a Department permit must be certified by a professional engineer registered in the State of Florida. This requirement also applies to responses to Department requests for additional information of an engineering nature. Therefore, included in this submittal are a certification statement by the authorized representative or responsible official and a P.E. certification.

If you have any questions regarding this response package, please don't hesitate to contact Dave Meyer at (727) 820-5295.

Sincerely,

Bernie M. Cumbie
Manager, Crystal River Fossil Plant & Fuel Operations

Attachments

Mr. Scott Osbourn, P.E., Golder Associates Inc. (SOSBOURN@GOLDER.COM)
Mr. Jamie Hunter, Progress Energy Florida, Inc. (JOHN.HUNTER@PGNMAIL.COM)
Mr.Dave Meyer, Progress Energy Florida, Inc. (DAVE.MEYER@PGNMAIL.COM)
Ms. Mara Nasca, SWD Office (MARA.NASCA@DEP.STATE.FL.US)
Mr. Gregg Worley, EPA Region 4 (WORLEY.GREGG@EPAMAIL.EPA.GOV)
Mr. John Bunyak, NPS (JOHN_BUNYAK@NPS.GOV)
Mr. Bernie Cumbie, Progress Energy Florida, Inc. (BERNIE.CUMBIE@PGNMAIL.COM)

ATTACHMENT 1

REVISED APPLICATION FORMS
(P.E. AND R.O. CERTIFICATIONS)

APPLICATION INFORMATION

Owner/Authorized Representative Statement

Complete if applying for an air construction permit or an initial FESOP.

1. Owner/Authorized Representative Name :
   BERNIE CUMBIE, PLANT MANAGER
2. Owner/Authorized Representative Mailing Address...
   Organization/Firm: **PROGRESS ENERGY**
   Street Address: **100 CENTRAL AVE CN77**
   City: **ST PETERSBURG** State: **FLORIDA** Zip Code: **33701**
3. Owner/Authorized Representative Telephone Numbers...
   Telephone: **(352) 563-4484** ext. Fax: **(352) 563-4496**
4. Owner/Authorized Representative Email Address: **BERNIE.CUMBIE@PGNMAIL.COM**
5. Owner/Authorized Representative Statement:

   I, the undersigned, am the owner or authorized representative of the facility addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other requirements identified in this application to which the facility is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit.

Signature

11/9/06
Date

APPLICATION INFORMATION

Professional Engineer Certification

1. Professional Engineer Name: **SCOTT OSBOURN**
   Registration Number: **57557**
2. Professional Engineer Mailing Address...
   Organization/Firm: **Golder Associates Inc.****
   Street Address: **5100 West Lemon St., Suite 114**
   City: **Tampa** State: **FL** Zip Code: **33609**
3. Professional Engineer Telephone Numbers...
   Telephone: **(813) 287-1717** ext.**211** Fax: **(813) 287-1716**
4. Professional Engineer Email Address: **SOSBOURN@GOLDER.COM**
5. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this application for air permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

(3) If the purpose of this application is to obtain a Title V air operation permit (check here ☐, if so), I further certify that each emissions unit described in this application for air permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance plan and schedule is submitted with this application.

(4) If the purpose of this application is to obtain an air construction permit (check here ☒, if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here ☐, if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here ☐, if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Signature Date 11/10/06

(seal)

SCOTT OSBOURN LICENSE NO. 57557 STATE OF FLORIDA PROFESSIONAL ENGINEER

* Attach any exception to certification statement.

** **Board of Professional Engineers Certificate of Authorization #00001670**

FACILITY INFORMATION

Facility Regulatory Classifications

Check all that would apply *following* completion of all projects and implementation of all other changes proposed in this application for air permit. Refer to instructions to distinguish between a "major source" and a "synthetic minor source."

1. ☐ Small Business Stationary Source	☐ Unknown
2. ☐ Synthetic Non-Title V Source	
3. ☒ Title V Source	
4. ☒ Major Source of Air Pollutants, Other than Hazardous Air Pollutants (HAPs)	
5. ☐ Synthetic Minor Source of Air Pollutants, Other than HAPs	
6. ☒ Major Source of Hazardous Air Pollutants (HAPs)	
7. ☐ Synthetic Minor Source of HAPs	
8. ☒ One or More Emissions Units Subject to NSPS (40 CFR Part 60)	
9. ☒ One or More Emissions Units Subject to Emission Guidelines (40 CFR Part 60)	
10. ☐ One or More Emissions Units Subject to NESHAP (40 CFR Part 61 or Part 63)	
11. ☐ Title V Source Solely by EPA Designation (40 CFR 70.3(a)(5))	
12. Facility Regulatory Classifications Comment:	

Item 8 - CBO Unit FBC is subject to NSPS, Subpart Dc
Units 4 and 5 are subject to the CAMR rule in 2010.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **CO – Carbon Monoxide**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **1,440** lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.2 lb/MMBtu** Reference: **Vendor Specification**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): **5,063** tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **lb/hr = 0.2 lb/MMBtu * 7,200 MMBtu/hr = 1,440 lb/hr TPY = (6,800/7,200 MMBtu/hr)*1,440 lb/hr * 8760 hr/yr * 1 ton/2000 lb * 0.85 Capacity Factor = 5,063 TPY.**	
11. Potential Fugitive and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **Other**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.2 lb/MMBtu**	4. Equivalent Allowable Emissions: **1,440** lb/hour tons/year
5. Method of Compliance: **EPA Method 10; Annually**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **NO_X – Nitrogen Oxides**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **3,384** lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.47 lb/MMBtu** Reference: **PSD Avoidance.**	7. Emissions Method Code: **0**
8.a. Baseline Actual Emissions (if required): **24,069** tons/year	8.b. Baseline 24-month Period: From: **1/2003** To: **12/2004**
9.a. Projected Actual Emissions (if required): **23,797** tons/year **(11,899 TPY per unit)**	9.b. Projected Monitoring Period: ☐ 5 years ☒ 10 years
10. Calculation of Emissions: **lb/hr = 7,200 MMBtu/hr * 0.47 lb/MMBtu = 3,384 lb/hr. TPY = (6,800/7,200 MMBtu/hr)*3,384 lb/hr * 8760 hrs/yr * 1 ton/2000 lb * 0.85 Capacity Factor = 11,899 TPY**	
11. Potential Fugitive and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions **1** of **2**

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.47 lb/MMBtu heat input**	4. Equivalent Allowable Emissions: **3,384** lb/hour tons/year
5. Method of Compliance: **EPA Method 20/7E RATA: Continuous Emission Monitoring (CEM), annual average.**	
6. Allowable Emissions Comment (Description of Operating Method): **PSD Avoidance**	

Allowable Emissions Allowable Emissions of

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions of

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **Sulfuric Acid Mist – SAM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **86.4**lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.012 lb/MMbtu** Reference: **Vendor Specification/Process Knowledge**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): **303.8** tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **lb/hr = 7,200 MMBtu/hr * 0.012 lb/MMBtu = 86.4 lb/hr. TPY = (6,800/72,00 MMBtu/hr)*86.4 lb/hr * 8760 hrs/yr * 1 ton/2000 lb * 0.85 Capacity Factor = 303.8 TPY**	
11. Potential Fugitive and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions **1** of **1**

1. Basis for Allowable Emissions Code: **Other**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.012 lb/MMBtu**	4. Equivalent Allowable Emissions: **86.4** lb/hour tons/year
5. Method of Compliance: **EPA Method 8 or 8A; Initial Test Only**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **PM – Particulate Matter Total**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **216** lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.03 lb/MMBtu** Reference: **Vendor Specification/Process Knowledge**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): **759.5** tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **lb/hr = 7,200 MMBtu/hr * 0.03 lb/MMBtu = 216 lb/hr** **TPY = (6,800/7,200 MMBtu/hr)*216 lb/hr * 8760 hrs/yr * 1 ton/2000 lb * .85 Capacity Factor = 759.5 TPY**	
11. Potential Fugitive and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **Other**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.03 lb/MMBtu heat input**	4. Equivalent Allowable Emissions: **216** lb/hour tons/year
5. Method of Compliance: **EPA Method 5 or 5B; Annually**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **PM_{10} – Particulate Matter**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **216** lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.03 lb/MMBtu** Reference: **Vendor Specification/Process Knowledge**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): **759.5** tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **PM_{10} is assumed to be equal to PM.**	
11. Potential Fugitive and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions **1** of **1**

1. Basis for Allowable Emissions Code: **Other**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.03 lb MMBtu**	4. Equivalent Allowable Emissions: **216** lb/hour tons/year
5. Method of Compliance: **See PM.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **SO_2 – Sulfur Dioxide**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **1,944** lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.27 lb/MMBtu** Reference: **Based on modeled impacts.**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): **51,031** tons/year	8.b. Baseline 24-month Period: From: **1/2003** To: **12/2004**
9.a. Projected Actual Emissions (if required): **13,670** tons/year **(6,835 TPY per unit)**	9.b. Projected Monitoring Period: ☐ 5 years ☒ 10 years
10. Calculation of Emissions: **lb/hr = 7,200 MMBtu/hr * 0.27 lb/MMBtu = 1,944 lb/hr TPY = (6,800/7,200MMBtu/hr)*1,944 lb/hr * 8760 hr/yr * 1 ton/2000 lb * .85 Capacity Factor = 6,835 TPY**	
11. Potential Fugitive and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions **1** of **3**

1. Basis for Allowable Emissions Code: **Other**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.27 lb/MMBtu heat input**	4. Equivalent Allowable Emissions: **1,944** lb/hour tons/year
5. Method of Compliance: **Continuous Emission Monitor (CEM) 30-day rolling average 40 CFR Part 75 (Acid Rain Program)**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions **2** of **3**

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions of

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **VOC – Volatile Organic Compounds**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **28.8** lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.004 lb/MMBtu** Reference: **Vendor Specification/Process Knowledge**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): **101.2** tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **lb/hr = 0.004 lb/MMBtu * 7,200 MMBtu/hr = 28.8 lb/hr** **TPY = (6,800/7,200 MMBtu/hr)*28.8 lb/hr * 8760 hr/yr * 1 ton/2000 lb * 0.85 Capacity Factor = 101.2 TPY**	
11. Potential Fugitive and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **Other**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.004 lb/MMBtu**	4. Equivalent Allowable Emissions: **28.8**lb/hour tons/year
5. Method of Compliance: **EPA Method 18, 25, or 25a; base load.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **CO – Carbon Monoxide**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **1,440** lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.2 lb/MMBtu** Reference: **Vendor Specification/Process Knowledge**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): **5,063** tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **lb/hr = 0.2 lb/MMBtu * 7,200 MMBtu/hr = 1,440 lb/hr** **TPY = (6,800/7,200 MMBtu/hr)*1,440 lb/hr * 8760 hr/yr * 1 ton/2000 lb * 0.85 Capacity Factor = 5,063 TPY**	
11. Potential Fugitive and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **Other**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.2 lb/MMBtu**	4. Equivalent Allowable Emissions: **1,440**lb/hour tons/year
5. Method of Compliance: **EPA Method 10; Annually**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **NO_X – Nitrogen Oxides**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **3,384** lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.47 lb/MMBtu** Reference: **PSD Avoidance.**	7. Emissions Method Code: **0**
8.a. Baseline Actual Emissions (if required): **24,069** tons/year	8.b. Baseline 24-month Period: From: **1/2003** To: **12/2004**
9.a. Projected Actual Emissions (if required): **23,797** tons/year **(11,899 TPY per unit)**	9.b. Projected Monitoring Period: ☐ 5 years ☒ 10 years
10. Calculation of Emissions: **lb/hr = 7,200 MMBtu/hr * 0.47 lb/MMBtu = 3,384 lb/hr. TPY = (6,800/7,200 MMBtu/hr)*3,384 lb/hr * 8760 hrs/yr * 1 ton/2000 lb * 0.85 Capacity Factor = 11,899 TPY**	
11. Potential Fugitive and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions **1** of **3**

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.47 lb/MMBtu heat input**	4. Equivalent Allowable Emissions: **3,384** lb/hour tons/year
5. Method of Compliance: **EPA Method 20/7E RATA: Continuous Emission Monitoring (CEM), annual average**	
6. Allowable Emissions Comment (Description of Operating Method): **PSD Avoidance**	

Allowable Emissions Allowable Emissions of

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions **3** of **3**

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **Sulfuric Acid Mist – SAM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **86.4** lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.012 lb/MMBtu** Reference: **Vendor Specification/Process Knowledge**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): **303.8** tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **lb/hr = 7,200 MMBtu/hr * 0.012 lb/MMBtu = 86.4 lb/hr. TPY = (6,800/7,200 MMBtu/hr)*86.4 lb/hr * 8760 hrs/yr * 1 ton/2000 lb * 0.85 Capacity Factor = 303.8 TPY**	
11. Potential Fugitive and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions **1** of **1**

1. Basis for Allowable Emissions Code: **Other**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.012**	4. Equivalent Allowable Emissions: **86.4** lb/hour tons/year
5. Method of Compliance: **EPA Method 8 or 8A; Initial Test Only**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **PM – Particulate Matter Total**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **216** lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.03 lb/MMBtu** Reference: **Vendor Specification/Process Knowledge**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): **759.5** tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **lb/hr = 7,200 MMBtu/hr * 0.03 lb/MMBtu = 216 lb/hr** **TPY = (6,800/7,200 MMBtu/hr)*216 lb/hr * 8760 hrs/yr * 1 ton/2000 lb * .85 Capacity Factor = 759.5 TPY**	
11. Potential Fugitive and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **Other**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.03 lb/MMBtu heat input**	4. Equivalent Allowable Emissions: **216** lb/hour tons/year
5. Method of Compliance: **EPA Method 5 or 5B; Annually**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **PM_{10} – Particulate Matter**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **216** lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.03 lb/MMBtu** Reference: **Vendor Specification/Process Knowledge**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): **759.5** tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **PM_{10} is assumed to be equal to PM.**	
11. Potential Fugitive and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions **1** of **1**

1. Basis for Allowable Emissions Code: **Other**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.03 lb/MMBtu**	4. Equivalent Allowable Emissions: **216** lb/hour tons/year
5. Method of Compliance: **See PM.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **SO_2 – Sulfur Dioxide**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **1,944** lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.27 lb/MMBtu** Reference: **Based on modeled impacts.**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): **51,031** tons/year	8.b. Baseline 24-month Period: From: **1/2003** To: **12/2004**
9.a. Projected Actual Emissions (if required): **13,670** tons/year **(6,835 TPY per unit)**	9.b. Projected Monitoring Period: ☐ 5 years ☒ 10 years
10. Calculation of Emissions: **lb/hr = 7,200 MMBtu/hr * 0.27 lb/MMBtu = 1,944 lb/hr TPY = (6,800/7,200 MMBtu/hr)*1,944 lb/hr * 8760 hr/yr * 1 ton/2000 lb * .85 Capacity Factor = 6,835 TPY**	
11. Potential Fugitive and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 3

1. Basis for Allowable Emissions Code: **Other**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.27 lb/MMBtu heat input**	4. Equivalent Allowable Emissions: **1,944** lb/hour tons/year
5. Method of Compliance: **Continuous Emission Monitor (CEM) 30-day rolling average, 40 CFR Part 75 (Acid Rain Program).**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions 2 of 3

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions 3 of 3

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **VOC – Volatile Organic Compounds**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **28.8** lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.004 lb/MMBtu** Reference: **Vendor Specification/Process Knowledge**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): **101.2** tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **lb/hr = 0.004 lb/MMBtu * 7,200 MMBtu/hr = 28.8 lb/hr** **TPY = (6,800/7,200 MMBtu/hr)*28.8 lb/hr * 8760 hr/yr * 1 ton/2000 lb * 0.85 Capacity Factor = 101.2 TPY**	
11. Potential Fugitive and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **Other**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.004 lb/MMBtu**	4. Equivalent Allowable Emissions: **28.8** lb/hour tons/year
5. Method of Compliance: **EPA Method 18, 25, or 25a; base load.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

ATTACHMENT 2

PM SPECIATION SUMMARY TABLE

ATTACHMENT 2
PM SPECIATION SUMMARY - CRYSTAL RIVER Units 4 & 5

PM Category	Emission Unit [a]	Units	Total	Coarse PM	Soil (Fine PM)	Elemental Carbon (EC)	Inorganic (as H_2SO_4)	Organic
PM Filterable [b]	Units 4 or 5	lb/hr	216.0	120.00	92.45	3.55	NA	NA
		%	100%	56%	43%	1.6%	NA	NA
PM Condensable [c]	Units 4 or 5	lb/hr	288.00	NA	NA	NA	230.40	57.60
		%	100%	NA	NA	NA	80%	20%
Total PM_{10} (filterable+condensable)	Units 4 or 5	lb/hr	504.0	120.00	92.45	3.55	230.40	57.60
		%	100%	23.8%	18.3%	0.7%	45.7%	11.4%
Total PM_{10} (filterable+Organic Condensable PM)	Units 4 or 5	lb/hr	273.6	120.00	92.45	3.55	0.0	57.60
Modeled PM Speciation % (SO_4 modeled separately)		%	100%	43.9%	33.8%	1.3%	0.0%	21.1%

PM Particle Size Distribution for CALPUFF Assessment

Species	Size Distribution by Category (%)					Emission Rate (lb/hr)		
	AP-42 (Table 1.3-4)		Cumulative	Individual Categories				
Name	Particle Size (microns)	Cumulative (%)	Normalized PM10 (%)	Filterable (%)	Organic Condensable	Filterable	Organic Condensable	Total
Total PM_{10}						216.0	57.6	273.6
PM0063	0.63	18.5%	33.3%	33.3%	50.0%	71.9	28.8	100.7
PM0100	1	0.0%	0.0%	0.0%	50.0%	0.0	28.8	28.8
PM0125	1.25	0.0%	0.0%	0.0%	0	0.0	0.0	0.0
PM0250	2.5	25.9%	46.6%	13.3%	0	28.7	0.0	28.7
PM0600	6	0.0%	0.0%	0.0%	0	0.0	0.0	0.0
PM1000	10	55.6%	100.0%	53.4%	0	115.4	0.0	115.4
Totals				100.0%	100.0%	216.0	57.6	273.6
							Total Modeled PM_{10}	273.6

[a] Heat input rate for unit and fuel heat content — 7.200 MMBtu/hr; 0.70 sulfur content (%); 7.200 Unit 1

[b] PM fine consists of PM soil and PM elemental carbon

PM fine based on ratio of PM2.5 (fine) to PM10 (filterable) emission factor (Table 1.1-5, AP-42)

	lb/ton	
PM2.5	0.24	lb/ton
PM10	0.54	lb/ton

Ratio = 0.44 PM2.5/PM10

PM elemental carbon based on EPA's "Catalog of Global Emissions Inventories and Emission Inventory Tools for Black Carbon". Table 5, January 2002 DRAFT

0.037 of PM2.5

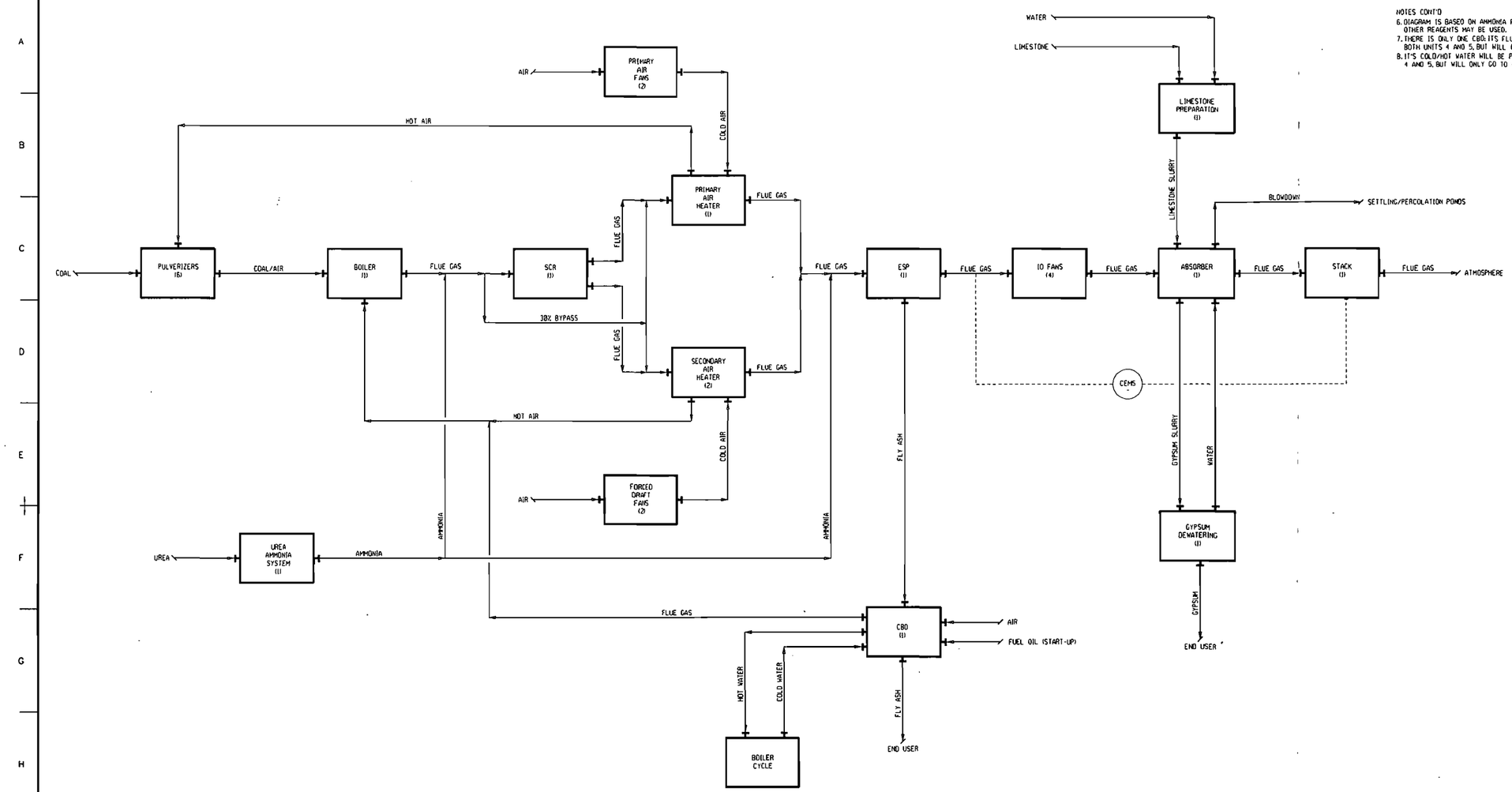
PM elemental carbon = 0.016 PM elemental carbon/PM10
PM soil= PM2.5 - PM elemental carbon = 0.43 PM soil/PM10
PM2.5 = 0.44 PM2.5/PM10
PM coarse= PM10 - PM2.5

[c] Condensable PM (Table 1.1-6, AP-42)

	lb/MMBtu	
Total	0.1 x S - 0.03	
	0.04	
Inorganic	0.03	(0.80 of Total)
Organic	0.01	(0.20 of Total)

ATTACHMENT 3

PROCESS SCHEMATIC – FIGURE 2-1A



NOTES CONT'D

6. DIAGRAM IS BASED ON AMMONIA FOR ACID MIST CONTROL; OTHER REAGENTS MAY BE USED.
7. THERE IS ONLY ONE CBO; ITS FLUE GAS WILL BE DUCTED TO BOTH UNITS 4 AND 5, BUT WILL ONLY GO TO ONE AT A TIME.
8. IT'S COLD/HOT WATER WILL BE PIPED TO BOTH UNITS 4 AND 5, BUT WILL ONLY GO TO ONE AT A TIME.

NOTES:

1. FOR GENERAL NOTES, ABBREVIATIONS AND SYMBOLS SEE DRAWINGS CRCA-0-OV-012-302-001, 002, 003, 004, 005, 006 AND 007.
2. SYSTEM CODE FOR VALVES AND PIPING SPECIALTIES ARE THE SAME AS THE ASSOCIATED PIPE DESIGNATION.
3. ALL EQUIPMENT, VALVES, AND SPECIALTY ITEM TAG NUMBERS ARE PREFIXED WITH CRCA-X-EQ- UNLESS OTHERWISE NOTED. (X=UNIT NUMBER)
4. ALL LOCAL VENTS AND DRAINS TO HAVE A 4" LONG NIPPLE THREADED ONE END TERMINATED LOCALLY UNLESS OTHERWISE NOTED.
5. ALL INSTRUMENT ROOT VALVES ARE 0.75" AND VENTS AND DRAINS ARE 1" UNLESS OTHERWISE NOTED. ALL FLOW ELEMENT ROOT VALVES ARE 0.5" UNLESS OTHERWISE NOTED.

DRAWING REFERENCES

DWG NO.	REV.	TITLE

DRAWING REVISIONS

REV.	DESCRIPTION	DRAWN	CHKD	APPRVD	DATE
A	PRELIMINARY	MAC	MJE	MJE	10/19/06

CONTRACTOR/VENDOR INFORMATION

WorleyParsons
resources & energy
2675 MORGANTOWN ROAD – READING, PA 19607 – (610) 855-2000
FL CERTIFICATE OF AUTHENTICATION #000068777

ORIGINALLY PREPARED UNDER THE SUPERVISION OF
PE: _____ STATE: _____
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PROGRESS ENERGY FLORIDA, INC.
POWER OPERATIONS GROUP

FACILITY: CRY	UNIT:	SYSTEM:
PROJECT NO:	EC NO:	W.O. NO: N/A
SIZE: ANSI-D	SCALE: NONE	PLOT: 1=1

Progress Energy

TITLE: CRYSTAL RIVER POLLUTION CONTROL PROJECT (FIGURE 2-1A) PROCESS FLOW DIAGRAM

SHT 001 OF 001 | DWG NO: CRCA-0-SK-021-305-007 | REV: A

PE&C-FILE: 021305007.pid
PE&C-DATE: 10/19/06

DIR MDL CRY-

ATTACHMENT 4

HEAT INPUT SUMMARY TABLES

Column 1	2	3	4	5	6	7	8	9
Crystal River Unit 4								
	COAL			OIL			TOTAL	
DATE/TIME	KPPH	BTU/LB	MMBTU/HI	BBL OIL	BTU/BBL	MMBTU/HI	MMBTU/HI	24 HR AV
2006 Highest Value								
5/14/06 20:00	592	12,281	7,266	0	5,789,591	0	7,266	
2006 Highest 24 Hour Period								
1/8/06 0:00	539	12,378	6,675	0	5,789,591	0	6,675	6,985
1/8/06 1:00	542	12,378	6,705	0	5,789,591	0	6,705	
1/8/06 2:00	544	12,378	6,732	0	5,789,591	0	6,732	
1/8/06 3:00	552	12,378	6,835	0	5,789,591	0	6,835	
1/8/06 4:00	552	12,378	6,837	0	5,789,591	0	6,837	
1/8/06 5:00	556	12,378	6,882	0	5,789,591	0	6,882	
1/8/06 6:00	558	12,378	6,905	0	5,789,591	0	6,905	
1/8/06 7:00	561	12,378	6,948	0	5,789,591	0	6,948	
1/8/06 8:00	562	12,378	6,958	0	5,789,591	0	6,958	
1/8/06 9:00	564	12,378	6,980	0	5,789,591	0	6,980	
1/8/06 10:00	564	12,378	6,979	0	5,789,591	0	6,979	
1/8/06 11:00	568	12,378	7,027	0	5,789,591	0	7,027	
1/8/06 12:00	564	12,378	6,977	0	5,789,591	0	6,977	
1/8/06 13:00	569	12,378	7,041	0	5,789,591	0	7,041	
1/8/06 14:00	570	12,378	7,053	0	5,789,591	0	7,053	
1/8/06 15:00	570	12,378	7,061	0	5,789,591	0	7,061	
1/8/06 16:00	569	12,378	7,047	0	5,789,591	0	7,047	
1/8/06 17:00	571	12,378	7,063	0	5,789,591	0	7,063	
1/8/06 18:00	576	12,378	7,124	0	5,789,591	0	7,124	
1/8/06 19:00	574	12,378	7,104	0	5,789,591	0	7,104	
1/8/06 20:00	571	12,378	7,065	0	5,789,591	0	7,065	
1/8/06 21:00	578	12,378	7,155	0	5,789,591	0	7,155	
1/8/06 22:00	585	12,378	7,241	0	5,789,591	0	7,241	
1/8/06 23:00	585	12,378	7,241	0	5,789,591	0	7,241	
2005 Highest Value								
9/13/05 22:00	596	12,175	7,252	0	5,789,591	0	7,252	
2005 Highest 24 Hour Period								
10/4/05 0:00	566	12,301	6,960	0	5,789,591	0	6,960	7,045
10/4/05 1:00	565	12,301	6,949	0	5,789,591	0	6,949	
10/4/05 2:00	566	12,301	6,958	0	5,789,591	0	6,958	
10/4/05 3:00	562	12,301	6,913	0	5,789,591	0	6,913	
10/4/05 4:00	560	12,301	6,885	0	5,789,591	0	6,885	
10/4/05 5:00	566	12,301	6,957	0	5,789,591	0	6,957	
10/4/05 6:00	567	12,301	6,974	0	5,789,591	0	6,974	
10/4/05 7:00	567	12,301	6,974	0	5,789,591	0	6,974	
10/4/05 8:00	575	12,301	7,070	0	5,789,591	0	7,070	
10/4/05 9:00	575	12,301	7,078	0	5,789,591	0	7,078	
10/4/05 10:00	579	12,301	7,120	0	5,789,591	0	7,120	
10/4/05 11:00	578	12,301	7,112	0	5,789,591	0	7,112	
10/4/05 12:00	582	12,301	7,154	0	5,789,591	0	7,154	
10/4/05 13:00	577	12,301	7,095	0	5,789,591	0	7,095	

Crystal River Unit 4

	COAL			OIL			TOTAL	
DATE/TIME	KPPH	BTU/LB	MMBTU/HI	BBL OIL	BTU/BBL	MMBTU/HI	MMBTU/HI	24 HR AV
10/4/05 14:00	575	12,301	7,073	0	5,789,591	0	7,073	
10/4/05 15:00	556	12,301	6,845	0	5,789,591	0	6,845	
10/4/05 16:00	570	12,301	7,015	0	5,789,591	0	7,015	
10/4/05 17:00	569	12,301	6,998	0	5,789,591	0	6,998	
10/4/05 18:00	572	12,301	7,042	0	5,789,591	0	7,042	
10/4/05 19:00	576	12,301	7,084	0	5,789,591	0	7,084	
10/4/05 20:00	585	12,301	7,190	0	5,789,591	0	7,190	
10/4/05 21:00	584	12,301	7,186	0	5,789,591	0	7,186	
10/4/05 22:00	587	12,301	7,217	0	5,789,591	0	7,217	
10/4/05 23:00	588	12,301	7,238	0	5,789,591	0	7,238	
2004 Highest Value								
4/27/04 13:00	588	12,339	7,255	0	5,796,752	0	7,255	
2004 Highest 24 Hour Period								
12/5/04 0:00	573	12,301	7,054	0	5,796,752	0	7,054	6,894
12/5/04 1:00	505	12,301	6,207	0	5,796,752	0	6,207	
12/5/04 2:00	485	12,301	5,971	0	5,796,752	0	5,971	
12/5/04 3:00	467	12,301	5,748	0	5,796,752	0	5,748	
12/5/04 4:00	512	12,301	6,292	0	5,796,752	0	6,292	
12/5/04 5:00	583	12,301	7,169	0	5,796,752	0	7,169	
12/5/04 6:00	577	12,301	7,093	0	5,796,752	0	7,093	
12/5/04 7:00	576	12,301	7,086	0	5,796,752	0	7,086	
12/5/04 8:00	577	12,301	7,098	0	5,796,752	0	7,098	
12/5/04 9:00	580	12,301	7,136	0	5,796,752	0	7,136	
12/5/04 10:00	579	12,301	7,122	0	5,796,752	0	7,122	
12/5/04 11:00	577	12,301	7,095	0	5,796,752	0	7,095	
12/5/04 12:00	579	12,301	7,118	0	5,796,752	0	7,118	
12/5/04 13:00	577	12,301	7,102	0	5,796,752	0	7,102	
12/5/04 14:00	577	12,301	7,094	0	5,796,752	0	7,094	
12/5/04 15:00	580	12,301	7,140	0	5,796,752	0	7,140	
12/5/04 16:00	578	12,301	7,109	0	5,796,752	0	7,109	
12/5/04 17:00	579	12,301	7,126	0	5,796,752	0	7,126	
12/5/04 18:00	577	12,301	7,096	0	5,796,752	0	7,096	
12/5/04 19:00	576	12,301	7,080	0	5,796,752	0	7,080	
12/5/04 20:00	569	12,301	6,995	0	5,796,752	0	6,995	
12/5/04 21:00	559	12,301	6,882	0	5,796,752	0	6,882	
12/5/04 22:00	556	12,301	6,844	0	5,796,752	0	6,844	
12/5/04 23:00	552	12,301	6,791	0	5,796,752	0	6,791	
2003 Highest Value								
7/29/03 16:00	579	12,324	7,137	15.53003	5,761,455	89	7,226	
2003 Highest 24 Hour Period								
5/7/03 0:00	537	12,410	6,668	0	5,761,455	0	6,668	6,764
5/7/03 1:00	532	12,410	6,597	0	5,761,455	0	6,597	
5/7/03 2:00	541	12,410	6,711	0	5,761,455	0	6,711	
5/7/03 3:00	543	12,410	6,734	0	5,761,455	0	6,734	
5/7/03 4:00	544	12,410	6,754	0	5,761,455	0	6,754	
5/7/03 5:00	550	12,410	6,823	0	5,761,455	0	6,823	

Crystal River Unit 4

	COAL			OIL			TOTAL	
DATE/TIME	KPPH	BTU/LB	MMBTU/HI	BBL OIL	BTU/BBL	MMBTU/HI	MMBTU/HI	24 HR AV
5/7/03 6:00	551	12,410	6,835	0	5,761,455	0	6,835	
5/7/03 7:00	551	12,410	6,841	0	5,761,455	0	6,841	
5/7/03 8:00	554	12,410	6,874	0	5,761,455	0	6,874	
5/7/03 9:00	542	12,410	6,727	0	5,761,455	0	6,727	
5/7/03 10:00	541	12,410	6,719	0	5,761,455	0	6,719	
5/7/03 11:00	547	12,410	6,784	0	5,761,455	0	6,784	
5/7/03 12:00	547	12,410	6,794	0	5,761,455	0	6,794	
5/7/03 13:00	544	12,410	6,751	0	5,761,455	0	6,751	
5/7/03 14:00	543	12,410	6,734	0	5,761,455	0	6,734	
5/7/03 15:00	549	12,410	6,817	0	5,761,455	0	6,817	
5/7/03 16:00	548	12,410	6,795	0	5,761,455	0	6,795	
5/7/03 17:00	547	12,410	6,785	0	5,761,455	0	6,785	
5/7/03 18:00	548	12,410	6,806	0	5,761,455	0	6,806	
5/7/03 19:00	546	12,410	6,781	0	5,761,455	0	6,781	
5/7/03 20:00	543	12,410	6,738	0	5,761,455	0	6,738	
5/7/03 21:00	546	12,410	6,779	0	5,761,455	0	6,779	
5/7/03 22:00	544	12,410	6,748	0	5,761,455	0	6,748	
5/7/03 23:00	544	12,410	6,751	0	5,761,455	0	6,751	

Column 1	2	3	4	5	6	7	8	9
Crystal River Unit 5								
	COAL			OIL			TOTAL	
DATE/TIME	KPPH	BTU/LB	MMBTU/HI	BBL OIL	BTU/BBL	MMBTU/HI	MMBTU/HI	24 HR AVG
2006 Highest Value								
8/25/06 7:00	597	12,117	7,229	0	5,789,591	0	7,229	
2006 Highest 24 Hour Period								
1/24/06 0:00	560	12,378	6,927	0	5,789,591	0	6,927	6,845
1/24/06 1:00	559	12,378	6,914	0	5,789,591	0	6,914	
1/24/06 2:00	558	12,378	6,902	0	5,789,591	0	6,902	
1/24/06 3:00	559	12,378	6,919	0	5,789,591	0	6,919	
1/24/06 4:00	561	12,378	6,946	0	5,789,591	0	6,946	
1/24/06 5:00	563	12,378	6,972	0	5,789,591	0	6,972	
1/24/06 6:00	565	12,378	6,999	0	5,789,591	0	6,999	
1/24/06 7:00	568	12,378	7,025	0	5,789,591	0	7,025	
1/24/06 8:00	566	12,378	7,003	0	5,789,591	0	7,003	
1/24/06 9:00	564	12,378	6,977	0	5,789,591	0	6,977	
1/24/06 10:00	562	12,378	6,951	0	5,789,591	0	6,951	
1/24/06 11:00	559	12,378	6,925	0	5,789,591	0	6,925	
1/24/06 12:00	557	12,378	6,899	0	5,789,591	0	6,899	
1/24/06 13:00	555	12,378	6,873	0	5,789,591	0	6,873	
1/24/06 14:00	553	12,378	6,844	0	5,789,591	0	6,844	
1/24/06 15:00	550	12,378	6,813	0	5,789,591	0	6,813	
1/24/06 16:00	548	12,378	6,783	0	5,789,591	0	6,783	
1/24/06 17:00	546	12,378	6,753	0	5,789,591	0	6,753	
1/24/06 18:00	543	12,378	6,723	0	5,789,591	0	6,723	
1/24/06 19:00	541	12,378	6,692	0	5,789,591	0	6,692	
1/24/06 20:00	538	12,378	6,662	0	5,789,591	0	6,662	
1/24/06 21:00	536	12,378	6,632	0	5,789,591	0	6,632	
1/24/06 22:00	533	12,378	6,595	0	5,789,591	0	6,595	
1/24/06 23:00	530	12,378	6,558	0	5,789,591	0	6,558	
2005 Highest Value								
10/20/05 14:00	581	12,301	7,142	0	5,789,591	0	7,142	
2005 Highest 24 Hour Period								
3/25/05 0:00	570	12,108	6,908	0	5,789,591	0	6,908	6,948
3/25/05 1:00	571	12,108	6,913	0	5,789,591	0	6,913	
3/25/05 2:00	571	12,108	6,917	0	5,789,591	0	6,917	
3/25/05 3:00	572	12,108	6,922	0	5,789,591	0	6,922	
3/25/05 4:00	572	12,108	6,926	0	5,789,591	0	6,926	
3/25/05 5:00	572	12,108	6,925	0	5,789,591	0	6,925	
3/25/05 6:00	572	12,108	6,925	0	5,789,591	0	6,925	
3/25/05 7:00	572	12,108	6,924	0	5,789,591	0	6,924	
3/25/05 8:00	572	12,108	6,924	0	5,789,591	0	6,924	
3/25/05 9:00	572	12,108	6,923	0	5,789,591	0	6,923	
3/25/05 10:00	572	12,108	6,923	0	5,789,591	0	6,923	
3/25/05 11:00	572	12,108	6,922	0	5,789,591	0	6,922	
3/25/05 12:00	572	12,108	6,926	0	5,789,591	0	6,926	
3/25/05 13:00	573	12,108	6,936	0	5,789,591	0	6,936	

Crystal River Unit 5

	COAL			OIL			TOTAL	
DATE/TIME	KPPH	BTU/LB	MMBTU/HI	BBL OIL	BTU/BBL	MMBTU/HI	MMBTU/HI	24 HR AVG
3/25/05 14:00	574	12,108	6,947	0	5,789,591	0	6,947	
3/25/05 15:00	575	12,108	6,957	0	5,789,591	0	6,957	
3/25/05 16:00	575	12,108	6,967	0	5,789,591	0	6,967	
3/25/05 17:00	576	12,108	6,978	0	5,789,591	0	6,978	
3/25/05 18:00	577	12,108	6,988	0	5,789,591	0	6,988	
3/25/05 19:00	578	12,108	6,999	0	5,789,591	0	6,999	
3/25/05 20:00	578	12,108	7,004	0	5,789,591	0	7,004	
3/25/05 21:00	578	12,108	7,001	0	5,789,591	0	7,001	
3/25/05 22:00	578	12,108	6,998	0	5,789,591	0	6,998	
3/25/05 23:00	578	12,108	6,995	0	5,789,591	0	6,995	
2004 Highest Value								
2/24/04 8:00	571	12,280	7,008	0	5,796,752	0	7,008	
2004 Highest 24 Hour Period								
2/19/04 0:00	556	12,280	6,833	0	5,796,752	0	6,833	6,945
2/19/04 1:00	558	12,280	6,858	0	5,796,752	0	6,858	
2/19/04 2:00	560	12,280	6,883	0	5,796,752	0	6,883	
2/19/04 3:00	563	12,280	6,908	0	5,796,752	0	6,908	
2/19/04 4:00	564	12,280	6,928	0	5,796,752	0	6,928	
2/19/04 5:00	566	12,280	6,949	0	5,796,752	0	6,949	
2/19/04 6:00	568	12,280	6,970	0	5,796,752	0	6,970	
2/19/04 7:00	568	12,280	6,977	0	5,796,752	0	6,977	
2/19/04 8:00	568	12,280	6,981	0	5,796,752	0	6,981	
2/19/04 9:00	569	12,280	6,985	0	5,796,752	0	6,985	
2/19/04 10:00	569	12,280	6,989	0	5,796,752	0	6,989	
2/19/04 11:00	569	12,280	6,993	0	5,796,752	0	6,993	
2/19/04 12:00	570	12,280	6,997	0	5,796,752	0	6,997	
2/19/04 13:00	570	12,280	7,000	0	5,796,752	0	7,000	
2/19/04 14:00	570	12,280	7,004	0	5,796,752	0	7,004	
2/19/04 15:00	570	12,280	6,995	0	5,796,752	0	6,995	
2/19/04 16:00	569	12,280	6,981	0	5,796,752	0	6,981	
2/19/04 17:00	567	12,280	6,968	0	5,796,752	0	6,968	
2/19/04 18:00	566	12,280	6,955	0	5,796,752	0	6,955	
2/19/04 19:00	565	12,280	6,941	0	5,796,752	0	6,941	
2/19/04 20:00	564	12,280	6,928	0	5,796,752	0	6,928	
2/19/04 21:00	563	12,280	6,914	0	5,796,752	0	6,914	
2/19/04 22:00	562	12,280	6,901	0	5,796,752	0	6,901	
2/19/04 23:00	557	12,280	6,842	0	5,796,752	0	6,842	
2003 Highest Value								
10/17/03 15:00	573	12,583	7,204	0	5,761,455	0	7,204	
2003 Highest 24 Hour Period								
11/3/03 0:00	548	12,495	6,847	0	5,761,455	0	6,847	6,828
11/3/03 1:00	548	12,495	6,853	0	5,761,455	0	6,853	
11/3/03 2:00	549	12,495	6,859	0	5,761,455	0	6,859	
11/3/03 3:00	549	12,495	6,866	0	5,761,455	0	6,866	
11/3/03 4:00	550	12,495	6,868	0	5,761,455	0	6,868	
11/3/03 5:00	549	12,495	6,865	0	5,761,455	0	6,865	

Crystal River Unit 5

	COAL			OIL			TOTAL
DATE/TIME	KPPH	BTU/LB	MMBTU/HI	BBL OIL	BTU/BBL	MMBTU/HI	MMBTU/HI 24 HR AVG
11/3/03 6:00	549	12,495	6,862	0	5,761,455	0	6,862
11/3/03 7:00	549	12,495	6,858	0	5,761,455	0	6,858
11/3/03 8:00	549	12,495	6,855	0	5,761,455	0	6,855
11/3/03 9:00	548	12,495	6,852	0	5,761,455	0	6,852
11/3/03 10:00	548	12,495	6,849	0	5,761,455	0	6,849
11/3/03 11:00	548	12,495	6,845	0	5,761,455	0	6,845
11/3/03 12:00	547	12,495	6,840	0	5,761,455	0	6,840
11/3/03 13:00	547	12,495	6,830	0	5,761,455	0	6,830
11/3/03 14:00	546	12,495	6,820	0	5,761,455	0	6,820
11/3/03 15:00	545	12,495	6,810	0	5,761,455	0	6,810
11/3/03 16:00	544	12,495	6,800	0	5,761,455	0	6,800
11/3/03 17:00	543	12,495	6,790	0	5,761,455	0	6,790
11/3/03 18:00	543	12,495	6,780	0	5,761,455	0	6,780
11/3/03 19:00	542	12,495	6,770	0	5,761,455	0	6,770
11/3/03 20:00	542	12,495	6,769	0	5,761,455	0	6,769
11/3/03 21:00	543	12,495	6,780	0	5,761,455	0	6,780
11/3/03 22:00	544	12,495	6,792	0	5,761,455	0	6,792
11/3/03 23:00	545	12,495	6,804	0	5,761,455	0	6,804

ATTACHMENT 5

BOILER AND FUEL DESIGN SPECIFICATIONS

Instructions

for the

Care and Operation

of

Babcock & Wilcox Equipment

furnished on Contract

RB-588

for

Florida Power Corporation

Crystal River Plant
Unit 4

Progress Energy

UNIT DESCRIPTION

PLANT

This unit is installed as Unit No. 4 at the Crystal River Plant located near Crystal River, Florida. Plant elevation is 11 feet above sea level.

The unit supplies steam to a GE turbine rated at 665 MW. The consulting engineer is Black & Veatch, Kansas City, Missouri.

BOILER

This is a semi-indoor, balanced draft Carolina Type Radiant Boiler designed for pulverized coal firing. The unit has 54 Dual-Register burners arranged in three rows of nine burners each on both the front and rear walls. Furnace dimensions are 79 feet wide, 57 feet deep, and 201 feet from the centerline of the lower wall headers to the drum centerline. The steam drum is 72 inches ID.

The maximum continuous rating is 5,239,600 lb/hr of main steam flow at 2640 psig and 1005° F at the superheater outlet with a reheat flow of 4,344,700 lb/hr at 493 psig and 1005° F with a normal feedwater temperature of 546° F. This is a 5% overpressure condition. The full load rating is 4,737,900 lb/hr of main steam flow at 2500 psig and 1005° F with a reheat flow of 3,959,800 lb/hr at 449 psig and 1005° F with a normal feedwater temperature of 535° F. Main steam and reheat steam temperatures are controlled to 1005° F from MCR load down to half load (2,368,900 lb/hr) by a combination of gas recirculation and spray attemperation.

The unit is designed for cycling service and is provided with a full boiler by-pass system. The unit can be operated with either constant or variable turbine throttle pressure from 63% of full load on down.

The design pressures of the boiler, economizer, and reheater are 2975, 3050, and 750 psig respectively.

Steam for boiler soot blowing is taken off the primary superheater outlet header. Steam for air heater soot blowing is taken off the secondary superheater outlet.

SCOPE OF SUPPLY

The major items of equipment supplied by B&W include:

- RBC unit pressure parts including boiler, primary and secondary superheater, economizer, and reheater.
- Fifty-four Dual-Register burners and lighters.
- Six MPS-89GR pulverizers and piping to burners.
- By-pass system including valves and piping.
- Two stages of superheat attemperators (first stage tandem) and one stage of reheat attemperation (2 nozzles); nozzles only, no block or control valves or spray water piping.
- Three Rothemuhle air heaters (one primary and two secondary).
- Ducts from secondary air heaters to windbox.

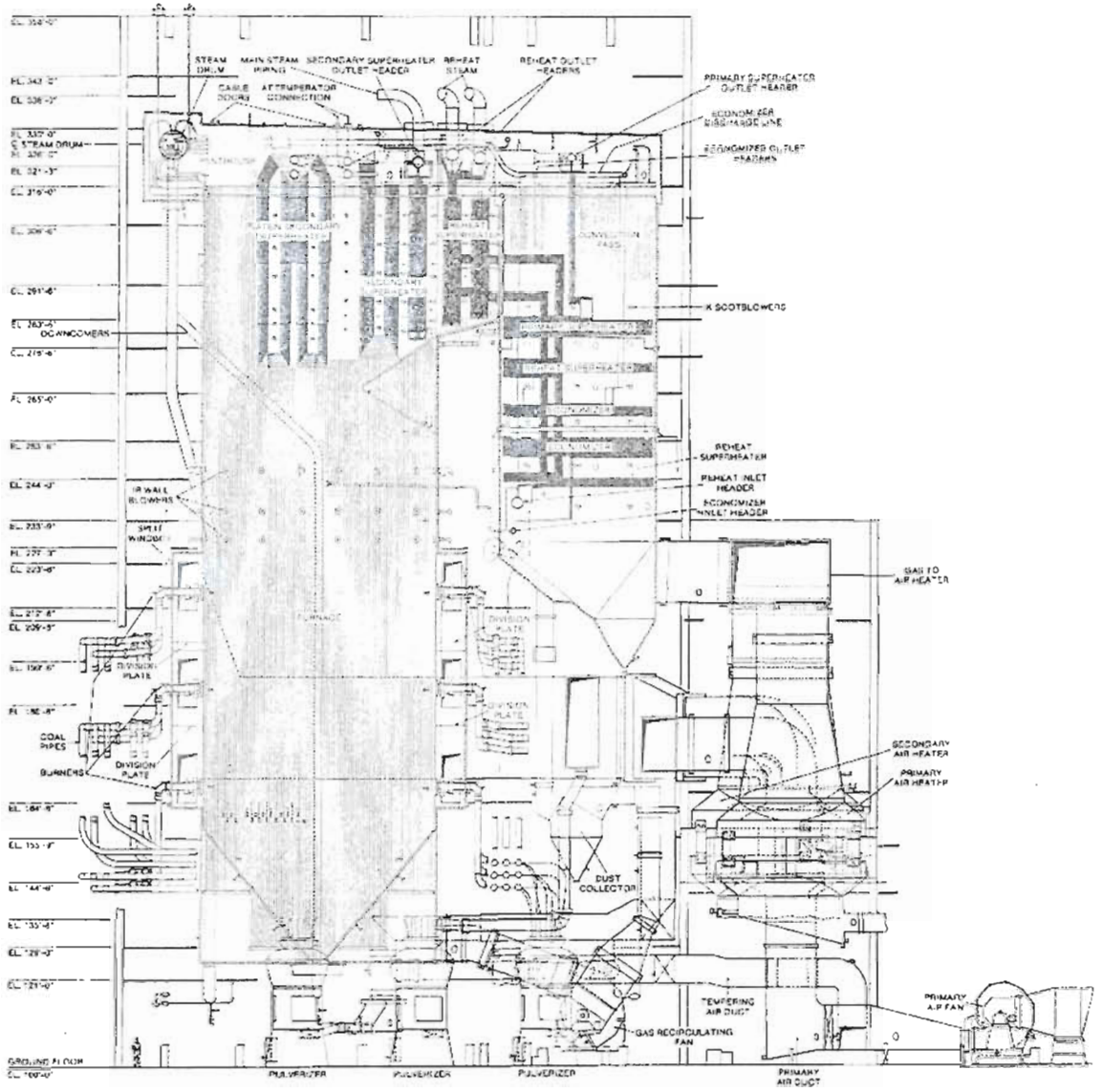
- Primary air system: two TLT centrifugal PA fans and ducts from fans to pulverizers.
- Gas recirculation system: one TLT centrifugal GR fan, one dust collector and flues.
- Six Stock gravimetric coal feeders and drives.
- Bailey burner controls.
- Safety valves and ERV.
- Brickwork, refractory, insulation and lagging (BRIL).
- Seal air piping and fans.
- Erection.
- Recommended spare parts.

FUEL

The guarantees for this unit are based on firing a 50/50 blend of Eastern bituminous and Western sub-bituminous coal. The performance coal is classified as high slagging and medium fouling. Performance was also checked on Illinois deep-mined coal which is classified as severe slagging and high fouling. The furnace and convection pass are designed for a severe slagging and severe fouling coal.

Ultimate Analysis: % by Weight

	Performance	Illinois
Ash	7.90	13.00
Sulfur	0.49	4.20
Hydrogen	3.90	4.40
Carbon	58.80	62.00
Chlorine	0.03	0.02
Water	18.50	10.00
Nitrogen	1.10	1.38
Oxygen	9.28	5.00
Total	100.00	100.00
Higher Heating Value	10285 Btu/lb	11000 Btu/lb



FLORIDA POWER CORPORATION
CRYSTAL RIVER PLANT, UNIT NO. 4
CRYSTAL RIVER, FLORIDA

BABCOCK & WILCOX RADIANT REHEAT BOILER

Progress Energy

A — FUEL AS FIRED

SAMPLES

ANALYSES: 50/50 BLEND, EASTERN & WESTERN

COAL

ASTM	KIND	
	CLASS	
	GROUP	
SOURCE	MINE	
	SEAM	
	DISTRICT	
	COUNTY	
	STATE	
SIZE		
GRINDABILITY		48
SURFACE MOISTURE, %		
		PERF.
ASH SOFT. TEMP., F (REDUCING)		
PROX. ANAL. %	MOISTURE, TOTAL	18.5
	VOLATILE MATTER	31.0
	FIXED CARBON	42.6
	ASH	7.9
	TOTAL	100.0

ULTIMATE ANALYSIS

FUEL	BIT.	SUB-BIT.	
% BY	WT.	WT.	WT.
ASH	10.0	5.8	7.90
S	0.5	0.48	0.49
H_2	4.4	3.4	3.90
C	69.0	48.5	58.80
CH_4			
C_2H_6			
C_3H_8			
C_4H_{10}			
C_5H_{12}			
C_6H_{14}			
CO			
CO_2			
O_2	0.05	0.02	0.03
H_2O	7.0	38.0	18.50
N_2	1.4	0.7	1.10
O_2	7.65	11.1	9.28
TOTAL	100.00	100.00	100.00
BTU/LB	12,450	8,125	10,285
BTU/CU FT AT 60F 30 IN. HG			

*EXCLUDING VALVES AND STATIC HEAD.

UTILITY BOILER PERFORMANCE SUMMARY

BY RLG APPD. DATE

THE BABCOCK & WILCOX COMPANY

P12-4657-16Y0-1S0

Q — PREDICTED PERFORMANCE

STEAM LEAVING SH, M LB/HR	2368.9	4737.9	5239.6
STEAM LEAVING RH^1, M LB/HR	2063.8	3959.8	4344.7
STEAM LEAVING RH^2, M LB/HR			
TYPE OF FUEL	PC	PC	PC
LOAD CONDITION	CONT.	CONT.	CONT.
EXCESS AIR LEAVING ECON., %	35	20	20
NO. OF BURNERS IN OPERATION	45	54	54
FUEL INPUT, MKB/HR	3348	6053	6581
HEAT AVAIL. MKB/HR (FUEL & HEATED AIR)	3615	6367	6886
QUANTITY, M LB/HR — FUEL (MCFH-NAT. GAS)	325.5	588.6	639.8
QUANTITY, M LB/HR — FLUE GAS ENTERING AIR HEATER	3228	6051	6579
QUANTITY, M LB/HR — AIR TO BURNING EQUIPMENT	3327	5419	5891
QUANTITY, M LB/HR — AIR HEATER LEAKAGE PRI/SEC	107/210	128/272	111/286
PRESSURE, PSIG — STEAM AT SH OUTLET	2425	2500	2640
PRESSURE, PSIG — STEAM AT RH^1 INLET	240	474	520
PRESSURE, PSIG — STEAM AT RH^2 INLET			
PRESSURE DROP — REHEATER 1	13	25	27
PRESSURE DROP — REHEATER 2			
PRESSURE DROP — ECONOMIZER *	5	20	25
PRESSURE DROP — DRUM TO SH OUTLET	39	155	189
TEMPERATURE, F — STEAM — LEAVING SUPERHEATER	1005	1005	1005
TEMPERATURE, F — STEAM — LEAVING REHEATER 1	1005	1005	1005
TEMPERATURE, F — STEAM — ENTERING REHEATER 1	528	598	604
TEMPERATURE, F — STEAM — LEAVING REHEATER 2			
TEMPERATURE, F — STEAM — ENTERING REHEATER 2			
TEMPERATURE, F — FLUE GAS — LEAVING ECONOMIZER	630	689	697
TEMPERATURE, F — FLUE GAS — LEAVING AH (EXCL. LKG) PRI/SEC	280/260	280/278	280/279
TEMPERATURE, F — FLUE GAS — LEAVING AH (INCL. LKG) PRI/SEC	258/249	261/267	262/269
TEMPERATURE, F — AIR — WATER ENTERING ECONOMIZER	459	535	546
TEMPERATURE, F — AIR — ENTERING UNIT PRI/SEC	85/99	95/82	95/80
TEMPERATURE, F — AIR — LEAVING AIR HEATER PRI/SEC	555/555	575/596	579/601
RESISTANCE, IN. OF WATER — GAS — FURNACE & CONVECTION BANKS	1.7	3.5	3.9
RESISTANCE, IN. OF WATER — GAS — FLUES TO AH OUTLET	0.4	0.9	1.1
RESISTANCE, IN. OF WATER — GAS — AIR HEATER	1.7	3.6	4.1
RESISTANCE, IN. OF WATER — GAS — TOTAL FURN. TO AH OUTLET	3.8	8.0	9.1
RESISTANCE, IN. OF WATER — AIR — FUEL BURNERS & WINDBOX	1.0	2.5	2.9
RESISTANCE, IN. OF WATER — AIR — DUCTS & FLOW METER	1.2	3.3	3.8
RESISTANCE, IN. OF WATER — AIR — AIR HEATER	1.7	4.0	4.6
TOT. FROM AH INLET TO FURN	3.9	9.8	11.3
HEAT LOSS, % — DRY GAS *	4.23	4.34	4.43
HEAT LOSS, % — H_2 & H_2O IN FUEL	5.80	5.89	5.91
HEAT LOSS, % — MOISTURE IN AIR	0.11	0.11	0.11
HEAT LOSS, % — UNBURNED COMBUSTIBLE	0.30	0.30	0.30
HEAT LOSS, % — RADIATION	0.31	0.17	0.15
HEAT LOSS, % — UNACC. FOR & MFRS. MARGIN	1.50	1.50	1.50
TOTAL HEAT LOSS	12.25	12.31	12.40
EFFICIENCY OF UNIT, %	87.75	87.69	87.60
PULVERIZERS — NO. IN USE PER BOILER	5	6	5 6
PULVERIZERS — TOTAL POWER, KW HR/TON MOTOR OUTPUT			
PULVERIZERS — % THRU 200 U.S.S. SIEVE	74	69	65 68

PREDICTED PERFORMANCE IS BASED ON COMBUSTION AIR ENTERING UNIT WITH 0.013 LB MOISTURE/LB DRY AIR, ON 29.92 IN. HG. BAROMETRIC PRESSURE, ON CONDITIONS & EQUIPMENT GIVEN ON THIS SUMMARY SHEET & AN ARRANGEMENT SHOWN ON DRAWING P12-4657-16Y0

C — EQUIPMENT PER UNIT

TYPE RADIANT

SIZE 79 RBC 57 HB

DESIGN PRESSURE - 2,975 PSIG

FURNACE — WATER COOLED SCREEN (CIRCUMFERENTIAL)		
FURNACE — WATER COOLED (PROJECTED)		48,736
FURNACE — SUPERHEATER (CIRCUMFERENTIAL)		
FURNACE — SUPERHEATER (PROJECTED)		46,442
TOTAL FURNACE HEATING SURFACE		95,178
CONVECTION — SATURATED (CIRCUMFERENTIAL)		10,586
CONVECTION — SUPERHEATER (CIRCUMFERENTIAL)		243,015
CONVECTION — REHEATER 1 (CIRCUMFERENTIAL)		333,919
CONVECTION — REHEATER 2 (CIRCUMFERENTIAL)		
CONVECTION — ECONOMIZER		46,519
TOTAL CONVECTION HEATING SURFACE		634,039
TOTAL FURN. & CONV. PRESSURE PART. HTG. SURF.		729,217
FLAT PROJECTED FURNACE HEATING SURFACE TO FACE OF PLATENS (24" CTR)		73,581
FLAT PROJECTED FURNACE HEATING SURFACE TO FACE OF CONVECTION SURFACE		101,501
FURNACE VOLUME, CU FT		734,185

AIR HEATER: TYPE ROTHEMUHLE REGENERATIVE NO. 1-PRI. 2-SEC.
TOTAL HEATING SURFACE, SQ FT PRI.-250,522 SEC.-824,850
PRI. SIZE-10.6 Vu 56
SEC. SIZE-12.5 Vu 68

FUEL BURNER: TYPE DUAL REGISTER
NO. 54

PULVERIZER: TYPE MPS SIZE B9G NO. 6
CAPACITY OF 5 PULV. IS 5219 M LB STEAM/HR BASED ON 48 GRIND
10,285 BTU COAL AT 65 % THRU 200 U.S.S. SIEVE
FOR 1097 M LB COAL/PULV.-HR AT 65% THRU 200 U.S.S. SIEVE MIN. GRIND
IS 42 MAXIMUM TOTAL MOISTURE IS 18% REQUIRING 570 F AIR

STEAM TEMP. CONTROL: MAIN STEAM BY SPRAY ATTEMPERATION
REHEAT BY GAS RECIRCULATION

UNIT CONSTRUCTION FEATURES: MEMBRANE WALLS
BALANCE DRAFT

REVISIONS NO.	DESCRIPTION	BY	DATE

FLORIDA POWER CORP.
CRYSTAL RIVER, UNIT #4.

Progress Energy