Progress Energy

August 12, 2008

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Mr. Mike Halpin, P.E.
Siting Administrator
Florida Department of Environmental Protection
2600 Blairstone Road, MS48
Tallahassee, FL 32399-2400

Dear Mr. Halpin:

RE: Progress Energy Florida – Levy Nuclear Project Units 1 and 2
DOAH Case No. 08-2727; DEP OGC Case No. 08-1621; PPSA No. PA08-51
DETERMINATION OF INCOMPLETENESS (*Main Site & Associated Facilities)*

Please find enclosed four copies of Progress Energy Florida's responses to the "Determination of Incompleteness – Main Site & Associated Facilities" for the Levy Nuclear Plant.

PEF is concurrently distributing copies of these responses to the statutory parties, and to others who have received copies of the application. A copy of the distribution list is also attached.

If you have any questions about this submittal please contact me at (727) 820-5764 or at John.Hunter@PGNmail.com.

Sincerely,

Jamie Hunter
Lead Environmental Specialist

JJH:
Enclosure
Overnight Mail

Progress Energy Florida, Inc.
P.O. Box 14042
St. Petersburg, FL 33733

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SITE CERTIFICATION APPLICATION FOR
POWER PLANT AND ASSOCIATED FACILITIES

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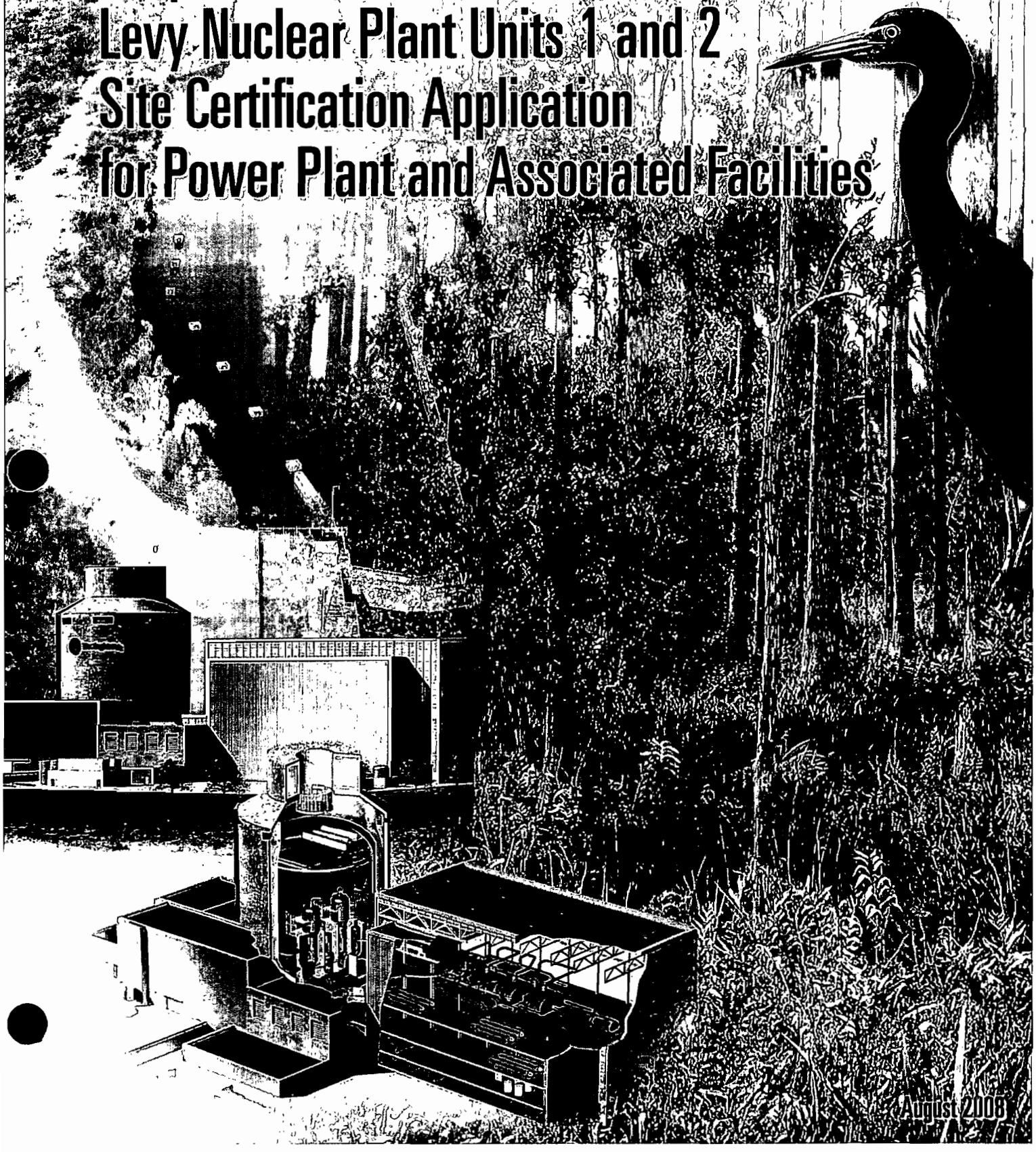
Responses to Comments on Levy Nuclear Plant Units 1 and 2 Site Certification Application for Power Plant and Associated Facilities



August 2008

Contents

Acronyms and Abbreviations ..... **vi**

FDEP Letter of Determination of Incompleteness of Certification Portion of Application ..... **x**

I. FDEP - NED **I-1**
COMMENT NUMBER: I.A I-1
COMMENT NUMBER: I.B.1 ..... I-2
COMMENT NUMBER: I.B.2 ..... I-3
COMMENT NUMBER: I.B.3 ..... I-4
COMMENT NUMBER: I.B.4 ..... I-5
COMMENT NUMBER: I.B.5 ..... I-6
COMMENT NUMBER: I.B.6 ..... I-7
COMMENT NUMBER: I.C.1 ..... I-8
COMMENT NUMBER: I.C.2 ..... I-9
COMMENT NUMBER: I.C.3 ..... I-13
COMMENT NUMBER: I.C.4 ..... I-14
COMMENT NUMBER: I.C.5 ..... I-15
COMMENT NUMBER: I.C.6 ..... I-16
COMMENT NUMBER: I.D General Comment I-17
COMMENT NUMBER: I.D.1 ..... I-18
COMMENT NUMBER: I.D.2 ..... I-19
COMMENT NUMBER: I.D.3 ..... I-20
COMMENT NUMBER: I.D.4 ..... I-22
COMMENT NUMBER: I.D.5 ..... I-24
COMMENT NUMBER: I.D.6 ..... I-25
COMMENT NUMBER: I.D.7 ..... I-26
COMMENT NUMBER: I.D.8 ..... I-29
COMMENT NUMBER: I.D.9 ..... I-30
COMMENT NUMBER: I.D.10 ..... I-31
COMMENT NUMBER: I.D.11 ..... I-32
COMMENT NUMBER: I.D.12 ..... I-33
COMMENT NUMBER: I.D.13 ..... I-56
COMMENT NUMBER: I.D.14 ..... I-57
COMMENT NUMBER: I.D.15 ..... I-58
COMMENT NUMBER: I.D.16 ..... I-59
COMMENT NUMBER: I.D.17 ..... I-60
COMMENT NUMBER: I.D.18 ..... I-61
COMMENT NUMBER: I.D.19 ..... I-62
COMMENT NUMBER: I.E.1 ..... I-63
COMMENT NUMBER: I.E.2 ..... I-64
COMMENT NUMBER: I.E.3 ..... I-65
COMMENT NUMBER: I.E.4 ..... I-66
COMMENT NUMBER: I.E.5 ..... I-67
COMMENT NUMBER: I.E.6 ..... I-68
COMMENT NUMBER: I.F General Comment I-70

Contents, Continued

COMMENT NUMBER: I.F.1 ..... I-71
COMMENT NUMBER: I.F.2 ..... I-72

II. FDEP - SWD II-1
COMMENT NUMBER: II.1 ..... II-1
COMMENT NUMBER: II.2 ..... II-2
COMMENT NUMBER: II.3 ..... II-3
COMMENT NUMBER: II.4 ..... II-4
COMMENT NUMBER: II.5 ..... II-5
COMMENT NUMBER: II.6 ..... II-6
COMMENT NUMBER: II.7 ..... II-7
COMMENT NUMBER: II.8 ..... II-9
COMMENT NUMBER: II.9 ..... II-10
COMMENT NUMBER: II.10 ..... II-11
COMMENT NUMBER: II.11 ..... II-12
COMMENT NUMBER: II.12 ..... II-13
COMMENT NUMBER: II.13 ..... II-17
COMMENT NUMBER: II.14 ..... II-18
COMMENT NUMBER: II.15 ..... II-21
COMMENT NUMBER: II.16 ..... II-22
COMMENT NUMBER: II.17 ..... II-23

III. FDEP - OGT III-1
COMMENT NUMBER: III.A.1 ..... III-1
COMMENT NUMBER: III.A.2 ..... III-2
COMMENT NUMBER: III.A.3 ..... III-3
COMMENT NUMBER: III.A.4 ..... III-4
COMMENT NUMBER: III.A.5 ..... III-6
COMMENT NUMBER: III.B.1 ..... III-7
COMMENT NUMBER: III.B.2 ..... III-8
COMMENT NUMBER: III.C III-9
COMMENT NUMBER: III.C.1 ..... III-10
COMMENT NUMBER: III.C.2 ..... III-11
COMMENT NUMBER: III.C.3 ..... III-12
COMMENT NUMBER: III.C.4 ..... III-13
COMMENT NUMBER: III.C.5 ..... III-14
COMMENT NUMBER: III.C.6 ..... III-15
COMMENT NUMBER: III.C.7 ..... III-17
COMMENT NUMBER: III.D.1 ..... III-18
COMMENT NUMBER: III.D.2 ..... III-19
COMMENT NUMBER: III.D.3 ..... III-20
COMMENT NUMBER: III.D.4 ..... III-21
COMMENT NUMBER: III.D.5 ..... III-22
COMMENT NUMBER: III.D.6 ..... III-23

Contents, Continued

COMMENT NUMBER: III.D.7 ..... III-24
COMMENT NUMBER: III.D.8 ..... III-25
COMMENT NUMBER: III.E.1 ..... III-26
COMMENT NUMBER: III.E.2 ..... III-27
COMMENT NUMBER: III.E.3 ..... III-28
COMMENT NUMBER: III.E.4 ..... III-29
COMMENT NUMBER: III.F.1 ..... III-30
COMMENT NUMBER: III.F.2 ..... III-31
COMMENT NUMBER: III.F.3 ..... III-32
COMMENT NUMBER: III.G III-33
COMMENT NUMBER: III.G.1 ..... III-34
COMMENT NUMBER: III.G.2 ..... III-35
COMMENT NUMBER: III.G.3 ..... III-36
COMMENT NUMBER: III.G.4 ..... III-37
COMMENT NUMBER: III.G.5 ..... III-38
COMMENT NUMBER: III.G.6 ..... III-39

IV. FDEP - SCO IV-1
COMMENT NUMBER: IV.1 ..... IV-1
COMMENT NUMBER: IV.2 ..... IV-2
COMMENT NUMBER: IV.3 ..... IV-3
COMMENT NUMBER: IV.4 ..... IV-4
COMMENT NUMBER: IV.5 ..... IV-5

V. DCA V-1
COMMENT NUMBER: V.1 ..... V-1
COMMENT NUMBER: V.2 ..... V-3
COMMENT NUMBER: V.3 ..... V-5
COMMENT NUMBER: V.4 ..... V-7

VI. FWC VI-1
COMMENT NUMBER: VI.A.2 ..... VI-17
COMMENT NUMBER: VI.B VI-94
COMMENT NUMBER: VI.C VI-95
COMMENT NUMBER: VI.D VI-97
COMMENT NUMBER: VI.E.1 ..... VI-99
COMMENT NUMBER: VI.E.2 ..... VI-103
COMMENT NUMBER: VI.E.3 ..... VI-104
COMMENT NUMBER: VI.F.1 ..... VI-105
COMMENT NUMBER: VI.F.2 ..... VI-107
COMMENT NUMBER: VI.F.3 ..... VI-108
COMMENT NUMBER: VI.G VI-110
COMMENT NUMBER: VI.H VI-111
COMMENT NUMBER: VI.I VI-112

Contents, Continued

VII. SWFWMD VII-1
COMMENT NUMBER: VII.A General Comment VII-1
COMMENT NUMBER: VII.A.1 ..... VII-30
COMMENT NUMBER: VII.A.2 ..... VII-31
COMMENT NUMBER: VII.B General Comment VII-33
COMMENT NUMBER: VII.B.1 ..... VII-34
COMMENT NUMBER: VII.B.2 ..... VII-35
COMMENT NUMBER: VII.B.3 ..... VII-36
COMMENT NUMBER: VII.B.4 ..... VII-37
COMMENT NUMBER: VII.C General Comment VII-38
COMMENT NUMBER: VII.C.1 ..... VII-39
COMMENT NUMBER: VII.C.2 ..... VII-40
COMMENT NUMBER: VII.C.3 ..... VII-41
COMMENT NUMBER: VII.C.4 ..... VII-43
COMMENT NUMBER: VII.D General Comment VII-44
COMMENT NUMBER: VII.D.1 ..... VII-46
COMMENT NUMBER: VII.D.2 ..... VII-47
COMMENT NUMBER: VII.E General Comment VII-48
COMMENT NUMBER: VII.E.1 ..... VII-49
COMMENT NUMBER: VII.E.2 ..... VII-50
COMMENT NUMBER: VII.E.3 ..... VII-51
COMMENT NUMBER: VII.F General Comment 1 ..... VII-52
COMMENT NUMBER: VII.F General Comment 2 ..... VII-54
COMMENT NUMBER: VII.G.1 ..... VII-55
COMMENT NUMBER: VII.G.2 ..... VII-56

VIII. WRPC VIII-1
COMMENT NUMBER: VIII.1 ..... VIII-1
COMMENT NUMBER: VIII.2 ..... VIII-3
COMMENT NUMBER: VIII.3 ..... VIII-5
COMMENT NUMBER: VIII.4 ..... VIII-7
COMMENT NUMBER: VIII.5 ..... VIII-8
COMMENT NUMBER: VIII.6 ..... VIII-10
COMMENT NUMBER: VIII.7 ..... VIII-11
COMMENT NUMBER: VIII.8 ..... VIII-12
COMMENT NUMBER: VIII.9 ..... VIII-13
COMMENT NUMBER: VIII.10 ..... VIII-14
COMMENT NUMBER: VIII.11 ..... VIII-15

IX. LEVY COUNTY IX-1
COMMENT NUMBER: IX.1 ..... IX-1
COMMENT NUMBER: IX.1 ..... IX-2
COMMENT NUMBER: IX.2 ..... IX-4
COMMENT NUMBER: IX.3 ..... IX-5
COMMENT NUMBER: IX.3 ..... IX-6

Contents, Continued

COMMENT NUMBER: IX.4 ..... IX-10
COMMENT NUMBER: IX.5 ..... IX-11
COMMENT NUMBER: IX.6 ..... IX-12

Attachments (on CD)

LNP SCA RAI-142 A1_VII.F
- Geotechnical Boring Logs
- Geovision Seismic Data
- Monitor Well Boring Logs
- Technos Geophysical Report
- Water Levels
- Well Completion Diagrams
- Well Construction Details

Acronyms and Abbreviations

°F	degrees Fahrenheit
ac.	acre
ALARA	As Low As Reasonably Achievable
B.O.R.	Basis of Review
BOCC	Board of County Commissioners
BTA	Best Technology Available
CFBC	Cross Florida Barge Canal
CFR	*Code of Federal Regulations*
CH_4	methane
cm	centimeter
CO_2	carbon dioxide
COLA	Combined License Application
CR	County Road
CREC	Crystal River Energy Complex
CWA	Clean Water Act
CWIS	Cooling Water Intake Structure
CWS	circulating water system
DCA	Department of Community Affairs
DMR	Discharge Monitoring Report
DOE	U.S. Department of Energy
DWRM	Division of Water Resource Management
DWRM2	District Wide Regional Model, Version 2
EP	Emergency Plan
EPA	U.S. Environmental Protection Agency
ER	Environmental Report
ERP	Environmental Resource Permit
F.A.C.	Florida Administrative Code
F.S.	Florida Statute

Acronyms and Abbreviations, Continued

F/RR	Forestry/Rural Residential
FIRM	Flood Insurance Rate Map
FLUCCS	Florida Land Use, Land Cover Classification System
FNAI	Florida Natural Areas Inventory
fps	feet per second
ft.	foot
ft/day	feet per day
ft^2/day	square foot per day
ft/sec	feet per second
ft^3/sec	cubic feet per second
FWC	Florida Fish and Wildlife Conservation Commission
gal.	gallon
gal/ac/mo	gallons per acre per month
gal/ac/yr	gallons per acre per year
GIS	Geographic Information System
gpm	gallons per minute
HDPE	high-density polyethylene
in.	inch
in/yr	inches per year
kg/ha/mo	kilograms per hectare per month
kV	kilovolt
lb.	pound
lb/ac/mo	pounds per acre per month
lb/hr	pounds per hour
LNP Unit 1	proposed Levy Nuclear Plant Unit 1
LNP Unit 2	proposed Levy Nuclear Plant Unit 1
LNP	proposed Levy Nuclear Plant Units 1 and 2
µm	micrometer

Acronyms and Abbreviations, Continued

µS/cm	microSiemens per centimeter
m	meter
m/s	meters per second
m^3/s	cubic meters per second
mg/L	milligrams per liter
mgd	million gallons a day
mrem/yr	milliRoentgen equivalent man per year
mS/cm	milliSiemens per centimeter
mV	millivolt
NAAQS	National Ambient Air Quality Standards
NAVD88	North American Vertical Datum of 1988
NED	Northeast District Office
NGVD	National Geodetic Vertical Datum
NPDES	National Pollutant Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission
NTU	Nephelometric Turbidity Unit
OFW	Outstanding Florida Waterbody
OGT	Office of Greenways and Trails
ORP	Oxidation-Reduction Potential
PDR	Preliminary Design Report
PEF	Progress Energy Florida, Inc.
PM	particulate matter
POD	point of discharge
PPSA	Power Plant Siting Act
ppt	parts per thousand
PSD	Prevention of Significant Deterioration
RAI	Request for Additional Information
RCRA	Resource Conservation and Recovery Act

Acronyms and Abbreviations, Continued

ROW	right-of-way
SCA	Site Certification Application
SIO	selected important organism
SLERP	Submerged Lands/Environmental Resource Program
SWD	Southwest District Office
SWFWMD	Southwest Florida Water Management District
SWS	service water system
TDS	total dissolved solids
TMR	Telescopic Mesh Refinement
tons/yr	tons per year
TSD	treatment, storage, and disposal
UMAM	Uniform Mitigation Assessment Method
USACE	U.S. Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound
WEDS	Wetlands Evaluation and Delineation Section
WRPC	Withlacoochee Regional Planning Council
WSW	west-southwest

STATE OF FLORIDA
DIVISION OF ADMINISTRATIVE HEARINGS

IN RE: PROGRESS ENERGY FLORIDA	**DOAH Case No. 08-2727**
LEVY NUCLEAR PROJECT	**DEP OGC Case No. 08-1621**
UNITS 1 and 2	**PPSA No. PA08-51**

_____ /

DETERMINATION OF INCOMPLETENESS OF CERTIFICATION PORTION OF APPLICATION
(Main Site & Associated Facilities)

Pursuant to section 403.5066, Florida Statutes (F.S.), the Florida Department of Environmental Protection (Department) hereby finds the application incomplete. A description of all completeness issues is attached and incorporated by reference herein, and is also available on the Department's FTP server link listed below:

ftp://ftp.dep.state.fl.us/pub/siting/Outgoing/PEF%20Levy/DEP%20Plant%20Determination%20of%20Incompleteness/

Pursuant to section 403.5066, F.S., as a result of the Department's declaration that the application is incomplete, the Applicant, within 15 days after the filing of this statement by the Department, is required to file with the Division of Administrative Hearings, the Department, and all parties:

(a) A withdrawal of the application; or,

(b) A statement agreeing to supply the additional information necessary to make the application complete. The additional information shall be provided within 30 days after the issuance of the Department's statement on completeness of the application. The time schedules under this act shall not be tolled if the Applicant makes the application complete within 30 days after the issuance of the Department's statement on completeness of the application. A subsequent finding by the Department that the application remains incomplete, based upon the additional information submitted by the Applicant or upon the failure of the Applicant to timely submit the additional information, tolls the time schedules under this act until the application is determined complete;

(c) A statement contesting the Department's determination of incompleteness; or

(d) A statement agreeing with the Department and requesting additional time beyond 30 days to provide the information necessary to make the application complete. If the Applicant exercises this option, the time schedules under this act are tolled until the application is determined complete.

I HEREBY CERTIFY that a true and correct copy of the foregoing has been furnished by **ELECTRONIC MAIL ONLY (1 copy with all attachments and 1 without)** to the persons on the attached service list this ***14TH*** day of **JULY**, 2008.

/s/ *Toni L. Sturtevant*

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DOAH Case No. 08-2727
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July 14, 2008

TO: Toni Sturtevant, OGC

FROM: Mike Halpin, Siting Coordination Office

Pursuant to § 403.5066, Florida Statutes, the Department of Environmental Protection (DEP) after consulting with the affected agencies has determined that the application for the site certification of Progress Energy Florida (PEF) Levy Nuclear Plant is not complete to support a recommendation concerning certification. The following Item I represents the DEP Northeast District's requests for additional or clarifying information; item II the Southwest District; item III the Department of Community Affairs; Item IV the Florida Fish and Wildlife Conservation Commission; Item V Levy County; Item VI the Southwest Florida Water Management District; and Item VII represents the Withlacoochee Regional Planning Council's request for additional information. The applicant should identify any items which may be more suitably handled through post-certification submittals, as well as propose related conditions of certification. Requests for completeness items related to federal permit applications are processed directly by the federally delegated or approved program and are not shown herein.

I. DEP NORTHEAST DISTRICT OFFICE (NED)

A. NED Air Program

Provide specific means planned for disposal of all materials cleared and grubbed.

B. NED Water Resource Program Potable Water Section

1. Provide further details for proposed potable water treatment plant and distribution system. Submit a preliminary design report according to the format of rule 62-555 FAC, signed and sealed drawings and DEP Forms 62-555.900(1) and 62-555.900(20). For additional information please visit this DEP website: http://www.dep.state.fl.us/legal/rules/drinkingwater/62-555.pdf
2. Will the potable water system comply with Florida Administrative Code (F.A.C.) requirements as found in 62-555, 62-550, 62-560, 62-699 and Lead & Copper Rule? These rules can be found at http://www.dep.state.fl.us/water/rulesprog.htm#dw .
3. Will the potable well(s) be constructed according to public well standards found in 62-532, F.A.C.?

4. Will the potable well(s) meet required setbacks as found in 62-555.312, F.A.C.?

5. The list of requirements for a Preliminary Design Report (PDR) can be found in 62-555.520(4), F.A.C. A preliminary design report or specifications, details, and design drawings are required for approval of a potable water system.

6. A demonstration of financial, managerial, and technical capacity (capacity development) form must be completed by all new potable water systems of the type that this system will be. This system will be a non-transient non-community public water system.

C. NED Water Resource Program Wastewater Permitting Section

1. Please provide the information required by Section E of the permit application for the transmission lines and associated access road and structure pads, including site plans, drainage analysis, stormwater management system design, etc.

2. For the floodplain analysis please address the following questions:

   a) Calculate the flow rates on the site using a minimum of three cross-sections and provide a tabular summary. The data summary should include stage or water elevation, basin areas and volumes of cut and fill and calculations of the compensating storage for pre and post conditions. Show the stage as the difference between the 100 year storm event and the elevation of the seasonal high water level in NVGD basis.

   b) It is suggested that the three cross-sections represent the plant site, the heavy haul road south of the plant site and the heavy haul road at CR 40. Can the three major watershed areas be used for this basis (as mapped in Appendix A4)?

   c) With the fill material in place, which drawing depicts the pre and post flow lines for the drainage from the site at these three main locations (the plant site, the heavy haul road south of the plant site and the heavy haul road at CR 40)?

   d) Indicate if the calculations are using Manning equation and indicate coefficients used and expected flow regimes for the site or other techniques used for the calculations. Has or will a model such as HEC-RAS or a GIS application be used for this site?

3. An NPDES Generic Permit for Stormwater Discharge from Large and Small Construction Activities is required, if one or more acres of land will be disturbed during construction, and if stormwater runoff is discharged to surface waters or offsite. The application shall be submitted to the DEP-NPDES Notices Center in Tallahassee. For additional information please visit this DEP website: http://www.dep.state.fl.us/water/stormwater/npdes/construction3.htm

4. Provide further details for proposed potable water treatment plant and distribution system. Submit a preliminary design report according to the format of rule 62-555 FAC, signed and sealed drawings and DEP Forms 62-555.900(1) and 62-555.900(20). For additional information please visit this DEP website: http://www.dep.state.fl.us/legal/rules/drinkingwater/62-555.pdf

5. Provide further details for the proposed industrial wastewater treatment and if effluent is land applied as a ground water discharge or discharged to surface waters in accordance with rules 62-620 and 62-660 FAC. Submit DEP Forms 2CS and 2 CG as applicable. For additional information please visit this DEP website: http://www.dep.state.fl.us/water/wastewater/iw/index.htm

6. Provide design details of the stormwater and drainage system for the transmission corridor (route) on-site of the property. The design summary should include drawings and calculations of the compensating storage for pre and post conditions.

D. NED Water Facilities\Ground Water Section

Pursuant to rule 62-520.600, F.A.C., and based on the information provided in the application, the proposed Ground Water Monitor Plan is not complete.

1. After evaluation of the proposed monitoring wells, parameters, frequencies, and well location map(s), the ground water monitoring plan will become finalized, and the pre-operational and operational ground water monitoring programs will be incorporated into the Site Certification as condition requirements. Any changes in the ground water monitoring plan will require a modification of the Site Certification.

2. PEF's Quality Assurance/Quality Control Program(s) in Reference 6.6-003 must meet the field sampling and analytical requirements of rule 62-160, F.A.C.

3. Table 2.3-50, Groundwater Field Parameters (Vol.9, Chapter 6) indicates specific conductivity values in the monitor wells ranging from 0.266 to 0.624 uS/cm. Specific conductivity values for aquifers in this area should range from 100 to 800 uS/cm for aquifer(s) in this area. Note that 1 uS/cm = 1 umhos/cm. Please clarify these values, and make any necessary corrections to the table, if applicable.

4. Table 2.3-52, Groundwater Metals (Vol.9, Chapter 6) indicates existing arsenic values in monitor well MW-13S above the Florida ground water standard of 10 ug/L for the last three quarterly sampling events of 2007. The turbidity levels for this well during the same sample events seem very low in the range of 6 to 7 NTUs. Please investigate previous activity in the area of this well, and provide potential sources for the elevated levels of arsenic in the aquifer.

5. Numerous references in the application indicate normal releases of contaminants into the environment from the proposed facility will have negligible effects on

ground water. Please provide additional details for this type of direct discharge into the ground water aquifer (i.e.: describe type of discharges, parameters of concern, locations of discharges, amount of discharges, identify locations on scaled site plans, etc.).

6. Information provided in the application indicates that all discharge or disposal areas will be lined, but liner or enclosure specifics are not provided, except for the wastewater retention basin. Please provide the liner and enclosure details on all potential discharge basins, sumps, tanks, and sites (i.e.: CWS basin, SWS Settling basin, liquid radwaste systems, spent fuel storage areas, dry cask storage areas, transformer oil collection pits, equipment parts washing discharge sites, vehicle washing with under carriage cleaning sites, etc.).

7. A suitably scaled site plan (maximum 11" x 14") is requested that clearly identifies the locations of all discharge and disposal areas mentioned in the previous item.

8. In addition to the ground water monitoring parameters that were all ready sampled in the existing wells, representative samples of the following parameters are requested to be analyzed prior to operation in monitor wells MW-1S, MW-3S, and MW-15S. These wells can be substituted for proposed wells in the general area, if they are no longer available.

   Aluminum, antimony, barium, beryllium, cadmium, selenium, silver, thallium, fecal coliform, gross alpha-including radium 226 but excluding radon & uranium, combined radium 226 & 228, uranium, tritium, strontium-90, and all primary organics of EPA Methods 624 and 625, or comparable EPA methods. The method detection limits must be lower than the drinking\ground water standards in rule 62-550, F.A.C.

9. The facility needs to propose a number of representative monitor wells that can be used to provide a characterization analysis once every five years after the facility begins operating. This analysis will be for all primary inorganics in rule 62-550.310, F.A.C., secondary standards in rule 62-550.320, F.A.C., and all organics of EPA Methods 624 and 625, or comparable EPA methods. The method detection limits must be lower than the drinking\ground water standards in rule 62-550, F.A.C. Both upgradient and downgradient wells need to be proposed.

10. The characterization analysis mentioned in the above item needs to be conducted once every five years on the wastewater effluent stream, including the radiological parameters mentioned in the item below.

11. In addition to the chemical ground water monitoring parameters listed in Tables 6.6-2 and 6.6-3, the following radionuclide need to be monitored annually for gross alpha-including radium 226 but excluding radon & uranium, combined radium 226 & 228, uranium, tritium, and strontium-90. Please select a number of

representative reactor area and sentinel monitor wells. All potential liquid radioactive waste release areas should be monitored, as well.

12. DEP Monitor Well Completion Report Form (attached) must be submitted for the existing permanent monitor wells MW-1S, MW-2S, MW-3S, and MW-4S. Any new permanent monitor well will need to have this form submitted, as well.
13. A 72-hour prior notification must be provided to the Ground Water Section of the DEP Northeast District Office before any future monitor well is installed.
14. Any changes in the monitor well locations need to be shown on an aerial photo, similar to Figure 6.1-4.
15. The construction details of all proposed monitor wells need to be submitted, including depths.
16. The four supply wells indicate a potential drawdown area of the aquifer. The effects of this drawdown may cause a localized reversal of ground water flow for the aquifer. With respect to the drawdown, please provide assurance that the monitor well locations are satisfactorily located to monitor all potential contamination sources.
17. Please identify one or more background (i.e.: upgradient) monitor wells. The background well(s) will need to be labeled using the following nomenclature: MWB-3S, MWB-3D, etc. All other well names can stay the same. Figure 6.1-4 will need to be revised to reflect these new names. This figure will be incorporated into the Site Certification conditions.
18. Please provide a contingency plan for potential sinkholes that may affect the wastewater areas.
19. Please provide a scaled location map showing all Class 4 springs, or greater within one-mile of facility property boundary that could be affected by the facility's operations and potential contamination. Figure 2.6-2 shows the Homosassa Springs Dome, and any hydrogeological and chemical issues regarding aquifer connectivity to any springs in the area, and the effects on these springs needs to be addresses.

E. NED Submerged Lands/Environmental Resource Program (SLERP)

1. Please provide the maximum length of trench in wetlands that would remain open at any point in time during construction and the maximum length of time the trench would remain open prior to beginning backfilling operations for the installation of the make-up and blowdown pipelines.
2. Will all of the excavated material be used for backfilling the trench? If not, where and how will the excess material be disposed?

3. Please submit a statement addressing whether dewatering is required. Detail the dewatering proposal to include the methods that are proposed to contain the discharge, methods of isolating dewatering areas, and indicate the period dewatering structures will be in place.

4. A public easement for the crossing of state owned submerged lands is required.

5. Please clarify the scope of wetland impacts resulting from the project. Please indicate if impacts are temporary or permanent and if they are in forested or non-forested wetlands. FLUCCS Code designation is fine.

6. Please provide a mitigation plan that will adequately offset the proposed amount of wetland impacts for the entire project. Provide a detailed description of restoration, enhancement, or creation activities that are proposed. If credits are going to be purchased from mitigation banks servicing the affected areas, credit reservation letters must be submitted prior to the issuance of a permit. Credits must be sought from banks servicing the basins in which the impacts occur.

F. NED Waste Management Program Solid Waste Section

Based on the review of the application, the following discrepancies were noticed:

1. The application states, "Levy County operates a Class I Solid Waste Management Facility located north of the LNP site and approximately 3 mi. southeast of the Town of Bronson to serve the entire county area including the incorporated areas. Between 2001 and 2005 Levy received an average of 27,758 tons2 of material to landfill annually (FDEP's 2005 Solid Waste Annual Report). The Levy County Comprehensive Plan notes that the facility is at 49 percent of design capacity and is not anticipated to reach full capacity until 2020, allowing the facility to accommodate the limited amounts of solid waste generated at LNP for local disposal."

   Please note, while Levy County has active Class I Solid Waste Transfer Station and Class III landfill at the above-referenced Facility, the Class I landfill is in the process of closure construction under DEP Permit Number 0018490-004-SF.

2. The application states, "Solid waste generated during construction will be disposed of in an approved upland disposal facility. Construction waste may be taken to a temporary on-site spoils area prior to for off-site disposal." (sections **4.10.1.3 and 4.10.2.3**)

   However, according to Rule 62-701.300(1)(a) FAC, "No person shall store, process, or dispose of solid waste except at a permitted solid waste management facility or a facility exempt from permitting under this chapter." Therefore, in order to evaluate the necessity of permitting a temporary on-site temporary storage area, additional information concerning the process and storage procedures, including the maximum length of storage at the temporary on-site spoils area is needed.

II. DEP SOUTHWEST DISTRICT OFFICE (SWD)

1. Please revise the aerial surveys, to include the following:
   - Clearly show the proposed haul road, pipe line, and rail spur corridors on aerial photos. The photos should be scaled at 1:400 or less.
   - Show the limits of any wetlands located within the proposed corridors and the FLUCCS codes that correspond to each wetland.
2. Once the wetlands are delineated and the boundaries are approved by Department staff. Provide a table that shows the potential wetland impacts (in square feet or acres). The table should include the types of wetlands impacted using FLUCCS codes and whether the impacts will be temporary or permanent. Refer to Chapter 62-343.900(1), Section E, Florida Administrative Code (F.A.C.).
3. Turbidity and sediments must be controlled to prevent violations of water quality pursuant to Rule 62-302.500, 62-302 .530(70) and 62-4.242, FAC. Best Management Practices, as specified in the *Florida Stormwater, Erosion and Sedimentation Control Inspectors Manual*, shall be installed and maintained at all locations where there is possibility of transferring suspended solids into wetlands and/or surface waters due to the permitted activity. If site-specific conditions require additional measures, then the Applicant shall implement them as necessary to prevent adverse impacts to wetlands and/or surface waters. The location of erosion control barriers must be shown on plan view drawings and the specific soil stabilization methods to be used at each site must be described. Erosion control and soil stabilization methods should be included on the plan and cross sectional view drawings required in condition number one above. Refer to the Southwest Florida Water Management District Basis of Review (B.O.R.) Chapter 3.2.4.1.
4. In areas where temporary or permanent wetland impacts occur mitigation will be required. Provide the supporting UMAM information required in Chapter 62-345, F.A.C. Also, provide a mitigation plan for the impact areas using UMAM. In addition, a restoration plan will need to be provided for the impact areas. Refer to Chapter 62.345, F.A.C.
5. If this project significantly degrades or is within an Outstanding Florida Waterbody (OFW), provide reasonable assurance the project is clearly in the public interest. Refer to the B.O.R. Chapter 3.1.1.
6. Provide a state lands title determination from the Division of State Lands Title and Land Records Section indicating whether any portion of the project is located on sovereign submerged state lands or within an aquatic preserve. If any portion of the project is located on sovereign submerged state lands or within an aquatic preserve then the project must comply with Chapter 18-20 and 18-21 F.A.C. and Chapter 253 and 258 Florida Statutes (F.S.) and section G of the Joint Application

for Environmental Resource Permits must be completed and submitted to the Department prior to construction. Refer to Chapter 62-343.900(1), Section G.

7. Volume 2, Figure 9-A 1.2-14 shows the typical access road is 18 feet wide. Is it possible to reduce the size of the road in wetland areas? Also, the typical road height will be two feet above the seasonal high water line. To reduce the impacts to wetlands associated with access roads, would it be possible to maintain the existing natural grade? Refer to the B.O.R. Chapter 3.2.1.1.

8. Volume 6, the construction drawings shows the make-up and blowdown lines corridor adjacent to the heavy haul road. To reduce impacts is it possible to locate the pipes under the heavy haul road? Refer to the B.O.R. Chapter 3.2.1.1.

9. Will the heavy haul road remain in use after the LNP's construction or is the road temporary? Refer to the B.O.R. Chapter 3.2.3.

10. To ensure that flooding does not occur, provide documentation that the size, number, and placement of the culverts associated with the heavy haul road is appropriate. Refer to the B.O.R. Chapter 4.2.

11. To ensure that the haul road does not have contaminated runoff show a vegetated swale on either side of the road. Refer to the B.O.R. Chapter 5.1

12. In volume 6 and 7 of the application, are the UMAM scores solely for the impacts associated with the LNP? Or, do the UMAM scores include the pipe line, rail spur, and heavy haul road corridor impacts? Please show the locations of the scored wetlands on an aerial photo and contact Greg Nieboer at (813) 632-7600 for an onsite verification of the UMAM scores. Refer to Chapter 63-345, F.A.C.

13. Are the wetlands associated with the construction of the Haul Road, Rail Spur, and Pipeline going to be delineated by the Wetlands Evaluation and Delineation Section (WEDS) in Tallahassee? If not, please contact the SW District Greg Nieboer at (813) 632-7600 for an onsite verification of the wetland lines. Please flag the wetland lines before the onsite verification. Refer to Chapter 63-340, F.A.C.

14. What are the largest size vessels that use the Ingles Lock Bypass Channel? Provide cross-sectional drawings showing the height of the bridges above mean high water. Provide reasonable assurance that the bridges over the Ingles Lock Bypass Channel will not be a navigational hazard. Refer to the B.O.R. Chapter 3.2.3.1.

15. Provide a cross-sectional detail for the boat slip and earthern berm removal. Include water depths, mean high water level, and mean low water level. Refer to Chapter 62-343.900(1), Section E.

16. A barge slip and ramp are referred to in the narrative and throughout the permit application. It is stated that these structures will be permitted separately. Are they going to be permitted through an Environmental Resource Permit (ERP) separate

from the Sitting Act? If so, when will the ERP application be submitted to the S.W. District? If they are going to be permitted through the Siting Act please provide a detailed plan view and cross-sectional view drawing of the slip and ramp.

17. The development is in a flood plain but no flood plain compensation was provided, as is required in Chapter 4.4 of the SWFWMD B.O.R. The increase in stage due to loss in storage is stated to be 0.44 inches. Does this mean 0.44 inches over the entire project area? Why was flood plain compensation not provided? Refer to 40D-4.301, F.A.C., and the Southwest Florida Water Management District Environmental Resource Permit Information Manual, Management and Storage of Surface Waters, Part B, Basis of Review (BOR).

III. DEP OFFICE OF GREENWAYS AND TRAILS (OGT)

A. Overall Comments and concerns

1. Public access to public lands should remain intact as well as OGT's access to our managed property for maintenance purposes. Need clarification on this issue in locations where construction and development by Progress will occur.
2. Co-location of all linear facilities constructed by PE would be desirable. Some of their proposed locations show facilities running parallel in separate locations. A reduction in the overall footprint and impact to state lands is our request.
3. It is unclear as to precisely which lands and how many acres of state-owned lands will be impacted by PE. This makes it difficult for the state to ascertain exactly what PE should provide in exchange (to offset the impacts to state lands).
4. We believe that PE's land ownership is now different than what is depicted in the application. (They have gained additional ownership.) This information needs to be available as we negotiate offsets to state lands.
5. Need exact location of PE's proposed rail corridor

B. Canal Off-Loading Site

1. For off loading heavy equipment, power units, and construction materials. No mention of request to moor barges at the existing mooring dolphins, wing wall of Inglis Lock or in canal near site. If multiple barges show up to off load, they will have to park some where. Where will the tugs/barges moor?
2. Will the water area become a security area? (i.e. preclude the public? If so, for how long and where exactly?)

C. Water Intake Site

There will be four 54" diameter intake pipes (2 per power unit) buried 5' below grade. The power units will require 198.1 cubic feet per second of intake water for

cooling. In contrast, this is twice the typical flow coming down the Withlacoochee River below the Inglis dam from seepage leakage.

1. Water in the barge canal will increase in salinity. This may then impact the fresh water ecosystem in the river with the higher salt concentrations. Need analysis of this.
2. Public access across OGT facilities must be maintained. Unclear how this will be accomplished.
3. Crosses Bypass Canal on top of proposed 33′ wide bridge. So the pipes will rise up out of the ground and then back into the ground each side of the Bypass Canal. How do we get our east / west access for maintenance and trails on both the north and south sides of the canal? (Need specifics on this plan.)
4. Grates have screens that will pass small fish. Fish and Wildlife review of impacts here?
5. It appears the grating system has an automatic cleaning system that dumps debris into bins that are then transferred to a fenced off site. How large is this fenced area and how often will container be dumped?
6. Why does the piping system not stay adjacent to the transmission corridor versus pulling away to the east which means they will be using more OGT property? The corridor north of the CR40 is 1,000′ wide, it has an extra 260′ on the east side for future transmission lines. Would those lines impact state lands?
7. Below CR40, the corridor drops down to 670′ wide to Inglis Inland where it picks up the existing 69kV line, widening back to 705′. So is PEF requesting 1,000′ through our lock site and thru Inglis Island? At the area west of the lock, there is an extra 260′ not utilized the water piping could be run straight to the canal instead of spreading out the location. Need clarification and explanation for occupying so much space here.

D. Blow Down Pipeline along Barge Canal

1. Blow down pipe location on the north of canal is probably acceptable. Southern location is not acceptable and would conflict with current recreational facilities. OGT's verbal discussions with Progress may contradict the depiction in the application. Just need clarification.
2. The proposed easement area on the Holcim property (South of Canal and West of US 19 bridge) would require an easement from Holcim (OGT also has an easement here). Would our trail or vehicle access road be closed for a period of time? What is the plan?
3. The north south route from the barge canal to the power plant is proposed to be on OGT managed property, west side of the existing transmission line. Why is the

blow down pipeline not installed within the existing easement? No information is provided in the documents.

4. Improvements can not impact the existing height of the adjacent canal berm below 33' for meeting dam failure flood control.

5. Piping will have to be below the existing 12 foot wide access road adjacent to the mechanically stabilized earthen wall (this is a flood control wall). How will this be installed without damaging the wall?

6. Blow down pipe cannot interfere with berm swale drainage system, including buried storm water pipes.

7. Placement of pipes must not interfere with plans for future public boat ramp west of US 19 bridge and north of canal.

8. If construction of PE facilities, damages existing facilities, they would need to be repaired/replaced. (i.e., trails, access roads, etc.

E. Haul Road / Pipeline Corridor

1. 150' ROW seems excessive width. OGT could grant a temporary construction easement if that width is only needed for construction.

2. Why does PE need separate bridges over Bypass Canal? OGT suggests co-locating the haul road and the pipes.

3. No plans showing how OGT access will occur between the two canals over the haul road and pipeline corridors. Appears to block public and OGT access going east and west.

4. Bridge cuts off boat access for aquatic plant control in the bypass canal due to the low clearance. Needs to be addressed.

F. Other Issues:

1. The construction of the pipeline corridors and haul road occur in an area occupying storage and materials which would need to be relocated in nearby vicinity. If PE intends to use this area, OGT would require new storage areas.

2. Regarding the fueling, disposal and refilling of nuclear materials - are they being shipped to the site by rail or barge? If barge off loading is used, how would this impact the Cross Florida Greenway and Public lands?

3. Decommissioning - if the units are decommissioned or become obsolete in the future, will remove the transmission lines?

G. OGT's requested offsets for Progress Energy's impacts to and use of state lands (the Cross Florida Greenway) at this time. These are not all inclusive.

1. **Design and construct a connector trail.** PE owns a corridor from **Chiefland to Dunnellon** which connects to state owned and OGT managed trails/properties. (This would connect The Nature Coast Trail in Chiefland and the Cross Florida Greenway near Dunnellon.) OGT has had preliminary discussions with PE and is working towards a MOU for PE to provide a perpetual public access right on this corridor and also to design and construct a paved trail the length of this corridor. This would complete a major connection between two state trails.

2. **Design and construct a paved trail from the Felburn Trailhead** (east of US 19) and continue east to Inglis Dam recreational area. (**This includes a bridge** over the Withlacoochee River.)

3. **Pave the vehicular access road west of US 19** on the Cross Florida Greenway. This road serves as public access to the fishing areas along the canal and to the Gulf.

4. **Purchase the timber rights on the Dixon Hammock property**. This parcel is owned by the BOT and managed by OGT, but two private companies still hold some timber rights in this parcel.

5. **Inglis Island oil pit clean up and remediation**. This oil pit was left by Florida Power decades ago. Oil sludge from the former Inglis hydro power plant.

6. **Design and construct a paved trail under PE's proposed transmission line corridor** leading from Inglis Island south and connecting to the proposed Suncoast Parkway II and **Suncoast Trail** extension. (This is being designed and built by the Turnpike Authority.) Connection most likely within the vicinity of Bitter Root Road, but uncertain as to exact location at this time because the Suncoast Parkway is still under design.

IV. DEP SITING OFFICE

1. PEF states in Section 1.3.7 (p. 1-6, Volume 1) that "each anticipated variance from applicable state and local standards that is sought as part of the state certification proceedings for an operation-related impact is shown in the applicable SCA section". Please provide a list of all such anticipated variances.

2. No radioactive materials other than fissile materials and their products (which fall under the jurisdiction of the United States Nuclear Regulatory Commission) are mentioned in the application. What other radioactive materials will be used or possessed at the site? Describe PEF's plans and timelines for authorization of such materials.

3. Concerned citizens have advised this office of a potential lime-rock mine planned to be located across the highway from the proposed nuclear plant, with corresponding blasting operations. Please advise as to the affects of such an

operation in the vicinity of the plant location, as well as the compatibility of nuclear power plants with nearby blasting operations.

4. Describe the potential offsets of carbon emissions from the LNP when compared to a comparably sized natural gas fired combined cycle plant.

5. Please submit summary information indicative of the outreach efforts which were extended to potentially affected persons in the vicinity of the power plant. Furthermore, the applicant should be advised that Governor Crist approved House Bill 7135 on June 25th. Accordingly, this Office requests that Progress Energy make a good faith effort to comply with the new Statutory requirements, including those below from 403.5115(6), F.S:

(a) A good faith effort shall be made by the applicant to provide direct written notice of the filing of an application for certification by United States mail or hand delivery no later than 45 days after filing of the application to all local landowners whose property, as noted in the most recent local government tax records, and residences are located within the following distances of the proposed project:

1. Three miles of the proposed main site boundaries of the proposed electrical power plant.

2. One-quarter mile for a transmission line corridor that only includes a transmission line as defined by s. 403.522(22).

3. One-quarter mile for all other linear associated facilities extending away from the main site boundary except for a transmission line corridor that includes a transmission line that operates below those defined by s. 403.522(22).

(b) No later than 60 days from the filing of an application for certification, the applicant shall file a list with the department's Siting Coordination Office of landowners and residences that were notified.

V. DEPARTMENT OF COMMUNITY AFFAIRS

1. What is the atmospheric loading and concentration of the salt plume from cooling towers and what is the direction in which it will travel?

2. Describe the anticipated impacts of salt deposits to adjacent surface water bodies and to the state forests and other conservation lands in the vicinity.

3. Describe the expected potential long term impacts to the surficial aquifer and eventually to the groundwater. Document loading of salt to groundwater resources including the surficial and Floridan aquifer with extended exposure to salt deposits.

4. Identify the containment measures being considered to negate these impacts.

VI. FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION (FWC)

A. Listed Species Surveys

1. The applicant, in the Environmental Report (Volumes 8 and 9), indicated that various listed species (gopher tortoises [threatened], Florida scrub jays [threatened], red-cockaded woodpeckers [species of special concern], Sherman's fox squirrel [species of special concern]) were found at the proposed Levy Nuclear Plant site and in or adjacent to the proposed Powerline Transmission corridors. FWC records indicate that the transmission corridors are also within the range of the Florida mouse (species of special concern), which is unlikely to have been detected during observational surveys. The explanations of survey methodologies contained in Chapter 6 are very brief. We request that the applicant provide additional information on the methodologies used to survey for listed species, dates and times when the surveys were conducted, location maps of the surveys and transect locations, and specific locations and numbers of listed species found.

2. It is also not clear what monitoring studies and survey protocols will be conducted during and after construction. The applicant will need to provide additional information that describes the monitoring plans and protocols, for all species (aquatic and terrestrial), that are anticipated to be conducted during construction, after construction, and for operational monitoring. We will need more detailed survey information prior to completion of the Levy Nuclear Plant and the associated Transmission Lines application.

B. Gopher tortoises.

Chapter 6, Section 6.5.1.2.1, indicates that a gopher tortoise relocation plan will be developed in accordance with FWC guidelines. After the spring of 2009, new gopher tortoise management permitting requirements will be in place. These permits require either on-site or off-site relocation of all gopher tortoises potentially impacted by development, and a mitigation contribution to the FWC will be required for all relocation permits. We encourage Progress Energy to conduct on-site relocations to address any gopher tortoise issues, especially in the vicinity of the transmission lines, rather than offsite relocations where suitable habitat exists. The applicant will need to indicate if the on-site relocation plan is intended for different segments of the transmission corridor and plant location or as a complete "unit." The applicant will also need to identify any offsite recipient site locations for the relocation of the gopher tortoises.

C. State Listed Species

Chapter 6, Section 6.5.1.2.1 Important Species, does not provide any conservation measures for state-listed Florida mice or Sherman's fox squirrels. The applicant will need to provide conservation and mitigation measures for state-listed species in accordance with Chapter 68A-27, Florida Administrative Code.

D. Red-cockaded Woodpeckers

Sec. 5.4.4.3 Biota Doses (pages 5-51 & 52), talks about the exposure of air-borne radiation to the terrestrial biota. ' Table 5.4-16 shows that with the exception of the red-cockaded woodpecker (RCW) and northern bobwhite, the doses meet the 25 milliRoentgen equivalent man per year (mremlyr) whole body dose equivalent criterion in 40 CFR 109." Using Fig. 2.7-16 - Wind Rose Jan. 1, 2001, to Dec. 31, 2005, approximately 20% of the winds in this area will be blowing onto inhabited red-cockaded woodpecker clusters and planned clusters on Goethe State Forest.

Also in Sec.5.4.4.3, "From an ecological viewpoint, population stability is considered more important to the survival of the species that the survival of individual organisms. Thus higher doses are permitted." While generally this is true for a widely dispersed viable population, an isolated population requires the survival of as many individuals as possible for its continued success. The following is from the Recovery Plan for the redcockaded woodpecker (Picoides borealis) Second Revision; U. S. Fish and Wildlife Service. ". . . The buffering effect of helpers against annual variation operates only when helpers can readily occupy breeding vacancies as they arise. Helpers do not disperse very far and typically occupy vacancies on their natal territories or a neighboring one. If groups are isolated in space, dispersal of helpers to neighboring is disrupted and the buffering effect of the helper class is lost. When this happens, populations become much less likely to persist through time. Cooperative breeding system does not allow rapid annual growth of populations." The population of red-cockaded woodpeckers on Goethe has only 40 active clusters; organized into two subpopulations, one in the Black Prong area of Goethe and the other in the southern end of Goethe, in the Daniels Island and Apex tracts, with little contact between both subpopulations. Subpopulations reach stability when they support 30 or more active clusters and therefore these subpopulations are not ecologically stable. For this reason, the State has directed substantial resources toward managing these subpopulations so they are sustained. The applicant should describe mitigation measures that will be undertaken to address the potential impacts to the red-cockaded woodpecker clusters and planned clusters on Goethe State Forest.

E. Manatees

1. The environmental report (4.3.2.2, page 4-47) states that standard manatee conditions will be followed and professional biologists will serve as boat-based observers during certain phases of construction. The applicant should provide information detailing how observers will be selected, whether they have any previous experience observing for manatees, how many observers will be assigned to the construction areas and how many hours per day each observer will be assigned to work.

2. The environmental report (4.3.2.2, page 4-46) states that a cofferdam will be used to minimize release of sediment to the Cross Florida Barge Canal. The applicant

should describe the procedure that will be used to ensure that manatees are not trapped behind the cofferdam.

3. The environmental report (4.3.2.2, page 4-46) describes the components of the cooling water intake structure as an intake structure, vertical bar screens, traveling screens, pumps and a pump house. The applicant should describe what access, if any, manatees could potentially have to the completed cooling water intake structure and what measures are being taken, if necessary, to prevent access.

F. Aquatic Systems

1. The applicant has provided information on the biological characterization of the Cross Florida Barge Canal in the vicinity of the Levy Nuclear Plant site in the Environmental Report and in the National Pollution Discharge Elimination System (NPDES) permit application. The applicant indicates that benthic invertebrate sampling was conducted by the "approved Aquatic Sampling Work Plan." A short summary is provided in Volume 5, NPDES permit, Attachment 2; Volume 8, Section 2.4.2.6; and also in Volume 9, Chapter 6. The applicant has indicated that the cooling water intake structure will affect flows and aquatic life in the Cross Florida Barge Canal for a distance of five miles from the Inglis Lock and Dam. We request that the applicant provide a copy of the "aquatic sampling work plan," detailed survey protocols for the macro-invertebrates, the various plankton communities, and fish communities. We request the applicant indicate where the new aquatic sampling stations will be located on the old Withlacoochee River channel. We also request the applicant provide a sampling protocol that would be initiated during operation of the plant in order to address impingement and entrainment. Further, we request that the applicant develop a mitigation plan to address impacts to aquatic life.

2. We request that the applicant consider providing a mitigation plan that includes the creation of multiple breaches along the earthen berm that extends into Withlacoochee Bay (Gulf of Mexico) from the Cross Florida Barge Canal. Historically, freshwater would enter the bay, flow southward and support a euryhaline system consisting of oysters and other estuarine organisms. With the creation of the berm for the Cross Florida Barge Canal, this supply of freshwater was diverted offshore. A hydrographic analysis should accompany the mitigation plan in order to model the modified flow pattern that would result from the creation of the proposed breaches and the ultimate consequence on the local salinity regime.

3. Previous mitigation was required for the effluent from the existing Crystal River Plant. Since the applicant proposes to use the existing Crystal River Plant's discharge canal, we request information regarding any marine or estuarine mitigation efforts associated with the construction and operation of the existing Crystal River Plant. This should include detailed descriptions of the specific

activities, along with the outcomes of each activity. We also request that the applicant address whether the mitigation was successful in terms of achieving the predefined goals.

G. Cumulative Impacts

The Environmental Report (volumes 8 and 9) for the proposed plant facility and the transmission lines does not appear to contain an analysis of the cumulative impacts of the proposed facility and its transmission lines in conjunction with the Crystal River Nuclear Facility and transmission lines and other activities in the area. We recommend that a thorough cumulative effects analysis be conducted that includes, at a minimum, effects on marine/estuarine habitat and species, atmospheric deposition of material from both power plants, bird migration/transmission line mortality, and impacts of the transmission line on habitat and species.

H. Potential Restoration of the Withlacoochee River

Volume 9, Section 4.1.1.1.2.3, provides information on the land use plan effects with the construction of the Levy County Plant. The applicant should explain impacts to plant operations of the lock and dam are removed from Lake Rousseau and possible impacts to the plant and operations if restoration of the Withlacoochee River is pursued in the future. In addition, the applicant should describe alternatives for different water intake structure locations that would allow for future restoration of the Cross Florida Barge Canal.

I. Recreational Access

The applicant should indicate if there will be any security zones established in any areas of the proposed facility that would restrict access to areas currently open to fishing and hunting activities.

VII. SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

A. Hydrologic Analysis

Drawdown Impact Modeling was submitted by the Applicant in support of the above referenced site certification application. The ground-water flow model MODFLOW was used to evaluate drawdown impacts from the proposed withdrawals. In order to evaluate the modeling the MODFLOW input and output data files will be needed. If a model preprocessor was used, such as Visual Modflow or Groundwater Vistas, the files created by those programs should also be submitted. In addition, an analysis of the cumulative impacts of all withdrawals within the model should be performed.

1. In order to assess the hydrologic impacts associated with proposed water use from all sources, the applicant must perform analyses that demonstrate the extent of the water-level drawdown in the surficial and Floridan aquifers, showing related lake level and spring flow impacts (where applicable) as a result of cumulative withdrawals. Please provide model-simulation results that illustrate the above

mentioned concerns, and provide maps to document models and display results at the appropriate scale(s). Please show the cumulative predicted drawdown associated with the currently permitted withdrawals for all users, and the cumulative predicted drawdown associated with the requested withdrawals. Please submit all model input and output files (raw MODFLOW or Groundwater Vistas) in digital format and sign and seal all reports describing the results of the model-simulation results. Reference Rule 40D-2.301(1), F.A.C.

2. Please compare and discuss the differences between the calibrated model transmissivity and the aquifer transmissivity determined from on-site pumping tests. In addition, please provide all surficial and Floridan aquifer pumping test data and analyses.

B. Environmental Evaluation

The proposed site is located within a known area of karst topography and groundwater recharge. Strict adherence to the engineering standards for stormwater facilities and maintenance of existing floodplains will be required.

According to the information contained within Attachment B (Groundwater Modeling) of Volume 5, the impact evaluation to wetlands was addressed utilizing the minimum flows and levels (MFLs) criteria in Chapter 40D-8, F.A.C.

1. MFLs have not yet been established within or adjacent to the site certification assessment area. Therefore, please provide an impact evaluation of the water resources utilizing the Performance Standards in Section 4 of the Basis of Review, Chapter 40D-2, F.A.C.

2. The groundwater modeling graphic presented in Attachment B of Volume 5 is difficult to interpret due to the large size of the assessment area and the numerous interior contours. Please show the specific wetlands expected to be directly impacted due to construction related activities on the site.

3. Attachment B of Volume 5 contains a table labeled "Summary of Wetland Areas with 1.0 ft or Greater Drawdown in Surficial Aquifer." In order to accurately assess the potential for adverse wetland impacts according to habitat type, please include within the table, wetland acreages based upon FLUCCS codes. Reference Sections 40D-2.101 and 40D-2.301, F.A.C.

4. The groundwater modeling assessment stated that 138 acres of wetlands would be impacted by 1 foot or more drawdown from the normal operation of the groundwater pumping wells. What actions are proposed to prevent these drawdowns from adversely impacting these wetlands?

C. Requested Quantities

The application requests a peak month quantity of 5,850,000 gallons per day (gpd). The purpose and time frame for using this quantity of water is unclear.

1. Please discuss the need for the requested peak month quantity. When will this quantity of water be needed and for how long?
2. Please explain the difference between the Normal Demineralized Water Makeup Rate of 350 gallons per minute (gpm) listed in Table 3.3-2 and the Annualized Cycle Average Makeup Source Rate of 44.6 gpm provided by Westinghouse in Table 3.3-1.
3. Please discuss the alternative technologies evaluated to minimize the consumptive use associated with evaporation from the Service Water System cooling towers?
4. Was the use of re-cycled storm water evaluated to reduce the amount of groundwater to be used? Please discuss other alternative water sources that have been considered to reduce groundwater use?

D. Barge Canal Withdrawals

CEMEX's Inglis Mine is located approximately four miles southwest of the proposed intake location. Elevated levels of chlorides and other constituents are currently showing up in some of the monitoring wells at the site. It is stated in the application that during normal operations, water in the barge canal will essentially be sea water from the Gulf of Mexico, effectively changing the normal conditions within the canal.

1. What effect will the increase in salinity in the barge canal have on the water quality of the Inglis Mine and surrounding area?
2. How will the withdrawal of water from the barge canal affect the ecology and water quality of the Withlacoochee River downstream of the Inglis dam, within the barge canal, the adjacent estuary, and designated Outstanding Florida Waters (OFW) areas, during various stream flow regimes and barge canal withdrawal regimes?

E. Dewatering During Construction

Dewatering will be required during construction of the two units. A dewatering plan was not included in the application.

1. Please describe the construction related dewatering activities and the expected drawdown.
2. How much water will be pumped during dewatering activities and where will the water be discharged?
3. What will be the duration of the dewatering activities at each unit construction site?

F. Boring and Well Information

Logs of borings A-10 and A-17 were provided with the application. It is unclear where these borings are located in relation the proposed plant sites. Also, boring logs, well

construction details, water quality data, water levels, and geophysical logs for all monitoring wells and test wells were not provided with the application.

Please provide copies of boring logs, well construction details, geophysical logs (if available), water levels, and water quality data for all borings, monitoring wells, and test wells completed at the site and provide a map showing the locations.

G. Regional Water Supply Planning

1. Lake Rousseau is not listed in Part 3 of the applicant's Environmental Report. Please provide additional information specifically addressing potential impacts to this water body, which has been identified as a potential water supply source by the District and by the Withlacoochee Regional Water Supply Authority.

2. Attachment E of the application does not include information on the new plant designs for water conservation. The applicant is proposing a Westinghouse AP1000 pressurized water reactor for this site. The District will require that the applicant use the lowest water quality available for the proposed use. Please provide additional information describing any water-conserving plant designs and anticipated conservation to be achieved from such designs.

VIII. Withlacoochee Regional Planning Council

1. Section 4.5 the Site Certification Application (SCA) generally discusses plant water use, including anticipated aquifer groundwater withdrawals. It references Section 3.3 of the Environmental Report (ER), and Section 6.3 of that same document outlines how hydrological monitoring would occur during plant construction and operation. Per the scale of projected groundwater use cited in Section 4.5.3 of the SCA, between 1.3 million and 5.8 million gallons daily, staff requests the applicant define and address fully in the site certification application the range of potential local to regional aquifer and connected natural systems impacts. Then, having established freshwater use impacts, how might current plans be adapted to promote conservation or reuse of groundwater resources?

2. Sections 4.7.2, 6.4.1 and 6.4.2 of the SCA cover on-site hazardous waste generation and off-site disposal. Section 3.8 of the ER identifies truck transport as the preferred mode for radioactive waste disposal. What analysis or decision-making criteria support this mode choice for hazardous and radioactive waste removal? What are the benefits of alternative mode choices? Specify what procedures and safeguards would apply to the transportation of all solid waste both to and from the plant site. Would the proposed program of radiological monitoring encompass routes utilized for hazardous and radioactive waste transport?

3. Section 4.4.2 of the SCA addresses the emission of particulate matter from mechanical draft cooling towers, but Section 6.6.2 states that no air quality monitoring shall occur on-site. The SCA identifies this phenomenon as the primary

source of gaseous emissions resulting from construction of the proposed plant. Are there opportunities to measure air quality as part of other monitoring activities? If no monitoring will occur, what surplus control technologies might be utilized to further reduce particulate matter release beyond best available technology?

4. Section 4.5 of the ER describes radiological impacts during plant construction. Section 3.5 of that document explains the Levy Nuclear Plant's waste management system, and it clarifies how the liquid and gaseous waste management system elements conduct radioactive effluent and emission release. Chapter 5 of the ER relates potential radiological impacts of plant operation including: exposure pathways, waste hazards, and other aspects of plant operation. In Chapter 6, the ER details the applicant's intended program of radiological monitoring. Of all the measures controlling radiological impacts of plant construction and operation, what action has the applicant voluntarily undertaken above that minimum necessary to obtain required plant licensing and permit approvals?

5. Section 4.11 of the SCA states that an Emergency Preparedness Disaster Plan would be created and submitted to the Florida Department of Community Affairs for review. When would this occur? What categories of risk and hazard would that plan generally identify, and which would be addressed elsewhere? Which existing public emergency planning documents may need to be modified as a result of project development? Would other new plans be required? In what documents would emergency evacuation routes be identified, and how would the public be made better aware of vital emergency planning information? Through partnership as well as direct support at the county and municipal levels, does the applicant intend to enhance local government emergency management capacity to increase level of response preparedness?

6. Chapter 6 of the SCA refers the reader to Chapter 5 of the ER for explanation of water use impacts stemming from plant operation. Section 4.2.1.5 of the ER discusses impacts to wetlands during construction, and 5.2.1.5 discusses the impact of plant operations on wetlands. ER Section 5.2.2.3 discusses the impacts of groundwater use and mentions potential for adverse effects to wetlands, owing to groundwater consumption. What scale of impact could result to wetlands on-site and in the vicinity as a result of proposed groundwater extraction? How could this impact planned wetland mitigation efforts during construction and plant operations phases? What long-term impacts exist?

7. Section 4.5.1.1 of the SCA discusses the system to manage residual heat output from the plant. The ER's Section 5.3.2 specifically discusses cumulative impacts to the aquatic ecosystem owing to increased heat and chemical discharge due to plant operation. As outlined in Chapter 6, the ER gives details of a thermal monitoring

program. What additional control technologies could yield extra mitigation of impact to regionally significant waters, fisheries, and aquatic ecosystems?

8. Section 4.5.1.4 of the SCA discusses organism removal from the cooling water intake system. What provisions has the applicant made to obviate adverse impact to marine life, especially endangered West Indian (Florida) Manatee and sea turtle species, which have been known to inhabit the Cross Florida Barge Canal? What other measures could the applicant voluntarily pursue to reduce potential conflicts between wildlife and proposed plant operations?

9. Section 5.0 of the SCA cites Section 4 of the ER to expound impacts related to project construction. ER Section 4.1.1.1.2.1 states that the plant site will be filled and graded to a general elevation of between 47′ to 50′. Oppositely, Figure 3.1.2 (Sheets 2, 3, and 4), contained in the ER, appears to show plant site elevation and building height indexed from a grade elevation of 100′. Correspondingly, the subterranean *basemat* is then correctly depicted at an elevation of 60.5′. ER Section 4.2.1.5 evidences this interpretation of Figure 3.1.2; as it describes *basemat* placed to a depth of 39.5′ feet. Yet this same section also mentions excavation may reach as much as 75′ from *ground surface* for some structural elements.

   While in all cases it is understood that filling would happen to elevate cooling towers and reactors above the 100-year floodplain, this presentation makes it unclear the depths to which excavation may occur on-site. Uniformly referencing a standard measure—such as mean sea level—would help clarify the scope of excavation and therefore any impacts to the subject location and vicinity. With proposed excavation activity defined, what potential aquifer impacts could result?

10. Section 5.2.2 of the SCA directs the reader to Chapter 6 of the ER for exposition of project impact monitoring. Section 6.1 of the ER identifies where the plant's residual thermal output could impact existing conditions in water bodies around the subject location, and it outlines supporting methodology for a program of vicinity water temperature monitoring. In so doing, this section extensively references Tables 6.1.1 through 6.1.3, which contain no data. Whereas in many cases data would not exist until a future point of collection, will background water temperature data now available be made publicly accessible? Likewise, to what extent will pre-application monitoring data be available as it pertains to current aquatic ecosystems and other categories of background conditions? Generally, how are the monitoring process and supporting methodologies—covered in ER Section 6.0—structured to recognize impacts directly attributable to project development as an independent variable?

11. Section 7 of the SCA discusses the economic impacts of the Levy Nuclear Plant. Has the applicant considered what other types of economic uses might benefit from co-location either on-site or in proximity to the Levy Nuclear Plant and Crystal River Energy Complex?

IX. Levy County

1. The Site Certification Application lacks a statement of consistency with County zoning ordinances as required by Section 403.50663 of the PPSA. The Application fails to contain any statement concerning the status of the zoning. Additionally, copies of applicable zoning ordinances that apply to the project are not included in the Site Certification Application, as required by applicable sections of the Florida Administrative Code. The County requests a statement of consistency with the County zoning ordinances, as well as copies of the applicable County ordinances the applicant determines are applicable.

2. Statements contained within the Application that refer to the County's zoning district and land use category designations as being one and the same are inaccurate for this site. The County requests information that will clarify these statements regarding the zoning and land use designations.

3. The Site Certification Application lacks sufficient information for the County to make a determination as to the consistency of the proposed use with various provisions of the County's Land Development Code. There is insufficient information related to the requirement for a special exception use permit for the use as an electric generating facility in the zoning district for this site. In addition, the Site Certification Application does not contain sufficient information to make the determination that the electric generating facility will not result in such noise, odor, dust, vibration, offsite glare, substantial traffic or degradation of road infrastructure so as to adversely impact surrounding development or cause hazardous traffic conditions.

4. Although the County recently received an application for a special exception use permit, County staff has not had ample opportunity yet to determine whether the application packet is complete. In addition, the special exception application has not gone through the regular public review process, nor has the application received a final approval or denial from the Board of County Commissioners. The County requests sufficient information for the County to review and determine whether the proposed project meets the criteria for approval of a special exception use permit for an electric generating facility in this zoning district and to make determinations relating to the offsite impacts described in the previous paragraph.

5. The subject property contains areas designated as environmentally sensitive by the County's Land Development Code and Comprehensive Plan. The Application identifies threatened, endangered and listed species of concern on the site. The Application does not provide the applicable permit or letter of exemption from the appropriate State of Florida Water Management District and the Florida Department of Environmental Protection and any other applicable permitting agency related to these issues, as required by the County's Land Development Code. The County requests those permits or letters of exemption.

6. The Site Certification Application does not appear to address the impacts to the aquifer and connected groundwater systems resulting from the proposed project. The Application appears to contain inconsistencies regarding water withdrawals from the Floridan aquifer. The total average daily withdrawal of fresh water from the aquifer is unclear, based on the information provided in the Application. The County requests information indicating the impacts to the aquifer and connected groundwater, clarifying inconsistencies related to water withdrawals, and indicating total average daily withdrawal of fresh water from the aquifer.

Attached also, please find a copy of submitted letters/comments from Florida Fish and Wildlife Conservation Commission, Southwest Florida Water Management District, Withlacoochee Regional Planning Council, Levy County, and Florida Department of State Division of Historical Resources.

Attach:

I. FDEP - NED

COMMENT NUMBER: I.A

RAI NUMBER: LNP SCA RAI-001

REQUESTING AGENCY: FDEP, Northeast District Office, Air Program

COMMENT:

Provide specific means planned for disposal of all materials cleared and grubbed.

RESPONSE:

Any open burning in connection with initial land clearing will be in accordance with Chapter 62-256, F.A.C., as well as any other applicable state and/or local requirements.

Information regarding disposal of land-clearing debris is also provided in PEF's ERP application, which is included in Appendix 10.4 of the SCA (Volumes 6 and 7). The specific information is included in Section E., Subpart III. Plans, Subparagraph S, page 16 of the ERP application, as follows:

> "Disposal site for any excavated material, including temporary and permanent disposal sites...For LNP site, rail corridor, heavy haul road, barge slip/boat ramp access, and blowdown pipe corridor, Building 186 is the designated stockpile area. No onsite disposal is anticipated. The clearing and grubbed vegetation will be burned. Anything that cannot be burned will be hauled off-site to an approved upland disposal area. The potential off-site disposal location will be: The Levy County Landfill, 4 miles SE of Bronson off US27; Bronson, Florida. Excess material resulting from the excavation of the top soil layer for construction and placement of foundations associated with the transmission lines may be spread in upland areas as allowed by the conditions of certification (Section 1.4). Any required excavation within the transmission corridors will be provided upon final route selection/structure (pole) placement and access road layout/design."

In the above description, Building 186 refers to Area 186 as indicated on the Attachment A.3 "Levy Overall Site Plan" (Drawing LNG-G100-X2-001).

Please also see the response to LNP SCA RAI-041 (I.F.1).

ATTACHMENTS:

None.

COMMENT NUMBER: I.B.1

RAI NUMBER: LNP SCA RAI-002

REQUESTING AGENCY: FDEP, Northeast District Office, Water Resource Program Potable Water Section

COMMENT:

Provide further details for proposed potable water treatment plant and distribution system. Submit a preliminary design report according to the format of rule 62-555 FAC, signed and sealed drawings and DEP Forms 62-555.900(1) and 62-555.900(20). For additional information please visit this DEP website: http://www.dep.state.fl.us/legal/rules/drinkingwater/62-555.pdf.

RESPONSE:

Currently, the proposed potable water treatment plant and distribution system is in the early stages of design, at what is considered to be "30% design." Final design reports and specification details may not be finalized until after the site is certified. PEF will agree to a condition of certification requiring the post-certification submittal of the preliminary design report according to the format of Rule 62-555, F.A.C., signed and sealed drawings, and FDEP Forms 62-555.900(1) and 62-555.900(20). Current plans have the system being supplied by raw water wells, and will consist of a treatment plant and a closed loop distribution system that will be constructed using HDPE piping.

ATTACHMENTS:

None.

COMMENT NUMBER: I.B.2

RAI NUMBER: LNP SCA RAI-003

REQUESTING AGENCY: FDEP, Northeast District Office, Water Resource Program Potable Water Section

COMMENT:

Will the potable water system comply with Florida Administrative Code (F.A.C.) requirements as found in 62-555, 62-550, 62-560, 62-699 and Lead & Copper Rule? These rules can be found at http://www.dep.state.fl.us/water/rulesprog.htm#dw.

RESPONSE:

Currently, the proposed potable water system is in the early stages of design, at what is considered to be "30% design." Final design reports and specification details may not be finalized until after the site is certified. PEF will agree to a condition of certification providing for post-certification review for compliance with Chapters 62-555, 62-550, 62-560, 62-699, F.A.C.), and the Lead & Copper Rule.

ATTACHMENTS:

None.

COMMENT NUMBER: I.B.3

RAI NUMBER: LNP SCA RAI-004

REQUESTING AGENCY: FDEP, Northeast District Office, Water Resource Program Potable Water Section

COMMENT:

Will the potable well(s) be constructed according to public well standards found in 62-532, F.A.C.?

RESPONSE:

The proposed water distribution and water treatment system will be constructed according to Chapter 62-532, F.A.C. Currently, the proposed potable water system is in the early stages of design, at what is considered to be "30% design." Final design reports and specification details may not be finalized until after the site is certified. PEF will agree to a condition of certification for post-certification review for compliance with the public well standards found in Chapter 62-532, F.A.C.

ATTACHMENTS:

None.

COMMENT NUMBER: I.B.4

RAI NUMBER: LNP SCA RAI-005

REQUESTING AGENCY: FDEP, Northeast District Office, Water Resource Program Potable Water Section

COMMENT:

Will the potable well(s) meet required setbacks as found in 62-555.312, F.A.C.?

RESPONSE:

The potable water wells have not yet been sited, but it is anticipated that all wells will meet the required setbacks as disclosed in Chapters 62-555.312, 62-532.400(7), and Table I, F.A.C. Well locations, design reports, and specification details may not be finalized until after the site is certified. However, PEF will agree to a condition of certification that requires setbacks as specified in Chapter 62-555.312, F.A.C.

ATTACHMENTS:

None.

COMMENT NUMBER: I.B.5

RAI NUMBER: LNP SCA RAI-006

REQUESTING AGENCY: FDEP, Northeast District Office, Water Resource Program Potable Water Section

COMMENT:

The list of requirements for a Preliminary Design Report (PDR) can be found in 62-555.520(4), F.A.C. A preliminary design report or specifications, details, and design drawings are required for approval of a potable water system.

RESPONSE:

The onsite potable water wells have not yet been sited and the well system is in the early stages of design at a level that is considered to be at "30% design." As such, design reports and specification details may not be finalized until after the site is certified. PEF will agree to a condition of certification requiring the post-certification submittal of the PDR as required by Chapter 62-555.520(4), F.A.C.

ATTACHMENTS:

None.

COMMENT NUMBER: I.B.6

RAI NUMBER: LNP SCA RAI-007

REQUESTING AGENCY: FDEP, Northeast District Office, Water Resource Program Potable Water Section

COMMENT:

A demonstration of financial, managerial, and technical capacity (capacity development) form must be completed by all new potable water systems of the type that this system will be. This system will be a non-transient non-community public water system.

RESPONSE:

Currently, the proposed potable water system is in the early stages of design, at what is considered to be "30% design." Final design reports and specification details may not be finalized until after the site is certified. PEF will agree to a condition of certification requiring the post-certification submittal to the FDEP of the detailed potable water system design information, including the above referenced form.

ATTACHMENTS:

None.

COMMENT NUMBER: I.C.1

RAI NUMBER: LNP SCA RAI-008

REQUESTING AGENCY: FDEP, Northeast District Office, Water Resource Program Wastewater Permitting Section

COMMENT:

Please provide the information required by Section E of the permit application for the transmission lines and associated access road and structure pads, including site plans, drainage analysis, stormwater management system design, etc.

RESPONSE:

PEF is seeking certification of corridors for the transmission lines associated with the LNP Units 1 and 2. Design details such as ROW location within the corridor, width of ROW, structure locations, structure heights, access road locations, and in some instances, conductor configuration, will not be finalized until after the corridors are certified. Therefore, the information in Section E of the ERP application, including access road and structure pad design, drainage analysis, and stormwater management is not available at this time. PEF will agree to a condition of certification requiring the post-certification submittal of the detailed design information, including wetland impacts and mitigation plans, to the FDEP, as authorized by Section 403.5113(2), F.S., and Rule 62-17.191, F.A.C.

ATTACHMENTS:

None.

COMMENT NUMBER: I.C.2

RAI NUMBER: LNP SCA RAI-009

REQUESTING AGENCY: FDEP, Northeast District Office, Water Resource Program Wastewater Permitting Section

COMMENT:

For the floodplain analysis please address the following questions:

a) Calculate the flow rates on the site using a minimum of three cross-sections and provide a tabular summary. The data summary should include stage or water elevation, basin areas and volumes of cut and fill and calculations of the compensating storage for pre and post conditions. Show the stage as the difference between the 100 year storm event and the elevation of the seasonal high water level in NVGD basis.

b) It is suggested that the three cross-sections represent the plant site, the heavy haul road south of the plant site and the heavy haul road at CR 40. Can the three major watershed areas be used for this basis (as mapped in Appendix A4)?

c) With the fill material in place, which drawing depicts the pre and post flow lines for the drainage from the site at these three main locations (the plant site, the heavy haul road south of the plant site and the heavy haul road at CR 40)?

d) Indicate if the calculations are using Manning equation and indicate coefficients used and expected flow regimes for the site or other techniques used for the calculations. Has or will a model such as HEC-RAS or a GIS application be used for this site?

RESPONSE:

Detailed floodplain analysis has not been prepared at this time. PEF will agree to a condition of certification requiring the post-certification submittal of the detailed design information, including floodplain analysis, to the FDEP as authorized by Section 403.5113(2), F.S. and Rule 62-17.191 F.A.C.

a) To estimate flow patterns by cross-sections would be difficult to justify technically. Flow rates using three cross-sections were not computed. The approach used in the application considered the potential rise during very large storms caused by the new facilities as was presented in the ERP application. The volumes of fill within the floodplain have been estimated in Section 6 of the Storm Water Management Report (SCA Appendix 10.4, Volume 6).

There are no streams or channels on the plant site property. The entire property is flatwoods with scattered cypress wetlands. All of the property has been highly disturbed by silviculture and has furrows and ridged beds for the trees. Even the wetlands have been harvested and disturbed at some point in time. The FIRM mapping is based on wetland and soil features visible on aerial photographs. Flood storage on the FIRM is assumed to be shallow staging above the normal water level of the onsite wetlands, which provide detention of the runoff from the entire basin. While it is common to describe runoff from large rural sites as overland sheet flow, the silvicultural activity has altered the landscape such that there is significant ponding in the "uplands" in the furrows so there are no flow paths that could easily be defined by cross-sections.

The estimated depth of 0.44 inches (0.04 feet) of potential rise during a 100-year storm represents an approximate maximum increase over the entire site assuming no benefits from the reduction in stormwater runoff volumes provided onsite through wet ponds, dry swales, or dry detention areas (see Storm Water Management Report for pre-development flows versus post-development flows with attenuation shown in Sections 5.3 and 5.10). Therefore, compensating storage was not identified at this time. Also, the wet detention ponds have been designed for the 100-year storm to set the actual proposed floodplain elevation at the plant site, which will be wholly contained on the PEF property. Pipes will maintain connectivity and drainage patterns across the roadways. Flow from the cross-drains will be distributed by spreader swales to keep the flow shallow.

Flow rates were calculated for each of the stormwater systems and the cross-drain piping to maintain floodplain connectivity from the east side of the heavy haul road to the west side of the heavy haul road. Flow rates for the wet detention ponds and dry retention systems are found in Sections 5.1 through 5.9 of the Storm Water Management Report (SCA Appendix 10.4, Volume 6). The pipe calculations are found in Section 5.11 of the Storm Water Management Report (SCA Appendix 10.4, Volume 6).

b) The three major watersheds (as mapped in Appendix A4) are used for discussing the general flow directions, but the flow is not by defined pathways that can be used to estimate flow depths accurately because of the highly disturbed soil conditions and the flatness of the landscape, which does not have defined flow channels. The entire property is characterized as flatwoods with scattered cypress wetlands. All of the property has been highly disturbed by silviculture and has furrows and ridged beds for the trees. There are no streams or channels on the plant site property.

c) In the Storm Water Management Report (SCA Appendix 10.4, Volume 6), Drawing Number LNG-G100-X3-002-00 shows pre-development drainage areas on the site. Instead of flow lines, a minimum time of concentration of 10 minutes was used to compute the hydrographs for post-developed conditions because of the short flow paths. Therefore, for post-developed conditions, a flow path of time of concentration is not needed if the minimum time of concentration is used. For the roads, the runoff will drain

from the center of the crowned road to the ditch, and this is used as the flow path to the dry swales draining the roads.

d) Calculation methods are described in the Storm Water Management Report (SCA Appendix 10.4, Attachment A.7, Volume 6). GIS has been used to calculate floodplain impact areas.

ATTACHMENTS: None.

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COMMENT NUMBER: I.C.3

RAI NUMBER: LNP SCA RAI-010

REQUESTING AGENCY: FDEP, Northeast District Office, Water Resource Program Wastewater Permitting Section

COMMENT:

An NPDES Generic Permit for Stormwater Discharge from Large and Small Construction Activities is required, if one or more acres of land will be disturbed during construction, and if stormwater runoff is discharged to surface waters or offsite. The application shall be submitted to the DEP-NPDES Notices Center in Tallahassee. For additional information please visit this DEP website:
http://www.dep.state.fl.us/water/stormwater/npdes/construction3.htm

RESPONSE:

The NPDES Generic Permit for Stormwater Discharge from Large and Small Construction Activities will be obtained prior to construction.

ATTACHMENTS:

None.

COMMENT NUMBER: I.C.4

RAI NUMBER: LNP SCA RAI-011

REQUESTING AGENCY: FDEP, Northeast District Office, Water Resource Program Wastewater Permitting Section

COMMENT:

Provide further details for proposed potable water treatment plant and distribution system. Submit a preliminary design report according to the format of rule 62-555 FAC, signed and sealed drawings and DEP Forms 62-555.900(1) and 62-555.900(20). For additional information please visit this DEP website:
http://www.dep.state.fl.us/legal/rules/drinkingwater/62-555.pdf

RESPONSE:

This is a duplicate comment. Please see the response to LNP SCA RAI-002 (I.B.1).

ATTACHMENTS:

None.

COMMENT NUMBER: I.C.5

RAI NUMBER: LNP SCA RAI-012

REQUESTING AGENCY: FDEP, Northeast District Office, Water Resource Program Wastewater Permitting Section

COMMENT:

Provide further details for the proposed industrial wastewater treatment and if effluent is land applied as a ground water discharge or discharged to surface waters in accordance with rules 62-620 and 62-660 FAC. Submit DEP Forms 2CS and 2 CG as applicable. For additional information please visit this DEP website: http://www.dep.state.fl.us/water/wastewater/iw/index.htm

RESPONSE:

The current design of the site does not propose any industrial wastewater to be disposed of onsite. All industrial wastewater is discharged from the site to the Gulf of Mexico, as a combined wastewater and cooling tower blowdown via a dedicated pipeline to the existing PEF CREC discharge canal.

Detailed information regarding the industrial wastewater discharge is found in the NPDES Permit application. A copy of the application, including Form 2CS, can be found in Volume 5 of the SCA. Since the requirement to obtain an NPDES permit is a federal permitting requirement, the processing of that application is being addressed separately from, but in conjunction with, the SCA. Treated effluent will not be land-applied; therefore, an FDEP groundwater discharge authorization is not required and Form 2CG is not applicable.

ATTACHMENTS:

None.

COMMENT NUMBER: I.C.6

RAI NUMBER: LNP SCA RAI-013

REQUESTING AGENCY: FDEP, Northeast District Office, Water Resource Program Wastewater Permitting Section

COMMENT:

Provide design details of the stormwater and drainage system for the transmission corridor (route) on-site of the property. The design summary should include drawings and calculations of the compensating storage for pre and post conditions.

RESPONSE:

PEF is seeking certification of corridors for the transmission lines associated with the LNP Units 1 and 2. Design details such as ROW location within the corridor, width of ROW, structure locations, structure heights, access road locations, and in some instances, conductor configuration, will not be finalized until after the corridors are certified. Therefore, the design summary of the stormwater and drainage system for the transmission line ROW is not available at this time. PEF will agree to a condition of certification requiring the post-certification submittal of the detailed design information of the transmission system, including wetland impacts and mitigation plans, to the FDEP, as authorized by Section 403.5113(2), F.S., and Rule 62-17.191, F.A.C.

ATTACHMENTS:

None.

COMMENT NUMBER: I.D General Comment

RAI NUMBER: LNP SCA RAI-014

REQUESTING AGENCY: FDEP, Northeast District Office, Water Facilities\Ground Water Section

COMMENT:

Pursuant to rule 62-520.600, F.A.C., and based on the information provided in the application, the proposed Ground Water Monitor Plan is not complete.

RESPONSE:

PEF believes that all of the requisite elements of the Groundwater Monitoring Plan are provided in the plan that was submitted with the SCA. However, FDEP's comments on the plan are acknowledged. PEF is therefore providing additional information or clarification on various elements of the plan in response to FDEP's comments. This additional information is provided in our individual responses to the following RAIs. The corresponding agency comment numbers are provided in parentheses:

LNP SCA RAI-016 (I.D.2)
LNP SCA RAI-022 (I.D.8)
LNP SCA RAI-023 (I.D.9)
LNP SCA RAI-024 (I.D.10)
LNP SCA RAI-025 (I.D.11)
LNP SCA RAI-026 (I.D.12)
LNP SCA RAI-027 (I.D.13)
LNP SCA RAI-028 (I.D.14)
LNP SCA RAI-029 (I.D.15)
LNP SCA RAI-030 (I.D.16)
LNP SCA RAI-031 (I.D.17)

PEF proposes that a condition of certification be established that will provide for post-certification review of the final Groundwater Monitoring Plan.

ATTACHMENTS:

None.

COMMENT NUMBER: I.D.1

RAI NUMBER: LNP SCA RAI-015

REQUESTING AGENCY: FDEP, Northeast District Office, Water Facilities\Ground Water Section

COMMENT:

After evaluation of the proposed monitoring wells, parameters, frequencies, and well location map(s), the ground water monitoring plan will become finalized, and the pre-operational and operational ground water monitoring programs will be incorporated into the Site Certification as condition requirements. Any changes in the ground water monitoring plan will require a modification of the Site Certification.

RESPONSE:

PEF will work with FDEP to incorporate any necessary changes or modifications into both the pre-operational and operational groundwater monitoring programs so that they can be considered final and made part of the Site Certification. PEF proposes that a condition of certification be created to address post-certification submittal and review of the details of the Groundwater Monitoring Plan.

ATTACHMENTS:

None.

COMMENT NUMBER: I.D.2

RAI NUMBER: LNP SCA RAI-016

REQUESTING AGENCY: FDEP, Northeast District Office, Water Facilities\Ground Water Section

COMMENT:

PEF's Quality Assurance/Quality Control Program(s) in Reference 6.6-003 must meet the field sampling and analytical requirements of Rule 62-160, F.A.C.

RESPONSE:

PEF's Quality Assurance/Quality Control Program(s) for groundwater monitoring will meet the field sampling and analytical requirements of Rule 62-160, F.A.C.

ATTACHMENTS:

None.

COMMENT NUMBER: I.D.3

RAI NUMBER: LNP SCA RAI-017

REQUESTING AGENCY: FDEP, Northeast District Office, Water Facilities\Ground Water Section

COMMENT:

Table 2.3-50, Groundwater Field Parameters (Vol.9, Chapter 6) indicates specific conductivity values in the monitor wells ranging from 0.266 to 0.624 uS/cm. Specific conductivity values for aquifers in this area should range from 100 to 800 uS/cm for aquifer(s) in this area. Note that 1 uS/cm = 1 umhos/cm. Please clarify these values, and make any necessary corrections to the table, if applicable.

RESPONSE:

A review of the table indicates that the specific conductivity units should in fact be mS/cm and not µS/cm as indicated in Table 2.3-50. A revised version of Table 2.3-50 showing the correct units is attached to this response.

ATTACHMENTS:

See following table.

Table 2.3-50
Groundwater Field Parameters

Well ID	Sample Date	pH	Specific Conductivity	Temperature	DO	ORP	Turbidity	Salinity
Units:		SU	mS/cm	°C	mg/L	mV	NTU	ppt
	MCL:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MW16D	3/6/2007	6.45	0.369	22.00	0.11	-83.1	2.16	N/A
	6/14/2007	6.78	0.59	21.84	0.52	-95.2	0.25	0.29
	9/13/2007	6.53	0.583	22.16	0.07	-36.7	0.67	0.28
	12/5/2007	6.68	0.49	21.85	0.15	-168.30	0.17	0.23
	Mean	**N/A**	**0.507**	**21.96**	**0.21**	**-95.8**	**0.81**	**0.27**
MW15S	3/6/2007	6.48	0.378	23.22	0.64	-91.9	4.75	N/A
	6/14/2007	6.66	0.615	22.68	0.74	-101.4	6.5	0.3
	9/13/2007	6.60	0.624	22.84	0.34	-104.4	4.09	0.3
	12/5/2007	6.66	0.51	23.65	0.33	-146	48.4	0.25
	Mean	**N/A**	**0.532**	**23.10**	**0.51**	**-110.9**	**15.94**	**0.28**
MW-14D	3/7/2007	6.68	0.359	22.05	0.36	-69.4	0.4	N/A
	6/15/2007	7.01	0.55	22.13	1.74	-105.5	0.55	0.27
	9/13/2007	6.85	0.611	22.58	0.06	-74.3	0	0.3
	12/5/2007	6.93	0.491	21.97	0.19	-268	5.57	0.24
	Mean	**N/A**	**0.503**	**22.18**	**0.59**	**-129.3**	**1.63**	**0.27**
MW-13S	3/7/2007	6.45	0.266	21.93	0.62	-69.2	10	N/A
	6/15/2007	6.78	0.385	21.67	1.96	-85.4	7	0.18
	9/13/2007	6.58	0.373	N/A	0.02	-79.3	6.36	0.16
	12/5/2007	6.54	0.339	22.91	0.19	-209.8	6.16	0.16
	Mean	**N/A**	**0.341**	**22.17**	**0.70**	**-110.9**	**7.38**	**0.17**

Notes:

°C = degree Celsius
DO = dissolved oxygen
MCL = maximum contaminant level
mg/L = milligrams per liter
mS/cm = microSiemens per centimeter
mV = millivolts
N/A = Not Available
NTU = nephelometric turbidity units
ORP = oxygen reduction potential
ppt = parts per thousand
SU = standard units

COMMENT NUMBER: I.D.4

RAI NUMBER: LNP SCA RAI-018

REQUESTING AGENCY: FDEP, Northeast District Office, Water Facilities\Ground Water Section

COMMENT:

Table 2.3-52, Groundwater Metals (Vol.9, Chapter 6) indicates existing arsenic values in monitor well MW-13S above the Florida ground water standard of 10 ug/L for the last three quarterly sampling events of 2007. The turbidity levels for this well during the same sample events seem very low in the range of 6 to 7 NTUs. Please investigate previous activity in the area of this well, and provide potential sources for the elevated levels of arsenic in the aquifer.

RESPONSE:

A historical review of the property indicates decades of timber management practices with no known building structures or other business activities onsite. A likely explanation for the existing arsenic values is as follows:

"Heterotrophic anaerobes, which require organic carbon for their metabolism, catalyze a number of thermodynamically favorable reactions such as Fe-Mn oxyhydroxide reductive dissolution (and the release of sorbed metals to solution) and sulfate reduction. Bacterial sulfate reduction to H2S can be very rapid if reactive organic carbon is present and can lead to precipitation of metal sulfides and perhaps increase the solubility of elements such as silver, gold, and arsenic that form stable Me-H2S aqueous complexes. Similarly, the bacterial degradation of complex organic compounds such as cellulose and hemicellulose to simpler molecules, such as acetate, oxalate, and citrate, can enhance metal solubility by forming Me organic complexes and cause dissolution of silicate minerals." [Southam, G. and Saunders, James A. The Geomicrobiology of Ore Deposits. Economic Geology; September 2005; v. 100; no. 6; p. 1067-1084; DOI: 10.2113/100.6.1067]

Field parameters for MW-13S as indicated in ER Table 2.3-50 indicate low DO (average: 0.70 mg/L) and relatively reducing conditions (ORP: -110.9mV). In addition, a strong correlation exists between elevated arsenic and iron concentrations within MW-13S (ER Table 2.3-52). In fact, iron concentrations are an order of magnitude higher in MW-13S than all other sampled wells. The increased arsenic concentrations in MW-13S are potentially natural as they can result from the reduction of iron oxide containing trace amounts of coprecipitated arsenic.

Based on historical land use, literature, and field measurements, MW-13S is appears to be located in a zone of iron reduction which has the potential to increase naturally occurring arsenic concentrations in groundwater.

ATTACHMENTS: None.

COMMENT NUMBER: I.D.5

RAI NUMBER: LNP SCA RAI-019

REQUESTING AGENCY: FDEP, Northeast District Office, Water Facilities\Ground Water Section

COMMENT:

Numerous references in the application indicate normal releases of contaminants into the environment from the proposed facility will have negligible effects on ground water. Please provide additional details for this type of direct discharge into the ground water aquifer (i.e.: describe type of discharges, parameters of concern, locations of discharges, amount of discharges, identify locations on scaled site plans, etc.).

RESPONSE:

No direct discharge into the groundwater from "normal releases of contaminants" will occur at the LNP site. Contaminants created from facility processes will be included with the cooling tower blowdown water stream and discharged to the CREC discharge canal through a dedicated blowdown pipeline. Therefore, no normal releases of contaminants will occur at the LNP site; thus, groundwater will not be affected by discharges at the LNP site.

ATTACHMENTS:

None.

COMMENT NUMBER: I.D.6

RAI NUMBER: LNP SCA RAI-020

REQUESTING AGENCY: FDEP, Northeast District Office, Water Facilities\Ground Water Section

COMMENT:

Information provided in the application indicates that all discharge or disposal areas will be lined, but liner or enclosure specifics are not provided, except for the wastewater retention basin. Please provide the liner and enclosure details on all potential discharge basins, sumps, tanks, and sites (i.e.: CWS basin, SWS Settling basin, liquid radwaste systems, spent fuel storage areas, dry cask storage areas, transformer oil collection pits, equipment parts washing discharge sites, vehicle washing with under carriage cleaning sites, etc.).

RESPONSE:

No industrial wastewater retention basins with potential groundwater discharges have been proposed for the LNP site. Liners and enclosures will be utilized for basins, sumps, tanks, etc., as required, to preclude discharges to groundwater. The project is currently in the early phases of design, at what is referred to as the "30% design stage." The current plan is to use an epoxy coating to line the CWS cooling tower basin, although the use of a different type of liner is being evaluated. Liner and enclosure details for basins, sumps, tanks, etc., can be provided post-certification.

ATTACHMENTS:

None.

COMMENT NUMBER: I.D.7

RAI NUMBER: LNP SCA RAI-021

REQUESTING AGENCY: FDEP, Northeast District Office, Water Facilities\Ground Water Section

COMMENT:

A suitably scaled site plan (maximum 11" x 14") is requested that clearly identifies the locations of all discharge and disposal areas mentioned in the previous item.

RESPONSE:

No industrial wastewater retention basins with potential groundwater discharges have been proposed for the LNP site. A site plan is attached that identifies the locations of storage facilities and facilities that potentially generate or handle wastewater. It is also assumed that the request for an 11x14 figure is a typographic error because of its unusual size and an 11x17 figure is attached.

ATTACHMENTS:

See following figure.

MOTOR POOL

HAZARDOUS WASTE STORAGE FACILITY

CHEMICAL STORAGE BUILDING - WAREHOUSE AREA

WASTEWATER RETENTION BASIN

UNIT 2

UNIT 1

DRY CASK STORAGE

WASTEWATER RETENTION BASIN

BLOWDOWN SUMP

BLOWDOWN SUMP

SEWAGE TREATMENT FACILITY

N

W E

S

LEGEND

LNP Associated Facility

0 0.1 0.2

Kilometers

0 0.1 0.2

Miles

Progress Energy Florida

Levy Nuclear Plant
Units 1 and 2
Site Certification Application

SCA Comment Response

FIGURE LNP SCA RAI-021 A1

Rev 0

File Path: ATL\Boomer\I\projects4\Progress_Energy_FL\MXD\LNP SCA RAI-021_ID2021.mxd; Date: 8/8/2008; User: DDickman

COMMENT NUMBER: I.D.8

RAI NUMBER: LNP SCA RAI-022

REQUESTING AGENCY: FDEP, Northeast District Office, Water Facilities\Ground Water Section

COMMENT:

In addition to the ground water monitoring parameters that were already sampled in the existing wells, representative samples of the following parameters are requested to be analyzed prior to operation in monitor wells MW-1S, MW-3S, and MW-15S. These wells can be substituted for proposed wells in the general area, if they are no longer available.

Aluminum, antimony, barium, beryllium, cadmium, selenium, silver, thallium, fecal coliform, gross alpha-including radium 226 but excluding radon & uranium, combined radium 226 & 228, uranium, tritium, strontium-90, and all primary organics of EPA Methods 624 and 625, or comparable EPA methods. The method detection limits must be lower than the drinking\ground water standards in rule 62-550, F.A.C.

RESPONSE:

PEF proposes that a condition of certification be created to provide for a post-certification review of an appropriate groundwater monitoring plan that includes well locations, water quality parameters, and sampling frequencies based upon the location and design of facilities with the potential for groundwater discharges.

ATTACHMENTS:

None.

COMMENT NUMBER: I.D.9

RAI NUMBER: LNP SCA RAI-023

REQUESTING AGENCY: FDEP, Northeast District Office, Water Facilities\Ground Water Section

COMMENT:

The facility needs to propose a number of representative monitor wells that can be used to provide a characterization analysis once every five years after the facility begins operating. This analysis will be for all primary inorganics in rule 62-550.310, F.A.C., secondary standards in rule 62-550.320, F.A.C., and all organics of EPA Methods 624 and 625, or comparable EPA methods. The method detection limits must be lower than the drinking\ground water standards in rule 62-550, F.A.C. Both upgradient and downgradient wells need to be proposed.

RESPONSE:

PEF proposes that a condition of certification be created to provide for a post-certification review of an appropriate Groundwater Monitoring Plan that includes well locations, water quality parameters, and sampling frequencies based on the location and design of facilities with the potential for groundwater discharges.

Monitoring wells MW-3S, MW-3D, MW-4S, MW-4D, MW-21S, and MW-21D are considered background or upgradient monitoring wells. All other monitoring wells are considered downgradient wells.

ATTACHMENTS:

None.

COMMENT NUMBER: I.D.10

RAI NUMBER: LNP SCA RAI-024

REQUESTING AGENCY: FDEP, Northeast District Office, Water Facilities\Ground Water Section

COMMENT:

The characterization analysis mentioned in the above item needs to be conducted once every five years on the wastewater effluent stream, including the radiological parameters mentioned in the item below.

RESPONSE:

PEF proposes that a condition of certification be created to provide for a post-certification review of an appropriate Groundwater Monitoring Plan that includes well locations, water quality parameters, and sampling frequencies based on the location and design of facilities with the potential for groundwater discharges.

There are no wastewater effluent discharges to groundwater. However, a characterization analysis of the wastewater effluent streams to surface waters will be conducted once every five years or in accordance with the specifications of the NPDES permit.

ATTACHMENTS:

None.

COMMENT NUMBER: I.D.11

RAI NUMBER: LNP SCA RAI-025

REQUESTING AGENCY: FDEP, Northeast District Office, Water Facilities\Ground Water Section

COMMENT:

In addition to the chemical ground water monitoring parameters listed in Tables 6.6-2 and 6.6-3, the following radionuclides need to be monitored annually for gross alpha-including radium 226 but excluding radon & uranium, combined radium 226 & 228, uranium, tritium, and strontium-90. Please select a number of representative reactor area and sentinel monitor wells. All potential liquid radioactive waste release areas should be monitored, as well.

RESPONSE:

PEF proposes that a condition of certification be created to provide for a post-certification review of an appropriate Groundwater Monitoring Plan that includes well locations, water quality parameters, and sampling frequencies based on the location and design of facilities with the potential for groundwater discharges.

ATTACHMENTS:
None.

COMMENT NUMBER: I.D.12

RAI NUMBER: LNP SCA RAI-026

REQUESTING AGENCY: FDEP, Northeast District Office, Water Facilities\Ground Water Section

COMMENT:

DEP Monitor Well Completion Report Form (attached) must be submitted for the existing permanent monitor wells MW-1S, MW-2S, MW-3S, and MW-4S. Any new permanent monitor well will need to have this form submitted, as well.

RESPONSE:

FDEP Monitor Well Completion Report Forms for the existing permanent monitor wells MW-1S, MW-2S, MW-3S, and MW-4S have been completed. Any new permanent monitoring well will also have this form completed and submitted as required.

ATTACHMENTS:

See the following monitoring well completion forms.

DEP Form # 62-522.900(3)
Form Title MONITOR WELL COMPLETION REPORT
Effective Date
DEP Application No. (Filled in by DEP)

Florida Department of Environmental Protection
Twin Towers Office Bldg. 2600 Blair Stone Road Tallahassee, Florida 32399-2400

MONITOR WELL COMPLETION REPORT

DATE: ~~01/30/2007~~ BB 07/25/08

INSTALLATION NAME: Levy Nuclear Plant Site

DEP PERMIT NUMBER: GMS NUMBER:

WELL NUMBER: MW-1S WELL NAME: MW-1S

DESIGNATION: Background Immediate Compliance X (?)

~~LATITUDE/LONGITUDE~~: Northing: 1719510.77 / Easting: 455053.80 (NAD83)

AQUIFER MONITORED: Surficial

INSTALLATION METHOD: Rotosonic 4"/6" SR109

INSTALLED BY: Prosonic

TOTAL DEPTH: 30.51 Ft (bls) DEPTH OF SCREEN: Top: 20.26 Ft Bottom: 30.26 Ft (bls)

SCREEN LENGTH: 10 Ft SCREEN SLOT SIZE: 10-slot SCREEN TYPE: slotted PVC

CASING DIAMETER: 2 inches CASING TYPE: PVC, sch 40

LENGTH OF CASING: 20.26 Ft bls FILTER PACK MATERIAL: 20-30 mesh sand

TOP OF CASING ELEVATION (~~MSL~~): 45.09 Ft NAVD 88

GROUND SURFACE ELEVATION (~~MSL~~): 41.95 Ft NAVD 88

COMPLETION DATE: 01/30/2007

DESCRIBE WELL DEVELOPMENT: surge block and submersible pump. Development log is attached.

POST DEVELOPMENT WATER LEVER ELEVATION (~~MSL~~): 40.50 Ft NAVD 88

DATE AND TIME MEASURED: March 6, 2007

REMARKS: (soils information, stratigraphy, etc.): See attached boring log.

REPORT PREPARED BY: Bryan Burkingstock / CH2M Hill / 678-530-4060
(name, company, phone number)

NOTE: PLEASE ATTACH BORING LOG.

(bls)= Below Land Surface

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:	
338884.FL	MW1S	SHEET 1 OF 2

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : (1719510.8 N, 455053.8 E)

ELEVATION : 42.0 ft MSL (NGVD83) DRILLING CONTRACTOR : Prosonic, Ocala, FL Driller: F. Kraus

DRILLING EQUIPMENT AND METHOD : Rotosonic S/N SR109, sonic, 4" x 6" ORIENTATION : Vertical

WATER LEVELS : — START : 1/30/2007 END : 1/30/2007 LOGGER : A Teal

DEPTH BELOW EXISTING GRADE (ft)	INTERVAL (ft)	RECOVERY (in)	#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
42.0	0.0				**Poorly Graded Sand With Organics (SP)** 0.0-1.0' - dusky brown, (5YR 2/2), wet, very fine to fine grained, silica sand, estimated 40% fine organics		
					Poorly Graded Sand (SP) 1.0-2.0' - pale yellowish brown, (10YR 6/2), wet, fine grained, silica sand, trace non plastic fines, trace organics		
		60.0	R1-SN		**Poorly Graded Sand With Organics (SP)** 2.0-3.5' - dusky yellowish brown, (10YR 2/2), moist to wet, very fine to fine grained, silica sand, estimated 40-50% fine organics		
					Silty Sand (SM) 3.5-5.0' - moderate yellowish brown, (10YR 5/4), moist, very fine to fine grained, silica sand, estimated 20-25% low plasticity fines, trace organics		
5	5.0						
37.0					**Silty Sand (SM)** 5.0-7.0' - dark yellowish brown to moderate yellowish brown, (10YR 4/2 to 10YR 5/4), moist, very fine to fine grained, silica sand, non to low plastic fines, trace fine organics; darker and siltier with depth		
					Clayey Sand (SC) 7.0-8.0' - light olive gray, (5Y 5/2), moist, medium plasticity		
					Silty Gravel With Sand (GM) 8.0-10.0' - yellowish gray, (5Y 8/1), moist, strong HCl reaction, angular to subangular, gravel size carbonate materials up to 1-5"; sand size carbonate particles are rounded to subangular, fossiliferous, trace clay		
10							
32.0		120.0	R2-SN		**Silty Gravel With Sand (GM)** 10.0-13.3' - Same as 8.0-10.0' except loose to dense, strong HCl reaction, fragments of fossiliferous limestone up to 3", approximately. 10% subangular to rounded silt sized carbonate particles		gastropod and pelycypod fragments and molds
					Limestone 13.3-15.0' - yellowish gray, (5Y 8/1), no apparent bedding, main piece is approximately 0.9' long, intact with approximately 0.2' thick fragments on top and bottom; moderate strength, fossiliferous		Cap rock?
15	15.0						
27.0					**Silty Gravel With Sand (GM)** 15.0-25.0' - Same as 8.0-10.0' except limestone fragments near top up to 4" in size except strong HCl reaction, grades at unknown depth to limestone (same as 13.3'); intact sections of moderate strength rock up to 0.9' long		Driller reports loss of approximately 50% of 10' run due to rapid fall rates, soft zone; from 15-25' run, only recovered approximately 5' of sample - no way to tell relative depths within this interval
20							

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:	
338884.FL	MW1S	SHEET 2 OF 2

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : (1719510.8 N, 455053.8 E)

ELEVATION : 42.0 ft MSL (NGVD83) DRILLING CONTRACTOR : Prosonic, Ocala, FL Driller: F. Kraus

DRILLING EQUIPMENT AND METHOD : Rotosonic S/N SR109, sonic, 4" x 6" ORIENTATION : Vertical

WATER LEVELS : --- START : 1/30/2007 END : 1/30/2007 LOGGER : A Teal

DEPTH BELOW EXISTING GRADE (ft)	INTERVAL (ft)	RECOVERY (in)	#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
22.0		120.0	R3-SN				
25	25.0						
17.0					**Silt (ML)** 25.0-27.3' - dark yellowish orange, (10YR 6/6), moist, very stiff, nonplastic to low plasticity, strong HCl reaction, no apparent bedding, blocky, carbonate materials		
		54.0	R4-SN		**Fat Clay And Limestone Fragments (CH)** 27.3-28.1' - (5BG 5/2), wet, plastic, no HCl reaction, Limestone is same as 13.3-15.0'; 4" by 2" fragments;		
30	30.0				**Silty Sand (SM)** 28.1-29.5' - dark yellowish orange, (10YR 6/6), wet, loose, strong HCl reaction, abundant fossiliferous fragments (white), sand sized carbonate materials, non plastic fines		
12.0					**No Recovery** **29.5-30.0'**		
					Bottom of Boring at 30.0 ft bgs on 1/30/2007		
35							
7.0							
40							

CH2MHILL

PROJECT NUMBER	WELL NUMBER		
338884.FL	MW-1S	SHEET 1	OF 1

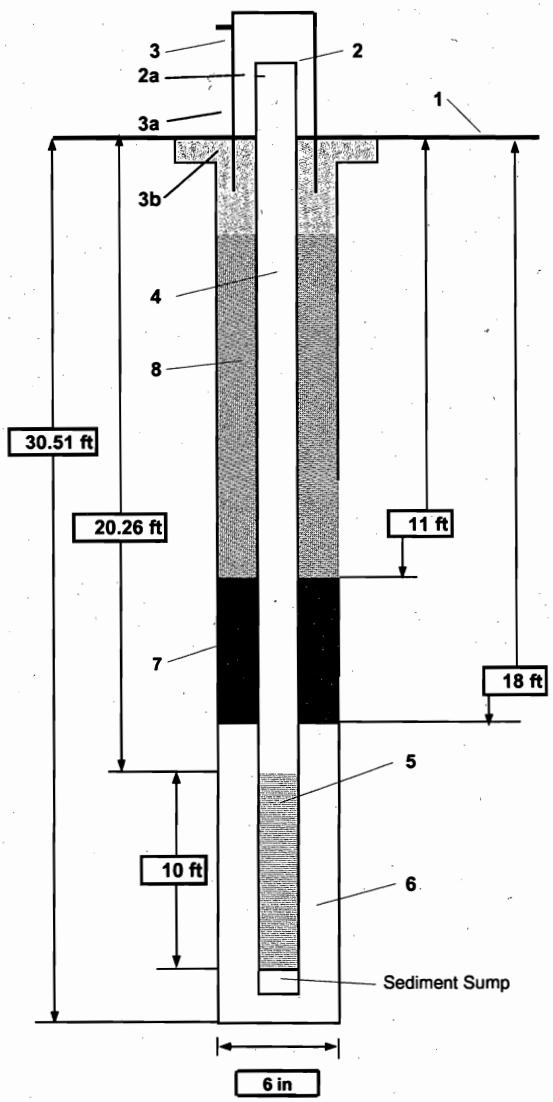
WELL COMPLETION DIAGRAM

PROJECT : PEF COLA LOCATION : Levy Nuclear Plant Site

DRILLING CONTRACTOR : Prosonic / Head Driller F Kraus

DRILLING METHOD AND EQUIPMENT USED : Rotosonic 4"/6" SR109

WATER LEVELS : See well development log MW-1S START : 1/30/07 END : 1/30/07 LOGGER : A. Teal



1- Ground elevation at well	41.95 ft.
2- Top of casing elevation	45.09 ft.
a) vent hole?	N/A
3- Wellhead protection cover type	Metal Locking Protective Casing
a) weep hole?	N/A
b) concrete pad dimensions	3 ft x 3 ft
4- Diameter/type of well casing	2" sch 40 PVC
5- Type/slot size of screen	2" sch 40 PVC 10-slot
6- Type screen filter	20-30 mesh sand / pea gravel for void
a) Quantity used	21 bags
7- Type of seal	Bentonite Pellets (3/8")
a) Quantity used	1.25 bags
8- Grout	
a) Grout mix used	Cement-Bentonite
	2 bags
b) Method of placement	Tremie Method
c) Vol. of well casing grout	Not measured
Development method	Surge block and submersible pump
Development time	1 hour
Estimated purge volume	340 gallons

Comments Sediment Sump = 0.25 ft
Total Well Depth (BTOC) = 33.65 ft
Final Well Development Field Parameters:
pH = 6.88, Conductivity = 0.438 µmhos/cm, T = 21.12 °C

NOTE: Diagram is not to scale.

CH2MHILL

PROJECT NUMBER	WELL NUMBER	
338884.FL	**MW-1S**	SHEET 1 OF 1

WELL DEVELOPMENT LOG

PROJECT: **PEF COLA** LOCATION: **Levy Nuclear Plant**

DEVELOPMENT CONTRACTOR: **Prosonic: Butch Kampf** DATE: **2/23/2007**

DEVELOPMENT METHOD AND EQUIPMENT USED: **Surge Block and Submersible Pump**

STATIC WATER LEVELS: **5.21 ft BTOC** START: **1023** END: **1123** LOGGER: **Nicole Jarzynieckl**

MAXIMUM DRAW DOWN DURING PUMPING: **5.38 ft BTOC**

RANGE AND AVERAGE DISCHARGE RATE: **Average 6 gal/min**

TOTAL QUANTITY OF WATER USED: **340 gal**

DISPOSITION OF DISCHARGE WATER: **Clear, yellow tint**

Time	Water Volume Discharge (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (oC)	pH	Conductivity (µmhos/cm)	Color / Odor / Comments
1023	Start	5.35	>1000	20.83	6.99	0.428	Brown, turbid, soft bottom
1028	35	5.34	>1000	20.76	6.90	0.441	Pumping 10gal/min no draw down
1033	60	5.36	>1000	21.23	6.90	0.444	Brown, turbid, soft bottom
1038	95	5.38	507	21.59	6.83	0.448	Slight draw down, good recharge, clearing
1043	125	5.25	55.8	21.13	6.87	0.442	Brown, clear, slightly turbid
1048	130, Restart	5.33	23.0	21.17	6.84	0.477	Restart pump, turbidity clearing, brown
1053	160	5.35	6.84	21.41	6.84	0.443	Clear, slight brown tint
1058	190	5.36	3.95	21.59	6.82	0.446	Clear, yellow tint
1103	220	5.37	3.15	21.02	6.85	0.441	Clear, yellow tint
1108	250	5.38	2.69	20.72	6.87	0.438	Clear, yellow tint
1113	280	5.37	2.00	21.02	6.92	0.437	Clear, yellow tint
1118	310	5.37	1.45	20.96	6.88	0.439	Clear, yellow tint
1123	340	5.37	1.18	21.12	6.88	0.438	Clear, yellow tint

Notes:
Surged well for 10 min @ start
Slight sulfur odor through pumping

DEP Form # 62-522.900(3)
Form Title MONITOR WELL COMPLETION REPORT
Effective Date
DEP Application No. (Filled in by DEP)

Florida Department of Environmental Protection
Twin Towers Office Bldg. 2600 Blair Stone Road Tallahassee, Florida 32399-2400

MONITOR WELL COMPLETION REPORT

DATE: 07/25/08

INSTALLATION NAME: Levy Nuclear Plant Site

DEP PERMIT NUMBER: GMS NUMBER:

WELL NUMBER: MW-25 WELL NAME: MW-25

DESIGNATION: Background Immediate Compliance X (?)

~~LATITUDE/LONGITUDE~~: Northing: 1729669.64 / Easting: 455298.09 (NAD83)

AQUIFER MONITORED: surficial

INSTALLATION METHOD: Rotosonic 4"/6" SR109

INSTALLED BY: Prosonic

TOTAL DEPTH: 31.58 Ft (bls) DEPTH OF SCREEN: Top: 21.33 Ft Bottom: 31.33 Ft (bls)

SCREEN LENGTH: 10 Ft SCREEN SLOT SIZE: 10-slot SCREEN TYPE: slotted PVC

CASING DIAMETER: 2 inches CASING TYPE: PVC, sch 40

LENGTH OF CASING: 21.33 Ft bls FILTER PACK MATERIAL: 20-30 mesh sand

TOP OF CASING ELEVATION (MSL): 45.84 Ft NAVD88

GROUND SURFACE ELEVATION (MSL): 43.34 Ft NAVD88

COMPLETION DATE: 01/29/2007

DESCRIBE WELL DEVELOPMENT: surge block and submersible pump
Development log is attached.

POST DEVELOPMENT WATER LEVER ELEVATION ~~(MSL)~~: 41.93 Ft NAVD88

DATE AND TIME MEASURED: March 6, 2007

REMARKS: (soils information, stratigraphy, etc.): See attached boring log.

REPORT PREPARED BY: Bryan Burkingstock / CH2m Hill / 678-530-4060
(name, company, phone number)

NOTE: PLEASE ATTACH BORING LOG.

(bls)= Below Land Surface

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:
338884.FL	MW2S SHEET 1 OF 2

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : (1729669.6 N, 455298.1 E)

ELEVATION : 43.3 ft MSL (NGVD83) DRILLING CONTRACTOR : Prosonic, Ocala, FL Driller: F. Kraus

DRILLING EQUIPMENT AND METHOD : Rotosonic S/N SR109, sonic, 4" x 6" ORIENTATION : Vertical

WATER LEVELS : — START : 1/29/07 15:54 END : 1/29/07 16:23 LOGGER : A. Teal

DEPTH BELOW EXISTING GRADE (ft)	INTERVAL (ft)	RECOVERY (in)	#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
43.3	0.0				**Silty Sand With Gravel (SM)** 0.0-0.5' - brownish gray, (5YR 4/1), wet, very fine to fine grained, gray silica sand, est. 15-20% non-plastic fines, mixed with fine to coarse sand sized and gravel sized limestone fragments to 3", strong reaction to HCl, (road fill)		
		60.0	R1-SN		**Silty Sand With Gravel (SM)** 0.5-1.3' - dark yellowish orange, (10YR 6/6), wet, fine grained, silica sand, est. 15-20% non-plastic fines		
					Silty Sand With Gravel (SM) Same as 0.5-1.3' except dark orange stained with fine to coarse gravel		
5	5.0				**Poorly Graded Sand With Silt/ Silty Sand (SP-SM/SM)** 1.6-3.5' - very pale orange, (10YR 8/2), wet, fine to very fine grained, est. 15-20% non-plastic fines, silica sand		
38.3					**Poorly Graded Sand With Silt (SP-SM)** 3.5-4.0' - yellowish gray, (5Y 8/1), wet, fine grained, silica sand, est. 5-10% non-plastic fines		
					Silty Sand (SM) 4.0-5.0' - pale yellowish brown, (10YR 6/2), moist, very fine to fine grained, nonplastic to low plasticity, est. 25-30% non to low plastic fines		
					Silt (ML) 5.0-10.0' - yellowish gray, (5Y 7/2), moist to wet, low plasticity, very rapid dilatancy, mild HCl reaction, scattered sand sized and gravel sized particles, carbonate materials		
10							
33.3		120.0	R2-SN		**Silt With Sand (ML)** 10.0-10.9' - pale olive, (10Y 6/2), wet, very fine grained, low plasticity, slow dilatancy, est. 20% very fine silica sand; at 10.6-10.9' gravel layer to 4" in size		
					Clayey Sand (SC) 10.9-11.1' - greenish gray, (5GY 6/1), moist, fine grained, silica sand, est. 30% medium to high plasticity fines		
					Poorly Graded (SP) 11.1-11.5' - white to yellowish gray, (N9 to 5Y 8/1), very fine to fine grained, silica sand, trace non-plastic fines		
					Poorly Graded Sand With Silt (SP) 11.5-13.0' - yellowish gray, (5Y 7/2), light and dark orange staining and mottling, very fine to fine grained, silica sand, est. 10-15% low plastic fines, trace fine gravel		
15	15.0						
28.3					**Silty Sand (SM)** 13.0-14.0' - very pale orange, heavy dark yellowish orange mottling, (10YR 8/2 mottled 10YR 6/6), wet, very fine to fine grained, silica sand, est. 15-20% non to low plastic fines		
					Silty Sand With Limestone (SM) 14.0-15.0' - pale yellowish brown, (10YR 6/4), wet, fine grained, silica sand with est. 20% non-plastic fines; estimated 50% white fine to coarse sand-sized and fine to coarse gravel-sized limestone fragments with mild to moderate Hcl reaction		
20							

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:	
338884.FL	MW2S	SHEET 2 OF 2

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : (1729669.6 N, 455298.1 E)

ELEVATION : 43.3 ft MSL (NGVD83) DRILLING CONTRACTOR : Prosonic, Ocala, FL Driller: F. Kraus

DRILLING EQUIPMENT AND METHOD : Rotosonic S/N SR109, sonic, 4" x 6" ORIENTATION : Vertical

WATER LEVELS : --- START : 1/29/07 15:54 END : 1/29/07 16:23 LOGGER : A. Teal

DEPTH BELOW EXISTING GRADE (ft)	INTERVAL (ft)	RECOVERY (in)	#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
23.3		120.0	R3-SN		**Silt And Limestone (ML)** 15.0-16.3' - yellowish gray, (5YR 7/2), moist, medium plasticity, mild HCl reaction, gravel-sized limestone fragments up to 3" x 1 1/2"; limestone contains organic debris and fossil casts **Silt And Limestone (ML)** 16.3-25.0' - silt sized carbonate matrix with gravel sized limestone fragments up to 5" long; at 19.7-20.0' Fat Clay (CH) seam, dusky yellow brown (10YR 2/2) high plasticity, very moist		
25	25.0						
18.3					**Limestone** 25.0-26.5' - yellowish gray, (5Y 7/2), mild HCl reaction		
		60.0	R4-SN		**Limestone** 26.5-27.3' - medium yellow brown, (10YR 5/4), thinly interbedded with organics **Silt With Sand (ML)** 27.3-28.4' - moderate HCl reaction, carbonate, localized clay stringers, high plasticity, low dilatancy, organic-rich decreasing with depth **Limestone With Clay And Silt** 28.4-30.0' - mild to moderate HCl reaction, angular to subangular, fragments to 3" by 3/4", silt sized carbonate matrix with <10% sand sized clay material around limestone fragments		
30	30.0						
13.3					Bottom of Boring at 30.0 ft bgs on 1/29/07 15:54		
35							
8.3							
40							

CH2MHILL

PROJECT NUMBER	WELL NUMBER	
338884.FL	MW-2S	SHEET 1 OF 1

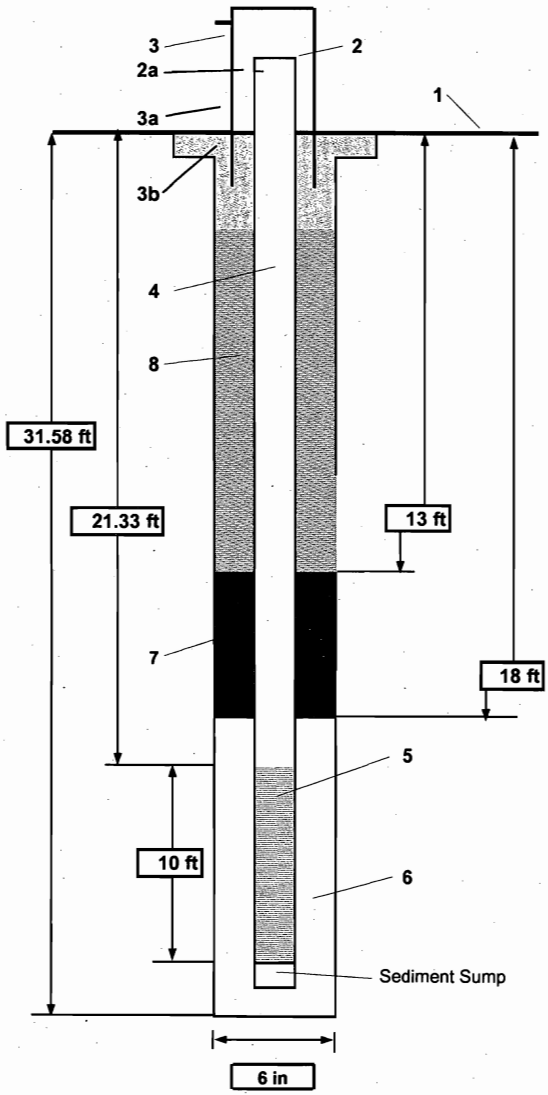
WELL COMPLETION DIAGRAM

PROJECT : PEF COLA LOCATION : Levy Nuclear Plant Site

DRILLING CONTRACTOR : Prosonic / Head Driller F Kraus

DRILLING METHOD AND EQUIPMENT USED : Rotosonic 4"/6" SR109

WATER LEVELS : See well development log MW-2S START : 1/29/07 END : 1/29/07 LOGGER : A. Teal



1- Ground elevation at well	43.34 ft.
2- Top of casing elevation	45.84 ft.
a) vent hole?	N/A
3- Wellhead protection cover type	Metal Locking Protective Casing
a) weep hole?	N/A
b) concrete pad dimensions	3 ft x 3 ft
4- Diameter/type of well casing	2" sch 40 PVC
5- Type/slot size of screen	2" sch 40 PVC 10-slot
6- Type screen filter	20-30 mesh sand
a) Quantity used	6 bags
7- Type of seal	Bentonite Pellets (3/8")
a) Quantity used	1.5 bags
8- Grout	
a) Grout mix used	Cement-Bentonite return grout: 11.1 lbs/ft
b) Method of placement	Tremie Method
c) Vol. of well casing grout	Not measured
Development method	Surge block and submersible pump
Development time	1 hour 10 minutes
Estimated purge volume	430 gallons

Comments Sediment Sump = 0.25 ft
Total Well Depth (BTOC) = 34.08 ft
Final Well Development Field Parameters:
pH = 6.83 ,Conductivity = 0.429 µmhos/cm, T = 21.83 °C

NOTE: Diagram is not to scale.

CH2MHILL

PROJECT NUMBER	WELL NUMBER	
338884.FL	**MW-2S**	SHEET 1 OF 1

WELL DEVELOPMENT LOG

PROJECT: **PEF COLA** LOCATION: **Levy Nuclear Plant**

DEVELOPMENT CONTRACTOR: **Prosonic: Butch Kampf** DATE: **2/23/2007**

DEVELOPMENT METHOD AND EQUIPMENT USED: **Surge Block and Submersible Pump**

STATIC WATER LEVELS: **5.41 ft BTOC** START: **1554** END: **1704** LOGGER: **Nicole Jarzyniecki**

MAXIMUM DRAW DOWN DURING PUMPING: **23.51 ft BTOC**

RANGE AND AVERAGE DISCHARGE RATE: **1 gal/min**

TOTAL QUANTITY OF WATER USED: **430 gal**

DISPOSITION OF DISCHARGE WATER: **clear, slight yellow tint**

Time	Water Volume Discharge (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (oC)	pH	Conductivity (µmhos/cm)	Color / Odor / Comments
1554	Start	5.41	> 1000	23.81	7.00	0.414	turbid, brown - surge well
1559	40	23.00	> 1000	22.66	6.83	0.440	turbid milky brown, huge draw down
1604	70	23.14	35.5	22.45	6.84	0.440	turbid, brown, cloudy
1609	100	23.30	98.3	22.19	6.84	0.435	turbid, brown, cloudy, 6 gal./min, clearing up
1614	130	23.31	29.9	22.27	6.92	0.436	cloudy, trace silt
1619	160	23.33	23.6	22.00	6.83	0.434	clearing up, trace silt
1624	190	23.37	12.1	22.07	6.91	0.434	clearing up, yellow tint
1629	220	23.45	13.7	22.20	6.81	0.436	clearing up, yellow tint
1634	250	23.45	8.43	21.74	6.94	0.443	clear, yellow tint
1639	280	23.45	5.63	21.96	6.87	0.430	clear, yellow tint
1644	310	23.50	6.18	22.11	6.80	0.434	clear, yellow tint
1649	340	23.51	4.87	21.60	6.85	0.428	clear, yellow tint
1654	370	23.51	4.18	21.60	6.87	0.428	clear, slight yellow tint
1659	400	23.58	3.48	21.84	6.81	0.421	clear, slight yellow tint
1704	430	23.58	3.34	21.83	6.83	0.429	clear, slight yellow tint

Notes:
Surged well for 10 min @ start

DEP Form # 62-522.900(3)
Form Title MONITOR WELL COMPLETION REPOR
Effective Date
DEP Application No. (Filled in by DEP)

Florida Department of Environmental Protection
Twin Towers Office Bldg. 2600 Blair Stone Road Tallahassee, Florida 32399-2400

MONITOR WELL COMPLETION REPORT

DATE: 07/25/08

INSTALLATION NAME: Levy Nuclear Plant Site

DEP PERMIT NUMBER: GMS NUMBER:

WELL NUMBER: MW-35 WELL NAME: MW-35

DESIGNATION: Background X (?) Immediate Compliance

~~LATITUDE/LONGITUDE~~: Northing: 1730335.14 / Easting: 460606.33 (NAD83)

AQUIFER MONITORED: surficial

INSTALLATION METHOD: Rotosonic 4"/6" SR109

INSTALLED BY: Prosonic

TOTAL DEPTH: 30.6 Ft (bls) DEPTH OF SCREEN: Top: 20.35Ft Bottom: 30.35 Ft (bls)

SCREEN LENGTH: 10 Ft SCREEN SLOT SIZE: 10-slot SCREEN TYPE: slotted PVC

CASING DIAMETER: 2 inches CASING TYPE: PVC, sch 40

LENGTH OF CASING: 20.35 Ft bls FILTER PACK MATERIAL: 20-30 mesh sand

TOP OF CASING ELEVATION (~~MSL~~): 51.55 Ft NAVD88

GROUND SURFACE ELEVATION (MSL): 48.41 Ft NAVD88

COMPLETION DATE: 01/31/2007

DESCRIBE WELL DEVELOPMENT: surge block and submersible pump. Development log is attached.

POST DEVELOPMENT WATER LEVER ELEVATION (~~MSL~~): 45.82 Ft NAVD88

DATE AND TIME MEASURED: March 6, 2007

REMARKS: (soils information, stratigraphy, etc.): See attached boring log.

REPORT PREPARED BY: Bryan Burkingstock / CH2m Hill / 678-530-4060
(name, company, phone number)

NOTE: PLEASE ATTACH BORING LOG.

(bls)= Below Land Surface

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:	
338884.FL	MW3S	SHEET 1 OF 2

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : (170335.1 N, 460606.3 E)

ELEVATION : 48.4 ft MSL (NGVD83) DRILLING CONTRACTOR : Prosonic, Ocala, FL Driller: F. Kraus

DRILLING EQUIPMENT AND METHOD : Rotosonic S/N SR109, sonic, 4" x 6" ORIENTATION : Vertical

WATER LEVELS : — START : 1/31/07 09:05 END : 1/31/07 09:23 LOGGER : A. Teal

DEPTH BELOW EXISTING GRADE (ft)	INTERVAL (ft)	RECOVERY (in)	#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
48.4	0.0				**Pooly Graded Sand With Organics (SP)** 0.0-0.5' - medium gray, (5N), moist, very fine to fine grained, silica sand, est. 25% organics		
					Poorly Graded Sand (SP) 0.5-1.2' - light brownish gray, (5YR 6/1), moist, fine grained, silica sand, trace fine organics, trace fines		
		60.0	R1-SN		**Poorly Graded Sand With Organics (SP)** 1.2-2.0' - Same as 0.0-0.5' except moderate yellowish brown (10YR 5/4) grading to dusky yellowish brown (10YR 2/2), estimated 20-30% fine organics		
					Poorly Graded Sand With Silt (SP-SM) 2.0-5.0' - pale yellowish brown, (10YR 6/2), moist to wet, very fine to fine grained, silica sand, est. 5-10% fines, trace fine organics, est. 10% dusky yellowish brown staining throughout		
5	5.0						
43.4					**Poorly Graded Sand With Silt (SP-SM)** 5.0-8.2' - Same as 2.0-5.0' except wet, trace dusky brown staining		
					Poorly Graded Sand With Silt And Organics (SP-SM) 8.2-11.1' - dusky brown to black, (5YR 2/2 to N1), moist to wet, very fine to fine grained, estimated 40-50% fine organics, estimated 10% fines, silica sand		Sharp contact at 8.2' 8.2-11.1' - plant matter, strong decay odor
10							
38.4		120.0	R2-SN				
					Poorly Graded Sand With Silt (SP-SM) 11.1-14.5' - dark yellowish brown, (10YR 4/2), wet, very fine to fine grained, silica sand, est. 5-10% fines, trace fine organics, est. 10% dusky yellowish brown staining		
15	15.0						
33.4					**Poorly Graded Sand (SP)** 14.5-15.0' - Same as 11.1-14.5' except estimated 15% staining		
					No Recovery **15.0-20.6'**		
20							

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:	
338884.FL	MW3S	SHEET 2 OF 2

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : (170335.1 N, 460606.3 E)

ELEVATION : 48.4 ft MSL (NGVD83) DRILLING CONTRACTOR : Prosonic, Ocala, FL Driller: F. Kraus

DRILLING EQUIPMENT AND METHOD : Rotosonic S/N SR109, sonic, 4" x 6" ORIENTATION : Vertical

WATER LEVELS : — START : 1/31/07 09:05 END : 1/31/07 09:23 LOGGER : A. Teal

DEPTH BELOW EXISTING GRADE (ft)	INTERVAL (ft)	RECOVERY (in)	#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
28.4		52.8	R3-SN				
					Silty Sand (SM) 20.6-25.0' - pale yellowish brown, (10YR 6/2), moist, very moist from 20.6-21.5', estimated 15% fines, very fine to fine silica sands, Fat Clay (CH) seam at 24.7-25.0' dusky yellow green (5GY 3/2), moist, firm, high-medium plasticity		Loss of core occurred in this run of approximately 5.6'. Driller reports softer section from approximately 15.0-20.0' then harder, "sticky" area from 20.0-25.0'. 4.4' of core believed to be from approximately 20.6-25.0'
25	25.0						
23.4					**Poorly Graded Sand (SP)** 25.0-27.1' - Same as 20.6-25.0' except very wet, loose at 26.0-27.1', Fat Clay (CH) seam at 25.0-26.0', same as 24.7-25.0' except grayish olive green (5GY 3/2) mottling and est. 15-25% gravel-sized limestone clasts up to 1" x 1/2"; strong HCl reaction		Loss of core occurred in this run approximately 2.9'. Driller reports very soft section below 27.0' to bottom of boring, 2.1' core believed to be from 25.0-27.1'
		25.2	R4-SN		**No Recovery** **27.1-30.0'**		
30	30.0						
18.4					Bottom of Boring at 30.0 ft bgs on 1/31/07 09:05		
35							
13.4							
40							

CH2MHILL

PROJECT NUMBER	WELL NUMBER	
338884.FL	MW-3S	SHEET 1 OF 1

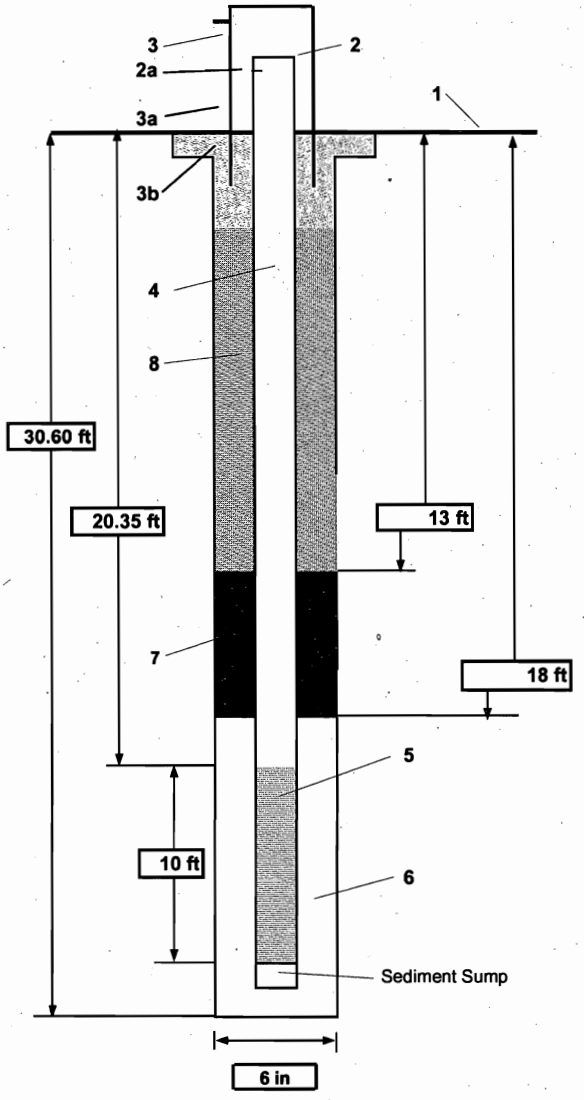
WELL COMPLETION DIAGRAM

PROJECT : PEF COLA LOCATION : Levy Nuclear Plant site

DRILLING CONTRACTOR : Prosonic / Head Driller F Kraus

DRILLING METHOD AND EQUIPMENT USED : Rotosonic 4"/6" SR109

WATER LEVELS : See well development log MW-3S START : 1/31/07 END : 1/31/07 LOGGER : A. Teal



1- Ground elevation at well	48.41 ft.
2- Top of casing elevation	51.55 ft.
a) vent hole?	N/A
3- Wellhead protection cover type	Metal Locking Protective Casing
a) weep hole?	N/A
b) concrete pad dimensions	3 ft x 3 ft
4- Diameter/type of well casing	2" sch 40 PVC
5- Type/slot size of screen	2" sch 40 PVC 10-slot
6- Type screen filter	20-30 mesh sand
a) Quantity used	Not Measured
7- Type of seal	Bentonite Pellets (3/8")
a) Quantity used	Not Measured
8- Grout	
a) Grout mix used	Cement-Bentonite
	Bags not measured
b) Method of placement	Tremie Method
c) Vol. of well casing grout	Not Measured
Development method	Surge block and submersible pump
Development time	4 hours 6 minutes
Estimated purge volume	528 gallons

Comments Sediment Sump = 0.25 ft
Total Well Depth (BTOC) =33.74 ft
Final Well Development Field Parameters:
pH = 5.70 ,Conductivity = 0.078 µmhos/cm, T = 22.83 °C

NOTE: Diagram is not to scale.

CH2MHILL

PROJECT NUMBER	WELL NUMBER	
338884.FL	**MW-3S**	SHEET 1 OF 3

WELL DEVELOPMENT LOG

PROJECT: **PEF COLA** LOCATION: **Levy Nuclear Plant**

DEVELOPMENT CONTRACTOR: **Prosonic: Butch Kampf** DATE: **2/22/2007 & 2/26/2007**

DEVELOPMENT METHOD AND EQUIPMENT USED: **Surge Block and Submersible Pump**

STATIC WATER LEVELS: **6.64 ft BTOC** START: **1410*** END: **1716*** LOGGER: **Nicole Jarzyniecki**

MAXIMUM DRAW DOWN DURING PUMPING: **28.19 ft BTOC**

RANGE AND AVERAGE DISCHARGE RATE: **1.7 gal/min**

TOTAL QUANTITY OF WATER USED: **528 gal**

DISPOSITION OF DISCHARGE WATER: **Clear to cloudy**

***Start and End time refer to the first purging event only. For 2/26/2007 Start: 1700 End: 1800**

Time	Water Volume Discharge (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (oC)	pH	Conductivity (µmhos/cm)	Color / Odor / Comments
1410	Start	6.64	> 1000	28.08	6.66	0.191	Murky, Turbid, grey-brown, silts - surge well
1415	5	---	> 1000	27.46	6.37	0.078	Murky, Turbid, grey-brown, silts
1420	8	---	> 1000	26.16	5.96	0.092	Murky, Turbid, grey-brown, silts
1425	11	---	> 1000	25.81	5.90	0.093	Murky, Turbid, grey-brown, silts
1430	18	---	> 1000	26.20	5.92	0.096	Murky, Turbid, grey-brown, silts
1435	20	---	> 1000	26.08	5.89	0.094	Murky, Turbid, grey-brown, silts
1440	25	---	> 1000	26.04	5.92	0.091	Murky, Turbid, grey-brown, silts
1445	30	---	> 1000	25.88	5.90	0.096	Murky, Turbid, grey-brown, silts
1450	33	---	> 1000	26.01	5.84	0.098	Murky, Turbid, grey-brown, silts
1455	35	---	> 1000	26.46	5.84	0.100	Murky, Turbid, grey-white, silts
1500	37	---	746	26.16	5.83	0.099	Murky, Turbid, grey-white, silts
1505	42	---	577	25.66	5.86	0.096	Murky, Turbid, grey-white, silts
1510	46	---	485	26.26	5.86	0.097	Murky, Turbid, grey-white, silts, slight clearing
1515	50	---	363	26.21	5.83	0.094	Milky, Turbid, grey-white, silts
1520	54	---	296	25.87	5.84	0.092	clearing up, murky, turbid
1525	58	---	242	26.04	5.83	0.092	clearing up, murky, turbid
1530	60	---	206	26.13	5.82	0.090	clearing up, murky, turbid
1535	65	---	170	26.00	5.81	0.088	clearing up, cloudy, turbid
1540	68	---	151	25.71	5.83	0.089	clearing up, cloudy, turbid
1545	71	---	130	25.62	5.84	0.084	clearing up, cloudy, turbid
1550	75	---	117	25.36	5.81	0.084	cloudy, clearing up
1555	80	---	109	25.09	5.85	0.084	cloudy, clearing up, stopped
1600	84	---	92	24.90	5.82	0.081	cloudy, clearing up
1605	86	---	86.3	25.53	5.81	0.082	cloudy, clearing up - surged well

CH2MHILL	PROJECT NUMBER 338884.FL	WELL NUMBER MW-3S	SHEET 2 OF 3

WELL DEVELOPMENT LOG

PROJECT: **PEF COLA** LOCATION: **Levy Nuclear Plant**

DEVELOPMENT CONTRACTOR: **Prosonic: Butch Kampf** DATE: **2/22/2007 & 2/26/2007**

DEVELOPMENT METHOD AND EQUIPMENT USED: **Surge Block and Submersible Pump**

STATIC WATER LEVELS: **6.64 ft BTOC** START: **1410*** END: **1716*** LOGGER: **Nicole Jarzyniecki**

MAXIMUM DRAW DOWN DURING PUMPING: **28.19 ft BTOC**

RANGE AND AVERAGE DISCHARGE RATE: **1.7 gal/min**

TOTAL QUANTITY OF WATER USED: **528 gal**

DISPOSITION OF DISCHARGE WATER: **Clear to cloudy**

***Start and End time refer to the first purging event only. For 2/26/2007 Start: 1700 End: 1800**

Time	Water Volume Discharge (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (oC)	pH	Conductivity (µmhos/cm)	Color / Odor / Comments
1610	90	---	77.4	24.90	5.81	0.079	cloudy, clearing up - surged well
1615	96	---	> 1000	24.10	5.84	0.084	very turbid, grey brown - surged well
1621	10	---	> 1000	23.92	6.01	0.096	very turbid brown, silt - surged well
1626	110	---	> 1000	23.83	5.86	0.093	turbid brown, surged well
1631	113	---	> 1000	25.75	6.06	0.096	cloudy, clearing up
1636	120	---	> 1000	25.95	6.05	0.087	turbid brown, clearing up
1641	122	---	> 1000	25.46	5.99	0.090	turbid, brown, clearing up
1646	126	---	994	25.67	6.00	0.090	turbid, brown, clearing up
1651	130	---	881	26.49	6.10	0.090	turbid, brown, clearing up
1656	135	---	945	23.55	5.83	0.086	turbid, brown, clearing up
1701	138	---	825	22.98	5.64	0.082	turbid, brown, clearing up
1706	143	---	552	22.64	5.65	0.080	turbid, brown, clearing up
1711	146	---	372	22.84	5.73	0.079	turbid, brown, clearing up
1716	150	---	252	22.83	5.70	0.078	turbid, brown, clearing up
2/26/2007							
1700	18	28.19	> 1000	---	---	---	Not Recorded
1705	48	26.97	400	---	---	---	Not Recorded
1710	78	26.98	165	---	---	---	Not Recorded
1715	108	27.02	113	---	---	---	Not Recorded
1720	138	26.99	72.5	---	---	---	Not Recorded
1725	168	26.97	55.8	---	---	---	Not Recorded
1730	198	27.04	41.1	---	---	---	Not Recorded
1735	228	27.05	33.7	---	---	---	Not Recorded
1740	258	26.97	27.3	---	---	---	Not Recorded

CH2MHILL

PROJECT NUMBER	WELL NUMBER	
338884.FL	**MW-3S**	SHEET 3 OF 3

WELL DEVELOPMENT LOG

PROJECT: **PEF COLA** LOCATION: **Levy Nuclear Plant**

DEVELOPMENT CONTRACTOR: **Prosonic: Butch Kampf** DATE: **2/22/2007 & 2/26/2007**

DEVELOPMENT METHOD AND EQUIPMENT USED: **Surge Block and Submersible Pump**

STATIC WATER LEVELS: **6.64 ft BTOC** START: **1410*** END: **1716*** LOGGER: **Nicole Jarzynlecki**

MAXIMUM DRAW DOWN DURING PUMPING: **28.19 ft BTOC**

RANGE AND AVERAGE DISCHARGE RATE: **1.7 gal/min**

TOTAL QUANTITY OF WATER USED: **528 gal**

DISPOSITION OF DISCHARGE WATER: **Clear to cloudy**

***Start and End time refer to the first purging event only. For 2/26/2007 Start: 1700 End: 1800**

Time	Water Volume Discharge (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (oC)	pH	Conductivity (µmhos/cm)	Color / Odor / Comments
1745	288	26.91	23.2	---	---	---	Not Recorded
1750	318	26.90	21.1	---	---	---	Not Recorded
1755	348	26.93	19.3	---	---	---	Not Recorded
1800	378	26.95	19.2	---	---	---	Not Recorded

Notes:
Moderate sulfur odor through entire development.
1801 Stopped Development - Complete

DEP Form # 62-522.900(3)
Form Title MONITOR WELL COMPLETION REPORT
Effective Date
DEP Application No. (Filled in by DEP)

Florida Department of Environmental Protection
Twin Towers Office Bldg. 2600 Blair Stone Road Tallahassee, Florida 32399-2400

MONITOR WELL COMPLETION REPORT

DATE: 07/25/08

INSTALLATION NAME: Levy Nuclear Plant Site

DEP PERMIT NUMBER: GMS NUMBER:

WELL NUMBER: MW-45 WELL NAME: MW-45

DESIGNATION: Background X (?) Immediate Compliance

~~LATITUDE/LONGITUDE~~: Northing: 1721283.93 / Easting: 461369.67 (NAD83)

AQUIFER MONITORED: Surficial

INSTALLATION METHOD: Rotosonic 4"/6" SR109

INSTALLED BY: Prosonic

TOTAL DEPTH: 30.60 Ft (bls) DEPTH OF SCREEN: Bottom: 30.35 Ft Top: 20.35 Ft (bls)

SCREEN LENGTH: 10 Ft SCREEN SLOT SIZE: 10-slot SCREEN TYPE: slotted PVC

CASING DIAMETER: 2 inches CASING TYPE: PVC, sch 40

LENGTH OF CASING: 20.35 Ft bls FILTER PACK MATERIAL: 20-30 mesh sand

TOP OF CASING ELEVATION (~~MSL~~): 48.83 Ft NAVD88

GROUND SURFACE ELEVATION (MSL): 46.38 Ft NAVD88

COMPLETION DATE: 01/30/2007

DESCRIBE WELL DEVELOPMENT: surge block and submersible pump
Development log is attached.

POST DEVELOPMENT WATER LEVER ELEVATION (~~MSL~~): 45.09 Ft NAVD88

DATE AND TIME MEASURED: March 6, 2007

REMARKS: (soils information, stratigraphy, etc.): See attached boring log.

REPORT PREPARED BY: Bryan Burkingstock / CH2M Hill / 678-530-4060
(name, company, phone number)

NOTE: PLEASE ATTACH BORING LOG.

(bls)= Below Land Surface

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:
338884.FL	MW4S SHEET 1 OF 2

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : (1721283.9 N, 461369.7 E)

ELEVATION : 46.4 ft MSL (NGVD83) DRILLING CONTRACTOR : Prosonic, Ocala, FL Driller: F. Kraus

DRILLING EQUIPMENT AND METHOD : Rotosonic S/N SR109, sonic, 4" x 6" ORIENTATION : Vertical

WATER LEVELS : --- START : 1/30/07 14:50 END : 1/30/07 15:18 LOGGER : A. Teal

DEPTH BELOW EXISTING GRADE (ft)	INTERVAL (ft)	RECOVERY (in)	#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
46.4	0.0				**Poorly Graded Sand With Silt (SP-SM)** 0.0-0.5' - very dusky red, (10R 2/2), wet, no HCl reaction, est. 5-10% fines, est. 20-30% organics, silica sand		Sharp contact at 0.5'
		60.0	R1-SN		**Poorly Graded Sand With Silt (SP-SM)** 0.5-3.5' - dark yellowish brown, trace light brown mottling, (10YR 6/6, mottled 5YR 5/6), wet, est. 5-10% fines, trace organics, silica sand		
					Poorly Graded Sand With Silt (SP-SM) 3.5-5.0' - pale red, (10R 6/2), wet to moist, est. 5-10% fines, trace blackish red (5R 2/2) mottling, est. 10% organics, silica sand		
5	5.0						
41.4					**Poorly Graded Sand With Silt (SP-SM)** 5.0-6.5' - dusky yellowish brown, (10YR 2/2), wet, est. 5-10% fines, est. 20-30% organics, silica sand		
					Poorly Graded Sand With Silt (SP-SM) 6.5-7.5' - Same as 3.5-5.0' except est. 10-20% grayish red (5YR 4/2) mottling and est. 5-10% grayish blue green (5BG 5/2) mottling		
					Poorly Graded Sand With Silt (SP-SM) 7.5-15.0' - yellowish gray, (5Y 7/2), trace grayish blue green mottling, silica sand; 14.5-15.0': induration of matrix, medium soft, mild HCl reaction, carbonate material		
10							
36.4		120.0	R2-SN				
15	15.0						
31.4					**Poorly Graded Sand With Silt And Limestone (SP-SM)** 15.0-25.0' - yellowish gray, (5Y 7/2), est. 20-25% gravel-sized limestone fragments from 1/4" to 4"; hard to soft, subangular to subrounded; mild HCl reaction, carbonate material		
20							

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:	
338884.FL	MW4S	SHEET 2 OF 2

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : (1721283.9 N, 461369.7 E)

ELEVATION : 46.4 ft MSL (NGVD83) DRILLING CONTRACTOR : Prosonic, Ocala, FL Driller: F. Kraus

DRILLING EQUIPMENT AND METHOD : Rotosonic S/N SR109, sonic, 4" x 6" ORIENTATION : Vertical

WATER LEVELS : — START : 1/30/07 14:50 END : 1/30/07 15:18 LOGGER : A. Teal

DEPTH BELOW EXISTING GRADE (ft)	INTERVAL (ft)	RECOVERY (in)	#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
26.4		120.0	R3-SN				
25	25.0						
21.4					**Limestone (SP-SM)** 25.0-26.0' - hard to soft		
		60.0	R4-SN		**Poorly Graded Sand With Silt And Limestone (SP-SM)** 26.0-30.0' - yellowish gray, (5Y 7/2), fine to medium grained, mild HCl reaction, est. 30-40% sand sized to 4" by 4" limestone fragments		
30	30.0						
16.4					Bottom of Boring at 30.0 ft bgs on 1/30/07 14:50		
35							
11.4							
40							

CH2MHILL

PROJECT NUMBER	WELL NUMBER		
338884.FL	MW-4S	SHEET 1	OF 1

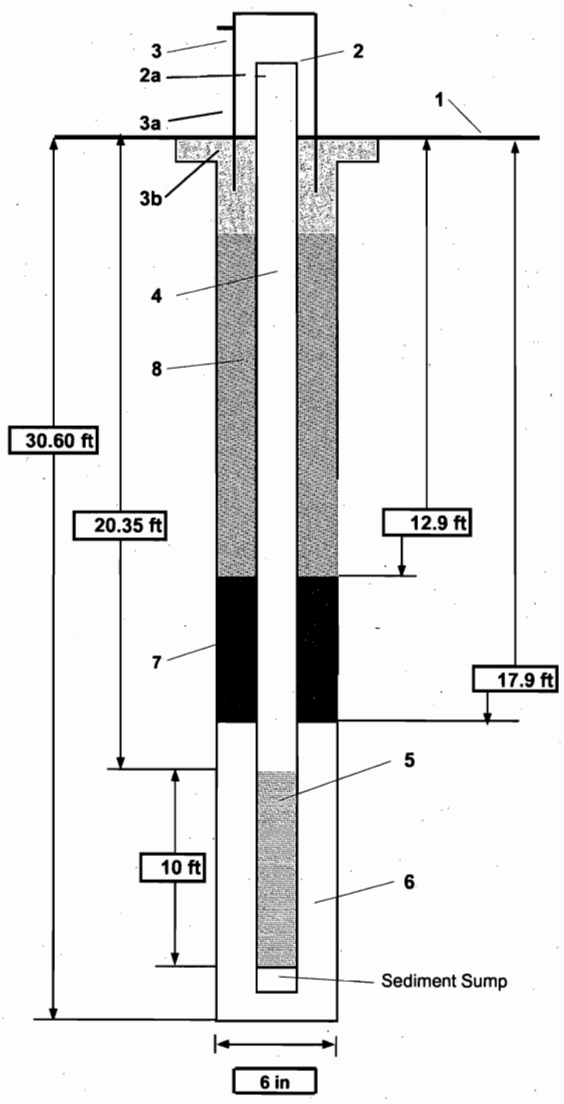
WELL COMPLETION DIAGRAM

PROJECT : PEF COLA LOCATION : Levy Nuclear Plant Site

DRILLING CONTRACTOR : Prosonic / Head Driller F Kraus

DRILLING METHOD AND EQUIPMENT USED : Rotosonic 4"/6" SR109

WATER LEVELS : See well development log MW-4S START : 1/30/07 END : 1/30/07 LOGGER : A. Teal



1- Ground elevation at well	46.38 ft.
2- Top of casing elevation	48.83 ft.
a) vent hole?	N/A
3- Wellhead protection cover type	Metal Locking Protective Casing
a) weep hole?	N/A
b) concrete pad dimensions	3 ft x 3 ft
4- Diameter/type of well casing	2" sch 40 PVC
5- Type/slot size of screen	2" sch 40 PVC 10-slot
6- Type screen filter	20-30 mesh sand
a) Quantity used	6 bags
7- Type of seal	Bentonite Pellets (3/8")
a) Quantity used	1.25 bags
8- Grout	
a) Grout mix used	Cement-Bentonite
	12.1 bags
b) Method of placement	Tremie Method
c) Vol. of well casing grout	Not measured
Development method	Surge block and submersible pump
Development time	1 hour 1 minute
Estimated purge volume	335 gallons

Comments Sediment Sump = 0.25 ft
Total Well Depth (BTOC) = 33.05 ft
Final Well Development Field Parameters:
pH = 6.90, Conductivity = 0.365 µmhos/cm, T = 22.55 °C

NOTE: Diagram is not to scale.

CH2MHILL

PROJECT NUMBER	WELL NUMBER	
338884.FL	MW-4S	SHEET 1 OF 1

WELL DEVELOPMENT LOG

PROJECT: **PEF COLA** LOCATION: **Levy Nuclear Plant**

DEVELOPMENT CONTRACTOR: **Prosonic: Butch Kampf** DATE: **2/23/2007**

DEVELOPMENT METHOD AND EQUIPMENT USED: **Surge Block and Submersible Pump**

STATIC WATER LEVELS: **4.81 ft BTOC** START: **0900** END: **1001** LOGGER: **Nicole Jarzynieckl**

MAXIMUM DRAW DOWN DURING PUMPING: **9.01 ft BTOC**

RANGE AND AVERAGE DISCHARGE RATE: **6 gal/min**

TOTAL QUANTITY OF WATER USED: **335 gal**

DISPOSITION OF DISCHARGE WATER: **Clear**

Time	Water Volume Discharge (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (oC)	pH	Conductivity (µmhos/cm)	Color / Odor / Comments
0900	Initial 20 gal	---	> 1000	21.79	---	---	Problem with YSI surged for 15 min stopped pumping
0915	50	9.01	943	22.22	6.96	0.369	Reset 10 gpm (adjusted flow)
0920	75	8.80	48.8	22.51	6.93	0.370	Rate 12 gpm clearing up
0925	100	8.81	13.0	22.95	6.92	0.371	clearing up
0930	125	8.82	14.4	22.52	6.94	0.367	well drawing down
0935	155	8.83	13.5	22.17	7.07	0.361	well drawing down, clear
0940	185	8.85	5.79	21.83	7.08	0.360	well drawing down
0945	215	8.85	4.93	22.30	6.93	0.364	drawdown stabilizing
0950	245	8.86	2.88	22.27	7.02	0.362	well recharging, clear
0955	275	8.85	1.87	22.36	7.05	0.362	crystal clear
0957	305	8.75	13.9	21.66	6.97	0.357	Restarted, clear, some trace partials
1001	335	8.80	4.81	22.55	6.90	0.365	clear

COMMENT NUMBER: I.D.13

RAI NUMBER: LNP SCA RAI-027

REQUESTING AGENCY: FDEP, Northeast District Office, Water Facilities\Ground Water Section

COMMENT:

A 72-hour prior notification must be provided to the Ground Water Section of the DEP Northeast District Office before any future monitor well is installed.

RESPONSE:

A 72-hour prior notification will be provided to the Ground Water Section of the FDEP Northeast District Office before any future monitoring well is installed.

ATTACHMENTS:

None.

COMMENT NUMBER: I.D.14

RAI NUMBER: LNP SCA RAI-028

REQUESTING AGENCY: FDEP, Northeast District Office, Water Facilities\Ground Water Section

COMMENT:

Any changes in the monitor well locations need to be shown on an aerial photo, similar to Figure 6.1-4.

RESPONSE:

Any changes in the monitoring well locations will be shown on an aerial photo, similar to Figure 6.1-4.

ATTACHMENTS:

None.

COMMENT NUMBER: I.D.15

RAI NUMBER: LNP SCA RAI-029

REQUESTING AGENCY: FDEP, Northeast District Office, Water Facilities\Ground Water Section

COMMENT:

The construction details of all proposed monitor wells need to be submitted, including depths.

RESPONSE:

The construction details including depths of all proposed monitoring wells will be submitted upon completion.

See also the response to LNP SCA RAI-026 (I.D.12).

ATTACHMENTS:

None.

COMMENT NUMBER: I.D.16

RAI NUMBER: LNP SCA RAI-030

REQUESTING AGENCY: FDEP, Northeast District Office, Water Facilities\Ground Water Section

COMMENT:

The four supply wells indicate a potential drawdown area of the aquifer. The effects of this drawdown may cause a localized reversal of ground water flow for the aquifer. With respect to the drawdown, please provide assurance that the monitor well locations are satisfactorily located to monitor all potential contamination sources.

RESPONSE:

The location and number of the supply wells have not been finalized. PEF proposes that a condition of certification be created to provide for a post-certification review of an appropriate Groundwater Monitoring Plan that includes well locations, water quality parameters, and sampling frequencies based on the location and design of the groundwater supply wells.

ATTACHMENTS:

None.

COMMENT NUMBER: I.D.17

RAI NUMBER: LNP SCA RAI-031

REQUESTING AGENCY: FDEP, Northeast District Office, Water Facilities\Ground Water Section

COMMENT:

Please identify one or more background (i.e.: upgradient) monitor wells. The background well(s) will need to be labeled using the following nomenclature: MWB-3S, MWB-3D, etc. All other well names can stay the same. Figure 6.1-4 will need to be revised to reflect these new names. This figure will be incorporated into the Site Certification conditions.

RESPONSE:

PEF proposes that a condition of certification be created to provide for a post-certification review of an appropriate Groundwater Monitoring Plan that includes well locations, water quality parameters, well nomenclature, and sampling frequencies. A well location figure will be included in this Groundwater Monitoring Plan.

ATTACHMENTS:

None.

COMMENT NUMBER: I.D.18

RAI NUMBER: LNP SCA RAI-032

REQUESTING AGENCY: FDEP, Northeast District Office, Water Facilities\Ground Water Section

COMMENT:

Please provide a contingency plan for potential sinkholes that may affect the wastewater areas.

RESPONSE:

PEF has performed an extensive geotechnical investigation that includes advancement of 116 boreholes, geotechnical laboratory testing, and geophysical methods to characterize the subsurface. The results of this investigation show that significant karst activity does not exist at the site. Since the potential for sinkhole formation is minimal and no industrial wastewater will be discharged onsite, a contingency plan is not necessary.

ATTACHMENTS:

None.

COMMENT NUMBER: I.D.19

RAI NUMBER: LNP SCA RAI-033

REQUESTING AGENCY: FDEP, Northeast District Office, Water Facilities\Ground Water Section

COMMENT:

Please provide a scaled location map showing all Class 4 springs, or greater within one-mile of facility property boundary that could be affected by the facility's operations and potential contamination. Figure 2.6-2 shows the Homosassa Springs Dome, and any hydrogeological and chemical issues regarding aquifer connectivity to any springs in the area, and the effects on these springs needs to be addresses.

RESPONSE:

No Class 4 springs, or greater, exist within 1 mile of the facility property boundary. The closest springs identified are beyond the 1-mile radius, and are Big King Springs and Little King Springs. Since no industrial wastewater will be discharged to groundwater at the LNP site, there is no potential for contamination of any springs within the area.

ATTACHMENTS:

None.

COMMENT NUMBER: I.E.1

RAI NUMBER: LNP SCA RAI-034

REQUESTING AGENCY: FDEP, Northeast District Office, Submerged Lands/Environmental Resource Program (SLERP)

COMMENT:

Please provide the maximum length of trench in wetlands that would remain open at any point in time during construction and the maximum length of time the trench would remain open prior to beginning backfilling operations for the installation of the make-up and blowdown pipelines.

RESPONSE:

It is anticipated that the pipe will be installed in approximately 400-foot pre-welded lengths. A typical daily construction sequence will include 400 feet of trenching, installation of the pipe length, and initiating backfill. This process will proceed daily while completion of backfilling of the previous day's trench is completed. Therefore, it is anticipated that the maximum length of time that a trench would remain open is less than two working days. The maximum length of open trench would be expected to be well under 800 feet, and given the distribution of wetlands along the pipeline corridor and the care taken to minimize impacts, considerably less open trench length is likely to be in wetlands.

ATTACHMENTS:

None.

COMMENT NUMBER: I.E.2

RAI NUMBER: LNP SCA RAI-035

REQUESTING AGENCY: FDEP, Northeast District Office, Submerged Lands/Environmental Resource Program (SLERP)

COMMENT:

Will all of the excavated material be used for backfilling the trench? If not, where and how will the excess material be disposed?

RESPONSE:

Current cut and fill estimates show that all of the excavated material from trenching operations will be used onsite. This material will primarily be used to backfill the trench from where it was excavated. Any excess excavated material will be used elsewhere onsite as fill material. Disposal of excavated material offsite is not anticipated.

ATTACHMENTS:

None.

COMMENT NUMBER: I.E.3

RAI NUMBER: LNP SCA RAI-036

REQUESTING AGENCY: FDEP, Northeast District Office, Submerged Lands/Environmental Resource Program (SLERP)

COMMENT:

Please submit a statement addressing whether dewatering is required. Detail the dewatering proposal to include the methods that are proposed to contain the discharge, methods of isolating dewatering areas, and indicate the period dewatering structures will be in place.

RESPONSE:

Dewatering during construction of the pipelines and linear facilities will be required for the north-south alignment of the makeup and blowdown pipelines. Installation of the east-west blowdown pipeline along the CFBC is not expected to require dewatering. Dewatering of isolated areas will be accomplished by wellpoint or sump pumps. The dewatering system will discharge into settlement structures in accordance with best management practices, as specified in the Florida Stormwater, Erosion, and Sedimentation Control Inspectors Manual. Isolated dewatering will be performed in areas where construction is active and only during the period required to complete that section of the facility.

Dewatering during construction of other areas of the LNP facility (including the Nuclear Islands) are described in the responses to LNP SCA RAI-138 through LNP SCA RAI-141 (VII.E through VII.E.3).

ATTACHMENTS:

None.

COMMENT NUMBER: I.E.4

RAI NUMBER: LNP SCA RAI-037

REQUESTING AGENCY: FDEP, Northeast District Office, Submerged Lands/Environmental Resource Program (SLERP)

COMMENT:

A public easement for the crossing of state owned submerged lands is required.

RESPONSE:

Comment acknowledged.

ATTACHMENTS:

None.

COMMENT NUMBER: I.E.5

RAI NUMBER: LNP SCA RAI-038

REQUESTING AGENCY: FDEP, Northeast District Office, Submerged Lands/Environmental Resource Program (SLERP)

COMMENT:

Please clarify the scope of wetland impacts resulting from the project. Please indicate if impacts are temporary or permanent and if they are in forested or non-forested wetlands. FLUCCS Code designation is fine.

RESPONSE:

Temporary and permanent wetland impacts to forested and non-forested systems have been estimated based on GIS FLUCCS data for the LNP site in Table 1 of the ERP application (SCA Appendix 10.4; SCA Volume 6). This table also includes a conservative estimate of potential impacts for the rail, onsite transmission lines, access roads, and makeup and blowdown pipelines based on potential ROWs within the overall corridors in which these facilities will be located. Once onsite wetland lines recently field verified by FDEP staff are surveyed and the actual offsite ROW alignments of the transmission line, rail, access roads, and pipelines are determined, the actual impact values will be updated with the associated mitigation proposed. ERP Attachment B (SCA Appendix 10.4; Volume 7), Table 3 provides estimated wetland impacts for the offsite transmission system based on conceptual ROW alignment.

ATTACHMENTS:

None.

COMMENT NUMBER: I.E.6

RAI NUMBER: LNP SCA RAI-039

REQUESTING AGENCY: FDEP, Northeast District Office, Submerged Lands/Environmental Resource Program (SLERP)

COMMENT:

Please provide a mitigation plan that will adequately offset the proposed amount of wetland impacts for the entire project. Provide a detailed description of restoration, enhancement, or creation activities that are proposed. If credits are going to be purchased from mitigation banks servicing the affected areas, credit reservation letters must be submitted prior to the issuance of a permit. Credits must be sought from banks servicing the basins in which the impacts occur.

RESPONSE:

A mitigation plan to compensate for unavoidable impacts to wetlands resulting from the entire project is being developed and will be implemented in accordance with all applicable requirements of agencies with jurisdiction over such issues. Details of the mitigation plan will be provided upon finalization of specific routes for the associated linear facilities, which include pipelines, access roads, transmission, and railroad facilities. Unavoidable wetland impacts associated with these facilities will be characterized and quantified in accordance with the UMAM, Rule 62-345, F.A.C. Results of the UMAM assessments will serve as the basis of the detailed mitigation plan.

The wetland mitigation plan is expected to consist of a combination of onsite and offsite wetland enhancement, restoration, and preservation measures. Onsite wetland impacts will be mitigated onsite to the extent practicable. Approximately 1,200 acres of onsite wetlands will be undisturbed by construction activities. These communities can be enhanced and restored in combination with upland buffer enhancement. Onsite ecological communities have been disturbed through decades of silvicultural activities, including logging, planting, fire suppression, and hydrologic modifications. Enhancement and restoration activities can consist of prescribed burns where practicable, thinning of existing vegetation, and grading as appropriate for wetlands and adjacent upland areas. These wetland and upland communities will be placed under a conservation easement for resource protection in perpetuity.

Where estimated mitigation needs exceed onsite resources, additional mitigation will be provided through offsite restoration and enhancement. This will consist of restoration and enhancement of offsite wetland communities and/or purchase of credits from a permitted mitigation bank. Section 373.4136(6)(d)2, F.S., and Rule 62-342.600(4), F.A.C. authorize

PEF to use a mitigation bank to mitigate wetland impacts outside of that mitigation bank's Mitigation Service Area, including in a different drainage basin, when the specified conditions are met.

ATTACHMENTS:

None.

COMMENT NUMBER: I.F General Comment

RAI NUMBER: LNP SCA RAI-040

REQUESTING AGENCY: FDEP, Northeast District Office, Waste Management Program Solid Waste Section

COMMENT:

Based on the review of the application, the following discrepancies were noticed.

RESPONSE:

The responses to FDEP's specific comments are provided in the following RAIs:

LNP SCA RAI-041 (I.F.1)
LNP SCA RAI-042 (I.F.2)

ATTACHMENTS:

None.

COMMENT NUMBER: I.F.1

RAI NUMBER: LNP SCA RAI-041

REQUESTING AGENCY: FDEP, Northeast District Office, Waste Management Program Solid Waste Section

COMMENT:

The application states, "Levy County operates a Class I Solid Waste Management Facility located north of the LNP site and approximately 3 mi. southeast of the Town of Bronson to serve the entire county area including the incorporated areas. Between 2001 and 2005 Levy received an average of 27,758 tons of material to landfill annually (FDEP's 2005 Solid Waste Annual Report). The Levy County Comprehensive Plan notes that the facility is at 49 percent of design capacity and is not anticipated to reach full capacity until 2020, allowing the facility to accommodate the limited amounts of solid waste generated at LNP for local disposal."

Please note, while Levy County has active Class I Solid Waste Transfer Station and Class III landfill at the above-referenced Facility, the Class I landfill is in the process of closure construction under DEP Permit Number 0018490-004-SF.

RESPONSE:

The Levy County Class I landfill no longer accepts solid waste and all Class I solid waste is sent to the FDEP-permitted transfer station located at the Levy County Solid Waste Management Facility and subsequently transferred to an FDEP permitted Class I landfill facility outside of the county. The non-construction and non-demolition solid waste generated at LNP for offsite disposal will also be taken to the transfer station and disposed of outside the county at the Class I landfill facility with which Levy County has a contract. The Levy County Class III landfill is still in operation and will continue to accept Class III solid waste (construction and demolition debris only).

ATTACHMENTS:

None.

COMMENT NUMBER: I.F.2

RAI NUMBER: LNP SCA RAI-042

REQUESTING AGENCY: FDEP, Northeast District Office, Waste Management Program Solid Waste Section

COMMENT:

The application states, "Solid waste generated during construction will be disposed of in an approved upland disposal facility. Construction waste may be taken to a temporary on-site spoils area prior to for off-site disposal." (Sections 4.10.1.3 and 4.10.2.3)

However, according to Rule 62-701.300(1)(a) FAC, "No person shall store, process, or dispose of solid waste except at a permitted solid waste management facility or a facility exempt from permitting under this chapter." Therefore, in order to evaluate the necessity of permitting a temporary on-site temporary storage area, additional information concerning the process and storage procedures, including the maximum length of storage at the temporary on-site spoils area is needed.

RESPONSE:

Waste containers will be stored in the staging area onsite for loading with non-hazardous construction debris. Construction waste materials will be placed in these roll-off type containers as they are generated. Full containers will be taken to the offsite FDEP-permitted Class III - Construction and Demolition Debris facility for disposal on a routine basis. These containers will be used only for temporary storage and will only be onsite until the next scheduled container pickup date. It is anticipated that the maximum length of temporary storage will be less than 30 days.

ATTACHMENTS:

None.

II. FDEP - SWD

COMMENT NUMBER: II.1

RAI NUMBER: LNP SCA RAI-043

REQUESTING AGENCY: FDEP, Southwest District Office (SWD)

COMMENT:

Please revise the aerial surveys, to include the following:

- Clearly show the proposed haul road, pipe line, and rail spur corridors on aerial photos. The photos should be scaled at 1:400 or less.
- Show the limits of any wetlands located within the proposed corridors and the FLUCCS codes that correspond to each wetland.

RESPONSE:

PEF is seeking certification of corridors for the heavy haul road, pipeline, and rail spur. As such, specific ROW width and design details will not be finalized until after the corridors are certified. The ROW and design details will affect the extent of impacts on wetlands.

PEF has been working with state and federal agencies to define the jurisdictional extent of potentially affected wetlands. Wetland FLUCCS mapping is provided in the ERP application included as SCA Section 10.4. The ERP application also includes aerial photography. More detailed information will be provided following the completion of jurisdictional determinations and land surveying.

PEF will agree to a condition of certification requiring the post-certification submittal of the detailed design information, including wetland impacts and mitigation plans, to the FDEP, as authorized by Section 403.5113(2), F.S. and Rule 62-17.191 F.A.C. Once plans are finalized and wetlands delineated, PEF can provide the requested larger scale aerial photos of the defined ROWs with jurisdictional wetlands and associated FLUCCS codes, subject to conditions of certification.

ATTACHMENTS:

None.

COMMENT NUMBER: II.2

RAI NUMBER: LNP SCA RAI-044

REQUESTING AGENCY: FDEP, Southwest District Office (SWD)

COMMENT:

Once the wetlands are delineated and the boundaries are approved by Department staff. Provide a table that shows the potential wetland impacts (in square feet or acres). The table should include the types of wetlands impacted using FLUCCS codes and whether the impacts will be temporary or permanent. Refer to Chapter 62-343.900(1), Section E, Florida Administrative Code (F.A.C.).

RESPONSE:

The existing wetlands on the site have been field delineated and approved by FDEP staff. PEF is in the process of performing a land survey of these wetlands. Once this has been completed, Table 1 of the ERP (SCA Appendix 10.4; Volume 6) will be updated and provided to FDEP to show the total wetland area, the permanent impact area, the temporary impact area, and undisturbed area.

ATTACHMENTS:

None.

COMMENT NUMBER: II.3

RAI NUMBER: LNP SCA RAI-045

REQUESTING AGENCY: FDEP, Southwest District Office (SWD)

COMMENT:

Turbidity and sediments must be controlled to prevent violations of water quality pursuant to Rule 62-302.500, 62-302 .530(70) and 62-4.242, FAC. Best Management Practices, as specified in the Florida Stormwater, Erosion and Sedimentation Control Inspectors Manual, shall be installed and maintained at all locations where there is possibility of transferring suspended solids into wetlands and/or surface waters due to the permitted activity. If site-specific conditions require additional measures, then the Applicant shall implement them as necessary to prevent adverse impacts to wetlands and/or surface waters. The location of erosion control barriers must be shown on plan view drawings and the specific soil stabilization methods to be used at each site must be described. Erosion control and soil stabilization methods should be included on the plan and cross sectional view drawings required in condition number one above. Refer to the Southwest Florida Water Management District Basis of Review (B.O.R.) Chapter 3.2.4.1.

RESPONSE:

PEF will control sediments and turbidity in accordance with the referenced rules. The Site Grading, Storm Water, and Erosion Control Plans that have been developed for the site take into account the limits of disturbance. Appropriate erosion control measures will be placed around the perimeter of disturbance of the site and roads to protect the wetlands during construction.

PEF is seeking certification of corridors for the heavy haul road, pipeline, and rail spur. As such, specific ROW width and design details will not be finalized until after the corridors are certified. The ROW and design details will address erosion control soil stabilization methods. PEF will agree to a condition of certification requiring the post-certification submittal of the detailed design information, to the FDEP, as authorized by Section 403.5113(2), F.S. and Rule 62-17.191, F.A.C.

ATTACHMENTS:

None.

COMMENT NUMBER: II.4

RAI NUMBER: LNP SCA RAI-046

REQUESTING AGENCY: FDEP, Southwest District Office (SWD)

COMMENT:

In areas where temporary or permanent wetland impacts occur mitigation will be required. Provide the supporting UMAM information required in Chapter 62-345, F.A.C. Also, provide a mitigation plan for the impact areas using UMAM. In addition, a restoration plan will need to be provided for the impact areas. Refer to Chapter 62.345, F.A.C.

RESPONSE:

PEF is currently identifying proposed ROWs for railroad and transmission facilities. Upon finalization of these ROWs, supporting UMAM information, as required in Chapter 62-345, F.A.C., will be provided for all wetlands potentially impacted by project activities. Results of the UMAM evaluations of onsite wetland systems are provided in Appendix 10.4 of the SCA, ERP (Volumes 6 and 7).

Mitigation for unavoidable temporary or permanent wetland impacts will be provided in accordance with all applicable federal and state regulations. Results of the UMAM evaluations and associated mitigation and restoration plans will be provided as post-certification submittals as authorized by Section 403.5113(2) and Rule 62-17.191, F.A.C.

ATTACHMENTS:

None.

COMMENT NUMBER: II.5

RAI NUMBER: LNP SCA RAI-047

REQUESTING AGENCY: FDEP, Southwest District Office (SWD)

COMMENT:

If this project significantly degrades or is within an Outstanding Florida Waterbody (OFW), provide reasonable assurance the project is clearly in the public interest. Refer to the B.O.R. Chapter 3.1.1.

RESPONSE:

The plant and associated facilities, that are not transmission related, are not proposed to be located in, or have any impact on, any OFWs.

ATTACHMENTS:

None.

COMMENT NUMBER: II.6

RAI NUMBER: LNP SCA RAI-048

REQUESTING AGENCY: FDEP, Southwest District Office (SWD)

COMMENT:

Provide a state lands title determination from the Division of State Lands Title and Land Records Section indicating whether any portion of the project is located on sovereign submerged state lands or within an aquatic preserve. If any portion of the project is located on sovereign submerged state lands or within an aquatic preserve then the project must comply with Chapter 18-20 and 18-21 F.A.C. and Chapter 253 and 258 Florida Statutes (F.S.) and section G of the Joint Application for Environmental Resource Permits must be completed and submitted to the Department prior to construction. Refer to Chapter 62-343.900(1), Section G.

RESPONSE:

A completed copy of the Joint Application for ERP for the project, including Section G, was provided in the SCA (Appendix 10.4). This information is located in Volume 6 of the SCA.

PEF has conferred with the Division of State Lands Title and Land Records Section.

ATTACHMENTS:

None.

COMMENT NUMBER: II.7

RAI NUMBER: LNP SCA RAI-049

REQUESTING AGENCY: FDEP, Southwest District Office (SWD)

COMMENT:

Volume 2, Figure 9-A 1.2-14 shows the typical access road is 18 feet wide. Is it possible to reduce the size of the road in wetland areas? Also, the typical road height will be two feet above the seasonal high water line. To reduce the impacts to wetlands associated with access roads, would it be possible to maintain the existing natural grade? Refer to the B.O.R. Chapter 3.2.1.1.

RESPONSE:

As stated in the SCA, existing roadways, access roads, and structure pads will be used for construction and maintenance access to the transmission line where practicable. Where the new transmission line will be constructed adjacent to existing transmission ROW, improvements to the associated access roads and/or pads may be made depending on the status of the existing conditions. Access roads are necessary to provide 24-hour access to the ROW for maintenance and to compensate for the increasing difficulty in using adjacent properties to access our ROWs. The structure pads are necessary to provide a safe work area for workers to install and maintain the line. Structure pads are work areas for construction at the locations where the steel power poles will be installed in the wetlands. Construction and maintenance of a power line of this size requires the use of various types of equipment and the safety of our crews is a major concern. The sizes proposed for the access roads and structure pads are necessary to provide the construction and maintenance crews with adequate ingress/egress for large equipment and a safe, stable work area around the pole location. These pads are even more vital to the safety of our crews when working on energized transmission lines. Given the importance of this transmission line to the transmission grid in the area, much of the maintenance needed on the line will have to be conducted while the line is energized in order to maintain service to our customers.

Where adequate access roads or structure pads do not exist, new roads and pads will be constructed. These roads will be unpaved with a top elevation up to 2 feet above expected seasonal high water and a typical road surface width of 18 feet. On the past several 230-kV transmission projects that PEF has constructed, with concurrence of the regulatory agencies the decision was made to install above grade, culverted access roads versus at-grade gravel-filled roads to minimize the impacts on the wetlands. These roads are designed to

settle in the wetlands. A Geotextile fabric is laid over the existing root mat and the road built on top of it. This eliminates the need to demuck in the wetland and retains the subsurface flow of water to maintain the connections between both sides of the wetlands rather than having a solid road bed entirely through the wetland. PEF will not demuck any of the wetlands during construction of the access roads or structure pads. With above grade access roads, access to the line is maintained even in high water conditions. After heavy storm events at grade access roads may not be accessible due to high levels of water.

As the final route is selected and the ROW needs are determined, PEF will review the placement of access roads to avoid and minimize impacts to the wetlands as required by the B.O.R. Chapter 3.2.1.1. PEF will agree to a condition of certification requiring the post-certification submittal of the detailed design information, including wetland impacts and mitigation plans, to the FDEP, as authorized by Section 403.5113(2), F.S., and Rule 62-17.191, F.A.C.

ATTACHMENTS:

None.

COMMENT NUMBER: II.8

RAI NUMBER: LNP SCA RAI-050

REQUESTING AGENCY: FDEP, Southwest District Office (SWD)

COMMENT:

Volume 6, the construction drawings shows the make-up and blowdown lines corridor adjacent to the heavy haul road. To reduce impacts is it possible to locate the pipes under the heavy haul road? Refer to the B.O.R. Chapter 3.2.1.1.

RESPONSE:

Placement of pipelines under the heavy haul road creates structural concerns based on the significant loads that will be transported along this road. Also, the construction delivery schedule requires the heavy haul road to be available before the pipeline work can be completed. Once deliveries begin, construction cannot be sequenced to allow for installation of the pipelines under the heavy haul road. For these reasons, the pipelines have been designed to be as close to the heavy haul road as possible to minimize impacts.

ATTACHMENTS:

None.

COMMENT NUMBER: II.9

RAI NUMBER: LNP SCA RAI-051

REQUESTING AGENCY: FDEP, Southwest District Office (SWD)

COMMENT:

Will the heavy haul road remain in use after the LNP's construction or is the road temporary? Refer to the B.O.R. Chapter 3.2.3.

RESPONSE:

The heavy haul road is intended primarily to support LNP's construction; however, after initial construction, the heavy haul road will be maintained to support the refurbishment of LNP components that may require heavy equipment hauling and to support future plant operations.

ATTACHMENTS:

None.

COMMENT NUMBER: II.10

RAI NUMBER: LNP SCA RAI- 052

REQUESTING AGENCY: FDEP, Southwest District Office (SWD)

COMMENT:

To ensure that flooding does not occur, provide documentation that the size, number, and placement of the culverts associated with the heavy haul road is appropriate. Refer to the B.O.R. Chapter 4.2.

RESPONSE:

See Section 5.11 of Storm Water Management Report (Attachment A.7 to Appendix 10.4 found in Volume 6 of the SCA) for Culvert Design computations. This includes culverts under the heavy haul road and access roads, all of which will be private roads owned by PEF. See Site Grading, Stormwater and Erosion Control Plans for the size, number, and placement of the culverts (SCA Appendix 10.4, Volume 6).

ATTACHMENTS:

None.

COMMENT NUMBER: II.11

RAI NUMBER: LNP SCA RAI- 053

REQUESTING AGENCY: FDEP, Southwest District Office (SWD)

COMMENT:

To ensure that the haul road does not have contaminated runoff show a vegetated swale on either side of the road. Refer to the B.O.R. Chapter 5.1.

RESPONSE:

A vegetated swale will be constructed on both sides of the heavy haul road. See SCA Appendix 10.4, Volume 6, Section 5.10 of the Storm Water Management Report for information on vegetated swales. See Appendix 10.4, Volume 6, for the Site Grading, Stormwater and Erosion Control Plans for proposed locations for vegetated swales.

ATTACHMENTS:

None.

COMMENT NUMBER: II.12

RAI NUMBER: LNP SCA RAI-054

REQUESTING AGENCY: FDEP, Southwest District Office (SWD)

COMMENT:

In volume 6 and 7 of the application, are the UMAM scores solely for the impacts associated with the LNP? Or, do the UMAM scores include the pipe line, rail spur, and heavy haul road corridor impacts? Please show the locations of the scored wetlands on an aerial photo and contact Greg Nieboer at (813) 632-7600 for an onsite verification of the UMAM scores. Refer to Chapter 63-345, F.A.C.

RESPONSE:

The UMAM scores in the ERP application (SCA Volumes 6 and 7) reflect wetlands on the LNP site, the heavy haul road, and those portions of the makeup and blowdown pipeline and transmission corridors located in Levy County north of the CFBC. Locations of these wetlands are shown in the aerial photograph attached. These areas are in the Northeast District of the FDEP, and, in accordance with Siting Coordination Office direction, the Northeast District will be contacted for verification of UMAM scores in these areas.

PEF is seeking certification of corridors for the portions of the pipeline and rail spur located within the boundary of the FDEP Southwest District. As such, specific ROW width and design details will not be finalized until after the corridors are certified. PEF will agree to a condition of certification requiring the post-certification submittal of the detailed design information, to the FDEP, as authorized by Section 403.5113(2), F.S. and Rule 62-17.191, F.A.C.

ATTACHMENTS:

See the following aerial photo.

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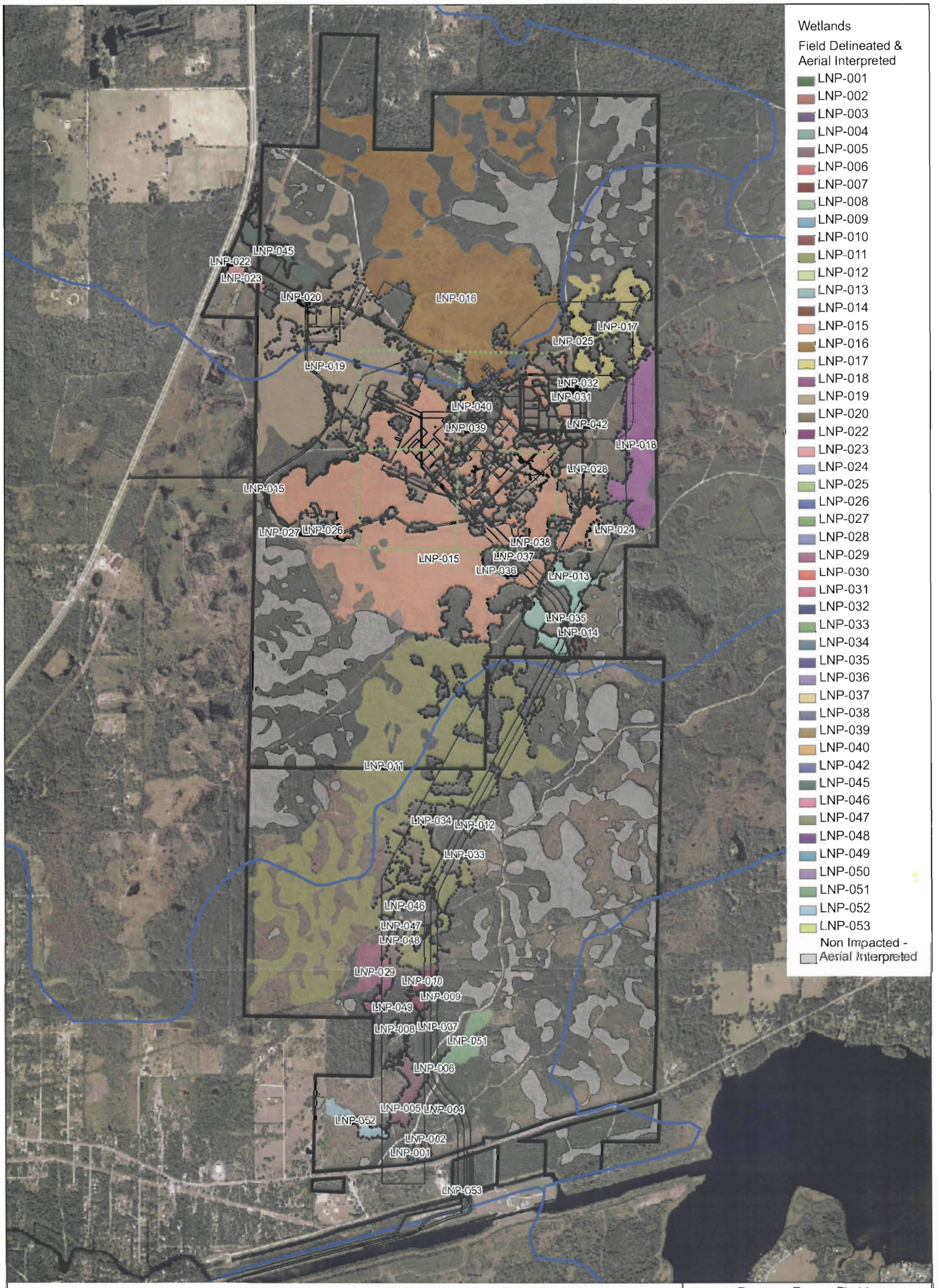


LEGEND

- Wetland Flag
- LNP Associated Facility
- Quad Grid
- Drainage Basin
- PEF Property Boundary

N W E S

0 250 500
Meters

0 1,000 2,000
Feet

Progress Energy Florida

Levy Nuclear Plant
Units 1 and 2
Site Certification Application

Florida Department of Environmental Protection
Formal Wetlands Delineation Area
FIGURE LNP SCA RAI-054 A1 Rev 0

File Path: I:\projects4\Progress_Energy_FL\MXD\UMAM_Wetland_Delineation_Area_ID2036.mxd, Date: August 8, 2008, User: HHardester

COMMENT NUMBER: II.13

RAI NUMBER: LNP SCA RAI-055

REQUESTING AGENCY: FDEP, Southwest District Office (SWD)

COMMENT:

Are the wetlands associated with the construction of the Haul Road, Rail Spur, and Pipeline going to be delineated by the Wetlands Evaluation and Delineation Section (WEDS) in Tallahassee? If not, please contact the SW District Greg Nieboer at (813) 632-7600 for an onsite verification of the wetland lines. Please flag the wetland lines before the onsite verification. Refer to Chapter 63-340, F.A.C.

RESPONSE:

Based on directions from the FDEP Siting Office, the Wetlands Evaluation and Delineation Section and/or the FDEP Northeast District will conduct the jurisdictional determination of wetlands associated with construction of the Haul Road, Rail Spur, and Makeup and Blowdown pipelines within Levy County.

When the final ROW is determined for the portions of the blowdown pipeline and rail spur in Citrus County and/or Marion County, a wetland delineation will be conducted, wetland lines flagged, and the WEDS and/or SWD contacted for onsite verification of the wetland boundaries.

ATTACHMENTS:

None.

COMMENT NUMBER: II.14

RAI NUMBER: LNP SCA RAI-056

REQUESTING AGENCY: FDEP, Southwest District Office (SWD)

COMMENT:

What are the largest size vessels that use the Inglis Lock Bypass Channel? Provide cross-sectional drawings showing the height of the bridges above mean high water. Provide reasonable assurance that the bridges over the Inglis Lock Bypass Channel will not be a navigational hazard. Refer to the B.O.R. Chapter 3.2.3.1.

RESPONSE:

The existing bridge into the Inglis Lock facility has a vertical clearance over the Inglis Lock Bypass Channel mean high water of approximately 3 inches. The Inglis Lock Bypass Channel is not meant to be navigable and is posted for no boating. See the attached photographs.

ATTACHMENTS:

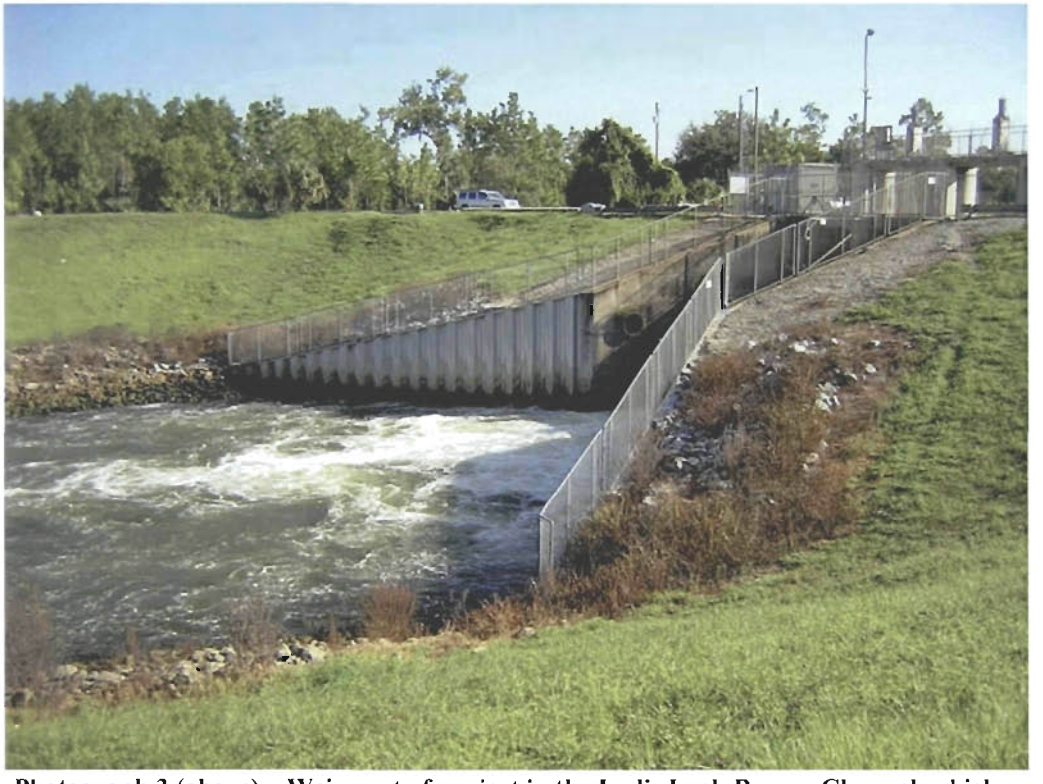
See the following photos.

Photographs of the Inglis Lock Bypass Channel

Photograph 1 (above) - View northwest from the Inglis Lock Bypass Channel crossing east of the project providing a view of the location of the proposed access road and bridge.

Photograph 2 (below) - View of existing eastern crossing, which has culverts to provide a barrier to navigation.

Photographs of the Inglis Lock Bypass Channel



Photograph 3 (above) –Weir west of project in the Inglis Lock Bypass Channel, which provides a barrier to navigation.

Photograph 4 (below) – No boating sign posted along Inglis Lock Bypass Channel.

COMMENT NUMBER: II.15

RAI NUMBER: LNP SCA RAI-057

REQUESTING AGENCY: Florida Department of Environmental Protection (FDEP), Southwest District Office (SWD)

COMMENT:

Provide a cross-sectional detail for the boat slip and earthern berm removal. Include water depths, mean high water level, and mean low water level. Refer to Chapter 62-343.900(1), Section E.

RESPONSE:

The proposed site plan, including portions of the boat slip within waters of the state and earthen berm removal details, are currently at what is considered to be "30% design." Final design details and specifications may not be finalized until after the site is certified. A separate ERP application has been submitted to the Northeast District that will allow for construction of the upland portions of the barge slip/access ramp, access road, and bridge south of CR 40.

ATTACHMENTS:

None.

COMMENT NUMBER: II.16

RAI NUMBER: LNP SCA RAI-058

REQUESTING AGENCY: FDEP, Southwest District Office (SWD)

COMMENT:

A barge slip and ramp are referred to in the narrative and throughout the permit application. It is stated that these structures will be permitted separately. Are they going to be permitted through an Environmental Resource Permit (ERP) separate from the Sitting Act? If so, when will the ERP application be submitted to the S.W. District? If they are going to be permitted through the Siting Act please provide a detailed plan view and cross-sectional view drawing of the slip and ramp.

RESPONSE:

Portions of the barge slip and ramp, located within the Northeast District, are being permitted through a separate ERP application which has been submitted to Northeast District. This separate permit will allow for construction of the upland portions of the barge slip/access ramp and access road and bridge south of CR 40. The minor excavation within waters of the state required to connect the slip to the CFBC will occur as part of this SCA and is covered in the ERP application included as SCA Appendix 10.4 (SCA Volumes 6 and 7).

ATTACHMENTS:

None.

COMMENT NUMBER: II.17

RAI NUMBER: LNP SCA RAI-059

REQUESTING AGENCY: FDEP, Southwest District Office (SWD)

COMMENT:

The development is in a flood plain but no flood plain compensation was provided, as is required in Chapter 4.4 of the SWFWMD B.O.R. The increase in stage due to loss in storage is stated to be 0.44 inches. Does this mean 0.44 inches over the entire project area? Why was flood plain compensation not provided? Refer to 40D-4.301, F.A.C., and the Southwest Florida Water Management District Environmental Resource Permit Information Manual, Management and Storage of Surface Waters, Part B, Basis of Review (BOR).

RESPONSE:

The SWFWMD Basis of Review (B.O.R.) requires no net encroachment into the 100-year flood plain, which will adversely affect conveyance, storage, water quality, or adjacent lands. The FIRM appears to be based on wetland and soil features visible on aerial photographs. There are no FIRM-identified floodplain elevations and boundaries are estimated. There are no creeks, streams, or other similar channels on the property. The native landscape has been severely altered by ridges and furrows used for the silviculture activities so overland flows are disrupted and slowed significantly. Also refer to the response to LNP SCA RAI-009 (I.C.2) for discussion regarding floodplain elevations. The following points of information are applicable to this response:

- Conveyance: Pipes will maintain conveyance and drainage patterns across the roadways. No new channels or ditches will be constructed to move runoff offsite. Flow will be maintained as overland flow as much as possible.

- Storage: Storage will be maintained in the wetland slough and by the proposed wet detention ponds onsite. Within the wetland slough, the 0.44-inch depth represents an approximate estimate of the maximum stage increase over the entire site assuming no benefits from stormwater impoundment that would be provided onsite through wet ponds, dry swales and dry detention areas. Refer to Section 5.3 through 5.10 of the Storm Water Management Report (Volume 6 of the SCA). The projected rise of less than ½-inch can easily be accommodated in the landscape, furrows and existing wetlands on the area not being developed (approximately 2,200 to 2,500 acres). Compensating storage was therefore not identified as being needed because there is no established floodplain elevation onsite and there are no estimated impacts to adjacent properties.

- Water Quality: Water quality has been addressed by compliance with B.O.R. Chapter 5.
- Adjacent Lands: No impact to adjacent lands is expected because there are no streams or creeks leaving the property. Also there are no residential subdivisions or other developments adjacent to the site that would be affected by such a small increase in water depth across the site.

ATTACHMENTS:

None.

III. FDEP - OGT

COMMENT NUMBER: III.A.1

RAI NUMBER: LNP SCA RAI-060

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Public access to public lands should remain intact as well as OGT's access to our managed property for maintenance purposes. Need clarification on this issue in locations where construction and development by Progress will occur.

RESPONSE:

It is not PEF's intent to restrict public access to public lands, except as necessary to protect the safety of the public. PEF will continue to work with OGT staff to address concerns related to impacts on OGT-managed lands from the design, construction, and operation of the project's facilities.

ATTACHMENTS:

None.

COMMENT NUMBER: III.A.2

RAI NUMBER: LNP SCA RAI-061

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Co-location of all linear facilities constructed by PE would be desirable. Some of their proposed locations show facilities running parallel in separate locations. A reduction in the overall footprint and impact to state lands is our request.

RESPONSE:

The current design incorporates as much co-location as possible in the design and construction of utilities. Separation for certain utilities is required by state and federal standards. Utilities also cannot be placed under the heavy haul road.

PEF will continue to work with OGT staff to address concerns related to impacts on OGT-managed lands from the design, construction, and operation of the project's facilities.

ATTACHMENTS:

None.

COMMENT NUMBER: III.A.3

RAI NUMBER: LNP SCA RAI-062

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

It is unclear as to precisely which lands and how many acres of state-owned lands will be impacted by PE. This makes it difficult for the state to ascertain exactly what PE should provide in exchange (to offset the impacts to state lands).

RESPONSE:

Evaluations are ongoing related to more detailed determination of impacted state-owned lands. PEF will continue to work with FDEP, OGT, and SWFWMD staff to address concerns related to impacts on state-owned and managed lands due to the design, construction and operation of facilities related to this project.

ATTACHMENTS:

None.

COMMENT NUMBER: III.A.4

RAI NUMBER: LNP SCA RAI-063

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

We believe that PE's land ownership is now different than what is depicted in the application. (They have gained additional ownership.) This information needs to be available as we negotiate offsets to state lands.

RESPONSE:

Figure LNP SCA RAI-063 A1 is attached to this response to illustrate PEF's property holdings adjacent to the LNP site.

ATTACHMENTS:

Please see following figure.

N
W E
S

LEGEND

LNP SITE

ADJACENT PEF PROPERTY

0 1 Mile
SCALE IS APPROXIMATE

Progress Energy Florida

Levy Nuclear Plant
Units 1 and 2
Site Certification Application

SCA Comment Response

FIGURE LNP SCA RAI-063 A1 Rev 0

\\Odin\Groups\Publications\~JMS-2008\NU_2008\NU012008001RDD\LNP SCA RAI-063 A1.pdf; Date:8/8/08; Tech:HRobertson

COMMENT NUMBER: III.A.5

RAI NUMBER: LNP SCA RAI-064

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Need exact location of PE's proposed rail corridor.

RESPONSE:

The proposed corridor to be certified for the rail spur is depicted in multiple figures located in Chapter 3 of the SCA. PEF is seeking certification of a corridor for the proposed rail spur. As such, specific ROW location, width, and design details will not be finalized until after the corridors are certified.

It should be noted that the proposed rail spur corridor does not impact OGT-managed lands.

ATTACHMENTS:

None.

COMMENT NUMBER: III.B.1

RAI NUMBER: LNP SCA RAI-065

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

For off loading heavy equipment, power units, and construction materials. No mention of request to moor barges at the existing mooring dolphins, wing wall of Inglis Lock or in canal near site. If multiple barges show up to off load, they will have to park some where. Where will the tugs/barges moor?

RESPONSE:

The intent is to deliver one barge at a time. However, conditions could arise where more than one barge is in the CFBC at a given time. In such a case, it is not anticipated that the existing mooring dolphins or wing wall would be used. The additional barge/tugs would be docked outboard of the first barge in the slip.

ATTACHMENTS:

None.

COMMENT NUMBER: III.B.2

RAI NUMBER: LNP SCA RAI-066

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Will the water area become a security area? (i.e. preclude the public? If so, for how long and where exactly?

RESPONSE:

PEF does not expect that any of the OGT lands will become part of any nuclear security area. Portions of PEF facilities within OGT-managed lands will require fencing to protect public safety. PEF will continue to work with OGT staff to address concerns related to impacts on OGT-managed lands from the design, construction, and operation of the project's facilities. For safety reasons, all appropriate areas associated with the intake structure on the CFBC will be fenced to preclude any danger to the public.

ATTACHMENTS:

None.

COMMENT NUMBER: III.C

RAI NUMBER: LNP SCA RAI-067

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

There will be four 54" diameter intake pipes (2 per power unit) buried 5' below grade. The power units will require 198.1 cubic feet per second of intake water for cooling. In contrast, this is twice the typical flow coming down the Withlacoochee River below the Inglis dam from seepage leakage.

RESPONSE:

Comment acknowledged. See response to LNP SCA RAI-068 (III.C.1).

ATTACHMENTS:

None.

COMMENT NUMBER: III.C.1

RAI NUMBER: LNP SCA RAI-068

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Water in the barge canal will increase in salinity. This may then impact the fresh water ecosystem in the river with the higher salt concentrations. Need analysis of this.

RESPONSE:

The potential changes in water quality and aquatic organism communities in the upper CFBC and the old Withlacoochee River channel below the Inglis Dam will be evaluated following the analysis of water quality and biological samples collected in the old river channel in July 2008 and in the CFBC in the fall and early winter of 2007 and quarterly through the fall in 2008. Biological and water quality data showing the existing conditions will be used as the basis for predicting future changes in water quality and aquatic ecosystems due to the projected cooling tower makeup water withdrawals. Potential changes to water quality will be predicted using modeling that considers the past and potential releases of freshwater from the Inglis Dam. These analyses are scheduled to be completed in late fall 2008.

Water quality within Lake Rousseau, the Inglis Lock Bypass Channel, and the lower Withlacoochee River will not be impacted by cooling water withdrawal within the CFBC.

ATTACHMENTS:

None.

COMMENT NUMBER: III.C.2

RAI NUMBER: LNP SCA RAI-069

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Public access across OGT facilities must be maintained. Unclear how this will be accomplished.

RESPONSE:

It is not PEF's intent to restrict public access to public lands, except as necessary to protect the safety of the public. PEF will continue to work with the OGT staff to develop an acceptable arrangement related to PEF's activities on OGT-managed lands.

ATTACHMENTS:

None.

COMMENT NUMBER: III.C.3

RAI NUMBER: LNP SCA RAI-070

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Crosses Bypass Canal on top of proposed 33' wide bridge. So the pipes will rise up out of the ground and then back into the ground each side of the Bypass Canal. How do we get our east / west access for maintenance and trails on both the north and south sides of the canal? (Need specifics on this plan.)

RESPONSE:

After installation of the utility pipes in trenches on both sides of the Utility Bridge, the trenches will be back filled and the ground graded to finished grade. Maintenance access trails (east to west on both sides of the Inglis Lock Bypass Channel) will be provided over the buried pipes. It is PEF's intent to maintain OGT staff access to managed lands. PEF will continue to work with OGT staff to address concerns related to impacts on OGT-managed lands from the design, construction, and operation of the project's facilities.

ATTACHMENTS:

None.

COMMENT NUMBER: III.C.4

RAI NUMBER: LNP SCA RAI-071

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Grates have screens that will pass small fish. Fish and Wildlife review of impacts here?

RESPONSE:

Florida Fish and Wildlife Conservation Commission has reviewed the SCA application.

The proposed LNP CWIS is designed with 4-inch bar screens to prevent larger aquatic organisms and debris from entering the intake forebay. Behind the bars screens and at the back of the intake forebay, water will be screened by 3/8-inch square mesh vertical traveling screens. Impingement of organisms of a size that would be retained on a 3/8-inch mesh screen will be minimized by the design of the CWIS forebay to assure less than 0.5 fps through-screen velocities. This low velocity design, which meets the screen velocity requirements of the 316(b) Phase I regulations, also results in approach velocities at the front of the 3/8-inch mesh screens that are approximately ½ of the through-screen velocities, or approximately 0.25 fps. This very low approach velocity will allow for healthy motile aquatic organisms to avoid impingement by simply swimming away from the face of the traveling screens when encountered.

Fish smaller than the 3/8-inch mesh size may be entrained into the cooling tower system make-up water. As noted in Section D, 10.02.1, 316(b) Demonstration of the SCA, additional analyses of the potential effects of entrainment on the aquatic system of the CFBC will be performed upon completion of on-going ichthyoplankton sampling at multiple sampling stations in the CFBC. This sampling is intended to provide current data on the current use of the CFBC by ichthyoplankters and will allow for predictions of potential impacts of water withdrawals of the proposed LNP CWIS on the fish community.

ATTACHMENTS:

None

COMMENT NUMBER: III.C.5

RAI NUMBER: LNP SCA RAI-072

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

It appears the grating system has an automatic cleaning system that dumps debris into bins that are then transferred to a fenced off site. How large is this fenced area and how often will container be dumped?

RESPONSE:

The intake structure is in the preliminary stages of design and is considered to be at the "30% design" stage. At this time, it is anticipated that debris will be collected and temporarily stored in containers within a fenced area. At regular intervals, this debris will be removed and disposed of in an approved offsite disposal facility. The size of this temporary storage area and the disposal interval will be determined as the design is finalized. PEF will continue to work with OGT staff to address concerns related to impacts on OGT-managed lands from the design, construction, and operation of the project's facilities.

ATTACHMENTS:

None.

COMMENT NUMBER: III.C.6

RAI NUMBER: LNP SCA RAI-073

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Why does the piping system not stay adjacent to the transmission corridor versus pulling away to the east which means they will be using more OGT property? The corridor north of the CR40 is 1,000' wide, it has an extra 260' on the east side for future transmission lines. Would those lines impact state lands?

RESPONSE:

The overall alignment of the facilities proposed for the barge canal area, cooling water intake structure/intake piping, cooling tower blowdown discharge piping, barge slip/access road, and the transmission lines are somewhat interdependent on each other. The transmission line cannot run directly overhead of any of the other facilities due to safety and operational considerations. In addition, the location of the barge slip and the cooling water intake structure must not interfere with each other. In addition, the heavy haul road and utility corridors have been intentionally separated north of the bypass canal in order to avoid wetlands. As stated in the SCA, PEF has proposed to collocate the four 500-kV transmission lines exiting the LNP in the Levy/Citrus Common Corridor. For a portion of the corridor, a 69-kV transmission line will also be collocated within the Common Corridor. The Levy/Citrus Common Corridor is a mile wide and approximately 5 miles in length, beginning at the LNP Boundary and extending south to County Road 488. Within this corridor, PEF will locate a ROW for the four 500-kV transmission lines and for a portion the 69-kV transmission line. The final ROW width for these transmission lines has not yet been determined. The SCA contains figures of typical ROW cross section for the transmission line ROW north of County Road 40 (1,000 ft. wide) and south of County Road 40 (705 ft. and 670 ft. wide, depending on whether the 69-kV line is located within the ROW). A list of figures in which these typical ROW widths are shown is set forth in the following table:

	North of CR 40 Figures	South of CR 40 Figures
LPC	9-A1.2-3, 9-A1.2-4, 9-A1.2-5, 9-A1.2-6	9-A1.2-7, 9-A1.2-8, 9-A1.2-9, 9-A1.2-10
LCR	9-A2.2-3, 9-A2.2-4, 9-A2.2-5, 9-A2.2-6	9-A2.2-7, 9-A2.2-8, 9-A2.2-9, 9-A2.2-10
LCFS	9-A3.2-3, 9-A3.2-4, 9-A3.2-5, 9-A3.2-6	9-A3.2-7, 9-A3.2-8, 9-A3.2-9, 9-A3.2-10

There are no plans at this time for any additional transmission lines from the site or any additional impacts to state lands. The certification being sought in this proceeding will not authorize PEF to place any future transmission lines across state lands.

PEF will continue to work with OGT staff to address concerns related to impacts on OGT-managed lands from the design, construction, and operation of the project's facilities.

ATTACHMENTS:

None.

COMMENT NUMBER: III.C.7

RAI NUMBER: LNP SCA RAI-074

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Below CR40, the corridor drops down to 670' wide to Inglis Inland where it picks up the existing 69kV line, widening back to 705'. So is PEF requesting 1,000' through our lock site and thru Inglis Island? At the area west of the lock, there is an extra 260' not utilized the water piping could be run straight to the canal instead of spreading out the location. Need clarification and explanation for occupying so much space here.

RESPONSE:

The overall alignment of the facilities proposed for the barge canal area, cooling water intake structure/intake piping, cooling tower blowdown discharge piping, barge slip/access road, and the transmission lines are interdependent. The transmission line cannot run directly overhead of any of the other facilities due to safety and operational considerations. In addition, the location of the barge slip and the cooling water intake structure must not interfere with each other.

PEF is seeking certification of corridors for the transmission lines associated with LNP Unit 1 and LNP Unit 2. As such, design details such as ROW location within the corridor, width of ROW, structure locations, structure heights, access road locations, and in some instances, conductor configuration, will not be finalized until after the corridors are certified. The figures included in the SCA for this area--9-A1.2-7, 9-A1.2-8, 9-A1.2-9, 9-A1.2-10, 9-A2.2-7, 9-A2.2-8, 9-A2.2-9, 9-A2.2-10, 9-A3.2-7, 9-A3.2-8, 9-A3.2-9, and 9-A3.2-10--are typical configurations. The final width of the ROW for the transmission lines will not be determined until the routing study and engineering design are complete. At that time, PEF will be able to provide the final ROW needs crossing Inglis Island. PEF will agree to a condition of certification requiring the post-certification submittal of the detailed design information, including ROW width and location across state lands, to the FDEP OGT, as authorized by Section 403.5113(2), F.S., and Rule 62-17.191, F.A.C.

PEF will continue to work with OGT staff to address concerns related to impacts on OGT managed lands from the design, construction and operation of the project's facilities.

ATTACHMENTS:

None.

COMMENT NUMBER: III.D.1

RAI NUMBER: LNP SCA RAI-075

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Blow down pipe location on the north of canal is probably acceptable. Southern location is not acceptable and would conflict with current recreational facilities. OGT's verbal discussions with Progress may contradict the depiction in the application. Just need clarification.

RESPONSE:

The final pipeline location will be determined based on minimizing impacts to the area, including the recreational facilities on the south side of the CFBC. PEF is requesting certification of the pipeline corridor as specified in the application to provide flexibility to cross under the CFBC at the most optimal location. The final blowdown pipe route within the proposed corridor will be submitted once the design is completed. PEF will continue to work with OGT staff to address concerns related to impacts on OGT-managed lands from the design, construction, and operation of the project's facilities.

ATTACHMENTS:

None.

COMMENT NUMBER: III.D.2

RAI NUMBER: LNP SCA RAI-076

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

The proposed easement area on the Holcim property (South of Canal and West of US 19 bridge) would require an easement from Holcim (OGT also has an easement here). Would our trail or vehicle access road be closed for a period of time? What is the plan?

RESPONSE:

The comment regarding the Holcim easement is noted. The trail and vehicle access road could be restricted for short-term periods during pipeline construction. PEF will continue to work with OGT staff to address concerns related to impacts on OGT-managed lands from the design, construction, and operation of the project's facilities.

ATTACHMENTS:

None.

COMMENT NUMBER: III.D.3

RAI NUMBER: LNP SCA RAI-077

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

The north south route from the barge canal to the power plant is proposed to be on OGT managed property, west side of the existing transmission line. Why is the blow down pipeline not installed within the existing easement? No information is provided in the documents.

RESPONSE:

The existing transmission line ROW in this area is 100 ft. in width and is occupied by an existing 230-kV H-frame transmission line. There is not enough room in this 100-ft. ROW to safely construct the large diameter blowdown pipelines. A new ROW is needed adjacent to this ROW for the pipeline. The new ROW that will be needed for the pipeline will be approximately 100- to 125-ft. wide.

ATTACHMENTS:

None.

COMMENT NUMBER: III.D.4

RAI NUMBER: LNP SCA RAI-078

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Improvements can not impact the existing height of the adjacent canal berm below 33' for meeting dam failure flood control.

RESPONSE:

Any temporary impacts to flood control structures will be restored to existing conditions. PEF will continue to work with OGT staff to address concerns related to impacts on OGT-managed lands from the design, construction, and operation of the project's facilities.

ATTACHMENTS:

None.

COMMENT NUMBER: III.D.5

RAI NUMBER: LNP SCA RAI-079

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Piping will have to be below the existing 12 foot wide access road adjacent to the mechanically stabilized earthen wall (this is a flood control wall). How will this be installed without damaging the wall?

RESPONSE:

Any temporary impacts to flood control structures will be restored to existing conditions. PEF will continue to work with OGT staff to address concerns related to impacts on OGT-managed lands from the design, construction, and operation of the project's facilities.

ATTACHMENTS:

None.

COMMENT NUMBER: III.D.6

RAI NUMBER: LNP SCA RAI-080

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Blow down pipe cannot interfere with berm swale drainage system, including buried storm water pipes.

RESPONSE:

The location of existing pipes and drainage system will be identified and the new pipes will be installed above or below any existing pipes as the individual condition requires. Any impacts to existing systems or pipes will be offset. PEF will continue to work with OGT staff to address concerns related to impacts on OGT-managed lands from the design, construction, and operation of the project's facilities.

ATTACHMENTS:

None.

COMMENT NUMBER: III.D.7

RAI NUMBER: LNP SCA RAI-081

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Placement of pipes must not interfere with plans for future public boat ramp west of US 19 bridge and north of canal.

RESPONSE:

PEF will continue to work with OGT staff to address concerns related to impacts on OGT-managed lands from the design, construction, and operation of the project's facilities.

ATTACHMENTS:

None.

COMMENT NUMBER: III.D.8

RAI NUMBER: LNP SCA RAI-082

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

If construction of PE facilities, damages existing facilities, they would need to be repaired/replaced. (i.e., trails, access roads, etc.)

RESPONSE:

Precautions will be in place during construction to avoid damaging existing facilities. Any damaged facilities will be repaired. PEF will continue to work with OGT staff to address concerns related to impacts on OGT-managed lands from the design, construction, and operation of the project's facilities.

ATTACHMENTS:

None.

COMMENT NUMBER: III.E.1

RAI NUMBER: LNP SCA RAI-083

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

150' ROW seems excessive width. OGT could grant a temporary construction easement if that width is only needed for construction.

RESPONSE:

A portion of the requested easement may be required only for construction activities (refer to LNP SCA RAI-061 (III.A.2) for discussion on co-location of these facilities). Discussion regarding easements on state-owned lands is ongoing. PEF will continue to work with OGT staff to address concerns related to impacts on OGT-managed lands from the design, construction, and operation of the project's facilities.

ATTACHMENTS:

None.

COMMENT NUMBER: III.E.2

RAI NUMBER: LNP SCA RAI-084

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Why does PE need separate bridges over Bypass Canal? OGT suggests co-locating the haul road and the pipes.

RESPONSE:

The heavy haul bridge will be needed early during site preparation and well before the utility pipe bridge; these bridges are covered under two separate permitting actions. The two bridge crossings of the Inglis Lock Bypass Channel will be co-located to the greatest extent that the design allows. Also, providing a separate utility pipe bridge is appropriate for the protection of public safety.

PEF will continue to work with OGT staff to address concerns related to impacts on OGT-managed lands from the design, construction, and operation of the project's facilities.

ATTACHMENTS:

None.

COMMENT NUMBER: III.E.3

RAI NUMBER: LNP SCA RAI-085

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

No plans showing how OGT access will occur between the two canals over the haul road and pipeline corridors. Appears to block public and OGT access going east and west.

RESPONSE:

Once complete, the haul road will provide access to the boat ramp and will provide open access to the public and OGT. Access across this road will not be restricted other than during those brief periods of time when the haul road is being used for deliveries. The pipelines will be buried in this area and will not cause any impediments to east/west access by either the public or OGT.

ATTACHMENTS:

None.

COMMENT NUMBER: III.E.4

RAI NUMBER: LNP SCA RAI-086

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Bridge cuts off boat access for aquatic plant control in the bypass canal due to the low clearance. Needs to be addressed.

RESPONSE:

PEF will work with OGT staff to provide a nearby alternate point of access to facilitate aquatic plant control. PEF will continue to work with OGT staff to address concerns related to impacts on OGT-managed lands from the design, construction, and operation of the project's facilities.

ATTACHMENTS:

None.

COMMENT NUMBER: III.F.1

RAI NUMBER: LNP SCA RAI-087

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

The construction of the pipeline corridors and haul road occur in an area occupying storage and materials which would need to be relocated in nearby vicinity. If PE intends to use this area, OGT would require new storage areas.

RESPONSE:

PEF will continue to work with OGT staff to address concerns related to impacts on OGT-managed lands from the design, construction, and operation of the project's facilities.

ATTACHMENTS:

None.

COMMENT NUMBER: III.F.2

RAI NUMBER: LNP SCA RAI-088

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Regarding the fueling, disposal and refilling of nuclear materials – are they being shipped to the site by rail or barge? If barge off loading is used, how would this impact the Cross Florida Greenway and Public lands?

RESPONSE:

Nuclear materials will be shipped to the site by rail and/or trucks. The CFBC will not be used for the transport of nuclear materials. Neither transport mode should be frequent nor should it adversely impact the Cross Florida Greenway or public lands.

ATTACHMENTS:

None.

COMMENT NUMBER: III.F.3

RAI NUMBER: LNP SCA RAI-089

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Decommissioning – if the units are decommissioned or become obsolete in the future, will remove the transmission lines?

RESPONSE:

The four new 500-kV transmission lines proposed to cross the Cross Florida Greenway are necessary to serve the new LNP. Once these lines are constructed, they will become part of the Florida electrical transmission grid. When the LNP is decommissioned, the need for the transmission lines would be evaluated to determine if they are no longer needed as part of the Florida electrical transmission grid. If they are still needed, they will not be removed.

ATTACHMENTS:

None.

COMMENT NUMBER: III.G

RAI NUMBER: LNP SCA RAI-090

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

OGT's requested offsets for Progress Energy's impacts to and use of state lands (the Cross Florida Greenway) at this time. These are not all inclusive.

RESPONSE:

PEF has been working directly with FDEP and the OGT to determine the appropriate amount of mitigation for the use of state lands. In order to assist in the calculation of what mitigation may be required to offset the use of state lands, an appraisal is being conducted as to the value of the state lands to be used, as well as the value of the land that might be used for a Chiefland/Dunnellon trail. Once the appraisal numbers are known, PEF, FDEP, OGT, and any other agency with jurisdiction will recommend appropriate mitigation measures for consideration by the Board of Trustees or other applicable land owners.

ATTACHMENTS:

None.

COMMENT NUMBER: III.G.1

RAI NUMBER: LNP SCA RAI-091

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Design and construct a connector trail. PE owns a corridor from Chiefland to Dunnellon which connects to state owned and OGT managed trails/properties. (This would connect The Nature Coast Trail in Chiefland and the Cross Florida Greenway near Dunnellon.) OGT has had preliminary discussions with PE and is working towards a MOU for PE to provide a perpetual public access right on this corridor and also to design and construct a paved trail the length of this corridor. This would complete a major connection between two state trails.

RESPONSE:

PEF has been working directly with FDEP and the OGT to determine the appropriate amount of mitigation for the use of state lands. In order to assist in the calculation of what mitigation may be required to offset the use of state lands, an appraisal is being conducted as to the value of the state lands to be used, as well as the value of the land that would be used for a Chiefland/Dunnellon trail. Once the appraisal numbers are known, PEF, FDEP, OGT, and any other agency with jurisdiction will recommend appropriate mitigation measures for consideration by the Board of Trustees or other applicable land owners.

ATTACHMENTS:

None.

COMMENT NUMBER: III.G.2

RAI NUMBER: LNP SCA RAI-092

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Design and construct a paved trail from the Felburn Trailhead (east of US 19) and continue east to Inglis Dam recreational area. (This includes a bridge over the Withlacoochee River.)

RESPONSE:

PEF has been working directly with FDEP and the OGT to determine the appropriate amount of mitigation for the use of state lands. In order to assist in the calculation of what mitigation may be required to offset the use of state lands, an appraisal is being conducted as to the value of the state lands to be used, as well as the value of the land that would be used for a Chiefland/Dunnellon trail. Once the appraisal numbers are known, PEF, FDEP, OGT, and any other agency with jurisdiction will recommend appropriate mitigation measures for consideration by the Board of Trustees or other applicable land owners.

ATTACHMENTS:

None.

COMMENT NUMBER: III.G.3

RAI NUMBER: LNP SCA RAI-093

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Pave the vehicular access road west of US 19 on the Cross Florida Greenway. This road serves as public access to the fishing areas along the canal and to the Gulf.

RESPONSE:

PEF has been working directly with FDEP and OGT to determine the appropriate amount of mitigation for the use of state lands. In order to assist in the calculation of what mitigation may be required to offset the use of state lands, an appraisal is being conducted as to the value of the state lands to be used, as well as the value of the land that would be used for a Chiefland/Dunnellon trail. Once the appraisal numbers are known, PEF, FDEP, OGT, and any other agency with jurisdiction will recommend appropriate mitigation measures for consideration by the Board of Trustees or other applicable land owners.

ATTACHMENTS:

None.

COMMENT NUMBER: III.G.4

RAI NUMBER: LNP SCA RAI-094

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Purchase the timber rights on the Dixon Hammock property. This parcel is owned by the BOT and managed by OGT, but two private companies still hold some timber rights in this parcel.

RESPONSE:

PEF has been working directly with FDEP and the OGT to determine the appropriate amount of mitigation for the use of state lands. In order to assist in the calculation of what mitigation may be required to offset the use of state lands, an appraisal is being conducted as to the value of the state lands to be used, as well as the value of the land that would be used for a Chiefland/Dunnellon trail. Once the appraisal numbers are known, PEF, FDEP, OGT, and any other agency with jurisdiction will recommend appropriate mitigation measures for consideration by the Board of Trustees.

ATTACHMENTS:

None.

COMMENT NUMBER: III.G.5

RAI NUMBER: LNP SCA RAI-095

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Inglis Island oil pit clean up and remediation. This oil pit was left by Florida Power decades ago. Oil sludge from the former Inglis hydro power plant.

RESPONSE:

PEF has been working directly with FDEP and the OGT to determine the appropriate amount of mitigation for the use of state lands. In order to assist in the calculation of what mitigation may be required to offset the use of state lands, an appraisal is being conducted as to the value of the state lands to be used, as well as the value of the land that would be used for a Chiefland/Dunnellon trail. Once the appraisal numbers are known, PEF, FDEP, OGT, and any other agency with jurisdiction will recommend appropriate mitigation measures for consideration by the Board of Trustees.

ATTACHMENTS:

None.

COMMENT NUMBER: III.G.6

RAI NUMBER: LNP SCA RAI-096

REQUESTING AGENCY: FDEP, Office of Greenways and Trails (OGT)

COMMENT:

Design and construct a paved trail under PE's proposed transmission line corridor leading from Inglis Island south and connecting to the proposed Suncoast Parkway II and Suncoast Trail extension. (This is being designed and built by the Turnpike Authority.) Connection most likely within the vicinity of Bitter Root Road, but uncertain as to exact location at this time because the Suncoast Parkway is still under design.

RESPONSE:

PEF has been working directly with FDEP and the OGT to determine the appropriate amount of mitigation for the use of state lands. In order to assist in the calculation of what mitigation may be required to offset the use of state lands, an appraisal is being conducted as to the value of the state lands to be used, as well as the value of the land that would be used for a Chiefland/Dunnellon trail. Once the appraisal numbers are known, PEF, FDEP, OGT, and any other agency with jurisdiction will recommend appropriate mitigation measures for consideration by the Board of Trustees.

ATTACHMENTS:

None.

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IV. FDEP - SCO

COMMENT NUMBER: IV.1

RAI NUMBER: LNP SCA RAI-097

REQUESTING AGENCY: FDEP, Siting Office (SCO)

COMMENT:

PEF states in Section 1.3.7 (p. 1-6, Volume 1) that "each anticipated variance from applicable state and local standards that is sought as part of the state certification proceedings for an operation-related impact is shown in the applicable SCA section". Please provide a list of all such anticipated variances.

RESPONSE:

There are no known variances from any state, regional, or local standards that will occur as a result of the construction or operation of the LNP.

ATTACHMENTS:

None.

COMMENT NUMBER: IV.2

RAI NUMBER: LNP SCA RAI-098

REQUESTING AGENCY: FDEP, Siting Office (SCO)

COMMENT:

No radioactive materials other than fissile materials and their products (which fall under the jurisdiction of the United States Nuclear Regulatory Commission) are mentioned in the application. What other radioactive materials will be used or possessed at the site? Describe PEF's plans and timelines for authorization of such materials.

RESPONSE:

As noted in Table 1.2-1 of the ER (SCA Volume 8), PEF plans to apply to the NRC for licenses for possession of source material (in accordance with 10 CFR 40.3), Special Nuclear Material (in accordance with 10 CFR 70.3), and fuel or by-product material (in accordance with 10 CFR 30.3). These licenses will be applied for late in the construction phase of the project to be in place before such materials can be brought onsite or generated onsite. Should any radiography work be necessary during construction or operation of the facility, the contracted radiographers will be responsible for obtaining appropriate licenses or permits for radiography sources that they may use.

ATTACHMENTS:

None.

COMMENT NUMBER: IV.3

RAI NUMBER: LNP SCA RAI-099

REQUESTING AGENCY: FDEP, Siting Office (SCO)

COMMENT:

Concerned citizens have advised this office of a potential lime-rock mine planned to be located across the highway from the proposed nuclear plant, with corresponding blasting operations. Please advise as to the affects of such an operation in the vicinity of the plant location, as well as the compatibility of nuclear power plants with nearby blasting operations.

RESPONSE:

ER Subsection 2.2.1.2 (SCA Volume 8) notes information regarding the proposed Tarmac King Road Limestone Mine. No shock waves from blasting are anticipated that would affect the LNP facility; nuclear plants are designed for seismic shock waves that are far greater than those associated with dynamite blasting anticipated at the proposed mine. The LNP facility will be compatible with and unaffected by the mine's operations.

ATTACHMENTS:

None.

COMMENT NUMBER: IV.4

RAI NUMBER: LNP SCA RAI-100

REQUESTING AGENCY: FDEP, Siting Office (SCO)

COMMENT:

Describe the potential offsets of carbon emissions from the LNP when compared to a comparably sized natural gas fired combined cycle plant.

RESPONSE:

Compared with a natural gas-fired combined-cycle power generating facility of the same electrical generating capacity, carbon emissions to the atmosphere from the LNP facility will be minimal. The only fuel-combustion-related emissions from the LNP facility will be from infrequently operated diesel-fired emergency equipment that will include emergency standby generators, ancillary generators, and fire pump engines. Aside from emergency events, this equipment will be operated only for up to 4 hours per month for purposes of reliability testing. A description of the air emissions from the LNP facility is provided in the following ER subsections:

ER 3.6.3.1	Gaseous Effluents
ER 3.6.3.1.1	Diesel Generators
ER 3.6.3.1.2	Fuel Storage Tanks
ER 3.6.3.1.3	Diesel-Driven Fire Pumps
ER 3.6.3.1.4	Annual Emissions

The primary carbon-containing emissions from natural gas combustion is CO_2, which is considered to be a "greenhouse gas." While other carbon-containing emissions can be generated from natural gas combustion (i.e., CO, CH_4, and various VOCs), they are typically many orders of magnitude less than CO_2. The estimated CO_2 emissions from a natural gas-fired combined-cycle generating facility capable of generating the same amount of electricity are approximately 6.4 million tons/yr. For comparison purposes, the estimated CO_2 emissions that will be emitted from the LNP as a result of the periodic testing of the diesel-powered equipment described above are only 618 tons/yr.

ATTACHMENTS:

None.

COMMENT NUMBER: IV.5

RAI NUMBER: LNP SCA RAI-101

REQUESTING AGENCY: FDEP, Siting Office (SCO)

COMMENT:

Please submit summary information indicative of the outreach efforts which were extended to potentially affected persons in the vicinity of the power plant. Furthermore, the applicant should be advised that Governor Crist approved House Bill 7135 on June 25th. Accordingly, this Office requests that Progress Energy make a good faith effort to comply with the new Statutory requirements, including those below from 403.5115(6), F.S:

> *(a) A good faith effort shall be made by the applicant to provide direct written notice of the filing of an application for certification by United States mail or hand delivery no later than 45 days after filing of the application to all local landowners whose property, as noted in the most recent local government tax records, and residences are located within the following distances of the proposed project:*
>
> *1. Three miles of the proposed main site boundaries of the proposed electrical power plant.*
>
> *2. One-quarter mile for a transmission line corridor that only includes a transmission line as defined by s. 403.522(22).*
>
> *3. One-quarter mile for all other linear associated facilities extending away from the main site boundary except for a transmission line corridor that includes a transmission line that operates below those defined by s. 403.522(22).*
>
> *(b) No later than 60 days from the filing of an application for certification, the applicant shall file a list with the department's Siting Coordination Office of landowners and residences that were notified.*

RESPONSE:

PEF has conducted an extensive outreach effort within and around Levy County beginning with the announcement of the preferred plant site in December of 2006. PEF's goal has been to communicate transparently, broadly, and continuously throughout the project. Through outreach activities, PEF has sought to communicate in numerous ways to ensure that the residents and communities around the proposed site received details about the project and had avenues to address issues and concerns. Provided below is information about these efforts.

The following website, email address, and toll-free number were established in 2006 for the public to provide comments and obtain information about the project.

www.progress-energy.com/poweringthefuture

1-888-840-0014

poweringthefuture@pgnmail.com

Media – Statewide press releases at plant announcement and key project milestones as well as visits to local media outlets in Levy County and surrounding counties were designed to get facts about the project out swiftly and broadly to the public. PEF has continued to work with local media to provide current project updates and address issues as they arise.

Local officials and community leaders – From the beginning, PEF has reached out to officials and community leaders via letters, emails, and meetings designed to provide facts and updates on the projects. PEF has held many meetings, inviting community leaders from all counties surrounding the proposed site. All press releases were also provided to these leaders.

State and Federal legislators – Legislators were provided press releases and project updates to assist in responses to constituents. PEF has met with legislators to provide direct project updates throughout the project.

Plant:

Levy County Government – PEF has worked closely with Levy County to provide information and address concerns. The County has held several public hearings associated with land use issues that were advertised to the public. Letters were sent to property owners around the site by PEF and the County for specific public hearings notifying them of the meetings as an opportunity to comment on the project. PEF presented project information and responded to issues and concerns at the meetings.

Property owners – The activities above were designed to disseminate information to the general public and property owners in the vicinity of the plant. Many property owners have attended public meetings. In addition, PEF mailed letter invitations and held an open house in 2007 specifically for property owners around the proposed site.

Additional activities – At public hearings conducted by the Florida Public Service Commission and the NRC earlier this year, PEF set up information exhibits manned by PEF employees to provide information and answer questions.

PEF has complied with the new requirements of House Bill 7135. Letters were mailed to all landowners within 3 miles of the LNP site on July 15. A list of the landowners and residents to whom these letters were mailed was filed with the FDEP on August 1, 2008, in accordance with House Bill 7135, Section 92.

Associated facilities:

During the corridor study, PEF conducted, among other things, 13 public open houses. Although the focus of the open houses was the siting of the transmission line corridor and substations, information about the proposed power plant and associated facilities was also provided at the open houses. Notice of these open houses included:

- More than 107,000 letters to property owners
- Letters to all local governments identified along corridors
- Letters to regional planning organizations, agencies, and civic associations
- Advertisements ran in all local media outlets
- All members of the Community Partnership for Energy Planning were included – Leadership Teams, Utility Search Conference participants, and Community Working Groups

PEF has also established a website specifically for the project's transmission line and rail line that provides the most current project information (see www.progress-energy.com/energyplanning). PEF is in the process of developing specific web pages for each transmission line within the project. Public informational meetings will be held as major phases of the project are complete and new information is available. For example, when route studies have been concluded in specific areas, informational meetings will be held in those areas for property owners, communities, and neighborhoods to share information about route options, the location of the lines and other details. Other meetings will also be held at other phases and as details on the project become available.

In addition to these actions, project updates are provided on a periodic basis to the local governments and key organizations. PEF has also established a call center operation (1-888-238-0373) and email address (EnergyPlanning@pgnmail.com) specifically to assist property owners and other stakeholders with their questions and concerns. PEF also provides updates to the media in order to broaden communication efforts.

In August, PEF plans to launch an interactive web-based tool to allow property owners to view in aerial and street views their properties in relation to the plant and associated facilities.

PEF has complied with the new requirements of House Bill 7135. Letters were mailed to all property owners within ¼ mile of all transmission corridors and the rail line corridor on May 20, 2008 or July 15, 2008. A list of the landowners and residents to whom these letters were mailed was filed with the FDEP on August 1, 2008, in accordance with House Bill 7135, Section 92.

ATTACHMENTS:

None.

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V. DCA

COMMENT NUMBER: V.1

RAI NUMBER: LNP SCA RAI-102

REQUESTING AGENCY: Department of Community Affairs (DCA)

COMMENT:

What is the atmospheric loading and concentration of the salt plume from cooling towers and what is the direction in which it will travel?

RESPONSE:

The potential for salt and solids drift and deposition from the mechanical draft cooling towers that will be used at the LNP is discussed in the following section of the SCA:

6.1.4.3 Cooling Tower Salt and Solids Deposition

A more detailed discussion of this issue is provided in the following sections of the ER that was submitted with the SCA (Appendix 10.11, Volume 9):

ER 5.3.3.1.3 Solids Deposition
ER 5.3.3.2.1 Salt Drift

The analyses described in these sections of the ER were based on mathematical modeling of the cooling tower plumes, the purpose of which was to estimate the amount of deposition of solids (all of which are conservatively assumed to be salts emitted as drift from the cooling towers) to the surface. As described in the ER, the estimated amount of dissolved solids that could potentially escape from the cooling towers as drift from the LNP cooling towers (for both LNP Units 1 and 2 operating simultaneously) is estimated to be 115.7 lb/hr during normal operation and 154.26 lb/hr for short-term excursions (as total particulate). This amount of material could be released and dispersed over the area surrounding the LNP site once both units become fully operational. A description of the results of an analysis of cooling tower plume drift and deposition is provided in ER Subsection 5.3.3.2.1.

The plume modeling analysis was performed using EPA's AERMOD dispersion model and 5 years (2001 through 2005) of hourly meteorological data. The analysis resulted in a maximum predicted offsite deposition rate (during normal plant operation) of 6.81 kg/ha/mo (6.13 lb/ac/mo) of total solids at a location due west of the cooling towers at the nearest property boundary. Even assuming that all of the solids contained in the cooling tower drift are salts, this rate is below an accepted threshold limit of 10 kg/ha/mo (9 lb/ac/mo), which is a threshold above which an adverse impact on vegetation could potentially occur for

sensitive species. The predicted offsite deposition impacts were also predicted to decrease significantly with increasing distance from the plant, with the maximum predicted deposition rate decreasing to approximately one-third of the maximum offsite value with an increasing distance of 1,000 m (3,280 ft.) from the site boundary.

The assessment of cooling tower drift and deposition as described in the SCA and the ER resulted in the conclusion that there would be minimal impacts at any location and no mitigation was required or justified.

ATTACHMENTS:

None.

COMMENT NUMBER: V.2

RAI NUMBER: LNP SCA RAI-103

REQUESTING AGENCY: Department of Community Affairs (DCA)

COMMENT:

Describe the anticipated impacts of salt deposits to adjacent surface water bodies and to the state forests and other conservation lands in the vicinity.

RESPONSE:

Adverse impacts to nearby waterbodies, state forests, or conservation lands are not anticipated to occur as described below. See also the response to LNP SCA RAI-102 (V.1).

Predictions of the salt plume concentrations, direction, and impacts of drift from the cooling towers on adjacent lands and waters are presented in the following sections of the SCA and the ER (SCA Appendix 10.11, Volume 9):

SCA	6.1.4.3	Cooling Tower Salt and Solids Deposition
ER	5.3.3.1.3	Solids Deposition
ER	5.3.3.2.1	Salt Drift

A deposition analysis of cooling tower drift from LNP Units 1 and 2 was performed to assess the rate of deposition to the surface in the area surrounding the plant site. The maximum predicted offsite deposition rate (during normal plant operation) of 6.81 kg/ha/mo (6.13 lb/ac/mo) of total solids at a location due west of the cooling towers at the nearest property boundary is below an accepted adverse effects threshold limit of 10 kg/ha/mo (9 lb/ac/mo) above which an adverse impact on vegetation could occur. The predicted offsite deposition impacts were also predicted to decrease significantly with increasing distance from the plant, with the maximum predicted deposition rate decreasing to approximately one-third of the maximum offsite value with an increasing distance of 1,000 m (3,280 ft.) from the site boundary. Therefore, adverse impacts to nearby waterbodies, state forests, or conservation lands are not anticipated to occur.

It is noted that a comprehensive salt drift deposition study was conducted at the nearby CREC to evaluate the physical impacts of salt deposition from that facility's natural and mechanical draft cooling towers on vegetation surrounding the CREC. This long-term study was conducted from 1981 through 1995 as a condition of the facility's NPDES and PSD permits. The results of the study demonstrated that there were no significant impacts to vegetation in the area surrounding the plant resulting from cooling tower operation and in

1995 FDEP was petitioned to approve termination of the study. In March of 1996, FDEP concluded that there were no significant impacts to vegetation due to salt drift from the plant and authorized the facility to discontinue the study.

ATTACHMENTS:

None.

COMMENT NUMBER: V.3

RAI NUMBER: LNP SCA RAI-104

REQUESTING AGENCY: Department of Community Affairs (DCA)

COMMENT:

Describe the expected potential long term impacts to the surficial aquifer and eventually to the groundwater. Document loading of salt to groundwater resources including the surficial and Floridan aquifer with extended exposure to salt deposits.

RESPONSE:

No long-term impacts are expected to the surficial aquifer or other groundwater resources due to salt deposition. The potential for salt and solids drift and deposition from the mechanical draft cooling towers that will be used at the LNP is discussed in the following section of the SCA:

6.1.4.3 Cooling Tower Salt and Solids Deposition

The plume modeling analysis was performed using EPA's AERMOD dispersion model and 5 years (2001 through 2005) of hourly meteorological data. The analysis resulted in a maximum predicted offsite deposition rate (during normal plant operation) of 6.81 kg/ha/mo (6.13 lb/ac/mo) of total solids at a location due west of the cooling towers at the nearest property boundary.

Even assuming that all of the solids contained in the cooling tower drift are salts, this rate of deposition is below an accepted limit of 10 kg/ha/mo (9 lb/ac/mo), which is a threshold above which an adverse impact on vegetation could potentially occur for sensitive species. The predicted offsite deposition impacts were also predicted to decrease significantly with increasing distance from the plant, with the maximum predicted deposition rate decreasing to approximately one-third of the maximum offsite value with an increasing distance of 1,000 m (3,280 ft.) from the site boundary.

Assuming an annual average rainfall of 50 in. and an evapotranspiration rate of 42 in/yr, the net recharge is 8 in/yr. This is the average amount used in the SWFWMD model for this area. The volume of recharge can be calculated from inches of water to gallons using the fact that an acre-inch of water is equal to 27,154 gal. Applying the net recharge to 1 ac. results in 217,234 gal/ac/yr or 18,103 gal/ac/mo. The most conservative approach is to assume that all of the salt deposited on the land surface goes into solution with rainwater and use the highest predicted salt deposition rate on the site. Therefore, dissolution of

9.68 lb. of salt per month into 18,103 gal. of water results in 150,927 lb. of water mixed with 9.68 lb. of salt. This would result in a TDS concentration increase of about 64 mg/L. Assuming rainfall has a TDS of about 200 mg/L, this would result in an increase from 200 to 264 mg/L TDS onsite and will be progressively lower with distance offsite. This level of change will have no detrimental impact to the surficial or Floridan aquifers.

ATTACHMENTS:

None.

COMMENT NUMBER: V.4

RAI NUMBER: LNP SCA RAI-105

REQUESTING AGENCY: Department of Community Affairs (DCA)

COMMENT:

Identify the containment measures being considered to negate these impacts.

RESPONSE:

No containment or other mitigation measures for salt drift are proposed to negate the impact of salt deposition on the land surface since no detrimental impacts to surface waters, nearby lands, or groundwater are predicted.

ATTACHMENTS:

None.

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VI. FWC

COMMENT NUMBER: VI.A.1

RAI NUMBER: LNP SCA RAI-106

REQUESTING AGENCY: Florida Fish and Wildlife Conservation Commission (FWC)

COMMENT:

The applicant, in the Environmental Report (Volumes 8 and 9), indicated that various listed species (gopher tortoises [threatened], Florida scrub jays [threatened], red-cockaded woodpeckers [species of special concern], Sherman's fox squirrel [species of special concern]) were found at the proposed Levy Nuclear Plant site and in or adjacent to the proposed Powerline Transmission corridors. FWC records indicate that the transmission corridors are also within the range of the Florida mouse (species of special concern), which is unlikely to have been detected during observational surveys. The explanations of survey methodologies contained in Chapter 6 are very brief. We request that the applicant provide additional information on the methodologies used to survey for listed species, dates and times when the surveys were conducted, location maps of the surveys and transect locations, and specific locations and numbers of listed species found.

RESPONSE:

Of the species referenced above, only the gopher tortoise was found at the LNP site. Surveys were conducted for gopher tortoise burrows onsite and along the heavy haul road and pipeline corridors between December 4, 2007 and January 28, 2008. Survey methodologies and results are addressed in a Technical Memorandum, dated January 31, 2008, entitled "Progress Energy Levy Nuclear Plant - Gopher Tortoise and Upland Habitat Condition Survey Results" a copy of which is attached to this response.

For transmission lines, PEF consultants performed limited observations of species in areas where access was available. This information was provided in the SCA (Chapter 9). As part of the corridor siting studies, potential impacts to listed species were preliminarily evaluated through review of FNAI data. FNAI maintains a GIS database that identifies the location of listed species occurrences throughout Florida. The data were reviewed to identify occurrences of listed species within the project study areas, including the proposed transmission line corridors.

Habitats within the proposed transmission line corridors were classified using habitat/land use classification codes identified in the Florida Department of Transportation's 1999 FLUCCS. The FLUCCS classification system uses dominant components of the vegetative community to assign habitat codes. The results of the habitat classification were used to

assess the potential for listed species' utilization of the transmission line corridors. Based on the habitats present, inferences were made regarding the potential for listed species occurrence within each of the transmission line corridors.

PEF is seeking certification of corridors for the transmission lines associated with the LNP Units 1 and 2. Design details such as ROW location within the corridor, width of ROW, structure locations, structure heights, access road locations, and in some instances, conductor configuration, will not be finalized until after the corridors are certified. Once access is available to the selected ROW, detailed surveys for listed species will be conducted.

PEF will agree to a condition of certification requiring the post-certification submittal of the results of detailed surveys of likely habitats on the site and ROWs to FWC and coordination with FWC on appropriate impact mitigation methodologies, as authorized by Section 403.5113(2), F.S., and Rule 62-17.191, F.A.C.

ATTACHMENTS:

See following technical memorandum.

Progress Energy Levy Nuclear Plant - Gopher Tortoise and Upland Habitat Condition Survey Results

PREPARED FOR: Progress Energy Florida

PREPARED BY: CH2M HILL

DATE: January 31, 2008

INTRODUCTION

Previous field surveys and available information for the proposed Progress Energy Levy Nuclear Plant (LNP) Site (Lotspeich, 2007; FNAI, 2007) identified occurrences or suitable habitat for the Florida state protected gopher tortoise (*Gopherus polyphemus*). In order to more clearly define potential gopher tortoise habitat, additional detailed field surveys were conducted by CH2M HILL ecologists from December 04, 2007 through January 28, 2008. Surveys were conducted within a defined LNP Survey Corridor that included the plant area, transmission line corridor, heavy haul road, upper road, and lower road. This memorandum provides a summary of the survey methodology, results, and recommendations pertaining to the gopher tortoise populations at the LNP Site. Also included is a map depicting the LNP Survey Corridor, location of identified gopher tortoise burrows, and Habitat Suitability Determinations of defined Survey Sections.

SITE DESCRIPTION

The LNP Site is comprised predominantly of coniferous (pine) plantation areas. These areas were historically pine flatwoods habitat that were intensively logged, furrowed, bedded, and planted with slash pine (*Pinus elliottii*). Nearly all upland habitat within the LNP Site has been converted to pine plantation, resulting in a relatively uniform land cover of dense slash pine of varying stages of development and remnant understory of flatwoods vegetation. Periodic harvesting activities involving heavy equipment operations have caused continued disturbance to the landscape. Several wetland areas are dispersed throughout the site, many of which exhibit evidence of degradation due to the pine plantation activities and altered hydrology due to the construction of the Cross Florida Barge Canal.

GOPHER TORTOISE HABITAT AND LIFE HISTORY

Gopher tortoises were recently reclassified by the Florida Fish and Wildlife Commission (FWC) as a threatened species after previously being listed as a species of special concern. This revised listing increases protections for the species and reflects the FWC determination that the species may become endangered within the foreseeable future throughout all or a significant portion of its range. Gopher tortoises currently are not federally listed in Florida by the United State Fish and Wildlife Service (UFSWS).

Gopher tortoises occur throughout Florida, often within xeric, fire-dependent communities such as longleaf pine-turkey oak associations located on sand ridges. Other commonly inhabited communities include pine and oak scrub, sandhills, live oak hammocks, pine

flatwoods, and dry prairie habitats. In many areas of the state these habitats have been significantly altered and gopher tortoises have colonized areas such as spoil sites, pastures, field edges, and other disturbed sites. The general characteristics of suitable habitat are relatively open canopy areas with loose, well-drained sandy soils for constructing burrows, and grasses or herbaceous vegetation for foraging (Diemer, 1992).

SURVEY METHODOLOGY

Based on preliminary desktop and previous cursory ecological assessments of the LNP Site (Lotspeich, 2007), it was determined that gopher tortoises could potentially inhabit all or most upland areas within the LNP Survey Corridor. The goal of the additional CH2M HILL surveys was to more clearly identify the upland areas within the LNP Survey Corridor that provide suitable habitat for gopher tortoises. Surveys were conducted generally following the methodology described in Ashton and Ashton (2007). Survey crews were comprised of two to three CH2M HILL ecologists conducting pedestrian surveys along representative transects, with one GPS orienteer guiding the surveys and documenting burrow locations. Relevant data including canopy closure, shrub density, forage vegetation, estimated groundwater depth, level of disturbance, soil type, and land use were collected along each transect.

Survey Sections

To facilitate surveys and Habitat Suitability Determinations, the larger LNP Survey Corridor was subdivided into individual Survey Sections along habitat type, existing road, or natural feature boundaries. Figure 1 depicts the boundaries of the 49 Survey Sections established at the LNP Site. Generalized transects were established through representative upland portions of all Survey Sections. Burrow locations were documented when encountered during the field survey effort.

Habitat Condition Variables

Habitat conditions throughout the LNP Site cover a broad spectrum of abiotic and biotic variables that either increase or decrease the likelihood that gopher tortoises would inhabit a given upland area. Conditions such as a relatively open canopy and shrub layer, presence and diversity of preferred forage species, well drained and deep sandy soil, limited human disturbances, and moderate ground cover are considered optimal for gopher tortoises. A dense canopy or shrub layer, paucity of forage vegetation, less well drained and shallow soil, and thick pine needle ground coverage are considered sub-optimal or inhibitive conditions (Ashton and Ashton, 2007). Based on generally accepted gopher tortoise habitat preferences described in Ashton and Ashton (2007), six Habitat Condition Variables were assessed within each Survey Section as a systematic approach to Habitat Suitability Determinations. These Habitat Condition Variables are summarized as follows:

> Canopy Closure - Sunlight availability affects the presence and growth of groundcover and other forage vegetation. Areas lacking adequate sunlight typically have minimal vegetative groundcover. In addition, gopher tortoises require sunlight to manage their body temperature and to provide ultraviolet radiation that is important for certain metabolic processes. Areas in which gopher tortoises have historically and currently been found are those with a relatively open canopy with cover below 60-percent and not exceeding 80-percent.

Shrub Density - Similar to canopy cover, shrub density affects the availability of sunlight for forage vegetation growth. A dense shrub layer may also serve as a physical impediment to the mobility of gopher tortoises. Optimal shrub density is below 60-percent and not exceeding 80-percent.

Forage Vegetation - The presence of a diverse array of grasses and herbaceous plants of a quality and quantity suitable for forage is the most important variable in determining suitable gopher tortoise habitat. Gopher tortoises will forage on broad leafed grasses and grass relatives, with seasonal foraging on herbaceous shrub and tree species, fruits, and flowers. Ashton and Ashton (2007) provides a listing of vegetation preferred by gopher tortoises. This listing was utilized to determine the likelihood of gopher tortoises foraging activities at the LNP Site.

Groundwater Depth - The groundwater depth determines whether or not a gopher tortoise can construct a burrow and sustain it in times of high water. In general, a groundwater depth no less than 0.5 meters to several meters below the ground surface is suitable for gopher tortoise burrowing. The presence and extent of wetlands and comparative topography in upland areas and the United States Department of Agriculture's (USDA) Soil Survey Geographic (SSURGO) database (USDA, 2007) were utilized as estimates of groundwater depth at the LNP Site.

Level of Disturbance - Human activities such as vehicle use, plowing, and logging significantly alter habitat conditions. The predominant disturbance activity at the LNP Site is logging, which involves heavy machinery and results in intensive ground disturbance.

Soil Type - Suitable soils for burrowing are typically well drained sandy soils with a deep groundwater depth and high percolation rates. Soil map units and associated soil characteristics at the LNP Site were identified using the USDA SSURGO soil database (USDA, 2007).

Based on the assessment of Habitat Condition Variables and actual occurrence of gopher tortoise burrows at the LNP Site, each Survey Section was classified as to the likelihood of providing suitable gopher tortoise habitat.

Land Use Classifications

The Florida Land Use, Cover, and Forms Classification System (FLUCFCS) nomenclature system (FDOT, 1999) was utilized to classify the dominant habitat and land use features within the LNP Survey Corridor for each Survey Section. The FLUCFCS system was developed by the Florida Department of Transportation (FDOT) State Topographic Bureau Thematic Mapping Section (Procedure No. 550-010-001-a, September 1985, Second Edition) as a means of generally classifying land throughout Florida. This system is widely used in Florida by land planners, environmental consultants, local governments, and regulatory agencies. In addition to classifying the land use in each Survey Section, the dominant vegetation within each land use category was noted as a general baseline vegetation assessment.

Habitat Condition Variables SURVEY RESULTS

Much of the land within the LNP Survey Corridor has been heavily and routinely disturbed through coniferous (pine) plantation activities. In general, suitable gopher tortoise habitat on site was identified in relatively undisturbed open areas, younger planted pine with open canopy, spoil areas, and open areas along existing roads. Areas with dense canopy and shrub cover, recently logged sites, shallow groundwater areas, and areas with thick pine needle cover were unsuitable.

Each Survey Section within the LNP Survey Corridor was assessed based on the six habitat condition variables discussed above. Each variable was qualitatively evaluated during field surveys. A Habitat Suitability Determination was made based on the cumulative consideration of the Habitat Condition Variables and actual occurrences of gopher tortoise burrows. Areas classified as Likely / Burrows Identified contained either very suitable habitat or actual burrows. Possible / Needs Improvements areas contained relatively suitable habitat, but would require land management activities such as prescribed fire or manual canopy and shrub thinning to provide more suitable habitat. Areas classified as Unlikely contained unsuitable or inhibitive habitat conditions. A total of 1094 acres at the LNP Site were assessed, the majority of which was classified as Unlikely.

Table 1 Progress Energy LNP Site - Gopher Tortoise Habitat Condition Acreages

Gopher Tortoise Habitat Suitability Determination	Acres	FLUCFCS[1] Codes
Likely / Burrows Identified	220	438, 441, 4389, 743, 812
Possible / Needs Improvements	43	320, 441
Unlikely	831	320, 441, 4418
Total Area Surveyed	**1094**	

[1] FDOT, 1999.

Table 2 and Figure 1 summarize the Habitat Condition Variables and Habitat Suitability Determination for each Survey Section. As previously discussed, the most important variable for determining suitable gopher tortoise habitat is the availability of quality forage vegetation (Ashton, 2007). This variable is directly related to canopy closure and shrub density. Areas with dense canopy cover or shrub layer lack sufficient sunlight for diverse groundcover growth.

Another significant variable was the groundwater depth. The northern portion of the LNP Site, especially at the core reactor area, was characterized as having a shallow groundwater depth and a greater concentration of wetlands than the southern portion. Thus, the northern portion provided less suitable burrowing habitat than the southern portion.

The dominant soil map unit at the LNP Site is Smyrna Fine Sands (USDA, 2007), which are rated by the USDA as having a groundwater depth within 20 to 40-inches of the ground surface. These soils were considered to provide sufficient conditions for constructing gopher tortoise burrows. A smaller area of Cassia-Pomello Complex map unit soils were located near the southern portion of the LNP Site. These soils contained a very dense population of

Table 2 Progress Energy LNP Site - Gopher Tortoise Survey Sections Summary

Survey Section	FLUCFCS Code[1]	Area (acres)	Gopher Tortoise Habitat Condition Variables[2]						Gopher Tortoise Habitat Suitability Determination
			Canopy Closure	Shrub Density	Forage Species Quality	Groundwater	Level of Disturbance	Compatible Soil Type	
1	441	47.41	Moderate	Moderate	Low	Shallow	High	Possible	Unlikely
2	4418	7.13	**Open**	Moderate	Moderate	Shallow	Very high	Possible	Unlikely
3	441	1.60	Dense	Dense	Low	Shallow	Moderate	Possible	Unlikely
4	4418	21.67	**Open**	Moderate	Moderate	Shallow	Very high	Possible	Unlikely
5	441	32.09	Dense	Moderate	Very Low	Shallow	Moderate	Possible	Unlikely
6	441	16.80	Moderate	Moderate	Moderate	Shallow	Moderate	Possible	Likely / Burrows Identified
7	441	4.85	Moderate	Dense	Moderate	Shallow	Moderate	Possible	Likely / Burrows Identified
8	441	1.63	Moderate	Dense	Low	Shallow	Moderate	Possible	Unlikely
9	441	0.30	Moderate	Moderate	Moderate	Shallow	**Low**	**Likely**	Possible / Needs Improvements
10	441	0.47	Moderate	Moderate	Moderate	Shallow	**Low**	**Likely**	Possible / Needs Improvements
11	441 / 4418	16.22	Moderate	Dense	Low	Shallow	Moderate	Possible	Unlikely
12	441	17.39	Moderate	Dense	Low	Shallow	Moderate	Possible	Unlikely
13	743 / 4388	24.26	Low	**Low**	**High**	**Very Deep**	Moderate	**Likely**	Likely / Burrows Identified
14	441	33.38	Low	Moderate	**Very High**	**Deep**	Moderate	**Very Likely**	Likely / Burrows Identified
15	441	24.09	Moderate	Moderate	Moderate	**Deep**	Moderate	**Likely**	Likely / Burrows Identified
16	441	29.49	Moderate	Moderate	Moderate	**Deep**	Moderate	**Likely**	Likely / Burrows Identified
17	438	5.25	**Open**	Moderate	**High**	Moderate	**Low**	**Likely**	Likely / Burrows Identified
18	438	4.77	Moderate	Moderate	**High**	Moderate	**Low**	**Likely**	Likely / Burrows Identified
19	441	2.18	Moderate	Dense	Low	Moderate	Moderate	Possible	Unlikely
20	441	10.91	Dense	Moderate	Moderate	Moderate	Moderate	Possible	Likely / Burrows Identified
21	441	3.77	Dense	Dense	Low	Moderate	Moderate	Possible	Unlikely
22	441	8.94	Moderate	Dense	Low	Moderate	Very High	Possible	Unlikely
23	441	4.22	Moderate	Moderate	Moderate	Moderate	High	Possible	Likely / Burrows Identified
24	441	1.88	Moderate	Very Dense	Low	Moderate	High	Possible	Unlikely
25	438	2.09	**Open**	Moderate	**High**	Moderate	**Low**	Possible	Likely / Burrows Identified
26	743 / 812	1.68	Moderate	**Low**	Moderate	Moderate	High	**Likely**	Likely / Burrows Identified
27	441	4.80	Dense	Dense	Low	Moderate	Moderate	Possible	Unlikely
28	438	3.39	**Open**	Moderate	**High**	Moderate	**Low**	Possible	Likely / Burrows Identified

Table 2 Progress Energy LNP Site - Gopher Tortoise Survey Sections Summary

Survey Section	FLUCFCS Code[1]	Area (acres)	Gopher Tortoise Habitat Condition Variables[2]						Gopher Tortoise Habitat Suitability Determination
			Canopy Closure	Shrub Density	Forage Species Quality	Groundwater	Level of Disturbance	Compatible Soil Type	
29	441	10.97	**Open**	Dense	Low	Moderate	Very High	Possible	Unlikely
30	320	8.66	**Open**	Very Dense	Low	Shallow	Moderate	Possible	Unlikely
31	441	5.83	Dense	Dense	Moderate	Moderate	Moderate	Possible	Unlikely
32	320	3.79	Moderate	Dense	Moderate	Moderate	**Low**	Possible	Possible / Needs Improvements
33	441	6.15	Dense	Dense	Moderate	Moderate	Moderate	Possible	Unlikely
34	411	6.98	Moderate	Dense	Moderate	Moderate	**Low**	Possible	Possible / Needs Improvements
35	441	3.11	Dense	Moderate	Moderate	Shallow	Moderate	Possible	Unlikely
36	441 / 4388	34.06	Moderate	Moderate	Moderate	**Deep**	Moderate	**Very Likely**	Likely / Burrows Identified
37	441	12.80	Moderate	Moderate	Moderate	Moderate	Moderate	Possible	Likely / Burrows Identified
38	441	3.28	Dense	Dense	Moderate	Shallow	Moderate	Possible	Unlikely
39	441	9.87	Dense	Dense	Moderate	Shallow	Moderate	Possible	Unlikely
40	441	5.04	Dense	Dense	Moderate	Shallow	Moderate	Possible	Unlikely
41	441	4.02	Dense	Very Dense	Moderate	Shallow	Moderate	Possible	Unlikely
42	441	8.70	Moderate	Dense	Moderate	Moderate	Moderate	Possible	Possible / Needs Improvements
43	441	12.79	Dense	Dense	Low	Moderate	Moderate	Possible	Unlikely
44	441	7.72	Moderate	Moderate	**High**	Shallow	Moderate	Possible	Likely / Burrows Identified
45	441	9.84	Moderate	Moderate	Moderate	Shallow	Moderate	Possible	Possible / Needs Improvements
46	441	13.27	Moderate	Moderate	Moderate	Shallow	Moderate	Possible	Possible / Needs Improvements
47	4418	1.89	None	Moderate	Moderate	Shallow	Very high	Possible	Unlikely
48	Multiple	592.37	Moderate	Moderate	Low	Shallow	Moderate	Possible	Unlikely
49	Restricted Access - Section Not Surveyed								

[1] FDOT, 1999.

[2] Habitat Condition Variables ratings in **bold** indicate optimal conditions for gopher tortoise habitation or foraging.

gopher tortoises and appeared to provide the most suitable soils for gopher tortoise burrow construction.

Disturbance at the LNP site was mostly attributed to coniferous (pine) plantation activities. Evidence of disturbance was most apparent in recently harvested areas, but given that all plantation areas were previously furrowed and bedded, it was noted that all plantation areas have historically experienced heavy disturbances that likely effect gopher tortoise populations.

Land Use and Habitat Conditions

Descriptions of FLUCFCS land use classes identified onsite are provided below. The predominant land use at the LNP Site is pine plantation (FLUCFCS code 441 or 4418).A summary of representative vegetation species identified within each FLUCFCS code and determination of gopher tortoise forage vegetation species preference according to Ashton (2007) is provided in Table 3.

Shrub and Brushland (320) Includes saw palmetto, gallberry, wax myrtle, coastal scrub and other shrubs and brush. Generally, saw palmetto is the most prevalent plant cover intermixed with a wide variety of other woody scrub plant species as well as various types of short herbs and grasses.

Pine Flatwoods (411) These forests are quite common throughout much of northern and central Florida. Originally, longleaf pines were common on drier sites while slash pines, which are less fire-resistant, were confined to moister sites; wildfire being the contributing factor in this distribution. The pine flatwoods class is dominated by either slash pine, longleaf pine, or both, and less frequently by pond pine. The common flatwoods understory species include saw palmetto, wax myrtle, gallberry, and a wide variety of herbs and brush.

Mixed Hardwoods (438) This is a hardwood community in which no single species or species group appears to achieve a 66-percent dominance of the canopy. This class of hardwoods includes any combination of large and small hardwood tree species none of which can be identified as dominating the canopy.

Disturbed Mixed Hardwoods (4389) Mixed Hardwoods (438) that have been disturbed through human activities.

Coniferous (Pine) Plantations (441) these are almost exclusively pine forests artificially generated by planting seedling stock or seeds. These stands are characterized by high numbers of trees per acre and their uniform appearance. Although row patterns often stand out, this is not always the case, especially where stands are a result of aerial seeding.

Recently Logged Coniferous (Pine) Plantations (4418) Coniferous (Pine) Plantations that have been recently logged or are considered to be in an early stage of development.

Spoil Areas (743) Part of the Disturbed Lands (740) category. Disturbed lands are those areas which have been changed due primarily to human activities other than mining. In Florida, these areas may be rather extensive and often appear outside of urban areas.

Railroad (812) Part of the Transportation (810) category. The Transportation category encompasses rail-oriented facilities, including stations, round-houses, repair and switching yards and related facilities.

Table 3 Progress Energy LNP Site - Upland Habitat Vegetation Summary

Land Use Type (FLUCFCS Code[1])	Typical Vegetation at the LNP Site		Gopher Tortoise Forage Species[2]	Survey Sections
Shrub and Brushland (320)	Saw palmetto	*Serenoa repens*	Important	30, 32
	Gallberry	*Ilex glabra*	Not Likely	
	Wax myrtle	*Myrica cerifera*	Not Likely	
	Wiregrass	*Aristida beyrichiana*	Important	
Pine Flatwoods (411)	Loblolly pine	*Pinus taeda*	Not Likely	34
	Saw palmetto	*Serenoa repens*	Important	
	Wiregrass	*Aristida beyrichiana*	Important	
	Gallberry	*Ilex glabra*	Not Likely	
	Fetterbush	*Lyonia lucida*	Seasonal	
	Bluestem	*Andropogon* spp.	Important	
	St. Johnswort	*Hypericum* spp.	Important	
Mixed Hardwoods (438)	Sand live oak	*Quercus geminata*	Seasonal	17, 18, 25, 28
	Sabal palm	*Sabal palmetto*	Important	
	Saw palmetto	*Serenoa repens*	Important	
	Wiregrass	*Aristida beyrichiana*	Important	
	Fennel	*Eupatorium capillifolium*	Important	
	Wax myrtle	*Myrica cerifera*	Not Likely	
	Baccharis	*Baccharis* sp.	Seasonal	
	Maidencane	*Panicum hemitomon*	Important	
	Blackberry	*Rubus* sp.	Important	
Disturbed Mixed Hardwoods (4389)	Sabal palm	*Sabal palmetto*	Important	36, 13
	Fennel	*Eupatorium capillifolium*	Important	
	Saw palmetto	*Serenoa repens*	Important	
	Wax myrtle	*Myrica cerifera*	Not Likely	
	Baccharis	*Baccharis* sp.	Seasonal	
	Blackberry	*Rubus* sp.	Important	
	Red cedar	*Juniperus virginiana*	Not Likely	
Coniferous (Pine) Plantations (441)	Slash pine	*Pinus elliottii*	Not Likely	1, 3, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 19, 20, 21, 22, 23, 24, 27, 29, 31, 33, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46
	Gallberry	*Ilex glabra*	Not Likely	
	Wax myrtle	*Myrica cerifera*	Not Likely	
	Japanese honeysuckle	*Lonicera japonica*	Not Likely	
	Fetterbush	*Lyonia lucida*	Seasonal	
	Saw palmetto	*Serenoa repens*	Important	
	Fennel	*Eupatorium capillifolium*	Important	
	Blackberry	*Rubus* sp.	Important	
	Greenbrier	*Smilax* sp.	Seasonal	

Table 3 Progress Energy LNP Site - Upland Habitat Vegetation Summary

Land Use Type (FLUCFCS Code[1])	Typical Vegetation at the LNP Site		Gopher Tortoise Forage Species[2]	Survey Sections
Recently Logged Coniferous (Pine) Plantations (4418)	Gallberry	*Ilex glabra*	Not Likely	2, 4, 47
	Wax myrtle	*Myrica cerifera*	Not Likely	
	Japanese honeysuckle	*Lonicera japonica*	Not Likely	
	Saw palmetto	*Serenoa repens*	Important	
	Fennel	*Eupatorium capillifolium*	Important	
	Blackberry	*Rubus* sp.	Important	
	Fetterbush	*Lyonia lucida*	Seasonal	
	Greenbrier	*Smilax* sp.	Seasonal	
Spoil Areas (743)	Blackberry	*Rubus* sp.	Important	13, 26
	Fennel	*Eupatorium capillifolium*	Important	
	Red cedar	*Juniperus virginiana*	Not Likely	
	Greenbrier	*Smilax* sp.	Seasonal	
	Bluestem	*Andropogon* spp.	Important	
Railroad (812)	N/A			26

[1] FDOT, 1999.
[2] Based on Ashton and Ashton (2007).

Gopher Tortoise Burrows

The goal of the additional CH2M HILL surveys was to identify the areas within the LNP Survey Corridor that provide suitable habitat for gopher tortoises. Gopher tortoise burrow locations were documented to assist with facility siting and future detailed survey efforts.

A total of 58 gopher tortoise burrows were identified within the LNP Survey Corridor during field surveys (See Table 4 and Figure 1) or were previously documented in existing site assessments (Lotspeich, 2007; FNAI, 2007). The majority of burrows were located in relatively open canopy and shrub layer areas, along existing roads, edges of wetlands, and on spoil areas. Due partly to the shallow groundwater depth in the northern portion of the LNP Site, the occurrence and density of gopher tortoises increased significantly toward the south, immediately north of Highway 40 and along the spoil areas of the Cross Florida Barge Canal.

Several listed species are known to co-exist in gopher tortoise burrows, including the eastern indigo snake (*Drymarchon corais couperi*), gopher frog (*Rana capito*), and Florida mouse (*Podomys floridanus*). No evidence of activity or occurrence of commensal species were noted during field surveys.

Table 4 Progress Energy LNP Site - Gopher Tortoise Burrows Location Summary

Burrow No.	Latitude[1]	Longitude[1]	Burrow Status	Survey Section	FLUCFCS Code[2]	Soil Map Unit[3]
GT 001	-82.610579	29.072311	Active	6	441	Smyma fine sands
GT 002	-82.610449	29.072162	Active	6	441	Smyma fine sands
GT 003	-82.609775	29.067603	Active	6	441	Smyma fine sands
GT 004	-82.624766	29.023833	Active	7	441	Smyma fine sands
GT 005	-82.624350	29.023783	Active	13	743 / 4389	Spoil from Barge Canal
GT 006	-82.624350	29.023883	Active	13	743 / 4389	Spoil from Barge Canal
GT 007	-82.623317	29.024383	Active	13	743 / 4389	Spoil from Barge Canal
GT 008	-82.621550	29.024700	Active	13	743 / 4389	Spoil from Barge Canal
GT 009	-82.621167	29.024817	Active	13	743 / 4389	Spoil from Barge Canal
GT 010	-82.625033	29.028233	Active	14	441	Cassia-Pomello
GT 011	-82.624967	29.028150	Active	14	441	Cassia-Pomello
GT 012	-82.625250	29.027883	Active	14	441	Cassia-Pomello
GT 013	-82.624600	29.027483	Active	14	441	Cassia-Pomello
GT 014	-82.625450	29.027483	Active	14	441	Cassia-Pomello
GT 015	-82.625200	29.027783	Active	14	441	Cassia-Pomello
GT 016	-82.624800	29.027683	Active	14	441	Cassia-Pomello
GT 017	-82.621717	29.029817	Active	14	441	Cassia-Pomello
GT 018	-82.621517	29.029800	Active	14	441	Cassia-Pomello
GT 019	-82.625100	29.028583	Active	14	441	Cassia-Pomello
GT 020	-82.624900	29.027950	Juvenile	14	441	Cassia-Pomello
GT 021	-82.624683	29.027883	Active	14	441	Cassia-Pomello
GT 022	-82.623217	29.029400	Active	14	441	Cassia-Pomello
GT 023	-82.623567	29.029383	Active	14	441	Cassia-Pomello
GT 024	-82.621433	29.027967	Active	14	441	Cassia-Pomello
GT 025	-82.621533	29.027950	Active	14	441	Cassia-Pomello
GT 026	-82.621850	29.027833	Juvenile	14	441	Cassia-Pomello
GT 027	-82.622300	29.027717	Active	14	441	Cassia-Pomello
GT 028	-82.624083	29.027600	Active	14	441	Cassia-Pomello
GT 029	-82.623450	29.027733	Active	14	441	Cassia-Pomello
GT 030	-82.623167	29.027900	Active	14	441	Cassia-Pomello
GT 031	-82.623850	29.027717	Active	14	441	Cassia-Pomello
GT 032	-82.624033	29.027650	Active	14	441	Cassia-Pomello
GT 033	-82.623500	29.028300	Active	14	441	Cassia-Pomello
GT 034	-82.623667	29.028333	Active	14	441	Cassia-Pomello
GT 035	-82.623567	29.028367	Active	14	441	Cassia-Pomello
GT 036	-82.623733	29.028950	Active	14	441	Cassia-Pomello
GT 037	-82.623183	29.029250	Active	14	441	Cassia-Pomello
GT 038	-82.625050	29.037983	Active	20	441	Smyma fine sands
GT 039	-82.623617	29.043333	Inactive	23	441	Smyma fine sands
GT 040	-82.621683	29.041650	Active	25	438	Smyma fine sands
GT 041	-82.621333	29.040667	Outside of Survey Corridor			
GT 042	-82.625011	29.043474	Active	37	441	Smyma fine sands
GT 043	-82.623391	29.043632	Active	37	441	Smyma fine sands
GT 044	-82.624033	29.034117	Active	16	441	Smyma fine sands
GT 045	-82.624717	29.035550	Active	18	438	Adamsville fine sands
GT 046	-82.625467	29.033533	Active	17	438	Adamsville fine sands

Table 4 Progress Energy LNP Site - Gopher Tortoise Burrows Location Summary

Burrow No.	Latitude[1]	Longitude[1]	Burrow Status	Survey Section	FLUCFCS Code[2]	Soil Map Unit[3]
GT 047	-82.607094	29.058127	Outside of Survey Corridor			
GT 048	-82.616767	29.062650	Active	44	441	Smyma fine sands
GT 049	-82.616900	29.062683	Active	44	441	Smyma fine sands
GT 050	-82.616617	29.062533	Active	44	441	Smyma fine sands
GT 051	-82.617416	29.042678	Outside of Survey Corridor			
GT 052	-82.622545	29.031407	Active	15	441	Smyma fine sands
GT 053	-82.623156	29.031981	Active	16	441	Smyma fine sands
GT 054	-82.623234	29.031657	Active	16	441	Smyma fine sands
GT 055	-82.623933	29.037300	Active	20	441	Smyma fine sands
GT 056	-82.622417	29.038350	Active	28	438	Smyma fine sands
GT 057	-82.622230	29.023410	Active	13	743 / 4389	Spoil from Barge Canal
GT 058	-82.622310	29.034300	Active	15	441	Smyma fine sands

[1] Geographic Coordinate System - World Geodetic System 1984
[2] Florida Department of Transportation (FDOT), 1999.
[3] USDA, 2007

FUTURE ACTIONS

The additional CH2M HILL surveys provide a detailed assessment of the habitat conditions at the LNP Site. Future activities related to gopher tortoises at the LNP Site will likely include the following actions:

- Gopher Tortoise Mitigation Plan - A detailed Gopher Tortoise Mitigation Plan for the LNP Site will need to be developed as comprehensive guidance for protecting gopher tortoise populations. This plan will include information regarding pre-construction detailed site surveys, possible relocation methodologies, identification of possible recipient sites, and protection measures to be implemented during construction and operation. During the additional CH2M HILL field surveys, several Survey Sections within the LNP Survey Corridor were identified as Possible / Needs Improvement (Survey Sections 32, 34, 42, 45, and 46). These Survey Sections could serve as potential recipient sites after land management activities such as prescribed fire or manual canopy and shrub thinning to provide more suitable habitat.

- Detailed Field Surveys - Detailed field surveys for gopher tortoise burrows will be necessary three to four months prior to construction at the LNP Site. These detailed field surveys will provide quantitative gopher tortoise population estimates and comprehensive inventory of gopher tortoise burrow locations as typically required by regulatory agencies.

- Gopher Tortoise Relocations - Gopher tortoises within project boundaries that may be impacted by proposed activities will be required to be relocated prior to construction. These relocations would involve burrow excavations or trapping following project-specific guidance from the FWS.

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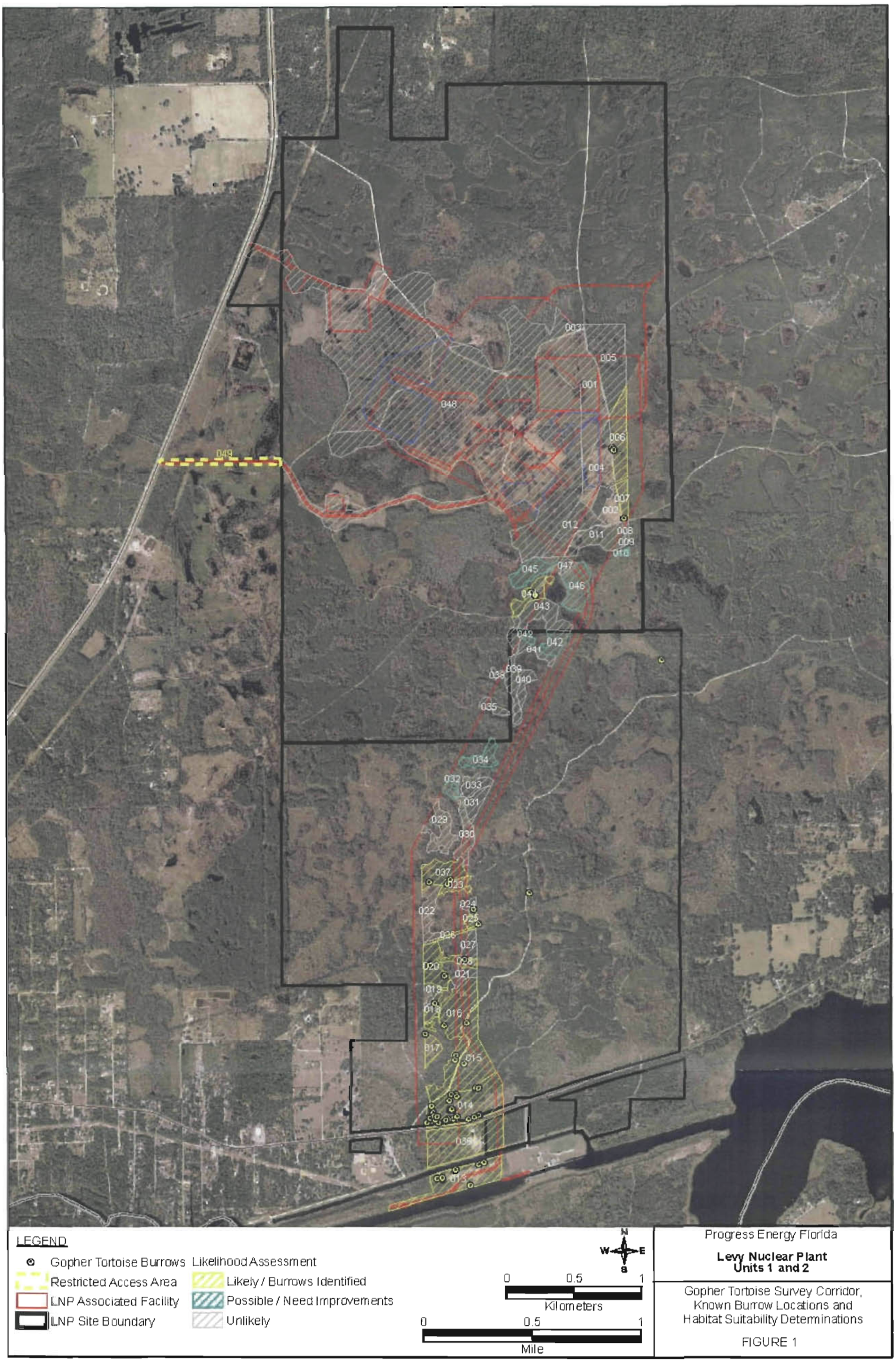

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COMMENT NUMBER: VI.A.2

RAI NUMBER: LNP SCA RAI-107

REQUESTING AGENCY: Florida Fish and Wildlife Conservation Commission (FWC)

COMMENT:

It is also not clear what monitoring studies and survey protocols will be conducted during and after construction. The applicant will need to provide additional information that describes the monitoring plans and protocols, for all species (aquatic and terrestrial), that are anticipated to be conducted during construction, after construction, and for operational monitoring. We will need more detailed survey information prior to completion of the Levy Nuclear Plant and the associated Transmission Lines application.

RESPONSE:

Information on pre-application, construction, and operational phase monitoring studies, plans, and protocols is provided in the following SCA and ER (SCA Appendix 10.11; Volume 9) sections:

SCA 3.3.6.3	Measurement Programs (Ecology)
SCA 5.4.2	Measuring and Monitoring programs (Ecological Impacts)
ER 6.5	Ecological Monitoring
ER 6.5.1	Terrestrial Ecology and Land Use
ER 6.5.1.1	Preapplication Terrestrial Ecology Monitoring
ER 6.5.2	Aquatic Ecology
ER 6.5.2.1	Preapplication Aquatic Ecology Monitoring
ER 6.7.5	Ecological Monitoring (Summary of Monitoring Programs)

Based on habitat characterization and extensive onsite observations, the listed terrestrial species most likely to be encountered on the LNP site is the gopher tortoise, for which preconstruction surveys have been conducted. Additional surveys will be conducted prior to construction to ensure that impacts to gopher tortoises are avoided to the extent practicable. Details of survey protocol are addressed in the memorandum entitled, "Progress Energy Levy Nuclear Plant - Gopher Tortoise and Upland Habitat Condition Survey Results" (please also see response to RAI-106 [VI.A.1]).

The aquatic communities of the CFBC, the old Withlacoochee River channel below Inglis Dam, and the CREC discharge canal area are being characterized by the collection of original field information and data. The details of the ongoing sampling effort are presented in the attached Aquatic Sampling Plan. The purpose of the new data is to allow for predictions of future changes to the aquatic ecosystem due to the construction and

operation of a CWIS on the upper portion of the CFBC and the discharge of cooling tower blowdown from LNP into the existing CREC discharge canal.

Through the SCA process PEF is seeking certification of corridors for the offsite transmission lines associated with the LNP Units 1 and 2. In developing the SCA, PEF's consultants performed habitat characterizations based on existing information and remote sensing and also made observations of species in areas where access was available. This information was provided in the SCA. Transmission system design details such as ROW location within the corridor, width of the ROW, structure locations, structure heights, access road locations and in some instances conductor configuration, will not be finalized until after the corridors are certified. Once access is available to the selected ROW, detailed surveys for listed species will be conducted.

ATTACHMENTS:

See following Aquatic Sampling Plan.

CH2MHILL

DOCUMENT APPROVAL SHEET

Document Type:	Field Workplan
Document Title:	COLA AQUATIC SAMPLING WORKPLAN FOR LEVY COUNTY SITE, PROGRESS ENERGY, FLORIDA
Document Number:	338884-WKPL-003
Revision Number:	Rev 1
Effective Date:	03/31/2008

Steven Eakin		03/31/2008
Prepared By (Print Name)	Signature	Date
Bobbie Hickman		3/31/08
Reviewed By (Print Name)	Signature	Date
Mike Keating		3/31/08
Approved By (Print Name)	Signature	Date

Form QA-FM-003 Form controlled by NBG-QA-05-01, Rev. 5

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Progress Energy, Florida
Levy County Site

COLA Aquatic Sampling Workplan

Prepared for

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March, 2008

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This document contains confidential and proprietary information for the Progress Energy COLA project.

Use of this document for purposes other than this project is prohibited. This work is non safety-related.

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Revision History

For the COLA Site Investigation Workplan for Levy County Site, Progress Energy, Florida

Rev	Date	Description	Filename
0	09-06-07	Initial Release	2008-03-31_Aquatic_Sampling_(338884-WKPL-003).doc
1	03-31-08	Updated to add extended sampling program in Cross-Florida Barge Canal, and new sampling program for Crystal River Energy Complex	2008-03-31_Aquatic_Sampling_(338884-WKPL-003).doc

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Contents

Section **Page**

Acronyms ..... **6 of 26**

1.0 Project Overview ..... **7 of 26**
1.1 Field Work Program ..... 7 of 26
1.1.1 Water Quality Sampling ..... 7 of 26
1.1.2 Substrate Characterization ..... 8 of 26
1.1.3 Fish Community ..... 8 of 26
1.1.4 Benthic Community ..... 8 of 26
1.1.5 Icthyoplankton and Meroplankton Community ..... 8 of 26

2.0 Description of Work ..... **9 of 26**
2.1 Sampling Stations ..... 9 of 26
2.1.1 Cross-Florida Barge Canal ..... 9 of 26
2.1.2 Crystal River Energy Complex ..... 9 of 26
2.2 Water Quality Sampling ..... 10 of 26
2.2.1 Water Quality Parameters and Methods ..... 10 of 26
2.3 Substrate Characterization ..... 14 of 26
2.3.1 Sediment Parameters and Methods ..... 14 of 26
2.4 Fish Community ..... 16 of 26
2.4.1 Sampling Stations ..... 16 of 26
2.4.2 Fish Collection Methods ..... 17 of 26
2.4.3 Fish Handling ..... 18 of 26
2.5 Benthic Community ..... 19 of 26
2.5.1 Sampling Stations ..... 19 of 26
2.5.2 Invertebrate Collection Methods ..... 19 of 26
2.5.3 Invertebrate Handling ..... 20 of 26
2.6 Icthyoplankton and Meroplankton Community ..... 21 of 26
2.6.1 Sampling Stations ..... 21 of 26
2.6.2 Plankton Sampling Methods ..... 21 of 26

3.0 Quality Assurance Requirements ..... **23 of 26**

4.0 Schedule ..... **24 of 26**

5.0 Workplan Change Management ..... **25 of 26**

6.0 Contact Information ..... **26 of 26**

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Appendices

A Aquatic Sampling Methods and Calibration
B Aquatic Sampling Forms

Tables

2-1 Sample Designation Scheme for General Analytical Samples ..... 14 of 26
2-2 Sample Designation Scheme for Sediment Analytical Samples ..... 16 of 26
2-3 Sample Designation Scheme for Benthic Infaunal Macroinvertebrate Samples ..... 20 of 26
2-4 Sample Designation Scheme for Icthyoplankton and Meroplankton Samples ..... 22 of 26

3-1 Laboratories and Subcontractor Quality Assurance Requirements ..... 23 of 26

4-1 General Field Event Schedule ..... 24 of 26

6-1 Key CH2M HILL Field Sampling Personnel ..... 26 of 26

Figures

2-1 Water Quality Sampling Locations ..... 11 of 26

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Acronyms

ASTM	American Society for Testing and Materials
COC	chain of custody
COLA	Combined Operating License Application
DO	dissolved oxygen
FDEP	Florida Department of Environmental Protection
GPS	global positioning satellite
HS&E	Health, Safety, and Environment
M&TE	Measuring and Test Equipment
MS/MSD	matrix spike/matrix spike duplicate
NIST	National Institute of Standards and Technology
SAL	Special Activity License
SOP	standard operating procedure
TBD	to be determined
USGS	United States Geological Survey
YSI	Yellow Springs Instruments

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1.0 Project Overview

An aquatic investigation will be conducted to support preparation of a Combined Operating License Application (COLA) for two Westinghouse Electric Company, LLC's AP1000 generating units at the Progress Energy Levy County site in Florida. The Levy site, approximately 3,000 acres in size, is located on the east side of U.S. Highway 19, approximately 5 miles north of the town of Inglis. The aquatic resources near this site identified for this investigation include the segment of the Cross Florida Barge Canal from the Inglis Lock westward to the Gulf of Mexico, and the vicinity of the Crystal River Energy Complex.

Data collected from the aquatic surveys described in this workplan are to characterize existing environmental conditions and are not safety related.

This document has been reviewed and approved by a senior scientist with appropriate credentials in aquatic ecology. This particular version of the Aquatic Work Plan for the Levy Nuclear Plant (LNP) site work was approved for issuance and use by Mr. Ray Bogardus, CH2M HILL Senior Aquatic Ecologist.

1.1 Field Work Program

The aquatic field work program will include multiple tasks designed to characterize various physical, chemical, and biological components of the study area water bodies. The program includes the investigation of two study areas, the Cross-Florida Barge Canal (CFBC) inclusive of the old Withlacoochee River channel between the CFBC and the Inglis Dam, and the vicinity of Crystal River Energy Complex (CREC) and its discharge canal.

Work performed by laboratories contracted to analyze specific chemical and biological parameters shall follow best commercial grade practices to insure that results are accurate. Data produced from the aquatic investigation described below is to characterize environmental conditions and is not related to safety.

1.1.1 Water Quality Sampling

- The objective is to characterize general water quality conditions along the length of the CFBC (4 stations), within the old Withlacoochee River channel connected to the CFBC (3 stations), and at the CREC (4 stations).
- At sampling stations, mid-depth water samples will be collected for laboratory analysis of chlorophyll *a*, total suspended solids, total dissolved solids, total phosphorous, nitrate plus nitrite, ammonia, and total Kjeldahl nitrogen. In addition, biochemical oxygen demand, chemical oxygen demand, orthophosphate, alkalinity, chlorides, sulfate, sodium, potassium, calcium, magnesium, mercury, and lead will be analyzed at the CREC stations.

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- Field measured parameters at sampling stations will include dissolved oxygen (DO), temperature, pH, conductivity, and salinity which will each be measured at the surface and bottom and where adequate depth exists, and at 1-meter depth intervals in between. Single measures of water clarity and total depth will also be recorded at each station.

1.1.2 Substrate Characterization

- The objective is to characterize sediment conditions in the CFBC (4 stations), old Withlacoochee River channel (3 stations), and in the CREC nearshore Gulf of Mexico area (2 stations).
- Sediment samples will be collected for laboratory analysis of total organic carbon and particle size.

1.1.3 Fish Community

- The objective is to characterize the fish community that occurs in the CFBC (4 stations), old Withlacoochee River channel (3 stations), and in the CREC nearshore Gulf of Mexico area (2 stations).
- Collected fish will be identified, counted, and measured for total length.

1.1.4 Benthic Community

- The objective is to characterize the benthic community that occurs in the CFBC (4 stations), old Withlacoochee River channel (3 stations), and in the CREC nearshore Gulf of Mexico area (2 stations).
- Benthic infaunal macroinvertebrates (e.g., polychaetes, amphipods) will be collected with a petite ponar dredge, and identified at a taxonomic laboratory. Motile crustaceans (e.g., blue crabs) will be sampled with larger equipment such as crab traps and trawls.

1.1.5 Icthyoplankton and Meroplankton Community

- The objective is to characterize the plankton (icthyoplankton and meroplankton) community that occurs in the CFBC (4 stations) and in the CREC nearshore Gulf of Mexico area (2 stations).
- Plankton will be sampled with a plankton net, with samples submitted to a taxonomic laboratory for identification.

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2.0 Description of Work

2.1 Sampling Stations

Sampling for various parameters will be conducted at 7 stations in the CFBC area, and at 4 stations in the CREC area as shown in **Figure 2-1.** A total of 11 stations will be sampled.

2.1.1 Cross-Florida Barge Canal

- **Station 1** represents the eastern end of the CFBC, and occurs about one-half mile west of the Inglis Lock.
- **Station 2** occurs at the approximate middle of the CFBC, approximately 3.5 miles west of Inglis Lock, and just west of west of Highway 19.
- **Station 3** represents the western end of the CFBC, located about one-half mile from the mouth.
- **Station 4** occurs approximately one-half mile outside the mouth of the CFBC in Withlacoochee Bay.
- **Station 8** occurs in the old Withlacoochee River channel near the Inglis Dam.
- **Station 9** occurs in the old Withlacoochee River channel approximately mid-way between the Inglis Dam and the confluence with the CFBC.
- **Station 10** occurs in the old Withlacoochee River channel near the confluence of the river with the CFBC.

2.1.2 Crystal River Energy Complex

- **CREC Station 1** is located at the proposed liquid release point within an existing concrete channel used for blowdown discharge from existing coal units.
- **CREC Station 2** is located within the discharge canal.
- **CREC Station 3** is located near the mouth of the CREC discharge canal, just outside the floating boat barrier.
- **CREC Station 4** is located near seagrass beds near the discharge point.

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2.2 Water Quality Sampling

2.2.1 Water Quality Parameters and Methods

Three groups of water quality parameters will be collected, including field measurements of physical water quality parameters, laboratory samples for general analysis (i.e., nutrients and chlorophyll *a*), and laboratory samples for additional analytes at the CREC study area. A summary of water quality parameters and station locations is provided in the following subsections.

2.2.1.1 Field Parameters

Field parameters to be measured include the following:

Dissolved oxygen (milligrams per liter [mg/L])
Temperature (°C)
pH
Conductivity (µmhos/cm)
Salinity (parts per thousand [ppt])
Clarity (i.e., Secchi depth, meters)
Total depth (meters)

Except for total depth, these parameters will be measured at each of the 7 CFBC and 4 CREC stations. Total depth will only be done at the 7 CFBC stations. At each station, field parameters will be measured at 6 inches below the surface, and then at 1-meter depth intervals until the bottom is reached. The sonde (described below) will be lowered off the side of a boat to the appropriate depths.

Field parameters will be measured at each station in conjunction with the sampling of analytical water quality samples, collection of ichthyoplankton and meroplankton samples, and once near the beginning and once near the end of sampling events where nekton (e.g., fish, crabs) are collected.

A Yellow Springs Instruments (YSI) multiparameter sonde will be used to measure dissolved oxygen, temperature, pH, conductivity, salinity, and depth. This meter will be calibrated at the beginning of each sampling day, and again following final measurements of the day. Measurements and calibration will be conducted in accordance with Florida Department of Environmental Protection (FDEP) standard operating procedures (SOPs), or equipment manufacturer SOPs, as presented in Appendix A.1. In accordance with Measuring and Test Equipment (M&TE) protocols, the YSI meter will be controlled and at specified periods calibrated and adjusted to maintain accuracy within necessary limits. The NBG-QA-12-01 Rev. 5 and 338884-PI-03-12 Rev. 0 will be implemented for M&TE activities. Instructions and control forms for M&TE are provided in Appendix B.1.

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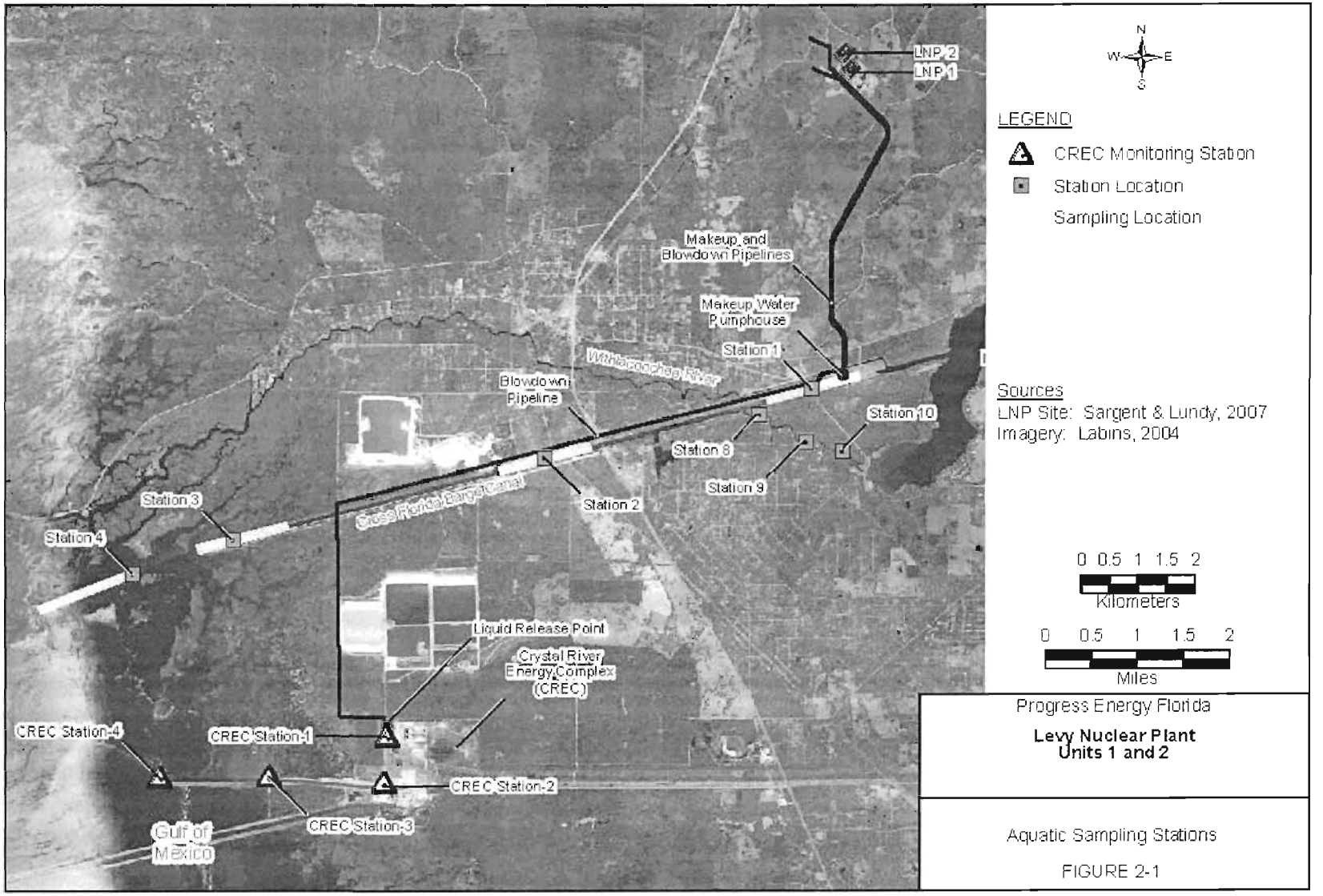

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Water clarity will be measured using a Secchi disk. The method for using the Secchi disk will follow the FDEP SOP FT1720, which is outlined below.

1. Remove sunglasses. If using a boat, conduct the measurements over the least shaded side of the boat.
2. Clip the chain or rope to the Secchi disk. Make sure the chain is attached so that depth is determined from the upper surface of the disk.
3. Slowly lower the Secchi disk in the water, visually observe the disk, and record the depth at which the disk disappears. If it is visible to the bottom of the water body, note on the field sheet the depth to the bottom, and that the Secchi depth is greater than the bottom depth.
4. Lower the disk beyond the point recorded in Section 2 above. Slowly raise the disk and record the depth at which it reappears. The Secchi depth is the average of the two readings.
5. Note any conditions that might affect the accuracy of the measurement in the field sheet. If the disappearance depth is < 1.0 meter, determine the depth to the nearest 0.01 meter or 1 inch by marking the chain at the nearest depth marker and measuring the remaining length with a tape measure.

Total depth at the sampling station will be measured using the YSI multiparameter probe with a depth sensor. A surveyor rod will be used as a backup depth measuring instrument.

Field measurement data will be stored in the memory of the YSI multiparameter sonde and downloaded directly to computer once the sonde has returned from field events. As a backup, field measurement data may be recorded by hand on a field parameter data sheets (Appendix B). Do not leave any blank spaces on data sheets; mark through blank areas and note not applicable (N/A). Additional notes regarding water quality characteristics or other environmental conditions will be recorded in a waterproof field logbook.

2.2.1.2 Analytical Parameters

General analytical samples will be collected for laboratory analysis of the following:

Chlorophyll *a* (mg/m^3)
Total suspended solids (mg/L)
Total dissolved solids (mg/L)
Total phosphorous (mg/L)
Nitrate + Nitrite (mg/L)
Ammonia (mg/L)
Total Kjeldahl nitrogen (mg/L)

These general analytical parameters will be collected each of the 7 CFBC and 4 CREC stations.

Additional analytical samples will be collected for laboratory analysis of the following:

Biochemical Oxygen Demand (BOD)
Chemical Oxygen Demand (COD)

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Orthophosphate
Alkalinity
Chlorides
Sulfate
Sodium
Potassium
Calcium
Magnesium
Mercury
Lead

These additional analytical parameters will be collected only at the 4 CREC stations.

Analytical water quality samples will be collected at sampling stations in conjunction with the sampling of nekton which will occur once in the late spring/early summer in the CFBC, and quarterly in the CREC area. Analytical samples will be collected once near the beginning and once near the end of the nekton sampling events.

Water samples will be collected using a peristaltic pump and manufacturer decontaminated Teflon tubing. Water will be pumped from the approximate middle of the water column directly into sample containers provided by the analytical laboratory. The detailed methodology is provided in Appendix A.2.

Field duplicate samples are to be collected at a frequency of 1 field duplicate per 10 surface water samples. The station locations from which the duplicates are taken will be selected randomly. Each duplicate sample will be split evenly into two sample containers, and submitted for analysis as two independent samples. This duplicate sample measures sampling precision and matrix homogeneity or heterogeneity.

One equipment blank will be collected per day. Equipment blanks provide an indication of the efficiency of the decontamination procedure (i.e., peristaltic pump and Teflon tubing) and indicate what possible contaminants may be artifacts from the decontamination process and not attributed to site activities.

Matrix spike/matrix spike duplicate (MS/MSD) samples are to be collected at a frequency of one MS/MSD set for every 20 field samples collected per matrix. This will result in one MS/MSD set being collected during each sampling day. The MS/MSD measures accuracy and precision as they relate to a matrix. The percent recoveries of the MS and MSD (that is, the amount recovered of the amount spiked) provides the matrix accuracy statistic.

Each sample will be designated by an alphanumeric code that will identify the project, media sampled, station number, and date. The duplicate samples will be designated with a letter code at the end of the sequence. The sample designation scheme for the general analytical samples will be as follows (Table 2-1):

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TABLE 2-1
Sample Designation Scheme for General Analytical Samples

First Segment	Second Segment	Third Segment	Fourth Segment	Fifth Segment
PE = Progress Energy	SW = media sampled	CFBC-01, -02, -03, -04, -08, -09, -10; CREC-01, -02, -03, -04 = station IDs. -00 = station ID for equipment blank location	MMDDYY = month, day, and year of sample collection	FD = field duplicate EB = equipment blank
Example sample designations	**PE-SW-CFBC-03-091107** **PE-SW-CREC-03-091107-FD**	**PE-SW-CFBC-00-091007-EB**		

Filled sample bottles will be held in insulated coolers and on ice in the field and maintained at a temperature $\leq 4°C$ until arrival at the laboratory. Collection information will be recorded on the laboratory chain of custody (COC) form (Appendix B.3). The COC form documents relevant sample identification information necessary to track transfer of sample control from the CH2M HILL representative to the analytical laboratory. The subcontracted laboratory will follow best commercial grade practices to insure that the analytical data is accurate. Any additional notes regarding sample collection will be recorded in a waterproof field logbook.

2.3 Substrate Characterization

2.3.1 Sediment Parameters and Methods

Sediment analytical samples will be collected for laboratory analysis of the following:

Total organic carbon (milligrams per kilogram [mg/kg])
Particle size (micrometers)

Analytical samples for these parameters will be measured at the 7 CFBC stations, and CREC Stations 3 and 4.

Three samples will be collected at each station. At the CFBC stations, one sample will be collected from the canal/river center, and one between the center and shoreline in each direction for a total of three samples per station. At CREC Stations 3 and 4, the three samples per station will be collected along an east-west transect at approximately 50 feet intervals and composited, resulting in one sample per station. Sediment samples will be collected once in the late spring/early summer at the CFBC stations, and semi-annually at the CREC stations.

Sediment will be collected using either a petite ponar dredge or hand-driven sampling tube, depending on substrate characteristics. The barge canal is known to contain soft sediments which can be readily sampled using the petite ponar, however the sediment characteristics

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in the vicinity CREC have not been evaluated, thus if a rock or shell bottom is present the hand-driven sampling device will be used. The detailed methodologies for use of a ponar dredge sampler and hand-coring device are provided below.

The petite ponar (ponar) dredge is a clamshell style device designed to collect a 6-inch square and up to 6-inch deep sediment sample. The ponar is heavily weighted, and has been adapted with a top screen and side plates to prevent sample loss upon ascent. To initiate ponar sampling, the jaws are carefully pulled open, and the lever type cross bar is locked in place with a spring pin. A lowering rope is attached at the center point of this cross bar, and tension must be maintained to keep the spring pin in place. Lower the dredge from the side of the boat to the bottom, making sure it settles flat. When tension is removed from the line, the spring pin pops out and the cross bars will drop, enabling the dredge to close as the line is pulled upward during retrieval. Pull the sampler to the surface. Check to make sure the jaws are fully closed. Carefully open the jaws and remove the sediment sample with a decontaminated stainless steel spoon, transferring the material into a decontaminated stainless steel bowl. Repeat as necessary until sufficient sediment is collected for the sample. Decontaminate the ponar, spoon, and bowl between samples. Use of a ponar dredge in hard bottom reef areas or seagrass beds (which may occur near the offshore stations), is prohibited by the Special Activity License (SAL) permit; thus, only muddy areas will be sampled.

The Wildco hand-corer is a stainless steel sediment coring tube, up to 24 inches long and with a 2-inch inner diameter, containing a removable plastic liner and nosepiece. A T-handle and extension rods are attached to the corer, and a sharp edged nosepiece at the opposite end of the coring tube allows the device to penetrate into the sediment. To operate the hand-corer, slide a decontaminated plastic liner inside the decontaminated coring section, and screw on the nosepiece. Attach the T-handle and enough 5-foot extension rods to match the depth to sediment. Lower the corer to the sediment surface, and push the device to at least 6 inches. After the corer penetrates the bottom, twist or pull it free to retrieve the sample. The hand-corer works by creating a partial vacuum which holds the sample in place and helps prevent washout. As the tube is pulled up, the polyurethane flutter valve on the head assembly tightly seals the upper end of the sampler. Carefully remove nose piece, slide out the plastic liner containing the sediment sample, and shake the sediment into a decontaminated stainless steel bowl. Repeat as necessary until sufficient sediment is collected for the sample. Decontaminate the corer head and bowl between samples.

Regardless of sampling device used, the retrieved sediment in the decontaminated stainless steel bowl will be homogenized using a stainless steel spoon. The spoon will be used to transfer the sediment into laboratory analytical jars.

Field duplicate samples are to be collected at a frequency of 1 field duplicate per 10 surface water samples. The locations from which the duplicates are taken will be selected randomly. Each duplicate sediment sample will be split evenly into two sample containers, and submitted for analysis as two independent samples. This duplicate sample measures sampling precision and matrix homogeneity or heterogeneity.

Each sample will be designated by an alphanumeric code that will identify the project, media sampled, station number, and date. The duplicate samples will be designated with a

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letter code at the end of the sequence. The sample designation scheme for the general analytical samples will be as follows (Table 2-2):

TABLE 2-2
Sample Designation Scheme for Sediment Analytical Samples

First Segment	Second Segment	Third Segment	Fourth Segment	Fifth Segment
PE = Progress Energy	SD = media sampled	CFBC-01A, -01B, -01C, -02A, -02B, -02C -03A, -03B, -03C, -04A, -04B, -04C, -08A, -08B, -08C, -09A, -09B, -09C, -10A, -10B, -10C; CREC-03A, -03B, -03C, -04A, -04B, -04C = station IDs with replicate indicators (A, B, C).	MMDDYY = month, day, and year of sample collection	FD = field duplicate EB = equipment blank
Example sample designations	**PE-SD-CFBC-03B-091107** **PE-SD-CREC-03C-091107-FD**			

Filled sample bottles will be held in insulated coolers and on ice in the field and maintained at a temperature $\leq 4°C$ until arrival at the laboratory. The subcontracted laboratory will follow best commercial grade practices to insure that the analytical data is accurate. Collection information will be recorded on the laboratory COC form (Appendix B). The COC form documents relevant sample identification information necessary to track transfer of sample control from the CH2M HILL representative to the analytical laboratory. Any additional notes regarding sample collection will be recorded in a waterproof field logbook.

2.4 Fish Community

2.4.1 Sampling Stations

Fish community sampling will be conducted at CFBC Stations 1, 2, 3, 4, 8, 9, and 10, and at CREC Stations 3 and 4. Each station generally represents up to a 1-mile segment of canal from which to collect specimens. Fish will be collected once in the late spring/early summer at the CFBC stations, and quarterly at the CREC stations.

Specific fish collection locations within the 1-mile zones have not been pre-determined. The best professional judgment of the field scientists will be used to identify ideal locations at which to deploy the various sampling gear. However, unit measures of effort will be recorded and similar levels of fishing effort will be used within each sampling zone for each utilized collection gear to allow for the calculation of catch per unit effort. These catch per unit effort values will be used to compare and contrast catch results amongst stations.

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2.4.2 Fish Collection Methods

Fish collection equipment and techniques are described below. Based on environmental conditions and collection success, the types of equipment used at each station are expected to vary. The goal is to collect the specimens of fish species that occur at each station, and though a variety of sampling techniques will be used, some may prove more productive than others. Any invertebrates collected using these techniques will be retained for identification, as described in Section 2.5.2

- **Beach seine** – An approximately 50-foot bag seine will be used to collect shoreline fish species. One end of the seine will be anchored to the shoreline, while the opposite end will be drawn out into deeper water by boat, and then back to the shoreline where the sampling crew will pull in the net and collected specimens. The rock rubble/oyster shell nature of most of the shoreline may result in low sampling efficiency. Other smaller length flat seines will be available as backup for small area seining opportunities. If no shoreline is present at a station, this technique will not be used.

- **Gill net** – Monofilament gill nets, each nominally 75 feet long, 6 feet deep, are available for use in collecting fish. Mesh sizes available to the field team include 1-, 2-, 4-, and 6-inch mesh. In addition, scientific gill nets containing short panels of 1-, 2-, 4-, and 6-inch mesh connected together, are available. The field team can make station specific determinations of the type of gill nets to be deployed, but the initial recommendation is to deploy one scientific gill net, one 4 inch mesh gill net, and one 6 inch gill net, all in close proximity at a station. Each net will be secured at the shoreline with a cinder block, and stretched perpendicular to the shoreline into deeper water and anchored with another cinder block. The nets will be bottom secured with lead weight along their length, and will have a float line at the top of the net. Nets will be deployed at each station on up to two separate days; they will be continually monitored (boat anchored nearby), and not left out overnight. Net soak times and specific deployment locations will be determined in the field using the best professional judgment of the lead scientist, but will not exceed 2 hours between being pulled completely out of the water and fish removed, as per the Special Activities License. These nets however can be redeployed as often as needed, so long as each soak time does not exceed 2 hours. Once deployed, gill nets will be frequently monitored so as to remove trapped species as quickly as possible to minimize damage to the organisms. The presence of endangered manatees and sea turtles, as well as other non-target wildlife (e.g., diving birds), makes it essential that every deployed net will remain in visual contact with the sampling team so that actions can be taken rapidly to prevent entrapment. If manatees are found to be close by, nets will be removed until the animals have moved on.

- **Trawl** – A 16-foot otter trawl will be pulled along the bottom at one or more locations within the approximate 1-mile segment for each station. The number of trawls will be determined by the sampling team in the field. Trawling may not be feasible at some stations depending on the amount of debris (e.g., large rocks) in the sampling areas which can snag the trawl. Since the bottom has not been surveyed in

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all sampling areas for the presence of debris, it cannot be known in advance how successful trawling will be at the proposed locations.

Trawl tow times will be limited to 20 minutes or less. No mechanical retrieval system will be used (per the Special Activity License). The trawl and boards will be dropped over the side of the boat and towed at a slow speed, typically 2 miles per hour or less.

Any marine turtles incidentally taken during trawling activities will be reported as required by the SAL permit. The form "Sea Turtle Stranding and Salvage Network – Stranding Form" will be completed for each incident (Appendix B)

- **Minnow traps** – A total of 10 galvanized minnow traps, measuring 16 x 9 inches, will be deployed across the 1-mile segment for each station. Traps will be baited with a variety of items which may include canned cat food, fish, or crab meat. Each trap will have a line and float, a tag marked with the SAL permit number (SAL 1044), and will be placed in shallow areas, usually near structure. Traps will be checked frequently throughout the day for captured fish.
- **Cast net** – Cast netting will be done at various locations across the 1-mile segment for each station. The number of casts will be determined in the field using the best professional judgment of the lead scientist. Cast nets with up to a 7-foot radius will be used, and tossed either from a boat or shoreline.

2.4.3 Fish Handling

Fish (and invertebrates) captured using the above techniques will be retained and held alive in aerated containers (if necessary) until processed. Processing will entail field identifications to genus and species (if practical), measurements for total length, and live release. Aerated containers will include, but not be limited to, insulated coolers, large plastic tubs, and 5-gallon plastic buckets. Aeration can be done using battery operated pumps and airline. Increased aeration will be provided as necessary to reduce stress to held fish.

Fish species data, and equipment deployment data, will be recorded on logsheets, as shown in Appendix B.6 and B.7.

Voucher specimens, intended to provide documentation for proper identification, will be collected for each distinct fish species. For large or easily identifiable species, clear photographs will be taken in the field before releasing. For very small, difficult to identify fish, specimens will be retained and initially field preserved in formalin, followed by at least one week with a transfer to ethanol. These specimens will be later identified in the laboratory.

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2.5 Benthic Community

2.5.1 Sampling Stations

Benthic macroinvertebrate community sampling will be conducted at CFBC Stations 1, 2, 3, 4, 8, 9, and 10, and at CREC Stations 3 and 4, each of which generally represents up to a 1-mile segment of canal from which to collect specimens. For benthic infaunal macroinvertebrates, co-located substrate characterization samples will also be collected at these stations, as described in Section 2.3.

Specific invertebrate collection locations within the 1-mile zones have not been pre-determined. The best professional judgment of the field scientists will be used to identify ideal locations at which to deploy the various sampling gear.

2.5.2 Invertebrate Collection Methods

Invertebrate collection equipment and techniques are described below. The goal is to collect specimens of invertebrate species that occur at each station. Any fish species collected using these techniques will also be retained for identification, as described in Section 2.4.

- **Trawl** – A 16-foot otter trawl will be pulled along the bottom at one or more locations within the approximate 1-mile segment for each station. The number of trawls will be determined by the sampling team in the field. Trawling may not be feasible at some stations depending on the amount of debris (e.g., large rocks) in the sampling areas which can snag the trawl. Since the bottom has not been surveyed in all sampling areas for the presence of debris, it cannot be known in advance how successful trawling will be at the proposed locations.

  Trawl tow times will be limited to 20 minutes or less. No mechanical retrieval system will be used (per the Special Activity License). The trawl and boards will be dropped over the side of the boat and towed at a slow speed, typically 2 miles per hour or less.

  Any marine turtles incidentally taken during trawling activities will be reported as required by the SAL permit. The form "Sea Turtle Stranding and Salvage Network – Stranding Form" will be completed for each incident (Appendix B.9)

- **Crab traps** – A total of 5 crab traps will be deployed across the 1-mile segment for each station. Traps will be baited with a variety of items which may include fish or crab meat. Each trap will have a line and float, a tag marked with the SAL permit number (SAL 1044). Traps will be checked frequently throughout the day for captured crabs and any other invertebrate species. The duration of deployment will be determined by the field sampling team, but may be up to five days.

- **Ponar dredge** - The petite ponar dredge device was previously described in Section 2.3.1. In conjunction with the collection of substrate characterization data (i.e., particle size and total organic carbon), additional sediment will be collected for the identification of benthic infaunal macroinvertebrates (e.g., polychaetes, amphipods).

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As with the collection of sediment as described in Section 2.3.1, one petite ponar dredge sample will be collected from the canal center, and one between the center and shoreline in each direction, for a total of three replicate samples per station. Each ponar dredge sample will be a single grab of sediment that is field sieved and sent to the taxonomic laboratory. Ponar dredge sampling and preservation processes for benthic invertebrates will follow FDEP SOP 7450 (Appendix A.3).

2.5.3 Invertebrate Handling

Macroinvertebrates (and fish) captured using the above techniques will be retained and held alive in aerated containers (if necessary) until processed. Field processing will entail field identifications to genus and species (if practical), measurements for total length, and live release. Aerated containers will include, but not be limited to, insulated coolers, large plastic tubs, and 5-gallon plastic buckets. Aeration can be done using battery operated pumps and airline. Increased aeration will be provided as necessary to reduce stress to held organisms.

Invertebrate species data, and equipment deployment data, will be recorded on logsheets, as shown in Appendix B.6 and B.8.

Voucher specimens, intended to provide documentation for proper identification, will be collected for each distinct fish species. For large or easily identifiable species, clear photographs will be taken in the field before releasing. For very small, difficult to identify fish, specimens will be retained and initially field preserved in formalin, followed by at least one week with a transfer to ethanol. These specimens will be later identified in the laboratory.

Petite ponar dredge samples will be preserved with 10 percent buffered formalin, labeled, stained with Rose Bengal powder, and shipped to the taxonomic laboratory for identification. The subcontracted laboratory will follow best commercial grade practices to insure that the taxonomic data is accurate. Sample labeling will be as follows (Table 2-3):

TABLE 2-3
Sample Designation Scheme for Benthic Infaunal Macroinvertebrate Samples

First Segment	Second Segment	Third Segment	Fourth Segment
PE = Progress Energy	BP = benthic ponar sample HP = hand-picked benthic sample	CFBC-01A, -01B, -01C, -02A, -02B, -02C -03A, -03B, -03C, -04A, -04B, -04C, -08A, -08B, -08C, -09A, -09B, -09C, -10A, -10B, -10C; CREC-03A, -03B, -03C, -04A, -04B, -04C = station IDs with replicate indicators (A, B, C).	MMDDYY = month, day, and year of sample collection
Example sample designations	**PE-BP-CREC-03B-091107** **PE-HP-CFBC-01A-091107**		

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Collection information from the petite ponar samples will be recorded on the laboratory COC form (Appendix B.4). The COC form documents relevant sample identification information necessary to track transfer of sample control from the CH2M HILL representative to the analytical laboratory. Any additional notes regarding sample collection will be recorded in a waterproof field logbook.

2.6 Icthyoplankton and Meroplankton Community

2.6.1 Sampling Stations

Plankton (icthyoplankton and meroplankton) community sampling will be conducted at CFBC Stations 1, 2, 3, and 4, and at CREC Stations 3 and 4. Plankton samples will be collected at the CFBC stations once in February/March 2008 (1 event), bi-weekly mid-March through June 2008 (7 events), and bi-weekly August through September 2008 (4 events), and quarterly at the CREC stations.

2.6.2 Plankton Sampling Methods

Plankton collection shall take place according to sampling methods described in Appendix A.4. Plankton samples will be collected using a 333-µm mesh conical (3:1) plankton net with a 0.5 meter mouth diameter equipped with a 3-point nylon bridle, a calibrated flowmeter (General Oceanics model 2030R), a 1-liter plastic cod-end container with 333-µm mesh side panels, and up to a 9-kilogram (20-pound) weight. Professional judgment will be used for equipment deployment locations within the range represented by each station. At each station, two plankton tows will be performed between low-slack and high-slack tides during the daytime. On the same day, two more plankton tows will be conducted at each station no sooner than one hour after sunset and between low-slack and high-slack tides, and no later than one hour prior to sunrise. As a result a total of 4 plankton samples will be collected per station. Tow durations will be 5 minutes each at an approximate rate of 1.3 meters/sec (3 mph). Each tow time will be divided equally between three depths (bottom, mid, and surface). Depth of sampling will be controlled by increasing or decreasing the length of the tow line while adjusting the boat travel speed that maintains constant tow line angle.

Upon retrieval of the net, the flowmeter reading will be recorded and the net contents rinsed into the cod-end container. The retained sample will be placed into a laboratory sample jar and preserved with 6 - 10 percent formalin. Sample labeling information is presented in Table 2-4. Collection information will be recorded on the laboratory COC form (Appendix B.5). The COC form documents relevant sample identification information necessary to track transfer of sample control from the CH2M HILL representative to the analytical laboratory. Any additional notes regarding sample collection will be recorded in a waterproof field logbook.

The plankton nets will be thoroughly rinsed between stations. Water quality parameters will be measured in 1-meter intervals from the bottom to the surface at each station after the paired plankton tows (daytime or nighttime) are completed.

The volume of water filtered through each plankton net will be quantified using a calibrated, in-line flowmeter (General Oceans models 2030R and 2030CF). In accordance

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with M&TE protocols, the flowmeters will be controlled and at specified periods calibrated and adjusted to maintain accuracy within necessary limits. Instructions and control forms for M&TE are provided in Appendix B.1.

TABLE 2-4
Sample Designation Scheme for Icthyoplankton and Meroplankton Samples

First Segment	Second Segment	Third Segment	Fourth Segment	Fifth Segment
PE = Progress Energy	PT = Plankton Tow Sample	CFBC-01A, -01B, -02A, -02B, -03A, -03B, -04A, -04B; CREC-03A, -03B, -04A, -04B, = plankton station IDs with replicate indicators (A, B).	DT = daytime sample NT = nighttime collected sample	MMDDYY = month, day, and year of sample collection
Example sample designations	**PE-PT-CFBC-03B-DAY-091107** **PE-PT-CREC-01A-NIT-091107**			

The subcontracted laboratory will follow best commercial grade practices to insure that the taxonomic data is accurate. Any additional notes regarding sample collection will be recorded in a waterproof field logbook.

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3.0 Quality Assurance Requirements

The Field Work Plan shall be performed using best commercial practices and to the terms and conditions of the contract and to any state or federal required regulations. The field project team shall be trained on the Field Workplan (338884-WKPL-003 Revision 1) and the Field Safety Instructions prior to beginning work. CH2M HILL staff and subcontracts shall document this training in a signed roster. In addition, CH2M HILL staff and subcontractors shall attend a 1 hour conference call training on CH2M HILL's Quality Program conducted by CH2M HILL staff. Documentation of this training may be conducted by role call. No work shall be performed prior to this and training being completed. A list of laboratories and subcontractors is provided in Table 3-1.

TABLE 3-1
Laboratories and Subcontractor Quality Assurance Requirements

	Task	QA Provided	Contact	Address
Ecological Associates, Inc.	Icthyoplankton and Meroplankton Taxonomic ID	E.A.I. Quality Manual, September 1st, 2003	Bob Ernest	PO Box 405 Jensen Beach, FL 34958
Water and Air Research	Benthic Macroinvertebrate Taxonomic ID	Quality Manual for Water and Air Research, Inc. Revision date: April 2007	David Evans	6821 SW Archer Rd. Gainesville, FL 32608 352-372-1500
STL (TestAmerica)	Water Quality Analyses	Laboratory Quality Manual, Revision 4, July 2006	Todd Baumgartner	2846 Industrial Plaza Drive Tallahassee, FL 32301 850-878-3994

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4.0 Schedule

Work is scheduled to begin in March, 2008 and will proceed until completion of the identified tasks. Field events will follow the schedule present in Table 4-1 below but may vary depending on field conditions, equipment availability, and personnel constraints. The project manager or field team leader may revise the field event schedule as needed to meet requests by the client, subcontractors, or field conditions.

TABLE 4-1
General Field Event Schedule

	Cross-Florida Barge Canal	Crystal River Energy Complex
Water Quality Sampling	Once - late spring/ early summer	Quarterly
Substrate Characterization	Once - late spring/ early summer	Semi-annual
Fish Community	Once - late spring/ early summer	Quarterly
Benthic Community	Once - late spring/ early summer	Semi-annual
Icthyoplankton and Meroplankton Community	Bi-weekly April through July 2008 (8 events) Bi-weekly August through September 2008 (4 events)	Quarterly

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5.0 Workplan Change Management

Changes to the approved field workplan will be conducted as per NBG-QA-05-01 Document Development and Change.

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6.0 Contact Information

The key CH2M HILL representatives for this work are listed in Table 6-1. During execution of fieldwork, project-related questions should be addressed first to the Field Team Lead for resolution. If further resolution is required, project-related questions should be addressed to the CH2M HILL COLA Aquatic Sampling Task Lead, Project Manager, or Senior Consultant. Health and Safety issues will be resolved as required in the Field Safety Instructions.

TABLE 6-1
Key CH2M HILL Field Sampling Personnel

Role	Person	Telephone	e-mail
Project Manager	Bill Marsh/GNV	Office: 352-335-7991 Cell: 352-316-0004	william.marsh@ch2m.com
Field Team Lead	John Martin/GNV	Office: 352-335-7991 Cell: 352-359-5717	john.martin@ch2m.com
Alternative Field Team Lead	Steven Eakin/GNV	Office: 352-335-7991 Cell: 352-246-7825	steven.eakin@ch2m.com
Health and Safety Manager	Karen Olson / DEN	Office: 303-771-0900 Cell: 720-210-9128	dagmar.olson@ch2m.com
Aquatic Task Senior Consultant	Ray Bogardus/PHL	Office: 215-563-4220 Cell: 215-327-4525	raymond.bogardus@ch2m.com
Quality Assurance Manager	Bobbie Hickman/DEN	Office: 720-286-2099 Cell: 720-308-1758	bobbie.hickman@ch2m.com
Client Field Representative	Jim Nevill	Cell: (919) 368-1313	James.Nevill@pgnmail.com

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Appendix A
Aquatic Sampling Methods and Calibration

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APPENDIX A

Aquatic Sampling Methods and Calibration

A.1 Yellow Springs Instruments Water Quality Meter

Field water quality parameters will be collected using a Yellow Springs Instruments (YSI) multiparameter sonde. The methods for measuring and calibrating pH, dissolved oxygen, conductivity, salinity, and temperature will be done in accordance with FDEP SOPs FT110, FT1500, FT1200, FT1300, and FT1400, as reproduced below.

FT 1100 FIELD MEASUREMENT OF HYDROGEN ION ACTIVITY (PH)

1. Equipment and Supplies

1.1. Field Instrument: Use any pH meter consisting of a potentiometer, a glass electrode, a reference electrode, and a temperature-compensating device.

1.1.1. For routine fieldwork use a pH meter accurate and reproducible to at least 0.2-unit in the range of 0.0 to 14.0 units, and equipped with temperature-compensation adjustment. Record the pH value in pH units to one decimal place.

1.1.2. Advanced silicon chip pH sensors (with digital meters) may be used if demonstrated to yield equivalent performance to glass electrode sensors for the intended application.

1.2. Standards: Purchased or laboratory-prepared standard buffer solutions of pH values that bracket the expected sample pH range. Use buffers with nominal values of 4.0, 7.0 and 10.0 units for most situations. If the sample pH is outside the range of 4.0 to 10.0, then use two buffers that bracket the expected range with the pH 7 buffer being one of the two buffers. Alternatively, prepare appropriate standards per table I in method SM4500-H+-B.

1.3. Recordkeeping and Documentation Supplies:

- Field notebook (w/ waterproof paper is recommended)
- Field record forms (e.g., forms FD 9000-7, FD 9000-8, and FD 9000-9)
- Indelible pens

2. Calibration and Use

2.1. General Concerns

2.1.1. The acceptance criterion for the initial calibration or the calibration verification is a reading of the standard within +/- 0.2-unit of the expected value.

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2.1.2. On a weekly basis, check the calibration to ensure the % theoretical slope is greater than 90% (if applicable to your instrument type).

2.1.2.1. Note the % slope in the calibration records.

2.1.2.2. A % slope of less than 90% indicates a bad electrode that must be changed or repaired.

2.1.2.3. If % slope cannot be determined on your meter, or the manufacturer's optimum specifications are different, follow the manufacturer's recommendation for maintaining optimum meter performance.

2.2. Interferences

2.2.1. Sodium at pH > 10.0 units can be reduced or eliminated by using a low sodium error electrode.

2.2.2. Coatings of oils, greases, and particles may impair the electrode's response. Pat the electrode bulb dry with lint-free paper or cloth and rinse with de-ionized water. For cleaning hard-to-remove films, use acetone very sparingly so that the electronic surface is not damaged.

2.2.3. Temperature effects on the electrometric measurement of pH are controlled by using instruments having temperature compensation or by calibrating the meter at the temperature of the samples.

2.2.4. Poorly buffered solutions with low specific conductance (< 200 µmhos/cm) may cause fluctuations in the pH readings. Equilibrate electrode by immersing in several aliquots of sample before taking pH.

2.3. Calibration: Follow the manufacturer's calibration instructions specific to your meter. Most instruments allow for a two-point calibration and a few models can perform a three-point calibration. Use the appropriate number of standard buffer solutions for calibration. Do not reuse buffers for initial calibrations.

2.3.1. Rinse the probe with de-ionized water (DI) before and between each standard buffer solution.

2.3.2. Follow the calibration activities specified in FT 1000, section 2.2.

2.3.2.1. Perform an initial calibration using at least two buffers. Always use a pH 7 buffer first.

2.3.2.2. If the pH sample range is expected to be wider than the range established by a two-point calibration (e.g., some samples at pH 4 and others at pH 8), then add a third calibration point. If the instrument cannot be calibrated with three buffers, the third buffer may be

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used as the initial calibration verification to extend the range.

2.3.2.3. After initial calibration, immediately perform an initial calibration verification (ICV). Read a buffer as a sample. To be acceptable, a calibration verification must be within +/- 0.2 pH units of the stated buffer value. For example, if reading the pH 4.0 buffer, the result must be in the 3.8 to 4.2 range. Certain regulatory programs may have more stringent acceptance criteria.

2.3.2.4. After sample measurement(s), perform a continuing calibration verification (CCV). Read a buffer as a sample. To be acceptable, a calibration verification must be within +/- 0.2 pH units of the stated buffer value. This CCV (if within acceptance criteria) can be used as the beginning of the chronological bracket. Certain regulatory programs may have more stringent acceptance criteria.

2.4. Measuring pH in situ: After calibrating the multi-probe sensors as outlined in 2.3 above, follow the meter's instructions to select the display for reading the pH of the sample. Immerse the probe at the desired depth in the water and wait for stabilization of the reading before recording the measurement.

2.5. Measuring pH in Flow-through Cells: When using a flow-through cell, the procedure described above in section 2.4 is applicable.

2.6. Measuring pH in Samples: After an acceptable initial calibration or calibration verification, follow these procedures to take a pH reading of a freshly collected sample (within 15 minutes of collection).

2.6.1. Pour enough of the fresh sample into a clean cup to take the reading.

2.6.2. Place the pH electrode in the sample (in the cup) and swirl the electrode.

2.6.3. Wait for stabilization, and read the pH value.

2.6.4. Turn the meter off after the last sample reading, rinse the electrode thoroughly with de-ionized water and replace the electrode's cap.

3. Preventive Maintenance: Refer to FT 1000, section 3.

4. Documentation

4.1. Standard and Reagent Documentation: Document information about standards and reagents used for calibrations, verifications and sample measurements.

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4.1.1. Note the date of receipt, the expiration date and the date of first use for all standards and reagents.

4.1.1.1. Document acceptable verification of any standard used after its expiration date.

4.1.2. Record the concentration or other value for the standard in the appropriate measurement units.

4.1.2.1. Note vendor catalog number and description for preformulated solutions as well as for neat liquids and powdered standards.

4.1.2.2. Retain vendor assay specifications for standards as part of the calibration record.

4.1.3. Record the grade of standard or reagent used.

4.1.4. When formulated in-house, document all calculations used to formulate calibration standards.

4.1.4.1. Record the date of preparation for all in-house formulations.

4.1.5. Describe or cite the procedure(s) used to prepare any standards in-house (FDEP SOP or internal SOP).

4.2. Field Instrument Calibration Documentation: Document acceptable calibration and calibration verification for each instrument unit and field test or analysis, linking this record with affected sample measurements.

4.2.1. Retain vendor certifications of all factory-calibrated instrumentation.

4.2.2. Designate the identity of specific instrumentation in the documentation with a unique description or code for each instrument unit used.

4.2.2.1. Record manufacturer name, model number and identifying number such as a serial number for each instrument unit.

4.2.3. Record the time and date of all initial calibrations and all calibration verifications.

4.2.4. Record the instrument reading (value in appropriate measurement units) of all calibration verifications.

4.2.5. Record the name of the analyst(s) performing the calibration.

4.2.6. Document the specific standards used to calibrate or verify the instrument or field test with the following information:

- Type of standard or standard name (e.g., pH buffer)

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- Value of standard, including correct units (e.g., pH = 7.0 SU)
- Link to information recorded according to section 4.1 above

4.2.7. Retain manufacturers' instrument specifications.

4.2.8. Document whether successful initial calibration occurred.

4.2.9. Document whether each calibration verification passed or failed.

4.2.10. Document any corrective actions taken to correct instrument performance according to records requirements of FD 3000.

4.2.10.1. Document date and time of any corrective action.

4.2.10.2. Note any incidence of discontinuation of use of the instrument due to calibration failure.

4.2.11. Describe or cite the specific calibration or verification procedure performed (FDEP SOP or internal SOP).

4.3. Record all field-testing measurement data, to include the following:

- Project name
- Date and time of measurement or test (including time zone, if applicable)
- Source and location of the measurement or test sample (e.g., monitoring well identification number, outfall number, station number or other description)
- Latitude and longitude of sampling source location (if required)
- Analyte or parameter measured
- Measurement or test sample value
- Reporting units
- Initials or name of analyst performing the measurement
- Unique identification of the specific instrument unit(s) used for the test(s)

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FT 1500 FIELD MEASUREMENT OF DISSOLVED OXYGEN (DO)

1. Equipment and Supplies

1.1. Field Instrument: a membrane/electrode DO meter, with polarographic or galvanic electrode, and a sensitivity that results in a precision of +/- 0.2 mg DO/L and an accuracy of +/- 0.2 mg DO/L. Temperature compensation must be done either automatically by the DO probe, or manually in accordance with SM 4500-O G. Temperature must also be calibrated in accordance with FT 1400.

1.2. Standards

1.2.1. NIST-traceable Celsius thermometer with a scale marked for every 0.1°C and a range of 0 to 100°C.

1.2.2. Access to an organization with capability to perform the Winkler titration procedure is recommended but not mandatory.

1.2.3. A "zero-DO standard", prepared on-site with an aliquot of the sample water, is optional. Prepare by adding excess sodium sulfite and a trace of cobalt chloride to bring the DO to zero.

1.3. Recordkeeping and Documentation Supplies:

- Field notebook (with waterproof paper is recommended)
- Field record forms (e.g., forms FD 9000-7, FD 9000-8 and FD 9000-9)
- Indelible pens

2. Calibration and Use:

The electrode method is predominantly used in-situ for dissolved oxygen determinations.

2.1. General Concerns

2.1.1. Turbulence is necessary to keep a constant flow of water across the membrane-sample interface. Make sure the appropriate mechanism is working before using the probe.

2.1.2. Follow instrument manufacturer's instructions for probe storage. For example, store the probe with a cover that creates a saturated atmosphere. A cap, with a wet sponge in it, will suffice for single-parameter probes. If the sensor is in a multi-probe device, keep the protective cap chamber moist during storage.

2.1.3. Before mobilizing, check to make sure there are no bubbles beneath the probe membrane, or any wrinkles or tears in the probe membrane. If so, replace the membrane and KCl solution. Check the leads, contacts, etc. for corrosion and/or shorts if meter pointer remains off-scale, does not calibrate, or drifts.

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2.1.4. Dissolved inorganic salts interfere with the performance of DO probes. For example, DO readings in salt water are affected by the salinity and must be corrected. The DO meter may adjust automatically based on readings taken from the specific conductivity/salinity probe. If corrections are not automatic the appropriate calculations must be used to correct for salinity. If automatic adjustments are used the specific conductivity/salinity probe calibration must be verified or calibrated in accordance with FT1200.

2.1.5. Reactive gases, which pass through the membrane, may interfere. For example, chlorine will depolarize the cathode and cause a high probe output. Long-term exposures to chlorine will coat the anode with the chloride of the anode metal and eventually desensitize the probe. Sulfide (from H2S) will undergo oxidation if high enough potential (voltage) is applied, creating current flow, yielding faulty readings. If such interferences are suspected, change the membrane electrode more frequently and calibrate at more frequent intervals.

2.2. Follow the quality control requirements for calibration (see activities in FT 1000, section 2.2).

2.3. Initial Calibration and Initial Calibration Verification

2.3.1. Air Calibration and Initial Calibration Verification (ICV): Calibrate the meter at 100% saturation. Before use, verify the meter calibration in water-saturated air to make sure it is properly calibrated and operating correctly. Make a similar verification at the end of the day or sampling event. Follow the manufacturer's instructions for your specific instrument.

2.3.1.1. Allow an appropriate warm up period before initial field calibration.

2.3.1.2. Wet the inside of the calibration chamber with water, pour out the excess water (leave a few drops), wipe any droplets off the membrane/sensor and insert the sensor into the chamber (this ensures 100% humidity).

2.3.1.3. Allow adequate time for the DO sensor and the air inside the calibration chamber to equilibrate.

2.3.1.4. Once the probe/calibration chamber is stable at ambient temperature, check the air temperature and determine, from the DO versus temperature table (See FT 1500-1) what the DO should measure. A stable and accurate temperature is required for a valid calibration. The acceptance criterion for DO calibration verification is +/- 0.3 mg DO/L.

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2.4. Continuous Calibration Verification

2.4.1. Air-Calibration Verification: DO sensor or instrument is calibrated against air that is saturated with water at a known temperature and ambient atmospheric pressure. Use Table FT 1500-1 below to verify calibration at specified temperature

2.4.1.1. Wet the inside of the calibration chamber with water, pour out the excess water (leave a few drops) and insert the sensor into the chamber (this ensures 100-percent humidity)

2.4.1.2. Allow adequate time for the DO sensor and the air inside the calibration chamber to equilibrate.

2.4.1.3. Measure the temperature in the calibration chamber and observe the readings until the instrument stabilizes.

2.4.1.4. Use the oxygen solubility Table FT 1500-1 below to determine the DO saturation at a measured temperature and atmospheric pressure. Calculate values to the nearest tenth degree by interpolation.

2.4.1.5. Compare DO meter reading with value obtained from Table FT 1500-1 below to verify continuous calibration.

2.5. Additional Verifications: The following methods may be used as additional checks to verify calibration. These additional checks may be required as part of a specific permit.

2.5.1. Winkler method (e.g. SM4500-0 C): this check is useful to assess the condition of the DO sensor (i.e., its degradation with time/use) and that the instrument can still maintain a valid calibration. (EPA Method# 360.2, and SM4500-O B)

2.5.1.1. For an accuracy calibration verification using the Winkler method, it is necessary to follow EPA Method# 360.2 or SM4500-O C.

2.5.1.2. Fill a clean bucket with uncontaminated or de-ionized water and place the probe into the bucket (with stirrer or equivalent mechanism turned off). Fill at least two biological oxygen demand (BOD) bottles without entraining atmospheric oxygen into the bottles. Carefully submerge the bottom of the bottle (one at a time) into the water and allow the water to fill the bottle. Place the bottle on the bottom of the bucket and carefully place stopper into it without adding atmospheric oxygen. Retrieve the bottles and determine their DO by the Winkler method (see

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SM4500-O-B for more details). Turn the stirrer or equivalent mechanism on and read the DO of the water in the bucket.

2.5.1.3. Adjust the DO meter according to manufacturer's instructions. Be sure to adjust the meter to the temperature of water in the bucket, and then calibrate the DO meter to read the average DO concentration of the two samples determined by the Winkler test.

2.5.2. Zero-DO Verification: The air calibration and the interfering effects of the sample can be further checked in the field by means of a "zero-DO standard" (SM 4500-O G.).

2.5.2.1. Prepare this standard on-site with an aliquot of the sample by adding excess sodium sulfite and a trace of cobalt chloride to bring the DO to zero. Prepare this zero-DO standard in a beaker or a large-mouth sample container of appropriate size to insert the DO probe.

2.5.2.2. After adding the chemicals, gently swirl the water and let it sit for about 30 seconds before inserting the probe.

2.5.2.3. Read the DO of the sample. If the reading is outside the acceptance interval, the instrument must be recalibrated and/or zero-adjusted if the meter allows for this adjustment.

2.5.3. Air-Saturated Water: The DO sensor or instrument system is calibrated against water that is saturated with oxygen at a known temperature and ambient atmospheric pressure.

2.5.3.1. The temperature and conductivity of water used for calibration should be about the same as the temperature and conductivity of the water to be measured.

2.5.3.2. Place DO sensor and calibration water in a large beaker or open-mouth container.

2.5.3.3. Aerate the water for an adequate amount of time.

2.5.3.4. Determine if the water is 100 percent saturated with oxygen, and take a temperature reading. Temperature must be calibrated or verified for accuracy before DO calibration verification.

2.5.3.5. Use Table FT 1500-1 above to determine the DO saturation value at the measured water temperature. Compare DO meter reading with value obtained from Table FT 1500-1 to ensure continuous calibration

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2.6. Measuring DO in Samples:

2.6.1. Insert or place the DO probe in situ at a measuring location representative of the sampling source:

2.6.1.1. Take the DO of an effluent just before it enters the receiving water. If the effluent aerated prior to entering the surface water, take the DO reading in the receiving water right where it enters.

2.6.1.2. For well mixed surface waters, e.g., fast flowing streams, take the DO reading at approximately 1-2 feet below the surface or at mid-depth.

2.6.1.3. For still or sluggish surface waters, take a reading at one foot below the surface, one foot above the bottom, and at mid-depth.

2.6.1.4. If it is shallow surface waters, (less than two feet) take the reading at mid-depth.

2.6.1.5. Do not take a reading in frothy/aerated water since you may get a false reading.

2.6.1.6. Groundwater samples must be measured in situ with a downhole probe or in a flow-through container. Do not measure bailed or pumped samples in an intermediate container containing static sample.

2.6.2. Rinse probe with de-ionized water and keep the probe in the saturated atmosphere (see 2.1.2 above) between sites and events.

2.6.3. If the readings show distinct, unexplainable changes in DO levels, or when the probe has been in waters with high sulfides, recalibrate using the Winkler method or perform maintenance per manufacturer's instructions. While taking a reading, if it is very low (e.g., below 1.0 mg/L), allow the meter to stabilize, record it and then, remove and rinse the probe, as the environment is very likely anoxic and may contain hydrogen sulfide, which can damage the probe.

2.6.4. Salinity and Temperature corrections may be necessary. Follow manufacturer instructions for automatic corrections or perform manual calculations (SM 4500-O G.).

3. Preventive Maintenance: Refer to FT 1000, section 3.

4. Documentation

4.1. Standard and Reagent Documentation: Document information about standards and reagents used for verifications.

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4.1.1. Note the date of receipt, the expiration date and the date of first use for all standards and reagents.

4.1.1.1. Document acceptable verification of any standard used after its expiration date.

4.1.2. Record the concentration or other value for the standard in the appropriate measurement units.

4.1.2.1. Note vendor catalog number and description for preformulated solutions as well as for neat liquids and powdered standards.

4.1.2.2. Retain vendor assay specifications for standards as part of the calibration record.

4.1.3. Record the grade of standard or reagent used.

4.1.4. When formulated in-house, document all calculations used to formulate calibration standards.

4.1.4.1. Record the date of preparation for all in-house formulations.

4.1.5. Describe or cite the procedure(s) used to prepare any standards in-house (FDEP SOP or internal SOP).

4.2. Field Instrument Calibration Documentation: Document acceptable calibration and calibration verification for each instrument unit and field test or analysis, linking this record with affected sample measurements.

4.2.1. Retain vendor certifications of all factory-calibrated instrumentation.

4.2.2. Designate the identity of specific instrumentation in the documentation with a unique description or code for each instrument unit used.

4.2.2.1. Record manufacturer name, model number and identifying number such as a serial number for each instrument unit.

4.2.3. Record the time and date of all initial calibrations and all calibration verifications.

4.2.4. Record the instrument reading (value in appropriate measurement units) of all calibration verifications.

4.2.5. Record the name of the analyst(s) performing the calibration.

4.2.6. Document the specific standards used to calibrate or verify the instrument or field test with the following information:

- Type of standard or standard name (e.g., saturation)

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- Value of standard, including correct units (e.g., mg/L at °C)
- Link to information recorded according to section 4.1 above

4.2.7. Retain manufacturers' instrument specifications.

4.2.8. Document whether successful initial calibration occurred.

4.2.9. Document whether each calibration verification passed or failed.

4.2.10. Document any corrective actions taken to correct instrument performance according to records requirements of FD 3000.

4.2.10.1. Document date and time of any corrective action.

4.2.10.2. Note any incidence of discontinuation of use of the instrument due to calibration failure.

4.2.11. Describe or cite the specific calibration or verification procedure performed (FDEP SOP or internal SOP).

4.3. Record all field-testing measurement data, to include the following:

- Project name
- Date and time of measurement or test (including time zone, if applicable)
- Source and location of the measurement or test sample (e.g., monitoring well identification number, outfall number, station number or other description)
- Latitude and longitude of sampling source location (if required)
- Analyte or parameter measured
- Measurement or test sample value
- Reporting units
- Initials or name of analyst performing the measurement
- Unique identification of the specific instrument unit(s) used for the test(s)

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FT 1200 FIELD MEASUREMENT OF SPECIFIC CONDUCTANCE (CONDUCTIVITY)

1. Introduction

Specific conductance is a useful method to approximate the total amount of inorganic dissolved solids.

1.1. Conductivity varies with temperature. For example, the conductivity of salt water increases 3%/degree C at 0°C, and only 2 %/degree C at 25°C.

1.2. Record the sample temperature or adjust the temperature of the samples prior to measuring specific conductance if the conductivity instrument does not employ automatic temperature compensation and correction of the instrument display value.

2. Equipment and Supplies

2.1. Field Instrument: Any self-contained conductivity instrument suitable for field work, accurate and reproducible to 5% or better over the operational range of the instrument, and preferably equipped with temperature-compensation adjustment. See references in FT 1210 below for additional information about instruments.

2.2. Standards: Purchased or laboratory-prepared standard potassium chloride (KCl) solutions with conductivity values that bracket the expected samples' range. (Analyte-free water is not a standard.) In the laboratory, prepare standards of appropriate conductivities per SM2510. See FT 1210, section 2., Do not reuse standards for initial calibrations.

2.3. Recordkeeping and Documentation Supplies:

- Field notebook or,
- Field record forms (e.g., forms FD 9000-7, FD 9000-8 and FD 9000-9)

3. Calibration and Use

3.1. General Concerns

3.1.1. Follow the instrument manufacturer's instructions for the details of operating the instrument.

3.1.2. For instruments without automatic temperature compensation, attempt to adjust the temperature of the samples to 25°C. If the temperature cannot be adjusted, record the temperature, correct for temperature (per section 3.4 below) and report the results corrected to 25°C. See references in FT 1210 below for further information about temperature correction.

3.1.3. Temperature measurement devices used to manually or automatically correct conductivity measurements must be calibrated per FT 1400.

3.2. Calibration and Calibration Verification:

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3.2.1. Follow the calibration activities specified in FT 1000, section 2.2.

3.2.2. Initial Calibration: Calibrate the meter prior to use according to the following steps:

3.2.2.1. When the sample measurements are expected to be 100 µmhos/cm or greater, use two standard potassium chloride solutions that bracket the range of expected sample conductivities. When the sample measurements are expected to be less than 100 µmhos/cm, a lower bracket is not required, but one standard potassium chloride solution that is within the range of expected measurements must be used for the calibration and the initial calibration verification (ICV).

3.2.2.2. Calibrate the instrument with the first standard.

3.2.2.3. Verify the calibration of the instrument with the second standard, bracketing the range of expected sample values.

3.2.2.4. If the instrument can be calibrated with more than one standard, choose additional calibration standards within the range of expected sample values. The second standard in section 3.2.2.3 above may be used as an additional calibration standard.

3.2.3. Acceptability: Accept the calibration if the meter reads within +/- 5% of the value of any calibration standard used to verify the calibration. For example, the acceptance range for a 100 µmhos/cm standard is 95 to 105 µmhos/cm. If the meter does not read within +/- 5% of each calibration verification standard, determine the cause of the problem and correct before proceeding.

3.2.4. Temperature Correction: Most field instruments read conductivity directly. If the meter does not automatically correct values to 25°C, calculate correction factors using the procedure in section 3.4 below. Record all readings and calculations in the calibration records.

3.2.5. Continuing Calibration Verification: Check the meter with at least one KCl standard with a specific conductance in the range of conductivity measured in environmental samples. The reading for the calibration verification must also be within +/- 5% of the standard value (see 3.2.3 above).

3.2.5.1. If new environmental samples are encountered outside the range of the initial calibration in 3.2.2 above, verify the instrument calibration with 2 standards bracketing the range of sample values. If these calibration verifications fail, recalibrate the instrument as in 3.2.2.

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3.2.5.2. More frequent calibration verifications may be required for discharge permit compliance measurements or other regulatory requirements.

3.3. Measuring Specific Conductance of Samples:

3.3.1. Follow manufacturer's instructions for sample measurement.

3.3.2. Immerse or place the conductivity probe or sensor in situ at a measuring location representative of the sampling source.

3.3.3. Allow the conductivity instrument to stabilize.

3.3.4. Measure the water temperature (if necessary for manual temperature compensation) and record the temperature. See FT 1400 for temperature measurement procedures.

3.3.5. If the meter is equipped with manual temperature compensation, adjust the conductivity meter to the water temperature per manufacturer's instructions.

3.3.6. If the conductivity meter has a set of positions that multiply the reading by powers of ten in order to measure the full range of potential conductivities, set this dial to the correct range in order to take a reading.

3.3.7. Record the sample conductivity measurement reading.

3.3.8. Rinse off the probe with de-ionized water. Follow manufacturer's instructions for probe storage between use.

3.4 Calculations for Temperature Compensation

If the meter does not automatically correct for temperature (manual or automatic adjustment), or if a probe with a cell constant other than 1 is used, the following formula must be used to normalize the data to 25°C:

$$K = \frac{(Km)(C)}{1 + 0.0191(T-25)}$$

Where: K = conductivity in □mhos/cm at 25°C

Km = measured conductivity in □mhos/cm at T degrees C

C = cell constant

T = measured temperature of the sample in degrees C

If the cell constant is 1, the formula for determining conductivity becomes:

$$K = \frac{(Km)}{1 + 0.0191(T-25)}$$

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Refer to SM2510B, 20th edition, if other calculations (i.e., determining cell constant, etc.) are required. See FT 1210 below.

3.5 In situ Measurements at Depth or With Flow-through Cells: After calibrating the instrument as outlined in 3.2 above, follow the manufacturer's instructions to measure the conductivity of the sample.

3.5.1. For in situ measurements immerse the probe at the desired depth and wait for stabilization of the reading and record its value. Follow a similar procedure when using a flow-through cell.

3.5.1.1 Preferably measure groundwater sample conductivity in situ with a downhole probe or in a flow-through system.

4. Preventative Maintenance: Refer to FT 1000, section 3.

5. Documentation

5.1. Standard and Reagent Documentation: Document information about standards and reagents used for calibrations, verifications and sample measurements.

5.1.1. Note the date of receipt, the expiration date and the date of first use for all standards and reagents.

5.1.1.1. Document acceptable verification of any standard used after its expiration date.

5.1.2. Record the concentration or other value for the standard in the appropriate measurement units.

5.1.2.1. Note vendor catalog number and description for preformulated solutions as well as for neat liquids and powdered standards.

5.1.2.2. Retain vendor assay specifications for standards as part of the calibration record.

5.1.3. Record the grade of standard or reagent used.

5.1.4. When formulated in-house, document all calculations used to formulate calibration standards.

5.1.4.1. Record the date of preparation for all in-house formulations.

5.1.5. Describe or cite the procedure(s) used to prepare any standards in-house (FDEP SOP or internal SOP).

5.2. Field Instrument Calibration Documentation: Document acceptable calibration and calibration verification for each instrument unit and field test or analysis, linking this record with affected sample measurements.

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5.2.1. Retain vendor certifications of all factory-calibrated instrumentation.

5.2.2. Designate the identity of specific instrumentation in the documentation with a unique description or code for each instrument unit used.

5.2.2.1. Record manufacturer name, model number and identifying number such as a serial number for each instrument unit.

5.2.3. Record the time and date of all initial calibrations and all calibration verifications.

5.2.4. Record the instrument reading (value in appropriate measurement units) of all calibration verifications.

5.2.5. Record the name of the analyst(s) performing the calibration.

5.2.6. Document the specific standards used to calibrate or verify the instrument or field test with the following information:

- Type of standard or standard name (e.g., conductivity standard)
- Value of standard, including correct units (e.g., conductivity = 100 µmhos/cm)
- Link to information recorded according to section 5.1 above

5.2.7. Retain manufacturers' instrument specifications.

5.2.8. Document whether successful initial calibration occurred.

5.2.9. Document whether each calibration verification passed or failed.

5.2.10. Document any corrective actions taken to correct instrument performance according to records requirements of FD 3000.

5.2.10.1. Document date and time of any corrective action.

5.2.10.2. Note any incidence of discontinuation of use of the instrument due to calibration failure.

5.2.11. Describe or cite the specific calibration or verification procedure performed (FDEP SOP or internal SOP).

5.3. Record all field-testing measurement data, to include the following:

- Project name
- Date and time of measurement or test (including time zone, if applicable)

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- Source and location of the measurement or test sample (e.g., monitoring well identification number, outfall number, station number or other description)

Latitude and longitude of sampling source location (if required)

- Analyte or parameter measured
- Measurement or test sample value
- Reporting units

Initials or name of analyst performing the measurement

- Unique identification of the specific instrument unit(s) used for the test(s)

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FT 1300 FIELD MEASUREMENT OF SALINITY

Use in conjunction with:

- FT 1000 General Field Testing and Measurement
- FQ 1000 Field Quality Control Requirements
- FS 1000 General Sampling Procedures
- FD 1000 Documentation Procedures

1. Introduction

Salinity is an important property of industrial and natural waters. This field parameter is also important for assessing the source or origin of effluents and of the mixing between fresh and marine waters in coastal regions, in both surface water and groundwater.

1.1. Salinity is a unit-less parameter since by definition it is the ratio of the mass of dissolved salts to the total mass of a given volume of water. Thus, salinity values are commonly expressed as "grams of salt/kilograms of water" or o/oo.

1.2. Salinity is determined by using indirect methods involving the measurement of a related physical property such as conductivity, density, sound speed, or refractive index. The commonly used procedures in the field are determination of conductivity or density of the sample.

1.3. The sample salinity is calculated from an empirical relationship between salinity and the physical property as determined from a standard solution. Refer to the referenced method SM2520 for further discussions on these topics.

1.4. Because of its high sensitivity and easy of measurement, the conductivity method is most often used to determine the salinity. (Note - using a hydrometer to measure the density or the specific gravity to obtain an approximate salinity value is not recommended for reporting purposes.)

2. Equipment and Supplies

2.1. Field Instrument: Depending on the chosen method, use:

2.1.1. Any self-contained conductivity instrument with a platinum- or graphite-electrode type cell, and a temperature sensor. Some conductivity instruments have meter scales pre-calibrated for salinity and are sometimes referred to as Salinometers. For routine fieldwork use a conductivity meter accurate and reproducible to at least 5% or 1 µmho/cm (whichever is greater), and equipped with temperature-compensation adjustment; or

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2.1.2. A precision "vibrating flow densimeter" (see Millero & Poisson, 1981) and a field thermometer with digital or analog readout.

2.2. Standards:

2.2.1. Purchased or laboratory-prepared Standard Seawater and/or potassium chloride (KCl) standards of appropriate equivalent salinities.

2.2.1.1. In the laboratory prepare the Standard Seawater per recipe in method SM2520 and SM8010 (Table III), and standard KCl solutions per recipe in method SM2510.

2.2.2. De-ionized water for calibration of the densimeter (if used).

2.3. Recordkeeping and Documentation Supplies:

- Field logbook (w/ waterproof paper is recommended)
- Field record forms (e.g., forms FD 9000-7, FD 9000-8 and FD 9000-9)
- Indelible pens

3. Calibration and Use

3.1. Conductivity Method

3.1.1. Calibration: - Calibrate the instrument per manufacturer's instructions using one calibration standard, either standard seawater or a KCl solution, as applicable. The acceptance criterion for initial calibration or a calibration verification is that the instrument reading is within +/- 5% of the standard value. For example, when calibrating with standard seawater, S = 35, the meter must read in the 34 to 36 range in order to be acceptable.

3.1.1.1. Use standard seawater (S = 35) when measuring salinity in the open ocean or estuaries with a predominance of seawater.

3.1.1.2. KCl may be used in estuarine waters with low salinity (S = 0 – 40).

3.1.1.3. If the meter does not provide a direct reading of salinity, use the equation found in SM2520B to convert the readings to salinity.

3.1.1.4. Follow the calibration activities in FT 1000, section 2.2.

3.1.1.5. Do not reuse standards for initial calibrations.

3.1.2. Field Use: - Rinse the probe with DI water after calibration and before each sample measurements. Follow the manufacturer's instructions for temperature compensation, if needed. Report salinities with only one decimal figure.

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4. **Preventive Maintenance:** Refer to FT 1000, section 3.

5. **Documentation**

5.1. Standard and Reagent Documentation: Document information about standards and reagents used for calibrations, verifications and sample measurements.

5.1.1. Note the date of receipt, the expiration date and the date of first use for all standards and reagents.

5.1.1.1. Document acceptable verification of any standard used after its expiration date.

5.1.2. Record the concentration or other value for the standard in the appropriate measurement units.

5.1.2.1. Note vendor catalog number and description for preformulated solutions as well as for neat liquids and powdered standards.

5.1.2.2. Retain vendor assay specifications for standards as part of the calibration record.

5.1.3. Record the grade of standard or reagent used.

5.1.4. When formulated in-house, document all calculations used to formulate calibration standards.

5.1.4.1. Record the date of preparation for all in-house formulations.

5.1.5. Describe or cite the procedure(s) used to prepare any standards in-house (FDEP SOP or internal SOP).

5.2. Field Instrument Calibration Documentation: Document acceptable calibration and calibration verification for each instrument unit and field test or analysis, linking this record with affected sample measurements.

5.2.1. Retain vendor certifications of all factory-calibrated instrumentation.

5.2.2. Designate the identity of specific instrumentation in the documentation with a unique description or code for each instrument unit used.

5.2.2.1. Record manufacturer name, model number and identifying number such as a serial number for each instrument unit.

5.2.3. Record the time and date of all initial calibrations and all calibration verifications.

5.2.4. Record the instrument reading (value in appropriate measurement units) of all calibration verifications.

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5.2.5. Record the name of the analyst(s) performing the calibration.

5.2.6. Document the specific standards used to calibrate or verify the instrument or field test with the following information:

- Type of standard or standard name (e.g., salinity standard)
- Value of standard, including correct units (e.g., salinity = 20 o/oo)
- Link to information recorded according to section 5.1 above

5.2.7. Retain manufacturers' instrument specifications.

5.2.8. Document whether successful initial calibration occurred.

5.2.9. Document whether each calibration verification passed or failed.

5.2.10. Document any corrective actions taken to correct instrument performance according to records requirements of FD 3000.

5.2.10.1. Document date and time of any corrective action.

5.2.10.2. Note any incidence of discontinuation of use of the instrument due to calibration failure.

5.2.11. Describe or cite the specific calibration or verification procedure performed (FDEP SOP or internal SOP).

5.3. Record all field-testing measurement data, to include the following:

- Project name
- Date and time of measurement or test (including time zone, if applicable)
- Source and location of the measurement or test sample (e.g., monitoring well identification number, outfall number, station number or other description)
- Latitude and longitude of sampling source location (if required)
- Analyte or parameter measured
- Measurement or test sample value
- Reporting units
- Initials or name of analyst performing the measurement
- Unique identification of the specific instrument unit(s) used for the test(s)

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FT 1400 . FIELD MEASUREMENT OF TEMPERATURE

1. Field Instruments

1.1 Use any of the following instrument types for performing field measurements:

- Digital thermistor (thermocouple type) and meter typical of field instruments
- Glass bulb, mercury-filled thermometer (not recommended for field ruggedness)
- Glass bulb, alcohol-filled thermometer with protective case
- Bi-metal strip/dial-type thermometer
- Advanced silicon chip temperature sensor and digital meter

1.1.1. Field instruments must be capable of measuring temperature in 0.1oC increments.

1.2. Standard Thermometer: NIST-traceable Celsius certified thermometer with scale marks for every 0.1°C increment, a range of 0°C to 100°C (or a range bracketing expected sample temperatures) and correction chart supplied with certification.

1.3. Recordkeeping and Documentation Supplies:

- Field notebook or forms (e.g., forms FD 9000-7, FD 9000-8 and FD 9000-9)

2. Calibration and Use

2.1. General Concerns

2.1.1. Select a temperature measuring device meeting the requirements of section 1.1 above.

2.1.2. Dial-type and thermocouple-type devices with meters are preferred over the glass thermometers for fieldwork because of their durability and ease of reading.

2.1.2.1. Transport glass thermometers in protective cases.

2.1.2.2. Inspect glass thermometers for liquid separation. Do not use a thermometer if the liquid has separated.

2.1.2.3. Most instruments with digital display will provide more decimal figures than are significant. Record the temperature reading with only one rounded decimal figure (e.g., 25.9 instead of 25.86°C).

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2.2. Calibration

2.2.1. Follow the calibration activities specified in FT 1000, section 2.2.

2.2.1.1. Other field-testing measurements requiring temperature compensation necessitate calibration of the temperature field measurement device according to this SOP.

2.2.2. Verify all thermistor (meter) devices and field thermometers against the NIST-traceable standard thermometer at several temperatures in the expected sample measurement range, using any correction factor indicated by the certificate supplied with the NIST-traceable thermometer.

2.2.2.1. See the reference in FT 1410, section 3 for additional guidance about making temperature comparisons with the standard thermometer.

2.2.2.2. Make note of the calibration in the calibration records. See section 4 below.

2.2.2.3. The field measurement device may be used with a linear correction factor provided that the observed temperature difference with the standard thermometer is documented at incremental temperatures over the range of expected sample temperatures. See the reference in FT 1410, section 3 below for further guidance about correction factors.

2.2.2.4 Use the resulting correction factor when making temperature measurements of samples with the field measurement device.

2.2.2.5 Prominently display the correction factor on the field measurement device, with the date last verified. A calibration correction curve or plot may also be used.

2.2.2.6 To be acceptable, a calibration verification must be within +/- 0.2°C of the corrected reading of the NIST-traceable thermometer.

2.2.2.7 Properly dispose of glass-bulb thermometers that do not meet the above calibration acceptance criteria.

2.2.3. Continuing Calibration Verifications:

2.2.3.1. Determine the maximum time between continuing calibration verifications for the specific field temperature measurement device based on instrument stability.

2.2.3.2. Verify the field measurement device against the standard NIST-traceable thermometer as in section 2.2.2 above.

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2.2.4. Refer to additional calibration requirements in FT 1000, section 2.2.

2.2.5. More frequent calibration verifications may be required for discharge permit compliance measurements or other regulatory requirements.

2.3. Measuring Sample Temperature

2.3.1. Insert or place the thermometer or sensor in situ at a measuring location representative of the sampling source.

2.3.2. Allow the thermometer or temperature sensor to equilibrate to ambient in situ temperature.

2.3.2.1. Groundwater samples must be measured in situ with a downhole probe or in a flow-through container. Do not measure bailed or pumped samples in an intermediate container containing static sample.

2.3.3. Record the temperature to the nearest 0.1°C when the reading stabilizes and remains constant.

3. Preventive Maintenance: Refer to FT 1000, section 3.

4. Documentation

4.1. Standards Documentation: Document information about the NIST-traceable standard thermometer in the calibration record, including:

- Unique identification for the thermometer
- Vendor certificate of calibration, including any correction factor
- Vendor's expiration date for the certificate of calibration

4.2. Field Instrument Calibration Documentation: Document acceptable calibration and calibration verification for each instrument unit and field test or analysis, linking this record with affected sample measurements.

4.2.1. Retain vendor certifications of all factory-calibrated instrumentation.

4.2.2. Designate the identity of specific instrumentation in the documentation with a unique description or code for each instrument unit used.

4.2.2.1. Record manufacturer name, model number and identifying number such as a serial number for each instrument unit.

4.2.3. Record the time and date of all initial calibrations and all calibration verifications.

4.2.4. Record the instrument reading (value in appropriate measurement units) of all calibration verifications.

4.2.5. Record the name of the analyst(s) performing the calibration.

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4.2.6. Document the following information about initial calibration and calibration verifications:

- Details of the method used to compare the field measurement device to the NIST-traceable standard thermometer (see guidance in the reference listed in FT 1410, section 3 below)
- Results of each calibration verification, including the expected reading (per the NIST-traceable standard thermometer) and the actual reading of the field measurement device, using any established correction factors and correct units

Link to information recorded according to section 4.1 above

4.2.7. Retain manufacturers' instrument specifications.

4.2.8. Document whether successful initial calibration occurred.

4.2.9. Document whether each calibration verification passed or failed.

4.2.10. Document any corrective actions taken to correct instrument performance (such as a new correction factor) according to records requirements of FD 3000.

4.2.10.1. Document date and time of any corrective action.

4.2.10.2. Note any incidence of discontinuation of use of the instrument due to calibration failure.

4.2.11. Describe or cite the specific calibration or verification procedure performed (FDEP SOP or internal SOP).

4.3. Record all field-testing measurement data, to include the following:

- Project name
- Date and time of measurement or test (including time zone, if applicable)
- Source and location of the measurement or test sample (e.g., monitoring well identification number, outfall number, station number or other description)

Latitude and longitude of sampling source location (if required)

- Analyte or parameter measured
- Measurement or test sample value
- Reporting units

Initials or name of analyst performing the measurement

- Unique identification of the specific instrument unit(s) used for the test(s)

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A.2 Peristaltic Pump Sampling

Discrete water quality samples will be collected using a peristaltic pump with decontaminated Teflon tubing. The method for collecting water samples using a pump and tubing will follow the FDEP SOP FT2110, section 1.1.3, as reproduced below.

FS 2110 SURFACE WATER SAMPLING TECHNIQUES

1.1.3. Pump and Tubing: Use appropriate pumps, equipment and tubing. (See restrictions listed in FS 1000 Tables FS 1000-1 through 1000-3).

Do not collect oil & grease, TRPH or FL-PRO samples with a pump. See FS 2000 for proper collection procedures for extractable organics and volatile organic compounds.

1.1.3.1. Lower tubing to a depth 6 to 12 inches below water surface, where possible.

1.1.3.2. Pump several tubing volumes through the system to flush the tubing prior to collecting the first sample.

1.1.3.3. Fill individual sample bottles via the discharge tubing, being careful not to remove the inlet tubing from the water.

1.1.3.4. Do not touch the discharge tubing to the sample container.

1.1.3.5. Leave adequate headspace in the sample container. This procedure allows for addition of preservatives (if required) and sample expansion. Do not use this step for volatile organics or other analytes where headspace is not allowed in the sample container.

1.1.3.6. Add preservatives if required, securely cap container, label and complete field notes.

1.1.3.7. Invert the container several times to ensure sufficient mixing of sample and preservatives.

1.1.3.8. Check preservation of the sample and adjust pH with additional preservative, if necessary.

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A.3: FDEP SOP for Dredge Sampling

FS 7450 Dredge Sampling

1. Equipment and Supplies

- Ekman or Petite Ponar dredge
- Box sieve (constructed of fiberglass-coated wood and U.S. 30 mesh screen), bucket sieve or dip net with U.S. 30 mesh sieve material
- White enamel or plastic pan
- Plastic squeeze bulb
- Small bucket
- Wide-mouth plastic sample containers
- Permanent marker
- Buffered formalin
- Rose Bengal dye (optional)

2. Methods

2.1 Use of the Ekman dredge is restricted to sampling soft substrates (silt, muck) in areas with little current. The Ponar dredge may be used for sampling under these conditions and also in areas with a harder substrate (rocks, shells, sand). The number of replicates collected is dependent upon several factors, including the area sampled by the device, the purpose of the study, and the degree of patchiness in the distribution of the organisms at the site. Routinely, take three dredges. Place all replicates in separate sample containers (for statistical analyses). If you are sampling in an exceptionally depauperate area, additional replicates may be required (pilot study needed). In that case, the number of replicates should be equal at all stations to be comparable.

2.2 When you sample from a boat, collect dredge samples from the rear and downstream of the vessel to avoid contamination of other types of samples with disturbed sediments. Rinse the box sieve with ambient water and tie it to the side of the boat where samples will be collected. When placed in the water, it will float at the surface. If a box sieve is unavailable, the dredged material may be washed in a dip net or bucket sieve, provided it is fitted with a U.S. 30 mesh sieve material

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2.3 Dredges

2.3.1 **Ekman:** Open the spring-loaded jaws and attach the chains to the pegs at the top of the sampler. Lower the dredge to the bottom, making sure it settles flat. Holding the line taught, send down the messenger to close the jaws of the dredge. Pull the sampler to the surface and place it immediately into the box sieve. Carefully open the jaws and empty the contents into the sieve, rinsing to assure complete sample purging. The spring-loaded Ekman can be dangerous. Hold the dredge firmly above the hinges, and take care to not get pinched by the spring-loaded jaws, which could produce serious injury. Check to make sure the jaws are fully closed and that no sample was lost while lifting the dredge. Discard the grab if the dredge is not fully closed.

2.3.2 **Petite Ponar:** Open the jaws and place the crossbar into the proper notch. Lower the dredge to the bottom, making sure it settles flat. When tension is removed from the line, the cross-bar will drop, enabling the dredge to close as the line is pulled upward during retrieval of the dredge. Pull the sampler to the surface and place it immediately into the box sieve. Carefully open the jaws and empty the contents into the sieve, rinsing to assure complete sample purging. Check to make sure the jaws are fully closed and that no sample was lost while lifting the dredge. Discard the grab if the dredge is not fully closed.

2.4 Swirl the sieve in the water with a back-and-forth motion to wash the fine sediments through. Concentrate the remaining sample into one corner of the sieve. If a sediment type is especially clayey or mucky, it may be necessary to use a hand to break up clumps and agitate the sample to reduce it. Make sure you rinse any detritus from your hand back into the sieve.

2.5 Fill the small bucket with ambient water and use this water to fill the squeeze bulb. Using the squeeze bulb, rinse the sample from the sieve to the pan. Take care to rinse the entire contents of the sample into the pan. Some organisms may stick to the screen.

2.6 Use the squeeze bulb to transfer the sample from the pan into the pre-marked wide-mouth jug, making sure the location, date, and replicate number are accurate.

3 Sample Preservation and Handling

3.1 Preserve the sample with 10% buffered formalin (see FS 7001, section 1) by adding a 9 to 1 ratio of water to 100% formalin. If laboratory processing is possible within eight hours, the samples may be stored on ice, without addition of formalin. If desired, add a very small amount of rose bengal dye (approximately 100 mg per liter of material) to the sample as a picking aid.

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A.4: Plankton SOP

Plankton Net Specifications and Deployment

The plankton gear consisted of a 0.5-m-mouth-diameter 333-µm-mesh conical (3:1) plankton net equipped with a 3-pt nylon bridle, a calibrated flow meter (General Oceanics model 2030R or SeaGear model MF315), a plastic cod-end jar with 333-µm-mesh panels, and a 9-kg (20-lb.) weight. The net was deployed between low slack and high slack tide, with sampling beginning no sooner than one hour after sunset and typically ending less than four hours later. Tow duration was 5 min, with tow time being divided equally among bottom, midwater and surface depths. The fishing depth of the weighted net was controlled by adjusting the length of the tow line while using tachometer readings to maintain a constant line angle. The tow line was attached to a winch located on the gunnel near the transom. Placement of the winch in this location caused asymmetry in the steering of the boat, which caused propeller turbulence to be directed away from the towed net. Tow speed was approximately 1.3 m s^{-1}, resulting in a tow length of >400 m over water and a 9 and a typical filtration of 70-80 m^3. Upon retrieval of the net, the flowmeter reading was recorded and the contents of the net were rinsed into the cod-end jar using an electric wash-down pump and hose with an adjustable nozzle. The samples were preserved in 6-10% formalin in ambient saline.

The net was cleaned between surveys using an enzyme solution that dissolves organic deposits. Salinity, temperature, pH and dissolved oxygen were measured at one-meter intervals from surface to bottom after each plankton-net deployment.

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Appendix B
Aquatic Sampling Forms

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APPENDIX B

Aquatic Sampling Forms

B.1 Measuring and Testing Equipment

Purpose

This workplan defines the requirements and responsibilities for the control of Measuring and Test Equipment (M&TE) used to support CH2M HILL Nuclear Business Group activities and is based on NBG-QA-012-01 Rev. 5 and 338884-PI-03-12 Rev. 0.

Tools, gages, instruments, and other measuring and test equipment used for activities affecting quality shall be controlled and at specified periods calibrated and adjusted to maintain accuracy within necessary limits.

Scope

This workplan is applicable to Project Energy COLA Projects that are responsible for:

- Calibration, control, or use of M&TE
- Procurement of M&TE and M&TE calibration services

Objectives

Controlling Measuring and Test Equipment. (M&TE) per CH2M HILL Nuclear Business Group Procedures.

Responsibility and Authority

Project Manager Responsibilities:

- Review and approve specifications for selecting M&TE requirements.
- Review and approve project-specific M&TE procedures.
- Resolves Out of Calibration Reports.

Project Field Task Lead Responsibilities:

- Ensures that the requirements of this instruction are implemented.
- Ensure that M&TE is calibrated and properly maintained by project staff.
- Controls and documents the use of M&TE at the field site. Including subcontractor's M&TE brought on site to support CH2M HILL activities.

Project Quality Assurance Manager

Verifies the requirements of this instruction adhered to, through reviews, surveillances, and/or audits.

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Actions

1) Field Task Lead or designee

A. Shall have the following M&TE documents and forms on site to control and document the use of M&TE on site.
   1. M&TE Inventory Log
   2. M&TE History File
   3. M&TE Usage Log
   4. Calibration Certificate
   5. Calibration Log

B. Each M&TE File shall contain:
   1. Calibration Certificate
   2. M&TE Usage Log
   3. Calibration Log (Form M&TE-FM-001)

C. An M&TE Master File shall be set up to contain the following:
   1. M&TE Inventory Control Log
   2. M&TE History FILE

D. Every form where M&TE is used shall contain the M&TE number, date and the name of the person using the M&TE to record data from the M&TE.

E. Documents Out-of Calibrations on Form M&TE-FM-002 and submits the filled out form to Document Control.

F. Fills out the Calibration Log Form (M&TE-FM-001) with the make, type, and serial number (or any other identification) of all measuring equipment used on site, date of last calibration, date of next calibration, the calibrating official, date the equipment entered service on site, applications, any applicable standards, required accuracy, calibration intervals, and notes for nonconformance.

G. Submits to Document Control at start of job a copy of M&TE records and files (filled out) that are being used on site. When new M&TE is put in service, or when M&TE is taken out of service, on site, shall update the files and logs and submit to Document Control. (Submits electronically within 3 days the updated file and logs. New calibrated certificates fall with in this category.)

H. Submits to Document control all logs, files, and certificates at the end of the job, when the M&TE is taken out of service, or no longer on site.

I. All documents required to be submitted to Document Control in accordance with the controlling Document Control Procedures.

J. All M&TE records and files are Quality Records.

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PROJECT #_____
PROJECT
SITE_____

MEASURING AND TEST EQUIPMENT HISTORY FILE

M&TE NAME	M&TE NUMBER	CALIBRATED DATE	CALIBRATION DUE DATE	WHERE USED	DATE IN	DATE OUT

UNCONTROLLED COPY

CH2M HILL **M T E USAGE LOG** Page___of___

Project#_____ **Project name**_____

M T E Name_____ **M T E #**_____ Date_____

	Item	Date	Comments
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

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CH2MHILL

M&TE CALIBRATION LOG

Equipment Make:		Equipment Type:	
Equipment Identification Number:		Equipment Owner:	
Location:		Owner Contact Info:	
Starting Service Date:		Ending Service Date:	
Applications:		Standards:	
Accuracy Required:		Calibration Interval:	
Calibration Method:			

Calibration Date	Next Due Date	Calibrating Official	Status	Comments

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CH2MHILL M&TE CALIBRATION NONCONFORMANCE NOTICE

Equipment Make:		Date:	
Equipment Identification Number:		Equipment Type:	
Location:		Equipment Owner:	
Last Calibration Date:		Next Calibration Date:	
Significance: *(Mark one)*	High ☐	Medium ☐	Low ☐
Material Recall:	Yes ☐ No ☐	Reason:	
Nonconformance Condition:			

	Name	Position	Signature	Date
Person that Identified the Nonconformance:				

Resolution/Action Taken:				
Equipment Accepted for Continued Use:	Yes ☐		No ☐	

	Name	Position	Signature	Date
Person Resolving Nonconformance:				
M&TE Owner				

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M&TE EQUIPMENT INVENTORY

Equipment Description		Identification Number	Status	Last Calibrated	Due Date
CH2M HILL EQUIPMENT					

B.2 Water Quality Data

FIELD PARAMETER DATA SHEET FOR SURFACE WATER

PROJECT:_____ SAMPLERS:_____ METER #_____

STATION NUMBER	GPS COORDINATES	PARAMTER UNIT	DATE mm/dd/yy	TIME hr:min	TOTAL DEPTH Meters	SAMPLE DEPTH Meters	Temp Celsius	DO mg/L	Conductivity µmhos/cm	Salinity ppt	pH units	Secchi depth Meters

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B.3 STL Laboratory Chain of Custody Form

TestAmerica Tallahassee
2846 Industrial Plaza Drive
Tallahassee, FL 32301
Phone (850) 878-3994 Fax (850) 878-9504

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler:	Lab PM:	Carrier Tracking No(s):	COC No: 640-
Client Contact:	Phone:	E-Mail:		Page
Company:				STL Job #:

Address:	Due Date Requested	Analysis Requested	Preservation Codes:
City:	TAT Requested (days):		A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2SO3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - ph 4-5 L - EDA Z - other (specify) Other:
State, Zip:			
Phone:	PO #:		
Email:	WO #:		
Project Name:	Project #:		
Site:	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Total Number of containers	Special Instructions/Note:
			Preservation Code:					

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

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B.4 Water and Air Research Chain of Custody Form

Water and Air Research, Inc.
6821 S.W. Archer Road • (352) 372-1500
Gainesville, Florida 32608
info@waterandair.com

CHAIN-OF-CUSTODY-RECORD

Proj. No/Name	Site Name & Address	Sample Matrix	Number of Containers	Identify Parameters Desired and No. of Containers	Preservation
Samplers: (Signature)					CF Chilled-Filtered SF Sulfuric-Filtered NF Nitric-Filtered C Chilled S Sulfuric N Nitric B Basic/NaOH Z Zinc T Thiosulfate H HCL OT Other (see Remarks)

Sample Field ID. Number	Date	Time	Comp.	Grab	Station Location/Number	Remarks or Observations

Precleaned Containers Relinquished by: *(Signature)*	Date/Time /	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date/Time /	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date/Time /	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date/Time /	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date/Time /	Received for Laboratory by: *(Signature)*			

Matrix Types

S	Soil or Sediment	WW	Wastewater	T	Animal Tissues
SW	Surface Water	SL	Sludge or Solid Waste	MW	Marine Water
GW	Groundwater	DW	Drinking Water	P	Plant Tissue
OT	Other (see remarks)				

Distribution: Original Accompanies Shipment and is to be Returned to Project Manager,
Yellow Copy - Field Team; Pink Copy - Lab; Gold Copy - File

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B.5 Ecological Associates, Inc. Chain of Custody Form

p. 1/2

ANALYSIS REQUEST AND CHAIN-OF-CUSTODY RECORD

☐ Jensen Beach, FL (1458 NE Sunview Ter. Zip: 34957 (772) 334-3720)
☐ OTHER: _____

PROJECT NUMBER: 338884.FL.04.07.01 | PROJECT NAME: PROGRESS ENERGY
CONTACT NAME: JOHN MARTIN | PHONE NUMBER: 352-335-5877 x 52217
SAMPLER(S): JOHN MARTIN
SIGNATURE(S): John R Martin

PAGE: _____ OF: _____
STANDARD ☐ RUSH ☐
DATE REPORT REQUESTED: _____

SAMPLING DATE	SAMPLING TIME	SAMPLE IDENTIFICATION	AQUEOUS MATRIX	NONAQUEOUS MATRIX	PRESERVATIVES (LIST IN REMARKS)	NUMBER OF CONTAINERS	REQUIRED ANALYSES: MERO PLANKTON	REQUIRED ANALYSES: ICHTYOPLANKTON	REMARKS
10/18/07	1653	PE-PT-01A-DT-101807	✓		✓	1 1/4 dram	✓		
10/18/07	1713	PE-PT-01B-DT-101807	✓		✓	1 1/4 dram	✓		
10/18/07	1748	PE-PT-02A-DT-101807	✓		✓	1	✓		
10/18/07	1802	PE-PT-02B-DT-101807	✓		✓	1	✓		
10/18/07	1827	PE-PT-03A-DT-101807	✓		✓	1	✓		
10/18/07	1843	PE-PT-03B-DT-101807	✓		✓	1	✓		
10/18/07	1857	PE-PT-04A-DT-101807	✓		✓	1	✓		
10/18/07	1911	PE-PT-04B-DT-101807	✓		✓	1	✓		
10/19/07	0345	PE-PT-01A-NT-101907	✓		✓	1	✓		
10/19/07	0356	PE-PT-01B-NT-101907	✓		✓	1	✓		

EXAMPLE

RELINQUISHED BY: (SIGNATURE AND AFFILIATION)	DATE	TIME	RECEIVED BY: (SIGNATURE AND AFFILIATION)	DATE	TIME
John R Martin CH2M HILL	11/26/07	1200			
RELINQUISHED BY: (SIGNATURE AND AFFILIATION)	DATE	TIME	RECEIVED BY: (SIGNATURE AND AFFILIATION)	DATE	TIME
RELINQUISHED BY: (SIGNATURE AND AFFILIATION)	DATE	TIME	RECEIVED BY: (SIGNATURE AND AFFILIATION)	DATE	TIME

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE & TIME	CUSTODY INTACT YES NO	CUSTODY SEAL NUMBER	LOG NUMBER	LABORATORY REMARKS
					LUGOL SOLUTION

1/23/2007 [illegible]

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B.6 Equipment Log Sheet

EQUIPMENT SET TIMES & COORDINATES
PROGRESS ENERGY

Gear Deployment Record Number	Gear Type	Equip #	Station	Date In	Time In	Date Out	Time Out	Total Deploy Time (min)	GPS North (LAT)	GPS West (LONG)

B.7 Fish Data Log Sheet

FISH SAMPLE LOG SHEET
CLIENT NAME: PROGRESS ENERGY

FIELD TEAM:

Gear Deployment Record Number	Species	Total Length (mm)	Voucher ID#	Count	Catch Date	Station

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B.8 Invertebrate Data Log Sheet

INVERTEBRATE SAMPLE LOG SHEET **FIELD TEAM:**
CLIENT NAME: PROGRESS ENERGY

Gear Deployment Record Number	Species	Sex	Total Length (mm)	Voucher ID#	Count	Catch Date	Station

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B.9 Sea Turtle Stranding and Salvage Network – Stranding Form

SEA TURTLE STRANDING AND SALVAGE NETWORK – STRANDING REPORT

OBSERVER'S NAME / ADDRESS / PHONE:
First _____ M.I.____ Last _____
Affiliation _____
Address _____
_____
Area code/Phone number _____

STRANDING DATE:
Year 20☐☐ Month ☐☐ Day ☐☐
Turtle number by day ☐☐

State coordinator must be notified within 24 hrs; this was done by ☐phone (561)575-5407 ☐email ☐fax (561)743-6228 ☐FWC Turtle Pager 1-800-241-4653 ID#274-4857

SPECIES: (check one)
- ☐ CC = Loggerhead
- ☐ CM = Green
- ☐ DC = Leatherback
- ☐ EI = Hawksbill
- ☐ LK = Kemp's Ridley
- ☐ LO = Olive Ridley
- ☐ UN = Unidentified

Check Unidentified if not positive. Do Not Guess.

STRANDING LOCATION: ☐Offshore (Atlantic or Gulf beach) ☐Inshore (bay, river, sound, inlet, etc)
State _____ County _____
Descriptive location (be specific) _____
_____
_____
Latitude _____ Longitude _____

Carcass necropsied? ☐Yes☐No
Photos taken? ☐Yes ☐No
Species verified by state coordinator? ☐ Yes ☐ No

CONDITION: (check one)
- ☐ 0 = Alive
- ☐ 1 = Fresh dead
- ☐ 2 = Moderately decomposed
- ☐ 3 = Severely decomposed
- ☐ 4 = Dried carcass
- ☐ 5 = Skeleton, bones only

FINAL DISPOSITION: (check)
- ☐1 = Left on beach where found; painted? ☐Yes* ☐No(5)
- ☐2 = Buried: ☐ on beach / ☐ off beach; carcass painted before buried? ☐ Yes* ☐ No
- ☐3 = Salvaged: ☐ all / ☐ part(s), what/why? _____
- ☐4 = Pulled up on beach/dune; painted? ☐Yes* ☐No
- ☐6 = Alive, released
- ☐7 = Alive, taken to rehab. facility, where? _____
- ☐8 = Left floating, not recovered; painted? ☐Yes* ☐No
- ☐9 = Disposition unknown, explain _____

**If painted, what color?* _____

SEX:
- ☐ Undetermined
- ☐ Female ☐ Male

Does tail extend beyond carapace?
- ☐ Yes; how far?_____ cm / in
- ☐ No

How was sex determined?
- ☐ Necropsy
- ☐ Tail length (adult only)

TAGS: ***Contact state coordinator before disposing of any tagged animal!!***
Checked for flipper tags? ☐ Yes ☐ No
Check all 4 flippers. If found, record tag number(s) / tag location / return address
_____
_____
_____

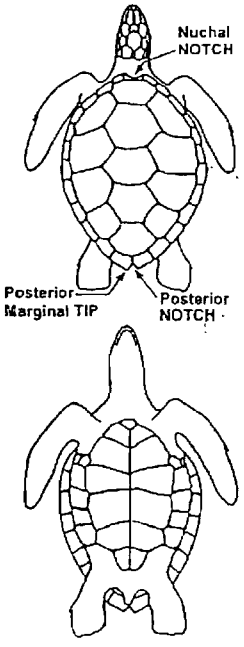
PIT tag scan? ☐ Yes ☐ No
If found, record number / tag location
_____
_____

Coded wire tag scan? ☐ Yes ☐ No
If positive response, record location (flipper)
_____

Checked for living tag? ☐Yes ☐ No
If found, record location (scute number & side)
_____

CARAPACE MEASUREMENTS: (*see drawing*)

Using calipers		**Circle unit**
Straight length (NOTCH-TIP)	_____	cm / in
Minimum length (NOTCH-NOTCH)	_____	cm / in
Straight width (Widest Point)	_____	cm / in
Using non-metal measuring tape		**Circle unit**
Curved length (NOTCH–TIP)	_____	cm / in
Minimum length (NOTCH-NOTCH)	_____	cm / in
Curved width (Widest Point)	_____	cm / in
		Circle unit
Weight ☐ actual / ☐ est.	_____	kg / lb



Mark wounds / abnormalities on diagrams at left and describe below (note tar or oil, gear or debris entanglement, propeller damage, epibiota, papillomas, emaciation, etc.). **Please note if no wounds / abnormalities are found.**
_____
_____
_____
_____
_____
_____

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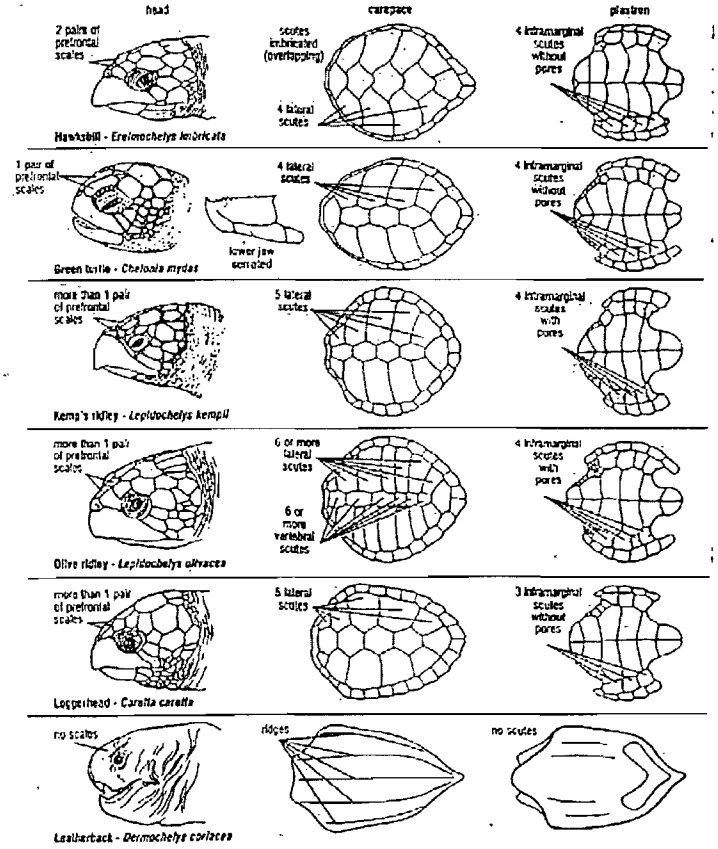
SPECIES IDENTIFICATION



PLEASE FAX TO (561)743-6228, THEN PLEASE USE AN ENVELOPE AND MAIL ORIGINAL FORM TO:

FLORIDA STSSN COORDINATOR
FLORIDA FISH & WILDLIFE CONSERVATION COMMISSION
FLORIDA MARINE RESEARCH INSTITUTE
P.O. BOX 3478
TEQUESTA, FL 33469

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COMMENT NUMBER: VI.B

RAI NUMBER: LNP SCA RAI-108

REQUESTING AGENCY: Florida Fish and Wildlife Conservation Commission (FWC)

COMMENT:

Chapter 6, Section 6.5.1.2.1, indicates that a gopher tortoise relocation plan will be developed in accordance with FWC guidelines. After the spring of 2009, new gopher tortoise management permitting requirements will be in place. These permits require either on-site or off-site relocation of all gopher tortoises potentially impacted by development, and a mitigation contribution to the FWC will be required for all relocation permits. We encourage Progress Energy to conduct on-site relocations to address any gopher tortoise issues, especially in the vicinity of the transmission lines, rather than offsite relocations where suitable habitat exists. The applicant will need to indicate if the on-site relocation plan is intended for different segments of the transmission corridor and plant location or as a complete "unit." The applicant will also need to identify any offsite recipient site locations for the relocation of the gopher tortoises.

RESPONSE:

Impacts to gopher tortoises (*Gopherus polyphemus*) will be avoided to the extent practicable. If impacts to a burrow cannot be avoided, gopher tortoises will be relocated in accordance with the then current FWC guidelines. Relocation will be onsite where practicable. For areas that will be impacted on the LNP site, gopher tortoises will be relocated to an appropriate onsite recipient area identified in the relocation plan and approved by the FWC. For impacts along a transmission corridor, efforts will be made to relocate gopher tortoises in similar unimpacted areas of the ROW. In areas where onsite relocation is not feasible, tortoises will be relocated to an offsite recipient area approved by the FWC. The location of any onsite or offsite relocation area will be identified in the post-certification gopher tortoise information submitted to FWC. Any commensal species observed during the burrow excavation that are listed by the USFWS or the FWC will be relocated in accordance with the applicable USFWS and/or FWC guidelines for that species.

ATTACHMENTS:

None.

COMMENT NUMBER: VI.C

RAI NUMBER: LNP SCA RAI-109

REQUESTING AGENCY: Florida Fish and Wildlife Conservation Commission (FWC)

COMMENT:

Chapter 6, Section 6.5.1.2.1 Important Species, does not provide any conservation measures for state-listed Florida mice or Sherman's fox squirrels. The applicant will need to provide conservation and mitigation measures for state-listed species in accordance with Chapter 68A-27, Florida Administrative Code.

RESPONSE:

PEF will provide conservation and mitigation measures for federally and state-listed species that may be affected by the project in accordance with Chapter 68A-27, F.A.C.

- Terrestrial Important Species:
  The need for wildlife conservation measures for a species depends upon the likelihood that the site is used by the listed species. Florida mice and Sherman's fox squirrels have not been observed on the LNP site, nor do onsite construction areas contain preferred habitat for these species. PEF will conduct post-certification, pre-construction wildlife surveys for all protected species likely to occur in any project area.

- Aquatic Important Species:
  Eight federally listed threatened or endangered aquatic species were either directly observed or identified from the published listings as having the potential to occur in the vicinity of the project site (ER Table 2.4-26). Nine State of Florida listed endangered, threatened, or species of special concern were either observed or identified as having the potential to occur in the vicinity of the project site (ER Table 2.4-28). No federally or state-listed species that are currently proposed for listing were found to have the potential to occur within the project vicinity.

PEF will provide conservation and mitigation measures for federally and state-listed species that may be affected by the project in accordance with Chapter 68A-27, F.A.C.

For transmission line corridors, PEF's consultants performed limited onsite observations of species in areas where access was available. This information was provided in the SCA (Chapter 9). As part of the corridor siting studies, potential impacts to listed species were preliminarily evaluated through review of FNAI data. FNAI maintains a GIS database that identifies the location of listed species occurrences throughout Florida. The data were

reviewed to identify occurrences of listed species within the project study areas, including the proposed transmission line corridors.

Once access is available to the selected ROW, detailed surveys for listed species will be conducted. PEF will agree to a condition of certification requiring the post-certification submittal of the results of those detailed surveys to FWC and coordination with FWC on appropriate impact mitigation methodologies, as authorized by Section 403.5113(2), F.S., and Rule 62-17.191, F.A.C.

ATTACHMENTS:

None.

COMMENT NUMBER: VI.D

RAI NUMBER: LNP SCA RAI-110; LNP SCA RAI-111; LNP SCA RAI-112

REQUESTING AGENCY: Florida Fish and Wildlife Conservation Commission (FWC)

COMMENT:

Sec. 5.4.4.3 Biota Doses (pages 5-51 & 52), talks about the exposure of air-borne radiation to the terrestrial biota. ' Table 5.4-16 shows that with the exception of the red-cockaded woodpecker (RCW) and northern bobwhite, the doses meet the 25 milliRoentgen equivalent man per year (mrem/yr) whole body dose equivalent criterion in 40 CFR 109." Using Fig. 2.7-16 - Wind Rose Jan. 1, 2001, to Dec. 31, 2005, approximately 20% of the winds in this area will be blowing onto inhabited red-cockaded woodpecker clusters and planned clusters on Goethe State Forest.

Also in Sec.5.4.4.3, "From an ecological viewpoint, population stability is considered more important to the survival of the species that the survival of individual organisms. Thus higher doses are permitted." While generally this is true for a widely dispersed viable population, an isolated population requires the survival of as many individuals as possible for its continued success. The following is from the Recovery Plan for the redcockaded woodpecker (Picoides borealis) Second Revision; U. S. Fish and Wildlife Service. ". . . The buffering effect of helpers against annual variation operates only when helpers can readily occupy breeding vacancies as they arise. Helpers do not disperse very far and typically occupy vacancies on their natal territories or a neighboring one. If groups are isolated in space, dispersal of helpers to neighboring is disrupted and the buffering effect of the helper class is lost. When this happens, populations become much less likely to persist through time. Cooperative breeding system does not allow rapid annual growth of populations." The population of red-cockaded woodpeckers on Goethe has only 40 active clusters; organized into two subpopulations, one in the Black Prong area of Goethe and the other in the southern end of Goethe, in the Daniels Island and Apex tracts, with little contact between both subpopulations. Subpopulations reach stability when they support 30 or more active clusters and therefore these subpopulations are not ecologically stable. For this reason, the State has directed substantial resources toward managing these subpopulations so they are sustained. The applicant should describe mitigation measures that will be undertaken to address the potential impacts to the red-cockaded woodpecker clusters and planned clusters on Goethe State Forest.

Sec. 5.4.4.3 Biota Doses (pages 5-51 & 52), talks about the exposure of air-borne radiation to the terrestrial biota. ' Table 5.4-16 shows that with the exception of the red-cockaded woodpecker (RCW) and northern bobwhite, the doses meet the 25 milliRoentgen equivalent man per year (mrem/yr) whole body dose equivalent criterion in 40 CFR 109." Using Fig. 2.7-16 - Wind Rose Jan. 1, 2001, to Dec. 31, 2005, approximately 20% of the winds in this

area will be blowing onto inhabited red-cockaded woodpecker clusters and planned clusters on Goethe State Forest.

RESPONSE:

The reported doses calculated to the biota including the red-cockaded woodpecker were conservatively based on the maximum sector meteorological values for atmospheric dispersion which is WSW from the LNP site. The Goethe State Forest is generally to the northeast of the site. The atmospheric dispersion factors in the northeast direction, from the LNP site to the Goethe State Forest, are about a factor of 1.4 lower than those used in the calculation of the doses. Therefore, the calculated doses to the Goethe State Forest inhabitants are overestimated by this factor. Specifically, the calculated dose to the red-cockaded woodpecker would be lower than the 25 mrem/yr whole body dose equivalent criterion in 40 CFR 190. Based on these dose levels there will be no impacts to red-cockaded woodpecker individual or as a population. Therefore, additional mitigation measures are not deemed necessary.

ATTACHMENTS:

None.

COMMENT NUMBER: VI.E.1

RAI NUMBER: LNP SCA RAI-113

REQUESTING AGENCY: Florida Fish and Wildlife Conservation Commission (FWC)

COMMENT:

The environmental report (4.3.2.2, page 4-47) states that standard manatee conditions will be followed and professional biologists will serve as boat-based observers during certain phases of construction. The applicant should provide information detailing how observers will be selected, whether they have any previous experience observing for manatees, how many observers will be assigned to the construction areas and how many hours per day each observer will be assigned to work.

RESPONSE:

This project will comply with the USFWS Standard Manatee Conditions for In-Water Work (dated July 2005). This document is shown in the following attachment. In addition, the project will follow the manatee protection guidelines for the Withlacoochee River in the Levy County Comprehensive Plan (dated May 1995).

At least one person will be designated as manatee observer when in-water work is being performed. That person will either be experienced in manatee observation or will have received appropriate training. It is expected that the experienced or trained manatee observer will be employed on site during all in-water construction activities and will advise personnel to cease operation upon sighting a manatee within 50 ft. in-water project activity. Any in-water work will be avoided at night or during periods when conditions do not allow effective observation.

ATTACHMENTS:

See following document for USFWS Standard Manatee Conditions for In-Water.

STANDARD MANATEE CONDITIONS FOR IN-WATER WORK

July 2005

The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.

b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.

c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.

d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.

e. Any collision with or injury to a manatee shall be reported immediately to the FWC Hotline at 1-888-404-FWCC. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-232-2580) for north Florida or Vero Beach (1-561-562-3909) for south Florida.

f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Awareness signs that have already been approved for this use by the Florida Fish and Wildlife Conservation Commission (FWC) must be used. One sign measuring at least 3 ft. by 4 ft. which reads *Caution: Manatee Area* must be posted. A second sign measuring at least 81/2" by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities.

FWC Approved Manatee Educational Sign Suppliers

ASAP Signs & Designs
624-B Pinellas Street
Clearwater, FL 33756
Phone: (727) 443-4878
Fax: (727) 442-7573

Wilderness Graphics, Inc.
P. O. Box 1635
Tallahassee, FL 32302
Phone: (850) 224-6414
Fax: (850) 561-3943
www.wildernessgraphics.com

Cape Coral Signs & Designs
1311 Del Prado Boulevard
Cape Coral, FL 33990
Phone: (239) 772-9992
Fax: (239) 772-3848

Municipal Supply & Sign Co.
1095 Fifth Avenue, North
P. O. Box 1765
Naples, FL 33939-1765
Phone: (800) 329-5366 or
(239) 262-4639
Fax: (239) 262-4645
www.municipalsigns.com

Vital Signs
104615 Overseas Highway
Key Largo, FL 33037
Phone: (305) 451-5133
Fax: (305) 451-5163

Universal Signs & Accessories
2912 Orange Avenue
Ft. Pierce, FL 34947
Phone: (800) 432-0331 or
(772) 461-0665
Fax: (772) 461-0669

New City Signs
1829 28th Street North
St. Petersburg, FL 33713
Phone: (727) 323-7897
Fax: (727) 323-1897

United Rentals Highway Technologies
309 Angle Road
Ft. Pierce, FL 34947
Phone: (772) 489-8772
or (800) 489-8758 (FL only)
Fax: (772) 489-8757

CAUTION: MANATEE HABITAT

All project vessels

IDLE SPEED / NO WAKE

When a manatee is within 50 feet of work all in-water activities must

SHUT DOWN

Report any collision or injury to:

1-888-404-FWCC (1-888-404-3922)

Florida Fish and Wildlife Conservation Commission

COMMENT NUMBER: VI.E.2

RAI NUMBER: LNP SCA RAI-114

REQUESTING AGENCY: Florida Fish and Wildlife Conservation Commission (FWC)

COMMENT:

The environmental report (4.3.2.2, page 4-46) states that a cofferdam will be used to minimize release of sediment to the Cross Florida Barge Canal. The applicant should describe the procedure that will be used to ensure that manatees are not trapped behind the cofferdam.

RESPONSE:

A steel sheet pile cofferdam will be installed for the intake structure construction. Prior to installing the steel sheet pile, a floating turbidity barrier will be placed in the CFBC just outside the work area. It will be connected into the CFBC banks just upstream and downstream from the sheet pile location. The area will be clear of manatees before this installation as verified by a trained observer.

It is unlikely that manatees will remain in the immediate area of cofferdam construction while active work is in progress due to the anticipated level of noise and equipment and personnel activity. However, to assure that manatees are not affected by cofferdam construction and to ensure that no manatees are located behind the cofferdam before its closure, at least one trained observer will be designated as manatee observer when in-water work is being performed. That person will either be experienced in manatee observation or will have received appropriate training. It is expected that the manatee observer will be employed onsite during all in-water construction activities and will advise personnel to cease operation upon sighting a manatee within 50 ft. of in-water project activity. In-water work will be avoided at night or when conditions would significantly limit the observer's ability to sight manatees.

ATTACHMENTS:

None.

COMMENT NUMBER: VI.E.3

RAI NUMBER: LNP SCA RAI-115

REQUESTING AGENCY: Florida Fish and Wildlife Conservation Commission (FWC)

COMMENT:

The environmental report (4.3.2.2, page 4-46) describes the components of the cooling water intake structure as an intake structure, vertical bar screens, traveling screens, pumps and a pump house. The applicant should describe what access, if any, manatees could potentially have to the completed cooling water intake structure and what measures are being taken, if necessary, to prevent access.

RESPONSE:

In order to prevent any occurrences of manatee entering the CWIS on the CFBC, where they might become trapped, water will first be strained by trash racks, and then it will pass through traveling screens before entering the makeup water pumps. As discussed in ER Subsection 5.3.1.1 (SCA Appendix 10.11, Volume 9), makeup water for cooling processes will be withdrawn from the CFBC. The velocity of up-canal water movement associated with the intake flow will be very minor, about 0.02 m/s (0.07 ft/sec); therefore, no significant effect on healthy motile organisms is likely. During maximum operation the water intake velocity will be approximately 5.38 m3/s (190 ft3/sec), or approximately 33 percent of the mean tidal flow in the CFBC.

As described in ER Subsection 3.4.2.1.1 (SCA Appendix 10.11, Volume 9), the CWIS has been designed with 0.95-cm (3/8-in.) screen openings and a through-screen velocity at the traveling screens of less than 0.15 m/s (0.5 ft/sec). The cooling water intake system design will be in compliance with the requirements of the CWA Section 316 Phase I Rule. Any manatees approaching the screens will be able to avoid impingement because these animals will be restrained from entering the CWIS forebay by trash rack (that is, bar screens). The very low velocities at the bar screens will allow the animals to easily swim away from the screens.

ATTACHMENTS:

None.

COMMENT NUMBER: VI.F.1

RAI NUMBER: LNP SCA RAI-116

REQUESTING AGENCY: Florida Fish and Wildlife Conservation Commission (FWC)

COMMENT:

The applicant has provided information on the biological characterization of the Cross Florida Barge Canal in the vicinity of the Levy Nuclear Plant site in the Environmental Report and in the National Pollution Discharge Elimination System (NPDES) permit application. The applicant indicates that benthic invertebrate sampling was conducted by the "approved Aquatic Sampling Work Plan." A short summary is provided in Volume 5, NPDES permit, Attachment 2; Volume 8, Section 2.4.2.6; and also in Volume 9, Chapter 6. The applicant has indicated that the cooling water intake structure will affect flows and aquatic life in the Cross Florida Barge Canal for a distance of five miles from the Inglis Lock and Dam. We request that the applicant provide a copy of the "aquatic sampling work plan," detailed survey protocols for the macro-invertebrates, the various plankton communities, and fish communities. We request the applicant indicate where the new aquatic sampling stations will be located on the old Withlacoochee River channel. We also request the applicant provide a sampling protocol that would be initiated during operation of the plant in order to address impingement and entrainment. Further, we request that the applicant develop a mitigation plan to address impacts to aquatic life.

RESPONSE:

A copy of the Aquatic Sampling Plan is attached to LNP SCA RAI-107 (VI.A.2). The plan shows where the new aquatic sampling stations will be located on the old Withlacoochee River channel. This plan also describes survey protocols used for the sampling of fish, plankton, and macroinvertebrate communities in baseline assessments.

Impingement and entrainment is addressed as part of the NPDES permitting process under Section 316(b) of the CWA applicable to cooling water intake structures at new (Phase I) facilities. FDEP has adopted EPA's Phase I "New Facility" regulations by reference; PEF intends to employ a closed-cycle recirculating cooling system that is considered Best Technology Available under federal regulations and, by reference, FDEP rule. Because PEF intends to meet the requirements of Track I under EPA's Phase I rule, any mitigation of impacts is encompassed in compliance with applicable 316(b) regulations and rules and FDEP permit conditions.

ATTACHMENTS:

None.

COMMENT NUMBER: VI.F.2

RAI NUMBER: LNP SCA RAI-117

REQUESTING AGENCY: Florida Fish and Wildlife Conservation Commission (FWC)

COMMENT:

We request that the applicant consider providing a mitigation plan that includes the creation of multiple breaches along the earthen berm that extends into Withlacoochee Bay (Gulf of Mexico) from the Cross Florida Barge Canal. Historically, freshwater would enter the bay, flow southward and support a euryhaline system consisting of oysters and other estuarine organisms. With the creation of the berm for the Cross Florida Barge Canal, this supply of freshwater was diverted offshore. A hydrographic analysis should accompany the mitigation plan in order to model the modified flow pattern that would result from the creation of the proposed breaches and the ultimate consequence on the local salinity regime.

RESPONSE:

Based on the investigations and analyses conducted by PEF, it is not clear that the level of aquatic impacts resulting from the operation of the proposed CWIS and the cooling tower blowdown discharge to the existing CREC discharge canal will require mitigation. It also is not clear that breaching the existing berms on the southern side of the dredged barge canal would result in a renewal of previously existing estuarine communities. The potential adverse effects of changing the existing berms on the boating channel and protected species utilizing the berms is also undetermined.

ATTACHMENTS:

None.

COMMENT NUMBER: VI.F.3

RAI NUMBER: LNP SCA RAI-118

REQUESTING AGENCY: Florida Fish and Wildlife Conservation Commission (FWC)

COMMENT:

Previous mitigation was required for the effluent from the existing Crystal River Plant. Since the applicant proposes to use the existing Crystal River Plant's discharge canal, we request information regarding any marine or estuarine mitigation efforts associated with the construction and operation of the existing Crystal River Plant. This should include detailed descriptions of the specific activities, along with the outcomes of each activity. We also request that the applicant address whether the mitigation was successful in terms of achieving the predefined goals.

RESPONSE:

As discussed in ER Section 5.3.2 (SCA Appendix 10.11, Volume 9), discharge of the LNP closed cycle cooling blowdown will account for only 4.9 percent of the total flow of the CREC discharge canal and will have no adverse thermal impact. Use of the CREC discharge canal for LNP discharge will not impact aquatic communities or existing mitigation measures at CREC and does not justify additional mitigation. As requested, following is a discussion on the mitigations employed at CREC.

PEF implemented mitigation measures at CREC to address 316(a) and 316(b) concerns associated with the once-through condenser cooling water systems of Crystal River Units 1, 2, and 3. Mechanical draft helper cooling towers were installed in 1992 along the discharge canal and are operated during warmer months to maintain a thermal discharge maximum temperature of 96.5°F over a 3-hour rolling average at the POD. The proposal to install helper cooling towers was made to return the discharge area to the approximate thermal levels in existence prior to the operation of Crystal River Unit 3 (beginning in 1977), thereby reducing thermal impacts to seagrass beds in Crystal Bay. Subsequent seagrass monitoring studies have indicated that seagrass beds in the vicinity of the CREC are dynamic in nature and subject to various limiting factors, including light penetration, salinity variation, and wave action. Recolonization, though variable, has been observed in previously thermally-impacted areas.

Entrainment and impingement impacts are minimized to acceptable levels through seasonal flow reductions and the operation of a multi-species marine hatchery. A 15 percent reduction in overall cooling water flow from Units 1, 2, and 3 from November through April was achieved by curtailing flow for Units 1 and 2 by approximately 30 percent to accomplish the

flow reduction objective. This represents a reduction in circulating water flow of roughly 200,000 gpm and successfully reduces entrainment and impingement levels accordingly. Since 1991, a multi-species marine hatchery has been operated at Crystal River to culture and release SIO based on local ecological, commercial, and/or recreational importance. Utilizing the expertise of a Technical Advisory Committee, it was recommended that the facility culture red drum, spotted seatrout, pink shrimp, and striped mullet as the first four species to culture. Pigfish and silver perch were later added to the list. During 2003, blue crab and stone crab were added to the list for a total of eight species. To date, the center has raised and released 947,394 red drum fingerlings; 1,375,500 spotted seatrout fingerlings; 415,102 pink shrimp; 525,000 first feeding striped mullet larvae; 39,942 silver perch larvae; 32,347,962 stone crab larvae; and 93,746,281 blue crab larvae.

ATTACHMENTS:

None.

COMMENT NUMBER: VI.G

RAI NUMBER: LNP SCA RAI-119

REQUESTING AGENCY: Florida Fish and Wildlife Conservation Commission (FWC)

COMMENT:

The Environmental Report (volumes 8 and 9) for the proposed plant facility and the transmission lines does not appear to contain an analysis of the cumulative impacts of the proposed facility and its transmission lines in conjunction with the Crystal River Nuclear Facility and transmission lines and other activities in the area. We recommend that a thorough cumulative effects analysis be conducted that includes, at a minimum, effects on marine/estuarine habitat and species, atmospheric deposition of material from both power plants, bird migration/transmission line mortality, and impacts of the transmission line on habitat and species.

RESPONSE:

The discussion of cumulative impacts applicable to construction of the LNP are addressed in ER Section 4.7 (SCA Appendix 10.11, Volume 9). The discussion of cumulative impacts applicable to operation of the LNP are addressed in ER Section 5.11 (SCA Appendix 10.11, Volume 9). The discussion of impacts applicable to LNP discharge to the CREC discharge canal are addressed in ER Section 5.3.2 (SCA Appendix 10.11, Volume 9).

As discussed in LNP SCA RAI-103 (V.2), a comprehensive salt drift deposition study was conducted at CREC to evaluate the physical impacts of salt deposition from 1981 through 1995. The study demonstrated that there were no significant impacts to vegetation in the area. Given the distance between the two plants, the cumulative impacts of the cooling towers are not expected to be significant.

Much of the transmission expansion will occur within existing transmission ROWs also serving the CREC. This use of existing ROWs will minimize additional impacts to terrestrial and aquatic ecosystems.

ATTACHMENTS:

None.

COMMENT NUMBER: VI.H

RAI NUMBER: LNP SCA RAI-120

REQUESTING AGENCY: Florida Fish and Wildlife Conservation Commission (FWC)

COMMENT:

Volume 9, Section 4.1.1.1.2.3, provides information on the land use plan effects with the construction of the Levy County Plant. The applicant should explain impacts to plant operations of the lock and dam are removed from Lake Rousseau and possible impacts to the plant and operations if restoration of the Withlacoochee River is pursued in the future. In addition, the applicant should describe alternatives for different water intake structure locations that would allow for future restoration of the Cross Florida Barge Canal.

RESPONSE:

During the development of the initial plant site design and layout, an engineering and environmental assessment of alternative cooling water intake sources and withdrawal locations was performed. Based on this assessment of existing conditions, as well as all known ongoing development plans for the area, the location for the cooling water intake structure, at the east end of the CFBC, was determined to be the most appropriate. Should circumstances arise in the future, such as those identified in the comment above, that would preclude the use of the current cooling water location/design, then a separate assessment would be conducted, based on the circumstances known at that time.

ATTACHMENTS:

None.

COMMENT NUMBER: VI.I

RAI NUMBER: LNP SCA RAI-121

REQUESTING AGENCY: Florida Fish and Wildlife Conservation Commission (FWC)

COMMENT:

The applicant should indicate if there will be any security zones established in any areas of the proposed facility that would restrict access to areas currently open to fishing and hunting activities.

RESPONSE:

There are no areas of the proposed facility that are currently open to fishing and hunting where plant security zones would restrict such activities in the future.

ATTACHMENTS:

None.

VII. SWFWMD

COMMENT NUMBER: VII.A General Comment

RAI NUMBER: LNP SCA RAI-122

REQUESTING AGENCY: SWFWMD

COMMENT:

Drawdown Impact Modeling was submitted by the Applicant in support of the above referenced site certification application. The ground-water flow model MODFLOW was used to evaluate drawdown impacts from the proposed withdrawals. In order to evaluate the modeling the MODFLOW input and output data files will be needed. If a model preprocessor was used, such as Visual Modflow or Groundwater Vistas, the files created by those programs should also be submitted. In addition, an analysis of the cumulative impacts of all withdrawals within the model should be performed.

RESPONSE:

The wellfield configuration for LNP is currently being refined to minimize potential impacts to project facilities, surface waters, wetlands, and adjacent users. The analysis presented is based on the conceptual wellfield layout, and the well locations may be further refined as the design of the LNP proceeds.

The drawdown impacts resulting in the requested water use were simulated using the SWFWMD DWRM regional MODFLOW model. The model files from the modeling performed for the SCA submittal and the revised wellfield layout included in response to this and other RAI comments are included on the attached DVD.

Cumulative impact modeling was performed as requested. That modeling and other work performed to respond to other SCA comments is summarized in the attached Technical Memorandum titled: Revised Conceptual Wellfield Layout and Evaluation of Simulated Drawdown Impacts, Levy Nuclear Plant.

Input and output model files for the SCA submittal and the revised wellfield layout and groundwater contour maps can be found on a DVD entitled "Groundwater Modeling Data Files for Levy Nuclear Plant Units 1 and 2, Site Certification Application for Power Plant and Associated Facilities." The table below identifies each file used in the cumulative and incremental average-day simulations and the incremental peak-week simulations.

Average-Day Cumulative Simulation Filename	Average-Day Incremental Simulation Filename	Peak Week Incremental Simulation Filename	Description
avg_cumulative._kx	avg_incremental._kx	max-week._kx	Hydraulic conductivity / transmissivity array
avg_cumulative._kz	avg_incremental._kz	max-week._kz	Leakance array
avg_cumulative._s1	avg_incremental._s1	max-week._s1	Primary storage coefficient array
avg_cumulative._s2	avg_incremental._s2	max-week._s2	Secondary storage coefficient array
avg_cumulative.bas	avg_incremental.bas	max-week.bas	Basic package input
avg_cumulative.bcf	avg_incremental.bcf	max-week.bcf	Block-centered-flow package input
avg_cumulative.cbb	avg_incremental.cbb	max-week.cbb	Cell-by-cell flow output file
avg_cumulative.cbw	avg_incremental.cbw	max-week.cbw	Cell-by-cell flow (wells) output file
avg_cumulative.chd	avg_incremental.chd	max-week.chd	Constant-head boundary package input file
avg_cumulative.crcx	avg_incremental.crcx	max-week.crcx	Cell-by-cell flow (recharge) output file
avg_cumulative.ddn	avg_incremental.ddn	max-week.ddn	Drawdown-save file
avg_cumulative.dis	avg_incremental.dis	max-week.dis	Discretization package input
avg_cumulative.drn	avg_incremental.drn	max-week.drn	Drain package input
avg_cumulative.glo	avg_incremental.glo	max-week.glo	Global output file
avg_cumulative.gmg	avg_incremental.gmg	max-week.gmg	Geometric multi-grid solver package input
avg_cumulative.hds	avg_incremental.hds	max-week.hds	Head-save file
avg_cumulative.kzi	avg_incremental.kzi	max-week.kzi	Vertical hydraulic conductivity array
avg_cumulative.lst	avg_incremental.lst	max-week.lst	Output listing file
avg_cumulative.mf2	avg_incremental.mf2	max-week.mf2	Control file created by Groundwater Vistas
avg_cumulative.nam	avg_incremental.nam	max-week.nam	Name input file
avg_cumulative.oc	avg_incremental.oc	max-week.oc	Output control package input file
avg_cumulative.rch	avg_incremental.rch	max-week.rch	Recharge package input file

Average-Day Cumulative Simulation Filename	Average-Day Incremental Simulation Filename	Peak Week Incremental Simulation Filename	Description
avg_cumulative.riv	avg_incremental.riv	max-week.riv	River package input file
avg_cumulative.wel	avg_incremental.wel	max-week.wel	Well package input file
avg_cumulative.zone	avg_incremental.zone	max-week.zone	Zone input file
LNP_avg_20080801.gwv		LNP_max_20080801.gwv	Groundwater Vistas (pre-processor) model file

ATTACHMENTS:

See the following technical memorandum.

MODFLOW Input and Output Files for LNP Units 1 and 2 are included on DVD. Due to the large size of these files, the DVD has been provided only to SWFWMD and the FDEP Siting Office.

Revised Conceptual Wellfield Layout and Evaluation of Simulated Drawdown Impacts, Levy Nuclear Plant

PREPARED FOR: Progress Energy

PREPARED BY: CH2M HILL

DATE: August 10, 2008

I certify that this report was prepared under my supervision and direction.

Christopher J. Peters, P.G.
Florida Professional Geologist PG 2361
8/10/08

1.0 Introduction

This technical memorandum (TM) documents the simulated hydrologic impacts associated with the proposed normal daily withdrawal of 1.58 million gallons per day (mgd) of groundwater from the upper Floridan aquifer (UFA) to provide fresh water for Progress Energy Florida's (PEF's) proposed Levy Nuclear Plant (LNP). The impacts were evaluated using a MODFLOW (Harbaugh, Banta, Hill, and McDonald, 2000) groundwater flow model developed by CH2M HILL and documented in the SCA Volume 5, Section D 10.09, Water Use Permit, Attachment B, Groundwater Modeling (Progress Energy, 2008). This new groundwater model developed for the LNP evaluation was based on the Southwest Florida Water Management District's (SWFWMD's) District-Wide Regulation Model, Version 2 (DWRM2) (Environmental Simulations Inc., 2004) but with a finer grid to represent the project site better.

Modifications were subsequently made to the LNP model based on feedback from SWFWMD; and those changes (and the corresponding revised model results) are the focus of this TM. Information on model development, calibration, etc. can be found in SCA Volume 5, Section D 10.09, Water Use Permit, Attachment B, Groundwater Modeling.

The wellfield configuration for LNP is currently being refined to avoid and minimize potential impacts to surface waters, wetlands, and adjacent users. The analysis presented in this memorandum is based on the conceptual wellfield layout and the well locations may be further refined as the design of LNP proceeds.

2.0 Model Revision Objectives

After their initial review, the SWFWMD staff requested further analysis of the following:

- Extent of water-level drawdown in the surficial and Floridan aquifers resulting from withdrawals of LNP and existing permitted users; and
- Lake level and spring flow impacts (where applicable).
- Impact of simulated drawdown on wetlands.

3.0 Model Modifications

Two modifications were made to the LNP analysis as a result of the SWFWMD's requests: two springs (Little King and Big King) were added to the model; and the layout and operation of the proposed wellfield were modified to reduce simulated drawdown impacts in the surficial aquifer system (SAS).

3.1 Springs

Two springs were identified within the LNP model domain; Little King and Big King Springs that were not included in the SWFWMD's DWRM2 model (Environmental Simulations Inc., 2004). Exhibit 1 depicts their locations relative to the LNP site and the model domain. Brief descriptions of these springs can be found in Appendix C of Scott et al. (2004).

The springs were added to the model using MODFLOW's drain (DRN) package. The DRN package allows water to be removed from a model cell based on the head differential between the model-calculated water level for that model cell and a specified elevation for the drain. The simulated flow is modulated by the conductance term, which is a product of the cell area and hydraulic conductivity.

Neither discharge nor elevation data were available for the springs. It was assumed that the pre-development (stress period 1) discharge from each spring was on the order of 3 million gallons per day (mgd). This is consistent with the springs' classification as third-magnitude springs (Scott, et al., 2004). The drain elevations were set to be at or slightly below the land surface elevation for that model cell. The transmissivity in each spring cell was increased by three orders of magnitude to account for the presence of the springs and produce the target flows.

Exhibit 2 summarizes the details on each spring added to the model.

3.2 Wellfield

The layout and operation of the proposed wellfield was also modified. The original wellfield layout included 4 wells on 1,000 ft spacing located northeast of the plant. The new conceptual wellfield layout includes eight wells, running in a north-south alignment with approximately 3,000 ft well spacing. The wells are positioned east of the haul road and power transmission corridor south of the main plant, and then to the west of the transmission corridor north of the bend in the haul road. Exhibit 3 depicts the original and revised wellfield layouts.

The operating plan for the wellfield was also modified. In the revised model, the pumpage was rotated so that only one well is pumped at a time, with a different well operating each

day. Three stress periods were simulated for this revision: the steady-state pre-development period (stress period 1), steady-state 2001 baseline conditions in DWMR2 (stress period 2), and the transient model of the daily rotation (stress periods 3 through 367). To implement this daily rotation concept; the 365-day duration stress period 3 of the previous LNP model was replaced with 365 one-day stress periods. The impact evaluations discussed in this TM were evaluated for stress period 367, which is temporally equivalent to the end of stress period 3 in the previous LNP model (one year of pumpage). Exhibit 4 depicts the time discretization in the revised model.

For the evaluation of maximum-day impacts, stress periods 1 and 2 were followed by an additional 7 stress periods to simulate one week of peak pumping. This was based on the assumption that the maximum period for peak demands would be one week. The basis for this assumption is described in Section 4.2 of this TM.

3.3 Summary of Modifications

The LNP model originally submitted as part of the SCA was modified to include Little King and Big King springs; which were added to the model as MODFLOW drain cells. The wellfield layout and well spacing were modified, and the model's temporal discretization was increased to allow the daily rotation of wells during the predictive phase of the simulation (DWRM2 stress period 3). No other changes were made to the model.

4.0 Results

4.1 Existing Impacts

Details on adjacent Individual and General Water Use Permits (WUPs) in the model domain are summarized in Exhibit 5 and the locations of wells all categories of WUPs (including smaller general permits) are depicted in Exhibit 6. No modifications were made to their simulated withdrawal rates or locations, which are from the DWRM2 model.

Exhibits 7 and 8 depict their simulated drawdown impacts (relative to pre-development conditions) on the SAS and UFA, respectively, without LNP's proposed pumping.

In the SAS (Exhibit 7), there is a 0.7-ft cone of depression located in the northern portion of the model domain associated with withdrawals under WUP 005095007. Immediately north of the proposed LNP site, there is approximately 0.4-ft of drawdown associated with WUP 001726001. South of the site, there is approximately 0.4 ft of drawdown resulting from the Town of Inglis' pumpage (WUP 008953003). Other SAS drawdowns of 0.1 ft or less result from scattered smaller users.

In the UFA (Exhibit 8), the drawdown pattern is virtually identical, with slight increases near WUP 005095007 and the Town of Inglis.

4.2 Drawdown Evaluation Considerations

The revised model incorporates a daily rotation among the eight wells in the LNP wellfield. Since only one well is active on a given day, the configuration of the simulated cone of depression changes from day-to-day, with the greatest drawdown observed at the well that is currently pumping. Since the extent of any given drawdown contour (0.5 ft, for example)

will vary depending on how the wellfield is being operated on any one day in the model, an aggregated contour evaluation was performed to evaluate the maximum potential drawdown.

The maximum potential drawdown analysis incorporates the following:

- Once a well has run for a day, it is then off for the next seven days before being used again. Thus, over an 8-day period, each well will be run once.
- As a transient model, the aggregate drawdown resulting from operating all of the wells will be greatest at the end of the simulation.
- The maximum potential drawdown can therefore be evaluated by looking at the aggregated drawdown around each well for the final eight stress periods in the simulation.

Exhibits 9 and 10 depict the results of this procedure for the upper Floridan aquifer. Exhibit 11 depicts the results for the SAS.

In the UFA (Exhibit 9) the aggregated simulated half-foot drawdown contours do not extend very far off the site, and do not impact any adjacent users. The aggregated simulated tenth-foot drawdown contours (Exhibit 10) extend further off-site; however they overlay one another as would be expected further away from the individual pumping wells.

In the SAS (Exhibit 11) the aggregated simulated drawdown contours for stress periods 360 to 367 are not significantly different from those in stress period 367. Additionally, the simulated drawdown contours are greatest in the central portion of the wellfield. This is a result of the greater drawdown in the UFA in the center of the wellfield resulting from interference between wells. Wells toward the ends of the wellfield experience less drawdown.

Based on this evaluation of the maximum potential simulated drawdown in the SAS and UFA, simulated drawdown impacts in the two aquifer systems were evaluated using the results from stress period 367 only. As shown in Exhibits 10 and 11, the drawdown in this stress period is equivalent to the maximum potential drawdown analysis of all eight wells.

4.3 Average-Day Impacts

The following sections discuss *incremental* and *cumulative* simulated drawdown impacts. Incremental drawdown impacts are those additional simulated drawdown impacts relative to 2001 water levels. Cumulative drawdown impacts are those of LNP's proposed wellfield, as well as the impact of adjacent permitted users. The cumulative drawdown is referenced to assumed pre-development water levels. Both cumulative and incremental impacts include the pumping from adjacent permitted users.

4.3.1 Drawdown

Incremental impacts (relative to 2001 conditions) for the SAS and UFA are depicted in Exhibits 12 and 13, respectively. Simulated incremental impacts to wetlands are discussed in Section 5.

Exhibits 14 and 15 depict the simulated average-day cumulative drawdown impacts in the SAS and UFA, respectively, at the end of the simulation (stress period 367). Exhibit 14 depicts up to 0.7 feet of simulated SAS cumulative drawdown in the central portion of the LNP wellfield. In the UFA, the maximum simulated cumulative drawdown is approximately 1.9 ft at the well that is active in stress period 367 (Exhibit 15). The simulated 0.1-ft drawdown contour extends approximately 3 miles away from the proposed wellfield, and encompasses several adjacent permitted users. An additional 0.5 ft of drawdown on another user's pumped well is not expected to cause any adverse impacts.

4.3.2 Lakes and Springs

The simulated average-day impacts to lakes and springs were quantified by calculating the difference in net flux through the model cells representing those features for model runs with and without LNP's withdrawals. Lakes and rivers are simulated in the model by MODFLOW's River (RIV) package and springs are simulated using MODFLOW's Drain (DRN) package. Since the only change made to the model in this case was the addition of LNP's pumpage; any difference in model-simulated flux, (flow into or out of river or drain cells) can be attributed to LNP's simulated withdrawals.

Exhibit 16 summarizes the simulated impacts on lakes and springs. With no LNP withdrawals, there is a net flux of 37.68 mgd from the Floridan aquifers into river cells. With the simulated withdrawals from LNP, there is a reduction of 0.26 mgd in discharge from the aquifer to model river cells representing rivers and lakes. As a groundwater flow model, MODFLOW cannot directly simulate water levels in rivers and lakes since these features are represented as fixed head cells so only flux (flow) is variable in those modeled cells. The drain cells representing Big King and Little King springs discharge at a rate of 5.82 mgd without LNP withdrawals. With LNP pumping, the simulated discharge from the drain cells representing Big King and Little King springs is reduced by 0.06 mgd, or approximately 42 gallons per minute.

4.4 Maximum Week Impacts

The most conservative maximum pumping rate for the LNP facility is 5.8 mgd. This projection is the summary of the four main processes that utilize the freshwater supply. Those include potable, service water, demineralized water, and fire protection systems. The facility design capacities for each water system were used to calculate the maximum pumping rate capacity for the wellfield. While it is highly unlikely that all four processes would be pumping at their maximum design capacity at the same time, the wellfield must be designed to meet this improbable scenario.

The most likely scenario that could result in the maximum pumping rate would be during facility maintenance that occurs annually for one week.

A second model simulation was conducted to evaluate incremental drawdown impacts associated with one week of pumpage at a rate of 5.8 mgd. It was assumed that on each day, four wells would be operating simultaneously; each at a rate of 1.45 mgd. As with the previous simulation, the operating wells were spaced out and rotated on a daily basis.

4.4.1 Maximum Week Drawdown

The simulated incremental drawdown in the SAS did not exceed 0.1 ft. Exhibit 17 depicts the simulated maximum week incremental drawdown impact in the UFA at the end of the simulation. The simulated 0.5-ft drawdown contour extends approximately 1.25 miles from the proposed wellfield, and only one adjacent user is located close to the 0.5 ft contour to the north.

4.4.2 Lakes and Springs

The simulated maximum-week impacts to lakes and springs were quantified by calculating the difference in net flux for model runs with and without LNP's withdrawals. Exhibit 18 summarizes the simulated impacts on lakes and springs.

The net impact to rivers and lakes is a reduction in the discharge from the aquifer of 0.10 mgd greater than the average day impacts. The simulated discharge from the model cells representing Big King and Little King springs is reduced by an additional 0.07 mgd greater than average day impacts.

5.0 Wetlands

In accordance with the SWFWMD Basis of Review for Water Use Permits, withdrawal of water must not cause unacceptable adverse impacts to environmental features, such as surface water bodies, protected species habitat, and wetlands (Section 4.2). Lacking permanent surface waterbodies or significant protected species habitat, the predominant environmental features of concern on the LNP property are wetlands.

Wetlands within the project area were delineated and the lines were subsequently field-verified by the Wetland Evaluation and Delineation Section (WEDS) of the FDEP. A wetland map was compiled using the field delineated wetland boundaries in areas to be impacted by construction, and photo-interpreted wetland boundaries in on-site areas that will be undisturbed. Offsite wetlands were mapped using data from the Florida Land Use and Cover Classification System (FLUCCSIII) database.

Cypress swamp (FLUCCS code 621) is the predominant wetland type in the vicinity of the LNP site, followed by bottomland (FLUCCS Code 615), wetland forested mixed (FLUCCS Code 630), and wet prairies (FLUCCS Code 643). The LNP site is characterized by stands of planted slash pine interspersed with isolated pond cypress swamps. The cypress swamps have been logged and exhibit varying successional stages, from relatively intact systems to remnant cypress savannah with largely herbaceous vegetation. Historic aerial photographs suggest that most of the wetlands classified as wet prairies by FLUCCS were previously cypress systems that were clearcut. While ditching is limited on-site, water table dynamics in the wetlands have been modified through silvicultural activities such as clear-cutting, bedding, and access road construction.

The SCA submittal contained an evaluation of the predicted drawdown in the surficial aquifer as a result of pumping the Floridan aquifer at the site. The original simulated drawdown in the SAS as a result of pumping the UFA at the average-day rate of 1.58 mgd from 4 wells separated by 1,000 ft estimated that the wetland area with 1.0 ft or greater predicted drawdown was approximately 138 acres. In response to comments from the

FDEP, SWFWMD, Levy County, and other agencies, several modifications were made in the wellfield layout to reduce the potential impact of the drawdown on wetlands.

For this revised conceptual layout and operation, the number of wells was increased from 4 to 8 and the well spacing was increased from 1,000 ft to about 3,000 ft. Using a daily well rotation plan, the potential drawdown impacts in the surficial aquifer are significantly less than those resulting from the original wellfield plan. Exhibit 12 depicts the simulated surficial aquifer drawdown contours and wetlands based on this revised wellfield plan.

The incremental SAS drawdown effects from pumping the UFA are below 0.5 ft throughout the wellfield and site, and approximately by the same amount in the immediate vicinity of the wells located in the middle of the plant site (Exhibit 12). With the reduced SAS drawdown predicted from the model, the wet season water level of the on-site wetlands is expected to remain within the normal range of water levels, and the hydroperiods of these wetlands are expected to remain within a normal range and duration. Exhibit 19 summarizes the acres of wetlands (by FLUCCS code) that fall within the incremental 0.5 contour depicted by Exhibit 12.

6.0 Conclusions

An evaluation of simulated withdrawal of 1.58 mgd of UFA groundwater for the proposed LNP project indicates that:

- Simulated *incremental* SAS and UFA drawdown in the wellfield is on the order of 0.5 and 1.9 ft, respectively.
- Simulated *cumulative* SAS and UFA drawdown in the wellfield is on the order of 0.7 and 1.9 ft, respectively.
- There are no wetlands with either an incremental or cumulative drawdown of 1.0 foot or greater within the wellfield's area of influence.
- For simulated incremental drawdown, approximately 3.5 acres are herbaceous non-forested wetlands of the type potentially affected by greater than 0.5 feet. These wetlands will not otherwise be impacted by project operations.
- Under Average Day conditions, the operation of the LNP wellfield decreased the model-simulated surficial and Floridan aquifer discharge into river cells used to represent rivers and lakes by approximately 0.26 mgd, or about 0.7%.
- Under Average Day conditions, the operation of the LNP wellfield decreased the model-simulated discharge from the drain cells representing Big King and Little King springs by approximately 0.06 mgd, or about 1.0%.

The operation of LNP's proposed wellfield is not expected to adversely impact adjacent permitted users of the Floridan aquifer. The model predicts less than 0.1 ft of additional drawdown on the nearest other UFA user under Average Day conditions. The model simulation for Maximum Week withdrawals estimates 0.5 ft of additional drawdown on the nearest Floridan well. Wetland impacts are limited to small areas near the wells.

7.0 References

Environmental Simulations Inc., 2004. Development of the District Wide Regulation Model for the Southwest Florida Water Management District. Contract 02CON000177.

Harbaugh, A.W., E.R. Banta, M.C. Hill, and M.G. McDonald, 2000. MODFLOW-2000, the U.S. Geological Survey Modular Ground-Water Model - User Guide to Modularization Concepts and the Ground-Water Flow Process. U.S. Geological Survey Open-File Report 00-92.

Progress Energy, 2008. Site Certification Application.

Scott, T.M., G.H. Means, R.P. Meegan, R.C. Means, S.B. Upchurch, R.E. Copeland, J. Jones, T. Roberts, and A. Willet, 2004. Springs of Florida, Version 1.1. Florida Geological Survey Bulletin 66.

Exhibits

EXHIBIT 1
Springs Near LNP Site

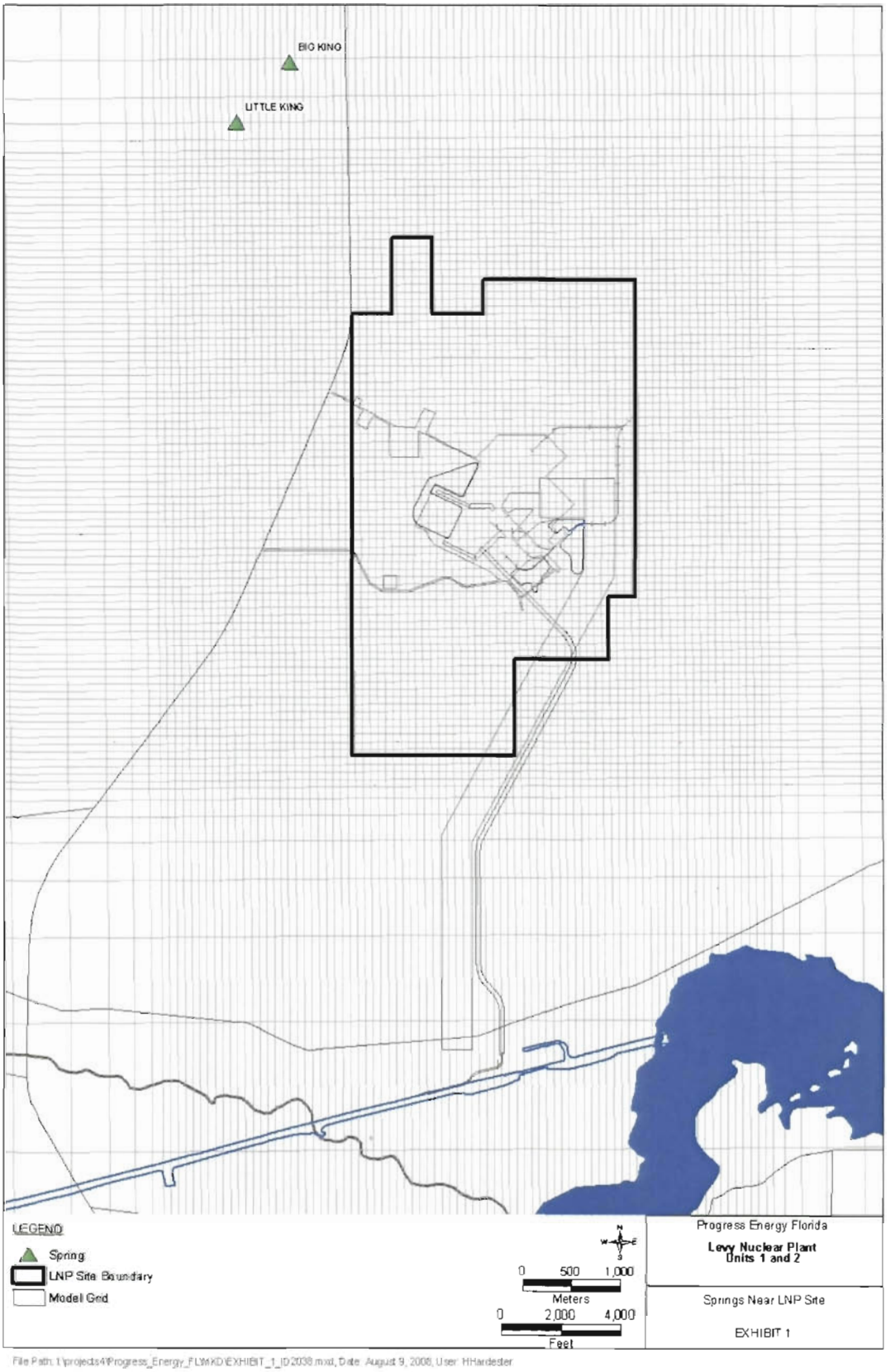

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EXHIBIT 2
MODFLOW Drain Cell Parameters Used to Simulate Springs

Spring	Model Layer	Model Row	Model Column	Drain Elevation, ft	Conductance, ft^2/d	Stress Period 1 Flow, mgd
Big King	2	10	31	26	$5x10^5$	3.12 mgd
Little King	2	12	24	24	$4x10^5$	2.85 mgd

EXHIBIT 3
Original and Revised Wellfield Layouts

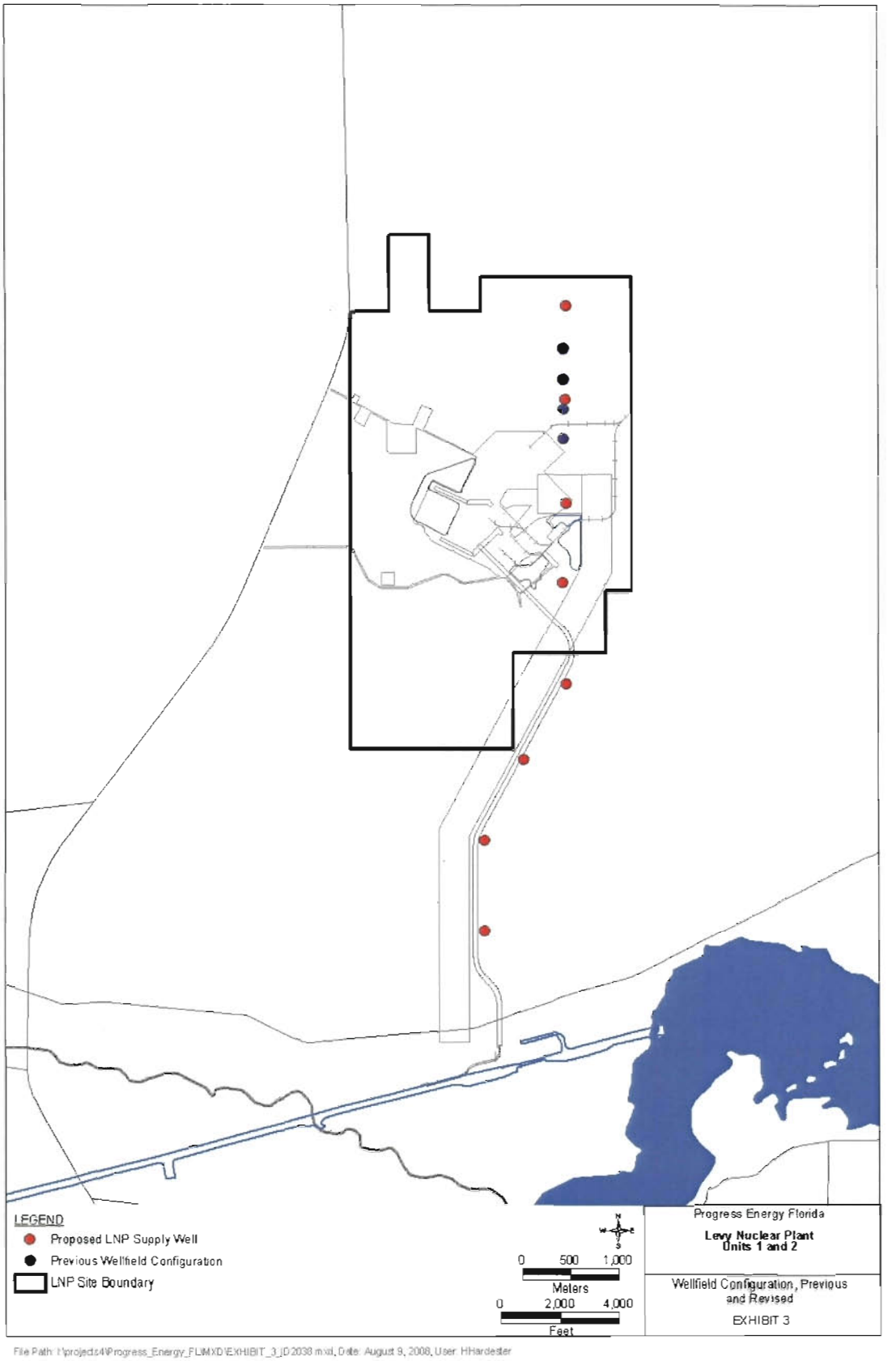

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EXHIBIT 4
Model Stress Periods

Stress Period	Duration	Steady State or Transient	Description
1	365 days	Steady-state	Pre-development conditions
2	365 days	Steady-state	2001 conditions
3 to 367	365 days	Transient	Predictive Simulation

EXHIBIT 5
Adjacent Water Use Permits

WUP No.	Owner/Project	WUP Expiration Date	Consumptive Use	Simulated Withdrawal Rate (gpd)
Individual WUPs				
2842	CITRUS COUNTY WATER RESOURCES DEPARTMENT	11/18/2007	Public Supply	150,120
4257	RAINBOW SPRINGS UTILITIES	7/27/2010	Public Supply	92,820
4695	FLORIDA POWER CORPORATION	11/26/2017	Industrial and Commercial	629,500
3672	FLORIDA POWER CORPORATION	April 2010	Industrial and Commercial	
5095	NEEDMORE FARM	11/17/2008	Agricultural	746,800
7819	INGLIS MINE	3/2/2008	Industrial and Commercial, Mining and Dewatering	23,400
General WUPs				
1726	MARGARET & LONNIE KNIGHT	5/3/2011	Agricultural	203,600
2999	MARION UTILITIES INC	9/3/2008	Public Supply	123,850
6282	ROBERT KILLIAN	5/2/2018	Agricultural	256,601
6798	EDWARD J. GERRITS, INC.	5/18/2009	Agricultural	176,060
7145	ROMEO RIDGE RANCH TERRY ROBERTS	10/9/2012	Agricultural	104,420
7755	TOWN OF YANKEETOWN	6/4/2014	Public Supply	106,380
8339	CITY OF DUNNELLON	10/8/2014	Public Supply	310,950
8953	TOWN OF INGLIS	2/22/2015	Public Supply	178,400
10260	BRASSBOYS ENTERPRISES, INC DBA CITRUS SPRINGS GOLF & CC	4/16/2013	Recreation/Aesthetic	131,090
12144	PETER DEROSA	1/31/2011	Agricultural	94,500
12159	KENNETH R & TERESA P CARROLL	3/12/2011	Agricultural	107,430
12527	RAINBOW SPRINGS LTD	6-30-2014	Recreation/Aesthetic	
12570	MARGARET KNIGHT	2-9-2014	Agricultural	
12571	DALE WRIGHT	2-10-2014	Agricultural	
13103	TEALBROOKE GOLF INC	5-19-2018	Recreation/Aesthetic	
13197	SHADE TREE TURF LLC	3-10-2018	Agricultural	
13273	TARMAC AMERICA LLC	Application Only	Industrial and Commercial, Mining and Dewatering	

EXHIBIT 6
Locations of Withdrawal Points (wells) for Adjacent Permitted Users

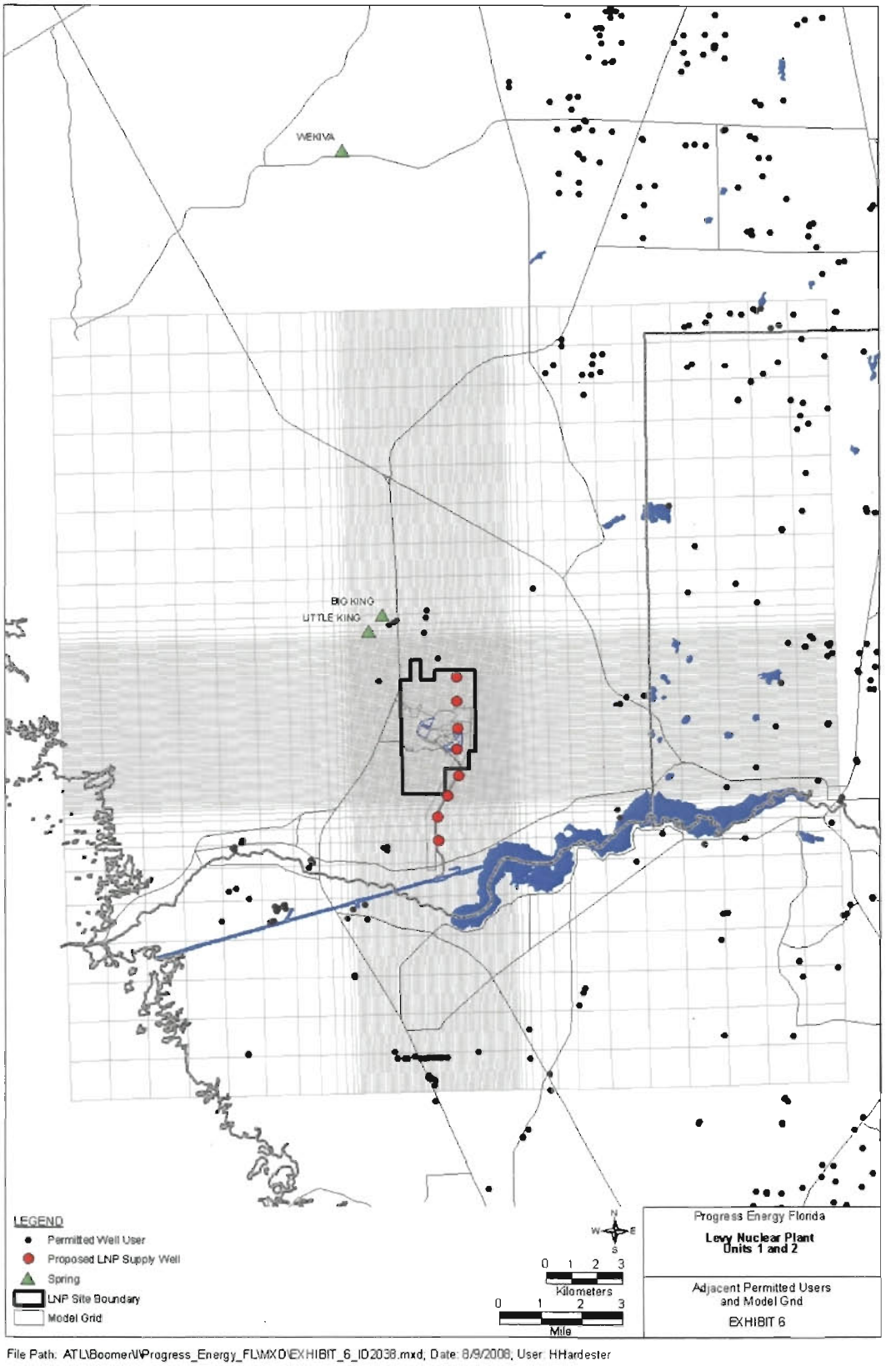

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EXHIBIT 7

Simulated Impact due to Other Users, Surficial Aquifer, from pre-Development Conditions

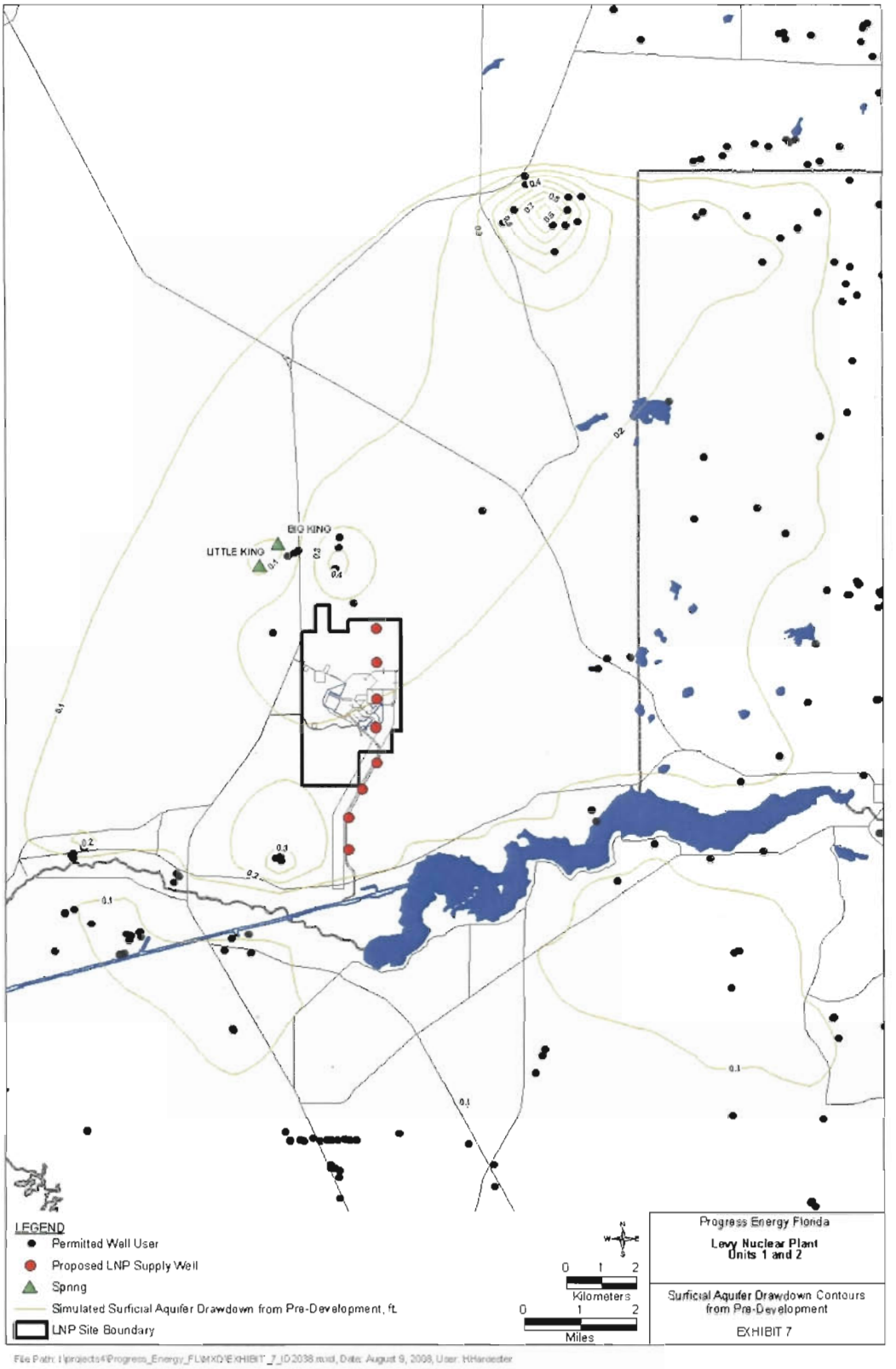

EXHIBIT 8

Simulated Impact Due to Other Users, Upper Floridan Aquifer, from Pre-Development Conditions

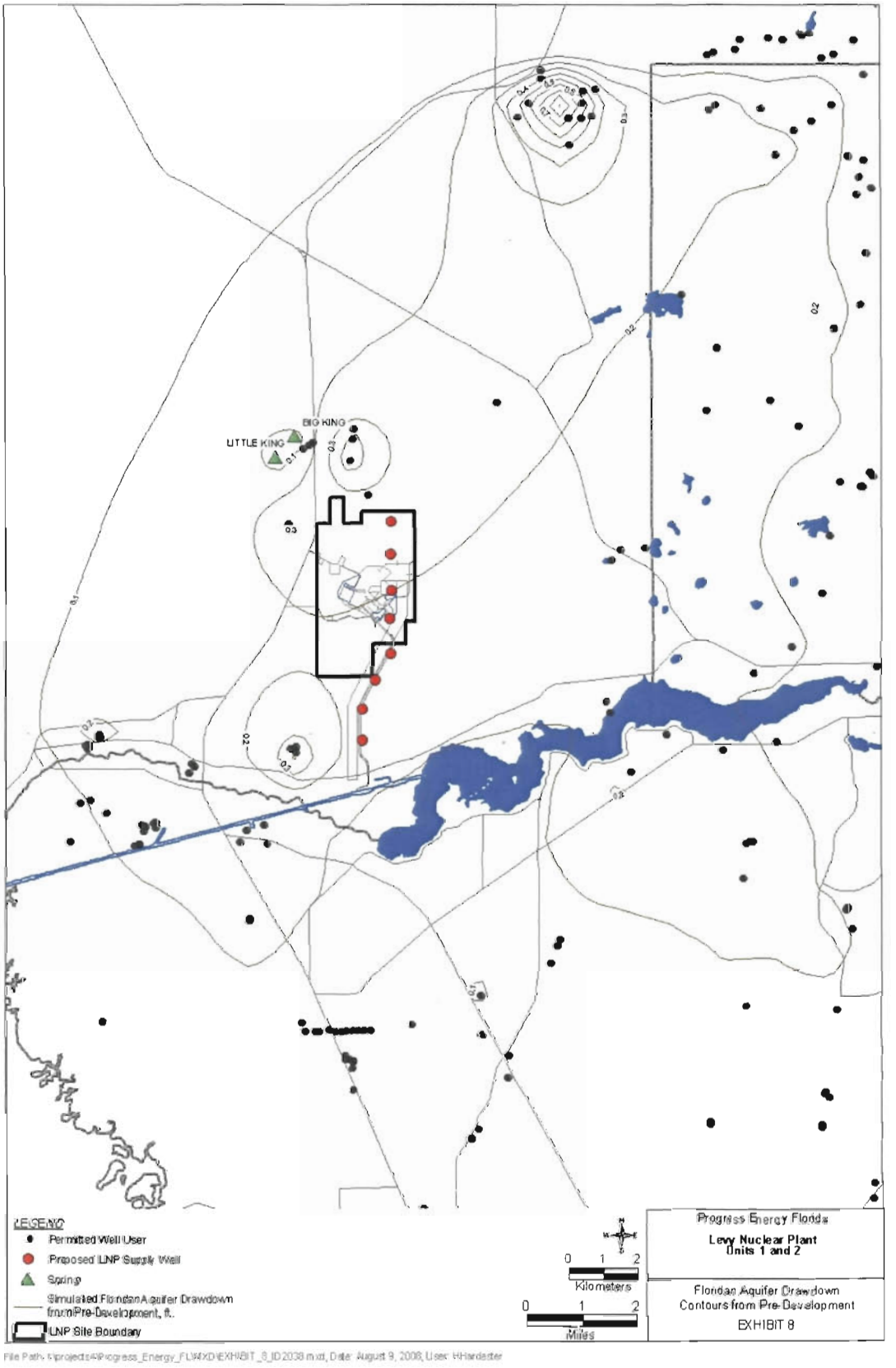

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EXHIBIT 9
Aggregated Simulated Half-Foot Drawdown, Upper Floridan Aquifer

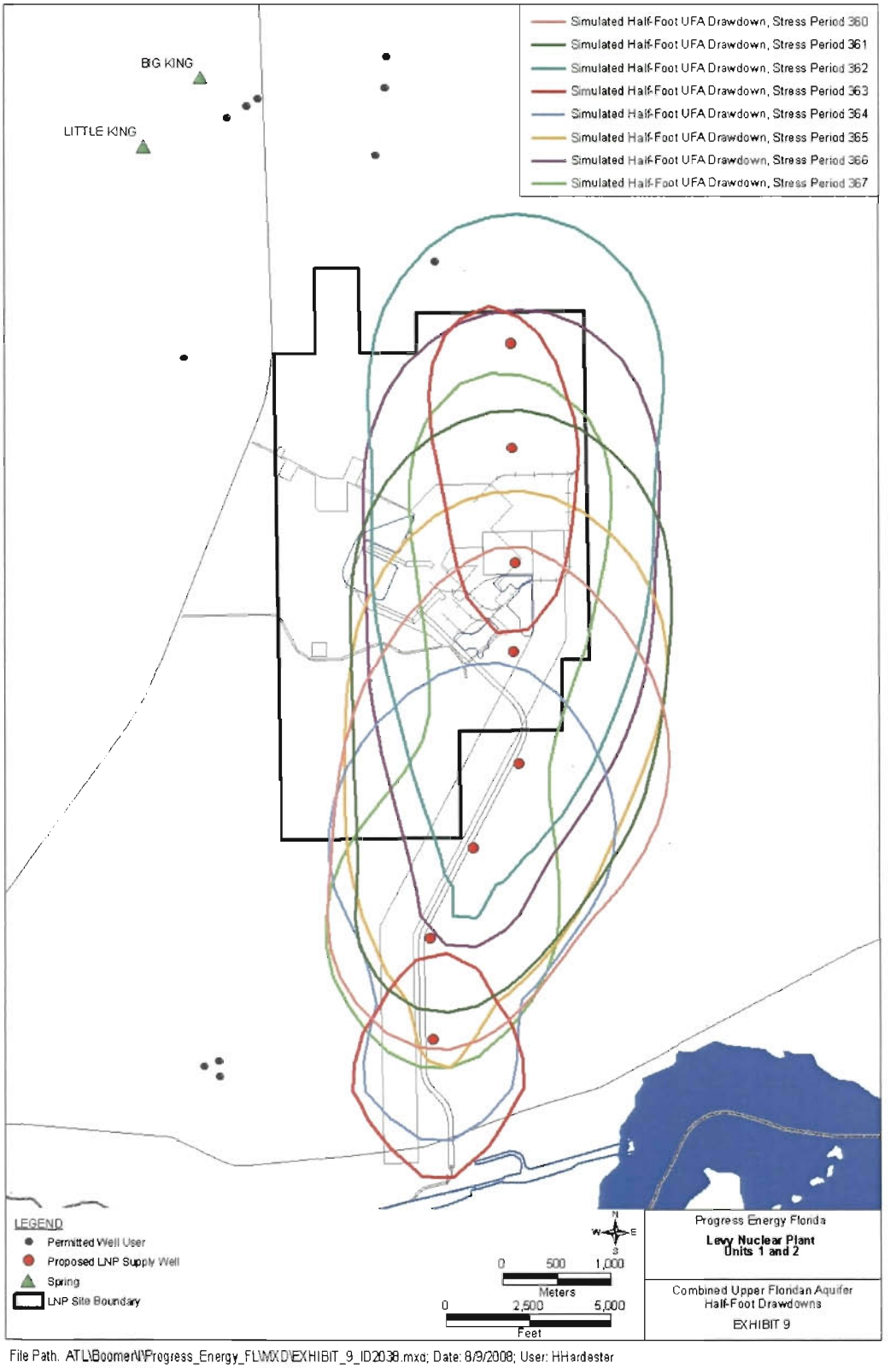

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EXHIBIT 10

Aggregated Simulated Tenth-Foot Drawdown, Upper Floridan Aquifer

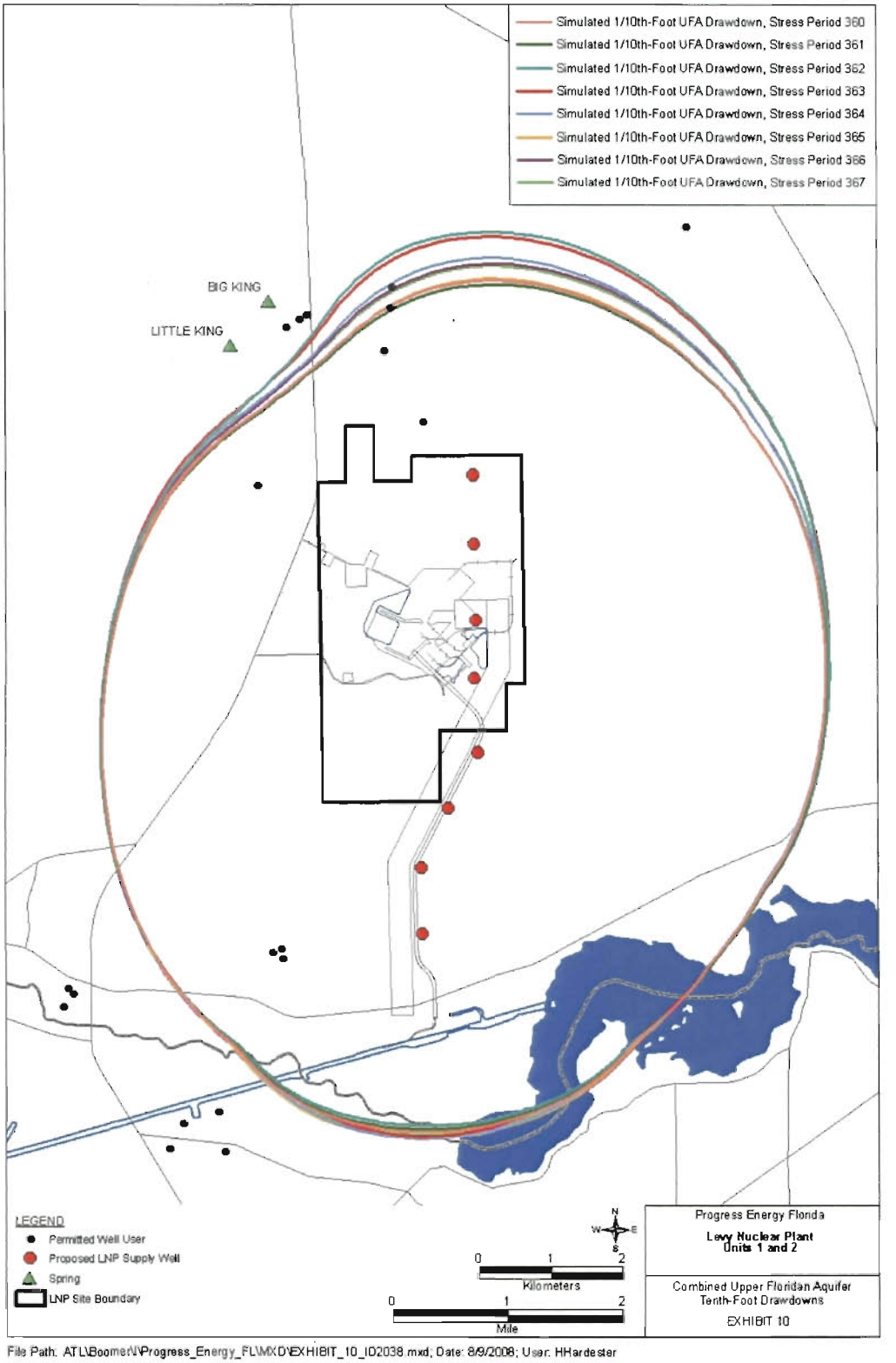

EXHIBIT 11
Aggregated Simulated Half-Foot Drawdown, Surficial Aquifer

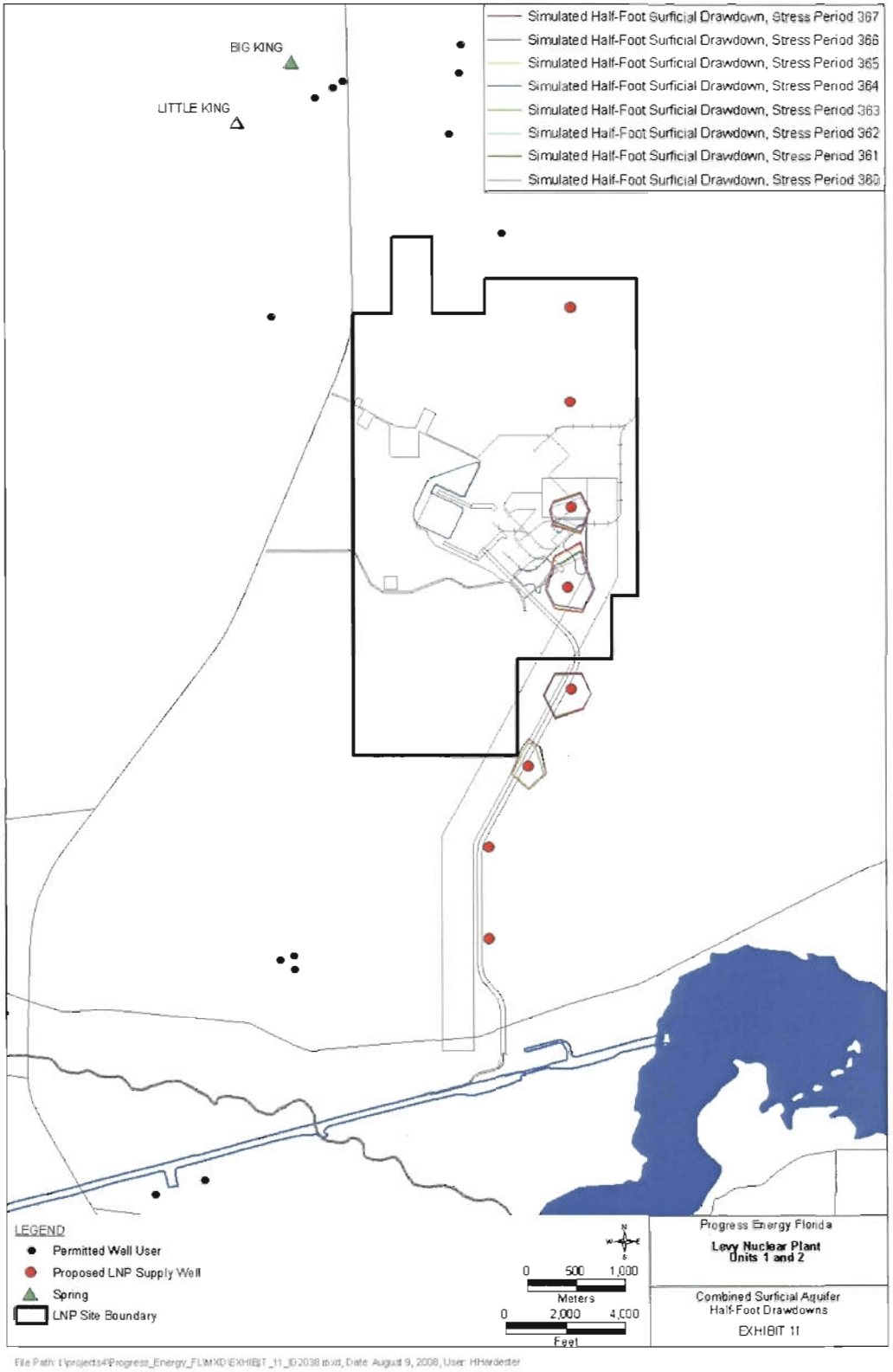

EXHIBIT 12
Simulated Incremental Surficial Aquifer Drawdown and Wetlands, Average-Day Conditions

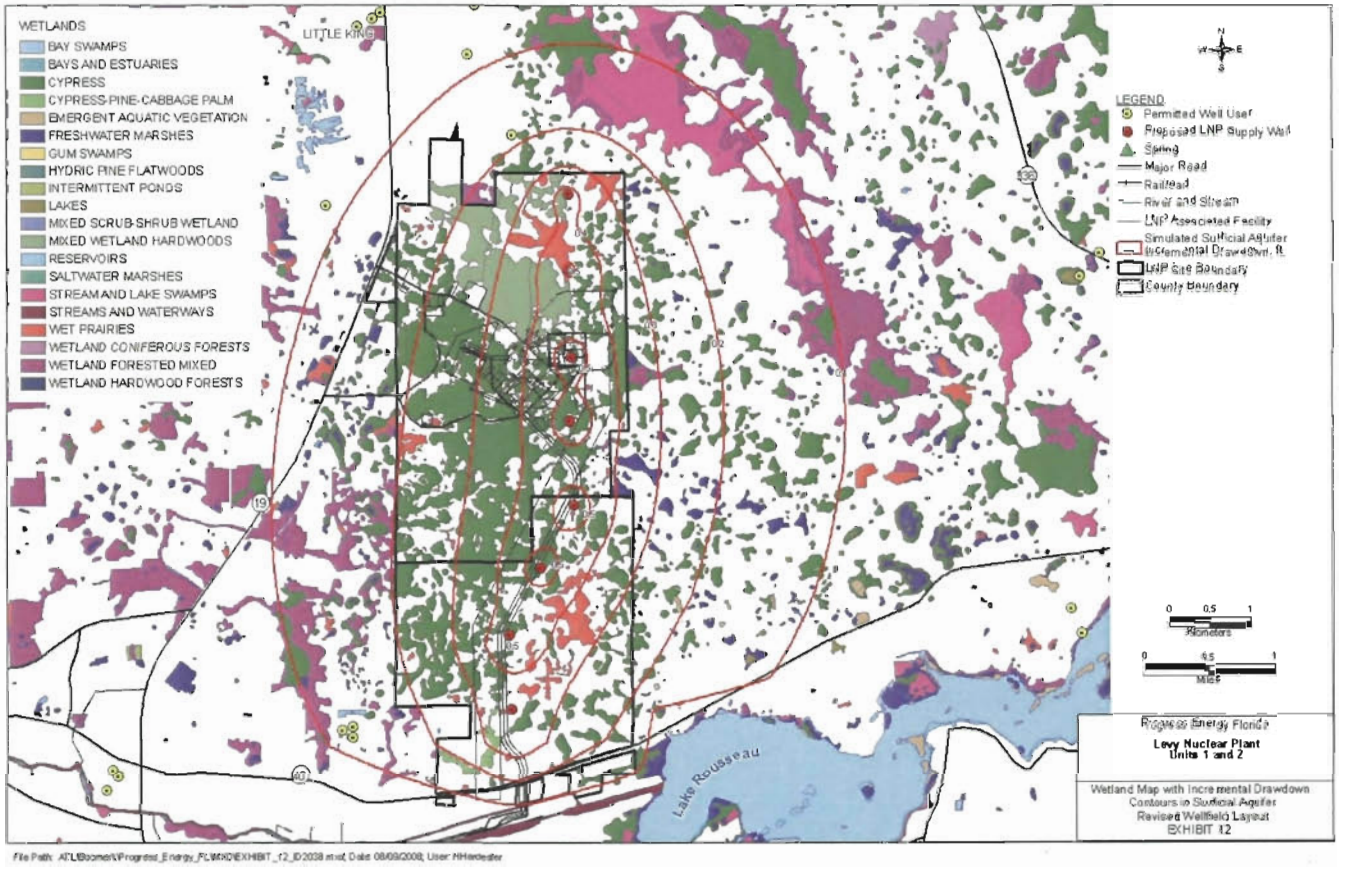

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EXHIBIT 13
Simulated Incremental Upper Floridan Aquifer Drawdown, Average-Day Conditions

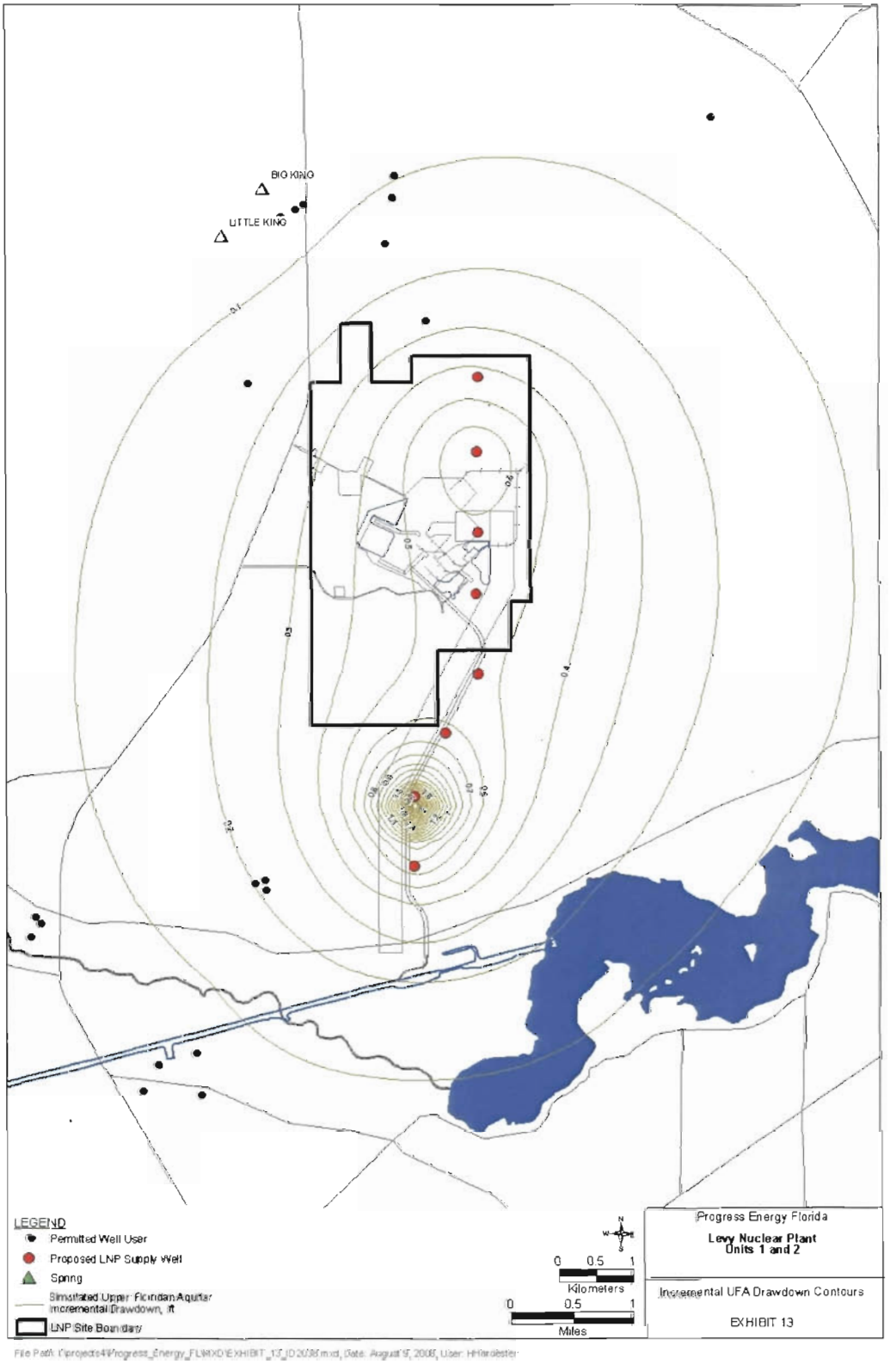

EXHIBIT 14

Simulated Cumulative Surficial Aquifer Drawdown and Wetlands, Average-Day Conditions

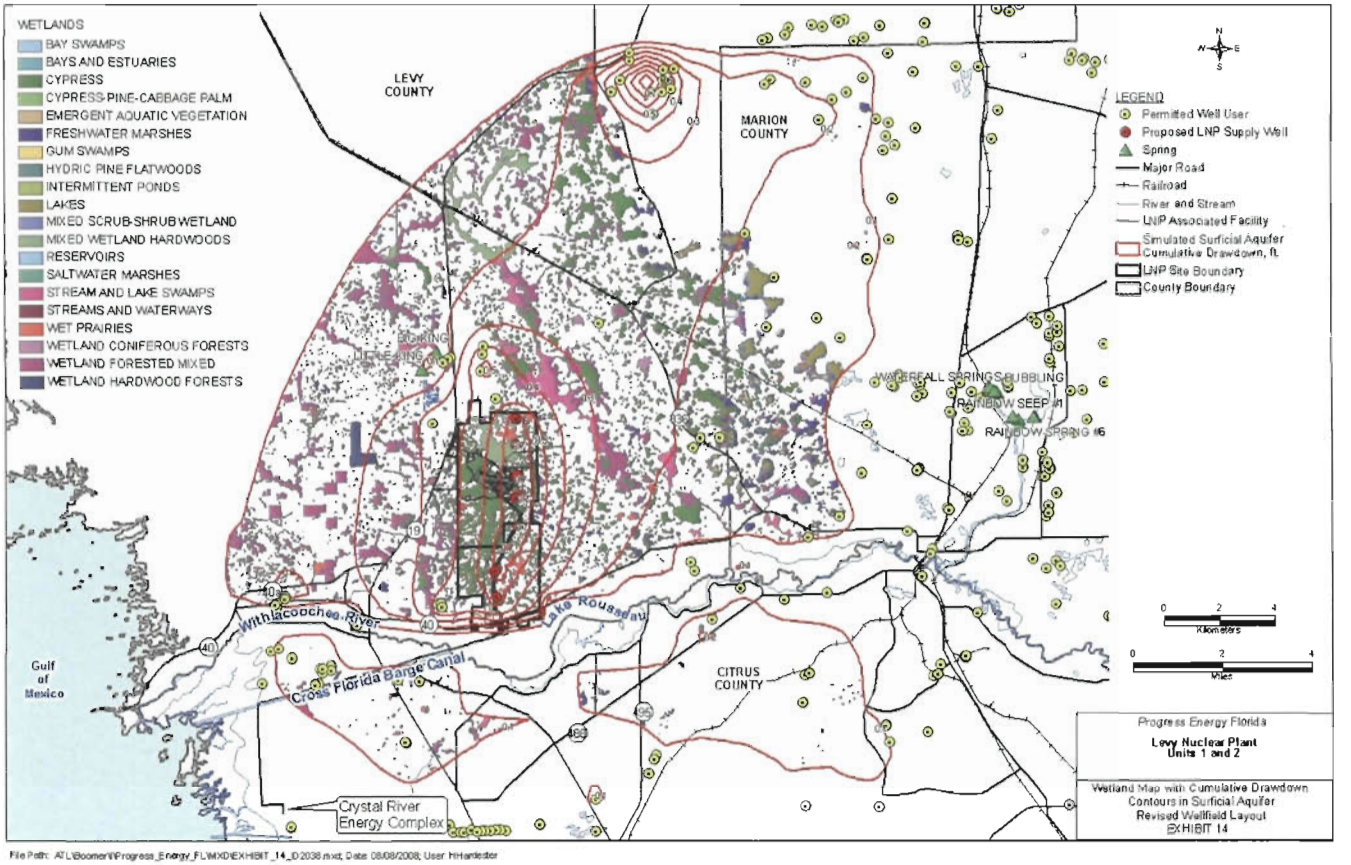

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EXHIBIT 15
Simulated Cumulative Upper Floridan Aquifer Drawdown, Average-Day Conditions

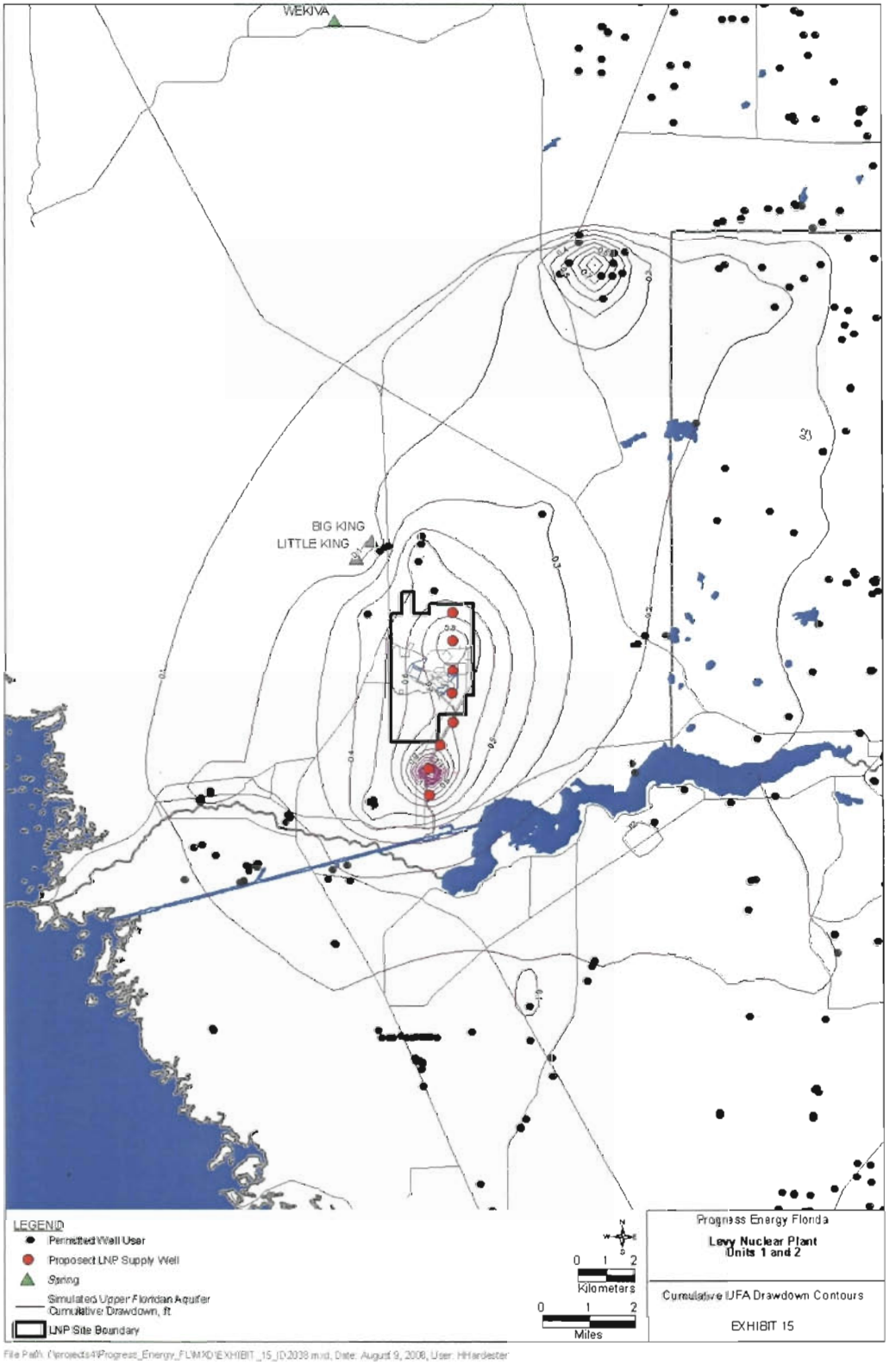

EXHIBIT 16
Simulated Impacts (mgd) to Lakes and Springs, Average-Day Conditions

	No LNP Withdrawals		With LNP Withdrawals		Difference	
	River	Springs	River	Springs	River	Springs
In	1.72	0.00	1.78		-0.05	0.00
Out	39.40	5.82	39.20	5.77	0.20	0.06
Net	-37.68	-5.82	-37.43	-5.77	-0.26	-0.06

All units are million gallons per day (mgd)

EXHIBIT 17
Simulated Upper Floridan Aquifer Incremental Drawdown, Maximum-Week Conditions

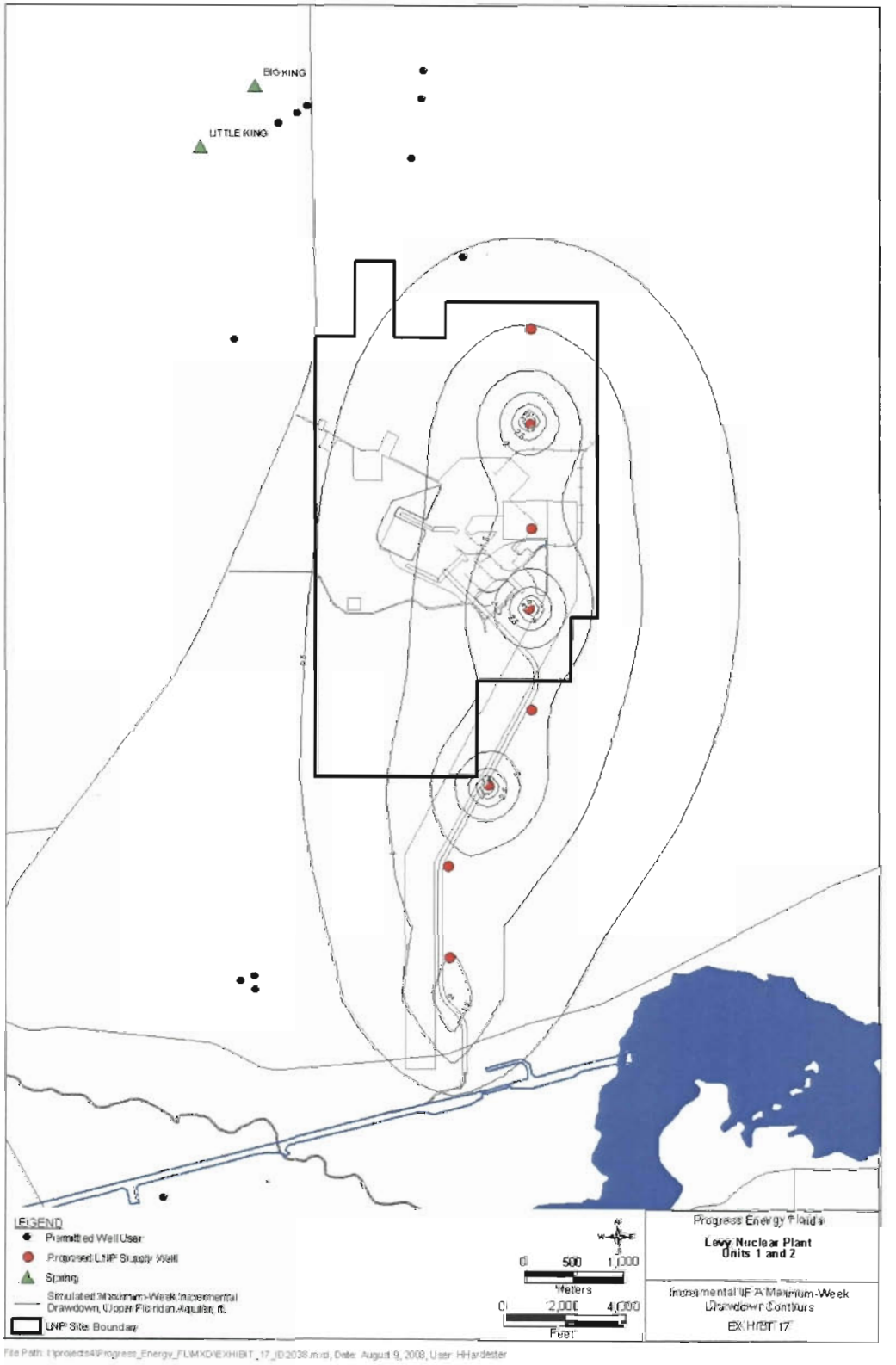

EXHIBIT 18
Simulated Impacts (mgd) to Lakes and Springs, Maximum Week Conditions

	No LNP Withdrawals		With LNP Withdrawals		Difference	
	River	Springs	River	Springs	River	Springs
In	1.72	0.00	1.76		-0.03	0.00
Out	39.40	5.82	39.34	5.76	0.06	0.07
Net	-37.68	-5.82	-37.59	-5.76	-0.10	-0.07

All units are million gallons per day (mgd)

EXHIBIT 19
Acres of Wetlands Within 0.5 Ft Contour for Simulated Incremental Surficial Aquifer Drawdown, by FLUCCS Code

Contour, ft	Code	Description	Acres
0.5 ft	621	CYPRESS	70.89
	643	WET PRAIRIES	3.50
	TOTAL		74.39

Note: Wetlands would not otherwise be impacted by project construction

COMMENT NUMBER: VII.A.1

RAI NUMBER: LNP SCA RAI-123

REQUESTING AGENCY: SWFWMD

COMMENT:

In order to assess the hydrologic impacts associated with proposed water use from all sources, the applicant must perform analyses that demonstrate the extent of the water-level drawdown in the surficial and Floridan aquifers, showing related lake level and spring flow impacts (where applicable) as a result of cumulative withdrawals. Please provide model simulation results that illustrate the above mentioned concerns, and provide maps to document models and display results at the appropriate scale(s). Please show the cumulative predicted drawdown associated with the currently permitted withdrawals for all users, and the cumulative predicted drawdown associated with the requested withdrawals. Please submit all model input and output files (raw MODFLOW or Groundwater Vistas) in digital format and sign and seal all reports describing the results of the model-simulation results. Reference Rule 40D-2.301(1), F.A.C.

RESPONSE:

The drawdown impacts resulting in the requested water use were simulated using the District's DWRM regional MODFLOW model. Cumulative impact modeling was performed evaluating the drawdown in the surficial and Floridan aquifers and impacts on other well users, lake levels, and spring flows as requested. See response to LNP SCA RAI-122 (VII.A).

ATTACHMENTS:

None.

COMMENT NUMBER: VII.A.2

RAI NUMBER: LNP SCA RAI-124

REQUESTING AGENCY: SWFWMD

COMMENT:

Please compare and discuss the differences between the calibrated model transmissivity and the aquifer transmissivity determined from on-site pumping tests. In addition, please provide all surficial and Floridan aquifer pumping test data and analyses.

RESPONSE:

The hydraulic conductivity and transmissivity values used in the original SWFWMD DWRM and the calibrated TMR model used for LNP simulations are summarized in the following table, along with applicable onsite and offsite pump test data.

Layer	Pre-Calibration	Post-Calibration	Onsite Pumping Test Data	Offsite Pumping Test Data
Surficial Aquifer System	Kx, Ky = 11 to 24 ft/day Kz = 25 ft/day	Kx, Ky = 10.4 ft/day Kz = 10 ft/day	K = 6.1 ft/day	
Upper Floridan Aquifer System	Tx, Ty = 20,200 to 1,520,000 ft^2/day Tz = 50,000 ft^2/day	Tx, Ty = 31,721 ft^2/day Tz = 30,000 ft^2/day		Winter Haven Test #5 T = 106,952 ft^2/day Combee T = 77,300 ft^2/day
Lower Floridan Aquifer System	Not Applicable	Tx, Ty = 19,925 ft^2/day Tz = 30,000 ft^2/day		

Slug test data are available from 23 piezometers onsite. Fourteen of these piezometers are completed in the surficial aquifer system, and the remaining nine piezometers are completed in the top of the Upper Floridan aquifer. The geometric mean hydraulic conductivity for the 14 surficial aquifer system piezometers is 6.1 ft/day. The geometric mean hydraulic conductivity for the nine Upper Floridan aquifer piezometers is 8.1 ft/day; however, this hydraulic conductivity value is not likely representative of Upper Floridan aquifer because these piezometers are completed only in the top of the Upper Floridan aquifer. No hydraulic conductivity data from long-term Upper Floridan aquifer pump tests are available at the site.

During TMR model generation, the TMR tool in the DWRM model identifies pump test data within the TMR model domain. Transmissivity values from two pump tests in the Upper Floridan aquifer were identified by the TMR tool. The results of these two offsite pumping tests are summarized in the table above.

As can be seen from the table, hydraulic conductivity and transmissivity values in the calibrated LNP TMR model are not significantly different than (i.e., they are within an order of magnitude of) those in the DWRM model and those determine by onsite and offsite pump tests.

ATTACHMENTS:

None.

COMMENT NUMBER: VII.B General Comment

RAI NUMBER: LNP SCA RAI-125

REQUESTING AGENCY: SWFWMD

COMMENT:

The proposed site is located within a known area of karst topography and groundwater recharge. Strict adherence to the engineering standards for stormwater facilities and maintenance of existing floodplains will be required. According to the information contained within Attachment B (Groundwater Modeling) of Volume 5, the impact evaluation to wetlands was addressed utilizing the minimum flows and levels (MFLs) criteria in Chapter 40D-8, F.A.C.

RESPONSE:

PEF has performed an extensive geotechnical investigation that includes advancement of 116 boreholes, geotechnical laboratory testing, and geophysical methods to characterize the subsurface. The results of this investigation show that significant karst activity does not exist at the site.

The drawdown impacts resulting from the requested water use were simulated using the SWFWMD DWRM regional MODFLOW model. Surficial aquifer drawdowns were used to evaluate potential wetland impacts using accepted Performance Standards in Chapter 40D-2, F.A.C. The wellfield layout has been modified to minimize potential wetland impacts. The conceptual wellfield has been changed from 4 wells on 1,000-ft. spacing to 8 wells on about 3,000-ft. spacing. The well operations have also been modified by pumping each well for 1 day, then rotating to the next well. The resulting drawdown impacts in the surficial aquifer are much less than previously predicted from the original wellfield layout.

The wellfield configuration for LNP is currently being refined to minimize potential impacts to project facilities, surface waters, wetlands, and adjacent users. The analysis presented is based on the conceptual wellfield layout, and the well locations may be further refined as the design of LNP proceeds.

A technical memorandum that describes an analysis of the wellfield can be found in response LNP SCA RAI-122 (VII.A).

ATTACHMENTS:

None.

COMMENT NUMBER: VII.B.1

RAI NUMBER: LNP SCA RAI-126

REQUESTING AGENCY: SWFWMD

COMMENT:

MFLs have not yet been established within or adjacent to the site certification assessment area. Therefore, please provide an impact evaluation of the water resources utilizing the Performance Standards in Section 4 of the Basis of Review, Chapter 40D-2, F.A.C. The groundwater modeling graphic presented in Attachment B of Volume 5 is difficult to interpret due to the large size of the assessment area and the numerous interior contours.

RESPONSE:

The drawdown impacts resulting in the requested water use were simulated using the SWFWMD DWRM regional MODFLOW model. Surficial aquifer drawdowns were used to evaluate potential wetland impacts using accepted Performance Standards in Chapter 40D-2, F.A.C. The wellfield layout has been modified as a result of the predicted wetland impacts. The conceptual wellfield has been changed from 4 wells on 1,000-ft. spacing to 8 wells on about 3,000-ft. spacing. The well operations have also been modified by pumping each well for 1 day, then rotating to the next well. The resulting drawdown impacts in the surficial aquifer are much less than previously predicted from the original wellfield layout.

A technical memorandum that describes an analysis of the wellfield can be found in response LNP SCA RAI-122 (VII.A).

ATTACHMENTS:

None.

COMMENT NUMBER: VII.B.2

RAI NUMBER: LNP SCA RAI-127

REQUESTING AGENCY: SWFWMD

COMMENT:

Please show the specific wetlands expected to be directly impacted due to construction related activities on the site.

RESPONSE:

Wetlands that will be impacted during the general construction of the facility are identified in Section 5.11 of Storm Water Management Report (Attachment A.7 to Appendix 10.4 found in Volume 6 of the SCA). Please also see the response to LNP SCA RAI-044 (II.2).

With regard to the construction and operation of onsite wells, the drawdown impacts resulting from the requested water use were simulated using the SWFWMD DWRM regional MODFLOW model. Surficial aquifer drawdowns were used to evaluate potential wetland impacts using accepted Performance Standards in Chapter 40D-2, F.A.C. Based on modeling and in order to minimize any potential impacts, the proposed wellfield design has been modified from 4 wells on 1,000-ft. spacing to 8 wells on about 3,000-ft. spacing. Wellfield operational design has also been modified to provide for a rotating sequence of wells pumped, pumping each well for 1 day, then rotating to another well. The resulting drawdown in the surficial aquifer is much less than previously predicted from the original wellfield layout.

A technical memorandum that describes an analysis of the wellfield can be found in response to LNP SCA RAI-122 (VII.A).

ATTACHMENTS:

None.

COMMENT NUMBER: VII.B.3

RAI NUMBER: LNP SCA RAI-128

REQUESTING AGENCY: SWFWMD

COMMENT:

Attachment B of Volume 5 contains a table labeled "Summary of Wetland Areas with 1.0 ft or Greater Drawdown in Surficial Aquifer." In order to accurately assess the potential for adverse wetland impacts according to habitat type, please include within the table, wetland acreages based upon FLUCCS codes. Reference Sections 40D-2.101 and 40D-2.301, F.A.C.

RESPONSE:

Based on the updated drawdown analysis there will be no drawdown of 1 ft. or more in the surficial aquifer. The resulting drawdown impacts in the surficial aquifer are much less than previously predicted from the original wellfield layout.

A technical memorandum that describes an analysis of the wellfield can be found in response to LNP SCA RAI-122 (VII.A).

ATTACHMENTS:

None.

COMMENT NUMBER: VII.B.4

RAI NUMBER: LNP SCA RAI-129

REQUESTING AGENCY: SWFWMD

COMMENT:

The groundwater modeling assessment stated that 138 acres of wetlands would be impacted by 1 foot or more drawdown from the normal operation of the groundwater pumping wells. What actions are proposed to prevent these drawdowns from adversely impacting these wetlands?

RESPONSE:

Refer to the response to LNP SCA RAI-128 (VII.B.3).

ATTACHMENTS:

None.

COMMENT NUMBER: VII.C General Comment

RAI NUMBER: LNP SCA RAI-130

REQUESTING AGENCY: SWFWMD

COMMENT:

The application requests a peak month quantity of 5,850,000 gallons per day (gpd). The purpose and time frame for using this quantity of water is unclear.

RESPONSE:

The most conservative maximum daily pumping rate for the LNP facility is 5.85 mgd. This projection is the summary of the four main processes that use the freshwater supply. Those include potable, service water, demineralized water, and fire protection systems. The facility design capacities for each water system were used to calculate the maximum pumping rate capacity for the wellfield. While it is highly unlikely that all four processes would be pumping at their maximum design capacity at the same time, the wellfield must be designed to meet this remote scenario. The most conservative situation resulting in the maximum pumping rate could occur annually for a duration of 1 week.

The maximum week pumping rate and resulting contour maps are presented in the response to LNP SCA RAI-122 (VII.A).

ATTACHMENTS:

None.

COMMENT NUMBER: VII.C.1

RAI NUMBER: LNP SCA RAI-131

REQUESTING AGENCY: SWFWMD

COMMENT:

Please discuss the need for the requested peak month quantity. When will this quantity of water be needed and for how long?

RESPONSE:

Please refer to the response to LNP SCA RAI-130 (VII.C).

ATTACHMENTS:

None.

COMMENT NUMBER: VII.C.2

RAI NUMBER: LNP SCA RAI-132

REQUESTING AGENCY: SWFWMD

COMMENT:

Please explain the difference between the Normal Demineralized Water Makeup Rate of 350 gallons per minute (gpm) listed in Table 3.3-2 and the Annualized Cycle Average Makeup Source Rate of 44.6 gpm provided by Westinghouse in Table 3.3-1.

RESPONSE:

The normal demineralized water makeup rate of 350 gpm listed in ER Table 3.3-1 (SCA Appendix 10.11, Volume 9) is an instantaneous flow rate expected at 100 percent power operation, but the demineralized water makeup is actually an intermittent water use. The annualized cycle average makeup quantity of 44.6 gpm is the total volume projected to be used over 1 year, divided by 525,600 minutes per year. The annualized value therefore represents both active and inactive periods and cannot be directly compared with the normal makeup rate.

ATTACHMENTS:

None.

COMMENT NUMBER: VII.C.3

RAI NUMBER: LNP SCA RAI-133

REQUESTING AGENCY: SWFWMD

COMMENT:

Please discuss the alternative technologies evaluated to minimize the consumptive use associated with evaporation from the Service Water System cooling towers?

RESPONSE:

The largest source of cooling water for the plant will be salt water from the Gulf of Mexico via the CFBC. There are, however, two independent cooling systems, with seawater being used for the main CWS that cools the steam turbine-generator and freshwater being used for the much smaller SWS.

The SWS cooling towers are dedicated to the cooling of the reactor components and they must use freshwater, which in this case, will have to be obtained from onsite wells. The SWS cooling towers have been designed and sized to use only a minimal amount of freshwater, and their total average water use represents less than 1 percent of the total plant water use. Additional detail on the amount of water that will be used by the SWS cooling system is provided in the following sections of the SCA and the ER (SCA Appendix 10.11, Volume 9):

SCA	4.5	Plant Water Use
ER	3.3	Plant Water Use
ER	3.3.1	Water Consumption
ER	3.3.1.1	Circulating Water System (Normal Plant Heat Sink)
ER	3.3.1.2	Service Water System

The estimated amount of water that will be provided to the SWS cooling system will be only 0.71 mgd on a normal operating basis (annual average), whereas the CWS cooling system will use an average of 122 mgd of salt water for cooling.

It is noted that the AP1000 reactor design is a standard NRC-certified design. The system has been designed to provide an efficient means of generating power with minimal environmental impacts. While the main cooling system (the CWS) that cools the steam turbine-generator is a non-safety related component of the plant that can be designed to use a variety of alternative and site-specific cooling alternatives (such as salt water), the SWS cooling system does not have such flexibility.

ATTACHMENTS:

None.

COMMENT NUMBER: VII.C.4

RAI NUMBER: LNP SCA RAI-134

REQUESTING AGENCY: SWFWMD

COMMENT:

Was the use of re-cycled storm water evaluated to reduce the amount of groundwater to be used? Please discuss other alternative water sources that have been considered to reduce groundwater use?

RESPONSE:

Approximately 99 percent of the water that will be used at the LNP will be salt water from the Gulf of Mexico. LNP Units 1 and 2 will use recycling (as opposed to once-through) mechanical draft cooling towers. By design the salt water is recycled through the towers until it cannot be reliably used any further, with up to 1.5 cycles of concentration during normal operation. Water quality in the cooling system and in the cooling tower basin will be maintained by continuously monitoring the solids content of the water and discharging blowdown water in order to limit solids content. By design, water conservation is inherent in the system.

To further reduce the amount of water that is used in the primary cooling system, stormwater runoff at the facility will be collected and treated in onsite ponds and pumped to the cooling tower system for reuse when possible. Salt water and stormwater are considered to be lower water quality than other potential sources and their use in this manner is therefore considered to be consistent with the principles of water conservation. There are no regional sources of wastewater that are available as an alternative source of cooling water for the plant's primary cooling system.

See also the discussion on makeup water alternatives in the response to LNP SCA RAI-133 (VII.C.3) and ER Subsection 9.4.2 (SCA Appendix 10.11, Volume 9).

ATTACHMENTS:

None.

COMMENT NUMBER: VII.D General Comment

RAI NUMBER: LNP SCA RAI-135

REQUESTING AGENCY: SWFWMD

COMMENT:

CEMEX's Inglis Mine is located approximately four miles southwest of the proposed intake location. Elevated levels of chlorides and other constituents are currently showing up in some of the monitoring wells at the site. It is stated in the application that during normal operations, water in the barge canal will essentially be sea water from the Gulf of Mexico, effectively changing the normal conditions within the canal.

RESPONSE:

The meaning of the last sentence of the comment is unclear: "It is stated in the application that during normal operations, water in the barge canal will essentially be sea water from the Gulf of Mexico, effectively changing the normal conditions within the canal."

ER Subsections 2.3.3.1 and 2.4.2.2 presented results of the water quality monitoring program conducted in the CFBC in 2007 as part of the application process. Water quality data were collected from stations spaced every 0.5 miles along the barge canal from the Inglis Lock to the Gulf of Mexico, and from 7 ecological sampling stations along the canal and into the Gulf. The results indicate that the salinity of the CFBC as far upstream as the Inglis Lock (Station 1) is at times equivalent to salinity measured at the discharge point of the CFBC in the Gulf (Station 4). Station 2 is the closest to the Inglis Mine, being approximately 1 mile upstream of the mine. At Station 2, salinity measured during October and November 2007 ranged from 9.21 ppt to 30.83 ppt. These results indicate that the water in the CFBC at the point of withdrawal for the LNP can be considered "seawater" as that term is defined in the SWFWMD's Water Use Permitting Basis of Review. Section 1.2 of the SWFWMD's Water Use Permitting B.O.R. provides that "[t]he use of seawater and treated wastewater effluent does not require a Water Use Permit." Thus, pursuant to the SWFWMD's B.O.R., the SWFWMD does not apply its substantive permitting criteria to the use of seawater.

Even with the potential diluting effects of seepage and small releases of freshwater discharged into the CFBC from the Lake Rousseau Dam and Inglis Lock, the elevated salinity data indicate that tidally influenced salt water still currently reaches upstream into the CFBC as far as the Inglis Lock.

ATTACHMENTS:

None.

COMMENT NUMBER: VII.D.1

RAI NUMBER: LNP SCA RAI-136

REQUESTING AGENCY: SWFWMD

COMMENT:

What effect will the increase in salinity in the barge canal have on the water quality of the Inglis Mine and surrounding area?

RESPONSE:

See response to comment LNP SCA RAI-135 (VII.D). The upstream portions of the CFBC near the Inglis Lock have been observed to contain salinity concentrations equivalent to those found in nearshore Gulf of Mexico waters. The LNP will not introduce salt water into areas that are not otherwise experiencing saline conditions.

ATTACHMENTS:

None.

COMMENT NUMBER: VII.D.2

RAI NUMBER: LNP SCA RAI-137

REQUESTING AGENCY: SWFWMD

COMMENT:

How will the withdrawal of water from the barge canal affect the ecology and water quality of the Withlacoochee River downstream of the Inglis dam, within the barge canal, the adjacent estuary, and designated Outstanding Florida Waters (OFW) areas, during various stream flow regimes and barge canal withdrawal regimes?

RESPONSE:

The withdrawal of cooling tower makeup water at the proposed LNP CWIS near the Inglis Lock on the CFBC is predicted not to adversely affect the ecology and water quality within the CFBC itself, the adjacent estuary, or designated OFW areas. As discussed in SCA Sections 6.1.2 and 6.1.3, inducing flow within the CFBC is actually expected to improve the overall quality of the aquatic habitat by providing more consistent water quality in the upper portions of the canal. Further, the CWIS-induced flow will not alter salinity patterns or water quality in adjacent estuarine waters or OFWs. Therefore, no adverse impacts from the induced flows from the LNP CWIS on aquatic ecology or water quality are predicted to occur.

The potential effects of CWIS induced flows on the Old Withlacoochee River channel below the Inglis Dam are continuing to be evaluated. In addition to the aquatic impact analyses presented in SCA Sections 6.1.2 and 6.1.3 and ER Subsections 5.3.1.2, 5.3.1.2.1, 5.3.1.2.2 and 5.3.1.2.3 (SCA Appendix 10.11, Volume 9), an updated assessment of aquatic impacts will be prepared upon completion of ongoing additional collections of water quality and biological data in the CFBC, the Old Withlacoochee River channel downstream of the Inglis Dam, and the CREC discharge canal.

ATTACHMENTS:

None.

COMMENT NUMBER: VII.E General Comment

RAI NUMBER: LNP SCA RAI-138

REQUESTING AGENCY: SWFWMD

COMMENT:

Dewatering will be required during construction of the two units. A dewatering plan was not included in the application.

RESPONSE:

A dewatering plan is currently being developed. Preliminary plans include an impervious diaphragm wall that will be installed around the 75-ft. deep excavation. Pressure grouting under the excavation to a depth of approximately 75 ft. will be injected within the diaphragm wall area. This will minimize the water flow into this excavation. Dewatering wells will be used to remove groundwater within the diaphragm wall area, which will be pumped to ditches.

PEF proposes that a condition of certification be established to provide for post-certification review and approval of the dewatering plan prior to commencement of dewatering.

ATTACHMENTS:

None.

COMMENT NUMBER: VII.E.1

RAI NUMBER: LNP SCA RAI-139

REQUESTING AGENCY: SWFWMD

COMMENT:

Please describe the construction related dewatering activities and the expected drawdown.

RESPONSE:

Please see the response to LNP SCA RAI-138 (VII.E).

ATTACHMENTS:

None.

COMMENT NUMBER: VII.E.2

RAI NUMBER: LNP SCA RAI-140

REQUESTING AGENCY: SWFWMD

COMMENT:

How much water will be pumped during dewatering activities and where will the water be discharged?

RESPONSE:

Please see the response to LNP SCA RAI-138 (VII.E).

Pumping quantities to empty the main area of excavation for each of the units is estimated to range from 29 to 88 gpm during the excavation period of 2 to 6 months. In addition, an average of 4.4 gpm from ordinary rainfall on the area is assumed. Therefore, the maximum average pumping rate is estimated to be approximately 92 gpm at each of the two units.

ATTACHMENTS:

None.

COMMENT NUMBER: VII.E.3

RAI NUMBER: LNP SCA RAI-141

REQUESTING AGENCY: SWFWMD

COMMENT:

What will be the duration of the dewatering activities at each unit construction site?

RESPONSE:

The duration of dewatering at each unit will be approximately 24 months.

ATTACHMENTS:

None.

COMMENT NUMBER: VII.F General Comment 1

RAI NUMBER: LNP SCA RAI-142

REQUESTING AGENCY: SWFWMD

COMMENT:

Logs of borings A-10 and A-17 were provided with the application. It is unclear where these borings are located in relation the proposed plant sites. Also, boring logs, well construction details, water quality data, water levels, and geophysical logs for all monitoring wells and test wells were not provided with the application.

RESPONSE:

The locations of all boreholes that were advanced for LNP Units 1 and 2 are illustrated on SCA Figure 3.3.1.2-1. The figure also shows the relative locations of the nuclear islands, including the containment structures. Borehole A-10 is noted to be in close proximity to LNP Unit 1 (40 to 50 ft. north-northeast of the containment structure location) and Borehole A-17 is in close proximity to LNP Unit 1 (at the south-southwest edge of the containment structure). SCA Figure 3.3.1.2-2 provides a subsurface cross-section at LNP Unit 2 and the relative location of the nuclear island is indicated on the figure as being between borings A-02 and A-10 in the cross-section. SCA Figure 3.3.1.2-3 illustrates a subsurface cross-section at LNP Unit 1 and the relative location of the nuclear island is indicated on the figure as being between borings A-14/A-14A and A22/A22A in the cross-section. It is noted that these boring logs were provided as examples of the considerable amount of information.

Groundwater levels and groundwater quality data are located in Subsection 2.3.3 of the ER (SCA Appendix 10.11, Volume 8). Table 2.3-8 presents groundwater levels measured over four quarters in 2007. Tables 2.3-50, 2.3-51, and 2.3-52 present groundwater quality analytical results from sampling events in 2007.

A complete set of boring logs, well construction details, water quality data, water levels, and geophysical logs for monitoring and test wells are provided on CD as part of this response. The CD contains the following information:

- Geotechnical Boring Logs
- Geophysical Report
- Seismic Data
- Well Construction Details
- Monitor Well Boring Logs

Twenty representative boring logs have been provided to SWFWMD and the FDEP Siting Office in hard copy format.

ATTACHMENTS:

See Boring Logs and Geophysical Data for Levy Units 1 and 2 on CD included at the end of the binder.

Twenty representative boring logs have been provided in hard copy to SWFWMD and the FDEP Siting Office per their request. All boring logs, including those provided as hard copy to SWFWMD and the Siting Office, are included electronically on the CD.

COMMENT NUMBER: VII.F General Comment 2

RAI NUMBER: LNP SCA RAI-143

REQUESTING AGENCY: SWFMWD

COMMENT:

Please provide copies of boring logs, well construction details, geophysical logs (if available), water levels, and water quality data for all borings, monitoring wells, and test wells completed at the site and provide a map showing the locations.

RESPONSE:

Please see the response to LNP SCA RAI-142 (VII.F), which provides all of the requested information.

ATTACHMENTS:

None.

COMMENT NUMBER: VII.G.1

RAI NUMBER: LNP SCA RAI-145

REQUESTING AGENCY: SWFWMD

COMMENT:

Lake Rousseau is not listed in Part 3 of the applicant's Environmental Report. Please provide additional information specifically addressing potential impacts to this water body, which has been identified as a potential water supply source by the District and by the Withlacoochee Regional Water Supply Authority.

RESPONSE:

Construction and operation of the LNP will have no significant impacts on Lake Rousseau. PEF has performed a hydrological analysis in the area surrounding the LNP using the SWFWMD DWRM model. The lake is represented in the DWRM model as *river* cells. *River* cells have a constant head assigned and function by allowing water to enter or exit the model as head changes occur across model cell faces. The only evaluation possible using the model is to evaluate flux, or flow, through the *river* cells. With no LNP withdrawals, there is a net flux of 37.68 mgd from the surficial and Floridan aquifers into river cells in the model domain. These include Lake Rousseau and the Withlacoochee River. With the simulated withdrawals from the LNP, there is a reduction of 0.26 mgd in discharge from the aquifer to model river cells representing the lake and river.

This is a very small volume compared with the total groundwater discharge, amounting to less than 1 percent change. The evaluation of the net flux change in *river* cells is presented in a technical memorandum that is attached to the response in LNP SCA RAI-122 (VII.A).

ATTACHMENTS:

None.

COMMENT NUMBER: VII.G.2

RAI NUMBER: LNP SCA RAI-146

REQUESTING AGENCY: SWFWMD

COMMENT:

Attachment E of the application does not include information on the new plant designs for water conservation. The applicant is proposing a Westinghouse AP1000 pressurized water reactor for this site. The District will require that the applicant use the lowest water quality available for the proposed use. Please provide additional information describing any water conserving plant designs and anticipated conservation to be achieved from such designs.

RESPONSE:

Water conservation is inherent in the LNP system design. The main use of water at the plant is in the plant's mechanical draft cooling towers to cool LNP Units 1 and 2. Salt water from the Gulf of Mexico will be used for the primary cooling system. This water will be recycled (1.5 cycles of concentration during normal operation) in the plant's mechanical draft cooling towers.

The main source water for cooling is salt water (Gulf of Mexico) drawn from the CFBC. Additional LNP water use must be freshwater as specified in the Westinghouse AP1000 NRC-approved design documentation. The quantity of water is set by the Westinghouse reactor requirements approved by the NRC. To further reduce water demand, stormwater runoff from the power generation facility will be collected and treated in onsite wet ponds and then pumped to the cooling tower system for reuse when feasible. Salt water and stormwater are considered lower water quality than other potential sources. There is no regional wastewater system available for reclaimed water supply.

The cooling system will require approximately 122 mgd of water from the Gulf of Mexico. The Gulf was selected as the source because of the abundance of water with negligible environmental impacts. It was estimated that on an average annual basis, as much as 1.6 mgd of stormwater will be used in the LNP cooling system. Water conserving measures such as low flow plumbing facilities will be used at the associated LNP buildings.

It is noted that the AP1000 reactor design is a standard NRC-certified design. The system has been designed to provide an efficient means of generating power with minimal environmental impacts. While the main cooling system (the CWS) that cools the steam turbine-generator is a non-safety related component of the plant that can be designed to utilize a variety of alternative and site-specific cooling alternatives (such as salt water), the Service Water cooling system does not have such flexibility.

ATTACHMENTS:

None.

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VIII. WRPC

COMMENT NUMBER: VIII.1

RAI NUMBER: LNP SCA RAI-148

REQUESTING AGENCY: Withlacoochee Regional Planning Council (WRPC)

COMMENT:

Section 4.5 the Site Certification Application (SCA) generally discusses plant water use including anticipated aquifer groundwater withdrawals. It references Section 3.3 of the Environmental Report (ER), and Section 6.3 of that same document outlines how hydrological monitoring would occur during plant construction and operation. Per the scale of projected groundwater use cited in Section 45.3 of the SCA, between 1.3 million arid 5.8 million gallons daily, staff requests the applicant define and address fully in the site certification application the range of potential local to regional aquifer and connected natural systems impacts. Then, having established freshwater use impacts, how might current plans be adapted to promote conservation or reuse of groundwater resources?

RESPONSE:

The drawdown impacts resulting in the requested water use were simulated using the SWFWMD DWRM regional MODFLOW model. Cumulative and incremental impact modeling was performed to evaluate impacts on regional groundwater levels, other well users, and natural wetland systems connected to the surficial aquifer. The wellfield layout has been modified as a result of the predicted wetland impacts. The conceptual wellfield has been changed from 4 wells on 1,000-ft. spacing to 8 wells on about 3,000-ft. spacing. The well operations has also been modified by pumping each well for one day, then rotating to the next well. The resulting drawdown impacts in the surficial aquifer are much less than previously predicted from the original wellfield layout.

The wellfield configuration for LNP is currently being refined to minimize potential impacts to project facilities, surface waters, wetlands, and adjacent users. The analysis presented in the Technical Memorandum attached to LNP SCA RAI-122 (VII.A) is based on the conceptual wellfield layout and the well locations may be further refined as the design of LNP proceeds.

A discussion regarding conservation of groundwater resources can be found in the response to LNP SCA RAI-146 (VII.G.2).

ATTACHMENTS:

None.

COMMENT NUMBER: VIII.2

RAI NUMBER: LNP SCA RAI-149

REQUESTING AGENCY: Withlacoochee Regional Planning Council (WRPC)

COMMENT:

Sections 4.7.2, 6.4,1 and 6.4.2 of the SCA cover on-site hazardous waste generation and off-site disposal. Section 3.8 of the ER identifies truck transport as the preferred mode for radioactive waste disposal. What analysis or decision-making criteria support this mode choice for hazardous and radioactive waste removal? What are the benefits of alternative mode choices? Specify what procedures and safeguards would apply to the transportation of all solid waste both to and from the plant site. Would the proposed program of radiological monitoring encompass routes utilized for hazardous and radioactive waste transport?

RESPONSE:

Hazardous Waste:

The amount of hazardous waste generated at the LNP is expected to be small, and the facility will be considered either a Conditionally Exempt Small Quantity Generator or a Small Quantity Generator under RCRA. Wastes generated at the LNP that are subject to RCRA hazardous waste regulations will be treated or disposed of at RCRA-permitted TSD facilities. Petroleum wastes, such as used oil, will be collected and containerized, temporarily stored onsite, and subsequently removed by an FDEP-certified used oil transporter or disposed of at a TSD facility. Because of the small quantities of hazardous waste expected to be generated at the LNP and the relatively close proximity of TSD facilities, transportation of hazardous waste by truck was considered the most appropriate mode of transportation. Transportation of hazardous waste will be conducted by EPA/FDEP-registered hazardous waste transporters in accordance with all applicable federal and state hazardous waste and other regulations.

Radioactive Waste:

As noted in Section 3.8 of the ER (SCA Appendix 10.11, Volume 9), the onsite spent fuel storage facilities (one per unit) constructed to support the LNP will have enough storage capacity to store 889 total fuel assemblies for each unit. This will provide more than enough capacity for 5 years of spent fuel storage. Five years is the minimum decay time expected before shipment of irradiated fuel assemblies. The section further describes the analysis of shipping spent fuel to a geologic repository by either truck or rail. The DOE is responsible for spent fuel transportation from reactor sites to the repository and will make the final decision on transport mode (10 CFR 961.1). ER Subsection 3.8.2 discusses the environmental

impacts of transporting spent fuel from the LNP site to a spent fuel disposal facility using Yucca Mountain, Nevada, as a possible location for a geologic repository.

ATTACHMENTS:

None.

COMMENT NUMBER: VIII.3

RAI NUMBER: LNP SCA RAI-150

REQUESTING AGENCY: Withlacoochee Regional Planning Council (WRPC)

COMMENT:

Section 4.4.2 of the SCA addresses the emission of particulate matter from mechanical draft cooling towers, but Section 6.6.2 states that no air quality monitoring shall occur on-site. The SCA identifies this phenomenon as the primary source of gaseous emissions resulting from construction of the proposed plant. Are there opportunities to measure air quality as part of other monitoring activities? If no monitoring will occur, what surplus control technologies might be utilized to further reduce particulate matter release beyond best available technology?

RESPONSE:

A summary of the emissions from the LNP facility is provided in the PSD Air Permit Application, a copy of which is included in SCA Appendix 10.2.5. While PM emissions, at 299 tons/yr, will in fact be the primary source of emissions from the LNP facility, there are no state or federal ambient air quality standards for PM and ambient monitoring is therefore not required or recommended by FDEP or EPA. An ambient air quality standard for PM-10 (particulate matter with a diameter of less than 10 μm) does exist, but with an estimated PM-10 emission rate of only 3.3 tons/yr, the emissions of this pollutant are considered to be insignificant and ambient monitoring is not justified since no significant or measurable impact on ambient air quality is expected at any location. Due to the nature of this facility, and the fact that it will only burn a very small amount of diesel fuel (on an infrequent basis) in its emergency generating equipment, no significant impacts on ambient air quality are anticipated for any pollutant, at any location.

PM emissions from the cooling towers will be controlled by the use of state-of-the-art cooling towers with very high efficiency mist eliminators that are designed to limit cooling tower drift (fine droplet emissions) and to conserve water use. Additionally, the plant will be operated such that it will limit the cycles of concentration in the cooling water to 1.5, which will effectively reduce the potential for solids content to carry through to drift emissions. Beyond this, there are no practical methods of further reducing drift and PM emissions from mechanical draft cooling towers. There are no add-on PM emission control devices that are feasible for use on cooling towers.

ATTACHMENTS:

None.

COMMENT NUMBER: VIII.4

RAI NUMBER: LNP SCA RAI-151

REQUESTING AGENCY: Withlacoochee Regional Planning Council (WRPC)

COMMENT:

Section 4.5 of the ER describes radiological impacts during plant construction. Section 3.5 of that document explains the Levy Nuclear Plant's waste management system, and it clarifies how the liquid and gaseous waste management system elements conduct radioactive effluent and emission release. Chapter 5 of the ER relates potential radiological impacts of plant operation including: exposure pathways, waste hazards, and other aspects of plant operation. In Chapter 6, the ER details the applicant's intended program of radiological monitoring. Of all the measures controlling radiological impacts of plant construction and operation, what action has the applicant voluntarily undertaken above that minimum necessary to obtain required plant licensing and permit approvals?

RESPONSE:

As noted in the comment, many sections of the ER address PEF's plans and commitments to properly managing radiological impacts during construction and operation of the proposed LNP Units 1 and 2. These sections also note PEF's commitments to waste minimization and programs to maintain radiation exposures to workers and the public ALARA. Such programs go beyond meeting the minimum regulatory criteria; and as noted in ER Subsection 5.4.5 (SCA Appendix 10.11, Volume 9), the overall decreasing trend in average reactor collective doses since 1983 is indicative of successful implementation of ALARA dose reduction measures at commercial power reactor facilities.

ATTACHMENTS:

None.

COMMENT NUMBER: VIII.5

RAI NUMBER: LNP SCA RAI-152

REQUESTING AGENCY: Withlacoochee Regional Planning Council (WRPC)

COMMENT:

Section 4.11 of the SCA states that an Emergency Preparedness Disaster Plan would be created and submitted to the Florida Department of Community Affairs for review. When would this occur? What categories of risk and hazard would that plan generally identify, and which would be addressed elsewhere? Which existing public emergency planning documents may need to be modified as a result of project development? Would other new plans be required? In what documents would emergency evacuation routes be identified, and how would the public be made better aware of vital emergency planning information? Through partnership as well as direct support at the county and municipal levels, does the applicant intend to enhance local government emergency management capacity to increase level of response preparedness?

RESPONSE:

PEF has developed an EP which was submitted to the NRC with the COLA on July 30, 2008. This comprehensive EP is intended to respond to potential radiological emergencies at the proposed LNP, and includes proposed evacuation routes and a section devoted to the public education program. The basic purpose of this EP is to ensure that the state of onsite and offsite emergency preparedness provides reasonable assurance that adequate corrective and protective measures can and will be taken in the event of a radiological emergency at the site. With the cooperation and coordination of local and state organizations and their plans for emergency preparedness, this EP integrates the necessary elements to provide effective emergency response.

The EP was reviewed with the following supporting agencies that have provided certifications of their willingness and ability to support such potential radiological emergencies:

- Citrus County Emergency Management
- Levy County Emergency Management
- Marion County Emergency Management
- State of Florida Division of Emergency Management
- Citrus Memorial Hospital

- Seven Rivers Regional Medical Center
- Citrus County Dept. of Public Safety Fire Rescue Division
- Nature Coast Emergency Medical Services Fire Department

The State of Florida Division of Emergency Management, which is administratively tied to the Florida DCA has reviewed and commented on the EP and notes in a letter dated March 28, 2008, that the "proposed emergency plan is a thorough, practical, and useful tool for use in managing real life events."

ATTACHMENTS:

None.

COMMENT NUMBER: VIII.6

RAI NUMBER: LNP SCA RAI-153

REQUESTING AGENCY: Withlacoochee Regional Planning Council (WRPC)

COMMENT:

Chapter 6 of the SCA refers the reader to Chapter 5 of the ER for explanation of water use impacts stemming from plant operation. Section 4.2.1.5 of the ER discusses impacts to wetlands during construction, and 5.2.1.5 discusses the impact of plant operations on wetlands. ER Section 5.2.2.3 discusses the impacts if groundwater use and mentions potential for adverse effects to wetlands, owing to groundwater consumption. What scale of impact could result to wetlands on-site and in the vicinity as a result of proposed groundwater extraction? How could this impact planned wetland mitigation efforts during construction and plant operations phases? What long-term impacts exist?

RESPONSE:

Refer to the response to LNP SCA RAI-122 (VII.A).

ATTACHMENTS:

None.

COMMENT NUMBER: VIII.7

RAI NUMBER: SCA RAI-154

REQUESTING AGENCY: Withlacoochee Regional Planning Council (WRPC)

COMMENT:

Section 4.5.1.1 of the SCA discusses the system to manage residual heat output from the plant. The ER's Section 5.3.2 specifically discusses cumulative impacts to the aquatic ecosystem owing to increased heat and chemical discharge due to plant operation. As outlined in Chapter 6, the ER gives details of a thermal monitoring program. What additional control technologies could yield extra mitigation of impact to regionally significant waters, fisheries, and aquatic ecosystems?

RESPONSE:

The proposed LNP cooling tower blowdown contribution to the existing CREC thermal plume is less than a 5 percent increase in flow at CREC and will result in a slight decrease in temperatures of the combined LNP/CREC thermal plume. The existing CREC operates helper cooling towers during warm months to maintain compliance with NPDES 316(a) thermal limits. Since the existing plume meets those thermal limits and the CREC operates within the bounds of a previously granted 316(a) approval, it is expected that the new combined plume also will meet those established limits, possibly by an even wider margin, and that additional mitigation will not be necessary. Thus there will be no impacts from LNP to regionally significant waters, fisheries, and aquatic ecosystems.

ATTACHMENTS:

None.

COMMENT NUMBER: VIII.8

RAI NUMBER: LNP SCA RAI-155

REQUESTING AGENCY: Withlacoochee Regional Planning Council (WRPC)

COMMENT:

Section 4.5.1.4 of the SCA discusses organism removal from the cooling water intake system. What provisions has the applicant made to obviate adverse impact to marine life, especially endangered West Indian (Florida) Manatee and sea turtle species, which have been known to inhabit the Cross Florida Barge Canal? What other measures could the applicant voluntarily pursue to reduce potential conflicts between wildlife and proposed plant operations?

RESPONSE:

The proposed LNP CWIS is designed to protect wildlife from impingement impacts. The 4-inch bar screens at the entrance to the CWIS forebay are designed to exclude waterborne debris and large wildlife, such as manatees (adults and juveniles) and adult and most juvenile sea turtles. Should very small turtles pass through the bar screens and enter the CWIS forebay, the through-screen velocities at the 3/8-inch traveling screens at the rear of the forebay are designed to be less than 0.5 ft/sec, meeting the BTA technology requirements of the 316(b) Phase I Rule. A 0.5 ft/sec through-screen velocity at the 3/8-inch screens means that the approach velocity just in front of the traveling screens will be approximately 0.25 ft/sec, a very low velocity at which healthy small sea turtles that do enter the CWIS forebay and encounter the face of the traveling screens will easily be able to avoid by swimming away. Additional wildlife protection measures may include periodic inspection of the CWIS forebay.

Refer to responses to LNP SCA RAI-113 (VI.E.1) through LNP SCA RAI-115 (VI.E.3).

ATTACHMENTS:

None.

COMMENT NUMBER: VIII:9

RAI NUMBER: LNP SCA RAI-156

REQUESTING AGENCY: Withlacoochee Regional Planning Council (WRPC)

COMMENT:

Section 5.0 of the SCA cites Section 4 of the ER to expound impacts related to project construction. ER Section 4.1.1.1.2.I states that the plant site will be filled and graded to a general elevation of between 47' to 50'. Oppositely, Figure 3.1.2 (Sheets 2, 3, and 4), contained in the ER, appears to show plant site elevation and building height indexed from a grade elevation of 100'. Correspondingly, the subterranean basemat is then correctly depicted at an elevation of 60.5'. ER Section 4.2.1.5 evidences this interpretation of Figure 3.1.2; as it describes basemat placed to a depth of 39.5' feet. Yet this same section also mentions excavation may reach as much as 75' from ground surface for some structural elements.

While in all cases it is understood that filling would happen to elevate cooling towers and reactors above the I00-year floodplain, this presentation makes it unclear the depths to which excavation may occur on-site. Uniformly referencing a standard measure—such as mean sea level would help clarify the scope of excavation and therefore any impacts to the subject location and vicinity. With proposed excavation activity defined, what potential aquifer impacts could result?

RESPONSE:

Indexed elevations cited in Figure 3.1-2 (SCA Appendix 10.11, Volume 9) are standard AP1000 plant layout, using a standard plant grade elevation of 100 ft.

In ER Subsection 4.1.1.1.2.1, all of the elevations are LNP site specific with present grade elevation of about 42 ft. NAVD88. The depth of Nuclear Island excavation will be to a depth about 75 ft. below grade. The impact on the aquifer will be minimized by constructing a reinforced diaphragm wall around the entire perimeter of the Nuclear Island and placing an injected grout curtain on the bottom. No other impacts to the aquifer are expected.

ATTACHMENTS:

None.

COMMENT NUMBER: VIII.10

RAI NUMBER: LNP SCA RAI-157

REQUESTING AGENCY: Withlacoochee Regional Planning Council (WRPC)

COMMENT:

Section 5.2.2 of the SCA directs the reader to Chapter 6 of the ER for exposition of project impact monitoring. Section 6.1 of the ER identifies where the plant's residual thermal output could impact existing conditions in water bodies around the subject location, and it outlines supporting methodology for a program of vicinity water temperature monitoring. In so doing, this section extensively references Tables 6.1.1 through 6.1.3. which contain no data. Whereas in many cases data would not exist until a future point of collection, will background water temperature data now available be made publicly accessible? Likewise, to what extent will pre-application monitoring data be available as it pertains to current aquatic ecosystems and other categories of background conditions? Generally, how are the monitoring process and supporting methodologies— covered in ER Section 6.0—structured to recognize impacts directly attributable to project development as an independent variable?

RESPONSE:

Temperature data from the CREC monitoring activities are included in DMRs from past and ongoing NPDES monitoring activities at the CREC and are part of the public record at the FDEP. Preapplication monitoring of aquatic systems conducted in the CFBC and other categories of information, such as periodic monitoring of sea grass beds in the estuary adjacent to the CREC discharge canal, is ongoing and will be provided to FDEP in early 2009.

The proposed monitoring activities presented in ER Chapter 6 are intended to provide objective water quality and biological data and information using FDEP-approved technical approaches that are designed to allow for independent statistical and non-statistical analyses of the collected data and information. The analyses will utilize pre-application and post-application construction and pre-operational data and information as the background against which any future changes due to operation of the proposed LNP will be compared. The proposed monitoring data and information presented in ER Chapter 6 utilize accepted methods of collection and analysis designed to allow for an independent assessment of impacts directly attributable to project development and operation.

ATTACHMENTS:

None.

COMMENT NUMBER: VIII.11

RAI NUMBER: LNP SCA RAI-158

REQUESTING AGENCY: Withlacoochee Regional Planning Council (WRPC)

COMMENT:

Section 7 of the SCA discusses the economic impacts of the Levy Nuclear Plant. Has the applicant considered what other types of economic uses might benefit from co-location either on-site or in proximity to the Levy Nuclear Plant and Crystal River Energy Complex?

RESPONSE:

PEF considered co-location of the proposed facility at the CREC as part of the site selection process described in Section 9.3 of the ER; however, the CREC site was not considered preferable, as described in ER Subsection 9.3.3.1 (SCA Appendix 10.11, Volume 9). While open to such opportunities, PEF has not identified specific economic uses that might benefit from co-location either onsite or in proximity to the LNP and CREC.

ATTACHMENTS:

None.

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IX. LEVY COUNTY

COMMENT NUMBER: IX.1

RAI NUMBER: LNP SCA RAI-161

REQUESTING AGENCY: Levy County

COMMENT:

The Site Certification Application lacks a statement of consistency with County zoning ordinances as required by Section 403.50663 of the PPSA. The Application fails to contain any statement concerning the status of the zoning.

RESPONSE:

The following consistency statement was provided in the Special Exception Application that was submitted on June 30, 2008, by Engelhardt, Hammer & Associates on behalf of PEF:

> "Under the current future land use designation of Public Use and the current zoning of Forestry / Rural Residential the subject property requires approval of a Special Exception to allow the construction and operation of an electric generating facility subject to the Florida Electrical Power Plant Siting Act, Section 403.501 through 403.518, Florida Statutes. Based on the current Levy Co. LDC, such electric generating facilities are only permissible as special exceptions within the Forestry / Rural Residential zoning district and therefore, this request is consistent with the existing zoning."

At the time the SCA was filed on June 2, 2008, local land use approvals were still being acted upon by Levy County. Recent amendments to Levy County's comprehensive plan and zoning ordinances have made the project site consistent with those ordinances. Issuance of the pending special exception will complete that process.

The Special Exception Application is currently scheduled for public hearing and action by the Levy County Board of County Commissioners on September 2, 2008. Approval by the BOCC of the Special Exception will constitute zoning approval of the LNP by Levy County.

ATTACHMENTS:

None.

COMMENT NUMBER: IX.1

RAI NUMBER: LNP SCA RAI-162

REQUESTING AGENCY: Levy County

COMMENT:

Copies of applicable zoning ordinances that apply to the project are not included in the Site Certification Application, as required by applicable sections of the Florida Administrative Code.

RESPONSE:

At the time the SCA was filed on June 2, 2008, local land use approvals were still being acted upon by Levy County. Recent amendments to Levy County's comprehensive plan and zoning ordinances have made the project site consistent with those ordinances. Issuance of the pending special exception will complete that process. The Special Exception Application is currently scheduled for public hearing and action by the Levy County Board of County Commissioners on September 2, 2008. Approval by the BOCC of the Special Exception will constitute zoning approval of the LNP by Levy County.

A copy of the applicable zoning ordinances was included in SCA, Appendix 10.3, Volume 5.

ATTACHMENTS:

None.

COMMENT NUMBER: IX.1

RAI NUMBER: LNP SCA RAI-163

REQUESTING AGENCY: Levy County

COMMENT:

The County requests a statement of consistency with the County zoning ordinances, as well as copies of the applicable County ordinances the applicant determines are applicable.

RESPONSE:

The following consistency statement was provided in the Special Exception Application that was submitted on June 30, 2008, by Engelhardt, Hammer & Associates on behalf of PEF:

> "Under the current future land use designation of Public Use and the current zoning of Forestry/Rural Residential the subject property requires approval of a Special Exception to allow the construction and operation of an electric generating facility subject to the Florida Electrical Power Plant Siting Act, Section 403.501 through 403.518, Florida Statutes. Based on the current Levy Co. LDC, such electric generating facilities are only permissible as special exceptions within the Forestry/Rural Residential zoning district and therefore, this request is consistent with the existing zoning."

The Special Exception Application is currently scheduled for public hearing and action by the Levy County Board of County Commissioners on September 2, 2008. Approval by the BOCC of the Special Exception will constitute zoning approval of the LNP by Levy County.

ATTACHMENTS:

None.

COMMENT NUMBER: IX.2

RAI NUMBER: LNP SCA RAI-164

REQUESTING AGENCY: Levy County

COMMENT:

Statements contained within the Application that refer to the County's zoning district and land use category designations as being one and the same are inaccurate for this site. The County requests information that will clarify these statements regarding the zoning and land use designations.

RESPONSE:

PEF acknowledges that Levy County uses different designations for future land use and for zoning. The LNP site is within a F/RR zoning district while its future land use designation is categorized as Public Use. The Public Use future land use category is described in ER Subsection 2.2.1.5 while Section 50-668 of the Levy County Zoning Ordinance notes that the F/RR zoning district is intended to allow:

> "...very low density residential development, spatially separated from the predominant land use in the district, commercial forests since the management of forest land requires the use of prescribed fire, herbicides and pesticides, and heavy equipment which generate smoke chemicals and dust, respectively. These characteristics render forestry land uses generally incompatible with residential, commercial and most public uses, and the forest lands must therefore be protected from encroachment by such uses. Conversely, the county recognizes the need to protect new residents to the county from the hazards associated with constructing homes in areas subject to wildfires, dust and exposure to chemicals."

ATTACHMENTS:

None.

COMMENT NUMBER: IX.3

RAI NUMBER: LNP SCA RAI-165

REQUESTING AGENCY: Levy County

COMMENT:

The Site Certification Application lacks sufficient information for the County to make a determination as to the consistency of the proposed use with various provisions of the County's Land Development Code. There is insufficient information related to the requirement for a special exception use permit for the use as an electric generating facility in the zoning district for this site.

RESPONSE:

The Special Exception Application, which was submitted on June 30, 2008, by Engelhardt, Hammer & Associates on behalf of PEF, provides additional detail and analysis that demonstrates consistency with the various code provisions found in the County's Land Development Code. The Special Exception Application includes:

- A description of the requested use, activities, and development associated with the site;
- Existing conditions and compatibility on property adjacent to the site;
- Required additional written and mapping documentation for electric generating facilities;
- Demonstration of consistency with Levy's Comprehensive Plan; and
- The Electric Generating Facilities Impact Assessment Report.

ATTACHMENTS:

None.

COMMENT NUMBER: IX.3

RAI NUMBER: LNP SCA RAI-166

REQUESTING AGENCY: Levy County

COMMENT:

The Site Certification Application does not contain sufficient information to make the determination that the electric generating facility will not result in such noise, odor, dust, vibration, offsite glare, substantial traffic or degradation of road infrastructure so as to adversely impact surrounding development or cause hazardous traffic conditions.

RESPONSE:

Noise

A comprehensive assessment of noise attributable to plant construction and plant operation was included in the following sections of the SCA and the ER (SCA Appendix 10.11, Volume 9):

SCA 3.3.8	Ambient Noise
SCA 5.7	Impact on Human Populations
ER 4.4.1.1	Noise (Construction)
SCA 6.7	Noise (Operation)
ER 5.8.1.1	Noise (Operation)
SCA Appendix 10.8	Noise Assessment of Proposed Nuclear Plant

The noise assessment included an ambient background noise measurement survey and a mathematical noise modeling analysis to estimate projected noise levels at the locations of nearest residences and offsite locations. The nearest residences are approximately 1.6 to 1.7 miles west of the center of where the main plant equipment will be located.

The assessment demonstrated that noise from construction activities may be noticeable at the nearest property boundaries during intense construction activities. At the locations of the nearest residences, construction noise levels are generally predicted to be below the daytime noise limitation of 65 decibels established by the Levy County Noise Ordinance.

During plant operation, the predicted increase in noise at the nearest residences is less than 2 decibels during periods when ambient background noise levels are most quiet. Noise from the plant should therefore only be perceptible under very limited ambient conditions, such as calm winds with very low background ambient noise levels. The noise analysis also predicted that offsite noise levels, regardless of location, will not exceed the noise limitations established by the Levy County Noise Ordinance, which are 65 decibels during daytime hours and 55 decibels during nighttime hours.

No adverse or unacceptable noise impacts during plant operation are expected to result from the operation of the plant at any offsite location.

Odor

The operation of the plant will not result in any activities, processes, wastes, fumes, smoke, or atmospheric emissions of any kind that will result in odors or smells at any location. PEF currently operates four nuclear power generating facilities in Florida, North Carolina, and South Carolina, and odors attributable to plant operation have never been an issue.

Dust and Air Quality

Ambient air quality impacts attributable to plant construction and operation are discussed in the following sections of the SCA and the ER (SCA Appendix 10.11, Volume 9):

SCA 3.3.7.2	Ambient Air Quality
ER 2.7.2	Regional Air Quality
SCA 5.5	Air Impacts (Construction)
ER 4.4.1.2	Air Quality
ER 4.4.1.3	Visual Aesthetic Disturbances
ER 10.3.1.3	Air
SCA 6.6	Air Quality Impacts (Operation)
SCA App.10.2.5	PSD Permit Application

Construction activities will generate dust as well as vehicle and construction equipment-related exhaust emissions. The size of the developed area (including material and equipment laydown areas) is expected to be only about 650 ac. or 21 percent of the 3,105-ac. site. Because of the large nature of the site, impacts on air quality at offsite locations are expected to be infrequent and minor. Air emissions during construction, as described in the SCA and the ER, will be consistent with other large construction projects, and there should be no significant impacts on air quality at offsite locations during the construction period. Fugitive dust emissions can vary considerably during construction and an aggressive fugitive dust control program will be implemented and periodically reviewed to minimize air emissions and their potential impact at offsite locations. The entire State of Florida is designated as being in attainment of the NAAQS for all pollutants. Air quality in the area surrounding the plant is not expected to change significantly as a result of the construction of the plant and supporting facilities.

As a nuclear-powered electrical generating facility, the plant will have very few sources of air emissions during operation. With the exception of some relatively small diesel-fueled emergency power generating equipment and fire pumps, the plant will not have any significant sources of emissions attributable to the combustion of fossil or other fuels. In fact, the operation of the plant will effectively displace approximately 6.4 million tons of greenhouse gas emissions every year compared with the same size natural gas-fired power plant. The only source of visible air emissions at the plant will be two banks of mechanical draft cooling towers that will emit harmless water vapor to the atmosphere.

An application for an air emission construction and operating permit has been prepared and submitted in conjunction with PEF's SCA for the project. The application demonstrates that the operation of the plant will not cause or contribute to a violation of any state or federal ambient air quality standard for any pollutant at any location.

While an increase in employment will occur due to plant operations, the increase in traffic in the region will not result in a significant change in air quality at any location.

In general, the air quality impacts on people, buildings, roads, and recreation areas attributable to the operation of the plant are not expected to be significant at any location.

Vibration

There may be some limited activities during construction that could produce perceptible levels of vibration in the immediate zone of construction and possibly at the nearest property boundaries. These activities may include infrequent and limited periods of blasting, pile driving, and the operation of heavy earthmoving equipment. These activities can be expected to occur primarily during daylight hours and the impacts at offsite locations are expected to be minimal and infrequent. PEF will employ best management practices to minimize these impacts to the extent feasible.

All equipment and plant components with the potential to produce low or high-frequency vibration will be designed to be vibration free in the interest of increasing its service life. This equipment includes the steam turbine, cooling towers, and cooling water pumps, all of which will operate on a continuous basis throughout the life of the plant. Because of the very expensive nature of this equipment and the high costs associated with plant downtime to repair or replace equipment, great care is taken during the manufacturing and installation process to ensure that these components will be vibration free. In addition, the facility has been designed to provide a minimum setback distance of 1,000 ft. between developed areas of the plant and the property boundary. As a result, there will be no perceptible vibration at any offsite location as a result of plant operation.

There will also be a pumping station located adjacent to the CFBC. The pumps will be designed and installed to operate with no perceptible vibration in the vicinity of the pump station.

PEF has four operating nuclear generating facilities in Florida, North Carolina, and South Carolina. Vibration has never been an issue at any of these facilities.

Lighting and Offsite Glare

Lighting and glare from plant operations is not expected to be perceptible from the nearest residences, public roadways, or generally accessible offsite locations surrounding the plant site. The tallest structures at the facility will be less than 250 ft. high and will require Federal Aviation Administration review for lighting requirements. Plant structures at the main plant site will not be visible from offsite locations. Plant lighting in parking, administration and operational areas will be designed to be environmentally friendly, with downward focused

fixtures where feasible, resulting in minimal visibility from offsite locations. The use of security lighting will be limited primarily to the restricted areas of the plant, which will be located at the center of the 3,105-ac. project site. The nearest residences are located approximately 1.6 to 1.7 miles to the west of the center of the main plant area. The nearest roadway (Highway 19) is located approximately 1.3 miles to the west of the center of the main plant area. Because the area is heavily forested, and the 1,000-ft. buffer between plant structures and the property boundaries will be maintained during plant operations, there will be no line-of-sight visibility of plant structures or lighting from any location. Glare from plant lighting is not expected to be significant at any offsite location.

Traffic and Degradation of Road Infrastructure

Traffic impacts attributable to the construction and operation of the plant are discussed in the following sections of the SCA and the ER (SCA Appendix 10.11, Volume 9):

SCA 5.1.2	Roads
ER 4.4.2	Social and Economic Impacts
ER 4.4.2.1.1	Employment
ER 4.4.2.10	Transportation Facilities
ER 5.8.2	Social and Economic Impacts of Station Operation
ER 5.8.2.8	Transportation Facilities

The SCA also references a traffic study conducted in 2007 by Lincks and Associates, Inc. that projected traffic volumes relative to existing road capacities during the peak construction year (2014). The study estimated traffic during construction will increase approximately 16 to 37 percent on US 19 (depending on direction), representing approximately 25 to 30 percent of the estimated travel capacity of the highway.

During operation, the study estimated that traffic in the year 2020 will increase approximately 5 to 12 percent on US 19 (depending on direction), representing approximately 27 to 29 percent of the estimated travel capacity of the highway.

Local roadways will continue to operate at acceptable levels of service.

ATTACHMENTS:

None.

COMMENT NUMBER: IX.4

RAI NUMBER: LNP SCA RAI-167

REQUESTING AGENCY: Levy County

COMMENT:

Although the County recently received an application for a special exception use permit, County staff has not had ample opportunity yet to determine whether the application packet is complete. In addition, the special exception application has not gone through the regular public review process, nor has the application received a final approval or denial from the Board of County Commissioners. The County requests sufficient information for the County to review and determine whether the proposed project meets the criteria for approval of a special exception use permit for an electric generating facility in this zoning district and to make determinations relating to the offsite impacts described in the previous paragraph.

RESPONSE:

The Special Exception Application submitted on June 30, 2008, by Engelhardt, Hammer & Associates on behalf of PEF demonstrates that the proposed project meets the criteria or standards set out in Section 50-796 of the County Land Development Code. PEF will continue to work with the county to provide information necessary for it to review the Special Exception Application.

ATTACHMENTS:

None.

COMMENT NUMBER: IX.5

RAI NUMBER: LNP SCA RAI-168

REQUESTING AGENCY: Levy County

COMMENT:

The subject property contains areas designated as environmentally sensitive by the County's Land Development Code and Comprehensive Plan. The Application identifies threatened, endangered and listed species of concern on the site. The Application does not provide the applicable permit or letter of exemption from the appropriate State of Florida Water Management District and the Florida Department of Environmental Protection and any other applicable permitting agency related to these issues, as required by the County's Land Development Code. The County requests those permits or letters of exemption.

RESPONSE:

Environmentally sensitive lands identified on the LNP site include wetlands as defined by the FDEP and USACE. Impacts to onsite wetlands have been avoided and minimized to the extent practicable. PEF will provide compensation for unavoidable impacts to onsite wetlands in accordance with applicable state and federal guidelines. The Environmental Resource Permit Application, found in Volumes 6 and 7 of the SCA, addresses onsite wetlands.

Protected species are addressed in Section 5.4 of the SCA and in ER Subsections 2.4.1, 4.3.1, and 6.5.1. PEF will comply with all applicable federal- and state-listed species protection regulations. PEF will obtain the necessary permits prior to construction.

ATTACHMENTS:

None.

COMMENT NUMBER: IX.6

RAI NUMBER: LNP SCA RAI-169

REQUESTING AGENCY: Levy County

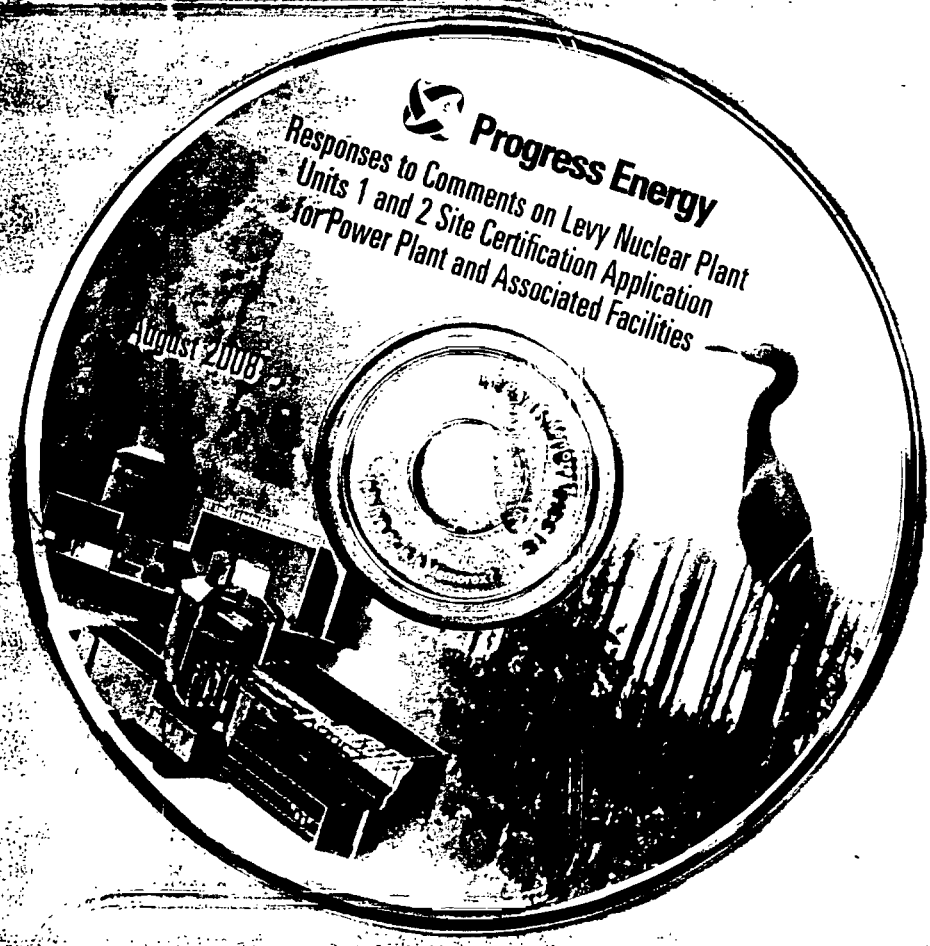
COMMENT: The Site Certification Application does not appear to address the impacts to the aquifer and connected groundwater systems resulting from the proposed project. The Application appears to contain inconsistencies regarding water withdrawals from the Floridan aquifer. The total average daily withdrawal of fresh water from the aquifer is unclear, based on the information provided in the Application. The County requests information indicating the impacts to the aquifer and connected groundwater, clarifying inconsistencies related to water withdrawals, and indicating total average daily withdrawal of fresh water from the aquifer.

RESPONSE:

Refer to the response to LNP SCA RAI-122 (VII.A). The requested withdrawal of water from the aquifer is 1.58 mgd annual average.

ATTACHMENTS:

None.


Progress Energy
Responses to Comments on Levy Nuclear Plant
Units 1 and 2 Site Certification Application
for Power Plant and Associated Facilities
August 2008

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