



L-2009-265
10 CFR 52.3

November 24, 2009

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555-0001

Re: Florida Power & Light Company
Proposed Turkey Point Units 6 and 7
Docket Nos. 52-040 and 52-041
Revised Hydrology Response to NRC Information
Request in COL Application Acceptance Review Letter

Reference: FPL Letter to NRC, L-2009-252 dated November 10, 2009, Response to
NRC Information Requests in COL Application Acceptance Review Letter

By letter dated September 4, 2009, the Nuclear Regulatory Commission (NRC) notified Florida Power & Light Company (FPL) that the Combined Operating License (COL) Application for Turkey Point Units 6 and 7 was acceptable for docketing. In that letter, the staff requested additional information in order to develop a complete integrated review schedule. The enclosure to this letter replaces Enclosure 2, Hydrology, of the reference letter which responded to the NRC information requests.

As discussed in the Enclosure, FPL will provide the NRC a copy of the weekly construction summaries within 30 days of submittal to the Florida Department of Environmental Protection (FDEP). In addition, the intermediate casing seat recommendation record, the final casing seat recommendation record, and the final construction and testing report will each be submitted to the NRC within 30 days of their submittal to the FDEP.

If you have any questions, or need additional information, please contact me at 561-691-7490.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on November 24, 2009

Sincerely,

William Maher
Senior Licensing Director – New Nuclear Projects

Enclosure

cc:

PTN 6&7 Project Manager, AP1000 Projects Branch 1, USNRC DNRL/NRO
Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

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Enclosure

**FPL COLA Acceptance Review Information Request
Revised Response
Hydrology
(Section 2.4.12)**

**This Enclosure is a complete replacement
Of FPL Letter L-2009-252, Enclosure 2**

NRC Request:

With respect to Section 2.4.12, the application relies on the regional hydrogeologic characteristics to support the feasibility of the proposed deep well injection system and to describe the onsite characteristics of the Floridan Aquifer system. Please provide a description of the types of exploratory well data you plan on submitting to the NRC and an estimate of when these data and corresponding analyses will be provided to the staff.

FPL REVISED RESPONSE:

This enclosure discusses the types and availability of data obtained during construction of the proposed exploratory well. It is anticipated that the exploratory well construction permit will require submittal of weekly construction summaries to the Florida Department of Environmental Protection (FDEP) and the Technical Advisory Committee (TAC) throughout the construction period. FPL will provide the NRC a copy of the weekly construction summaries mentioned above within 30 days of submittal to the FDEP. The intermediate casing seat recommendation record, the final casing seat recommendation record, and the final construction and testing report will each be submitted to the NRC within 30 days of their submittal to the FDEP.

FPL proposes to construct a Class V exploratory well to confirm the geology and hydrogeology of the Turkey Point site relating to the feasibility of disposal of fluids via deep well injection. The key hydrogeologic features to be explored and confirmed are the hydraulic characteristics of (1) the proposed injection zone ("boulder zone") and (2) the confining strata between the injection zone and the base of the Underground Source of Drinking Water (USDW). The exploratory well would be constructed in the southwest corner of the Turkey Point 6 & 7 site.

On January 20, 2009, FPL applied to the Florida Department of Environmental Protection (FDEP) for a permit to construct the proposed exploratory well. The permit application is under review by the FDEP and the Technical Advisory Committee (TAC). The TAC provides interagency coordination to evaluate exploratory and deep injection well permit applications. The TAC agency representatives include the United States Geologic Survey (USGS), South Florida Water Management District (SFWMD) and the Southeast District and Tallahassee offices of the FDEP. Additionally, the TAC will also review the casing setting depths recommended to, and approved by, the FDEP prior to installation of well casings below the top of the Floridan Aquifer.

The permit to construct an exploratory well, when issued to FPL, will require submittal of construction and testing data associated with the construction and testing of the exploratory well to the FDEP and the TAC. The data requirements are typically formation and core sample descriptions, pilot hole water sample analytical results, geophysical logs, and packer test hydraulic and water quality analytical reports. This data will be submitted with weekly construction summaries, to support FPL's casing setting depth recommendations (for casings set below the top of the Floridan Aquifer) and a report that is prepared at the completion of well construction. An overview of these data submittals is provided below.

It is anticipated that the exploratory well construction permit will require submittal of weekly construction summaries to the FDEP and the TAC throughout the construction period. These weekly construction summaries include construction and testing data collected during the weekly reporting period. The data includes a description of lithologic samples (drill cuttings) and cores, pilot hole water quality data, geophysical log data, packer test hydraulic and water quality data, and a description of the construction activities that took place during that reporting period. FPL expects that the exploratory well construction permit will require that the weekly construction summaries be submitted to the FDEP and the TAC.

FPL expects the exploratory well construction permit to require submittal of casing setting depth recommendations for the intermediate and final casing depths of the exploratory and dual-zone monitor wells. Each casing setting depth recommendation will include a summary of the data collected during construction and testing while drilling in the Floridan Aquifer. This will include a lithologic log of samples (drill cuttings) and cores, pilot hole water quality data, geophysical log data, packer test hydraulic and water quality data, and a description of the construction activities that took place during that reporting period. Each casing setting depth recommendation will be submitted to the FDEP and the TAC approximately four calendar days after completion of the applicable pilot hole drilling and testing. For the exploratory well, casing setting depth recommendations are anticipated to be submitted after pilot hole drilling and testing has been completed between the approximate depths of 1,650 feet below pad level (bpl) and 3,500 feet bpl. For the dual-zone monitor well, it is anticipated that the casing setting depth recommendations will be submitted after pilot hole drilling and testing has been completed to a depth of approximately 1,900 feet bpl. FDEP will either approve the casing setting depth recommendations submitted or request additional information.

At the completion of construction of the exploratory well, a pressure test will be performed to demonstrate the absence of leaks in the final casing and injection tubing of the well. Within 90 days of the completion of performance of the pressure test, a final construction and testing report providing the construction test data, an interpretation of the data, and the construction details of the wells will be prepared and submitted to the FDEP and the TAC. Separate final construction and testing reports will be submitted for the exploratory well and dual-zone monitor well. The reports will provide geophysical log prints, copies of laboratory water quality reports (packer test water samples, pilot hole water samples, injection zone and monitor zones water samples), casing mill certificates, core samples laboratory report, and a lithologic log of formation samples and core descriptions. The interpreted data will be used to develop a geologic and hydrogeologic column for the site, which will be included in the reports. The reports will be signed and sealed by a Florida licensed professional engineer and professional geologist.

A description of well construction and testing data collection is provided in the paragraphs below. The figure included with this response depicts the proposed exploratory well testing program.

Well construction and data collection prior to penetrating the Floridan Aquifer (from pad level to a depth of approximately 925 feet bpl) will include collection of formation samples at 10-foot intervals and performance of X-Y caliper, natural gamma ray, dual induction, and spontaneous potential geophysical logs. This data will be used to identify the base of the Biscayne Aquifer, the base of the Hawthorn Group, and the top of the Floridan Aquifer.

Well construction and data collection in the Floridan Aquifer will take place in two depth phases. The first phase will include construction and testing data collection from approximately 925 feet bpl (the anticipated depth of the top of the Floridan Aquifer) to approximately 1,650 feet bpl. The purpose of data collection during this phase of construction is to identify the base of the USDW and to identify the top of geologic formations penetrated by the borehole. Data collected during this phase of construction will be interpreted and compiled in an 'Intermediate Casing Seat Recommendation' record that is submitted to the FDEP and TAC. Approval of the Intermediate Casing Seat Recommendation record must be obtained from the FDEP prior to installing the intermediate casing and moving to the second phase of well construction and data collection in the Floridan Aquifer.

The second phase of well construction and data collection in the Floridan Aquifer takes place from approximately 1,650 to 3,500 feet bpl. The purpose of testing during this phase of construction is to confirm the confining characteristics of the formations within this interval and to identify the depth of the injection zone. Data collected during this phase of construction will be interpreted and compiled in a 'Final Casing Seat Recommendation' record that is submitted to the FDEP and the TAC. Approval of the Final Casing Seat Recommendation record must be obtained from the FDEP prior to installing the final casing of the well.

The data collection will include geophysical logging, drill cutting samples, coring, and packer testing to provide the data needed to confirm the confining characteristics of the strata between the injection zone and the base of the USDW. The base of the USDW will be identified by interpretation of geophysical logs and confirmed through water sampling and analysis during straddle packer testing. The confining characteristics of intervals overlying the Boulder Zone will be evaluated by interpretation of geophysical logs, straddle packer pumping data, drill cutting samples, and core sample data. The chemical and physical characteristics of the injection zone will be determined through geophysical logging, formation sampling at 10-foot intervals (drill cuttings), and formation fluid sampling.

At the completion of exploratory well construction, a water sample will be collected from the interval that will be used as the injection zone (after the exploratory well has been converted to a Class I Industrial deep injection well) and analyzed against *Primary and Secondary Drinking Water Quality Standards* for public water systems established by the Florida Safe Drinking Water Act and listed in FDEP Rules 62-550.310 and 62-550.320, Florida Administrative Code (F.A.C.) and selected *Minimum Criteria for Ground Water* established in FDEP Rule 62-520.400, F.A.C. to determine the chemical and physical characteristics of the injection zone native water.

A description of the data sources and their use with regard to water quality assessment and confinement analysis is provided below.

Formation Samples - Formation samples (drill cuttings) will be collected at 10-foot intervals from pad level to the total drilled depth of the exploratory well. The samples will be described for rock type, color, grain size, consolidation, porosity, and fossils. The sample descriptions will be compiled into a lithologic log of the well that is used to determine the geologic formations penetrated by the well bore and provide information about the confining characteristics of the formations (estimated porosity of the samples). Drill cutting samples also provide information to select core sample collection depths in the confining interval overlying the Boulder Zone. An on-site geologist will be monitoring drill cutting samples to identify, in particular, rock that appears to be well consolidated because well-consolidated rock increases the probability of successful core collection. FPL expects that the exploratory well construction permit will require that a description of the drill cutting samples collected during the previous week be included in that week's construction summary. The weekly construction summaries will be submitted to the FDEP and the TAC. The lithologic log developed from the description of the formation samples collected during construction of the exploratory well will be submitted to the FDEP and the TAC in support of the Intermediate and Final Casing Seat Recommendations and will be included in the final construction and testing report.

Pilot Hole Water Samples – Water samples will be collected at approximately 90-foot depth intervals from the closed-circulation drilling fluids system used with the reverse-air drilling method during pilot hole drilling in the Floridan Aquifer. The 90-foot sampling interval is selected to allow sample collection to occur while the connection of the next 90-foot long drill pipe section is made to allow drilling to advance. The samples will undergo analysis for total dissolved solids (TDS), chloride, ammonia, total Kjeldahl nitrogen (TKN) and conductivity. The purpose of the sampling and analysis is to develop a profile of water quality with depth to identify the depth of the base of the USDW. It is anticipated that the exploratory well construction permit will require that laboratory reports providing analytical results of all pilot hole water sample analyses be submitted in support of the Intermediate and Final Casing Seat Recommendation records. The pilot hole water sample data will to be submitted to the FDEP and the TAC with the weekly construction summaries, casing seat recommendation records and the final construction and testing report.

Core Samples – A minimum of six and up to eight, 4-inch diameter cores will be collected during pilot hole drilling between the depths of approximately 1,650 and 2,900 feet bpl. Based on professional experience, six to eight cores are needed to evaluate the general confining characteristics of the anticipated confining interval. A core barrel with a minimum length of 10 feet will be used for the core sample collection. Each core sample will have a minimum length of five feet based on core acceptance criteria established in the well construction and testing technical specifications.

Portions of the Floridan Aquifer are expected to consist of relatively soft, low-permeability limestones that are inappropriate for core sampling. While these materials

possess confining characteristics, they tend to erode and fall apart during the coring process, resulting in less than desirable core recovery. Therefore, drill cuttings will be monitored for degree of consolidation and hardness to identify core sample collection depths that are likely to yield a high percentage of core recovery.

Each core sample will be described and photographed. At least one 6-inch section of each core will be sent to a laboratory for vertical and horizontal permeability, porosity, specific gravity, Young's Modulus, and compressive strength analysis. Core descriptions will be submitted to the FDEP and the TAC with the weekly construction summaries and exploratory well Final Casing Seat Recommendation record. The core sample laboratory analysis results will be available approximately 45 days after submittal of the core samples to the laboratory. The core sample laboratory analytical data will be included in the final construction and testing report that summarizes the construction and testing of the exploratory well. The final construction and testing report will be distributed to the FDEP and the TAC.

Geophysical Log Data – Geophysical logging of the pilot hole will take place during both phases of construction and testing in the Floridan Aquifer. A copy of the geophysical logs performed each week will be included in that week's construction summary and will be distributed to the FDEP and TAC. Copies of the logs will also be included in the Intermediate Casing Seat Recommendation and Final Casing Seat Recommendation records, both of which will be distributed to the FDEP and TAC and require FDEP approval prior to installation of the intermediate and final casings, respectively. A copy of each geophysical log performed during the construction and testing of the exploratory well will be included in the final construction and testing report. The final construction and testing report will be distributed to the FDEP and the TAC within 90 days of completion of the pressure test on the final casing and injection tubing at the conclusion of construction of the exploratory well. After the pilot hole is drilled to a depth of approximately 1,650 feet bpl, the following logs will be performed:

- X-Y Caliper
- Natural Gamma Ray
- Dual Induction
- Spontaneous Potential
- Borehole Compensated Sonic
- Fluid Conductivity
- Fluid Temperature
- Flowmeter

Each geophysical log will be performed under static (non-flowing) conditions. The fluid conductivity, fluid temperature, and flowmeter logs will be performed under both static and flowing conditions. The geophysical log data for this phase of construction and testing will be used to identify the base of the USDW and assist in the selection of packer testing intervals.

After installation of the intermediate casing and completion of the pilot hole to a depth of approximately 3,500 feet bpl, the following geophysical logs will be performed:

- X-Y Caliper
- Natural Gamma Ray
- Dual Induction
- Spontaneous Potential
- Borehole Compensated Sonic
- Fluid Conductivity
- Fluid Temperature
- Flowmeter
- Video
- Borehole Televiewer

These logs will be performed under static (non-flowing) conditions. The fluid conductivity, fluid temperature, and flowmeter logs will be re-performed under flowing conditions. The geophysical log data for this phase of construction and testing will be used to evaluate the confining characteristics of the logged interval and assist in the selection of packer testing intervals.

Packer Testing Data – Geophysical log data will be used to select appropriate intervals for packer testing. Packer testing will take place during both phases of construction and testing in the Floridan Aquifer. These tests will provide information on the water quality and hydraulic characteristics of the test interval. The packer testing procedure is described below:

1. Inflate two straddle packers to isolate the selected test interval. Typically the packers are positioned approximately 15-20 feet apart to isolate a test interval.
2. Air-develop water from the test interval until the water is free of solids to establish maximum water productivity from the test interval.
3. Allow the water level to return to pre-development water level.
4. Install a submersible pump and water level transducer inside the drill string to monitor water level in, and pumping rate from, the test interval. Record water level and pumping rate through the remainder of the test, including the recovery period.
5. Begin pumping from the test interval at a predetermined rate based on the rate at which water was produced from the test interval during development.
6. Pump the test interval at a constant rate until the water level stabilizes. Continue pumping until one drill string volume of water has been pumped from the test interval.
7. Just prior to completing the pumping phase of the test, collect a water sample for chloride, TDS, ammonia, TKN, sulfate, pH, and temperature

analysis. If pumping one drill string volume of water from the test interval is not feasible due to low productivity, collect water samples from the test interval via a thief-sampler.

8. Continue water level data collection until water level has recovered to near the pre-test level.

A minimum of two and up to four packer tests will be performed between approximately 1,250 and 1,650 feet bpl. These packer tests confirm the depth of the base of the USDW. Selected potential water-producing intervals (based on interpretation of geophysical logs) above and below the apparent base of the USDW (based on interpretation of the geophysical logs) will undergo packer testing to confirm the location of the base of the USDW.

Following geophysical logging of the pilot hole from approximately 1,650 to 2,900 feet bpl, a minimum of four and up to eight packer tests will be performed. The actual number of packer tests performed will depend on the results of the first four packer tests performed on this interval. If more than four packer tests are needed to confirm the confining characteristics of the strata between the top of the injection zone and base of the USDW, up to an additional four packer tests will be performed.

Preliminary packer test water level data will be submitted with the weekly construction summaries and will be distributed to the FDEP and TAC. Packer test water level and water quality data will be submitted to the FDEP and the TAC in the Intermediate Casing Seat Recommendation and the Final Casing Seat Recommendation records. The packer test data will also be included in the final construction and testing report that summarizes the construction and testing of the exploratory well. The final construction and testing report will be distributed to the FDEP and the TAC within 90 days of completion of the pressure test on the final casing and injection tubing at the conclusion of construction and testing of the exploratory well.

The table below provides the estimated submittal dates for the interpreted data discussed above based on the current well construction schedule. These dates assume an October 1, 2010 exploratory well construction start date, which could change based on the date of issuance of the FDEP exploratory well construction permit. The dates listed in the 'Anticipated Submittal' column are anticipated dates for submittal of the Intermediate Casing Seat Recommendation record, the Final Casing Seat Recommendation record, and the final construction and testing report.

Data	Anticipated Submittal to FDEP
Drill Cutting Samples, Pilot Hole Water Samples, and Packer Testing Data	December 1, 2010* February 1, 2011** June 1, 2011***
Core Samples	February 1, 2011** June 1, 2011***
*Anticipated date of submittal of the Intermediate Casing Seat Recommendation **Anticipated date of submittal of the Final Casing Seat Recommendation ***Anticipated date of submittal of the construction and testing report	

A summary of current and anticipated FDEP permitting phases is provided below.

Construction and testing of the exploratory well cannot begin until the FDEP issues an exploratory well construction permit. FPL has applied for the FDEP exploratory well construction permit. The permit application has been determined by the FDEP to be complete and a draft exploratory well construction permit for this project is being prepared by the FDEP. The exploratory well permit will allow exploration of the geology and hydrogeology of the site by construction testing of the exploratory well and associated dual-zone monitor well, but prohibit injection of fluids.

Construction and testing data collected during construction of the exploratory well will be used to support a FDEP Class I deep injection well construction permit application. The FDEP will not issue a Class I deep injection well construction permit unless the data collected during construction testing of the exploratory well confirms that the geology and hydrogeology of the site are appropriate for construction and operation of a Class I deep injection well. A Class I deep injection well construction permit converts the exploratory well to a Class I deep injection well and allows operational testing of the injection and dual-zone monitor wells. The operational testing phase is six months to two years and allows an extended demonstration that the injection and dual zone monitor wells are operating as designed and in accordance with FDEP Rule 62-528 F.A.C..

Operating and monitoring data compiled during the operational testing phase will be provided in support of a Class I deep injection well operating permit at the conclusion of the operational testing phase. If the data demonstrate the injection well is operating as designed and in accordance with Rule 62-528 F.A.C., the FDEP will issue an operating permit for the injection well. The operating and monitoring data are required under the operating permit to support operating permit renewal applications that are required every five years.

