October 21, 2010

MEMORANDUM TO: Ryan Whited, Branch Chief
Environmental Projects Branch 2
Division of Site and Environmental Reviews
Office of New Reactors

FROM: Tomeka L. Terry, Project Manager **/RA/**
Environmental Projects Branch 2
Division of Site and Environmental Reviews
Office of New Reactors

SUBJECT: SUMMARY OF THE ENVIRONMENTAL ALTERNATIVE SITES AUDIT RELATED TO THE REVIEW OF THE COMBINED LICENSE APPLICATION FOR TURKEY POINT UNITS 6 AND 7

The U.S. Nuclear Regulatory Commission (NRC) staff, Pacific Northwest National Laboratory (PNNL), and Information Systems Laboratories (ISL) participated in an environmental alternative sites audit related to the review of the combined license (COL) application submitted by Florida Power and Light (FPL) for Turkey Point Units 6 and 7. The four alternative sites identified in the Turkey Point environmental report (ER) are the Glades site in Glades County, FL, the Martin site in Martin County, FL, the Okeechobee 2 site in Okeechobee County, FL, and the St. Lucie site in St. Lucie County, FL.

The site audit was held on July 12, 2010 and July 13, 2010, at which time the team traveled to the Glades site, Martin site, Okeechobee 2 site, and St. Lucie site, respectively. The purpose of the trip was to: (1) conduct discussions with FPL concerning the environmental report submitted as part of the application and associated information needs; and (2) tour the sites and surrounding areas.

This report provides a summary of the audit. Enclosure 1 is a list of attendees that participated in the audit. Enclosure 2 is the schedule of events. Enclosure 3 provides some specific information discussed during the audit for each of the four alternative sites.

FPL provided presentations that summarized data provided within the current ER and utilized working draft figures showing the hypothetical boundaries of the alternative sites which are not currently in the ER Rev. 0, but will be provided in future revisions of the ER. FPL's presentations were followed by brief discussions during which audit team members raised

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questions regarding the alternative sites and the screening process by which the sites were identified. Site specific questions that were discussed are captured in the site specific discussions in enclosure 3. Briefings were followed by travel to the sites for reviews of existing conditions.

Docket Nos. 52-040 and 52-041

Enclosures: As stated

cc w/enclosures: See next page

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Cc w/enclosures: See next page

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Alternative Site Audit Trip Report
Turkey Point Nuclear Plant Units 6 and 7 COL
(Florida Power and Light - FPL)
July 12 -13, 2010

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Rick Orthen	FPL
Jena Mier	FPL
Steve Scroggs	FPL
Phil Yates	FPL
Willie Welch	FPL
George Madden	FPL
Dave Wagner	Bechtel
Shauna Stetler Hardy	Tetra Tech
Karl Bullock	Golder

Turkey Point Alternative Sites Audit Schedule

Sunday, July 11, 2010

Travel day
- Fly to Florida
- Drive to Clewiston, FL (staying for 1 night)

Monday, July 12, 2010

8:00-9:00 AM	Overview presentation on Glades and Okeechobee alternative sites by FPL (location to be determined)
9:00-9:30 AM	Travel to Glades alternative site
9:30 AM -12:15 PM	Review Glades site Travel to city of Okeechobee (about 50 minutes)

Lunch 12:15 – 1:30 PM

1:30-2:00 PM	Travel to Okeechobee alternative site
2:00-3:30 PM	Review Okeechobee site

Drive to Okeechobee, FL (staying for 1 night)

Tuesday, July 13, 2010

8:00-9:00 AM	Overview presentation on Martin and St. Lucie alternative sites by FPL (location to be determined)
9:00-9:30 AM	Travel to Martin alternative site
09:30-11:30 AM	Review Martin site
11:30 AM - 2:00 PM	Travel to St. Lucie Site – Lunch along the way
2:00-4:30 PM	Tour St Lucie Site

Spend the night in St. Lucie (staying for 1 night)

Wednesday, July 14, 2010

- Contingency alternative site visit time
- Travel to Homestead if attending scoping meetings
- Those not staying for scoping meetings will travel home Wednesday afternoon

Enclosure 2

General Issues Applicable to Multiple Alternative Sites**:**

1. **Site Specific Characterization –** Although all alternative sites have been characterized in the environmental report (ER) Revision. 0 using reconnaissance level data, NRC staff has indicated to Florida Power and Light (FPL) its interest in alternative site-specific figures showing the outlines of each site, and revisions to certain affected environment parameters (e.g. impacted acres of wetlands) based on the placement of a hypothetical plant footprint within each site's boundaries.

2. **Site Screening Methodology** – FPL explained the screening methodology which utilized Geographical Information System technology and applied exclusionary criteria to FPL's service territory, defined as the region of interest (ROI), remains unavailable at this time. The Staff infers from the ER Rev. 0 and Site Selection Study Report that this exclusionary screening process may provide information regarding the ROI to Candidate Area screening described in NRC's environmental standard review plan (ESRP) Section 9.3. See the St. Lucie site-specific discussion below for further discussion of issues related to this screening information.

3. **Operational Make-up Water Sources** – Although the ER Rev. 0 indicates that operational water needs for the *Glades, Okeechobee #2, and Martin* sites might be met from either surface water bodies (Lake Okeechobee, Rivers, or canals) or the subsurface (Floridan aquifer), FPL (Steve Scroggs) indicated that the Floridan might be the only viable water source; however, FPL has not consulted with regulators to confirm the availability of any particular water source. The St. Lucie site would utilize ocean water for operational water needs. Reuse water availability was briefly discussed with FPL.

4. **Lake Okeechobee** - For each alternative site that is considering the use of Lake Okeechobee for cooling water, FPL consulted Florida Natural Areas Inventory (FNAI) to determine if threatened or endangered (T&E) species were expected to occur in the specific county where the alternative site was located. However, because Lake Okeechobee encompasses multiple counties in Florida, and most aquatic species are highly mobile, a specific county-level assessment may not provide certain information regarding T&E species.

5. **Lake Okeechobee Cultural Resources** - Additionally, FPL mentioned that previously submerged canoes were discovered in Lake Okeechobee during a recent drought. FPL noted that the Tribes were interested in the protection of the canoes, and that the State Historic Preservation Office classified this area as "culturally sensitive". FPL also identified information regarding the Indian Mounds in the area of Lake Okeechobee that will assist in describing the cultural environment for the alternative sites in the area that may rely on water from Lake Okeechobee.

6. **Blowdown Water Discharge** – The ER Rev. 0 does not specify how and where blowdown water would be discharged for the *Glades, Okeechobee #2, and Martin* sites. FPL acknowledged that it has not done site-specific evaluations to determine a preferred discharge option, or define discharge structures and locations. Options include discharge into large diversion canals, Lake Okeechobee, Kissimmee River, or injection into the Floridan aquifer.

7. **Water Storage** – FPL acknowledged that a water storage reservoir would likely be needed at the *Glades, Okeechobee #2, and Martin* sites for operational make-up water. This potential need is not described in ER Rev.0, and FPL has not conducted any site engineering work to estimate the potential size of such a reservoir. Therefore, this may affect estimates of onsite acreages impacted by site development.

8. **Transmission lines** – No route-specific siting work has been done for the alternative sites, and consequently, the ER does not characterize the affected environment along such a route. FPL made some operational assumptions for the most likely point of transmission line interconnects to estimate the numbers of miles of expanded and new right of way that might be needed.

9. **Roadway Widening** – The description of construction traffic provided in ER Rev. 0 indictates that several miles of existing highway would have to be widened at the Okeechobee 2, Martin, and St. Lucie sites. ER Rev. 0 does not characterize the affected environment that would be impacted by such widening.

10. **Impacted Wetland Acreage** – Currently ER Rev. 0 reports wetland acreages that may be impacted based upon FPL's wetland screening criterion which quantified wetlands within a 5,000 acre circle around each alternative site. To better assess the actual potential impacts to wetlands, the Staff may request revised estimates based on site-specific hypothetical plant site and laydown area footprint figures for each site.

11. **Volume of Fill Material** – The Glades and St. Lucie sites would require fill to elevate the site from the 100 year floodplain. FPL has not generated engineering estimates of the volume of fill that would be required, not identified specific sources from which fill would be obtained (potential sources were mentioned but FPL has not formally identified any specific locations), and has not estimated the truck, rail, or barge traffic that would be generated by hauling fill. Additionally, the Corps identified that Florida floodplain regulations would require that FPL generate a cut/fill plan, whereby for every acre of floodplain filled a new acre of floodplain must be created nearby or adjacent to the newly filled area. Whether or not the site areas are large enough to accommodate a floodplain mitigation area is unknown at this time and such acreage is not included in ER Rev. 0 impacts.

12. **Tribal Interactions** – FPL indicated that it has corresponded with the Brighton Indian Reservation, Big Cypress Indian Reservation, and Alligator Alley Miccosukee Indian Reservation. These are tribes in the vicinity of the alternative sites, separate from the tribes in the vicinity of the Turkey Point site. The ER Rev.0 does not currently contain information on these interactions.

13. **Cultural Resources** – The alternative sites have not been surveyed for cultural resources; however, if developed, FPL stated that it would use the same cultural resources protocols for all of the alternative sites and transmission lines as it intends to use for Turkey Point, which would include a complete Phase I survey of the area of potential affect (APE). FPL also stated that it would consider cultural resource impacts in determining the location of transmission lines.

Site Specific Information

Glades Site

The Glades site is 2-3 miles west of the town of Moore Haven along US highway 27. The nearest population center (>25,000 people) is Ft. Myers, 45 miles west of the site. A state prison is located nearby. Approximately 60 miles of new transmission lines would be needed to connect the site to existing transmission routes. The site is primarily agricultural based with the principle crop being sugarcane. Commercial fill is available east and south of the site. The site is located in a census minority block group. Characterization in the ER Rev. 0 is based on reconnaissance level data and no site-specific engineering analyses have been performed.

The site is at 15 ft elevation, and within the 100-yr floodplain, and thus FPL would have to raise the site elevation approximately 15 ft. This estimate is from other industrial facilities in the area, which have raised their elevations 10-15 ft above grade. However, since a design basis flood (DBF) analysis has not been done for the site, this is a very rough estimate and thus it would be difficult to assess the amount of borrow material that might be needed. In addition, the Federal Emergency Management Agency (FEMA) and local jurisdictions have certain restrictions/limitations on filling in a 100-yr floodplain.

Glades Issues Discussed:

a) As a potential operational water source, the C-43 Channel, Lake Okeechobee, or Floridan subsurface aquifer were each discussed in ER Rev. 0. However, FPL has not developed locations or design features for intake structures. FPL indicated that the Floridan aquifer is most likely the only operational water source option but it has had no discussions with regulators to confirm availability of water from the aquifer.

b) The Army Corps of Engineers (Corps) noted that it may consider the entire site wetlands due to recent determinations for a different project on reclaimed (from wetlands) agricultural lands. Corps may go back to the land's original, pre-drained, pre-agricultural status in its review of this site.

c) No specific surface water bodies for receiving construction or operational discharges have been identified, but FPL indicated it would likely use existing canals for construction de-watering and Boulder Zone injections for operational blowdown.

d) The two National Register of Historic Places (NRHP) historic districts in the town of Moore Haven, 3-4 miles east of the proposed site, were located and assessed for visual impacts of the transmission lines.

e) It appears that the plant and transmission lines (which would be taller than any extant features along State Route 25) probably would be visible from portions of the historic district (particularly the courthouse).

Okeechobee 2 Site

The Okeechobee #2 site is located 2-3 miles west of the town of Okeechobee, but the closest population center (>25,000 people) is Port St. Lucie, 30 miles to the east. A state prison is located near the site. The site is primarily agricultural and currently mostly pastured cattle grazing and limited residential structures. To connect the site to the existing transmission routing, approximately 48 miles of new transmission lines would be needed. FPL noted that there are artesian wells onsite. FPL (Steve Scroggs) mentioned that the ranchers like the natural artesian springs for the cattle, but stated that large karst sinkholes/features are not present here. The site is located just outside of the 100 yr. floodplain at 28 ft elevation.

Okeechobee 2 Issues Discussed:

a) ER Rev. 0 identifies that 6 miles of State Route 70 would require widening to accommodate construction traffic. Current land uses of this section and potential impacts have not been addressed in the ER.

b) The anticipated operational water source is not defined. The Kissimmee River, Lake Okeechobee, or Floridan subsurface aquifer are discussed in ER Rev. 0; however, FPL has not developed locations or design features for intake structures. FPL indicated the Floridan aquifer is most likely the only operational water source option but it has had no discussions with regulators to confirm availability of water from the aquifer.

c) No specific surface water bodies for receiving construction or operational discharges have been identified, but FPL indicated it would likely use existing canals for construction de-watering and Boulder Zone injections for operational blowdown.

d) If additional land were to be needed for a cooling water lake, the site footprint may have to extend to the east, requiring a relocation of the existing drainage. If such a need arises, additional land may be needed to mitigate the floodplain impacts that would occur if the drainage was relocated. FPL is uncertain whether the 3,000 acre site could accommodate such mitigation measures.

Martin Site

The Martin site has multiple existing units that are fossil plants (oil and/or gas); MW output is 3800 winter (maximum) and 3600 MW in summer. The site also contains a 6,800 acre cooling water lake. FPL acknowledged that the lake has excess cooling capacity but does not believe that the lake could serve the needs of the new reactors. There is an adjacent natural forested area on site to the north, and designated wetland mitigation areas (Barley Barbour Swamp adjacent to the existing cooling ponds). New transmission lines could utilize existing right-of-ways but with substantial widening. Nearby is a coal fired cogeneration facility owned by others. The nearest population center is Port St. Lucie, 30 miles to the east. The site has rail and highway access. Since FPL submitted its license application, FPL constructed a solar generation facility (on the proposed location for the new nuclear units) that will be integrated into the existing steam generating of Unit 8 providing 75 MW of renewable power. This new solar facility is scheduled to be operational by the end of Calendar Year 2010. The site elevation is 28 ft; depth to groundwater is 30 ft. It is outside of the 100 yr floodplain.

Martin Issues Discussed

a) A Solar Power Generating Facility has been constructed on the proposed reactor site; the NRC is considering the effect of this development on the reasonableness of the site as an alternative reactor site. FPL suggested that there may be other acreage at the Martin site that could be utilized although it has taken no action to formally evaluate such an option.

b) The anticipated operational water source is not defined. The C-44 canal, Lake Okeechobee, or Floridan subsurface aquifer are discussed in ER Rev. 0; however, FPL has not developed locations or design features for intake structures. FPL indicated the Floridan aquifer is most likely the only operational water source option but it has had no discussions with regulators to confirm availability of water from the aquifer.

c) No specific surface water bodies for receiving construction or operational discharges have been identified, but FPL indicated that it would likely use existing canals for construction de-watering and Boulder Zone injections for operational blowdown.

d) FPL maintains a wetlands mitigation bank that is sized to mitigate not only the existing facility wetlands impacts but includes acreage for an integrated gasification combined cycle plant that was never built.

e) ER Rev. 0 identifies that an undefined number of miles of State Route 710 would need widening to accommodate construction traffic. Current land uses of this section and potential impacts have not been addressed in the ER.

f) FPL's welcoming sign at the entrance to the Martin Site referenced field work at the Martin site that yielded Indian artifacts and human remains at the known Indian mounds preserved in Barley Barber Preserve, adjacent to the plant's reservoir. This information was not provided in ER Rev. 0.

St. Lucie Site

The St. Lucie site has two operating nuclear units. The nearest towns are Port St. Lucie and Ft. Pierce. The site is located within the 100 year floodplain, on a barrier island (Hutchison) with access via two causeways that are north and south of the site. South of the site there are numerous high rise condominiums. Additional transmission towers would be needed in 80 miles of new or expanded existing right-of-way. Construction of the units could necessitate clearing of mangrove wetlands adjacent to the Indian River estuary and the use of large amounts of fill to bring the site to the grade level of the other units. The mangrove communities are maintained through water management for mosquito control, but likely harbor important species and function as habitat for wildlife. All fill would have to be transported to the site. Site rail service is only available nearby on the mainland and would require a new bridge to access the site directly. Although onsite barge facilities exist, they are located adjacent to the existing units and would entail bridging of the cooling water intake canal. Therefore, FPL is assuming that new barge facilities would be needed to develop on the proposed site. However, FPL has not estimated any source or volume of fill, or transportation mode. The water source would be the Atlantic Ocean using the existing intake canal for St. Lucie Units 1 and 2.

St. Lucie Issues Discussed:

a) The site was included as an alternative based on FPL's interpretation of NRC guidance in ESRP Section 9.3, not because it was among the highest scoring sites. Given that this site scored lower than other screened sites that were eliminated from further consideration; may not meet the population exclusionary criteria of > 300 persons per square mile; and does not meet FPL's stated minimum size of 2,500 to 3,000 acres, NRC will examine this interpretation in its technical review.

b) Florida requires a 1:1 mitigative replacement of all filled areas of the 100 year floodplain immediately adjacent to the filled area. FPL is uncertain how this mitigation requirement could be met at this site.

c) ER Rev. 0 identifies that 18 miles of State Route A1A would require widening to accommodate construction traffic. Current land uses of this section and potential impacts have not been addressed in the ER.

d) The inclusion of a discussion of Lake Okeechobee in the ER Rev. 0 is apparently inapplicable to the St. Lucie site. The Lake is not an operational water supply alternative. FPL may revise this discussion in future revisions of the ER.

e) FPL indicated that there had been a recent discovery of cultural material near Old Blind Creek and a shell midden where 14 Native American burials were found. This information was not included in ER Rev. 0.

f) During the visit to the water intake location, Michael Bresette, the biologist in charge of sea turtle rescue operations, affiliated with Inwater Research Group, Inc., indicated that he knew of at least two archaeological sites on plant property where archaeological work had been conducted. This work is not described in the ER Rev. 0.