



DEPARTMENT OF
ENVIRONMENTAL PROTECTION

AUG 17 2011

SITING COORDINATION

August 16, 2011

via UPS

Ms. Cindy Mulkey, Administrator
Florida Department of Environmental Protection
Siting Coordination Office
3900 Commonwealth Blvd., MS No. 48
Tallahassee, FL 32399-3000

**Re: Florida Power Corporation d/b/a Progress Energy Florida, Inc. (PEF)
Crystal River Fossil Plants
Petition to Modify Site Certification PA 77-090
Ash Storage Vertical Expansion and Other Misc. Projects (Mod P)
Response To FDEP's Second Request for Additional Information
Dated January 18, 2011**

Dear Ms. Mulkey:

On September 10, 2010, the Florida Department of Environmental Protection's (FDEP or Department) Siting Coordination Office received a petition from Progress Energy Florida, Inc. (PEF) for a modification to the Crystal River Energy Complex (CREC) Site Certification Order Conditions (PA 77-090). On October 11, 2010, the Department issued a Request for Additional Information (RAI) and on December 17, 2010, PEF submitted its response to the Department's RAI.

On January 18, 2011, the Department issued a Second RAI. In response, PEF conducted additional field work and design changes followed by a discussion with Department staff on June 16, 2011, to address certain agency comments included in FDEP's Second RAI. Provided below is PEF's response to FDEP's Second RAI. For ease of reference, PEF restates in italics the Department's questions/comments followed by PEF's response.

FDEP Comment #A.1.a: Response #A.1(1) indicates that the results of the CCP ash leaching tests and historical groundwater monitoring data indicate that the material will not adversely impact groundwater quality. However, the CCP leaching tests (see CCP Manual, Table 3) for all materials tested exceed the Department's water quality standards or criteria for at least one parameter, and in most cases for several parameters. The "historic" groundwater data is not specifically identified. However, review of water quality monitoring data provided to the Department's Industrial Wastewater Section for monitoring MW-2R and MW-2R2 indicate that these wells have exceeded Department water quality standards or criteria for the following parameters: chloride, iron, TDS, gross alpha, and arsenic. Please note also that although there is some variability in the data, arsenic concentrations have increased an order of magnitude in the period from 2003 to 2010. While these exceedances may not be considered to be violations of Department standards, the data suggest that the materials stored or disposed in the landfill may be impacting groundwater quality.

PEF Response:

The CREC's Coal Combustion Product (CCP) Storage/Disposal Area was thoroughly characterized for CCP leachability by Environmental Consulting and Technology (ECT) Inc. in late 2007. A final CCP characterization report was submitted to the Department in March 2008. While PEF recognizes that CCPs may have the potential to leach some of their constituents, historical site groundwater quality data demonstrates that the CCP Storage/Disposal Area is not impacting groundwater quality in violation of Department groundwater rules. The Department appears to agree with that conclusion in its comment.

In accordance with FDEP groundwater rules, the CREC (including the CCP Storage/Disposal Area) is an "existing installation" as it was an installation reasonably expected to release contaminants into the groundwater on or before July 1, 1982, and it operated consistently with statutes and rules relating to groundwater discharges in effect at the time. As an "existing installation", the CREC's zone of discharge (ZOD) extends laterally to the CREC's property boundary. Pursuant to Rule 62-520.420(4), F.A.C., primary and secondary drinking water standards do not apply within the CREC's ZOD. Moreover, as an "existing installation", the CREC is exempt from having to comply with secondary drinking water standards outside its designated ZOD, unless FDEP determines that compliance with one or more secondary drinking water standards is necessary to protect groundwater that is used or is reasonably likely to be used as a potable water source. See Rule 62-520.520(1), F.A.C. PEF is unaware of any such FDEP determination relative to the CREC or groundwater in proximity to the CREC.

PEF recognizes that water quality monitoring data from intermediate wells MWI-2R and MWI-2R2 reflect exceedances of chloride, iron, TDS, gross alpha, and arsenic. As the Department seemingly acknowledges, the exceedances for chloride, iron, TDS, gross alpha, and arsenic are found within the CREC's zone of discharge and do not constitute violations of Department standards. Moreover, as an "existing installation" under FDEP's groundwater rules, the CREC does not have to comply with the secondary drinking water standards for chloride, iron, and TDS outside of the CREC's designated ZOD.

Baseline sampling of temporary intermediate wells (TW intermediate wells) was performed in October 2009 (TW-1 through TW-4) and January 2010 (TW-5) as part of the hydrogeological and geotechnical investigation for the horizontal expansion ("east sliver") and proposed vertical expansion of the CCP Storage/Disposal Area. Subsequent groundwater samples were collected from the intermediate TW intermediate wells (excluding TW-2R which is classified as a piezometer) as well as MWI-2R2 and MWC-12R in March and April 2011. A summary of the sampling dates and results is shown in Table 1 of the Technical Memorandum included as Attachment 1 to this response. Historical groundwater trends and CCP leach results for arsenic are discussed in the Technical Memorandum (see Attachment 1). As the Department notes, arsenic concentrations in monitoring well MWI-2R2 appear to have increased in recent years. However, as illustrated on the distance vs. concentration plots in the Technical Memorandum, the concentrations are not very different from those observed in 1981 in groundwater (prior to construction and operation of the CCP Storage/Disposal Area). A summary of the Synthetic Precipitation Leaching Procedure (SPLP) data is contained in Table 2 of the Technical Memorandum included as Attachment 1 to this response.

Gross alpha concentrations in groundwater concentrations appear erratic and at times have exceeded the PDWS in MWI-2R2, MWC-12R (background), and MWC-21R. However, as stated in the Technical Memorandum included as Attachment 1 to this response, the elevated levels of gross alpha do not appear to be correlated with the operation of the CCP Storage/Disposal Area based on the fact that CCP SPLP results did not reflect exceedances of the primary drinking water standard for that constituent and gross alpha concentrations in groundwater exceed those observed in SPLP results for CCPs.

FDEP Comment #A.1.b: Response #A.1(2) indicates that the CCPs are “non-degradable” and behave as compacted earthen fill with minimal potential for “squeezing” of fluid from pore spaces. The Department does not disagree that the CCPs have minimal potential for “squeezing” fluid. However, the Department is unconvinced that the CCPs are “non-degradable” as no information that demonstrates the “degradability” of the materials has been provided. Further, the results of leaching tests and groundwater monitoring appear to indicate that some parameters may leach from the CCPs or other wastes that have been placed in the landfill.

PEF Response:

Please see PEF’s response to FDEP Comment A.1.a., regarding the leachability of CCPs that have been placed in the landfill.

With respect to the Department’s comment that no information was provided to demonstrate the “degradability” of CCPs, CREC’s fly ash meets Class F standards (per ASTM C618) and reflects a composition of the following materials (average values):

Fly Ash
Silicon dioxide (SiO ₂) – 57.32%
Aluminum oxide (Al ₂ O ₃) – 24.37%
Titanium oxide (TiO ₂) – 1.27%
Calcium oxide (CaO) – 2.41%
Potassium oxide (K ₂ O) – 1.84%
Magnesium oxide (MgO) – 1.06%
Sodium oxide (Na ₂ O) – 0.57%
Phosphorus pentoxide (P ₂ O ₅) – 0.27%
Sulfur trioxide (SO ₃) – 1.63%
Other materials – 1.99%
Loss on Ignition Materials (LOI) – 4.16%

Recent analysis of bottom ash disposed in the CCP Storage/Disposal Area indicates a composition of the following materials (average values):

Bottom Ash
Silicon dioxide (SiO ₂) – 59.70%
Aluminum oxide (Al ₂ O ₃) – 27.45%
Titanium dioxide (TiO ₂) – 1.46%
Iron oxide (Fe ₂ O ₃) – 5.38%
Calcium oxide (CaO) – 1.95%
Magnesium oxide (MgO) – 0.88%
Potassium oxide (K ₂ O) – 2.28%
Sodium oxide (Na ₂ O) – 0.42%
Sulfur trioxide (SO ₃) – 0.05%
Phosphorus pentoxide (P ₂ O ₅) – 0.21%
Strontium oxide (SrO) – 0.08%
Barium Oxide (BaO) – 0.14%
Manganese oxide (MnO ₂) – 0.02%
Loss on Ignition Materials (LOI) – 1.53%

Having gone through the combustion process, the degradability potential of these materials (including LOI materials) is likely minimal. In addition, as described in the HELP modeling included in PEF's December 17, 2010, response to FDEP's First RAI (and summarized in the Technical Memorandum found in Attachment 1 to this response), the predicted leachate generation rate for the materials is very low, further reducing the potential for the materials to impact groundwater in violation of Department rule requirements.

FDEP Comment #A.1.c: *Response #A.1. indicates that PEF is committed to beginning the phased closure of the ash storage area starting with the north slope by end of 2011. However, design details or other information for this closure were not provided. Please provide a schedule for the submittal of the proposed closure design. It does not appear that sequence of filling drawings or details have been provided to the Department. Consequently, it is unclear if the landfill will have reached the final design grades proposed in this vertical expansion application by end of 2011, or if it will be closed regardless of its topography at that point. Please clarify the proposed filling & closure sequence.*

PEF Response:

Discussion of the proposed filling and closure sequence for the CCP Storage/Disposal Area and related figures are contained in the Technical Memorandum found in Attachment 1.

FDEP Comment #A.2.a.: *Response #A.2. indicates that liner requirements are not "automatically applicable to facilities like the CREC ash storage area." The Department does not disagree that some requirements in Chapter 62-701, F.A.C., may not be applicable to the CREC facility. The response indicates that because the Department allowed a vertical expansion of the landfill in 1988 without an interface liner, that an interface liner should not be required in the current application. However, please note that the 1988 solid waste management Rule 17- 701, F.A.C., does not appear to include specific requirements for vertical expansions of landfills, whereas current Rule, 62-701.430, F.A.C., effective 1/6/10, includes specific requirements for vertical expansions of landfills. Please note also that Condition III.A. of PA77-090 states, The Licensee shall comply with rules adopted by the Department subsequent to the issuance of the certification under the PPSA which prescribe new or stricter criteria, to the extent that the rules are applicable to electrical power plants. Except when express variances, exceptions, exemptions, or other relief have been granted, subsequently adopted Department rules which prescribe new or stricter criteria shall operate as automatic modifications to certifications.*

PEF Response:

The CREC manages CCPs generated at the facility, in this case fly ash and bottom ash, in a dry storage/disposal area. The CCP Storage/Disposal Area at the CREC is governed under specific Conditions of Certification issued pursuant to Florida's Electrical Power Plant and Transmission Line Siting Act, Part II, Chapter 403, Florida Statutes. More specifically, the CCP Storage/Disposal Area is addressed in Condition of Certification B.I.G.1., Progress Energy Florida Conditions of Certification Crystal River Energy Complex (Unit 3 Nuclear Power Plant, Units 4 and 5 Fossil Plant), PA 77-090 (May 14, 2010).

Typical solid waste management facilities and related practices at electric utility power plants were summarized as part of the information exchange between the electric utility industry and FDEP pursuant to former Rule 62-701.720, F.A.C., as referenced in Rule 62-701.220(4), F.A.C., and FDEP's written determinations regarding electric utility power plant solid waste disposal facilities issued thereunder.

As the Department is aware, pursuant to that information exchange process, FDEP determined that Class I landfill standards are not automatically applicable to facilities like CREC's CCP Storage/Disposal Area. Examples of the Class I landfill requirements in Chapter 62-701, F.A.C., that historically have not automatically been applied to these facilities include, but are not limited to, liner and leachate collection systems, groundwater monitoring (given that groundwater monitoring is typically addressed for these facilities in power plant site certification conditions or other relevant permits like NPDES permits), and those relating to final cover design.

Generally, design and operational criteria for industrial solid waste disposal facilities (like the CCP Storage/Disposal Area) are established on a case-by-case basis using scientific data and other information to provide reasonable assurance that applicable FDEP standards will be met.

In its Second RAI, FDEP suggests that interface liner requirements were not required the last time that the CCP Storage/Disposal Area was authorized to expand vertically. FDEP goes on to note that current Rule 62-701.430, F.A.C., may require interface liners for vertical expansions of certain landfills. In its comment, FDEP also references Condition III.A. of the CREC's Conditions of Certification which provides:

The Licensee shall comply with rules adopted by the Department subsequent to the issuance of the certification under the PPSA which prescribe new or stricter criteria, to the extent that the rules are applicable to electrical power plants. Except when express variances, exceptions, exemptions, or other relief have been granted, subsequently adopted Department rules which prescribe new or stricter criteria shall operate as automatic modifications to certifications.

PEF assumes that FDEP cites this provision to support a position that the interface liner requirement for vertical expansion of certain landfills is now applicable to the CCP Storage/Disposal Area and should be considered included in the CREC's Conditions of Certification. PEF does not believe that such position is supported by this condition as the express language of the condition itself provides an exception to this general proposition where "variances, exceptions, exemptions, or other relief have been granted."

As noted, pursuant to former Rule 62-701.720, F.A.C. and current Rule 62-701.220(4), F.A.C., FDEP determined that Class I landfill standards are not automatically applicable to facilities like CREC's CCP Storage/Disposal Area. This rule provision and the written agency determinations made thereunder are prime examples of the kind of "variances, exceptions, exemptions, or other relief" that precludes automatic modification to the CREC's Conditions of Certification to incorporate the provisions of Rule 62-701.430 F.A.C. Thus, as with other landfill standards, the interface liner requirement in Rule 62-701.430 F.A.C., is not automatically applicable to the CCP Storage/Disposal Area.

As previously mentioned in PEF's response to FDEP Comment A.1.a., baseline sampling of TW intermediate wells was performed in October 2009 (TW-1 through TW-4) and January 2010 (TW-5) as part of the hydrogeological and geotechnical investigation for the horizontal expansion ("east sliver") and proposed vertical expansion of the CCP Storage/Disposal Area. Subsequent groundwater samples were collected from the TW intermediate wells (excluding TW-2R which is classified as a piezometer) as well as MWI-2R2 and MWC-12R in March and April 2011. A summary of the sampling dates and results is shown in Table 1 of the Technical Memorandum included as Attachment 1 to this response.

PEF does not believe that there is a need for an interface liner for the vertical expansion from the authorized 80 foot height to the proposed 120 foot height with increased side slopes of 3(H):1(V) for the reasons addressed in PEF's response letter dated December 17, 2010, and summarized in the Technical Memorandum (Attachment 1 to this response). In brief, PEF's position is supported by: (1) the results of CCP leach testing and historical groundwater monitoring; (2) the results of HELP modeling that indicates the quantity of leachate that will likely be produced is relatively small (less than 1 gallon per minute); and (3) the relatively short additional period of time that the CCP Storage/Disposal Area will continue to operate as a result of the proposed vertical expansion (on the order of 3½ additional years). PEF maintains that vertical expansion of the CCP Storage/Disposal Area, without installation of an interface liner, can be undertaken with reasonable assurance that applicable Department standards will be met.

As set forth more fully in the Technical Memorandum in Attachment 1, the aforementioned technical reasons coupled with the CCP Storage/Disposal Area closure sequencing plan, demonstrate that the installation of an interface liner is unnecessary and that any potential environmental benefit of such a liner would be minimal and disproportional to the cost of liner installation and loss of associated CCR storage space.

***FDEP Comment #A.2.b.:** Response #A.2. also proposes that a liner is not required because of PEF's belief that there are no environmental impacts based on the leaching and groundwater monitoring data discussed in Response #A.1. See those comments above.*

PEF Response:

Please see PEF's response to FDEP Comment A.1.a., regarding leachability of CCPs and other wastes that have been placed in the landfill and relevant groundwater monitoring data and related conclusions and PEF's response to FDEP Comment A.2.a., regarding the absence of a compelling regulatory justification for, or significant environmental benefit from, installation of an interface liner.

***FDEP Comment #A.2.c:** As previously requested, please provide an adequate basis for not requiring an interface liner, or a revised design that includes a liner and appropriate leachate collection system. Please provide construction-level design drawings, calculations, etc., as appropriate. Please provide full-sized construction drawings.*

PEF Response:

Please see PEF's response to FDEP Comment A.1.a., regarding the leachability of CCPs and other wastes that have been placed in the landfill and relevant groundwater monitoring data and related conclusions and PEF's response to FDEP Comment A.2.a., regarding the absence of a compelling regulatory justification or significant environmental benefit supporting installation of an interface liner. Calculations complying with the requirements of Rule 62-701.430(2), F.A.C., have been provided in previous submittals (some additional geotechnical calculations are included in this response). Design features such as final cover contours, cover system details, perimeter stormwater ditch, benches, downcomers, the access ramp, etc. are shown on the drawings previously submitted to the Department are tied in to site topography and can be readily converted to construction-level drawings once the vertical expansion and the conceptual closure sequencing is approved by the Department. Construction-level drawings and a Construction Quality Assurance (CQA) Plan will be submitted to the Department prior to beginning each phase of closure. Following the completion of each phase of closure, a certification report will be submitted to the Department and include as-built survey information and the results of quality assurance/quality control (QA/QC) testing performed.

To further assist FDEP's technical review, enclosed with this response in Attachment 7 are full-sized drawings from the August 25, 2010 technical submittal for vertical expansion of the CCP Storage/Disposal Area.

FDEP Comment #A.2.d: *The information submitted does not comply with the requirements of Rules 62-701.400(3), (7) and (8), F.A.C. Neither Technical Specifications nor CQA Plan were provided. Please provide Technical Specifications and CQA Plan which complies with Rule 62-701.400(7) and (8), F.A.C.*

PEF Response:

PEF does not believe technical specifications or a CQA Plan are necessary for the proposed vertical expansion of the CCP Storage/Disposal Area as PEF maintains that an interface liner is unnecessary. See PEF responses to FDEP Comments A.1.a., A.2.a., and A.2.c.

FDEP Comment #A.3.a: *Response #A.3.a. indicates that the August 25, 2010 submittal (received September 10, 2010) included block and circular failure modes. However, the information presented does not clearly identify which Figures represent which failure conditions. The analyses do not appear to include equipment loading. Although Attachment 2 of the current submittal includes "references" for the slope stability models, the "references" do not include the author of the text or publication date and it is not clear how the formulas or other information is incorporated or supports the analyses.*

As previously requested, absent an adequate basis for not requiring an interface liner, please provide revised stability analyses that include an interface liner, equipment loading, and block and circular failures. Please include copies of the relevant portions of all references, assumptions, figures, etc., supporting the analyses.

PEF Response:

Figures 2, 4, 6, and 7 in the slope stability calculations included in the August 25, 2010 submittal were mislabeled as "wedge" factors of safety. Those analyses were in fact circular (Spencer) analyses. Revised slope stability analyses have been performed to include equipment loading and both block and circular failures for the CCP Storage/Disposal Area. The resulting minimum factors of safety and critical surfaces are not significantly different from those presented in the August 25, 2010 submittal. The revised slope stability model outputs are provided in Attachment 2. A summary of the slope stability analysis results are as follows:

- Condition 1 - 80 feet high, 4H:1V side-slopes, and no GCL/clay liner
 - Circular Failure Factor of Safety (FOS) = 1.89
 - Block Failure FOS = 1.89
- Condition 2 - 80 feet high, 4H:1V side-slopes, GCL/clay liner (East Sliver)
 - Circular Failure FOS = 1.72
 - Block Failure FOS = 1.75
- Condition 3 - 120 feet high, 3H:1V side-slopes, no GCL/clay liner
 - Circular Failure FOS = 1.79
 - Block Failure FOS = 1.70
- Condition 4 - 120 feet high, 3H:1V side-slopes, GCL/clay liner (East Sliver)
 - Circular Failure FOS = 1.68
 - Block Failure FOS = 1.63

As provided in PEF's responses to FDEP Comments A.1.a, A.2.b, and A.2.c., PEF does not believe that a compelling regulatory justification or significant environmental benefit exist supporting the installation of an interface liner. As a result, the enclosed stability analyses do not include an interface liner as part of the proposed vertical expansion.

Annotated references for geotechnical calculations (settlement and bearing capacity) are provided in Attachment 3.

FDEP Comment #A.3.b(1)(a): *(Engineering Report §5.4.2, Attachment 4, Compaction Grouting Program) This attachment appears to provide information related to compaction grouting in the "sliver". Please provide the basis for stopping grout injection after a grout take of 50 c.y. In other words, if a particular injection point was still capable of receiving additional grout (possibly indicating a more substantial void/cavity), why was the grouting stopped at 50c.y.?*

PEF Response:

Compaction grouting was stopped at injection points for a variety of reasons including high pressure (within 15 feet of ground surface for safety reasons), injection pipe lift, grout return observed at surface, and ground surface displacement. At locations where approximately 50 cubic yards (CY) of grout was injected, secondary injection points were installed adjacent and grouted.

FDEP Comment #A.3.b(1)(b): *Please provide the basis for selection of the initial grout inject points CP-1, CP-2, CP-3, CP-4 and CP-5. It appears that CP-6 was selected based on boring PB-4.*

PEF Response:

Injection point CP-6 was selected based on subsurface conditions encountered in boring PB-4. The remaining injection points were randomly distributed throughout the east sliver.

FDEP Comment #A.3.b(1)(c): *Please specify the lateral distance between each grout injection point in a particular cluster (e.g., CP-1 cluster etc.).*

PEF Response:

Primary injection points designated A through D, were spaced 30 feet radially from the central injection point. Secondary injection points were spaced at 15 feet.

FDEP Comment #A.3.b.1.d: *Based on the distances between the grout injection points and the quantity of grout injected, please discuss the size of the largest cavity/void that was grouted.*

PEF Response:

First, it should be noted that the process used was compaction grouting to depths of 40 to 60 feet below ground surface (bgs) with pressures on the order of 100 to greater than 300 pounds per square inch (psi) applied (equivalent to 5 to 10 times overburden pressures, which generally average 1 psi per foot of depth). The compaction grouting process actually compacts or densifies the soil/rock around the injection point and fills any open pore space and voids. A 50 CY grout take under pressures of greater than 100 psi in a 40 foot deep injection point does not equate to a 50 CY void.

Based on the boring logs and grouting logs, the largest loosely-filled cavity/void that was grouted was probably at boring PB-4/grout point CP-6. In boring PB-4, the top of a loosely-filled zone was encountered at a depth of 16 feet bgs. The grout take logs for CP-6 and its offsets (CP-6A through CP-

6E) indicate the grout takes were generally pretty minor down to depths of approximately 30 to 40 feet bgs at which point the grout takes picked up (albeit under fairly high line pressures, on the order of 200 to 300 psi). Based on this data and assuming an initial effective porosity of 50%, we estimate that from about 16 feet to 30 feet bgs the loosely-filled zones may have had fairly limited lateral extent (perhaps equivalent to a cylinder on the order of 1 to 3 feet diameter) and that from 30 feet to 60 feet bgs there could have been larger loosely-filled zones (perhaps equivalent to a cylinder on the order of 10 to 12 feet diameter). Again, based on the line pressures noted on the grout logs these zones were not likely "open" voids.

FDEP Comment #A.3.b(1)(e): *The information indicates that rotary wash drilling techniques were used to install the grout injection points. Please clarify if the limestone "roof" thickness was determined for each of the grout injection points.*

PEF Response:

Lithologic logs were not created for grout injection points. However, based on the field observations and information from the driller, the minimum depth to zones that had measurable grout takes was 10 feet or greater.

FDEP Comment #A.3.b(2): *Response #A.3.b(2) indicates that the FGS Subsidence Incident Report was reviewed and only four sinkholes were reported within T17S, R16E and 1 was reported in T18S, R16E. The response also states, "the cavities exposed during the grading work at the FGD pond... were few (only 3 across the footprint), small (ranging from about 3 or 5 feet in diameter), and depths of only 4 to 8 feet." Please clarify if these 3 sinkholes were reported to FGS and are included in the FGS Subsidence Incident Report. Please clarify if the aerial photograph in Attachment 5 is from 1967 and clarify when the PEF plant was constructed. Please provide additional evaluation of the potential for sinkholes at the site as required by Rule 62-701.410(2)(b), F.A.C. It is the Department's understanding that active sinkholes were observed onsite during the construction of the FGD pond system, and several of the boring logs identify soft/loose soils and/or losses of drilling circulation (e.g., PB-4, PB-4B, etc.).*

PEF Response:

The small cavities encountered during the construction of the FGD pond were described in the certification report submitted to FDEP (Golder, January 2010) and in PEF's response to FDEP's First RAI on the certification report submitted to FDEP (Golder, March 2010). The FGS report (2008) pre-dates the FGD pond construction and as such would not include those features. The aerial photograph referenced was from 1967. The plant (Unit 1) began operation in 1966.

Based on the information collected and reviewed, there is no evidence of active sinkholes being present within the footprint of the CCP Storage/Disposal Area.

FDEP Comment #A.3.b(3): *Please provide the calculations supporting the "Punching Shear Failure Evaluation." Although a figure was provided, the calculations and supporting references do not appear to have been provided.*

PEF Response:

The calculations associated with the graph of punching shear failure analysis are included in Attachment 4 to this response.

FDEP Comment #A.3.b(4): *Attachment D (September 10, 2010). Please provide a figure showing where the “intact rock cores” that were tested for compressive strength were taken on the site.*

PEF Response:

The soil borings in the FGD pond where “intact rock cores” samples were collected for compressive strength testing are shown on the figure in Attachment 5 to this response.

FDEP Comment #A.3.c(1): *(Appendix I). See Comment #3.a. above. As previously requested, please clarify if the figures provided in this appendix are for circular or block failures, and if the analyses included equipment loading. Please specify the equipment loading.*

PEF Response:

Revised slope stability model outputs for circular and block failures are provided in Attachment 2 (see PEF Response to FDEP Comment A.3.a.). Equipment loading has been included in the revised slope stability calculations as a surcharge at the crest of the slope. The equipment loading was designated at 753 pounds per square feet (psf) based on the ground pressure of a Caterpillar D6N LGP bulldozer (Caterpillar Performance Handbook, Edition 32, October 2001).

FDEP Comment #A.3.c(2): *See Comment #3.a. above. As previously requested, unless an adequate basis for not requiring an interface liner has been provided, please provide revised settlement analyses that include an interface liner and equipment loading. Please include copies of the relevant portions of all references, assumptions, figures, etc., supporting the analyses.*

PEF Response:

PEF believes that sufficient legal, technical, and practical reasons exist for not installing an interface liner as provided in this response to FDEP’s Second RAI comments. See PEF responses to FDEP Comments A.1.a., A.2.b., and A.2.c. As a result, the analyses do not include an interface liner as part of the proposed vertical expansion.

FDEP Comment #A.4: *(Rules 62-701.320(7)(e) and 62-701.500, F.A.C. Landfill operation). Response #A.4 indicates that the operations plan “will be submitted... within 120 days of the approval of this modification request.”*

Rule 62-701.320(5), F.A.C. requires that permit applications for a solid waste management facility shall include the application, engineering plans and reports, and all supporting information for the proposed construction, operation or closure of the facility. Information in every application shall be of sufficient detail to show how the facility will be constructed, operated, and closed, and how it will be monitored and maintained after closure, in order to comply with the requirements of Chapter 62-701, F.A.C.

Condition III.A. of PA#77-090 states,

The Licensee shall comply with rules adopted by the Department subsequent to the issuance of the certification under the PPSA which prescribe new or stricter criteria, to the extent that the rules are applicable to electrical power plants. Except when express variances, exceptions, exemptions, or other relief have been granted, subsequently adopted Department rules which prescribe new or stricter criteria shall operate as automatic modifications to certifications.

As previously requested, please provide a landfill operation plan that includes the information required by this rule. An operation plan was not provided.

PEF Response:

Within 120 days of approval of PEF's modification request, PEF will submit a CCP Storage/Disposal Area Operations Plan (Operations Plan) to the Department that describes the pertinent operations of this specific facility. PEF believes that providing an Operations Plan following agency approval of PEF's modification request will allow for a more accurate and robust Operations Plan particularly given that there may be conditions included in the final modification that will need to be specifically addressed in the Operations Plan. The Operations Plan will contain appropriate information relative to specific operations, closure, and other aspects of the CCP Storage/Disposal Area in accordance with applicable provisions of Chapter 62-701, F.A.C. PEF suggests that this submittal and the corresponding submittal deadline be included in the proposed modification to the CREC's Conditions of Certification as a post-certification compliance review requirement in accordance with Rule 62-17.191, F.A.C.

***FDEP Comment #A.5.a:** (Rules 62-701.410(1) and 62-701.510, F.A.C. Hydrogeological investigation and groundwater monitoring plan). The Department does not disagree that the PEF CREC may be an "existing installation" as defined in Chapter 62-520, F.A.C. However, Rules 62-701.510(3)(a) and (b), F.A.C., identify wells within the zone of discharge as "detection" wells, and wells located at or immediately adjacent to the compliance line of the zone of discharge as "compliance" wells, respectively. In order to determine the appropriate designation in accordance with Chapter 62-701, F.A.C., please provide the distances from the edge of waste for each of the downgradient monitoring wells: TW-1, TW-4, MWI-2R2, TW-5 and TW-3. If PEF's zone of discharge is the facility property boundary, please specify which monitoring wells that are "compliance" wells (i.e. located at the property boundary) that will monitor impacts from the landfill.*

PEF Response:

As provided in detail in PEF's response to FDEP Comment A.1.a., the CREC (including the CCP Storage/Disposal Area) is an "existing installation" under the Department's groundwater rules in Chapter 62-520, F.A.C. Thus, the lateral extent of the CREC's ZOD is located at the facility's property boundary. A layout of the facility monitoring well network is shown on Figure 5 in Attachment 1. The approximate distances between the intermediate monitoring wells and the edge of waste is as follows: TW-1 (30 feet), TW-4 (90 feet), MWI-2R2 (95 feet), TW-5 (100 feet), and TW-3 (100 feet).

***FDEP Comment #A.5.b:** Response #A.5.a., indicates that the ash landfill is the "subject of a comprehensive facility-wide groundwater monitoring plan that has been approved by FDEP under both the Site Certification Order... as well as the facility's FDEP-issued industrial wastewater permit. [emphasis added]" However, after a review of the current Conditions of Certification (COC) and discussion with the Department's Industrial Wastewater Section, it does not appear that the "facility-wide" monitoring plan has been approved in the COC or Industrial Wastewater permit or has been implemented by PEF. Response #A.5.b., states, "PEF will submit a revised groundwater monitoring plan to incorporate additional wells requested by the Department." A timeframe for this submittal was not specified. See also Comment #5.d. below.*

As previously requested, since a groundwater monitoring plan that complies with Rule 62-701.510, F.A.C., is required for the landfill, prior to approval of the vertical expansion modification, please provide the revised site-wide groundwater monitoring plan at this time.

PEF Response:

PEF proposes to revise the existing groundwater monitoring plan pursuant to a post-certification compliance review requirement in accordance with Rule 62-17.191, F.A.C. that would be included as part of a site-wide Industrial Wastewater Operations and Maintenance Plan (IWW O&M Plan) required under the modified Conditions of Certification. The current groundwater monitoring plan which addresses site-wide groundwater monitoring (including monitoring of the CCP Storage/Disposal Area) will be modified to include well sampling frequency, parameters to be sampled, and the reporting requirements for the four TW intermediate wells that were installed in October 2009 to augment monitoring of the CCP Storage/Disposal Area. PEF will continue to work with the Department's Industrial Wastewater (IWW) Section to ensure the four TW intermediate wells are properly addressed in the groundwater monitoring requirements contained within the IWW O&M Plan.

***FDEP Comment #A.5.c:** Engineering Report, Table 1. No additional information is requested for this item.*

PEF Response:

PEF acknowledges FDEP's comment.

***FDEP Comment #A.5.d:** Engineering Report, Table 3. Response #A.5.d. states, "PEF has not provided additional sampling results... because there is no requirement to sample and report data from TW-1, TW-2, TW-3, TW-4 and TW-5... Sampling of these wells is anticipated to commence with the inclusion of these wells under the industrial wastewater monitoring requirements in the modified COC."*

As a condition of the approval of the construction and operation of the lateral expansion of the landfill (i.e. the "sliver") (see the Department's letter dated June 3, 2010), the Department requested and PEF agreed to sampling monitoring wells TW-1 through TW-5 at the same frequency as the existing Industrial Wastewater wells (i.e., quarterly). Please provide more recent sampling results for these wells.

PEF Response:

PEF acknowledges the Department's comment. However, PEF interprets the June 3, 2010, agency approval letter to require sampling of the four TW intermediate wells at the time that the Conditions of Certification are revised to incorporate these sampling requirements. Therefore, additional sampling was not conducted in 2010 pending Department issuance of revised Conditions of Certification.

Baseline sampling of the TW intermediate wells was performed in October 2009 (TW-1 through TW-4) and January 2010 (TW-5) as part of the hydrogeological and geotechnical investigation for the horizontal expansion ("east sliver") and proposed vertical expansion of the CCP Storage/Disposal Area. Subsequent groundwater samples were collected from the TW intermediate wells (excluding TW-2R which is classified as a piezometer) as well as MWI-2R2 and MWC-12R in March and April 2011. A summary of the sampling dates and results is shown in Table 1 of the Technical Memorandum included as Attachment 1 of this response. These TW intermediate wells will be sampled quarterly in conjunction with quarterly groundwater sampling required by CREC's IWW permit which includes MWI-2R2 and MWC-21R.

***FDEP Comment #A.6:** (Rule 62-701.320(7)(e), 62-701.320(7)(f) and 62-701.330(3)(c), F.A.C. Drawings). No additional information is requested concerning this item.*

PEF Response:

PEF acknowledges the Department's comment.

FDEP Comment #1: *Coal Combustion Product (CCP)/Solid Waste Materials Management Plan, (3-ring binder) revision 4, September 2010 (received December 20, 2010). Response #A.7. indicates that a revised CCP Manual "will include the applicable updates for product management units following CREC's recent construction and operational changes and will make reference to the site-wide groundwater monitoring plan as the appropriate regulatory vehicle for monitoring groundwater in the vicinity of applicable CCP management units." A schedule for the submittal of this information was not provided. Please provide a revised CCP Management Manual that includes the revised groundwater monitoring plan discussed above.*

PEF Response:

PEF continues to modify the referenced CCP Management Plan on a regular basis since the original CCP Management Plan was developed in December 2008. Revisions to the CCP Management Plan occurred in May 2009, December 2009, April 2010 and September 2010 with copies provided to the Department. PEF and the FDEP's IWW Section have had discussions regarding the development of a new Industrial Wastewater Operations and Maintenance Plan (IWW O&M Plan) which likely will be submitted pursuant to a post-certification compliance review requirement in accordance with Rule 62-17.191, F.A.C., that would be included as part of the requested modifications to the Conditions of Certification. The IWW Section further indicated that the proposed IWW O&M Plan will incorporate the revised site-wide groundwater monitoring plan. At that time, PEF believes the CCP Management Plan would be revised to accurately make reference to the IWW O&M Plan which will include the revised groundwater monitoring plan (to include monitoring of the CCP Storage/Disposal Area). The IWW O&M Plan will also include monitoring well sampling frequency, parameters to be analyzed, and other information typically found in an industrial wastewater permit and/or groundwater monitoring plan.

FDEP Comment #2: *Please provide an updated CCP manual or supplemental information that includes the quantities of each CCP and solid waste material produced, sold and stored in 2009 and 2010. The CCP Manual provided is based on 2007/2008 information.*

PEF Response:

PEF will include the information requested above in FDEP Comment #2 in the next revision to the CCP Management Plan along with other pertinent updates PEF is working on. The last revision to the CCP Plan is dated September 2010.

FDEP Comment #3: *§2.7. Please clarify the other "proper disposal" for the coal yard runoff pond dredge material. Please provide the characterization of the coal yard runoff pond dredge sediments. Since these ponds were recently lined, it does not appear that this information was included in the 2008 ECT report.*

PEF Response:

The ECT characterization report was completed before the new lined coal yard runoff ponds were placed into service. Also, the coal fines/sediment dredge material is returned to the coal pile in lieu of disposal. However, if coal pile fines/sediment is disposed, PEF ensures this material is disposed in a lined, FDEP-permitted landfill.

FDEP Comment #4: *§3.7.2. Please provide the SPLP results for the FGD pond solids.*

PEF Response:

In accordance with the CREC's CCP Management Plan, sampling and analysis of new solid material streams are to be conducted. On April 6, 2010, PEF submitted a technical report to the FDEP Southwest

District Office Solid Waste Section which contained SPLP analytical results for synthetic gypsum (FGD gypsum) that were generated from the Flue Gas Desulfurization (FGD) system and solids collected from the newly lined FGD ponds.

The technical report was developed by PEF's environmental consultant, Golder Associates, which documented the sampling and characterization procedures for the FGD gypsum and FGD pond solids. The technical report serves as a supplement to the ECT characterization report dated March 2008. A copy of the April 1, 2010, submittal is contained in Attachment 6 to this response.

FDEP Comment #5: §3.7.4. Please clarify where the FGD pond "suction dredge" will discharge.

PEF Response:

Operation of the FGD blowdown lined settling ponds began in February 2010. As a result, cleaning of the ponds has not been performed, to date. It is anticipated that the ponds will be cleaned during the latter half of 2011. A specific technology to clean the ponds has yet to be selected, but will likely involve a surface suction dredge from which the material will be dewatered using a filter press or similar apparatus on site, adjacent to the ponds. The solids will be returned to the gypsum handling area for processing and the liquid fraction (filtrate) sent to the permitted IWW percolation pond system that currently receives treated FGD blowdown from the FGD settling pond system.

FDEP Comment #6: Table 1. Please specify the "beneficial use offsite" (type of use and location) for the off-spec gypsum. Please provide the analytical results that demonstrate that the truck wash solids are not contaminated and are suitable for use as landfill cover.

PEF Response:

At the present time, there is no offsite beneficial use for off-spec gypsum. Gypsum that is not beneficially used is appropriately disposed off-site in an FDEP-permitted Class I landfill. With respect to the management of truck wash solids, PEF will market this material for beneficial use as landfill cover for permitted Class I landfills, as appropriate or PEF will properly dispose of this material in a lined, FDEP-permitted Class I landfill. The FDEP-permitted Class I landfill will inform PEF if the material is suitable for cover material per the landfill's operations plan/permit. Any information or data the landfill may require to ensure the material is suitable for cover material would be provided to the landfill.

FDEP Comment #7: Table 2. Please update this table based on current (2009, 2010) data.

PEF Response:

PEF will include the information requested above in the next revision to the CCP Management Plan along with other pertinent updates PEF is working on. The last revision to the CCP Plan is dated September 2010. Also, the CCP Management Plan will be revised to reference the IWW O&M Plan which will include the updated site-wide groundwater monitoring plan

FDEP Comment #1: Please be advised that based on the descriptions and historic practices at the facility, some of the materials disposed in the landfill (e.g., non-CCPs and miscellaneous solid wastes) are not considered to be industrial by-products and may require management within lined or contained areas.

PEF Response:

PEF acknowledges FDEP's comment.

FDEP Comment #B: *(North Plant Area Stormwater Modeling Report)*. According to the information submitted on the response to FDEP's RAI dated December 17, 2010 and information submitted to the NPDES permit renewal application (FL0036366) dated June 11, 2010, PEF wants to send the treated coal pile runoff to the CR 4 & 5 IWW percolation pond on a regular basis. In addition, the facility wants the capability to have an alternative flow path to the existing coal pile runoff collection system (outfall I-CHO). Please confirm these statements.

PEF Response:

Subsequent to PEF's December 17, 2010 RAI response, further discussions with the FDEP Southwest District Office IWW Section staff and the NPDES permit writer in FDEP's Tallahassee headquarters were held. During these discussions, it was agreed that treated coal pile runoff will only be sent to the existing coal pile runoff collection system that discharges via NPDES-permitted outfall I-CHO rather than to the Crystal River (CR) 4&5 IWW percolation pond. This requirement has been incorporated into the recently reissued CR 4&5 NPDES permit. The discharge point of this wastewater source to the IWW percolation pond will be terminated. As a result, PEF believes the Department's comments and concerns relative to additional hydraulic loading of the IWW percolation pond as a result of this source have been adequately addressed.

FDEP Comment #B.a: *Base on Attachment 12, page 4 and 6 of 7, the coefficient of horizontal permeability was assumed instead of field test to run MODRET to calculate the maximum water elevation and recovery time. In addition, the vertical field permeability testing was performed in 2007 before the pond was cleaned. The facility needs to provide unsaturated vertical and saturated Horizontal hydraulic conductivity based on field test (actual) conditions. Recalculate the maximum water elevation and recovery time based on actual conditions.*

PEF Response:

Please see PEF's response to FDEP Comment #B above.

FDEP Comment #B.b: *Please provide the Department with the treatment volume of stormwater and freeboard that will be available at the CR 4 & 5 IWW percolation pond.*

PEF Response:

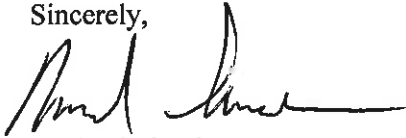
Please see PEF's response to FDEP Comment #B above.

PEF believes this response to the Department's Second RAI sufficiently addresses the agency's request for additional information contained in the Department's January 18, 2011 correspondence. PEF respectfully requests modification to Site Certification Order Conditions PA 77-09 in accordance with PEF's petition dated September 10, 2010 and PEF's responses to the Department First and Second RAI's related thereto.

Ms. Cindy Mulkey, Administrator
Florida Department of Environmental Protection
August 16, 2011

If the Department would like to meet for the purpose of discussing these PEF responses, please let us know. In the meantime, if you have any questions regarding this submittal, please contact me or Bob Stafford. I can be reached at (727) 820-5588 and Bob Stafford can be reached at (727) 820-5538.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Shrader", with a long horizontal flourish extending to the right.

Michael Shrader
Lead Environmental Specialist
Environmental Services & Strategy

Ms. Cindy Mulkey, Administrator
Florida Department of Environmental Protection
August 16, 2011

Enclosures:

Attachment 1 – Technical Memorandum (Golder, August 5, 2011)
Attachment 2 – Slope Stability Analyses (Revised)
Attachment 3 – Geotechnical Calculation References (Revised)
Attachment 4 – Punching Shear Analysis
Attachment 5 – Soil Boring Locations - Intact Rock Core Samples
Attachment 6 – FGD Pond Sampling Report (Golder, April 1, 2010)
Attachment 7 – Full Sized Drawings from August 25, 2010 Technical Submittal

c: Mr. Danny Stubbs, FDEP SW District
Mr. R. Tedder, FDEP SW – Tallahassee (enc)
Ms. Susan Pelz, FDEP SW District (enc)
Ms. Yanisa Angulo, FDEP SW District (Attachment1)