PERMITTEE

Florida Power Corporation
d/b/a Progress Energy Florida (PEF), Inc.
299 First Avenue, North
St. Petersburg, Florida 33701

PERMITTING AUTHORITY

Florida Department of Environmental Protection (Department)
Division of Air Resource Management
Office of Permitting and Compliance
2600 Blair Stone Road, MS #5505
Tallahassee, Florida 32399-2400

PROJECT

Air Permit No. 0170004-036-AC
Crystal River Power Plant Units 1 and 2
Sulfur Dioxide (SO_2) Emission Standards/Controls

This final air construction permit establishes an additional SO_2 emission standard for Crystal River Units 1 and 2, authorizes installation of dry flue gas desulfurization (FGD) systems and authorizes physical changes to the electrostatic precipitators and plant components or installation of baghouses to facilitate installation of the dry FGD systems. The proposed work will be conducted at the existing Crystal River Power Plant, which is a nominal 2,300 megawatts (MW) coal-fueled power plant (excluding a nuclear unit). The plant is located in Citrus County at 15760 West Power Line Street in Crystal River, Florida. The UTM coordinates are Zone 17, 334.3 km East and 3204.5 km North.

NOTICE AND PUBLICATION

The Department distributed a draft minor air construction permit package on July 31, 2012. The applicant published the Public Notice in the Citrus County Chronicle on August 5, 2012. The Department received the proof of publication on August 9, 2012. No requests for administrative hearings or requests for extensions of time to file a petition for administrative hearing were received.

COMMENTS

No comments on the draft permit were received from individual members of the public or the EPA Region 4 Office. Comments were received as a single submittal on behalf of the Sierra Club, the National Parks Conservation Association, Earthjustice, and respective members (Sierra et al.) in Florida described in the communication "who will be substantially affected by the draft permit for construction at Progress Energy's Crystal River Plant". Comments were received from the applicant (PEF) after expiration of the comment period that are discussed below but not considered in making a final decision regarding this permitting action.

I. REVIEW OF COMMENTS FROM THE SIERRA CLUB ET AL.

Comments were submitted by the Sierra Club et al. as a cover letter with attachments comprising approximately 313 pages. Link to Sierra et al. Comments. The key comments contained in the 15-page cover letter are repeated or paraphrased *(in italics)* below and followed by the Department's response.

1. *Sierra Club et al. overall comment*: *"The permit does not assure compliance with state or federal law".*

   Department Response: The Department disagrees. The final permit complies with applicable state and federal law and implementing regulations for issuing minor source construction permits. The final permit complies with the Department's Standards for Issuing and Denying Permit as the Department has reasonable assurance that the construction, expansion, modification, operation, or activity of the installation will not

discharge, emit, or cause pollution in contravention of Department standards or rules. [Rule 62-4.070, Florida Administrative Code (F.A.C.).

All applicable requirements including permits and regulations will continue to be incorporated into the facility Title V air operation permit, revisions and renewals. Taken together, the permits (including future permits) and enforceable requirements provide reasonable assurance of compliance with state or federal law.

2. *Sierra et al. characterization of Crystal River Units 1 and 2 and its emissions: These units are aging, largely uncontrolled coal-fired boilers which emit a variety of haze-causing pollutants including sulfur dioxide (SO_2), a dangerous pollutant which also contributes to visibility impairment throughout the state".*

   Department Response: The draft permit provided for three options under consideration by the applicant, one of which is not included in the final permit. The remaining options are: (A) Discontinuation of operation of the older Units 1 and 2 as coal-fired units by December 31, 2020; and (B) installation of SO_2 controls, including compliance with a low SO_2 limit.

   The Department agrees that the units emit (combustion exhaust gases that contain) several haze-causing pollutants including SO_2. Given the type of source, the rates emitted within the combustion exhaust gases and the ground-level concentrations experienced in the vicinity of the site, SO_2 is a ***criteria pollutant***. EPA has set National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. SO_2 is not on the list of approximately 188 pollutants listed as hazardous air pollutants (HAP) that are regulated pursuant to the Standards of Performance for New Stationary Sources (NSPS) contained in 40 Code of Federal Regulations, Part 60 (40 CFR 60).

3. *Sierra et al. reference to Draft Permit Condition at 3 (presumably page 3): "See Draft Permit Condition at 3 (explaining that the permit is intended to 'provid[e] additional options for complying with Florida's Regional Haze Plan') for Florida Class I Areas, Pre hearing Draft (August 3, 2012) ("Florida Haze Plan") at 128-33 (setting out determinations implemented by the permit)".*

   Department Response: The reference is a continuation of the previous comment. The actual reference is not a draft permit condition, but rather a part of the description of the project. Similarly, intentions are not permit conditions. The reference does not include the explanatory words added by Sierra et al., "*for Florida Class I Areas, Pre hearing Draft (August 3, 2012) ("Florida Haze Plan") at 128-33 (setting out determinations implemented by the permit)".*

4. *Sierra et al. reference to the Crystal River BART determination: "The Crystal River BART determination cannot assure compliance with the required reductions in visibility-impairing pollutants. As we explain in detail below, the permit fails to set emissions limits for SO_2 or PM which are commensurate with BART if the facility does not retire in 2020".*

   Department Response: The reference is a continuation of the previous comment. The permit is not the Crystal River Unit 1 and 2 BART determination. A draft BART determination was indeed submitted under a rulemaking process as an update of the Department's State Implementation Plan (SIP) and in accordance with the federal process prescribed pursuant to the Clean Air Act. Issuance of the present permit will enhance the ultimate success of the SIP process and does not contravene the draft SIP submittal or the as-yet unknown ultimate EPA decision regarding that submittal.

5. *Sierra et al. conclusion regarding draft permit: "This permit, therefore, may not properly issue". "The Department may issue a permit only after it receives reasonable assurance that the installation will not cause pollution in violation of any of the provisions of Chapter 403, Florida Statutes (F.S.), or the rules promulgated thereunder". Sierra et al. cite: Rules 62-4.030, 62-4.070, 62-212.300(3)(a)(2) and 62-296.340, F.A.C.; 40 CFR Section 51.308; and 42 U.S. Code Section 7491. Sierra et al. specifically claim per analysis attached to their submittal "it (i.e. the permit) does not reasonably assure compliance with the Florida BART rule, 62-296.340, …….".*

Department Response: The Department disagrees that the permit may not properly issue. The Department accepts the claim of lack of reasonable assurance with respect to "Scenario C" described at Page 3. Option C is embodied in the permit at Section 2, Scenario C, Specific Conditions C.1, C.2 and C.3 and constitutes future establishment of a permit limit (for SO_2) to exempt out of BART. The Department will strike Scenario C in its entirety as follows:

~~SCENARIO C: ESTABLISH A PERMIT LIMIT TO EXEMPT OUT OF BART.~~

~~C.1. *Submission of Permit Application: If PEF chooses to establish permit conditions sufficient to exempt out of BART, an application for an air construction permit containing a complete 5-factor BART determination clearly indicating control strategies and necessary emissions limits shall be submitted to the Department no later than January 1, 2015. This application shall be submitted along with the notification required in Condition 2.7, above, indicating that exempting out of BART is the chosen emission reduction scenario.*~~
~~*[Rules 62-4.070 & 62-296.340, F.A.C.; and, Application No. 0170004-036-AC]*~~

~~C.2. *Physical Changes Authorized by Exemption Permit: The authority to make any necessary physical changes pursuant to emissions reduction Scenario C shall be effective upon the effective date of the air construction permit issued according to that chosen scenario. The emissions limitations established by that permit shall become effective as soon as practicable following completion of the physical changes authorized by that permit, but no later than 5 years after the effective date of EPA's approval of these specific requirements in the Florida Regional Haze State Implementation Plan.*~~
~~*[Rule 62-4.070, F.A.C. and Application No. 0170004-036-AC]*~~

~~C.3. *Compliance With Chosen BART Exemption Conditions: PEF shall complete all necessary physical changes and shall comply with the proposed BART exemption emissions limits no later than January 1, 2018, or within 5 years of EPA's final approval of Florida's final Regional Haze SIP, whichever is later. [Rules 62-4.070 & 62-296.340, F.A.C.; and, Application No. 0170004-036-AC]*~~

The Department will also remove references to Scenario C appearing throughout the permit.

The Department has reasonable assurance in accordance with Rule 62-4.030, F.A.C., that the installation (i.e. the shutdown of the units or the installation of control equipment) will not cause pollution in violation of any of the provisions of Chapter 403, F.S., or the rules promulgated thereunder. The Department also has reasonable assurance in accordance with Rule 62-4.070, F.A.C., that shutdown of the units (or installation of control equipment) will not discharge, emit, or cause pollution in contravention of Department standards or rules.

The claim that this permit does not reasonably assure compliance with Rule 62-296.340 (BART), F.A.C., is refuted by the fact that the rule does not require a BART determination for SO_2 or nitrogen oxides (NO_X) for any electric generating unit at a BART-eligible source that is subject to the Clean Air Interstate Rule (CAIR) Program. A BART determination pursuant to Department Rule 62-266.340, F.A.C., was already performed for particulate matter (PM) emissions from the units in 2009 and was subject to public comments and challenge. It is premature to claim that the permit does not reasonably assure compliance with an ongoing SIP effort that will revise that rule. The permit complies with all applicable Department rules.

6. *Sierra et al. claim the permit offers no reasonable assurance that Crystal River will not cause a violation of Florida Law: "See F.A.C. 62-4.030. Pollution is: The presence in the outdoor atmosphere or waters of any substances, contaminants, noise, biological, or radiological integrity of air or water in quantities or at levels which are or may be harmful or injurious to human health or welfare, animal or plant life, or property or which unreasonably interfere with enjoyment of life or property, including outdoor recreation unless authorized by applicable law". F.S. 403.031(7).*

   "As our comments below explain, Crystal River's proposed emissions, authorized by this draft permit, will continue to cause or contribute to visibility impairment at the region's Class I areas and across the state due

to the presence of SO_2 which, again, is an extremely dangerous pollutant. Specifically, the units in question cause significant visibility impairment at St. Marks (3.96 deciviews – dv), Chassahowitzka (6.97 dv), Wolf Island (1.52 dv), and Okefenokee (2.70) national wilderness areas".

Department Response: Refer to Figure 1. There has been a dramatic reduction of SO_2 emissions at the Crystal River Power Plant between 1997 and 2011. Much of the reduction occurred following installation of add-on SO_2 controls on coal-fueled Units 4 and 5. Facility SO_2 reductions to-date equal 84,000 tons/year and 74 percent (%).

Figure 1. SO_2 Emission Trend for Crystal River Power Plant, including Units 1, 2, 4 and 5 (tons/year)

Units 4 and 5 were constructed pursuant to a prevention of significant deterioration (PSD) permit (PSD-FL-007) and a BACT determination issued by the U.S. EPA in 1978. The SO_2 project implemented between 2008 and 2010 represents control beyond that required by that EPA BACT determination.

Prior to issuance of Permit PSD-FL-007 including BACT determinations authorizing construction of Units 4 and 5 by EPA, the SO_2 limit applicable to Units 1 and 2 was more than 6.0 pounds per million British thermal units (lb/MMBtu). The subject permit included a limit of 2.1 lb SO_2/MMBtu applicable to pre-existing Units 1 and 2 as part of the same action to insure compliance of the four Crystal River coal-fueled units with the NAAQS and allowable PSD increments.

Units 1 and 2 generally operate at approximately 1.5 lb SO_2/MMBtu. Clearly, based on Figure 1, meaningful reductions have already occurred from Units 1 and 2. The shutdown of Units 1 and 2 under Scenario A or installation of add-on air pollution control equipment to meet a limit of 0.15 lb/MMBtu (or 95 percent

reduction of the potential combustion concentration) will have a further ameliorative effect on ambient SO_2 concentrations and regional haze.

The four coal-fueled units (including Units 1 and 2), operate in compliance with State laws and Department rules. The Department has reasonable assurance that after issuance of the permit, the facility will continue to comply with State laws and rules. Scenarios A or B (shutdown or the proposed SO_2 emission standard applicable to Units 1 and 2) in accordance with the final permit will provide further reductions to those already realized from the Crystal River Power Plant. The suggestion that the act of issuance of this permit somehow causes pollution (per the cited statute) not authorized by applicable law is without merit.

The Sierra Club prepared "an air modeling impact analysis of the Crystal River Power Plant to help USEPA, state and local air agencies identify facilities that are likely causing violations of the 1-hour SO_2 NAAQS". This specific document for Crystal River Power Plant was prepared for the Sierra Club by Wingra Engineering, Madison, WI and is titled "Evaluation of Compliance with 1-hour SO_2 NAAQS for the Crystal River Power Plant" (July 25, 2012). The Department has not vetted the procedures or approved the findings presented in the document. Nevertheless, two of the tables from that report are reproduced (renumbered) below. Table 1 is a summary of Wingra Engineering's modeled emission rates in pounds per hour (lb/hour) from the units and the facility.

Table 1. Modeled SO_2 Emissions from Crystal River Power Plant (Wingra Report Table 2)

Stack ID	Unit ID	Allowable Emissions 24-hour Average (lb/hour)	Maximum Emissions 1-hour Average (lb/hour)
S01	Unit 1	7,875	4,319
S02	Unit 2	10,069	5,092
S45	Units 4 and 5	17,280	10,531
Stack Total	All Units	32,224 [1]	19,942 [2]
Department Note 1. Would equate to 141,141 tons/year if maintained at this rate for the entire year. Department Note 2. Would equate to 87,346 tons/year if maintained at this rate for the entire year.			

The assumptions used in the modeling imply very high rates that are not consistent with the measured annual emissions (in tons/year) per Figure 1. Table 2 indicates the emission rates in lb/hour, which according to Wingra's modeling effort, the units can emit while attaining the new and very stringent 1-hour SO_2 NAAQS of 196.2 micrograms per cubic meter ($\mu g/m^3$).

Table 2. Required Emission Reductions for Compliance with 1-hour SO_2 NAAQS (Wingra Report Table 2)

Acceptable Impact (NAAQS minus Background) 99th Percentile 1-hr Daily Max ($\mu g/m^3$)	Required Total Facility Reduction Based on Allowable Emissions (%)	Required Total Facility Emission Rate (lb/hour)	Required Total Facility Emission Rate (lb/MMbtu)
(196.2 – 5.2) = 191.0	79.1%	6,720.8 [1]	0.25
Department Note 1. Would equate to 29,437 tons/year if maintained at this rate for the entire year.			

Per Figure 1 during 2011 the facility emitted less SO_2 (26,207 tons) than the annualized value that would be allowed by the Wingra Engineering approach (29,437 tons/year) to attain the 1-hour SO_2 NAAQS. The emission factors already achieved by Units 4 and 5 (~0.12 lb/MMBtu) are about half of the target value suggested by the Wingra approach (0.25 lb/MMBtu). Scenario B envisions an emission standard of 0.15 lb/MMBtu for Units 1 and 2 if these are not shut down. Therefore, the final permit will provide a large margin of safety for attainment with the new and very stringent 1-hour SO_2 NAAQS.

Figure 2 includes graphs of the SO_2 emission trends (tons/year and lb/MMBtu) at the PEF Crystal River Power Plant, the PEF Anclote Power Plant (~1,050 MW) located in Pasco County and the Bartow Power Plant (~1,200 MW) located in Pinellas County. The emissions from the three facilities when combined are also shown. The three plants are all within 85 kilometers (km) of the nearest Class 1 area; the Chassaohowitzka National Wildlife Area (NWA).

Figure 2. SO_2 Emission Trends for Three Large Regional Progress Energy Facilities

The reductions in SO_2 at the repowered PEF Bartow Power Plant are greater than 99% compared with levels emitted as recently as 2007. Significant reductions have also been realized at the Anclote Power Plant. Expansion of natural gas capacity and prohibition of residual fuel oil use at the Anclote Power Plant required by the recently issued Department PSD Permit PSD-FL-419 (September 2012) will add to the impressive SO_2 reductions achieved in recent years.

The emission reductions already achieved at the three plants coupled with the additional projects planned at both the Crystal River Plant will reduce both the background SO_2 concentrations and the actual effect on those background concentrations by the three plants.

The foregoing discussion refutes the claim and even the notion regarding violation of Florida law. In fact it demonstrates the diligence with which the company has pursued emission reductions in an atmosphere of great uncertainty in federal rulemaking. There is every reason to believe that the Crystal River coal-fueled units comply and will continue to comply with existing and future air pollution rules. There is also every reason to believe that the pronounced downward trend in emissions and ambient SO_2 concentrations will continue and will be facilitated by issuance of the final permit.

7. *Sierra et al. states "the draft permit's SO_2 and PM BART determinations are legally and technically flawed": The reader is referred to page 2 of the cover letter at the link provided above.*

   Department Response: The Department disagrees as conclusively demonstrated by the foregoing discussion. The Department is authorized to issue a final permit for a project to control emissions from Units 1 and 2 regardless of an ongoing federal SIP review of proposed revisions to the existing Department BART rule.

8. *Sierra Club et al. states "DEP has the Authority and the Duty to Enforce the Haze Rule: The reader is referred to pages 2 through 4 of the cover letter at the link provided above.*

   Department Response: The Department does not quarrel with this statement and issuance of the permit does not conflict with the statement by Sierra et al.

9. *Sierra Club et al. states "the Draft Crystal River SO_2 BART Determination (and corresponding draft air construction permit) must be revised to be legally compliant". The reader is referred to pages 4 through 13 of the cover letter at the link provided above.*

   Department Response: The draft permit needs only to exclude Scenario C to better comply with the reasonable assurance provisions contained in Rule 62-4.070, F.A.C. As discussed above, Scenario C will be struck based on reasonable assurance provisions.

10. *Sierra Club et al. states "the Draft Permit must include BART limits for PM". The reader is referred to pages 13 through 14 of the cover letter at the link provided above.*

    Department Response: The draft permit includes limits under Scenario B for PM (0.015 lb/MMBtu) to provide reasonable assurance that PSD is not triggered for PM/PM_{10} under the dry FGD option. The limit is actually more stringent than established by the Department as BART (0.04 lb PM/MMBtu) through Department permit No. 0170004-017 issued in 2009. Link to Crystal River BART Permit .

11. *Sierra Club et al. provides its Conclusion and summarizes as follows: "In short, because DEP lacks any reasonable assurance that this permit will assure compliance with pollution control mandates, it must revise or at a minimum not finalize the permit. [Sierra et al.] would be happy to discuss this matter with [Department staff], and look forward to DEP's efforts to improve the faulty controls in this draft".*

    Department Response: The Department has reasonable assurance regarding Scenarios A and B such that it may issue a final permit.

II. LATE COMMENTS FROM THE APPLICANT

On September 5, 2012, and after closure of the 30-day comment period pursuant to the Public Notice, the Department received further comments from PEF. They are accessible at the following link: Link to PEF Letter

The key comments contained in the one-page letter are repeated or paraphrased *(in italics)* below and followed by the Department's response.

1. *PEF comment regarding Scenario C: "PEF understands that issues have been raised regarding inclusion of this option in the permit based on the condition's apparent vagueness. In order to minimize issues related to the finalization of this permit, PEF requests that this option and the associated conditions be removed from the permit when it is issued in final form".*

   Department Response: The letter and comment arrived too late to consider in the final permitting action. However, the Department already determined to remove Scenario C pursuant to the comments of Sierra Club et al. as discussed above and considers the comment to constitute concurrence by PEF with this change.

2. *PEF comment regarding Selective Catalytic Reduction (SCR) NO_X Control: PEF requests that authorization to install an SCR system on Units 1 and 2 be included in the final version of the permit when issued.*

Department Response: The letter and comment arrived too late to consider in the final permitting action. PEF should submit an application pursuant to the instructions and on the forms provided in Rule 62-210, F.A.C. Notwithstanding the expected reductions in NO_X as well as the reductions in SO_2 and PM from the present and recent permitting actions, the applicant should submit information to show whether PSD is triggered or how it is avoided for certain collateral emissions such as sulfuric acid mist, carbon monoxide (CO) and visible emissions.

CONCLUSION

The final action of the Department is to issue the permit excluding Scenario C. No other changes are required.