

**STATE OF FLORIDA
DIVISION OF ADMINISTRATIVE HEARINGS**

In re: Florida Power & Light Company
Turkey Point Power Plant Units 3-5
Modification to Conditions of
Certification

DEP Case No. PA 03-45E
OGC Case No. 14-0510
DOAH Case No. 15-001559EPP

NOTICE OF FILING DIRECT WRITTEN TESTIMONY AND EXHIBITS

Applicant, Florida Power & Light Company (FPL), by and through its undersigned counsel, hereby serves notice of the filing of the written direct testimony, on the proposed modification of conditions of certification for FPL's Turkey Point Units 3-5, of the following witnesses: Gregory Powell, Kerri J. Kitchen, James L. Andersen, Karl Bullock, Kennard F. Kosky, and James R. Lindsay. Given the size of these materials, copies of the direct written testimony and exhibits are available for the parties to review on the ftp server used by FPL for the exchange of exhibits. A link will be provided within the email of service of this notice. A printed copy of the written direct testimony with exhibits is being provided to the Administrative Law Judge along with this notice.

In accordance with rule 62-17.141(3), Florida Administrative Code, copies of this written testimony have been provided for public inspection at the locations listed below as specified in the newspaper notice of the modification hearing:

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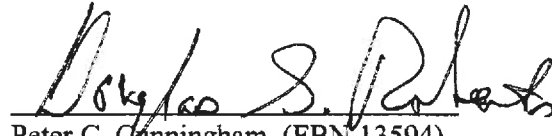
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Respectfully submitted this 20th day of November, 2015.



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CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing has been furnished via electronic mail to the following, this 20th day of November, 2015.

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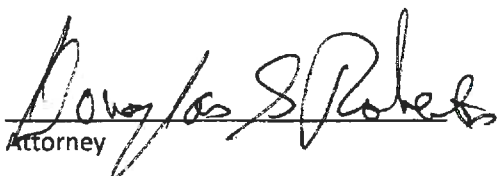
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November 20, 2015

**FLORIDA POWER & LIGHT COMPANY'S
NOTICE OF FILING DIRECT WRITTEN
TESTIMONY & EXHIBITS OF:**

JAMES L. ANDERSEN

KARL BULLOCK

KERRI KITCHEN

KENNARD KOSKY

JAMES LINDSAY

GREGORY POWELL

**STATE OF FLORIDA
DIVISION OF ADMINISTRATIVE HEARINGS**

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1 **BEFORE THE DIVISION OF ADMINISTRATIVE HEARINGS**

2 **FLORIDA POWER & LIGHT COMPANY**

3 **TURKEY POINT UNITS 3- 5 MODIFICATION**

4 **DIRECT TESTIMONY OF JAMES L. ANDERSEN**

5 **DOAH CASE NO.: 15-1559EPP**

6 **BACKGROUND/QUALIFICATIONS**

7 **Q. Please state your name and business address.**

8 A. My name is James L. Andersen. My business address is 1931 Commerce Lane, Suite 3,
9 Jupiter, Florida, 33458.

10 **Q. Who is your current employer and what position do you hold?**

11 A. I am employed by JLA Geosciences, Inc. I am the President of the company.

12 **Q. Please describe your educational background beginning with your undergraduate**
13 **degrees.**

14 A. I obtained an Associate of Science degree from Palm Beach Junior College. I then
15 obtained a Bachelor of Science, major in Geology from Florida Atlantic University.

16 **Q. Please describe your professional work experience since obtaining your last**
17 **academic degree.**

18 A. I began my career in hydrogeology in 1984 with the Hydrogeologic consulting firm
19 Missimer and Associates, Inc. (M&A) in Cape Coral, Florida and then subsequently in
20 Palm Beach Gardens until 1994. My work at M&A initially consisted of mud logging
21 associated with water well construction, operating a geophysical logging unit, measuring
22 and collecting hydrogeologic data, performing pump tests and aquifer performance tests,
23 and conducting environmental and contamination-related studies. Following field data

1 collection, I performed pumping test analyses for variable and constant rate pumping test
2 data; performed aquifer performance test analyses on unconfined, semi-confined and
3 confined aquifers; and performed instantaneous discharge tests and non-pumping well
4 test analyses including slug tests and constant head tests. I also performed computer
5 modeling, using analytical and finite difference computer modeling software to calculate
6 well and wellfield aquifer drawdown at distance and solute transport. My work was
7 performed primarily in South Florida; however, I also worked on M&A projects in other
8 areas of Florida and the outer banks of North Carolina. My responsibilities as a
9 hydrogeologist included work on wells completed in the water table aquifer, the Tamiami
10 Aquifer, the Sandstone Aquifer, the Middle and Lower Hawthorne Aquifers and the
11 Upper Floridan Aquifer. I have extensive experience in the design of open hole, screen
12 and gravel pack type completed wells and using well construction methods that include:
13 mud rotary, cable tool, direct and reverse air drilling. The uses for the constructed wells
14 typically included water supply, test, injection, water-level observation and water-quality
15 monitoring. My environmental and contamination-related work at M&A included
16 landfill groundwater monitoring, petroleum contamination assessment, and soil and
17 groundwater contamination cleanup.

18 In 1994 I joined Stemle, Andersen & Associates, Inc., a small environmental and water
19 resource consulting firm located in Boynton Beach, Florida and established an office in
20 Jupiter Florida. My work there primarily consisted of water supply consulting for water
21 utilities and consulting engineers in Southeast Florida. The firm also provided
22 environmental contamination-related services for a major oil company. Projects included
23 the permitting, design and construction of numerous wellfields completed in the surficial,

1 Biscayne, and Upper Floridan aquifers in St Lucie, Martin, Palm Beach and Dade
2 Counties.

3 In 2003 I started the consulting firm JLA Geosciences (JLA) in Jupiter Florida where I
4 currently work. The firm provides water supply consulting to many types of interests
5 including water and electric utilities, commercial interests, agriculture, industry, and local
6 municipal, county-level and state agencies. I am president of JLA where I oversee
7 company operations and financial management, manage projects, provide technical
8 quality control and oversee staff. JLA has a staff of eight (8) including bachelors,
9 masters and PhD degreed hydrogeologists, a biologist/environmental scientist and a CPA.
10 I routinely perform water supply permitting, well system design and manage construction
11 projects for nearly all types of water supply, water disposal and groundwater monitoring-
12 related wells in Florida, Virginia, New Jersey, Michigan, the Virgin Islands, and
13 Bermuda.

14 **Q. Please describe your professional work experience in the areas of design and**
15 **construction of groundwater wells?**

16 A. I have successfully completed over 250 supply wells at approximately 50 different
17 wellfields in Florida and outside the state. Not all of these wells included design;
18 however, they all involved well construction. I have been responsible for more than 80
19 Upper Floridan Aquifer wells at 18 different wellfields throughout the state of Florida
20 including Dade, Broward, Palm Beach, Martin, St Lucie, Indian River, Volusia, Lee,
21 Sarasota and Polk Counties. I have an extensive background in well design for
22 nanofiltration (NF) and reverse osmosis (RO) raw water supply, in design and
23 implementation of saline water intrusion investigations and corrective actions, in

1 wellfield contamination investigations, in collection and analysis of water quality data, in
2 rehabilitation of old wells, and in supervising various types of drilling.

3 **Q. Please describe any professional registrations or certifications that you hold in your**
4 **field of expertise.**

5 A. I am a State of Florida licensed professional geologist, license number 1103.

6 **Q. Do you hold any memberships in professional organizations in your field of**
7 **professional expertise, and if so please identify those organizations for us.**

8 A. I am a member of the following organizations:

9 Florida Association of Professional Geologists

10 American Institute of Professional Geologists

11 Geological Society of America

12 International Association of Hydrogeologists

13 South Florida Hydrologic Society

14 Southeast Desalting Association

15 American Membrane Treatment Association

16 **Q. Please describe any professional or technical publications you have published or**
17 **presentations you have given in your field of expertise.**

18 A. I have authored or co-authored articles and given presentations on wells and groundwater
19 quality, among other topics. These are listed on my CV.

20 **Q. Do you have prior experience in addressing the compliance of a proposed**
21 **groundwater well with the water well permitting statutes and rules, and if so could**
22 **you describe that experience?**

23 A. Yes, every well designed by JLA to be drilled in Florida must be in compliance with

1 applicable State of Florida permitting statutes and rules. When JLA is responsible for
2 construction services and inspections during a well construction project, JLA reviews
3 well construction materials for compliance with the design specifications, inspects the
4 drilling process, casing materials used, installation and assembly methods, annular seal
5 materials, cement mix ratios, annular cement installation methods, cement cure time and
6 wellhead and well seal method as applicable to ensure regulatory compliance. Where
7 specific well performance testing is required by permit, the specific requirements are
8 followed. I performed this role in the design and construction of the existing Upper
9 Floridan aquifer wells that were installed for FPL's Turkey Point Unit 5.

10 **Q. Have you ever testified as an expert witness before and if so, please describe those**
11 **proceedings and the nature of your testimony and the fields of expertise in which**
12 **you were qualified as an expert?**

13 A. Yes. I provided expert testimony in a case in the Eleventh Judicial Circuit in Miami-
14 Dade County, related to a well failure. I was qualified as an expert in, among other
15 things, wellfield design and development.

16 **Q. Is Exhibit FPL- 14 a true and correct copy of your current professional resume?**

17 A. Yes.

18 **FPL OFFERS JAMES ANDERSEN AS AN EXPERT IN THE FIELD OF**
19 **HYDROGEOLOGY INCLUDING THE DESIGN AND CONSTRUCTION OF**
20 **GROUNDWATER WELLS**

21 **Q. Could you please describe the subject of your testimony in this proceeding?**

1 A. My testimony is that the Upper Floridan Aquifer (UFA) wells for the addition of water to
2 the FPL Turkey Point Plant Cooling Canal System (CCS) were designed and will be
3 constructed in accordance with applicable State of Florida statutes and rules.

4 **Q. Could you please describe your role in the project to install new groundwater**
5 **wells into the Upper Floridan Aquifer at the FPL Turkey Point Plant?**

6 A. I am the project manager and principal in charge at JLA who oversaw design of the UFA
7 wells, assisted with the siting of the wells, planned the well construction site layouts,
8 specified environmental controls during construction, and provided assistance to relevant
9 questions in the petition to modify the site certification to add the wells and UFA water
10 use.

11 **INTRODUCTION OF SECTIONS OF REQUEST FOR MODIFICATION**

12 **Q. Have you prepared or are you prepared to sponsor into evidence the sections of the**
13 **Request for Site Certification Modification and completeness responses listed by**
14 **your name on Exhibit FPL-2, including any tables, figures, or attachments to those**
15 **sections and completeness responses?**

16 A. The applicable portions of the sections, yes, I am.

17 **Q. Are the materials listed on Exhibit FPL-2 that you are sponsoring true and correct?**

18 A. Yes.

19 **Q. Do you agree with the contents of those materials listed on Exhibit FPL-2 that you**
20 **are sponsoring?**

21 A. Yes.

22 **HYDROGEOLOGY AT THE TURKEY POINT PLANT PROPERTY**

1 **Q. Are you familiar with geology and hydrogeology that occurs in the region that**
2 **includes the Turkey Point Plant property?**

3 A. Yes.

4 **Q. Could you please identify Exhibit FPL-15? (Regional hydrostratigraphy profile)**

5 A. Yes. This is a figure showing the general regional hydrostratigraphy. This reasonably
6 represents the geology and geohydrology in the region.

7 **Q. Referring to Exhibit FPL-15, could you please provide a general description of the**
8 **subsurface geology and hydrogeology at the Turkey Point Plant property?**

9 A. This figure shows a generalized regional hydrostratigraphic column for South Florida. In
10 the area of the Turkey Point Plant, there are three major subsurface hydrogeologic units.
11 Starting at the surface is the surficial aquifer system, which includes the unconfined and
12 highly permeable Biscayne Aquifer, and the less permeable Tamiami Formation. The
13 surficial aquifer system at the project site is approximately 200 feet thick. Underlying the
14 surficial aquifer system is the intermediate confining unit of the Hawthorn Group. This
15 unit is between 700 and 900 feet thick (approximately) and consists of very low
16 permeability material. It separates the surficial aquifer system from the underlying
17 Floridan Aquifer system. The Floridan Aquifer system includes the Upper Floridan
18 aquifer, the middle confining unit, and the Lower Floridan aquifer. The Boulder Zone is
19 a highly permeable zone within the Lower Floridan aquifer.

20 **Q. Could please describe in greater detail the Upper Floridan Aquifer and its overlying**
21 **geology?**

22 A. The Floridan Aquifer System in South Florida is a confined aquifer and underlies the
23 intermediate confining unit. The brackish upper portion, having total dissolved solids

1 concentrations typically having less than 10,000 mg/l, is called the Upper Floridan
2 Aquifer (Reese, 1994). During construction of the Turkey Point Unit 5 UFA wells, the
3 entire thickness of the Upper Floridan was not penetrated during drilling and the
4 maximum depth that was penetrated was 1,247-feet below land surface (bls). The upper
5 Floridan is predominantly composed of interbedded limestone and dolomite of early
6 Oligocene to middle Eocene age. In the study area, two primary rock units comprise the
7 Upper Floridan Aquifer System. From approximately 910 feet beneath the site, in
8 descending order, these units are the Basal Hawthorne Unit (late Oligocene age),
9 Suwannee Limestone (early Oligocene age) and Avon Park Limestone (middle Eocene
10 age) (Reese, 1994, 2000).

11 The water producing zones within the Floridan aquifer can generally be referred to as
12 "flow zones". A flow zone is typically a thin sequence of highly solutioned rock where
13 water flowing within the aquifer is concentrated. Numerous thin flow zones may
14 contribute water to the open interval of a well and often times a high percentage of the
15 water produced by the well comes from one or two thin flow zones. Based on the
16 lithologic logs, geophysical logs and wellhead flow data from the Unit 5 UFA wells, the
17 most productive flow zones occurred in the Floridan aquifer between approximately
18 1,020-feet and 1,230-feet BLS. These depths correspond to the same highly productive
19 zones of the Avon Park Limestone.

20 **Q. What is the areal extent of the Upper Floridan Aquifer in southern Florida?**

21 A. The horizontal extent of the aquifer is not defined in southern Florida, but is considered
22 to extend off shore beneath the continental shelf. The aquifer can be found in the Florida
23 Keys; however, the salinity of water in the aquifer increases with distance from the

1 mainland. In southern Florida, the Upper Floridan Aquifer largely contains brackish
2 water. In central and northern Florida, the Upper Floridan aquifer generally contains
3 freshwater.

4 **FDEP and SFWMD Criteria for Well Construction**

5 **Q. Are you familiar with the criteria for the construction of groundwater wells under**
6 **Rule Chapter 62-532, Florida Administrative Code (F.A.C.)?**

7 A. Yes.

8 **Q. Are you familiar with the criteria for the construction of groundwater wells under**
9 **Chapter 373, Florida Statutes, and Rule Chapter 40E-3, F.A.C., of the South**
10 **Florida Water Management District?**

11 A. Yes.

12 **Q. In your own words, what are the principal purposes of those provisions of Chapter**
13 **373, Florida Statutes, and the FDEP and SFWMD rules related to water well**
14 **construction?**

15 A. The principal purpose of these statutes and rules is to protect and manage water resources
16 of the State of Florida including groundwater to allow for its full and beneficial use for a
17 variety of purposes to support water supply, environmental resources, conservation, and
18 protection of water quality for the citizens of the State. This is achieved under these
19 statutes and rules by regulating the construction of new water wells to prevent
20 contamination to water resources.

21 **Q. In your own words, what are the substantive criteria that the FDEP and SFWMD**
22 **have adopted in Chapters 62-532 and 40E-3, F.A.C., respectively, related to the**
23 **design and construction of groundwater wells?**

1 A. Under these substantive criteria, wells are to be properly constructed to prevent
2 contamination of underground sources of drinking water from storm water runoff;
3 contamination of drinking water from environmental hazards; migration of contaminants
4 through uncased or unsealed boreholes, and unsealed or otherwise unsanitary well and
5 wellhead facilities.

6 **Q. Are there existing groundwater wells at the Turkey Point Plant that withdraw**
7 **water from the Upper Floridan Aquifer?**

8 A. Yes. There are three existing FPL-owned UFA wells located in the vicinity of FPL
9 Turkey Point Unit 5.

10 **Q. To your knowledge were those wells properly constructed and operated in**
11 **accordance with applicable FDEP and SFWMD criteria for water wells?**

12 A. Yes.

13 **Q. Could you please identify Exhibit FPL-16, which is Figure 1.3-1 from the Petition**
14 **for Modification “Aerial with Well Sites.”?**

15 A. Yes. This is a figure showing the proposed locations of the six new UFA wells.

16 **Q. Is that Exhibit FPL-16 true and correct?**

17 A. Yes.

18 **Q. Could you please identify composite Exhibit FPL-17 which is a compilation of**
19 **Figures 2.1-1A through 2.1-1F from the Petition for Modification “Well Site**
20 **Areas”?**

21 A. This is a composite figure showing a more close-up view of the locations for each of the
22 proposed wells.

1 **Q. Using this composite Exhibit FPL-17, could you provide a bit more detail as to the**
2 **proposed locations of each of the wells?**

3 A. As seen on Exhibit FPL-17, Well F-1, the easternmost well, is located within the
4 protected area of FPL Turkey Point Units 3&4. It is adjacent to the CCS, will be
5 installed in a protected vault, and piped underground to the CCS for gravity flow of water
6 to the CCS. F-1 will also be fitted with connections for emergency water use in Units 3
7 and 4 under requirements of the US Nuclear Regulatory Commission. Wells F-2, F-3 and
8 F-4 are located along the northern edge of the CCS and are spaced approximately 1800
9 feet apart. Wells F-5 and F-6 are located along the western edge of the CCS and spaced
10 approximately 2000 feet apart. All of the wells are adjacent to the CCS to allow gravity
11 flow of water into the CCS.

12 **Q. Could you please describe the process used to select the proposed locations of the**
13 **new wells to be installed into the Upper Floridan Aquifer?**

14 A. The process used to select the well sites included various criteria as follows:

- 15 a) Each well site needed adequate space required for drilling and support equipment to
16 construct each well. It takes an area of approximately 10,000 to 20,000 square feet to
17 construct a UFA well.
- 18 b) Each well needed to be sited in close proximity to the release location to efficiently
19 transmit water to the intended location (the CCS). Additionally a compatible water
20 release location (the CCS) is needed to accept produced development and testing water
21 during construction of the well.
- 22 c) Well sites need to be spaced sufficiently distant from each other to minimize pumping-
23 induced water level interference effects. Well interference increases drawdown in wells.

1 Based on the known aquifer characteristics, computer model simulated drawdown, and
2 experience with other comparable UFA wellfields in South Florida, an approximate
3 spacing of 2,000 feet was selected.

4 d) The northwest corner of the CCS was considered desirable by providing distance from
5 the existing Unit 5 UFA wells and minimizing drawdown impact to existing legal users
6 including the Ocean Reef Club and Card Sound Golf Club on North Key Largo.

7 e) The six (6) proposed UFA wells are not currently planned to be fitted with submersible
8 well pumps to increase flow. The wells will be operated using artesian aquifer pressure
9 only with an expected flow rate of approximately 2,000 gpm each. This condition
10 minimizes stress on the aquifer. Having sufficient spacing of the wells, and sufficient
11 distance from the existing in-service Unit 5 wells was important to minimize well
12 interference effects and maximize individual well flow rates.

13 **Q. To your knowledge, what is the expected start date for construction of the wells?**

14 A. My understanding is that well construction will begin as soon as all necessary approvals
15 are obtained and final.

16 **Q. What is the expected duration for the construction of each well and for construction
17 of all of the proposed UFA wells?**

18 A. The expected duration is estimated to be 2-3 months per well and 8-12 months to
19 complete all the wells. It is anticipated that multiple drilling rigs will be used for the
20 project.

21 **Q. Could you please identify Exhibit FPL-18?**

22 A. Yes. This is Figure 3.2-1 from the Petition for Modification, titled "Well Construction
23 Diagram," showing a profile view of the proposed wells' construction.

1 Q. Is Exhibit FPL-18 true and correct?

2 A. Yes.

3 Q. Referring to Exhibit FPL-18, could you please describe the design of the new wells
4 to be installed into the Upper Floridan Aquifer?

5 A. The design of the new wells is similar to the design of the Unit 5 UFA wells that were
6 successfully installed and currently in service. The diameters of the casings and
7 boreholes in the new wells are somewhat smaller because the wells will not be
8 accommodating large vertical turbine well pumps as is the case with the Unit 5 UFA
9 wells. The new wells consist of three strings of casing: i.) a steel, 48-inch diameter
10 (0.375" wall thickness) pit casing installed to a depth of approx. 60 feet below land
11 surface (bls); ii.) a steel, 36-inch diameter (0.375" wall thickness) surface casing installed
12 to a depth of approx. 460 feet bls, within a nominal 47-inch diameter borehole and
13 cement grouted to land surface; and iii.) a fiberglass reinforced plastic (FRP), 20-inch
14 diameter (0.63" wall thickness) final casing installed to approximately 1,020 feet bls,
15 within a nominal 35-inch diameter borehole and cement grouted to land surface.
16 Following casing installation, grouting and cement curing, the completion interval is
17 drilled without drilling mud, using the reverse air drilling method to total depth of 1,250
18 feet bls. The completion interval consists of a drilled open borehole in solid limestone
19 rock, with no casing.

20 Q. What is the expected cased depth and total depth of the wells?

21 A. The final casing depth of the FRP casing is expected to be approximately 1,020 feet
22 below land surface. The total depth of the wells is expected to be 1,250 feet bls.

1 **Q. Could you please describe the process for construction and completion of the new**
2 **wells?**

3 **A.** Each well will include three strings of casing as described above.

4 PIT CASING - The largest and outermost casing is the “pit casing” that will be installed
5 to a depth of approximately 60 feet. The pit casing consists of steel, 48-inch diameter
6 pipe (0.375” wall thickness as required by rule) installed either by vibrating in place or
7 within a mud rotary borehole with the minimum annular space of 2-inches. Casings that
8 are cemented in place will include a grout mix with neat cement with no more than 5.5
9 gallons of water added per 94 pound sack of Portland cement. If bentonite is added to the
10 cement mix, no more than 6 percent will be added (up to 8% is allowable by rule) with 6
11 gallons of water per sack. The purpose of the pit casing is to provide an initial foundation
12 for drilling, prevent mud leaks and blow outs at the surface, and prevent the highly
13 permeable portions of the shallow aquifer from causing circulation problems during
14 drilling.

15 SURFACE CASING – Following pit casing installation, a mud rotary borehole of a
16 nominal 47-inches in diameter is drilled from the base of the pit casing (60 feet) to a
17 depth of 460 feet, to accommodate a 36-inch diameter steel surface casing (0.375” wall
18 thickness as required by rule) installed to 460 feet bls. The surface casing will be
19 cemented in place using neat Portland cement grout with a cemented annular space of at
20 least 5½ inches (the applicable rule requires a minimum of 2 inches). The grout mix will
21 have no more than 5.5 gallons of water added per 94 pound sack of Portland cement. If
22 bentonite is added to the cement mix, no more than 6 percent will be added (up to 8% is
23 allowable by rule) with 6 gallons of water per sack. The lower 100 feet of casing will be

1 cemented using only neat Portland cement. The surface casing provides a seal and
2 separation from the surficial aquifer including the Biscayne Aquifer to prevent drilling
3 activities within the brackish Upper Floridan Aquifer from impacting the upper aquifers
4 during well construction. This approach is more conservative than required by water well
5 construction rules. As was the case with the pit casing, the installed surface casing also
6 prevents permeable portions of the shallow aquifer from causing circulation problems
7 during deeper drilling.

8 FINAL CASING – The final casing consists of a fiberglass reinforced polyester (FRP),
9 20-inch inside diameter (ID) casing (having a 0.63” wall thickness and 225 psi pressure
10 rating that exceeds the minimum required schedule 40 rating for PVC) installed to
11 approximately 1,020 feet bls within a nominal 35-inch diameter borehole and cement
12 grouted to land surface. The cementing requirements are the same as previous casing
13 strings and the lower 100 feet of casing will be cemented using only neat Portland
14 cement. The cemented annular space for the final FRP casing will be at least 4¼ inches
15 (by rule a minimum of 2-inches is required). Cement cure times are 12 hours between
16 lifts and 48 hours for full cure prior to continuing drilling operations (this exceeds the
17 rule minimum cement grout cure time of 12 hours).

18 Following casing installation, grouting and cement curing, the well casing is evacuated of
19 drilling mud, replaced with water and the completion interval is drilled using the reverse
20 air drilling method to total depth of 1250 feet bls. The use of air and water for drilling
21 prevents drilling mud from being discharged into the CCS. The completion interval is
22 completed open hole construction as is standard for wells completed in the UFA.

- 1 **Q.** Will the well casings you described conform to the standards identified in subsection
2 62-532.500(1), F.A.C., as incorporated by reference in paragraph 40E-3.036(1)(c),
3 F.A.C.?
- 4 A. Yes.
- 5 **Q.** What is the proposed grouting interval for the wells?
- 6 A. The grouted interval of the wells will be continuous from the base of the final casing
7 (estimated to be 1,020 feet below land surface) up to land surface as required by rule.
- 8 **Q.** Will the grouting method you described comply with the substantive requirements
9 of Rule 40E-3.517, F.A.C.?
- 10 A. Yes.
- 11 **Q.** Will the wells be sealed and covered and if so, please describe those seals and their
12 purpose?
- 13 A. Each well facility will include a surface stainless steel wellhead that is sealed to the FRP
14 casing and also sealed within a concrete pad. Each wellhead will be equipped with a
15 sealed stainless steel isolation valve fitted to the discharge piping to control and isolate
16 flow from the well. All well piping materials and fitted equipment will be either 316L
17 stainless steel pipe or high density polyethylene pipe (HDPE). Discharge piping for each
18 well will include a mechanical calibrated flow meter equipped with a totalizer to measure
19 water release rate and total water released.
- 20 **Q.** Will the sealing method you described comply with the substantive requirements of
21 Rule 40E-3.517, F.A.C.?
- 22 A. Yes.

1 **Q. You mentioned that the wells will be artesian. Will the well casing penetrate the**
2 **entire thickness of the overlying formation above the Upper Floridan Aquifer?**

3 **A. Yes.**

4 **Q. Will the well design include a control of the discharge from the well in accordance**
5 **with Rule 40E-3.529, F.A.C.?**

6 **A. Yes, the wellhead design includes a 316L stainless steel wellhead and 316L stainless steel**
7 **isolation valve to prevent unintentional water discharge from each well.**

8 **Q. Will the top of the well casing extend at least 12 inches above land surface or above**
9 **the 100 year flood elevation?**

10 **A. Yes.**

11 **Q. Will the well casing, covers, and casing heights comply with all applicable non-**
12 **procedural requirements?**

13 **A. Yes**

14 **Q. Could you please describe the pumps that will be installed for the pumping of water**
15 **from the wells?**

16 **A. No pumps will be used for the permanent well facilities. Water production from each**
17 **well will be limited to artesian flow. Flow will be metered using calibrated flow meters**
18 **and each well will be equipped with an isolation valve as required. During development**
19 **and testing of the wells, the well contractor will use pumps that will likely be submersible**
20 **turbine type and powered by electric motors.**

21 **Q. In your opinion, will the construction of the wells cause harm to the water resources**
22 **of the Water Management District or interfere with existing legal users, under rule**
23 **40E-3.301(3), F.A.C.?**

1 A. No.

2 **Q. What is the basis for your opinion?**

3 A. Construction will be in accordance with, or more stringent than State of Florida water
4 well construction rules that were established to prevent harm to water resources of the
5 State. Well construction will be performed by a State of Florida certified water well
6 contractor(s) with oversight and inspection by qualified professionals with experience in
7 water well construction.

8 **Q. During construction, will an accurate field log be maintained for the well**
9 **construction?**

10 A. Yes.

11 **Q. Following construction of the wells, will FPL submit a well completion report**
12 **pursuant to Rule 40E-3.411, F.A.C.?**

13 A. Yes.

14 **Q. Will the new UFA wells be constructed so as to prevent adverse impacts, including**
15 **uncontrolled surface flow, uncontrolled movement of water from one aquifer or**
16 **water bearing zone of differing water quality to another, and contamination of**
17 **groundwater or surface water resources, required under rule 40E-3.502(1), F.A.C.?**

18 A. Yes.

19 **Q. What is the basis for your opinion?**

20 A. Construction will be in accordance with, or more stringent than, State of Florida water
21 well construction rules that were established to prevent harm to water resources of the
22 State. Each well will be fitted with a water tight wellhead and isolation valve to prevent
23 unintended flow from the well. Each well has cemented in place casings, explained in

1 detail previously, that prevent water flow from one water bearing zone to another. As
2 intended, all produced water from the wells will be released in a controlled manner only
3 to the CCS.

4 **Q. Will the new wells be located so as to not pose a threat of contamination to the water**
5 **resource and to provide for the protection of the health, safety and welfare of the**
6 **user, in accordance with Rule 40E-3.504(1), F.A.C.?**

7 A. Yes

8 **Q. Will the well construction materials be reasonably free of contamination as required**
9 **by Rule 40E-3.512, F.A.C.?**

10 A. Yes.

11 **Q. What is the basis for your opinion?**

12 A. All well construction materials used for the wells will be new, previously unused and
13 approved for use in water well construction.

14 **Q. Will water used during construction of the wells be supplied from a potable well or**
15 **a potable water supply?**

16 A. The water source for construction of the wells will be from a potable water supply.

17 **Q. Will the construction of the wells require use of explosives?**

18 A. No.

19 **Q. During construction, will the wells be available for inspection by representatives of**
20 **FDEP and SFWMD in accordance with Rule 62-532.510, F.A.C?**

21 A. Yes

22 **Q. Once the water is pumped from the new Upper Floridan Aquifer wells, what will be**
23 **done with that water?**

1 A. Water discharged from the UFA wells will be directed to the CCS using permanent
2 piping fitted to the wellhead. The wells are each located adjacent to the CCS, so the
3 piping length is minimized and so the wells will efficiently deliver water to the CCS for
4 the purpose of salinity reduction.

5 **Q. At what locations at the Turkey Point plant will the water from the UFA wells be**
6 **released to the cooling canal system?**

7 A. Water released from the UFA wells will enter the CCS at each well location discussed
8 previously.

9 **PPSA CRITERIA**

10 **Q. In your opinion, will the design and construction of the proposed wells to be**
11 **installed in the Upper Floridan Aquifer include technical safeguards that are**
12 **technically sufficient for the public welfare and protection?**

13 A. Yes.

14 **Q. What is the basis for your opinion?**

15 A. The wells will be constructed to standards that meet or exceed State of Florida
16 requirements for well construction. Construction will be performed by experienced and
17 qualified water well contractors that are licensed by the State of Florida. Construction of
18 the wells will be overseen by experienced professionals with principal oversight by State
19 of Florida licensed professional geologists with expertise in UFA well construction.

20 **Q. In your opinion, will the design and construction of the proposed wells to be**
21 **installed in the Upper Floridan Aquifer comply with the applicable nonprocedural**
22 **requirements of FDEP and SFWMD?**

23 A. Yes.

1 **Q. What is the basis for your opinion?**

2 A. The intent of the well design is to not only meet, but exceed applicable well construction
3 regulations. This design provides the well contractor with the ability to construct a
4 “better” and more constructable well than if the design simply complied with the
5 minimum standards. More constructable means boreholes are larger to accommodate
6 unforeseen circumstances when casings are installed. It means an additional casing string
7 is installed, or the casing is installed deeper, to case off problematic loss of circulation
8 zones that prevent proper drilling circulation to remove drill cuttings. I have extensive
9 experience with not only designing and constructing successful wells but I have also been
10 tasked with diagnosing and correcting (where possible) problem UFA wells. Often times
11 problem wells were constructed to a minimum standard. From this experience, we have
12 implemented this design to reduce the risk of construction related failure. The
13 construction of the wells will employ best management practices and meet or exceed all
14 applicable standards and employ best management practices.

15 **Q. In your opinion, can the construction of the proposed wells be performed in an**
16 **orderly, reliable and timely fashion?**

17 A. Yes.

18 **Q. What is the basis for your opinion?**

19 A. A detailed plan and schedule has been developed. In my experience, with experienced
20 and qualified water well contractors and an appropriate level of experienced and qualified
21 professional oversight, these projects are constructed in an orderly, reliable and timely
22 fashion and will be done so here.

1 Q. In your opinion, will the design and construction of the proposed wells to be
2 installed in the Upper Floridan Aquifer minimize, “through the use of reasonable
3 and available methods, the adverse effects on human health, the environment, and
4 the ecology of the land and its wildlife and the ecology of state waters and their
5 aquatic life” that might be caused by the wells?

6 A. Yes.

7 Q. What is the basis for your opinion?

8 A. The wells will be constructed within drill sites that will have environmental controls to
9 prevent construction related discharges outside the well site. Drilling equipment will be
10 powered by electricity and electric motors are significantly quieter and cleaner than diesel
11 engines typical of drilling equipment. Drilling solids will be retained and reused as fill
12 material for use at the site. Drilling fluids will be contained in the areas identified for
13 fluid containment and not discharged outside the containment areas.

14 Q. In your opinion, will the design and construction of the proposed wells to be
15 installed in the Upper Floridan Aquifer have any adverse impacts upon air and
16 water quality, fish and wildlife, water resources, and other natural resources of the
17 state and if so, could you identify those impacts?

18 A. No. The proposed wells will be designed and constructed in accordance with all
19 applicable requirements, including those in place for protection of the environment and,
20 as discussed previously, FPL will implement environmental controls to minimize any
21 impacts during construction of the wells.

1 Q. In your opinion, will the design and construction of the proposed wells to be
2 installed in the Upper Floridan Aquifer serve and protect the broad interests of the
3 public?

4 A. Yes.

5 Q. What is the basis for your opinion?

6 A. The proposed wells are designed and will be constructed to meet or exceed all applicable
7 standards designed to protect the public.

8 Q. Does this conclude your prepared written testimony?

9 A. Yes.

**FLORIDA POWER & LIGHT COMPANY
TURKEY POINT UNITS 3-5 MODIFICATION
DOAH CASE NO. 15-1559**

PETITION FOR MODIFICATION AND COMPLETENESS WITNESS SPONSORSHIP

Witness	Petition Sections Sponsored (including figures, tables, attachments referenced in same)	Completeness Responses Sponsored
Steve Scroggs	1.0—Need for the Proposed Facility	SFWMD-5
	1.1—Facility Introduction	SFWMD-6
	1.2—The Applicant	SFWMD-7
	1.3—Overview of the Project(s)	MDC-1
	1.3.2—Fukushima Compliance	MDC-3
	1.3.3—Unit 5 Well Water Re-allocation	MDC-5
	1.4—Conditions of Certification	MDC-6
	1.5—Need for the Project	MDC-12
	1.6—Summary of Public Outreach	MDC-15
	3.1—Background	
	3.10.1—Construction Materials and Equipment	
	4.1.4—Roads and Slip	
	Appendix C	
Jim Andersen	2.1.1—Site Location	MDC-10
	2.3.1—Geogydrology	MDC-18
	2.3.2—Subsurface Hydrology	
	3.2.1—Production Well Description	
	3.3.1—Production Wells	
	3.3.2—Alternative Water Supply Line	
	4.1.1—Production Wells	
	4.1.2—Alternative Water Supply Line	
	4.1.2.1—General Construction Impacts	
	4.1.3—Alternative Water Supply Line	
Pete Andersen	1.3.1—Salinity Reduction Plan	SFWMD-1
	2.3.3—Site Water Budget and Area Users	SFWMD-2
	3.2.2—Cooling Canal System	SFWMD-3
	3.2.3—Permitted Water Withdrawals	SFWMD-4
	3.6—Plant Water Use	MDC-4
	4.3—Groundwater Impacts	MDC-7
	5.1.1—Production Wells	MDC-8
	5.1.2—Alternative Water Supply Line	MDC-9
	Appendix A	MDC-11
	Appendix B	MDC-13
		MDC-16
		MDC-17
		MDC-19
		MDC-20

		MDC-20
		MDC-21
		MDC-22
		MDC-23
		MDC-24 (including all subquestions A through)
		MDC-25
		Revised Appendix B
Greg Powell	2.3.4—Surficial Hydrology	
	3.7—Chemical and Biocide Waste	
	3.8—Solid and Hazardous Waste	
	3.9—Site Drainage	
	4.1.5—Flood Zones	
	4.2—Impact on Surface Water Bodies and Uses	
	4.2.1—Impact Assessment	
	4.2.2—Measuring and Monitoring Program	
	5.1.3—Leachate and Runoff	
	5.1.4—Measurement Programs	
	5.2—Sanitary and Other Waste Discharges	
Karl Bullock	2.3.5—Vegetation/Land Use	
	4.4.1—Impact Assessment (wetlands)	
	4.4.2—Measuring and Monitoring Programs (wetlands)	
	5.5—Ecological Impacts (wetlands)	
Jim Lindsay	2.3.6.1—Species-Environmental Relationships	MDC-14
	2.3.7—Pre-existing Stresses	
	2.3.7.1—Measurement Programs	
	4.4.1—Impact Assessment (wildlife)	
	4.4.2—Measuring and Monitoring Programs (wildlife)	
	5.5—Ecological Impacts (wildlife)	
Ken Kosky	2.3.8—Meteorological and Ambient Air Quality	
	2.3.8.1—Ambient Air Quality	
	2.3.9—Noise	
	3.4—Fuel	
	3.5—Air Emission and Controls	
	4.5—Air Impacts	
	4.5.1—Control Measures	
	4.6.1—Construction Noise Impacts	
	5.3—Air Quality Impacts	
	5.4—Noise Impacts	
Kerri Kitchen	2.2.1—Governmental Jurisdictions	MDC-2
	2.2.2.1—Future Land Use	
	2.2.2.2—Zoning	
	4.1.6—Topography and Soils	

CURRICULUM VITAE

JAMES L. ANDERSEN, P.G.

Principal Hydrogeologist, JLA Geosciences, Inc.

QUALIFICATIONS AND EXPERIENCE President of JLA Geosciences, Inc., Jupiter, Florida and is responsible for company operations, project management, technical oversight, well design and construction phase services team leader. Mr. Andersen is going on his 30th year of working experience in hydrogeology, groundwater water resource investigations, wellfield design, construction, evaluations and rehabilitation. He has extensive experience in project and personnel management related to water resource planning, design, bidding and construction phase services. Mr. Andersen has successfully completed over 250 supply wells at 50 different wellfields. He has been responsible for more than 80 Upper Floridan Aquifer wells at 18 different wellfields throughout the state of Florida. He has an extensive background in nanofiltration (NF) and reverse osmosis (RO) raw water supply investigations, wellfield contamination investigations, collection and analysis of water quality data; rehabilitation of old wells, and supervising various types of drilling. Mr. Andersen has served as a short course instructor and speaker for various agencies and organizations including FDEP, Florida Chamber of Commerce, AWRA and American Groundwater Trust (AGT), Southeastern Desalting Association (SEDA) and American Membrane Technology Association (AMTA) on topics such as membrane treatment water supply, Aquifer Storage and Recovery (ASR), well design, rehabilitation, permitting, well construction and contamination cleanup.

PROJECT EXPERIENCE

Principal Hydrogeologist/Project Hydrogeologist, FPL West County Energy Center Upper Floridan Aquifer Wellfield, Loxahatchee, Palm Beach County, FL. (2009) Project included design, construction and testing of four (4) new 24-inch diameter FRP Upper Floridan aquifer wells. Project included an APT. The wells have capacities of 3,500 gpm, 4,700 gpm, 7,000 gpm, and 3,500 gpm and produce 20 MGD of brackish water for power plant cooling. Designed and implemented of acid treatment program for two (2) wells resulting in a specific capacity percent gain of 43% and 121%. Performed a comprehensive 72-hour Upper Floridan Aquifer APT with the pumping well producing 6,000 gpm. Additionally, the project also included the design, well construction and development of one (1) potable Surficial Aquifer well.

Principal Hydrogeologist/Project Hydrogeologist, ASR Permitting, Testing Services, The City of West Palm Beach, West Palm Beach, Florida. (2009-2013, ongoing) Project scope of services included assisting the City in obtaining funding opportunities with cycle testing activities through various entities, assistance with obtaining FDEP Underground Injection control (UIC) permit modification, UIC monitor well design, permitting, construction and bidding phase services, exploration of Limited Aquifer Exemption assistance through FDEP, ASR Cycle Testing assistance, and evaluation of the City's recovery discharge alternatives.

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Principal Hydrogeologist/Project Manager/Project Hydrogeologist, Lake Region Water Treatment Plant, Upper Floridan Aquifer Wellfield SFWMD Permitting Assistance, and Well Construction and Testing Services Palm Beach County Water Utilities Department, Belle Glade, Florida (2012-2013). The Project included the well design, well installation construction observation and testing associated with the construction of one (1) new 14-inch diameter Upper Floridan aquifer well for the Lake Region WTP (2012). The Project included the development of a constant-density MODFLOW model with variable-density SEWAT code to obtain a SFWMD letter modification which predicted that additional UFA wells with increase spacing will reduce the rate of raw water salinity trends and decrease the rate of saline water upconing (approved).

Principal Hydrogeologist/Project Hydrogeologist, Class V Reverse Osmosis Concentrate Injection Well Permitting and Design Services, La Gorce Country Club, Miami Beach, Florida. (2011-2012, ongoing) Project scope of services included all phases of injection well permitting and construction, including preparation of the FDEP injection well construction and testing permit (approved), well design and contractor bidding services, in addition to observation and testing during construction, mechanical integrity testing and well summary report preparation.

Principal Hydrogeologist/ Project Hydrogeologist, Environmental Site Assessments, Well Siting and Water Quality Exploratory and Monitor Well Construction, City of West Palm Beach, West Palm Beach, Florida (2011) Project included Phase I Environmental Site Assessment reporting in accordance with Federal Register and ASTM Standard E 1527-05; well siting including site review of multiple City sites, review of vicinity history data, federal, state, and local regulatory agency files, interviews with knowledgeable persons regarding site activities, and site inspections. The project also included the preparation of technical specifications and construction oversight for the construction and testing of a 4-inch diameter water quality exploratory well to evaluate potential contaminations.

Principal Hydrogeologist/ Project Hydrogeologist, Palm Beach County Water Utilities Department System 9 Wellfield Construction of 6 Production Wells, Boca Raton, Florida (2011) Project included well design, well installation construction observation and testing associated with the construction of six (6), 16-inch diameter screened Surficial Aquifer production wells for Palm Beach County Water Utilities Department, System 9 Water Treatment Plant. The comprehensive development plan produced higher than anticipated well capacity and water quality which meet or exceed RO criteria at the maximum design pumping rate of 1,200 gpm.

Principal Hydrogeologist/Project Hydrogeologist, Town of Manalapan Reverse Osmosis Upper Floridan Aquifer Well 16, Manalapan, FL. (2008) design, construction observation and testing of one 14-inch diameter Floridan Aquifer production well including well design, construction observation, lithologic and water quality sampling, geophysical logging observation and analysis, well development observation and testing, and pump testing. The completed well met the design pumping rate of 1,500 gallons per minute with excellent water quality, meeting and exceeding reverse osmosis treatment parameters.

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Principal Hydrogeologist/Project Hydrogeologist, Upper Floridan Aquifer Reverse Osmosis Production Well, Private Residence, Jupiter Island, Florida. (2009). hydrogeologic consulting services associated with the construction of one 8.5-inch diameter production well for reverse osmosis including design, field construction observation, logging, sampling, measurement and testing services; interpreting the hydrogeologic, water quality and geophysical data; and making recommendations as to the depths of boreholes, well casings, and completion intervals for the water supply well. Sand test results were less than 0.1 ppm and SDI values were less than 1.0 at the design flow rate.

Principal Hydrogeologist/Project Hydrogeologist, FMPA/FPUA Treasure Coast Energy Center Floridan Aquifer Wellfield Construction, Fort Pierce, St Lucie County, FL. (2007) Project construction and testing of three (3) new 2,500 gpm, 17.4-inch diameter PVC Upper Floridan aquifer wells.

Principal Hydrogeologist/Project Hydrogeologist, City of Lake Worth Reverse Osmosis Upper Floridan Aquifer Wellfield, Palm Beach County, FL. (2006) Project design, construction and testing of one (1) test production well and (2) production wells for Reverse Osmosis. A new jetting development program was implemented at this project and as a result the wells have SDI results below 0.5 at design flow.

Principal Hydrogeologist/Project Manager/Project Hydrogeologist, Palm Beach Par 3, Upper Florida Aquifer Well, Palm Beach, FL (2009). Project included well design, well installation construction observation and testing associated with the construction of one (1) new 10-inch diameter Upper Floridan aquifer well for the Town's Palm Beach Par 3 golf course. Furthermore, JLA designed and implemented an aggressive acid treatment program which doubled specific capacity of the well.

Principal Hydrogeologist/Project Hydrogeologist, Town of Lantana Surficial Aquifer Public Water Supply Wells 11 and 12 (2009, 2010). As part of a project team working for the Town, designed and oversaw construction of two (2), 250 feet depth, 24 inch by 17.4 inch diameter public water supply construction wells and associated test wells. The wells are screen (16 inch diameter) and gravel pack type construction utilizing large slot stainless steel screens (0.090-0.100 inch slot openings) to maximize well efficiency and long term performance. Water quality of the aquifer was evaluated using test well program that helped identify the best intervals to complete the wells and obtain superior raw water quality.

Principal Hydrogeologist/Project Hydrogeologist, Bio-solids Processing Facility Industrial Wastewater Force Main Construction Dewatering Permit, New England Fertilizer Company (NEFCO)/Solid Waste Authority (SWA), West Palm Beach, Florida. (2012) Project scope of services included preparation of a dewatering plan, including analytical modeling, to South Florida Water Management District for the construction of a new Industrial Wastewater Force Main for SWA Biosolids Processing Facility.

Principal Hydrogeologist/Project Manager/Project Hydrogeologist, Town of Jupiter Upper Floridan Aquifer Wellfield Expansion Projects, Jupiter FL. (1995/1997/2004/2006) Project

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design, construction and testing of Upper Floridan aquifer wells RO-11, 12 and 13 (2004), RO-8, 9 and 10 (1997), RO-5, 6, 7 and a dual zone FAS monitor well (1995), RO-1 abandonment (2006). Performed 2 Upper Floridan aquifer APTs for the Town. The Floridan Aquifer wells mentioned brought Town's raw water capacity to its reverse osmosis plant to 23 MGD.

Principal Hydrogeologist/Project Hydrogeologist, South Martin Regional Utility, Floridan Aquifer Well Construction, Hobe Sound, Martin County, FL (2001) - Project included design and construction of two (2), 2.5 MGD Upper Floridan aquifer wells for the Utility's new reverse osmosis water treatment plant. A unique feature of this project was that the wells were sited at locations above 50 feet above mean sea level to prevent flowing condition during construction and reducing maintenance costs. Project included an APT. After two years in operation, RO plant micron prefilters need only be changed semi annually. The prefilters have never experienced a significant pressure drop resulting from the raw water quality, even after startup.

Principal Hydrogeologist/Project Manager/Project Hydrogeologist, Town of Jupiter Upper Floridan Aquifer Wellfield Improvement Project, Jupiter FL (1996) Project included investigation of poor yielding Upper Floridan aquifer wells, design, drilling to deepen and testing of existing Floridan wells RO-2 and RO-3. The project increased design capacity of the wells by 50 percent and increased the specific capacity of the wells by over 400%.

Principal Hydrogeologist/Project Hydrogeologist, Martin County Utilities, Tropical Farms Upper Floridan Aquifer Wellfield Construction for Reverse Osmosis, Stuart, FL (2003) - Upper Floridan aquifer wellfield included design, construction, acid treatment and testing of five (5) new Floridan aquifer wells to provide raw water to a new reverse osmosis plant for Martin County Utilities. Project included an Aquifer Performance Test (APT) to evaluate permeability in the Upper Floridan aquifer. The wells met the design yield criteria of 2.3 to 2.5 MGD per well and raw water quality in each of the wells exceeded design with SDI values of 1 or less.

Principal Hydrogeologist/Project Hydrogeologist, St. Lucie West Services District Upper Floridan Aquifer Wellfield, St. Lucie County, FL. (2004) Project design, construction, acid treatment and testing of one (1) test production well and (2) production wells. Specific capacities of the wells were between 150 and 300 gallons per minute per foot of drawdown at the per-well design flow of 2 MGD. SDI results were 1.0 or less.

Principal Hydrogeologist/Project Hydrogeologist, Martin County Utilities, North Plant, Upper Floridan Aquifer Wellfield Expansion, Jensen Beach, FL (2000) - Upper Floridan aquifer wellfield included design, construction and testing of two new Floridan Aquifer wells (RO-3 and RO-4) for Martin County Utilities to expand the existing reverse osmosis plant for Martin County Utilities.

Principal Hydrogeologist/Project Hydrogeologist, Upper Floridan Aquifer Reverse Osmosis Well F-2, Modification, La Gorce Country Club, Miami Beach, Florida. (2010). Evaluated produced water from the existing well through step drawdown testing, water quality testing, and geophysical logging, and worked with a contractor to modify the well with a shallower completion

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interval which produced lower total dissolved solids which enabled raw water which was more typical of low pressure RO systems, at a lower pumping rate.

Principal Hydrogeologist/Project Hydrogeologist, FPL Turkey Point Upper Floridan Aquifer Wellfield Expansion, Homestead, Dade County, FL. (2006) Project design, construction and testing of three (3) new 4,500 gpm, 24-inch diameter FRP Upper Floridan aquifer wells. Designed and implemented an aggressive acid treatment program so that all wells met or exceeded design flow requirements of 6.5 MGD each. Project included an APT. The well testing approach implemented for construction enabled the wells to produce water quality with a fraction of the TDS anticipated for the project.

Principal Hydrogeologist/Project Manager/Project Hydrogeologist, Seacoast Utility Authority Upper Floridan Aquifer Wellfield Projects, Palm Beach Gardens, FL (2007/2008/2009) Project included design, construction and testing of two Upper Floridan aquifer wells F-2, and F-3 (2008, 2009), and consulting assistance with the Floridan aquifer test well F-1 (2007). Project included a four well aquifer performance test (APT). The three Floridan Aquifer wells will provide 6.7 MGD of raw water capacity to a planned brackish LPRO water treatment plant to be built by 2013.

Principal Hydrogeologist/Project Hydrogeologist, Town of Jupiter Surficial Aquifer Wellfield Rehabilitation, Jupiter, Palm Beach County, FL. (2007) Managed and oversaw the rehabilitation and improvement of Surficial Aquifer wells 6, 7, 15, 16, 18, 27, 28, 32, 33, 34, 35, 36, 37, 38 and 67 for the Town of Jupiter. Designed and implemented the rehabilitation program that has increased well capacities and reduced sand production resulting in reduced operations costs and improved efficiency. Well improvements have included well acidation, conversion of screened wells to open hole wells, jetting, air lifting and pump development to "mine out" sand, dynamic well videos to identify sand sources, new pump installations, and water quality field testing. Overall JLAG has overseen the improvement on 15 Surficial Aquifer wells utilizing approximately 69% of the total project budget. This equates to \$22,500 per well as opposed to the cost of approximately \$115,000 for a new Surficial Aquifer production well.

Principal Hydrogeologist/Project Hydrogeologist, Town of Jupiter Surficial Aquifer Wellfield Expansion (2004) - including two phases in the Indian Creek and Abacoa developments. Included design, construction and testing of screened and open hole wells.

Principal Hydrogeologist/Project Hydrogeologist, Martin County Tropical Farms Surficial Aquifer Wellfield (2003). - investigation to determine the cause of poor and rapidly declining well yields in a surficial aquifer wellfield. Prepared specifications to rehabilitate wells and implemented a wellfield wide successful reconstruction program which increased well performance and improved water quality.

Principal Hydrogeologist/Project Hydrogeologist, Martin County Utilities, North Plant, Upper Floridan Aquifer Wellfield Rehabilitation, Jensen Beach, FL (2001) - Project included design and implementation of an Upper Floridan aquifer wellfield acid treatment and development program to restore well capacities. Low pumping levels were contributing to

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slime problems in the wells. The project achieved the stated goals in restoring pumping water levels to mitigate the source of the slime.

Principal Hydrogeologist/Project Hydrogeologist, Fort Pierce Utilities Authority Upper Floridan Aquifer Well Acidification, Fort Pierce, St Lucie County, FL. (1999) Project included designing, bidding and implementing an acid treatment program to improve an existing older Upper Floridan aquifer well.

Project hydrogeologist for Palm Beach County, FL Water Utilities Division, System 3 Upper Floridan Aquifer Storage and Recovery Pilot Program, Boynton Beach, FL. (1997) - Project included permitting, design and construction of an Upper Floridan aquifer ASR well and a dual zone (upper and mid) Floridan aquifer monitor well.

Principal Hydrogeologist/Project Hydrogeologist, South Martin County Regional Utility, Hobe Sound FL Consulting - monitoring and remediation design of saline water intrusion into the south wellfield, permitting of surficial and Upper Floridan aquifer withdrawal, Utilities hydrogeologist.

Principal Hydrogeologist/Project Hydrogeologist, Town of Jupiter Island Aquifer Resource Investigation - Fresh groundwater resource investigation and location of saline water interface in the shallow aquifer system on Jupiter Island. A "Geoprobe" system was used to profile the water quality in the unlithified and poorly lithified sediments beneath the island and test borings were performed to determine geologic units.

Principal Hydrogeologist/Project Hydrogeologist, City of Cape May, New Jersey Water Supply Study - Technical team member investigating the raw water supply for the City. The study included reviewing the current hydrogeologic conditions; efficiency and continued feasibility of the City's existing Aquifer Storage and Recovery (ASR) program in the Cohansee Aquifer; existing well operating condition; and future groundwater availability for supply. The City operates wells completed in the Cohansee and Atlantic City 800-foot Sand Aquifers.

Principal Hydrogeologist/Project Hydrogeologist, City of Franklin Virginia Hunterdale Replacement Well Construction - Water quality in the Lower Potomac Aquifer was profiled to determine construction of a replacement 20 inch by 12 inch screen and gravel pack production well for the City. Profile testing included the installation of a 4-inch diameter test well to a maximum depth of 740 feet and sampling dissolved fluoride and chloride concentrations at various depths. A 1,500-gallon per minute well was constructed and pump tested.

Project hydrogeologist for the City of Miami Beach Aquifer Storage and Recovery Pilot Program - Project included FDEP UIC permitting, design, construction and cycle testing of a shallow aquifer ASR well to inject potable water into an aquifer of sea water quality.

Staff Geologist, Dare County North Carolina (Kill Devil Hills) Yorktown Aquifer Test Well Construction - A Yorktown Aquifer Test well and six observation wells were constructed to evaluate the safe yield from a brackish coastal aquifer. The project included construction of the test production and observation wells, aquifer water quality profile analysis, geophysical

JLA Geosciences, Inc. 2014

Andersen, J.

logging, a 72 hour aquifer performance test, and groundwater flow and density dependant solute transport modeling for wellfield design.

Staff Geologist, City of Titusville Wellfield Development - Development of a 4.5 MGD Surficial Aquifer wellfield in the coastal ridge area of Titusville

Staff Geologist, City of Cape Coral, Floridan Wellfield Expansion - Investigations of the Lower Hawthorn and Upper Floridan aquifer for reverse osmosis supply (21 MGD) and well field development and existing well refurbishment

Staff Geologist, Island Water Supply Wellfield Expansion - Investigations for a 7.5 MGD raw water supply from Floridan Aquifer for treatment in an electrodialysis plant and a reverse-osmosis plant on Sanibel Island.

ACADEMIC BACKGROUND

Bachelor of Science - Geology; Florida Atlantic University, 1985.

PUBLICATIONS

Andersen, J.L., 2004, Wells and Groundwater Quality, article written for the Southeastern Desalting Association, first quarter publication "Recovery Zone".

Andersen, J.L., 2003, Well Maintenance, article written for the Southeastern Desalting Association, fourth quarter publication "Recovery Zone".

Hydrogeology an Environmental Approach, textbook, by Watson, I and Burnett, A.D., 1993, Buchanan Books, Cambridge, Ft. Lauderdale, minor contributor.

Missimer, T.M., Horvath, L.E., Martin, W.K., Andersen, J.L., and Todd, D.A., 1988, Modeling of Pumping-Induced Groundwater Quality Changes at the Dare County, North Carolina Wellfield: National Water Supply Improvement Association, Annual Proceedings.

PRESENTATIONS

Permitting Alternative (Groundwater) Water Supplies, American Membrane Technology Association / Southeast Desalting Association Joint Symposium, Hawks Cay Resort, Duck Key, Florida, September 26 - 28, 2004

Raw Water Supply Considerations for Reverse Osmosis Treatment, Southeast Desalting Association Fall Conference, Bonita Springs, Florida, October 27- 28, 2003

Environmental Permitting Short Course, Practical Aspects of Implementing Contamination and Remedial Actions at Chapter 17-770 FAC Sites, Florida Chamber of Commerce Environmental

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Andersen, J.

Permitting Short Course, Florida State University Conference Center, Tallahassee, FL, 1991, 1992, 1993

Storage Tanks Update Seminar, Practical Aspects of Implementing Contamination and Remedial Actions at Chapter 17-770 FAC Sites, Florida Chamber of Commerce Permitting Summer School, Annual Conference, Marco Island, FL, 1990, 1991, 1992, 1993

Initial Remedial Action as a Means of Reducing Overall Costs, presented to Florida Department of Environmental Regulation Storage Tank Program Annual Meeting, Orlando, FL, 1990

Regulations and Standards that Govern Environmental Contamination Cleanup, Conference to Harper Brothers, Inc, Contractors, as a part of their corporate spill prevention program, Fort Myers, FL, 1990.

The Effects of Tidal Surface Water Bodies on Hydrocarbon Plume Migration in Coastal Areas, Florida Association of Water Quality Control, Annual Conference, 1990

PROFESSIONAL REGISTRATION

State of Florida, Professional Geologist, No. 1103

PROFESSIONAL AFFILIATIONS

Southeast Desalting Association

American Membrane Treatment Association

Geological Society of America

International Association of Hydrogeologists

Series	Geologic unit	Marker units and horizons	Lithology	Hydrogeologic unit	Approximate thickness (feet)
HOLOCENE and PLEISTOCENE	Undifferentiated and various Pleistocene-aged formations		Quartz sand; silt; clay; shell; limestone; sandy shelly limestone	WATER-TABLE / BISCAYNE AQUIFER	
PLIOCENE	TAMIAMI FORMATION		Silt; sandy clay; sandy, shelly limestone; calcareous sandstone; and quartz sand	CONFINING BEDS LOWER TAMIAMI AQUIFER	20-400
MIOCENE AND LATE OLIGOCENE	HAWTHORN GROUP	PEACE RIVER FORMATION	Interbedded sand, silt, gravel, clay, carbonate, and phosphatic sand	CONFINING UNIT SANDSTONE AQUIFER OR PZ101	0-900
		ARCADIA FORMATION	Sandy micritic limestone; marlstone; shell beds; dolomite; phosphatic sand and carbonate; sand; silt; and clay	CONFINING UNIT MID-HAWTHORN AQUIFER OR PZ2	
		EGAL (Hawthorn) clay		CONFINING UNIT	
EARLY OLIGOCENE	SUWANNEE LIMESTONE		Fossiliferous, calcarenitic limestone	LOWER HAWTHORN PRODUCING ZONE PZ3	0-300
EOCENE	LATE	OCALA LIMESTONE	Chalky to fossiliferous, mud-rich to calcarenitic limestone	UPPER FLORIDAN AQUIFER (UF)	100-800
	MIDDLE	AVON PARK FORMATION	Fine-grained, micritic to fossiliferous limestone; dolomitic limestone; and dolostone. Also contains in the lower part anhydrite/gypsum as bedded deposits, or more commonly as pore filling material. Glauconitic limestone near top of Oldsmar Formation in some areas	MIDDLE CONFINING UNIT (MC1) APPZ	500-1,500 0-600
	EARLY	OLDSMAR FORMATION		MIDDLE CONFINING UNIT (MC2) LOWER FLORIDAN AQUIFER	0-1,800 0-700
				CONFINING UNIT	
PALEOCENE	CEDAR KEYS FORMATION		Dolomite and dolomitic limestone Massive anhydrite beds		1,200?

EXPLANATION

Geologic unit missing in some areas

APPZ Avon Park permeable zone

BZ Boulder Zone

EHMU Lower Hawthorn marker unit

PZ1 PZ2, PZ3 Permeable zones in west-central Florida

MAP Middle Avon Park marker horizon

GLAUC Glauconitic marker horizon

PLISTOCENE-AGED FORMATIONS IN SOUTHEASTERN FLORIDA:

Coquina Formation (Hermosa)

Panacea Sand

Miami Limestone

Fort Thompson Formation

Anastasia Formation

Key Largo Limestone

Regional Generalized Hydrostratigraphic Column

Source: Reese and Richardson, 2008.





LEGEND

- Aquifer Well
- Turkey Point Plant Property Boundary

REFERENCE

FACILITY LAYOUT, GOLDER ASSOCIATES INC., 2009-2014

CLIENT

FPL
MIAMI-DADE COUNTY, FLORIDA

PROJECT

FPL TURKEY POINT CCS SALINITY REDUCTION PROJECT

TITLE

AERIAL WITH WELL SITES

CONSULTANT

YYYY-MM-DD 2014-05-13

PREPARED NRL

DESIGN NRL

REVIEW KJK

APPROVED KFK

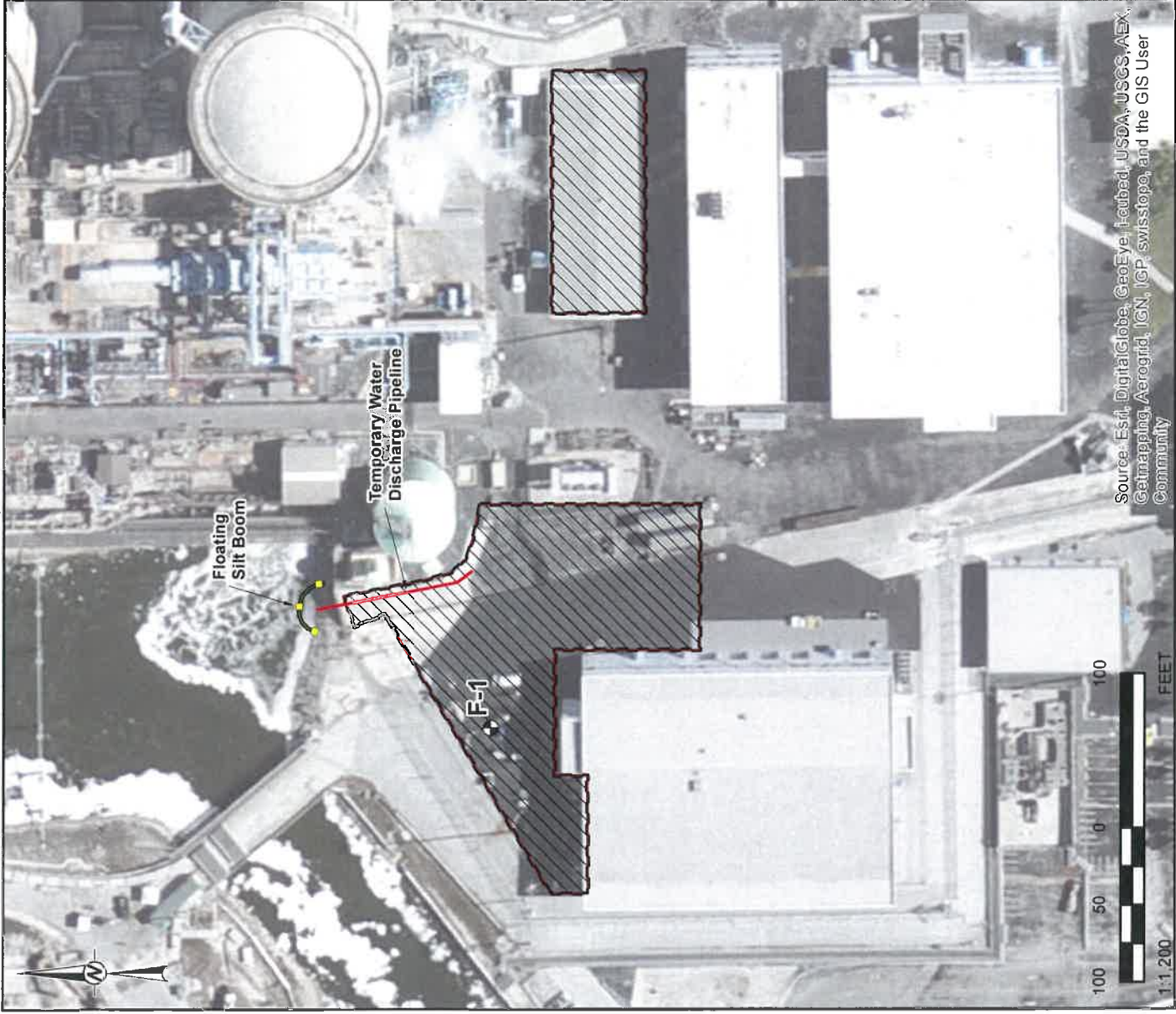


PROJECT No.
1303064

CONTROL
A003

Rev.
0

FIGURE
1.3-1



LEGEND

- Aquifer Well
- Discharge Line
- Floating Silt Boom
- Containment Area

REFERENCE

AQUIFER WELL LOCATIONS, JLA GEOSCIENCES, 2014

CLIENT

FPL
MIAMI-DADE COUNTY, FLORIDA

PROJECT

FPL TURKEY POINT CCS SALINITY REDUCTION PROJECT

TITLE

WELL SITE AREAS

CONSULTANT

YYYY-MM-DD	2014-08-05
PREPARED	NRL
DESIGN	NRL
REVIEW	KJK
APPROVED	KFK



PROJECT No.
1303064

CONTROL
A002

Rev
0

FIGURE
2.1-1A



LEGEND

- Aquifer Well
- Contour
- Discharge Line
- Discharge Pipe
- Floating Silt Boom
- Silt Fence
- Containment Area
- Rip Rap
- Well Site

REFERENCE

AQUIFER WELL LOCATIONS, JLA GEOSCIENCES, 2014

CLIENT

FPL
MIAMI-DADE COUNTY, FLORIDA

PROJECT

FPL TURKEY POINT CCS SALINITY REDUCTION PROJECT

TITLE

WELL SITE AREAS

CONSULTANT

YYYY-MM-DD 2014-08-05

PREPARED NRL

DESIGN NRL

REVIEW KJK

APPROVED KFK



PROJECT NO.

1303086

CONTROL

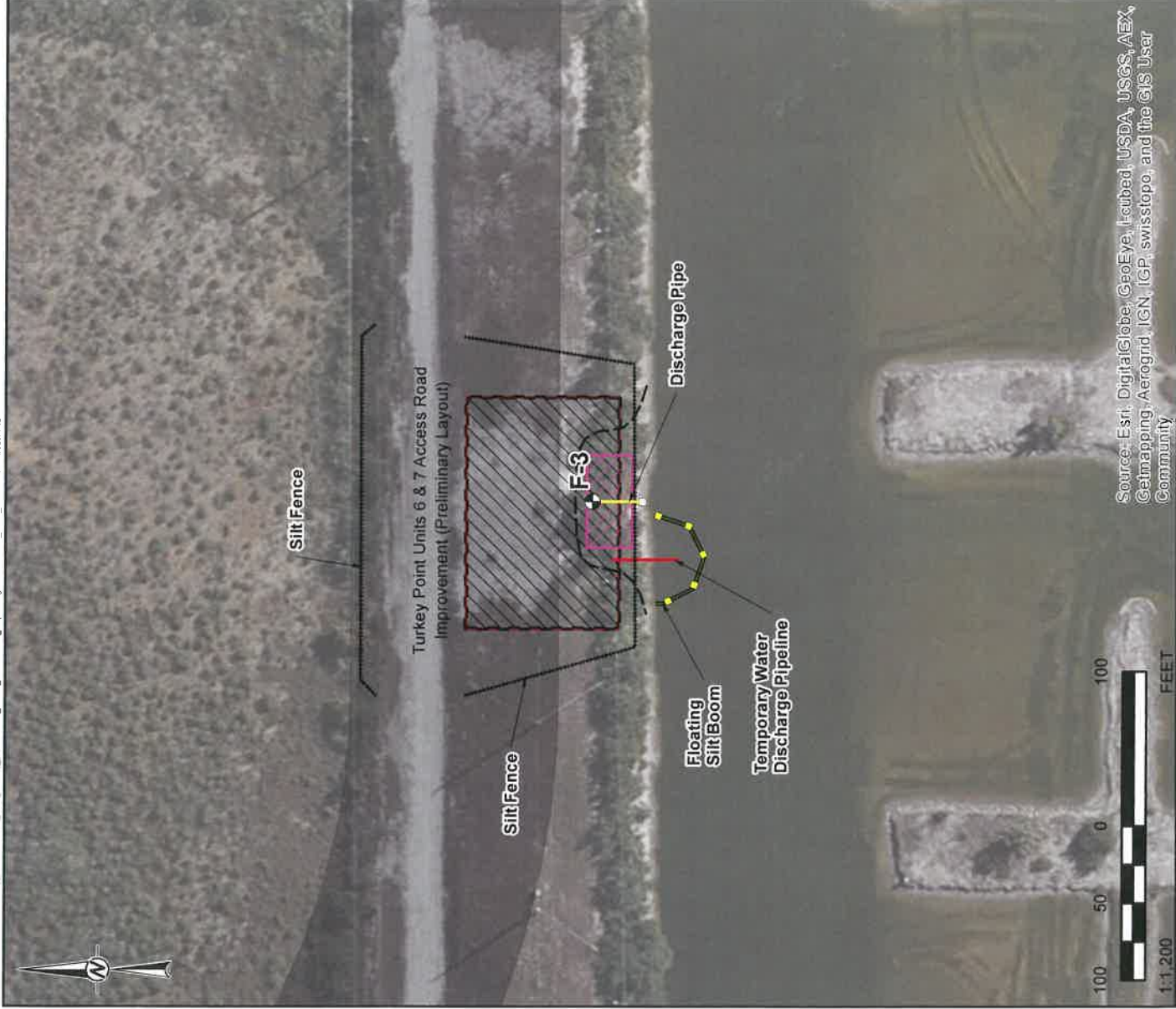
A002

Rev.

0

FIGURE

2.1-1B



Source: Esri, DigitalGlobe, GeoEye, Earthstar, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

- Aquifer Well
- - - Contour
- Discharge Line
- Discharge Pipe
- Floating Silt Boom
- Silt Fence
- ▨ Containment Area
- Rip Rap
- Well Site

REFERENCE

AQUIFER WELL LOCATIONS, JLA GEOSCIENCES, 2014

CLIENT

FPL
MIAMI-DADE COUNTY, FLORIDA

PROJECT

FPL TURKEY POINT CCS SALINITY REDUCTION PROJECT

TITLE

WELL SITE AREAS

CONSULTANT

YYYY-MM-DD 2014-09-05

PREPARED NRL

DESIGN NRL

REVIEW KJK

APPROVED KFK



PROJECT NO.

1303064

CONTROL

A002

Rev.

0

FIGURE

2.1-1C



LEGEND

- Aquifer Well
- Contour
- Discharge Line
- Discharge Pipe
- Floating Silt Boom
- Silt Fence
- Containment Area
- Rip Rap
- Well Site

REFERENCE

AQUIFER WELL LOCATIONS, JLA GEOSCIENCES, 2014

CLIENT

FPL
MIAMI-DADE COUNTY, FLORIDA

PROJECT

FPL TURKEY POINT CCS SALINITY REDUCTION PROJECT

TITLE

WELL SITE AREAS

CONSULTANT

YYYY-MM-DD	2014-09-05
PREPARED	NRL
DESIGN	NRL
REVIEW	KJK
APPROVED	KFK



PROJECT No.

1303064

CONTROL

A002

REV.

0

FIGURE

2.1-1D



LEGEND

- Aquifer Well
- Contour
- Discharge Line
- Discharge Pipe
- Floating Silt Boom
- Silt Fence
- Containment Area
- Rip Rap
- Well Site

REFERENCE

AQUIFER WELL LOCATIONS, JLA GEOSCIENCES, 2014

CLIENT

FPL
MIAMI-DADE COUNTY, FLORIDA

PROJECT

FPL TURKEY POINT CCS SALINITY REDUCTION PROJECT

TITLE

WELL SITE AREAS

CONSULTANT

YYYY-MM-DD 2014-09-05

PREPARED

DESIGN

REVIEW

APPROVED



PROJECT No.

1303064

CONTROL

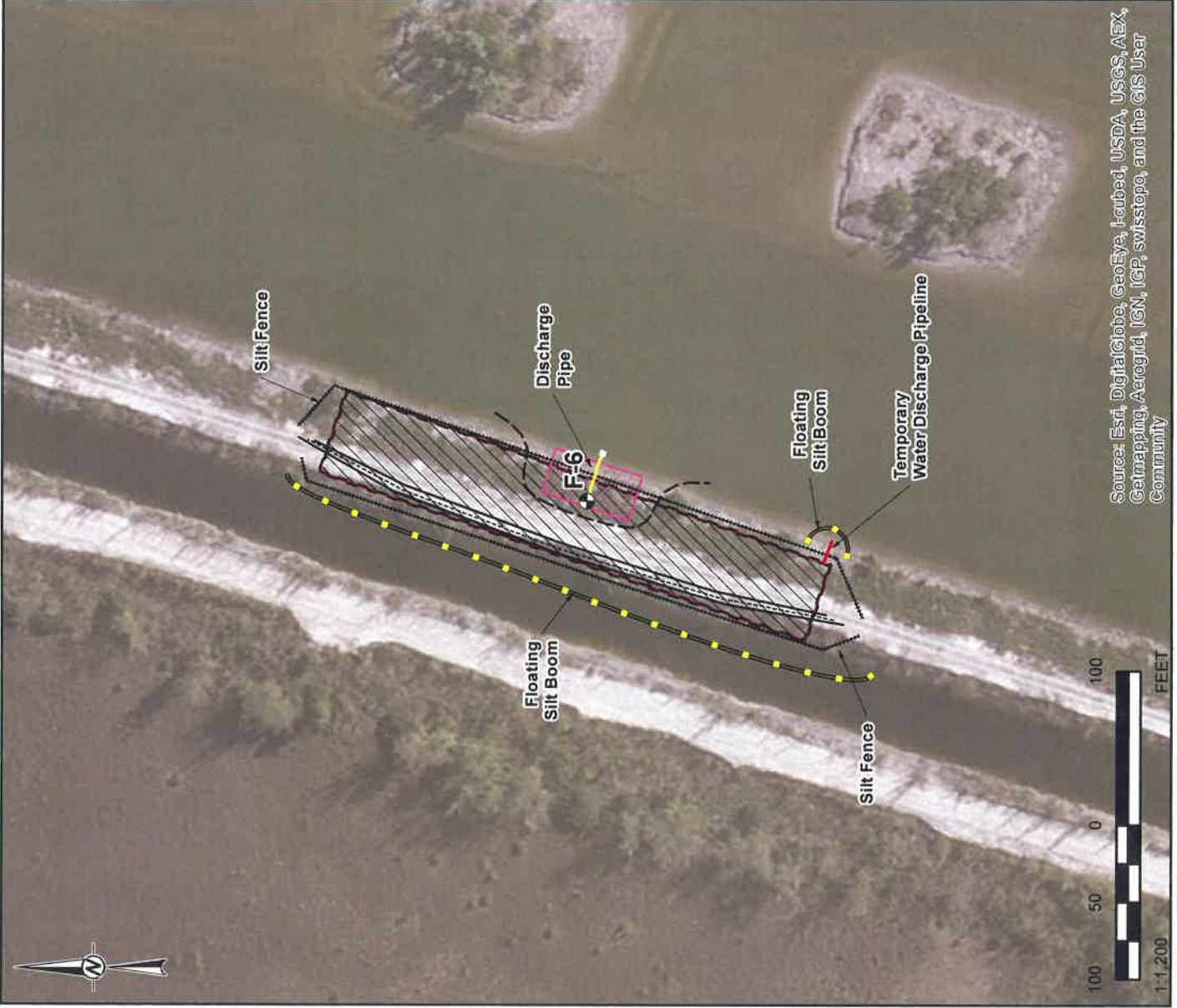
A002

Rev

0

FIGURE

2.1-1E



Source: Esri, DigitalGlobe, GeoEye, iSat, USDA, USGS, AEX, GeoMapping, AeroGrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

- Aquifer Well
- Contour
- Discharge Line
- Discharge Pipe
- Floating Silt Boom
- Silt Fence
- Containment Area
- Rip Rap
- Well Site

REFERENCE
AQUIFER WELL LOCATIONS, JLA GEOSCIENCES, 2014

CLIENT
FPL
MIAMI-DADE COUNTY, FLORIDA

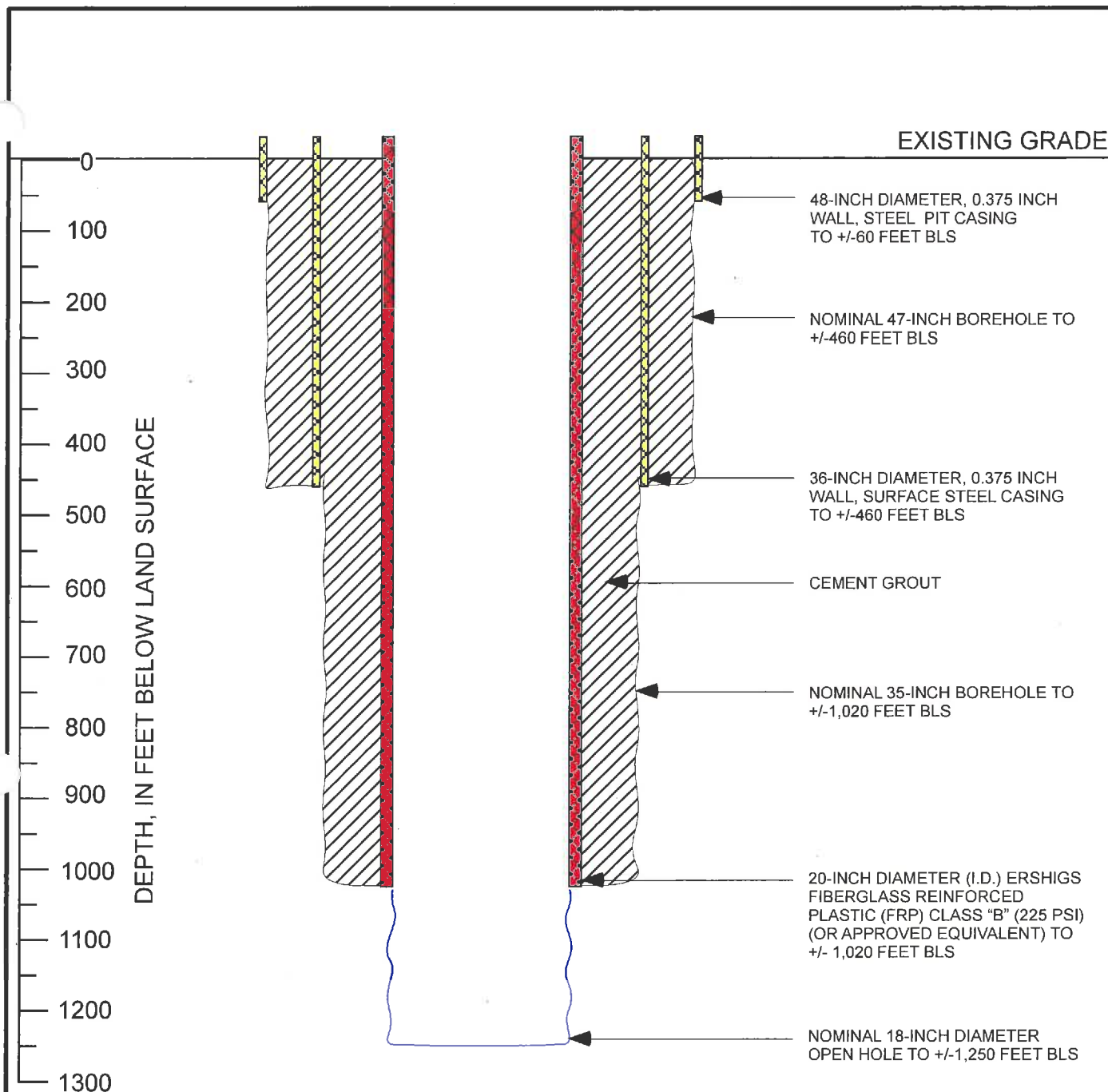
PROJECT
FPL TURKEY POINT CCS SALINITY REDUCTION PROJECT

WELL SITE AREAS

CONSULTANT	YYY-MM-DD	2014-09-05
PREPARED	NRL	
DESIGN	NRL	
REVIEW	KJK	
APPROVED	KFK	



PROJECT No.	CONTROL	Rev.	FIGURE
1303064	A002	0	2.1-1F



JLA Geosciences, Inc.

LEGEND:



CEMENT GROUT



FRP WELL CASING



STEEL WELL CASING



OPEN HOLE

SCALE:

AS SHOWN

DATE:

02/14/2014

DRAWN BY:

RKS

DWG #:

PROJECT SITE:

FLORIDA POWER AND LIGHT
TURKEY POINT CCS FRESHENING PROJECT
UPPER FLORIDAN AQUIFER WELLS F-1, F-2, F-3, F-4, & F-5

PROJECT NO:

14-001

FIGURE TITLE:

WELL CONSTRUCTION DIAGRAM

FIGURE NO:

3.2-1

1 **BEFORE THE DIVISION OF ADMINISTRATIVE HEARINGS**

2 **FLORIDA POWER & LIGHT COMPANY**

3 **TURKEY POINT UNITS 3-5 MODIFICATION**

4 **DIRECT TESTIMONY OF KARL BULLOCK**

5 **DOAH CASE NO.: 15-1559EPP**

6 **BACKGROUND/QUALIFICATIONS**

7 **Q. Please state your name and business address.**

8 A. My name is Karl Bullock. My business address is 6026 NW 1st Place,
9 Gainesville, FL 32607.

10 **Q. Who is your current employer and what position do you hold?**

11 A. I am employed with Golder Associates, Inc., in the position of Senior Ecologist and
12 Associate.

13 **Q. What is Golder Associates, Inc.?**

14 A. Golder is a global, employee-owned company providing environmental consulting,
15 engineering design, and construction services.

16 **Q. What are your responsibilities in your current position?**

17 A. My duties include the assessment of impacts to terrestrial and aquatic ecosystems,
18 environmental permitting, and mitigation.

19 **Q. Please describe your educational background beginning with your**
20 **undergraduate degree.**

21 A. I received a Bachelor of Science in Natural Resource Conservation in 1993 and a
22 Master of Science in Environmental Engineering Sciences, specializing in Wetland
23 Ecology, in 1997, both from the University of Florida.

1 **Q. Please describe your professional work experience since obtaining your last**
2 **academic degree.**

3 A. I have been employed with Golder Associates since I received my Master's degree in
4 1997. My duties involve the assessment of impacts to terrestrial and aquatic
5 ecosystems resulting from development projects of various sizes. I have analyzed the
6 potential ecological impacts of several electric generating plants throughout the
7 southeastern U.S., including Florida. In addition, I have performed ecological
8 assessments for several linear facilities, including electrical transmission lines in
9 Florida

10 My professional work experience focuses upon ecological assessment, impact
11 assessment, and permitting, including:

- 12 • Documentation of baseline conditions regarding vegetative communities,
13 jurisdictional wetland areas, and wildlife resources;
- 14 • Analysis of potential impacts to ecological resources;
- 15 • Evaluation of avoidance and minimization opportunities with respect to
16 refinement of project design; and
- 17 • Compliance with regulatory agency protocols and permitting requirements,
18 including preparation of mitigation proposals to offset ecological impacts.

19 **Q. Have you provided technical training to others in your field of expertise? If yes,**
20 **can you please provide a summary of those training programs you have**
21 **provided?**

22 A. I instructed a graduate level field laboratory in Wetland Ecology at the University of

1 Florida, focused upon flora and fauna taxonomy, biological sampling techniques, and
2 principles of jurisdictional wetland determination.

3 **Q. Have you ever testified as an expert witness before?**

4 A. Yes, I have provided expert testimony in 13 cases, including six Florida Power Plant
5 Siting Act cases: Florida Power and Light's Manatee, Martin, and Turkey Point
6 expansion projects, the West County Energy Center, Turkey Point Units 6 & 7, and
7 Progress Energy's Levy Plant. I have also provided expert testimony in Maryland on
8 three separate projects: Mirant's Dickerson and Chalk Point expansion projects and
9 Sempra Energy Resources' Catoctin Power project. The nature of my testimony in
10 each of these cases has involved providing testimony in the fields of terrestrial and
11 wetlands ecology, including analysis of potential ecological impacts to vegetative
12 communities, wetlands, wildlife, aquatic biological resources, and threatened and
13 endangered species.

14 **Q. In what fields of expertise were you qualified as an expert?**

15 A. I have been qualified as an expert in the fields of terrestrial and wetlands ecology.

16 **Q. Is Exhibit FPL-34 a true and correct copy of your resume?**

17 A. Yes.

18 **FPL OFFERS MR. KARL BULLOCK AS AN EXPERT IN THE FIELD OF**
19 **TERRESTRIAL AND WETLANDS ECOLOGY.**

20 **Q. Could you please describe the subject of your testimony in this proceeding?**

21 A. The subject of my testimony deals with the potential ecological impacts, including
22 wetland and listed species impacts resulting from the proposed modification of the

1 Turkey Point Units 3-5 certification.

2 **Q. Are you personally familiar with the FPL Turkey Point plant property and the**
3 **surrounding area?**

4 A. Yes, I am.

5 **Q. How have you become familiar with the FPL Turkey Point plant property and**
6 **surrounding area?**

7 A. I have become familiar with the Turkey Point plant property and surrounding
8 vicinity through field reconnaissance, literature reviews, review of aerial
9 photography, soil surveys, consultation with FPL representatives, and contact with
10 staff of several environmental agencies, including U.S. COE, U.S. FWS, FWC,
11 and Miami-Dade County DERM.

12 **Q. Are you familiar with FPL's proposed modification of the Turkey Point**
13 **Units 3-5 conditions of certification?**

14 A. Yes.

15 **Q. What has been your role in that proposed modification project?**

16 A. I have been tasked with the evaluation of potential ecological impacts to wetlands
17 resulting from the proposed modification.

18 **Q. Have you prepared or are you prepared to sponsor into evidence the sections**
19 **of the petition for modification and the completeness responses listed by your**
20 **name on Exhibit FPL-2, including any tables, figures, or attachments?**

21 A. Yes.

22 **Q. Are the materials listed on Exhibit FPL-2 that you are sponsoring true and**

1 correct?

2 A. Yes.

3 **Q. Do you agree with the contents of those materials listed on Exhibit FPL-2**
4 **that you are sponsoring?**

5 A. Yes.

6 **Q. Please identify Exhibit FPL-35.**

7 A. Exhibit FPL-35 is Figure 2.3-1 from the request for modification showing the
8 vegetative communities and land uses within the modification project area, which
9 is the area proposed for construction and operation of the new Upper Floridan
10 Aquifer wells.

11 **Q. Using Exhibit FPL-35, please describe the vegetation in the area proposed to**
12 **be used by the modification.**

13 A. The area for the wells to be installed as part of the modification is limited to
14 previously developed areas of the existing Turkey Point plant property, consisting
15 of areas along the cooling canals, devoid of natural vegetative communities.

16 **Q. Could you generally describe the vegetation in the vicinity of the area**
17 **proposed for the construction and operation of new wells?**

18 A. The proposed well sites are largely surrounded by existing power plant facilities
19 and the man-made cooling water canals. The area east of the cooling canal system
20 is primarily coastal mangroves adjacent to Biscayne Bay, while the area west of
21 the cooling canal system is primarily sawgrass marsh and freshwater wetlands
22 within the Model Lands Basin.

1 **Q. Do you have an opinion as to whether construction activities associated with**
2 **the proposed modification will cause harm to wetlands?**

3 A. Yes.

4 **Q. What is that opinion?**

5 A. No impacts to wetland systems are anticipated from construction of the proposed
6 wells as part of the requested modification.

7 **Q. What is the basis for that opinion?**

8 A. Construction activities for the wells are proposed within previously-disturbed
9 upland areas along the cooling canal banks, and erosion and sedimentation
10 controls will be used to avoid turbidity in adjacent wetlands or surface waters.

11 **Q. Do you have an opinion as to whether the withdrawal of 14 million gallons**
12 **per day (MGD) from the proposed Upper Floridan Aquifer wells will cause**
13 **harm to or otherwise adversely impact wetlands in the vicinity of the**
14 **proposed modification?**

15 A. Yes.

16 **Q. What is that opinion?**

17 A. The proposed withdrawal of 14 MGD from the Upper Floridan Aquifer wells will
18 not adversely impact wetlands in the vicinity.

19 **Q. What is the basis for that opinion?**

20 A. My opinion is based on Peter Andersen's analysis, which indicates that the
21 withdrawal of 14 MGD via the UFA wells will not cause drawdown in wetlands.
22 Nearby wetlands are hydraulically connected to the upper portions of the

1 Biscayne Aquifer. However, the Floridan aquifer at Turkey Point from which 14
2 MGD of water is proposed to be withdrawn is approximately 1,000 feet below
3 land surface and is not hydraulically connected to the Biscayne aquifer due to the
4 presence of a confining unit. Based on this, it is my opinion that the withdrawals
5 from the Upper Floridan aquifer will not affect wetlands.

6 **Q. Do you have an opinion as to whether the proposed modification will ensure**
7 **the protection of natural resources and systems?**

8 A. Yes

9 **Q. What is that opinion?**

10 A. The proposed modification has been designed to ensure the protection of natural
11 resources and systems.

12 **Q. What is the basis for that opinion?**

13 A. Construction of the modification maximizes utilization of previously-disturbed
14 areas of the Turkey Point plant and avoids clearing or placement of fill material
15 within natural vegetative communities or wetlands. Withdrawals from the
16 proposed UFA wells will not adversely affect natural resources and systems.

17 **Q. What is meant by the term “listed plant species”?**

18 A. Listed plant species are those plants that are classified by the United States Fish
19 and Wildlife Service or the Florida Department of Agriculture and Consumer
20 Services as endangered, threatened, of special concern, or commercially exploited.

21 **Q. Are there any listed plant species in the proposed modification area?**

22 A. No.

1 **Q. In your opinion, will construction and operation of the proposed**
2 **modification have any impact on listed plant species?**

3 A. No.

4 **Q. Are there any exotic or pest plant and nuisance species in the proposed**
5 **modification area?**

6 A. The proposed modification area is relatively devoid of vegetation, although
7 scattered individuals of exotic plants occasionally occur, such as beach naupaka
8 (*Scaevola taccada*), Brazilian pepper (*Schinus terebinthifolius*), and Australian
9 pine (*Casuarina equisetifolia*).

10 **Q. In your opinion, would construction or operation of the proposed**
11 **modification impact management and control of exotic plant species?**

12 A. No.

13 **Q. What is the basis for that opinion?**

14 A. The construction and operation of the proposed modification will not impact
15 ongoing management and control of exotic plant species at the Turkey Point
16 facility.

17 **Q. Overall, are you familiar with applicable nonprocedural requirements**
18 **related to protection of wetlands?**

19 A. Yes.

20 **Q. Do you have an opinion as to whether the construction of and withdrawals**
21 **from the proposed UFA wells will comply with those requirements?**

22 A. Yes.

1 **Q. What is that opinion?**

2 A. The proposed wells and the withdrawals of 14 MGD will comply with the
3 applicable nonprocedural requirements related to protection of wetlands.

4 **Q. What is the basis for your opinion?**

5 A. As previously stated, construction of and withdrawals from the wells will not have
6 any impact on wetlands in the vicinity. The modification, therefore, will be
7 consistent with applicable nonprocedural requirements designed to protect
8 wetlands.

9 **Q. In your opinion has FPL minimized any ecological effects of the construction
10 of the wells and the proposed 14 MGD of withdrawals?**

11 A. Yes.

12 **Q. What is the basis for your opinion?**

13 A. The well locations have been selected so as to avoid any natural vegetative
14 communities or wetlands, and the proposed withdrawals are not expected to result
15 in any adverse impacts to the hydroperiod of adjacent wetlands.

16 **Q. Does this conclude your prepared written testimony?**

17 A. Yes, it does.

**FLORIDA POWER & LIGHT COMPANY
TURKEY POINT UNITS 3-5 MODIFICATION
DOAH CASE NO. 15-1559**

PETITION FOR MODIFICATION AND COMPLETENESS WITNESS SPONSORSHIP

Witness	Petition Sections Sponsored (including figures, tables, attachments referenced in same)	Completeness Responses Sponsored
Steve Scroggs	1.0—Need for the Proposed Facility	SFWMD-5
	1.1—Facility Introduction	SFWMD-6
	1.2—The Applicant	SFWMD-7
	1.3—Overview of the Project(s)	MDC-1
	1.3.2—Fukushima Compliance	MDC-3
	1.3.3—Unit 5 Well Water Re-allocation	MDC-5
	1.4—Conditions of Certification	MDC-6
	1.5—Need for the Project	MDC-12
	1.6—Summary of Public Outreach	MDC-15
	3.1—Background	
	3.10.1—Construction Materials and Equipment	
	4.1.4—Roads and Slip	
	Appendix C	
Jim Andersen	2.1.1—Site Location	MDC-10
	2.3.1—Geogydrology	MDC-18
	2.3.2—Subsurface Hydrology	
	3.2.1—Production Well Description	
	3.3.1—Production Wells	
	3.3.2—Alternative Water Supply Line	
	4.1.1—Production Wells	
	4.1.2—Alternative Water Supply Line	
	4.1.2.1—General Construction Impacts	
	4.1.3—Alternative Water Supply Line	
Pete Andersen	1.3.1—Salinity Reduction Plan	SFWMD-1
	2.3.3—Site Water Budget and Area Users	SFWMD-2
	3.2.2—Cooling Canal System	SFWMD-3
	3.2.3—Permitted Water Withdrawals	SFWMD-4
	3.6—Plant Water Use	MDC-4
	4.3—Groundwater Impacts	MDC-7
	5.1.1—Production Wells	MDC-8
	5.1.2—Alternative Water Supply Line	MDC-9
	Appendix A	MDC-11
	Appendix B	MDC-13
		MDC-16
		MDC-17
		MDC-19
		MDC-20

		MDC-20
		MDC-21
		MDC-22
		MDC-23
		MDC-24 (including all subquestions A through)
		MDC-25
		Revised Appendix B
Greg Powell	2.3.4—Surficial Hydrology	
	3.7—Chemical and Biocide Waste	
	3.8—Solid and Hazardous Waste	
	3.9—Site Drainage	
	4.1.5—Flood Zones	
	4.2—Impact on Surface Water Bodies and Uses	
	4.2.1—Impact Assessment	
	4.2.2—Measuring and Monitoring Program	
	5.1.3—Leachate and Runoff	
	5.1.4—Measurement Programs	
	5.2—Sanitary and Other Waste Discharges	
Karl Bullock	2.3.5—Vegetation/Land Use	
	4.4.1—Impact Assessment (wetlands)	
	4.4.2—Measuring and Monitoring Programs (wetlands)	
	5.5—Ecological Impacts (wetlands)	
Jim Lindsay	2.3.6.1—Species-Environmental Relationships	MDC-14
	2.3.7—Pre-existing Stresses	
	2.3.7.1—Measurement Programs	
	4.4.1—Impact Assessment (wildlife)	
	4.4.2—Measuring and Monitoring Programs (wildlife)	
	5.5—Ecological Impacts (wildlife)	
Ken Kosky	2.3.8—Meteorological and Ambient Air Quality	
	2.3.8.1—Ambient Air Quality	
	2.3.9—Noise	
	3.4—Fuel	
	3.5—Air Emission and Controls	
	4.5—Air Impacts	
	4.5.1—Control Measures	
	4.6.1—Construction Noise Impacts	
	5.3—Air Quality Impacts	
	5.4—Noise Impacts	
Kerri Kitchen	2.2.1—Governmental Jurisdictions	MDC-2
	2.2.2.1—Future Land Use	
	2.2.2.2—Zoning	
	4.1.6—Topography and Soils	



Education

M.S. Environmental
Engineering Sciences,
University of Florida, 1997

B.S. Natural Resource
Conservation, University of
Florida, 1993

Golder Associates Inc. – Gainesville

Ecological Resources Scientist

Mr. Bullock is an ecological resources scientist with over 16 years of experience with Golder Associates Inc. in Gainesville, Florida. He is responsible for environmental resource permitting, wetland delineation and functional assessments, wetland mitigation, ecological habitat evaluations, US Army Corps of Engineers Section 404 permitting, alternative analyses, NEPA assessments, benthic macroinvertebrate surveys, vegetative monitoring, threatened and endangered species surveys, ecological risk assessments, and regulatory agency negotiations.

Employment History

Golder Associates Inc. – Gainesville, Florida

Ecology Practice Leader (1997 to Present)

Senior ecologist responsible for environmental resource permitting, wetland delineation and analysis of wetland mitigation alternatives, aquatic biological monitoring, vegetative monitoring, ecological risk assessment, environmental impact assessments, threatened and endangered species surveys, ecotoxicology, statistical analysis, and technical document production.

KBN Engineering and Applied Sciences, Inc. – Gainesville, Florida

Ecologist Contractor (1995 to 1997)

Field vegetative sampling, data analysis, wetland monitoring, flora/fauna species ID, statistical analysis, technical document production.

University of Florida, Center for Wetlands and Water Resources – Gainesville, Florida

Research Assistant (1994 to 1996)

Duties included field data collection and analysis for the Orange County Eastern Service Area experimental wastewater wetlands system. Fish and macroinvertebrate sampling, database management, statistical analysis, and preparation of reports.

University of Florida/Monsanto Chemical Company – Pensacola, Florida

Graduate Research Assistant (1994 to 1995)

Field sampling, laboratory analysis of fish and insect samples, and technical document production to determine concentrations and ecological effects of boron in an Escambia River floodplain swamp.

U.S. Forest Service – Klamath National Forest, California

Volunteer (1993 to 1993)

Salmon and steelhead trout census-taking, habitat typing of streams, installation



of fish structures, biological and physical data collection.

PROJECT EXPERIENCE -- ECOLOGY AND ENVIRONMENTAL ASSESSMENT

**Florida Power & Light
Turkey Point Units 6&7**
Miami-Dade County,
Florida

Team member responsible for analysis of environmental impacts associated with construction of two nuclear units at an existing power plant. Duties included wetland delineation, wetland functional assessment, jurisdictional determinations, impact analysis, wetland mitigation design, evaluation of threatened and endangered species impacts, preparation of endangered species management plans for construction and operation, preparation of Section 404(b)(1) alternatives analysis submitted to the U.S. Army Corps of Engineers (USACE) and Nuclear Regulatory Commission (NRC), Site Certification Application and Environmental Resource Permit/Section 404 Dredge and Fill application preparation, agency consultation with Florida Department of Environmental Protection (FDEP), USACE, U.S. Fish and Wildlife Service (USFWS), Florida Fish and Wildlife Conservation Commission (FWC), and Miami-Dade County, and expert testimony.

**Progress Energy Levy
Nuclear Plant**
Levy County, Florida

Team member responsible for analysis of potential environmental impacts of proposed transmission facilities associated with Levy Nuclear Plant. Duties included wetland delineation, wetland functional assessment, jurisdictional determinations, threatened and endangered species surveys, analysis of construction impacts and quantification of mitigation requirements, preparation of USFWS wood stork foraging habitat assessment, participation in numerous public open houses, consultation with FDEP, USFWS, FWC, and USACE, and expert testimony.

**OUC McIntosh to
Agnes ERP**
Polk and Osceola
Counties, Florida

Project manager responsible for wetland delineation, threatened and endangered species surveys, preparation of Environmental Resource Permit, gopher tortoise relocation, USFWS Section 7 consultation, and environmental oversight during construction associated with construction of roads, pads, and reconductoring of 230-kV transmission line. Field meetings and coordination with the FDEP, USACE, and USFWS regarding wetland functional assessment, threatened and endangered species impacts, and negotiation of mitigation requirements. Preparation of USFWS wood stork foraging habitat assessment and formal sand skink survey to support issuance of USFWS Biological Assessment for the project.



**Progress Energy
Weedon Island
Preserve**
Pinellas County, Florida

Project manager responsible for wetland delineation, threatened and endangered species survey, preparation of Environmental Resource Permit/Section 404 Dredge and Fill Permit application, and compensatory wetland mitigation design associated with the expansion of the Progress Energy Florida Northeast Substation. Golder designed and enacted an off-site compensatory wetland mitigation plan to offset the loss of wetland functions associated with expansion of the substation, in consultation with representatives from Pinellas County and FDEP. The Weedon Island Preserve contained an approximately 5.2-acre freshwater pond/marsh dominated by nuisance and exotic species of vegetation and surrounded by a dense near-monoculture of the exotic shrub Brazilian pepper (). Golder's annual monitoring and reporting indicates that the restoration of native freshwater marsh and upland maritime hammock through mechanical and chemical treatment and supplemental plantings has been highly successful and in compliance with the FDEP ERP permit conditions. Release from future monitoring is anticipated in 2013.

**OUC St. Cloud North to
Magnolia Ranch**
Osceola County, Florida

Project manager responsible for wetland delineation, threatened and endangered species survey, preparation of Environmental Resource Permit/Section 404 Dredge and Fill Permit application, and gopher tortoise relocation associated with the rebuild of an existing 69-kV transmission line. Coordination with the FDEP, FWC, and USACE.

**FPL Next Generation
Space Coast Solar
Energy Center ERP**
Brevard County, Florida

Project manager responsible for wetland delineation, threatened and endangered species survey, and preparation of Environmental Resource Permit/Section 404 Dredge and Fill Permit application for construction of solar photovoltaic energy generation facility in Brevard County. Field meetings and coordination with St. Johns River Water Management District (SJRWMD), FWC, and USACE regarding verification of wetland boundaries, avoidance/minimization of impacts, and response to requests for additional information.

**OUC Stanton Energy
Center – Curry Ford**
Orange County, Florida

Project manager responsible for wetland delineation, threatened and endangered species survey, preparation of Environmental Resource Permit submitted to USACE and FDEP, and coordination with FDEP Siting Office for an amendment to the existing Conditions of Certification associated with installation of mid-span structures within an existing 230-kV transmission line.

**FPL Manatee Next
Generation Solar
Energy Center ERP**
Manatee County, Florida

Project manager responsible for wetland delineation, threatened and endangered species survey, preparation of Environmental Resource Permit application, and on-site wetland mitigation plan for construction of solar photovoltaic energy generation facility in Manatee County. Coordinated field review of wetland boundaries and functional assessment with the FDEP and USACE regarding verification of wetland boundaries, avoidance/minimization of impacts, and response to requests for additional information.

**OUC Stanton – PEF
East Orange
Transmission Line
ERP**
Orange County, Florida

Project manager responsible for wetland delineation, threatened and endangered species survey, preparation of Environmental Resource Permit, and gopher tortoise relocation associated with construction of a new 230-kV transmission line. Field meetings and coordination with the FDEP, FWC, and USACE regarding negotiation of mitigation and compensating floodplain storage requirements.



**FPL Glades Power
Park Site Certification
Application**
Glades County, Florida

Task manager responsible for analysis of environmental impacts associated with construction and operation of new coal-fired plant. Managed jurisdictional wetland delineation, wetland functional assessment utilizing the FDEP Uniform Mitigation Assessment Method (UMAM), site visits with USACE, development of wetland mitigation proposal, evaluation of threatened and endangered species impacts, negotiation with FWC and USFWS regarding threatened/endangered species impacts, and Environmental Resource Permit application preparation.

**Gulf Power Company
Oleander Power Plant**
Brevard County, Florida

Project manager of wetland mitigation monitoring associated with construction of the Oleander Power Project, a nominal 850 MW power production. In addition to conservation easements protecting wetlands and oak hammock uplands, a 5.16-acre disturbed freshwater marsh was enhanced through removal of exotic species, topographic grading, and replanting with native wetland species. The wetland restoration efforts provided a system much greater in terms of functional value than the disturbed, impacted wetland system that existed prior to enhancement activities. Representatives of FDEP conducted a site visit of the enhancement wetland in April 2003, and submitted a letter to "applaud Oleander Power Plant for the 5+ acres of wetland enhancement efforts. All in all our April 3 site inspection revealed that the wetland enhancement is on its way to success." Golder achieved all permit success criteria and received FDEP release from future monitoring in 2006.

**Progress Energy
Transmission Line
Environmental
Permitting & Routing
Analysis**
Gulf & Franklin Counties,
Florida

Ecological evaluation to identify preferred and alternate routes for a proposed 69-kV transmission line between Port St. Joe and Apalachicola in Gulf and Franklin Counties, Florida, and subsequent negotiation with the FDEP and USACE regarding dredge/fill permit (Environmental Resource Permit). Conducted habitat classification, threatened and endangered species surveys, and jurisdictional wetland delineation to identify potential project encumbrances and permitting requirements. Coordination with FWC representatives regarding potential easement through wildlife management areas, listed species impacts, and mitigation opportunities. Negotiated with Division of State Lands Acquisition and Restoration Council (ARC) to acquire an easement across state lands for construction of transmission line, including compensating lands proposal.

**TECO/Progress Energy
Joint Transmission
Line Corridor Routing
Analysis**
Polk, Osceola, and
Orange Counties,
Florida

Ecological evaluation to identify preferred and alternate routes for a proposed 230-kV transmission line between Lake Agnes Substation in Polk County and proposed Gifford Substation in Orange County. Conducted habitat classification, threatened and endangered species surveys, and identification of preliminary wetland boundaries to identify potential project encumbrances and permitting requirements. Preparation of TLSA application for certification of preferred corridor and participation in meetings with County representatives and public open houses to discuss methods and results of the routing analysis.

**OUC Lake Agnes-Taft
Transmission Line
ERP**
Polk and Osceola
Counties, Florida

Project manager responsible for wetland delineation, threatened and endangered species survey, and preparation of Environmental Resource Permit for upgrade of transmission line road and structure pads along an existing transmission line right-of-way. Field meetings and coordination with the FDEP, FWC, and USACE regarding negotiation of mitigation requirements.



Floridian Natural Gas Storage Martin County, Florida	Ecology task manager for proposed natural gas storage facilities located on approximately 145 acres near Indiantown, in Martin County, Florida. Golder managed the preparation of the application for authorization for the Project under Section 7(c) of the Natural Gas Act (NGA), including Resource Reports 1 through 13, all in compliance with the requirements of the Federal Energy Regulatory Commission (FERC) regulations. The Resource Reports provide the detailed discussion required by Part 380 of the FERC's Regulations. In addition to the FERC resource reports, Golder conducted wetland delineation, threatened and endangered species surveys, prepared an Environmental Resource Permit/Section 404 Dredge and Fill application to the FDEP and USACE, environmental evaluation of alternative routes, and agency consultation with FDEP, FWC, USFWS, and Martin County.
Progress Energy Transmission Line Corridor Routing Analysis Central Florida	Ecological evaluation to identify sensitive resources within preferred and alternate routes for several proposed 500 and 230 kV transmission lines between the proposed Levy Nuclear facility and substations throughout Central Florida. Conducted habitat classification, threatened and endangered species surveys, and preliminary jurisdictional wetland boundaries to identify potential project encumbrances and permitting requirements.
FPL St. Lucie Wind Turbines ERP St. Lucie County, Florida	Project manager responsible for Environmental Resource Permit preparation for installation of six wind turbines in St. Lucie County. Conducted jurisdictional wetland delineation, impact avoidance/minimization analyses, mitigation proposal, negotiation with USACE, FDEP, and County environmental regulatory staff, and preparation of an Alternatives Analysis/NEPA Environmental Assessment for federal review.
FPL Turkey Point Unit 5 Site Certification Application Miami-Dade County, Florida	Team member responsible for analysis of environmental impacts associated with plant expansion. Duties included wetland delineation, wetland functional assessment utilizing UMAM as well as the USACE Wetland Rapid Assessment Method (WRAP), mitigation negotiation with FDEP, Miami-Dade County, and the SFWMD, evaluation of threatened and endangered species impacts, preparation of endangered species management plans for construction and operation, preparation of alternatives analysis submitted to the USACE, Environmental Resource Permit application preparation, and expert testimony.
SRWMD Low-Salinity Submerged Aquatic Vegetation Mapping Lower Suwannee River, Florida	Project manager for large scale GIS field mapping of submerged aquatic vegetation along 14 river miles of the lower Suwannee River, Florida. Coordination of field effort, taxonomic identification of submerged aquatic vegetation (SAV), management of subcontractors, negotiation with Agency representatives, and preparation of reports. Results presented at Suwannee River Water Management District (SRWMD) symposium, April 2001.
SJRWMD Biomonitoring in the TCAA Flagler, Putnam, & St. Johns Counties, Florida	Project manager for long term aquatic biological monitoring project designed to ascertain the effectiveness of agricultural Best Management Practices upon the water quality and benthic macroinvertebrate community composition of receiving waters. Scope included petite Ponar and Hester-Dendy sampling, laboratory analysis of water and sediment samples, data analysis, and comparison of pre- and post-BMP data collected from four tributaries of the St. Johns River.



**Progress Energy
Transmission Line
Corridor Routing
Analysis**

Sumter County, Florida

Ecological evaluation to identify preferred and alternate routes for a proposed 230-kV transmission line between Central Florida and Bushnell East substations in Sumter County, Florida. Conducted habitat classification, threatened and endangered species surveys, and jurisdictional wetland delineation to identify potential project encumbrances and permitting requirements.

**OUC St. Cloud
Transmission Line
ERP**

St. Cloud, Florida

Project manager responsible for wetland delineation, threatened and endangered species survey, and preparation of Environmental Resource Permit for upgrade of transmission line road and structure pads along an existing transmission line right-of-way. Coordinated with FDEP regarding negotiation of mitigation requirements.

IMC Phosphates EIS

Hardee County, Florida

Team member charged with preparation of ecological aspects of third party Environmental Impact Statement (EIS) for an approximately 20,000-acre proposed phosphate mine. Duties included site reconnaissance, interaction with U.S. Army Corps of Engineers' personnel, data analysis, assessment of existing environmental components, assessment of potential impacts resulting from the proposed project, and report preparation.

**FPL Ecological
Evaluation of
Transmission Line
Corridor**

Manatee County, Florida

Habitat classification, threatened and endangered species surveys, and preliminary wetland delineation for an approximately 14-mile transmission line corridor in Manatee County, Florida. Coordination with FWC and FDEP, response to agency comments and questions regarding ecological impacts of the proposed transmission line project.

**Tampa Electric
Company**

Polk and Pinellas
Counties, Florida

Ecological evaluation to identify preferred and alternate routes for a proposed 230-kV transmission line between Polk and Hillsborough Counties, Florida. Conducted habitat classification, threatened and endangered species surveys, and preliminary wetland delineation to identify potential project encumbrances and permitting requirements. Coordination with FWC and FDEP, response to agency comments and questions regarding ecological impacts of the proposed transmission line project.

**Confidential Client –
Superfund Site**

Tampa, Florida

Team member responsible for evaluation of ecological resources, determination of pathways and ecological receptors, coordination with EPA Region IV representatives, design of biological sampling design, and analysis of potential toxicity of contaminants of concern.

Florida Power & Light

Sanford, Florida

Designed and conducted benthic macroinvertebrate sampling program to characterize potential impacts of plant operation on the St. John's River. Field data collection, analysis of taxonomic results, and preparation of report.

**Sempra Energy
Resources**

Adamstown, Maryland

Task leader for ecological issues associated with the proposed construction of power generation facility. Conducted wetland delineation, habitat assessment, threatened and endangered species surveys, impoundment analyses, coordination with USACE and the Maryland Department of the Environment, preparation of Certificate of Public Convenience and Necessity (CPCN) application, and expert testimony.



Mirant Dickerson Plant Montgomery County, Maryland	Task manager in charge of ecological aspects of proposed plant expansion, including habitat evaluation, listed species surveys, air emission impacts to vegetation and wildlife, coordination with state and federal agencies, preparation of CPCN application, and expert testimony.
Mirant Dickerson Plant Prince George's County, Maryland	Task manager in charge of ecological aspects of proposed plant expansion, including habitat evaluation, listed species surveys, potential effects of air emissions to vegetation and wildlife, coordination with state and federal agencies, and preparation of CPCN application.
Enron Puerto Plata, Dominican Republic	Responsible for data analysis and report preparation for seagrass and coral reef monitoring project in conjunction with thermal effluent discharge in coastal environment.
AES Andres Site Andres, Dominican Republic	Responsible for data analysis and report preparation for coral reef baseline biological monitoring.
Biological Assessment Moultrie, Georgia	Designed and conducted biological assessment of low-order stream consisting of core sampling of benthic macroinvertebrates, preparation of samples for analysis, analysis of taxonomic results, and report preparation.
Jacksonville Electric Authority Jacksonville, Florida	Team member for quarterly sampling of impingement rates of estuarine species in electrical utility intake water. Duties included fish sampling, identification, and water quality monitoring.
Jacksonville Electric Authority Jacksonville, Florida	Comparison of continuous and intermittent operation of fish return system with regards to survival of impinged fish and shrimp, St. John's River, Florida.
Florida Power & Light Ft. Myers, Florida	Team member responsible for the ecological impact issues of the repowering project. Duties included vegetative community description and mapping, wetland delineation and Environmental Resource Permitting, Wetland Rapid Assessment Procedure (WRAP) analysis, wildlife surveys, benthic macroinvertebrate sampling and analysis, threatened and endangered species surveys, threatened plant relocation, and technical report preparation.
Florida Power & Light Martin County, Florida	Habitat classification, threatened and endangered species surveys, and preliminary wetland delineation for an approximately 12-mile transmission line corridor in Martin County, Florida. Coordination with Florida Fish and Wildlife Conservation Commission and Florida Department of Environmental Protection, response to agency comments and questions regarding ecological impacts of the proposed transmission line project.
Orlando Utilities Commission Orlando, Florida	Project manager responsible for wetland delineation, threatened and endangered species survey, and preparation of Environmental Resource Permit for construction of a bridge along a transmission line right-of-way. Responsible for coordinating with subcontractors, reviewing plans, preparation and submittal of permit to FDEP and USACE.
Florida Tile Lakeland, Florida	Team member responsible for evaluation of ecological resources, analysis of data, preliminary screening of contaminants of concern, and report preparation for RCRA Facility Investigation.



Tarmac Sand Mine Nassau County, Florida	Task manager responsible for wetland delineation, threatened and endangered plant and animal surveys, vegetative community mapping (FLUCFCS codes), and Environmental Resource Permitting for proposed sand mine.
Multiple Sites Multiple Sites	Worked with air engineers in preparation of several Prevention of Significant Deterioration air permits analyzing potential effects of atmospheric emissions on vegetation, soils, and wildlife.
EPA Office of Pesticide Programs Gainesville, Florida	DER Technical Reviewer responsible for evaluating ecotoxicological data submitted in support of pesticide registrations as required by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as well as evaluation of pesticide-influenced wildlife toxicity incident reports.
SWFWMD Withlacoochee River and Upper Coastal Basins Multiple Counties, Florida	Environmental Assessment of Altered Lands in the Withlacoochee River and Upper Coastal Basins: Project ecologist for environmental assessment of agriculturally altered lands within the Southwest Florida Water Management District Withlacoochee and Upper Coastal Basins. Field vegetation and wildlife surveys, classification and mapping of vegetation communities, technical document production.
Lakeland Electric Lakeland, Florida	Team member responsible for environmental and socioeconomic impacts associated with the conversion to combined cycle operation. Duties included analysis of land use and existing permit information, ecological impacts, and report preparation.
Bristol Park Bristol Park, Florida	Project ecologist for long-term biological monitoring of a wetland system receiving stormwater runoff from adjacent housing and office developments. Duties included vegetative community monitoring, wildlife surveys, water quality sampling, flow monitoring, and report preparation.
Jacksonville Electric Authority Jacksonville, Florida	Team member for quarterly sampling of impingement rates of estuarine species in electrical utility intake water. Duties included fish sampling, identification, and water quality monitoring.
SJRWMD Blue Cypress Marsh Indian River County, Florida	Ecological Assessment of the Effects of Fire on a Low Nutrient Marsh: Project ecologist responsible for field vegetative data collection, statistical analysis, and report preparation to determine the utility of fire as a management tool to reduce invasion by woody vegetation in the Blue Cypress Marsh for the St. Johns River Water Management District.

PROJECT EXPERIENCE – EXPERT WITNESS

Circuit Court, Seventh Judicial Circuit Volusia County, Florida	Confidential Client, 2010: Provided testimony regarding ecological resources and environmental permitting of a 1,859-acre mixed use community associated with a land purchase breach of contract dispute, including analysis of wetland and protected species habitat and mitigation alternatives.
Miami-Dade County BOCC Zoning Hearing Miami-Dade County, Florida	FPL Turkey Point Units 6 & 7 Unusual Use Application (Z12-090), 2013. Provided testimony regarding site selection, alternatives analysis, zoning consistency, and ecological impacts associated with proposed location for a reclaimed water treatment facility and ancillary pipeline.



State of Florida Division of Administrative Hearings Levy County, Florida	Progress Energy Levy Hearings, 2009: Provided testimony regarding ecological impacts of a proposed transmission lines associated with proposed nuclear power generation facility, including analysis of potential impacts to wetlands, threatened and endangered species, and vegetative communities.
State of Florida Division of Administrative Hearings Orange County, Florida	Progress Energy/Tampa Electric Company Hearings, 2008: Provided testimony regarding ecological impacts of a proposed transmission line, including analysis of potential impacts to wetlands, threatened and endangered species, and vegetative communities.
State of Florida Division of Administrative Hearings Palm Beach County, Florida	Florida Power and Light Hearings, 2006: Provided expert testimony regarding potential ecological impacts of proposed natural gas power facility, including analysis of impacts to vegetative communities and threatened/endangered species.
State of Florida Division of Administrative Hearings Citrus County, Florida	Progress Energy Hearings, 2008: Provided testimony regarding ecological impacts of proposed nuclear uprate project, including analysis of potential impacts to vegetative communities, wetlands, and threatened/endangered species.
State of Florida Division of Administrative Hearings Miami-Dade County, Florida	Florida Power and Light Hearings, 2004: Provided testimony regarding ecological impacts of proposed expansion of an existing power facility, including analysis of impacts to estuarine wetlands and threatened/endangered species. Coordination with ACOE, FDEP, USFWS, FFWCC, NMFS, and NPS.
State of Florida Division of Administrative Hearings Manatee County, Florida	Florida Power and Light Hearings, 2003: Provided testimony regarding ecological impacts of proposed expansion of an existing power facility, including analysis of ecological effects of freshwater surface water withdrawals from the Little Manatee River.
State of Florida Division of Administrative Hearings Martin County, Florida	Florida Power and Light Hearings, 2003: Provided testimony regarding ecological impacts of proposed expansion of an existing power facility, including analysis of potential impacts to wetlands, threatened and endangered species, and vegetative communities.
Maryland Public Service Commission Adamstown, Maryland	Sempra Energy Resources Catocin Power Hearings, 2004: Provided testimony regarding ecological impacts to threatened and endangered species, wetlands, and vegetative resources resulting from construction and operation of a new combined cycle power plant.
Maryland Public Service Commission Montgomery County, Maryland	Mirant Chalk Point Hearings, 2002: Provided testimony regarding ecological impacts to threatened and endangered species and forest resources resulting from proposed plant expansion.



**Maryland Public
Service Commission**
Montgomery County,
Maryland

Mirant Dickerson Hearings, 2001: Provided testimony regarding ecological impacts of proposed plant expansion.

PROFESSIONAL AFFILIATIONS

Society of Wetland Scientists

The Wildlife Society

Florida Native Plant Society

PUBLICATIONS

Other

Clayton, D.C., G.R. Best, and K.A. Bullock. 1995. Assessment of plant community continuity between cypress wetlands and southern pine plantations before and after harvesting. Submitted to Florida Department of Environmental Protection, Tallahassee, Florida.

Powell, R.L., G.T. Coyle, G.R. Best, D.C. Clayton, M. Clark, and K.A. Bullock. 1995. Determination of boron and its potential effects in Eagle's Nest Swamp at Monsanto's Pensacola Manufacturing Site. Submitted to Monsanto, St. Louis, Missouri.

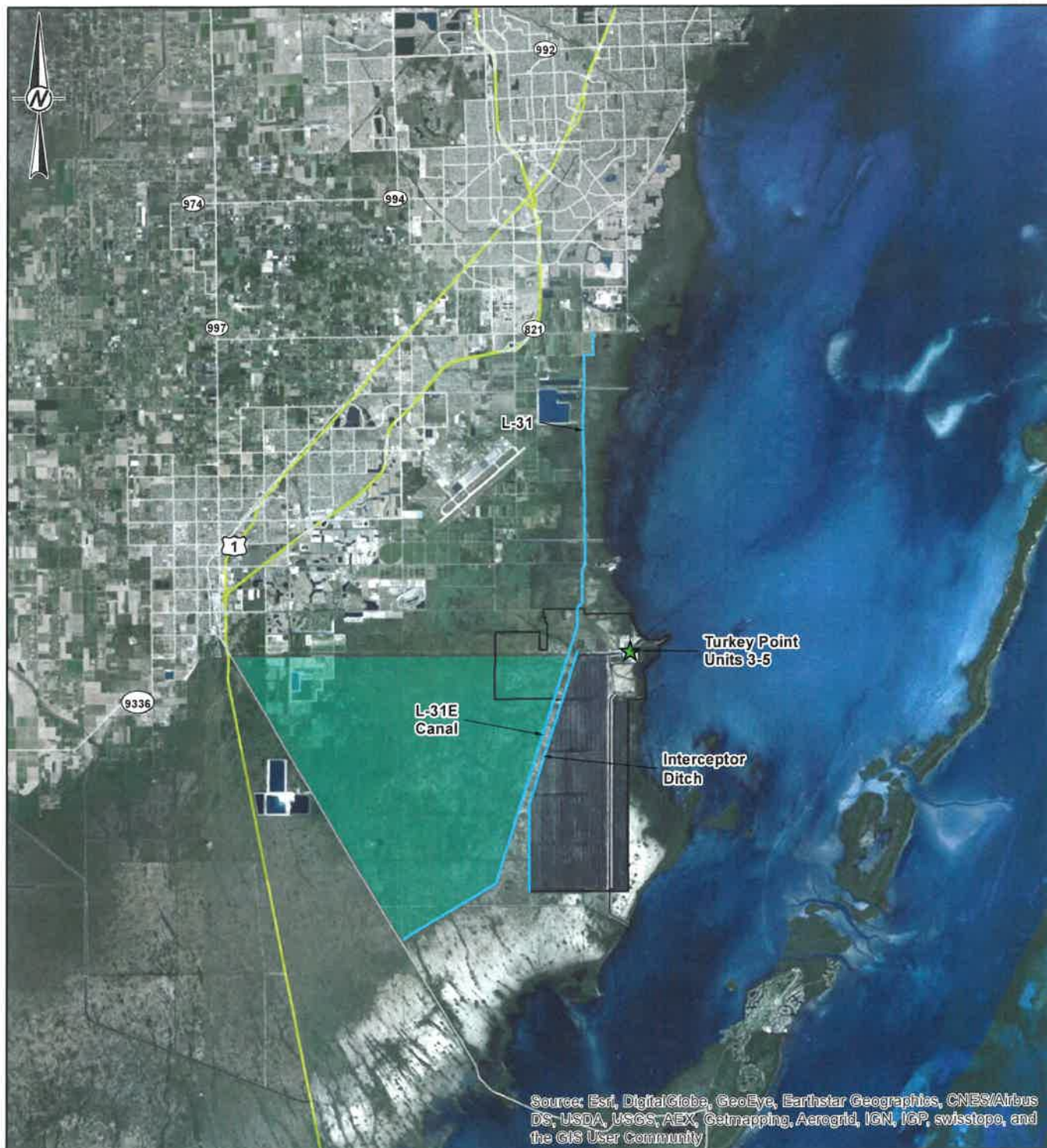
Bullock, K.A. 1997. Wetland macroinvertebrate community response to altered nutrient and hydrology regimes from reclaimed water addition. Master's Thesis, University of Florida Department of Environmental Engineering Sciences.

Golder Associates Inc., Live Oak Consulting, Inc. and Ron Keuhl. 1997. Environmental Assessment of Altered Lands in the Withlacoochee and Upper Coastal Basins. Submitted to the Southwest Florida Water Management District.

Golder Associates Inc. 2000. Effects of Atmospheric Ammonia Deposition on Vegetation. Submitted to Weed Systems, Inc., Hawthorne, Florida.

Golder Associates Inc., GIS Associates Inc., and Gecko Latitudes Inc. 2000. Mapping Low-Salinity Submerged Aquatic Vegetation in the Lower Suwannee River, Florida. Submitted to the Suwannee River Water Management District.





LEGEND

- ★ Turkey Point Units 3-5
- Canals
- Turkey Point Plant Property Boundary
- Model Lands Basin

REFERENCE(S)

TURKEY POINT UNITS 3-5, TURKEY POINT PLANT PROPERTY BOUNDARY, FPL, 2015
MODEL LANDS BASIN, FDEP, 1998-2015



MODEL LANDS BASIN

1 **BEFORE THE DIVISION OF ADMINISTRATIVE HEARINGS**

2 **FLORIDA POWER & LIGHT COMPANY**

3 **TURKEY POINT UNITS 3-5 MODIFICATION**

4 **DIRECT TESTIMONY OF KERRI J. KITCHEN**

5 **DOAH CASE NO.: 15-1559EPP**

6 **BACKGROUND/QUALIFICATIONS**

7 **Q. Please state your name and business address.**

8 A. My name is Kerri Kitchen. My business address is 5100 W. Lemon Street, Suite 208,
9 Tampa, FL 33609.

10 **Q. Who is your current employer and what position do you hold?**

11 A. I am employed by Golder Associates Inc. My position is Senior Environmental/Land
12 Use Planner.

13 **Q. Please describe your educational background beginning with your undergraduate**
14 **degree.**

15 A. I received a Bachelor of Science degree in Natural Resources (with a concentration in
16 Environmental Science) from The Ohio State University in 1995. I received a Master of
17 Urban Planning (with a concentration in Environment and Infrastructure Systems) from
18 New York University in 2002. Both my BS and MUP concentrated on the area of
19 environmental science and land use planning.

20 **Q. Please describe your professional work experience since obtaining your last**
21 **academic degree.**

22 A. I began my professional career as an environmental scientist with an environmental
23 consulting firm in New York City in 1997. While with this firm for 10 years, I worked

1 on land use planning, environmental impact assessments, and permitting for potable
2 water, wastewater, and stormwater infrastructure systems. I was responsible for land use
3 regulation investigations, utility siting studies, socioeconomic analyses, and public
4 outreach programs. In addition, I conducted and oversaw analyses associated with land
5 use/development review, socioeconomic, historic and archaeological resources, and
6 transportation. Since joining Golder in 2007, I have conducted and managed analyses
7 associated with land use planning, socioeconomic, historic and archaeological resources,
8 and transportation associated with public utility, industrial, and manufacturing projects.

9 **Q. Please describe the extent of your work with electric power generation facilities.**

10 A. Since joining Golder in 2007, I have been involved with the analyses and permitting
11 applications associated with land use approvals and socioeconomic, and I have overseen
12 analyses associated with historic and archaeological resources and transportation
13 resources in association with 17 electric power generation facilities. These analyses have
14 included projects certified under the Florida Power Plant Siting Act (PPSA). In addition,
15 I have been responsible for seeking environmental permits and land use approvals or
16 overseeing environmental compliance aspects of project development for the electric
17 power generation facilities.

18 **Q. In the course of your career have you had experience in preparing socioeconomic**
19 **impact assessments of proposed projects?**

20 A. Yes, I have.

21 **Q. What is a “socioeconomic impact assessment”?**

22 A. Socioeconomic impact assessment is the evaluation of a project’s effects on various
23 components of the built environment, including land use patterns, highway transportation
24 capacity and access, community facilities and services, economic effects of projects to

1 local governments and the local and regional economy, impacts to visual resources, and
2 impacts to archaeological and historic resources.

3 **Q. Please describe any memberships you hold in professional organizations in your**
4 **field of expertise.**

5 A. I am a member of the Urban Land Institute (ULI) and a member of Commercial Real
6 Estate for Women (CREW) organization.

7 **Q. Is Exhibit FPL-41 a true and correct copy of your resume?**

8 A. Yes, it is.

9 **FPL OFFERS KERRI J. KITCHEN AS AN EXPERT IN THE FIELDS OF LAND USE**
10 **PLANNING, AND SOCIOECONOMIC IMPACT ANALYSIS.**

11 **Q. Please describe the subject of your testimony in this proceeding.**

12 A. My testimony will address the potential impacts of the proposed modification of
13 certification for Turkey Point Units 3, 4 and 5 on adjacent land uses, cultural and
14 recreational resources, and transportation facilities, as well as the modification's
15 consistency with applicable land use plans and zoning ordinances.

16 **Q. What has been your role in FPL's proposed modification of the Turkey Point Units**
17 **3-5 certification?**

18 A. I was the Project Manager and assisted FPL by overseeing the development of the request
19 for modification submitted to FDEP. I was also responsible for reviewing the proposed
20 modification in reference to the land use and socioeconomic aspects of the proposed
21 modification and authored those portions of the request for modification.

22 **Q. Have you prepared or are you prepared to sponsor into evidence the sections of the**
23 **petition for modification and completeness responses, including any tables, figures,**
24 **or attachments, listed by your name on Exhibit FPL-2?**

1 A. Yes.

2 Q. Are the materials listed on Exhibit FPL-2 that you are sponsoring true and correct?

3 A. Yes.

4 Q. Do you agree with the contents of those materials listed on Exhibit FPL-2 that you
5 are sponsoring?

6 A. Yes.

7 **LAND USE COMPATIBILITY AND CONSISTENCY**

8 Q. Did you evaluate the land use consistency and compatibility of the proposed
9 modification?

10 A. Yes

11 Q. Could you please describe that analysis?

12 A. The evaluation consisted of reviewing site aerials, past site reports, and County
13 regulatory information in reference to the site and the surrounding area to document the
14 existing uses and the existing regulatory requirements specifically involving the location
15 areas for wells F-1 to F-6.

16 Q. Please identify Exhibit FPL-35.

17 A. This is Figure 2.3-1 from the petition for modification showing the currently-existing
18 land uses in the vicinity of the proposed modification area.

19 Q. Using that Exhibit FPL-35, please provide an overview of the existing land uses in
20 the vicinity of the proposed modification area, including any residential or
21 recreational land uses.

22 A. As depicted in Exhibit FPL-35, land uses within the immediate vicinity of the proposed
23 modification area are on FPL owned property. The modification area is adjacent to the
24 existing cooling canal system (CCS) and unpaved/gravel service roads. The areas are

1 predominately undeveloped, but may contain monitoring stations and miscellaneous
2 equipment associated with the power plant and the cooling canal system. There are no
3 residential or recreational land uses within the well location areas or the FPL owned
4 property. The closest private residence is located approximately 4 miles to the northwest
5 of the cooling canal system.

6 **Q. Based on your professional qualifications, could you please describe the expected**
7 **impact of the proposed modification on existing land uses in the vicinity, including**
8 **the residential, commercial, and recreational land uses and protected or sensitive**
9 **natural resource systems?**

10 A. The proposed modification will not have an adverse impact upon adjacent existing land
11 uses, including the residential, commercial, and recreational land uses and protected or
12 sensitive natural resource systems.

13 **Q. What is the basis for your opinion?**

14 A. The proposed modification is situated within an area owned by FPL and used for
15 electrical generation. The proposed use will not be located in close proximity to or cause
16 the disruption to residential, commercial or recreational land uses. The closest residence
17 is approximately 4 miles northwest, the closest commercial establishment (a daycare
18 center) is approximately 1.5 miles north, and the closest recreational area (Homestead
19 Bayfront Park) is approximately 2.5 miles to the north.

20 **Q. In your opinion as an expert in the field of land use planning, will the proposed**
21 **modification be consistent and compatible with the existing proximate land uses?**

22 A. In my opinion, the proposed modification will be consistent and compatible with the
23 adjacent existing land uses, which most immediately consist of equipment laydown,

1 monitoring equipment, and equipment associated with operation/maintenance of the
2 power plant and the cooling canal system.

3 **Q. What is the basis for your opinion?**

4 A. The basis of my opinion is that the proposed modification will continue to support the
5 operation/maintenance of the existing power plant and the cooling canal system. The
6 proposed use is consistent with the existing use and is in compliance with the intended
7 use of the area, as depicted in the County's Comprehensive Plan and land development
8 regulations.

9 **Q. In your opinion will the proposed modification have any aesthetic or viewshed
10 impacts?**

11 A. In my opinion, no.

12 **Q. What is the basis for your opinion?**

13 A. The proposed use will have minimal above-ground disruption. At each well, location a
14 new concrete pad and well equipment will be installed. This equipment will be
15 consistent with other existing monitoring equipment associated with the existing power
16 plant and cooling canal system equipment in place. No visual appearance of the new
17 equipment will be visible from outside the FPL property.

18 **Q. Are you familiar with the current land use designation of the proposed modification
19 area under Miami-Dade County's Comprehensive Development Master Plan
20 (CDMP)?**

21 A. Yes, I am.

22 **Q. What is the current designation?**

23 A. The areas associated with the proposed well locations F-2 to F-6 are within the
24 Environmental Protection land use designation, specifically Subarea E, Coastal Wetlands

1 and Hammocks, under the CDMP and its land use plan map. The location for well F-1 is
2 in an area designated Institutions, Utilities, and Communications.

3 **Q. In your opinion, based on your qualifications as a land use planner, is the proposed**
4 **modification consistent with the Land Use Element of the County's CDMP?**

5 A. Yes, the proposed modification is consistent with the Land Use Element. Necessary
6 electrical generation facilities are permitted in areas designated Environmental Protection
7 as well as areas designated Institutions, Utilities, and Communications. The proposed
8 modification would support the existing use, electrical generation, which is permitted
9 within these County land use designations. In addition, the proposed modification will
10 ensure continued maintenance of the cooling canal system, which will support an existing
11 public utility that provides existing and future electrical needs for the growing
12 surrounding area. The proposed use will not introduce incompatible activity or cause
13 disruption to neighboring uses.

14 **Q. Are you familiar with the Miami-Dade County requirements applicable to the**
15 **Coastal High Hazard Area and Hurricane Vulnerability Zone in their CDMP?**

16 A. Yes I am.

17 **Q. In your opinion as a land use planner, is the proposed modification consistent with**
18 **those requirements?**

19 A. It is my opinion that the proposed modification is consistent with the Coastal High
20 Hazard Area and the Hurricane Vulnerability Zone requirements of the County's CDMP.

21 **Q. What is the basis for your opinion?**

22 A. The proposed modification is located within the Coastal High Hazard Area and the
23 Hurricane Vulnerability Zone. The purpose of the requirements related to these areas is to
24 limit increased development in areas susceptible to hurricanes and flooding. The intent

1 of the proposed modification is to support the existing operation of the power plant and
2 the maintenance practices associated with the existing cooling canal system. It is not the
3 intent of the proposed use to increase development within these areas, nor will the
4 proposed modification do so.

5 **Q. Overall, in your opinion from a land use planning perspective, is the proposed**
6 **modification consistent with the County's CDMP?**

7 A. It is my opinion that the proposed modification is consistent with the County's CDMP.

8 **Q. What is the basis for your opinion?**

9 A. The proposed modification complies with the County's CDMP and its land use
10 designations. It will support the existing public facility, while protecting the natural
11 environment and maintaining a natural appearance that will not be a disruptive presence
12 towards neighboring uses.

13 **Q. Are you familiar with the Miami-Dade County land development regulations?**

14 A. Yes, I am.

15 **Q. More specifically, are you familiar with the zoning designation for the proposed**
16 **modification area?**

17 A. Yes, I am.

18 **Q. What is that designation?**

19 A. Proposed well F-1 is located within the Industrial Unlimited Manufacturing District (IU-
20 3) zoning designation. The other proposed well locations (F-2 to F-6) are located within
21 the GU Interim District zoning designation.

22 **Q. In your opinion, based on your qualifications as a land use planner, is the proposed**
23 **modification in compliance with the County's land development regulations,**
24 **including the zoning designation?**

1 A. It is my opinion that the proposed modification is in compliance with the County's land
2 development regulations, including the zoning designation.

3 **Q. What is the basis for that opinion?**

4 A. Within the Industrial Unlimited Manufacturing District (IU-3) zoning designation,
5 electrical power plants including nuclear reactors are a permitted use. The regulations for
6 the GU Interim zoning district states that uses in the GU district are associated with the
7 "trend of development" where the predominant use in adjoining properties, because of
8 their close proximity, can make for a compatible use. Therefore, the closest (adjacent)
9 zoning district is the IU-3 district and within this district the existing power plant and
10 associated facilities are considered a permitted use. The proposed modification, which
11 will serve to support the operation and maintenance of the existing power plant and
12 associated facilities, are considered compatible and, therefore, permitted.

13 **Q. Are you familiar with the State and regional comprehensive plans as they relate to**
14 **the proposed modification?**

15 A. Yes, I am.

16 **Q. Do you have an opinion as to whether the proposed modification is consistent with**
17 **the State Comprehensive Plan?**

18 A. Yes, I do.

19 **Q. What is that opinion?**

20 A. It is my opinion that the proposed modification is consistent with the State
21 Comprehensive Plan.

22 **Q. What is the basis for your opinion?**

23 A. The State Comprehensive Plan provides long range policy guidance for the orderly
24 social, economic, and physical growth of the State. The Plan does not, however, create

1 independent regulations. The proposed modification is not related to several of the goals
2 and policies of the State Plan, but the proposed modification is consistent with policies in
3 several sections, including Land Use and Energy.

4 **Q. Do you have an opinion as to whether the proposed modification is consistent with**
5 **the South Florida Regional Policy Plan?**

6 A. Yes, I do.

7 **Q. What is that opinion?**

8 A. It is my opinion that the proposed modification is consistent with the South Florida
9 Regional Policy Plan.

10 **Q. What is the basis for your opinion that the proposed modification is consistent with**
11 **that Plan?**

12 A. The South Florida Regional Policy Plan is a long range guide for the physical, economic,
13 and social development of the region. The Plan is a direction setting document and does
14 not create independent regulatory authority or authorize the adoption of agency rules,
15 criteria, or standards not otherwise authorized by law. Several goals and policies of the
16 Plan are unrelated to the proposed modification. The proposed modification is consistent
17 with several goals of that Plan, though; for example, enhance the economic and
18 environmental sustainability of the Region by ensuring the adequacy of its public
19 facilities (Goal 4); promote the health, safety, and welfare of South Florida's residents
20 through provision of affordable electricity (Goal 3); and development of clean,
21 sustainable, and energy-efficient power generation (Goal 9).

22 **SOCIOECONOMIC IMPACTS**

1 **Q. Have you evaluated the impacts of the proposed modification on regional public**
2 **facilities and services such as housing, schools, and police, fire, emergency**
3 **management, and medical facilities?**

4 A. Yes, I have.

5 **Q. In your opinion, will the proposed modification impact those facilities and services**
6 **or degrade any levels of service?**

7 A. It is my opinion that the proposed modification will not result in adverse impacts to
8 public facilities and services being provided to the surrounding area.

9 **Q. What is the basis for that opinion?**

10 A. The proposed modification will not introduce new staff, alter the existing staff
11 requirements, or require changes in existing operational or maintenance procedures or
12 practices associated with the existing FPL facility. Construction activities will be
13 temporary and will require only a limited workforce. Therefore, operation of the wells
14 will not result in the need for additional, or changes to existing public facilities or
15 services.

16 **Q. Did you evaluate the potential impacts of the proposed modification on**
17 **transportation facilities, including adopted levels of service, in the area?**

18 A. Yes, I have.

19 **Q. In your opinion, will the proposed modification adversely impact adopted levels of**
20 **service or otherwise adversely impact transportation facilities?**

21 A. It is my opinion that the proposed modification will not adversely impact the adopted
22 levels of service or adversely impact transportation facilities.

23 **Q. What is the basis for your opinion?**

1 A. The proposed modification will not result in additional transportation requirements, such
2 as staff changes or delivery/removal of supplies or equipment during operation of the
3 wells. Therefore, the existing transportation system within the project and the
4 surrounding area will not change as a result of the proposed modification. Construction
5 activities associated with the well construction will be temporary, with a limited
6 workforce and, therefore, likewise will not impact transportation facilities.

7 **Q. In your opinion, will the proposed modification impact tropical storm/hurricane**
8 **evacuation times?**

9 A. It is my opinion that the proposed modification will not impact tropical storm/hurricane
10 evacuation times.

11 **Q. What is the basis for your opinion?**

12 A. The proposed modification will not result in changes to staff or delivery/removal of
13 supplies or equipment at the Turkey Point Plant. Therefore, the proposed modification
14 would not result in additional pressure upon the surrounding areas during emergency
15 events/situations. Construction activities associated with the well construction will be
16 temporary, with a limited workforce and, therefore, likewise will not impact
17 transportation facilities during such events.

18 **Q. Did you evaluate the potential impacts of the proposed modification on landmarks**
19 **and sensitive areas in the region?**

20 A. Yes.

21 **Q. In your opinion, based on your qualifications, will the proposed modification have**
22 **an adverse impact on any landmarks and sensitive areas in the region?**

23 A. It is my opinion that the proposed modification will not result in an adverse impact on
24 any landmarks or sensitive areas within the region.

1 **Q. What is the basis for your opinion?**

2 A. Landmarks and sensitive areas occupied by the public are sufficiently removed from the
3 modification area so that users of the facilities at these locations will not be affected by
4 construction or operation of the new UFA wells.

5 **Q. Did you evaluate the potential impacts of the proposed modification on cultural,
6 archaeological, and historic resources?**

7 A. Yes.

8 **Q. To your knowledge, are there any archaeological or historic features in the area of
9 the proposed modification that would be adversely affected?**

10 A. No, there are no archaeological or historic features in the area of the proposed
11 modification.

12 **Q. In your opinion, will the proposed modification have any impacts on archaeological
13 or historic resources, including secondary impacts?**

14 A. It is my opinion that the proposed modification will not result in an adverse impact on
15 historic or archaeological resources include secondary impacts.

16 **Q. What is the basis for your opinion?**

17 A. There are no sites of historic or archaeological significance that will be impacted due to
18 the proposed modification. There are no sites listed or eligible for listing in the National
19 Register of Historic Places in proximity to the proposed well locations.

20 **Q. Are you familiar with the state and local requirements applicable to protection of
21 archaeological and historic resources and properties?**

22 A. Yes, I am.

23 **Q. In your opinion, is the proposed modification consistent with those requirements?**

1 A. It is my opinion that the proposed modification is consistent with the intent of these
2 requirements.

3 **Q. What is the basis for your opinion?**

4 A. The area of the proposed modification as well as the surrounding FPL property has been
5 evaluated in accordance with the state and local requirements for protection of
6 archaeological and historic resources. Golder has coordinated this evaluation with
7 evaluations by other technical experts to support the site evaluations and ensure that all
8 regulatory procedures have been incorporated into site and project investigations.

9 **Q. Overall, in your opinion, does the proposed modification minimize any potential**
10 **adverse socioeconomic impacts, including to land use, transportation, and cultural**
11 **resources including archaeological and historic sites?**

12 A. It is my opinion that the proposed modification would minimize potential adverse
13 impacts as they relate to socioeconomics, land use, transportation, and cultural resources
14 including archaeological and historic resources.

15 **Q. What is the basis for your opinion?**

16 A. The basis of my opinion is that the proposed modification will assist to support the
17 operation and maintenance of the existing power plant and the cooling canal system. The
18 installation of the wells will not require additional permanent staff that could affect the
19 socioeconomic and traffic requirements. The area designated for the wells is already
20 altered land within the FPL power plant property. That area does not contain and is not
21 within close proximity to cultural resource (historic or archaeological resource) areas.
22 These areas for the wells have been selected to avoid additional or new land disruption
23 and are specifically designed to minimize and avoid potential impacts.

24 **Q. Does this conclude your prepared written testimony?**

1 A. Yes.

**FLORIDA POWER & LIGHT COMPANY
TURKEY POINT UNITS 3-5 MODIFICATION
DOAH CASE NO. 15-1559**

PETITION FOR MODIFICATION AND COMPLETENESS WITNESS SPONSORSHIP

Witness	Petition Sections Sponsored (including figures, tables, attachments referenced in same)	Completeness Responses Sponsored
Steve Scroggs	1.0—Need for the Proposed Facility	SFWMD-5
	1.1—Facility Introduction	SFWMD-6
	1.2—The Applicant	SFWMD-7
	1.3—Overview of the Project(s)	MDC-1
	1.3.2—Fukushima Compliance	MDC-3
	1.3.3—Unit 5 Well Water Re-allocation	MDC-5
	1.4—Conditions of Certification	MDC-6
	1.5—Need for the Project	MDC-12
	1.6—Summary of Public Outreach	MDC-15
	3.1—Background	
	3.10.1—Construction Materials and Equipment	
	4.1.4—Roads and Slip	
	Appendix C	
Jim Andersen	2.1.1—Site Location	MDC-10
	2.3.1—Geogydrology	MDC-18
	2.3.2—Subsurface Hydrology	
	3.2.1—Production Well Description	
	3.3.1—Production Wells	
	3.3.2—Alternative Water Supply Line	
	4.1.1—Production Wells	
	4.1.2—Alternative Water Supply Line	
	4.1.2.1—General Construction Impacts	
	4.1.3—Alternative Water Supply Line	
Pete Andersen	1.3.1—Salinity Reduction Plan	SFWMD-1
	2.3.3—Site Water Budget and Area Users	SFWMD-2
	3.2.2—Cooling Canal System	SFWMD-3
	3.2.3—Permitted Water Withdrawals	SFWMD-4
	3.6—Plant Water Use	MDC-4
	4.3—Groundwater Impacts	MDC-7
	5.1.1—Production Wells	MDC-8
	5.1.2—Alternative Water Supply Line	MDC-9
	Appendix A	MDC-11
	Appendix B	MDC-13
		MDC-16
		MDC-17
		MDC-19
		MDC-20

		MDC-20
		MDC-21
		MDC-22
		MDC-23
		MDC-24 (including all subquestions A through)
		MDC-25
		Revised Appendix B
Greg Powell	2.3.4—Surficial Hydrology	
	3.7—Chemical and Biocide Waste	
	3.8—Solid and Hazardous Waste	
	3.9—Site Drainage	
	4.1.5—Flood Zones	
	4.2—Impact on Surface Water Bodies and Uses	
	4.2.1—Impact Assessment	
	4.2.2—Measuring and Monitoring Program	
	5.1.3—Leachate and Runoff	
	5.1.4—Measurement Programs	
	5.2—Sanitary and Other Waste Discharges	
Karl Bullock	2.3.5—Vegetation/Land Use	
	4.4.1—Impact Assessment (wetlands)	
	4.4.2—Measuring and Monitoring Programs (wetlands)	
	5.5—Ecological Impacts (wetlands)	
Jim Lindsay	2.3.6.1—Species-Environmental Relationships	MDC-14
	2.3.7—Pre-existing Stresses	
	2.3.7.1—Measurement Programs	
	4.4.1—Impact Assessment (wildlife)	
	4.4.2—Measuring and Monitoring Programs (wildlife)	
	5.5—Ecological Impacts (wildlife)	
Ken Kosky	2.3.8—Meteorological and Ambient Air Quality	
	2.3.8.1—Ambient Air Quality	
	2.3.9—Noise	
	3.4—Fuel	
	3.5—Air Emission and Controls	
	4.5—Air Impacts	
	4.5.1—Control Measures	
	4.6.1—Construction Noise Impacts	
	5.3—Air Quality Impacts	
	5.4—Noise Impacts	
Kerri Kitchen	2.2.1—Governmental Jurisdictions	MDC-2
	2.2.2.1—Future Land Use	
	2.2.2.2—Zoning	
	4.1.6—Topography and Soils	



LEGEND

- Aquifer Well
- Turkey Point Plant Property Boundary
- Land Use
 - Commercial
 - Upland Forest
 - Upland Hardwood Forest
 - Streams and Waterways
 - Reservoirs
 - Bays and Estuaries
 - Mangrove Swamp
 - Wetland Forested Mixed
 - Freshwater Marshes
 - Non-Vegetated Wetlands
 - Disturbed Lands
 - Roads and Highways
 - Utilities

REFERENCE

FACILITY LAYOUT, GOLDER ASSOCIATES INC., 2009-2014

CLIENT

FPL
MIAMI-DADE COUNTY, FLORIDA

PROJECT

FPL TURKEY POINT CCS SALINITY REDUCTION PROJECT

TITLE

LAND USE MAP

CONSULTANT

YYYY-MM-DD 2014-05-13



PREPARED NRL
DESIGN NRL
REVIEW KJK
APPROVED KFK

PROJECT No

1303064

CONTROL

A003

Rev

0

FIGURE

2.3-1

**Education**

*Master of Urban Planning
(Environment and
Infrastructure Systems),
New York University, New
York, New York, 2002*

*Bachelor of Science in
Natural Resources
(Environmental Science),
The Ohio State University,
Columbus, Ohio, 1995*

Languages

English – Fluent

Golder Associates Inc. – Tampa**Senior Environmental/Land Use Planner**

Kerri has 17 years of experience in environmental planning and consulting. Kerri is an experienced multi-disciplinary project manager and technical specialist with professional experience in facility siting, environmental impact assessments, land development reviews/applications, and public outreach.

Kerri's siting and permitting experience has included drinking water treatment plants, linear facilities (i.e. drinking water pipelines, fuel pipelines, and electrical transmission lines), utility stations (i.e., water/wastewater, electrical, and fuel), used oil recycling, and electric power generation (i.e., solar, fuel oil, biomass, waste, and natural gas). Kerri has served as project manager for environmental assessments (EA) and environmental impact statements (EIS) under the National Environmental Policy Act (NEPA) as well as New York State Environmental Quality Act (SEQRA) and NYC City Environmental Quality Review (CEQR). Kerri is knowledgeable in the regulation and procedures associated with Florida Siting Acts (i.e., Power Plant, Transmission Line, and Natural Gas Line). Kerri is also experienced in facilitating community action committees, public information sessions, and public hearings.

Employment History**Golder Associates Inc – Tampa, Florida**

Senior Environmental/ Land Use Planner (April 2007 to Present)

Multi-Disciplinary project manager and technical specialist responsible for environmental planning, land use planning, environmental permitting and impact assessments. Provides extensive experience in conducting land use and socioeconomic assessments; including local demography, environmental justice, infrastructure, and community involvement. Manages regulatory evaluations, siting studies and oversees the preparation of environmental permitting and land development applications.

Hazen and Sawyer, PC – New York, New York & Tampa, Florida

Senior Principal Scientist (1997 to 2007)

Project manager and technical specialist on land development evaluations, site studies and impact assessments, as well as the development and implementation of public involvement programs pertaining to public utility projects in the tri-state area.

Served as the manager in coordinating field investigations, collection and evaluation of field data, and coordinated application preparation and submission processes applicable to federal, state, and local environmental permits and land use/zoning approval requirements. The management of environmental applications followed the regulatory requirements of NEPA, SEQRA (NYS environmental regulations), and CEQR (NYC environmental regulations). The local planning/zoning approvals followed the NYC ULURP (Uniform Land Use Review Procedures) process.





PROJECT EXPERIENCE – LAND DEVELOPMENT

**Fort Green Storage,
LLC - Major Special
Exception**
Hardee County, FL, USA

The Fort Green Storage project consists of the design, construction, and operation of a liquified natural gas fueling station and storage facility in Hardee County, FL. The storage facility will receive delivery of natural gas - from nearby interstate pipelines - and liquefy it using a mixed refrigerant or nitrogen process. Up to four billion cubic feet of the liquified natural gas will then be stored and vaporized for intrastate-only consumption and/or loaded into trucks for regional distribution and use in the motor-fuels market. Project responsibilities included communication and coordination with County staff in confirming applicable regulatory requirements, application preparation, and monitoring County's review and approval schedule. As project manager was responsible for day-to-day management. As technical specialist was responsible for the assisting FGS in obtaining a Major Special Exception approval for the project.

**Geoplasma Waste-to-
Energy Project - Land
Planning Approvals**
City of Fort Pierce, St.
Lucie County, Florida,
USA

The Geoplasma-St. Lucie LLC project consists of a 24-mega-watt waste-to-energy plasma gasification facility where municipal solid waste from the St. Lucie County landfill would be used to generate a power supply. Project responsibilities involved communication and coordination with City staff in confirming applicable regulatory requirements, application preparation, and monitoring the City's review and approval schedule. As project manager was responsible for day-to-day management of the project. As technical specialist was responsible for the evaluation, identification, and application submission involving land planning approvals that complied with the land development regulation requirements of the City.

**NexLube Tampa LLC -
Land Planning
Approvals**
Hillsborough County,
Florida, USA

The NexLube project is a used oil recycling facility within the Port of Tampa, in Hillsborough County, Florida. As the technical specialist was responsible for coordinating communication with County staff in confirming applicable land planning approval requirements, coordinating application preparation, monitoring the County's review and approval schedule, and presenting project before Land Use Hearing Officer. Approval requirements included a site plan application, height and setback variance, environmental protection commission approval, a natural resource permit, and concurrency review. In addition, was responsible for information collection and application coordination with the Tampa Port Authority staff.

**Cape Canaveral Power
Plant - Land Planning
Approvals**
Brevard County, Florida,
USA

The Cape Canaveral project involved the conversion of a dual-fuel fired power generation plant into a lower-emission next generation clean energy center at FPL's Cape Canaveral Plant site. As project manager was responsible for the evaluation of the proposed project in reference to the County's Comprehensive Plan and Land Development Regulations and the confirmation of applicable land planning approvals. Management tasks included coordinating communication with Brevard County staff in confirming applicable land development requirements, coordinating application preparation, monitoring the County's review and approval schedule. Approval requirements included a zoning amendment, conditional use approval, and site plan approval. In addition, Golder assisted FPL and the Brevard County Planning and Zoning Department in amending the County's land development regulations to include electric power generation facilities within the zoning code and the identification of applicable performance standards associated with such facilities.

**Riviera Power Plant -
Land Planning
Approvals**

City of Riviera Beach,
Palm Beach County,
Florida, USA

The Riviera project involved the conversion of a dual-fuel fired power generation plant into a lower-emission next generation clean energy center at FPL's Riviera Beach Plant site. As project manager was responsible for the evaluation the proposed project in reference to the City's Comprehensive Plan and Land Development Regulations and the confirmation of applicable land planning approvals. Management tasks included coordinating communication with City staff in confirming applicable land development requirements, coordinating application preparation, and monitoring the City's review and approval schedule. Approval requirements included a site plan approval.

**Tampa Bay Water,
Water Seepage
Mitigation**

Hillsborough County, FL,
USA

In 2008, Golder Associates Inc. was retained by Tampa Bay Water to design and remediate water seepage at a shaft site along the southern bank of the Alafia River in Tampa. As the technical specialist evaluating the project in reference to the County's Comprehensive Plan and Land Development Regulations and confirming with County staff applicable permitting requirements, coordinating application preparation, and monitoring the County's review and approval schedule. Golder applied for and received a Natural Resource Permit for the project.

PROJECT EXPERIENCE – ENVIRONMENTAL ASSESSMENT

**Ona Mine
Environmental Impact
Statement**

Hardee County, Florida,
USA

Technical specialist in the third-party environmental impact assessment for the US Army Corps of Engineers, Jacksonville District, and Mosaic Fertilizer LLC. Responsible for evaluations pertaining to land use, community facilities, socioeconomics, environmental justice, and public services. Also coordinated efforts pertaining to cultural resources and traffic.

**Visual Impact
Assessment for a
Biomass Electric
Generating Plant**

Lowndes County,
Georgia, USA

Managed and implemented a visual impact assessment for a proposed biomass electric generating plant to determine the visibility of the proposed plant from adjacent properties and area public rights-of-way and facilities. Prepared presentation materials to assist the client in presenting the project to property owners and residents within the community. The assessment provided photos of existing and future conditions, using photo-simulation, to show the before and after conditions of the property and the project.

**Eco-tourism Resort -
Renewable Energy
Sources Evaluation**
Dominican Republic, DR

Project manager of a preliminary evaluation of renewable energy resource opportunities associated with the designing of an eco-tourism resort in the Dominican Republic. Using preliminary development plans, identified renewable technologies that could be part of the energy supply mix for the resort.

**Waste Management
Siting Study**

Polk County, Florida,
USA

Technical specialist for the land use evaluation and identification of potential sites for a waste management facility. Responsible for assisting the client in understanding the county regulations, permitting requirements, and procedures and they would impact project development.



PROJECT EXPERIENCE – POWER

Turkey Point Units 6&7
Miami-Dade County, FL,
USA

Technical specialist for the land use and socioeconomic evaluations associated with two new nuclear units at FPL's Turkey Point Plant. Project involvement also included technical coordination and management of the cultural resource, fiscal analysis, and traffic subconsultants. The evaluations were conducted in accordance with Florida's Power Plant Siting Act and were coordinated with the Nuclear Regulatory Commission Combined License Application (COLA) Environmental Report for the overall project.

**Central Power and
Lime, Inc Power Plant
Fuel Conversion
Project**
Hernando County,
Florida, USA

Conducted a Due Diligence Study involving the fuel conversion of an 11 year old 150MW coal electrical power generating unit to a biomass electrical power generating unit. Golder was responsible for the identification of applicable environmental permitting requirements and then coordinated with CPL and the reviewing agencies in preparing the environmental applications for submission. Serving as the Assistance Project Manager, was responsible for coordinating the project information needs, application preparation, and agency communication. In addition, coordinated the Golder team efforts and monitored the application submission and review procedures. Environmental permitting requirements consisted of a modification request under the Florida Power Plant Siting Act, FDEP Air Construction Permit, SFWMD Environmental Resource Program, Hernando County project review and land development code compliance.

**DeSoto Solar Project -
Site Certification**
DeSoto County, Florida,
USA

Project manager that was responsible for coordinating the site evaluation for the construction of 225 mega-watts of solar electric generation and the certification of up to 300 mega-watts of solar electric generation. The evaluation was conducted under the Florida's Power Plant Siting Act Site Certification and environmental licensing documents. Project responsibilities included team coordination, client communication, application preparation, coordination and communication with the DEP Site Coordination Office, and management of the project schedule and budget.

**Stanton Energy Center
- Site Certification
Modification**
Orange County, Florida,
USA

Project manager of an evaluation involving the 20 foot vertical expansion of the existing combustion waste storage area at the OUC Stanton Energy Center. The evaluation considered the potential changes to the site's certification and conditions of certification under the Florida's Power Plant Siting Act Site Certification and environmental licensing documents. Project activities included coordination and communication with the FDEP Site Coordination Office as it related to the potential changes to the site and assisted OUC in obtaining an Amendment to the site's Certification for the proposed project.

**Stanton Energy Center
- Site Certification
Modification**
Orange County, Florida,
USA

Project manager of an evaluation involving the installation of a second landfill gas pipeline associated with the existing OUC Stanton Energy Center. The proposed pipeline extends from the County municipal landfill (adjacent to the OUC property) to the electrical power generation plant. This evaluation considered the potential changes to the site's certification and conditions of certification under the Florida's Power Plant Siting Act Site Certification and environmental licensing documents. Project activities included coordination and communication with the FDEP Site Coordination Office as it related to the potential changes to the site and assisted OUC in obtaining an Amendment to the site's Certification for the proposed project.



- Riviera Beach Power Plant - Site Certification**
City of Riviera Beach,
Palm Beach County, FL,
USA
- Technical specialist of the land use and socioeconomic evaluations associated with the conversion of a dual-fuel fired power generation plant into a lower-emission next generation clean energy center at FPL's Riviera Plant Project. The evaluations were conducted under the Florida's Power Plant Siting Act Site Certification and environmental licensing documents. Project involvement also included coordinating and managing sub consultants pertaining to cultural resources, fiscal analysis, and traffic.
- Riviera Beach Power Plant - Site Certification (Modification)**
City of Riviera Beach,
Palm Beach County, FL,
USA
- Technical specialist of the land use and socioeconomic evaluation for a 6-mile natural gas pipeline associated with the proposed clean energy center at the FPL's Riviera Plant. Project involvement included parcel identification and ownership evaluation associated with the proposed pipeline route.
- Cape Canaveral Power Plant - Site Certification**
Brevard County, Florida,
USA
- Technical specialist of the land use and socioeconomic evaluations associated with the conversion of a dual-fuel fired power generation plant into a lower-emission next generation clean energy center at FPL's Cape Canaveral Plant. Project involvement included coordination and management of the cultural resources, fiscal analysis, and traffic subconsultants. The evaluations were conducted under the Florida's Power Plant Siting Act Site Certification Application and environmental licensing documents. .
- Turkey Point - Independent Spent Fuel Storage Installation (ISFSI) - Site Certification Modification**
Miami-Dade County,
Florida, USA
- Project Manager of an evaluation involving the design and construction of an interim dry storage facility for used nuclear fuel. The evaluation considered the potential changes to the site's certification and conditions of certification under the Florida's Power Plant Siting Act Site Certification and environmental licensing documents. Project activities included coordination and communication with the FDEP Site Coordination Office as it related to the potential changes to the site and assisted FPL in obtaining an Amendment to the site's Certification for the proposed project.
- Transmission Line Corridor Study**
Central Florida, USA
- Technical specialist of the land use evaluations within 11 Florida counties and 19 municipalities involving over 178 miles of new electric transmission lines to support a proposed nuclear power plant in Levy County. The evaluations were conducted under the Florida's Electric Transmission Line Siting Act and were coordinated with the Nuclear Regulatory Commission Combined License Application (COLA) Environmental Report for the overall project.
- Turkey Point Units 3 & 4 - Site Certification Modification**
Miami-Dade County,
Florida, USA
- Technical specialist of the land use and socioeconomic evaluations associated with the construction and operation of two new nuclear units at the existing FPL's Turkey Point Power Plant. Project involvement also included coordination and management of the cultural resources, fiscal analysis, and traffic subconsultants. Evaluations were conducted under the Florida Power Plant Siting Act Site Certification Application and environmental licensing documents and the licensing documents with the Nuclear Regulatory Commission Combined Operating License Application (COLA) Environmental Report.

**Joint 230-kV
Transmission Line
Project**

Polk, Osceola, and
Orange Counties,
Florida, USA

Project manager that was responsible for coordinating the evaluation and selection of a preferred corridor for a new 230-kV electric transmission line that involved a study area of 1,890 square miles and included three counties in central Florida. Project activities included a corridor selection study and public outreach that were conducted under the Florida's Transmission Line Siting Act. The project involved coordination between two utility clients and public outreach and communication that involved elected/appointed officials, agencies, organizations, property owners and community residents.

PROJECT EXPERIENCE – OTHER CONSULTING PROJECTS**NYC Gilboa Dam
Rehabilitation -
Environmental
Assessment**

Schoharie County, New
York, USA

Technical specialist in the evaluation and environmental impact assessment involving the rehabilitation of a 83-year dam that impounds the Schoharie Reservoir; part of the NYC water supply system. The evaluation and assessment included the status of the Dam, the Reservoir, and the Shandaken Tunnel (which distributes the water through the water supply system). The environmental assessment was conducted under NEPA and NYS State Environmental Quality Review Act (SEQRA).

**NYC Catskill/Delaware
Water Treatment Plant
- EIS**

Westchester County,
New York, USA

Assistant Project Manager in conducting an environmental impact assessment pertaining to a 2-billion gallon per day Ultraviolet Light Disinfection Facility that would serve to treat 90% of NYC water supply. The environmental impact statement was conducted under NEPA and NYS State Environmental Quality Review Act (SEQRA). The EIS was conducted in coordination with the USEPA and the NYS Department of Health.

**NYC Croton Water
Treatment Plant - Site
Selection and EIS**

Bronx and Westchester,
New York, USA

Project Manager in conducting a site selection and environmental assessment pertaining to a new 290-million gallon per day water treatment plant that would serve to treat 10% of NYC water supply. The project also included the siting and environmental evaluation of required water distribution pipelines (new and upgrades) and pump stations (new and upgrades). The site selection and environmental impact assessment involved multiple phases that ultimately included 11 potential sites evaluated equally. The environmental impact statement was conducted under NEPA and NYS State Environmental Quality Review Act (SEQRA). The EIS was conducted in coordination with the USEPA and the NYS Department of Health under a federal consent decree order.

**Staten Island Bluebelt -
Sanitary/Stormwater
Best Management
Practices**

Staten Island, New York,
USA

Technical specialist in the evaluation and environmental impact assessment involving the design and implementation of NYC Department of Environmental Protection drainage plans to introduce stormwater management and control within multiple watersheds of Staten Island, NY (Blue Heron, Lemon Creek, Mill Pond, and Richmond Creek). As the technical lead was responsible for preparing state environmental permitting applications and the environmental assessment document. The environmental assessment was conducted under NEPA and NYS State Environmental Quality Review Act (SEQRA).



TRAINING

American Red Cross First Aid and CPR Training

1/2013

OSHA 10-hour Construction Safety Training

11/6/2007

Open Water Driver Certification

12/2003

PROFESSIONAL AFFILIATIONS

Urban Land Institute

Commercial Real Estate for Women

1 **BEFORE THE DIVISION OF ADMINISTRATIVE HEARINGS**

2 **FLORIDA POWER & LIGHT COMPANY**

3 **TURKEY POINT UNITS 3-5 MODIFICATION**

4 **DIRECT TESTIMONY OF KENNARD F. KOSKY**

5 **DOAH CASE NO.: 15-1559EPP**

6 **BACKGROUND/QUALIFICATIONS**

7 **Q. Please state your name and business address.**

8 A. My name is Kennard F. Kosky, and my business address is 6026 NW 1st Place,
9 Gainesville, Florida 32607.

10 **Q. Who is your current employer and what position do you hold?**

11 A. I am employed by Golder Associates Inc., an engineering consulting firm
12 specializing in ground engineering and environmental services, as a Principal in
13 the firm's Gainesville, Florida, office.

14 **Q. What are your responsibilities in your current position?**

15 A. I serve as Project Director and Project Manager of various projects that primarily
16 involve the environmental aspects of electric power plants, including managing
17 and directing multidisciplinary environmental licensing projects and air pollution,
18 lighting and noise studies.

19 **Q. Please describe your educational background beginning with your**
20 **undergraduate degree.**

21 A. I received a Bachelor of Science degree in Engineering from Florida Atlantic
22 University, and a Master of Science degree in environmental engineering from the
23 University of Central Florida. I also completed one and one-half years of

1 doctoral-level course work in the engineering Ph.D. program at the University of
2 Florida.

3 **Q. Please describe your professional work experience since obtaining your**
4 **academic degrees.**

5 A. After graduating from college in 1970, I started employment with the United
6 States Environmental Protection Agency (EPA), back when the agency was
7 founded. I worked for two and one-half years as EPA's state assignee to the
8 predecessor of the Florida Department of Environmental Protection (FDEP). In
9 September of 1972, I transferred to the Florida environmental agency as a full-
10 time state employee until about September of 1974. From 1974 through the next
11 eleven years (September 1985), I worked with Environmental Science and
12 Engineering, Inc., initially as a group leader of air quality management and then as
13 vice-president of power programs and air resources. I co-founded KBN
14 Engineering and Applied Sciences, Inc. in 1985, which merged with Golder
15 Associates in 1996. During my time at KBN, I was the President and Principal
16 Engineer. I have been with Golder Associates since the merger in 1996.

17 **Q. Could you summarize the power plant licensing projects with which you**
18 **have been involved?**

19 A. Over the last 40 years, my primary activities have involved the siting and
20 licensing of electric power plants. I have worked on over 50,000 megawatts
21 (MW) of new and existing generation, including nuclear generating units,
22 conventional coal, oil, and gas-fired steam generating units, combined cycle units,

1 integrated coal gasification combined cycle units, simple cycle units, municipal
2 solid waste-fired units, biomass-fired steam generating units, and diesel-fired
3 units. My primary technical activities have involved developing air emission
4 inventories, evaluating air pollution control technologies, performing air quality
5 impact evaluations, and managing interdisciplinary licensing activities for these
6 facilities. I also served as either the project director or project manager for the
7 environmental licensing of many of those projects.

8 **Q. Please summarize your experience with air quality impact analysis.**

9 A. I have conducted air quality impact analyses on hundreds of projects in Florida and
10 other states since the 1970's. This experience includes calculating the air pollutant
11 emissions for sources as well as the stack gas parameters that are used in air quality
12 modeling analyses. I manage and direct the air quality modeling analyses using EPA
13 and FDEP approved dispersion models, meteorological data and procedures. I have
14 extensive experience at the FPL Turkey Point Plant conducting air quality analyses
15 starting in 1976 with determining compliance with air quality standards for Unit 1
16 and 2 through the recent Turkey Point Units 6 & 7 licensing that included air quality
17 analyses to obtain the federally approved Air Construction/Prevention of Significant
18 Deterioration Permit.

19 **Q. Please describe your training and experience in noise impact analyses.**

20 A. My undergraduate degree included specific courses in acoustics. During my
21 career, I have managed and directed noise assessment studies for over two dozen
22 major power plant projects including several noise assessments at FPL's Turkey

1 Point Plant. This experience includes baseline noise monitoring, noise
2 assessments using computerized models, and compliance with noise ordinances
3 and guarantees during construction and operation.

4 **Q. Does your experience include assessments related to lighting impact**
5 **analyses?**

6 A. Yes, I have managed or directed over a dozen projects involving the assessments
7 of lighting impacts from both regulatory and environmental perspectives such as
8 light trespass and light pollution. The former typically involves light that strays
9 from its intended purpose, while the latter describes nighttime sky brightness by
10 scattering of light in the atmosphere. These projects included the monitoring of
11 light intensity at night from existing and planned power plants, as well as
12 guidelines for minimizing light trespass and pollution.

13 **Q. Please describe any professional or technical publications you have**
14 **published.**

15 A. I have authored numerous professional reports dealing with air quality, air
16 pollution control, lighting and noise. I have also directed and authored many
17 sections of power plant licensing documents that have included nineteen Site
18 Certification Applications in Florida and seven Applications for Certificate of
19 Public Convenience and Necessity in other states. I have authored or co-authored
20 numerous technical publications related to air quality and air pollution control.

21 **Q. Please describe any professional registrations or certifications that you hold**
22 **in your fields of expertise.**

1 A. I am a registered Professional Engineer in mechanical engineering in the State of
2 Florida. I have been practicing as a registered Professional Engineer since 1976.

3 **Q. Do you hold any memberships in professional organizations in your fields of**
4 **professional expertise, and if so please identify those organizations for us.**

5 A. I have been a member of the state and national chapters of the Air and Waste
6 Management Association, formerly called the Air Pollution Control Association.
7 I was the state chairman, vice chairman, secretary and treasurer of that
8 organization in the late 1980s.

9 **Q. Have you provided technical training to others in your fields of expertise? If**
10 **yes, can you please provide a summary of those training programs you have**
11 **provided?**

12 A. Yes, over the last twenty years I have taught numerous courses related to air
13 pollution at the Florida Chamber Environmental Permitting Summer School and
14 the Annual Golder Air Permitting Workshop. These courses are eligible for
15 continuing education credits for professional engineers. Recently, I taught a
16 graduate level course at the University of Florida that focused on air pollution
17 control design of particles and particulate matter.

18 **Q. Have you ever testified as an expert witness before?**

19 A. Yes, I have testified as an expert witness over 50 times in various types of cases.
20 This includes testifying before the Florida Environmental Regulation
21 Commission; the Florida Public Service Commission; Administrative Law Judges
22 from the Florida Division of Administrative Hearings, including 21 proceedings

1 under Florida's Power Plant Siting Act (PPSA); numerous environmental and
2 county boards in Florida; a Circuit Court; a Grand jury; and the Governor of
3 Florida. I have also testified as an expert in cases in Maryland, Georgia, South
4 Carolina, Hawaii, California, and Louisiana.

5 **Q. In what fields of expertise were you qualified as an expert?**

6 A. I have been qualified as an expert in siting, environmental impacts, and regulatory
7 compliance for electric power plants; air quality impact analyses; air pollution
8 control technologies, including Best Available Control Technology (BACT);
9 noise monitoring and impact analyses; and light impact analysis.

10 **Q. Is Exhibit FPL-42 a true and correct copy of your resume?**

11 A. Yes.

12 **FPL OFFERS KENNARD F. KOSKY AS AN EXPERT IN THE FIELDS OF**
13 **ELECTRICAL POWER PLANT SITING; AIR QUALITY IMPACT ANALYSIS;**
14 **NOISE MONITORING AND IMPACT ANALYSIS; AND LIGHT IMPACT**
15 **ANALYSIS.**

16 **Q. Could you please describe the subject of your testimony in this proceeding?**

17 A. The subject of my testimony deals with the air emissions, air quality impacts,
18 noise impacts, and light impacts resulting from the proposed modification of the
19 Turkey Point Units 3-5 certification.

20 **Q. Are you familiar with FPL's proposed modification of the Turkey Point Units 3-**
21 **5 conditions of certification?**

22 A. Yes.

1 **Q. What has been your role in that proposed modification project?**

2 **A.** I was the Project Director for the preparation of the Petition for Modification
3 submitted to FDEP. In that capacity I reviewed the entire document and also
4 prepared several technical sections that include air quality and noise impacts.

5 **Q. Have you prepared or are you prepared to sponsor into evidence the sections**
6 **of the petition for modification and the completeness responses listed by your**
7 **name on Exhibit FPL-2, including any tables, figures, or attachments?**

8 **A.** Yes.

9 **Q. Are the materials listed on Exhibit FPL-2 that you are sponsoring true and**
10 **correct?**

11 **A.** Yes.

12 **Q. Do you agree with the contents of those materials listed on Exhibit FPL-2**
13 **that you are sponsoring?**

14 **A.** Yes.

15 **AIR QUALITY**

16 **Q. Mr. Kosky, are there any air emission sources associated with the portion of**
17 **the petition for modification—the construction of the Upper Floridan**
18 **Aquifer (UFA) wells to release approximately 14 MGD of UFA water into the**
19 **cooling canal system (CCS)—at issue in this proceeding?**

20 **A.** Yes, once the wells are completed, there will be a trailer mounted, diesel engine-
21 driven pump that would be used in the event of a power loss to well site F-1
22 during operation. The diesel engine will be tested periodically for maintenance

1 and to assure operability. This testing is not anticipated to exceed a few hours per
2 month. The other wells will not use pumps. The air emissions resulting from
3 testing and maintenance are estimated to be less than 0.5 tons/year for all
4 regulated air pollutants. There will also be temporary air emissions resulting from
5 construction activities in the form of generation of fugitive particulate matter (PM)
6 emissions from vehicular traffic and vehicle exhaust emissions.

7 **Q. Will FPL take reasonable precautions to control emissions during construction?**

8 A. Yes, during construction, FPL is required to take what is referred to in FDEP Rule
9 62-296.320(4)(c), Florida Administrative Code (F.A.C.), as “reasonable precautions”
10 to control the unconfined emissions of particulate matter. These controls, for
11 example, would include watering of unpaved roads to minimize dust emissions
12 caused by vehicles. These rules apply to any construction activity and are also
13 included in FDEP air operating permits for the Turkey Point Plant.

14 **Q. Are you familiar with the term “ambient air quality standards” or “AAQS”?**

15 A. Yes.

16 **Q. What are ambient air quality standards?**

17 A. AAQS are standards established by the EPA and FDEP that protect the public
18 health and welfare with an adequate margin of safety. Ambient air quality
19 standards have been promulgated for: nitrogen oxides (NO_x); carbon monoxide
20 (CO); sulfur dioxide (SO₂); particulate matter less than 10 micrometers in diameter
21 (PM₁₀); particulate matter less than 2.5 micrometers in diameter (PM_{2.5}); ozone;
22 and lead.

1 **Q. Does the existing air quality in the vicinity of the Turkey Point Plant meet the**
2 **state and federal ambient air quality standards?**

3 A. Yes, Miami-Dade County's air quality meets all of the AAQS.

4 **Q. In your opinion, will the proposed modification adversely impact ambient air**
5 **quality?**

6 A. No, the magnitude of air emissions resulting from the diesel-driven pump are
7 considered an "insignificant activity" under FDEP Rule 62-213.430(6), F.A.C.,
8 and will not result in any adverse air quality impacts.

9 The possibility of fugitive PM emissions from wind erosion during construction is
10 negligible due to the nature of the construction activities. Most of the areas used
11 for construction parking and laydown are paved or graveled, which will minimize
12 fugitive emissions. A number of control measures will be implemented, as
13 necessary per FDEP's rules, during the construction period to minimize fugitive
14 air emissions and potential impacts. The entrance roads and parking are paved,
15 which minimizes dust emissions from vehicles entering the plant. Watering on
16 unpaved roadways, construction site areas and laydown areas will be undertaken
17 as necessary. As a result, the estimated fugitive air emissions during construction
18 are not anticipated to adversely impact air quality. Given the short-term nature of
19 construction activities, adverse impacts to air quality in the vicinity of the plant
20 are not anticipated.

21 **Q. In your opinion, will the air emissions associated with the proposed**
22 **construction and operation of the modification have any adverse impact on**

1 **ambient air quality including in Everglades National Park, Biscayne**
2 **National Park, or Big Cypress National Preserve?**

3 A. No, the proposed modification will not have any adverse air quality impact in the
4 vicinity of the Project, or the Everglades National Park, Biscayne National Park or
5 Big Cypress National Preserve.

6 **Q. What is the basis for your opinion?**

7 A. My opinion is based on the fact that the air emissions are considered an
8 “insignificant activity” and are temporary and intermittent in nature. In addition,
9 FPL will employ reasonable precautions to control fugitive emissions during
10 construction.

11 **Q. Are you familiar with the Florida Department of Environmental Protection’s**
12 **rules related to air pollution control, air emissions, and air quality impacts?**

13 A. I am extremely familiar with the FDEP’s air rules and their evolution having
14 worked with these rules since the early 1970s. These air pollution rules include
15 Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-214, 62-296 and 62-297,
16 Florida Administrative Code.

17 **Q. In your opinion, is the proposed modification consistent and in compliance with**
18 **those requirements?**

19 A. Yes.

20 **Q. What is the basis for your opinion?**

21 A. My opinion is based on my experience with and knowledge of the type and
22 magnitude of air emission sources that will be associated with the Project and my

1 knowledge of the FDEP regulations. As previously stated, the emissions
2 associated with operation are considered an “insignificant activity” under FDEP
3 rules. FPL will employ reasonable precautions to control fugitive emissions
4 during construction as required by FDEP’s rules.

5 **Q. Are you familiar with the requirements related to air quality in Miami-Dade**
6 **County’s Code of Ordinances as found in Section 24-41?**

7 A. Yes.

8 **Q. In your opinion, is the proposed modification consistent and in compliance**
9 **with those requirements?**

10 A. Yes.

11 **Q. What is the basis for your opinion?**

12 A. My opinion is based on my experience of the type and magnitude of air emission
13 sources associated with the Project and the requirements of Section 24-41 of the
14 Miami-Dade County Code that contains the air quality requirements. Again, air
15 emissions associated with the modification will be minimal and temporary or
16 intermittent.

17 **Q. Are you familiar with provisions of Miami-Dade County’s Comprehensive**
18 **Development Master Plan (CDMP) related to air quality?**

19 A. Yes, I am.

20 **Q. More specifically, are you familiar with Objective CON-1 of the Miami-Dade**
21 **County CDMP that states: “Improve air quality in the County to meet all National**
22 **Ambient Air Quality Standards set by the Environmental Protection Agency (EPA)**
23 **and their respective deadlines; and reduce human exposure to air pollution”?**

1 A. Yes, I am.

2 Q. Are you familiar with the policies related to Objective CON-1 in the
3 County's CDMP?

4 A. Yes.

5 Q. In your opinion, is the proposed modification consistent with CON-1 and
6 supporting policies?

7 A. Yes.

8 Q. What is the basis for your opinion?

9 A. My opinion is based on my experience with and knowledge of the type and
10 magnitude of air emission sources associated with the Project and the
11 requirements of Objective CON-1 and its policies that include compliance with air
12 quality standards, location of sources to minimize human exposure, and the
13 modification having no adverse impacts to air quality in conservation/preservation
14 areas. As previously stated, the emissions associated with the proposed
15 modification will be minimal and temporary or intermittent. FPL will employ
16 measures to control any fugitive emissions in accordance with FDEP
17 requirements.

18 Q. In your opinion, are the air emissions associated with the proposed
19 modification consistent with Miami-Dade County's CDMP?

20 A. Yes.

21 Q. What is the basis for your opinion?

22 A. My opinion is based on the requirements of the CDMP and the "insignificant"

1 nature of the air emissions that will occur. These air emissions will also be
2 temporary or intermittent in nature and FPL will employ reasonable precautions to
3 control any fugitive emissions.

4 **Q. In your opinion, are the air emissions associated with the proposed**
5 **modification consistent with all applicable environmental regulations?**

6 A. Yes.

7 **Q. What is the basis for your opinion?**

8 A. Again, my opinion is based on the insignificant magnitude of emissions,
9 temporary nature of emissions, and the use of precautionary measures to control
10 fugitive emissions.

11 **NOISE**

12 **Q. Mr. Kosky, have you been involved with previous noise monitoring and**
13 **impact studies at the Turkey Point Plant and, if so, could you please describe**
14 **the studies?**

15 A. Yes, I directed baseline noise monitoring and impact analysis for the Turkey Point
16 Unit 5 Site Certification Application, noise compliance monitoring of Turkey
17 Point Unit 5 after it was constructed, and baseline noise monitoring and impact
18 analysis for the Turkey Point Units 6 & 7 Site Certification Application.

19 **Q. What were the results of the noise monitoring and impact analyses?**

20 A. The baseline noise monitoring and impact analyses results determined that the noise
21 levels at the boundaries of the Turkey Point Plant property from heavy construction
22 activities and existing plant operation would not result in adverse noise impacts.

1 This in part is due to the large size of the Turkey Point Plant property and the
2 distance to locations where noise may be heard. In addition, the magnitude and
3 duration of noise is such that there will not be adverse impacts to locations outside
4 the Turkey Point Plant property boundary.

5 **Q. Is the proposed modification anticipated to have adverse noise impacts**
6 **during construction?**

7 A. No.

8 **Q. What is the basis for your opinion?**

9 A. The construction equipment for the production wells will include two teams that
10 will be moved from well site to well site. These activities will be extremely
11 intermittent and transitory. The previous noise studies evaluated construction
12 activities that were significantly more complex in nature and duration than that
13 being proposed for this modification. The results of these studies demonstrated
14 that there would be no adverse noise impacts at the boundaries of the Turkey
15 Point Plant property. The maximum noise impacts of the proposed modification
16 will be less than or equal to existing ambient conditions at off-site locations.
17 Therefore, construction activities associated with the modification will not change
18 the character of observed noise levels in the vicinity of the plant.

19 **Q. Will there be noise impacts associated with operation of the UFA wells?**

20 A. There will be minimal noise associated with operation of the wells. The only
21 operational noise impacts will be when the emergency pump associated with well
22 site F-1 is operated for maintenance and testing, approximately 1-2 hours per

1 month and during emergency situations.

2 **Q. Is the proposed modification anticipated to have adverse noise impacts**
3 **during operation of the UFA wells?**

4 A. No. The modification will not result in a discernible increase in off-site noise
5 levels.

6 **Q. What is the basis for your opinion?**

7 A. My opinion is based on my experience with the type and magnitude of noise
8 levels that would occur during the operation of the UFA wells, and the previous
9 noise studies conducted at the Turkey Point Plant.

10 **Q. Are there any noise-related standards that would apply to the proposed**
11 **modification?**

12 A. Yes. Miami-Dade County has a nuisance noise ordinance in Section 21-28,
13 Miami-Dade County Code of Ordinances, for noises that are unreasonably loud,
14 excessive, unnecessary, or unusual. A non-exclusive list of those noises deemed
15 unreasonably loud, excessive, unnecessary, or unusual is included in the
16 ordinance.

17 **Q. In your opinion, will the noise associated with construction and operation of**
18 **the proposed modification comply with those County standards?**

19 A. Yes.

20 **Q. What is the basis for your opinion?**

21 A. My opinion is based on my experience with the previous baseline noise monitoring
22 and impact studies conducted at the Turkey Point Plant and the magnitude and nature

1 of the noise associated with the construction and operation of the UFA wells. Again,
2 the maximum noise impacts related to construction of the proposed modification will
3 be less than or equal to existing ambient conditions and will not change the character
4 of observed noise levels in the vicinity of the plant. Operational noise impacts will
5 not be discernible off-site.

6 **LIGHTING**

7 **Q. Will any outdoor lighting be required during construction and operation of**
8 **the UFA wells?**

9 A. Outdoor lighting will be required for the installation of the UFA wells in the
10 vicinity of the drilling/well installation activities and at the UFA well area for any
11 nighttime operation or maintenance activities at each well.

12 **Q. Are there any applicable lighting standards?**

13 A. Yes. Section 33-4.1 of the Miami-Dade County Code of Ordinances, Outdoor
14 Lighting, includes lighting requirements which, substantively, limit causing a
15 nuisance to adjacent properties.

16 **Q. In your opinion, will the lighting associated with the proposed modification**
17 **comply with those standards?**

18 A. Yes.

19 **Q. What is the basis for your opinion?**

20 A. My opinion is based on the minor amount of lighting required for the activities to
21 support the modification and the existing amount of lighting required for the safe and
22 secure operation of the existing units. As a result, lighting associated with the

modification will not be discernible from the existing lighting conditions at off-site locations.

Q. Are you familiar with policy LU-4A of the Miami-Dade County Comprehensive Development Master Plan (CDMP) which provides, in part, that noise, lighting, and other factors shall be considered when evaluating compatibility of land uses?

A. Yes. This policy includes noise, lighting and glare when evaluating compatibility among proximate land uses.

Q. In your opinion, as is relates to noise and lighting, is the proposed modification consistent with Policy LU-4A?

A. Yes.

Q. What is the basis for your opinion?

A. As discussed previously, noise associated with construction and operation of the modification will be intermittent and will be within existing ambient noise levels. Lighting associated with the construction and operation of the modification will not be discernible from the existing lighting conditions at off-site locations.

Q. Similarly, are you familiar with Section 33-4 of the Miami-Dade County Code of Ordinances, stating: “Nothing shall be allowed on the premises in any district which would in any way be offensive or obnoxious by reason of color, design, or the emission of odors, liquids, gases, dust, smoke, vibration or noise. Nor shall anything be placed, constructed or maintained that would in any way constitute an eyesore or nuisance to adjacent property owners,

1 residents, or to the community. No structure shall be erected, altered,
2 structurally altered or moved except by methods and on locations as
3 approved by the Director”?

4 A. Yes.

5 Q. In your opinion, is the proposed modification consistent with this
6 requirement?

7 A. Yes.

8 Q. What is the basis for your opinion?

9 A. My opinion is based on my experience with the type and nature of the air quality,
10 noise and lighting activities associated with the Project. As I stated previously,
11 any air emissions impacts will be insignificant and temporary, and FPL will
12 employ measures to control fugitive emissions. Any noise impacts will be within
13 ambient levels and will not be discernible off-site. With regard to lighting,
14 Project lighting will not be discernible at off-site locations and not cause adverse
15 lighting impacts.

16 **SITING CRITERIA—SECTION 403.509, FLORIDA STATUTES**

17 Q. In your opinion, with regard to air emissions, has FPL minimized the adverse
18 effects on human health, the environment, and the ecology of the land and its
19 wildlife and the ecology of state waters and their aquatic life?

20 A. Yes.

21 Q. What is the basis for your opinion?

22 A. My opinion is based on my experience with the type (insignificant amounts of air

emissions) and nature (extent and duration, i.e., small area and temporary) of air emissions associated with the Project and my familiarity with the Turkey Point Plant. Together, these demonstrate that adverse effects are minimized through available methods, including precautions to control fugitive air emissions, and that public health, the environment and ecology, including wildlife and aquatic life, are protected from adverse effects.

Q. In your opinion, with regard to noise, has FPL minimized the adverse effects on human health, the environment, and the ecology of the land and its wildlife and the ecology of state waters and their aquatic life?

A. Yes.

Q. What is the basis for your opinion?

I base my opinion on the nature and magnitude of the noise associated with the Project and the previous comprehensive noise analyses at the Turkey Point Plant that together demonstrate that adverse effects to human health and the environment from Project-related noise are minimized through available methods. Any noise generated by the modification will not be discernible off-site.

Q. In your opinion, with regard to lighting, has FPL minimized the adverse effects on human health, the environment, and the ecology of the land and its wildlife and the ecology of state waters and their aquatic life?

A. Yes.

Q. What is the basis for your opinion?

My opinion is based on the nature, extent and location of the lighting for the

1 Project that will minimize any adverse lighting effects on the environment
2 including human observations.

3 **Q. Does this conclude your prepared written testimony?**

4 **A. Yes.**

**FLORIDA POWER & LIGHT COMPANY
TURKEY POINT UNITS 3-5 MODIFICATION
DOAH CASE NO. 15-1559**

PETITION FOR MODIFICATION AND COMPLETENESS WITNESS SPONSORSHIP

Witness	Petition Sections Sponsored (including figures, tables, attachments referenced in same)	Completeness Responses Sponsored
Steve Scroggs	1.0—Need for the Proposed Facility	SFWMD-5
	1.1—Facility Introduction	SFWMD-6
	1.2—The Applicant	SFWMD-7
	1.3—Overview of the Project(s)	MDC-1
	1.3.2—Fukushima Compliance	MDC-3
	1.3.3—Unit 5 Well Water Re-allocation	MDC-5
	1.4—Conditions of Certification	MDC-6
	1.5—Need for the Project	MDC-12
	1.6—Summary of Public Outreach	MDC-15
	3.1—Background	
	3.10.1—Construction Materials and Equipment	
	4.1.4—Roads and Slip	
	Appendix C	
Jim Andersen	2.1.1—Site Location	MDC-10
	2.3.1—Geogydrology	MDC-18
	2.3.2—Subsurface Hydrology	
	3.2.1—Production Well Description	
	3.3.1—Production Wells	
	3.3.2—Alternative Water Supply Line	
	4.1.1—Production Wells	
	4.1.2—Alternative Water Supply Line	
	4.1.2.1—General Construction Impacts	
	4.1.3—Alternative Water Supply Line	
Pete Andersen	1.3.1—Salinity Reduction Plan	SFWMD-1
	2.3.3—Site Water Budget and Area Users	SFWMD-2
	3.2.2—Cooling Canal System	SFWMD-3
	3.2.3—Permitted Water Withdrawals	SFWMD-4
	3.6—Plant Water Use	MDC-4
	4.3—Groundwater Impacts	MDC-7
	5.1.1—Production Wells	MDC-8
	5.1.2—Alternative Water Supply Line	MDC-9
	Appendix A	MDC-11
	Appendix B	MDC-13
		MDC-16
		MDC-17
		MDC-19
		MDC-20

		MDC-20
		MDC-21
		MDC-22
		MDC-23
		MDC-24 (including all subquestions A through)
		MDC-25
		Revised Appendix B
Greg Powell	2.3.4—Surficial Hydrology	
	3.7—Chemical and Biocide Waste	
	3.8—Solid and Hazardous Waste	
	3.9—Site Drainage	
	4.1.5—Flood Zones	
	4.2—Impact on Surface Water Bodies and Uses	
	4.2.1—Impact Assessment	
	4.2.2—Measuring and Monitoring Program	
	5.1.3—Leachate and Runoff	
	5.1.4—Measurement Programs	
	5.2—Sanitary and Other Waste Discharges	
Karl Bullock	2.3.5—Vegetation/Land Use	
	4.4.1—Impact Assessment (wetlands)	
	4.4.2—Measuring and Monitoring Programs (wetlands)	
	5.5—Ecological Impacts (wetlands)	
Jim Lindsay	2.3.6.1—Species-Environmental Relationships	MDC-14
	2.3.7—Pre-existing Stresses	
	2.3.7.1—Measurement Programs	
	4.4.1—Impact Assessment (wildlife)	
	4.4.2—Measuring and Monitoring Programs (wildlife)	
	5.5—Ecological Impacts (wildlife)	
Ken Kosky	2.3.8—Meteorological and Ambient Air Quality	
	2.3.8.1—Ambient Air Quality	
	2.3.9—Noise	
	3.4—Fuel	
	3.5—Air Emission and Controls	
	4.5—Air Impacts	
	4.5.1—Control Measures	
	4.6.1—Construction Noise Impacts	
	5.3—Air Quality Impacts	
	5.4—Noise Impacts	
Kerri Kitchen	2.2.1—Governmental Jurisdictions	MDC-2
	2.2.2.1—Future Land Use	
	2.2.2.2—Zoning	
	4.1.6—Topography and Soils	

**Education**

Completed coursework (1.5 years) for Ph.D. in Environmental Engineering, University of Florida, Gainesville, FL, 1982

M.S. Environmental Engineering, University of Central Florida, Orlando, FL, 1976

B.S.E. Ocean Engineering, Florida Atlantic University, 1970

Languages

English – Fluent

Golder Associates Inc. – Gainesville**Employment History****Golder Associates – Gainesville, FL**

Principal (1996 to Present)

Principal Engineer, Project Director, and Project Manager for Permitting and Environmental Impact Assessments. Specializes in power plants, industrial facilities, and mining activities involving air quality. Provides oversight on permitting and licensing activities including emissions estimates and impact analyses. Provides expert testimony on pollution control quality issues and noise for a variety of electrical power, industrial, and mining activities. Note: KBN merged with Golder Associates in 1996.

KBN Engineering and Applied Sciences (KBN) – Gainesville, FL

President and Principal Engineer (1985 to 1996)

Responsible for administration of a 100-person environmental consulting firm generating about \$8 million per year in revenues. Principal Engineer, Project Director, and Project Manager for Permitting and Environmental Impact Assessments for electric power and industrial facilities. Provided expert testimony on pollution control and quality issues for a variety of industrial activities.

Environmental Science and Engineering, Inc. (ESE), Energy and Power Programs, Project Operations Department – Gainesville, FL

Vice President/Director (1980 to 1985)

Directed Power Programs group that included a wide diversity of services to the power industry. Project Manager of the \$3 million Florida Acid Deposition Study. Project Director and Manager for a variety of permitting and licensing projects. Provided expert testimony on a variety of projects.

ESE – Gainesville, FL

Director, Air Science Division (1978 to 1980)

Responsible for all corporate air resource activities including stack testing, permitting dispersion modeling, ambient monitoring, noise monitoring, and industrial hygiene. Staff consisted of 25 professionals in three groups: Source Testing, Ambient Monitoring, and Permitting. Project Manager for multidisciplinary power projects.

ESE – Gainesville, FL

Group Leader, Air Quality Management, Air Sciences Division (1974 to 1978)

Responsible for staff involved with ambient air monitoring, dispersion modeling, and air permitting. Project Manager for multidisciplinary power projects.



Florida Dept. of Pollution Control – Tallahassee/Orlando, FL

Air Pollutant Engineer (1970 to 1974)

Lead engineer in air operations involved in implementing State Implementation Plan (SIP) and air pollution regulations. Performed air permitting for over 200 facilities. Co-author of the first Florida SIP including conducting emission inventory, ambient monitoring analysis, regulatory analysis, and regulation development.

Schlumberger Well Services – Morgan City, LA

Well Logging Engineer (1970 to 1970)

Performed geological logging of exploratory wells for oil and/or gas production in the Gulf of Mexico.

**PROJECT EXPERIENCE – ENVIRONMENTAL ENGINEERING****Environmental
Engineering**

Mr. Kosky has performed over 200 projects focusing on a variety of industrial activities. These projects have involved control technology evaluations, regulatory interpretation, monitoring, permitting, impact analyses, and expert testimony. The following overview and project descriptions are examples of Mr. Kosky's experience.

**Major Project
Experience
Multiple Sites****Type of Industrial Activities:**

Power Plants – 73
Landfills – 5
Chemical Plants – 7
Rubber Manufacturing – 2
Metal Coil Coating – 3
Material Handling and Mining – 19
Pulp & Paper – 7
Resource Recovery/Incinerator – 9
Steel Mills – 4
Printing/Coating – 4
Food/Agricultural Facilities – 15
Petroleum Exploration and Refining – 9
Aerospace – 2
Fiberglass Boat Manufacturing – 4
Superfund – 5

Type of Projects:

Permitting and Licensing – 92
Air Pollution Emission Estimates – 67
Air Impact Analyses – 63
Air Pollution Control – 75
Policy and Regulations – 6
Air Monitoring – 26

**Domestic Experience
Multiple Sites**

Mr. Kosky has directed and performed projects related to his expertise in the following states:

Southeastern US: Florida, Georgia, South Carolina, North Carolina, Alabama, Mississippi, Tennessee, Kentucky, Louisiana, and Arkansas
Mid-Atlantic: Maryland, Virginia, West Virginia, District of Columbia, and New Jersey
Northeast: Connecticut and New York
Mid-West: Illinois, Indiana, Missouri, and Iowa
West: Texas, Nevada, California, Montana, Arizona, Alaska, and Hawaii.

**International Project Experience**

Mr. Kosky has performed a wide variety of international projects—many associated with the Multi-Lateral (e.g., World Bank) and Bi-Lateral (e.g., USAID) organizations. Projects located in the following continents and countries:

Asia: China, Pakistan, India, Russia, Taiwan, Thailand, and Indonesia

Africa: Egypt and Mauritius

North America: Canada and Mexico

Central America and Caribbean: Guatemala, Honduras, Jamaica, Dominican Republic, and Panama

South America: Columbia, Brazil and Argentina

Europe: Italy, Poland, Hungary and Bulgaria, and the Czech Republic

Middle East: Saudi Arabia.

Expert Testimony

Mr. Kosky has provided expert testimony in over 50 Cases. The following provides representative information of the type of proceedings and the nature of the expert/expert witness assistance. He has testified in the following types of proceedings:

- Hearing Officers and Administrative Law Judges (ALJs);
- Public Service Commissions;
- Circuit Court;
- Federal District Court;
- Governor of Florida;
- State and County Environmental Commissions;
- Environmental Review Boards;
- County Commissions;
- Land Use Commissions; and
- EPA.

Mr. Kosky has been accepted as an expert in the following areas:

- Power Plant Siting and Licensing
- Air Quality Impact Analyses;
- Air Pollution Control Technology (Design and Engineering);
- Best Available Control Technology;
- Air Pollution Emission Estimates;
- Air Regulation and Compliance; and
- Noise Evaluation and Impact Analyses

Mr. Kosky has testified and been accepted as an expert in Florida, Maryland, Georgia, Louisiana, California and Hawaii.



REPRESENTATIVE PROJECT EXPERIENCE – DOMESTIC

- | | |
|--|---|
| J.E.D. Solid Waste Expansion Project
Osceola County, FL | Project Director and Engineer-of-Record for Air Construction/PSD Permit Application for a solid waste landfill expansion from 16.2 million tons to an estimated 81.5 million tons. Project included landfill gas (LFG) to energy project using LFG to fire up to 12 engines producing up to 19.2 MW. |
| Royal Caribbean Cruises, LTD.
Miami, FL | Senior consultant for evaluating SO ₂ removal systems for visible plumes caused by sulphuric acid mist and blue plume using high sulphur fuels. Developed emissions and potential control techniques. |
| Turkey Point Nuclear Units 6 & 7, FPL
Miami-Dade County, FL | Project Manager for the preparation of licensing documents for the two nominal 1,100-megawatt (MW) nuclear units and associated facilities located at the existing Turkey Point Plant site in Miami-Dade County, Florida. These units are being licensed under Florida's Power Plant Siting Act (PPSA). Environmental documents prepared include the Site Certification Application (SCA), Federal Aviation Administration (FAA) obstruction to navigation application, U.S. Army Corps of Engineers (USACE) dredge and fill permit application, and air permit application [including prevention of significant deterioration (PSD) application]. The SCA was submitted in July 2009 and approved in 2014. |
| Wheelabrator North & South Broward RRF Carbon Injection
Broward County, FL | Project Director and Professional Engineer for the preparation of air construction permit applications for the installation of carbon injection systems for increased mercury (Hg) removal. The Hg control system will reduce the Hg emissions and help the facility to comply with the New Source Performance Standards of 40 CFR 60 Subpart Cb Hg emission requirement. |
| Northside Biomass Project, JEA Northside Units 1 & 2
Duval County, FL | Project Director and Professional Engineer (P.E.) for the preparation of air construction permit application for the use of biomass in Northside Units 1 & 2. The application was the approval of up to 240 tons/day of biomass fuel used in each 300 MW fluidized circulating bed boilers. The permitting involved emission calculations and a comparison of "baseline actual emissions" and "projected actual emissions" under FDEP's Prevention of Significant Deterioration (PSD) regulations. |
| St. Johns River Power Park (SJRPP)
Duval County, FL | Project Director for the preparation of Reasonable Progress Control Technology Analysis for Units 1 & 2. The project involved a control technology evaluation of the sulfur dioxide removal systems at SJRPP and using EPA's four factor analysis to evaluate possible measures towards achieving natural visibility conditions under Section 169A(g) of the Clean Air Act (CAA). The RPCTA was submitted to FDEP for incorporation into overall analysis to achieve Reasonable Progress Goals. |
| Port Everglades Energy Center (PEEC), FPL
Broward County, FL | Project Director and Professional Engineer for the licensing of PEEC. PEEC is a modernization of the existing 1,200 MW Units 1 through 4 with an efficient 3-on-1 natural gas combined cycle generating unit. The project was licensed under Florida's PPSA and received an air construction permit by FDEP for all regulated air pollutants except greenhouse gases (GHGs). A PSD application for GHG emission was submitted to EPA Region IV. |



**Wheelabrator North
Broward RRF Metal
Recovery**
Broward County, FL

Project Manager for the preparation of an SCA modification for the installation of a metal recovery facility. The metal recovery system is a series of conveyors and mechanical devices that will separate ferrous and non-ferrous metals from the bottom ash of the Municipal Solid Waste-fired boilers rated a nominal 750 tons/day. The project involved a re-designed to handle fly ash. Information demonstrating compliance with air emission and solid waste

**Martin Solar Energy
Center, Florida Power &
Light Company (FPL)**
Martin County, FL

Project Manager for the preparation of the environmental licensing of a thermal solar facility located at the FPL Martin Plant. The project involves the installation of 180,000 mirror over 500 acres to generate steam that will be used in a combined cycle plant. The solar generation facility will generate 100,000 MW-hrs per year. The licensing was through Florida's Power Plant Site Certification process as a modification.

**Applications for CPCN,
Chalk Point, Dickerson,
and Morgantown
Generating Stations,
Constellation Power
Source**
Prince Georges,
Montgomery, and Charles
Counties , MD

Project Director of the preparation of the environmental analysis for the Certificate of Public Convenience and Necessity (CPCN) Application for the installation of flue gas desulfurization (FGD) systems on seven existing coal-fired units. The projects were designed to meet the requirements of Maryland's Healthy Air Act by reducing emissions of sulfur dioxide and mercury. Projects involved assessment of New Source Review (NSR) for each plant and an analysis of emissions from material handling. An evaluation of air quality impacts performed for new stacks at each plant site. Expert testimony provided before a Public Service Commission (PSC) Hearing Examiner at public hearings.

**Riviera Beach Energy
Center (RBEC). FPL**
Palm Beach County, FL

Project Director for the preparation of the SCA for the RBEC. The project involved the replacement of two 300 MW oil and gas fired steam generating units with a nominal 1,250 MW natural gas combined cycle generating unit. The project was licensed under Florida's PPSA

**Applications for
Certificate of Public
Convenience and
Necessity (CPCN),
Gould Street and
Riverside Generating
Stations, Constellation
Power Source**
Baltimore, MD

Project Manager for the preparation of the CPCN Applications for the reactivation of the Gould Street Generating Station Unit 3 and Riverside Generating Station Unit 5. The Gould Street project involved the refurbishment of an existing 100 MW gas fired steam generating unit. The Riverside project involved the refurbishment of an existing 80 MW oil fired steam generating unit to gas firing. These units are licensed under Maryland's PSC. Environmental documents prepared include the CPCN and air permit application.

**Site Certification
Applications for St.
Lucie and Turkey Point
Nuclear Uprate Projects**
FL

Project Manager for the preparation of the Site Certification Applications (SCA) for two nuclear uprate projects. Projects involved increasing the nuclear generating capacity at Units 1 and 2 at the FPL St. Lucie Plant and Units 3 and 4 at the Turkey Point Plant. Each uprate project involved an increase of about 200 MW per plant. Applications included environmental evaluations of thermal discharges.



**Site Certification
Application for Biomass
Fired Power Plant**
Palm Beach County,
Florida

Project manager for the preparation of a site certification for a 140 MW biomass fired cogeneration facility for New Hope Power. The facility utilized bagasse associated with raw sugar cane production at the adjacent Okeelanta Sugar Mill and waste wood. Project involved the addition of a steam electric generator, cooling tower and associated facilities. Expert testimony provided.

**Cape Canaveral Energy
Center (CCEC). FPL**
Brevard County, FL

Project Director for the preparation of the SCA for the RBEC. The project involved the replacement of two 300 MW oil and gas fired steam generating units with a nominal 1,250 MW natural gas combined cycle generating unit. The project was licensed under Florida's PPSA.

**INEOS New Planet
BioEnergy Facility**
Vero Beach, FL

Project Director for Title V permit application and air construction permit revisions for a waste-to-ethanol facility using gasification and a biological process to produce 8.42 million gallons of automotive grade ethanol from biomass and processed municipal solid waste

FPL Glades Power Park
Palm Beach County, FL

Project Manager for the preparation of licensing documents for the two nominal 980-megawatt (MW) ultra supercritical pulverized coal fired units and associated facilities located on a 4,900 acre site in Glades County, Florida. These units are being licensed under Florida's Power Plant Siting Act. Environmental documents prepared include the Site Certification Application (SCA), Federal Aviation Administration (FAA) obstruction to navigation application, U.S. Army Corps of Engineers (USACE) dredge and fill permit application, and air permit application [including prevention of significant deterioration (PSD) application]. The SCA was submitted in December 2006.

**Petroleum Coke Co-Firing
St. Johns River Power
Park**
Jacksonville, FL

Project Manager and engineer-of-record for the FDEP authorization allowing up to 30 percent petroleum coke to be co-fired with coal. The authorization allowed co-firing with petroleum coke from 20 percent to 30 percent. Project involved air emissions for pet coke handling and combustion.

**West County Energy
Center Florida Power &
Light Company (FPL)**
Palm Beach County, FL

Project Manager for the preparation of licensing documents for the 2,450-megawatt (MW) West County Energy Center, Palm Beach County, Florida. This project involved the licensing of two 3-on-1 combined-cycle units using three MHI 501G 250-MW combustion turbines (CTs) with associated heat recovery steam generators (HRSGs), and a 440- MW steam turbine/condenser with cooling towers. These units are licensed under Florida's Power Plant Siting Act. Environmental documents prepared include the Site Certification Application (SCA), Federal Aviation Administration (FAA) obstruction to navigation application, U.S. Army Corps of Engineers (USACE) dredge and fill permit application, and air permit application [including prevention of significant deterioration (PSD) application]. Full Governor/Cabinet approval was obtained in December 2006.



**Application for CPCN,
Brandon Shores Units 4
and 5, Constellation
Power Source**
Ann Arundel County, MD

Project Manager for the preparation of the Certificate of Public Convenience and Necessity (CPCN) Application for installation of air pollution control systems and associated facilities on the two nominal 670 MW Brandon Shores Units 1 and 2. This project involves the installation of fuel gas desulfurization (FGD) systems, fabric filters, new dual flue stack, and material handling facilities for coal, limestone and FGD byproducts. These units are licensed under Maryland's Public Service Commission (PSC). Environmental documents prepared include the CPCN and air permit application (including PSD application).

**Site Certification
Application and
Licensing For Seminole
Generating Station Unit
3 Seminole Electric
Cooperative**
Putnam County, FL

Technical direction and review for the Site Certification Application and Air Construction/PSD Permit Application for SGS Unit 3, a nominal 750 MW (net) supercritical pulverized coal-fired unit. Provided expert testimony for the local land use hearing and prepared expert testimony for the Site Certification Hearing.

**Kenai Blue Sky Coal
Gasification Project,
Environmental
Permitting Feasibility
Analysis for Coal-
Gasification and
Pulverized Coal-Fired
Power Plant Agrium
U.S., Inc.**
Kenai, AK

Project Manager for the preparation of environmental permitting feasibility of coal-gasification and 400-200 MW pulverized coal fired power plant to be located at an existing ammonia/urea production facility. The project would involve the installation of coal gasification to product hydrogen and carbon dioxide as feedstock for the ammonia/urea production facilities. The coal-fired power plant would supply steam and energy for the gasification process and ammonia/urea production facilities, as well as supplying some power to the local grid. The coal gasification process and power plant would utilize Alaskan sub-bituminous coal.

**Southwest St. Lucie
Power Project Florida
Power & Light
Company (FPL)**
St. Lucie County, FL

Project Manager for the preparation of licensing documents for the 1,700-megawatt (MW) Southwest St. Lucie Power Project to be located in St. Lucie County, Florida. The project involved two nominal 850 MW supercritical pulverized coal fired units and associated facilities. Portions of the SCA was completed but not submitted.

**Application for
Certificate of Public
Convenience and
Necessity, Crane
Generating Station,
Constellation Power
Source**
Baltimore County, MD

Project Manager for the preparation of the Certificate of Public Convenience and Necessity (CPCN) Application for installation of coal barge unloading facility for the Crane Generating Station. This project involved the refurbishment of an existing oil unloading dock and coal handling equipment. These units are licensed under Maryland's Public Service Commission (PSC). Environmental documents prepared include the CPCN and air permit application.



**Site Certification
Application and
Licensing of the Turkey
Point Expansion Project
for Florida Power &
Light Company (FPL)**
Miami-Dade County, FL

Project Manager for the preparation of licensing documents for the 1,150-megawatt (MW) Turkey Point Expansion Project, Miami-Dade County, Florida. This project involved the licensing of 4-on-1 combined-cycle units using four GE Frame 7FA 170-MW combustion turbines (CTs) with associated heat recovery steam generators (HRSGs), and a 440-MW steam turbine. These units are licensed under Florida's Power Plant Siting Act. Environmental documents prepared include the Site Certification Application (SCA), Federal Aviation Administration (FAA) obstruction to navigation application, U.S. Army Corps of Engineers (USACE) dredge and fill permit application, and air permit application [including prevention of significant deterioration (PSD) application]. Full Governor/Cabinet approval was obtained in February 2005.

**Burner Replacement for
Gerdau-Ameristeel**
Baldwin, FL

Obtained a non-PSD determination from the Florida Department of Environmental Protection (FDEP) for a burner replacement project associated with an electric arc furnace. Project involved site visit, technical support, and discussions with FDEP.

**Petroleum Coke Co-
Firing at the Cedar Bay
Cogeneration Project**
Jacksonville, FL

Project Manager and engineer-of-record for the FDEP authorization allowing up to 35 percent petroleum coke to be co-fired with coal. The Cedar Bay facility consists of three 75-MW circulating fluidized bed (CFB) boilers fired with coal and located in Jacksonville, Florida. The authorization allowed co-firing with petroleum coke.

**Site Certification
Application for Biomass-
Fired Power Plant**
Palm Beach County, FL

Project manager for the preparation of a site certification for a 140 MW biomass fired cogeneration facility for New Hope Power. The facility utilized bagasse associated with raw sugar cane production at the adjacent Okeelanta Sugar Mill and waste wood. Project involved the addition of a steam electric generator, cooling tower, and associated facilities. Expert testimony provided.

**Hines Energy Center
Power Block 3 for
Progress Energy
(formerly Florida Power
Corporation)**
Polk County, FL

Project Manager and engineer-of-record for the air construction and PSD permit application for a 530-MW combined-cycle power project located in Polk County, Florida. Directed preparation of SCA sections related to air emission, best available control technology (BACT), air impacts, and noise impacts. Testified on all air quality and noise aspects at the SCA Hearing.

**Air Construction
Permits for Tropicana
Products, Inc.**
Bradenton, FL

Project Manager and engineer-of-record for various projects at Tropicana's Bradenton Citrus Processing Plant. The projects involved replacing the GE LM5000 aero-derivative gas turbine with the larger GE LM6000 turbine, like-kind replacement of the duct burner system on the cogeneration facility, and the installation of a stand-by boiler.

**Air Construction Permit
for Hydro Aluminum of
North America**
St. Augustine, FL

Project Manager for the preparation of two air construction permits for secondary aluminum foundry. Project involved physical changes to the melting furnace and increasing production limits. Project was able to net out of PSD review.



**Site Certification
Application and
Licensing of Expansion
Projects for Florida
Power & Light
Company**
Martin and Manatee
Counties, FL

Project Manager of the preparation of licensing documents for two 1,150-MW Expansion Projects. These projects involved the licensing of 4-on-1 combined-cycle units using four GE Frame 7FA 170-MW CTs with associated HRSGs, and a 440-MW steam turbine. These units were licensed under Florida's Power Plant Siting Act. Environmental documents prepared include the SCA, FAA obstruction to navigation application, and air permit application (including PSD application).

**Application for
Certificate of Public
Convenience and
Necessity, Dickerson
Units 4 and 5, Mirant
Corporation**
Montgomery County, MD

Project Manager for the preparation of the Certificate of Public Convenience and Necessity (CPCN) Application for the 1,100-MW Units 4 and 5 Project. This project involved the licensing of two 2-on-1 combined-cycle units using two existing GE Frame 7F 160-MW CTs and adding two GE Frame 7FA 170 MW CTs, four associated HRSGs, and two 220-MW steam turbines. These units are licensed under Maryland's Public Service Commission (PSC). Environmental documents prepared include the CPCN, FAA obstruction to navigation application, USACE dredge and fill permit application, and air permit application (including PSD application).

**Application for
Certificate of Public
Convenience and
Necessity, Chalk Point
Units CT7 through
CT10, Mirant
Corporation**
Charles County, MD

Project Manager of the preparation of the CPCN Application for the 320-MW CT Project. This project involved the licensing of four GE Frame 7EA 80-MW simple-cycle units. These units are licensed under Maryland's PSC. Environmental documents prepared include the CPCN, FAA obstruction to navigation application, and air permit application (including PSD application).

**Greenhouse Gas Life-
Cycle Analysis for
Bitor America
Corporation**
Boca Raton, FL

Project Manager for the preparation of a life-cycle analysis of greenhouse gas (GHG) emissions from various fossil fuels and technologies. The life-cycle analysis compared GHG emissions from the use of coal, natural gas, LNG, oil, and Orimulsion. The technologies evaluated included conventional steam generation, Integrated Gasification Combined-Cycle (IGCC), and combined-cycle.

**Odor Evaluations for
Sea Ray Boats, Inc.**
Palm Coast, FL

Project Manager for the evaluation of odor impacts from styrene emissions associated with an existing fiberglass boat manufacturing facility in Flagler County, Florida. Project involved meteorological monitoring, styrene monitoring using SUMA canisters, air dispersion modeling and conceptual design of exhaust stack. Involved in negotiations with regulatory agency on consent order requirements and made public presentations to citizens group.

**Odor Evaluations for
Sea Ray Boats, Inc.**
Merritt Island, FL

Project Manager for the evaluation of odor impacts from styrene emissions associated with three co-located fiberglass boat manufacturing plants located in Brevard County, Florida. Project involved air dispersion modeling and conceptual design of exhaust stacks for two facilities. Involved in negotiations with regulatory agency and made public presentations to citizens group.



Lone Oak Energy Center for Calpine Eastern Corporation Lowndes County, MS	Project engineer for the air construction and PSD permit application for an 800-MW combined-cycle power project. PSD permit applications required evaluations of Best Available Control Technology (BACT) and air impact analyses to the project's impacts as compared to ambient air quality standards (AAQS), and PSD Class I and II Increments.
Calhoun County Peaker Project for FPL Energy Calhoun County, AL	Project Manager for the air construction and PSD permit applications and environmental permits for a 680-MW simple-cycle power project. PSD permit applications required evaluations of BACT and air impact analyses to the project's impacts as compared to AAQS, and PSD Class I and II Increments.
Hillabee Energy Center for Calpine Eastern Corporation Tallapoosa County, AL	Project engineer for the air construction and PSD permit applications for a 700-MW combined-cycle power project. PSD permit applications required evaluations of BACT and air impact analyses to the project's impacts as compared to AAQS, and PSD Class I and II Increments.
Auburndale Peaker Project for Calpine Eastern Corporation Polk County, FL	Project Manager and engineer-of-record for the air construction and PSD permit applications for a 130-MW simple-cycle power project. PSD permit applications required evaluations of BACT and air impact analyses to the project's impacts as compared to AAQS, and PSD Class I and II Increments.
Hines Energy Center Power Block 2 for Florida Power Corporation Polk County, FL	Project Manager and engineer-of-record for the air construction and PSD permit applications for a 530-MW combined-cycle power project. PSD permit applications required evaluations of BACT and air impact analyses to the project's impacts as compared to AAQS, and PSD Class I and II Increments.
Osprey Energy Center for Calpine Eastern Corporation Polk County, FL	Project Manager and engineer-of-record for the air construction and PSD permit applications for a 530-MW combined-cycle power project. PSD permit applications required evaluations of BACT and air impact analyses to the project's impacts as compared to AAQS, and PSD Class I and II Increments. Provided technical oversight for the preparation of the SCA.
Simple-Cycle Power Projects for Florida Power & Light Company Martin and Ft. Myers, FL	Project Manager and engineer-of-record for the air construction and PSD permit applications for two 170-MW simple-cycle units located at the existing FPL Martin and Ft. Myers Power Plant sites. Each project also required an evaluation of the noise impacts. The project at the Martin Plant required a modification of the SCA.
Shady Hills Generating Station for IPS Avon Park Corporation and El Paso Energy Hardee County, FL	Project Manager and engineer-of-record for the air construction and PSD permit applications for a 510-MW simple-cycle power project.
Odor and Air Quality Consulting for the Viera Company Brevard County, FL	Lead technical consultant in providing oversight on the air permitting of a waste scrap shredder. Project involved specifying procedures and reviewing results of source tests and impact analyses.



Resumé

KENNARD F. KOSKY

- Installation of Citrus Fruit Extractors for Tropicana Products, Inc.**
Ft. Pierce, FL
Project manager and engineer-of-record for the air construction and PSD permit applications for the addition of fruit extractors at the Tropicana Plant. Detailed air dispersion modeling was required.
- DeSoto Power Project for IPS Avon Park Corporation and Entergy Power Group**
DeSoto County, FL
Project Manager and engineer-of-record for the air construction and PSD permit applications for a 680-MW simple-cycle power project.
- Air Construction Permit Preparation and Review for Ascend Advanced Materials, Inc.**
Pensacola, FL
Multiple projects related to air construction and operation permitting for various process additions to the Ascend Advanced Materials (formerly Solutia and Monsanto) integrated nylon production plant. This included minor source PSD netting permit for increased plant production, and new adipic acid production intermediates. Assisted Ascend in the review and comments to FDEP on the Title V permit application. Prepared an air permit application for an inlet fogging system for Ascend's cogeneration facility.
- Sea Ray Boats, Inc., Cape Canaveral Plant**
Brevard County, FL
Project Manager for a BACT evaluation and air modeling impact analysis for a new fiberglass boat manufacturing facility. Project involved negotiations with regulatory agency on permit conditions.
- Heard County Power Project for Dynegy, Inc.**
Hardee County, FL
Project engineer for the air construction and PSD permit applications for a 510-MW simple-cycle power project.
- Fogger Installation at Combustion Turbine Sites**
Jacksonville, FL
Project Manager for the preparation of air permit applications for the installation of inlet cooling "foggers" on simple-cycle CTs at Jacksonville Electric Authority's (JEA) Northside and Kennedy Plant sites. Project involved developing strategy for "netting out" of PSD.
- Miami-Dade Resource Recovery Facility**
Miami-Dade County, FL
Multiple Projects related to air resources and licensing of the Miami-Dade County Resource Recovery Facility. The facility is a 3,000 ton per day refuse-derived fuel (RDF) electric generating facility. Project Manager for the original licensing of the RDF facility and Project Director for the conversion from wet RDF to dry RDF. Odor and noise studies conducted during its operation.
- Palmetto Power Project for Dynegy, Inc.**
Hardee County, FL
Project Director and engineer-of-record for the air construction and PSD permit applications for a 510-MW simple-cycle power project.
- Vandolah Power Project for IPS Avon Park Corporation and El Paso Energy**
Hardee County, FL
Project Manager and engineer-of-record for the air construction and PSD permit applications for a 680-MW simple-cycle power project.



**Fogger Installation at
Combustion Turbine
Sites for Florida Power
& Light Company**
Multiple Sites, FL

Project Manager for the preparation of air permit applications for the installation of inlet cooling "foggers" at the Ft. Myers, Putnam, and Martin Plant sites. Project involved developing strategy for "netting out" of PSD.

**Independent Power
Projects for Tenaska,
Inc.**
Multiple Sites

Project Director and engineer-of-record for the preparation of PSD and air permit applications the following projects: Heard County, Georgia – 850-MW simple-cycle; Autauga County, Alabama, Two Projects – an 800-MW combined-cycle and an 8870-MW combined-cycle project located on adjacent sites; Lakefield, Minnesota – 480-MW simple-cycle (BACT); Coosa County, Alabama Project – 540-MW simple-cycle project.

**Oleander Power Project
for Constellation
Energy**
Brevard County, FL

Project Manager for the preparation of PSD and Air Permit Applications for the Oleander Power Project. Project consisted of 5 General Electric Frame 7FA simple-cycle CTs (nominal 850 MW). Project involved providing expert testimony.

**Repowering Project for
Florida Power & Light
Company**
Sanford, FL

Project Manager for the preparation of air permit applications for conversion of two existing steam electric units (Units 4 and 5) at the FPL Sanford Plant to combined cycle using 8 General Electric Frame 7FA CTs. The repowering would produce a nominal 2,200 MW of gas-fired combined-cycle generation. The project involved the preparation of the PSD and Air Permit Applications, noise evaluation, and FAA Notifications.

**Generation Project for
Thermal EcoTek,
Corporation**
Lake Worth, FL

Project Manager for the preparation of the PSD and Air Permit Applications for the Lake Worth Generation Project. Project consisted of the repowering of 2 existing steam units with a nominal capacity of 74 MW using a General Electric Frame 7FA CT (170 MW).

**Repowering Project
Licensing for Florida
Power & Light
Company**
Ft. Myers, FL

Project Manager for environmental licensing documents for the conversion of the existing steam electric units (Units 1 and 2) at the FPL Ft. Myers Plant to combined cycle using 6 General Electric Frame 7FA CTs. The repowering would produce a nominal 1,500 MW of gas-fired combined-cycle generation. The project involved the preparation of the PSD and Air Permit Applications, Environmental Resource Permit (ERP) Application, Wastewater Discharge Permit Application (i.e., the SPDES), FAA Notifications, and county applications.

**Lakeland Electric (City
of Lakeland) McIntosh
Unit 5**
Lakeland, FL

Project Manager for the preparation of the PSD and air permit applications for the McIntosh Unit 5 simple-cycle project. Included preparation of the Modification Request to Site Certification for McIntosh Unit 3. Project consisted of the first Westinghouse 501G CT with a nominal capacity of 250 MW.

Project manager for the licensing of Units 5 as a simple cycle unit to a 370 MW combined cycle unit. The project involved adding a HRSG, steam turbine and cooling tower using reclaimed water. For the latter, the project had to demonstrate meeting FDEP's requirements for using reclaimed water in cooling towers. The project was licensed under Florida's PPSA.



**Title V Permit
Applications for Eagle-
Picher Corporation
Multiple Sites**

Project Director for the preparation of Title V Permit applications or Federally Enforceable Synthetic Minor Operating Permit applications for 9 facilities in 6 states. The facilities include activities associated with metal coil coating, rubber part manufacturing, and printing. The states where the facilities are located include Connecticut, Florida, Michigan, New Jersey, Pennsylvania, and New York.

**Odor and Noise
Monitoring for North
and South Broward
Resource Recovery
Facilities
Broward County, FL**

Project director for noise and odor studies at two large municipal waste combustors. The studies were based on ASTM methods to demonstrate conformance with requirements of regulatory approvals.

**Destin Dome Natural
Gas Development
Project for Chevron
U.S.A. Production
Company
Pensacola, FL**

Project Manager for the OCS air permit application submitted to the U.S. Environmental Protection Agency (EPA) to develop the natural gas reserves in a 33-square-mile area offshore of Pensacola. The projects involved preparation of permit applications including emission estimates of well drilling and production facilities. Air emission sources included two drilling rigs, one central production facility, and 16 satellite production facilities. The project included PSD evaluations to determine BACT and air impact analysis using the OCD air dispersion model.

**Title V Permit
Applications for
Potomac Electric Power
Company
Multiple Sites**

Project Manager for the preparation of Title V Permit applications or Federally Enforceable Synthetic Minor Operating (FESOP) Permit applications for 7 facilities in 2 states and 1 jurisdiction. The Title V facilities consist of 6 power plants with coal and oil fossil fuel-fired steam generating units, CTs, and diesel units. The FESOP is for a service facility. The facilities are located in Maryland (3 plants and the service facility), Virginia (1 plant) and the District of Columbia (2 plants).

**Air Permitting for
Destin Dome Blocks 57
and 96, Chevron U.S.A.
Production Company
Outer Continental Shelf
Pensacola, FL**

Project Manager for the Outer Continental Shelf (OCS) air permits issued by the EPA to conduct well drilling within the U.S. boundary, offshore of Florida. The projects involved preparation of permit applications including emission estimates of well drilling activities. The applications were the first in the Eastern U.S. under 40 Code of Federal Regulation (CFR), Part 55. These regulations were promulgated as a result of the 1990 Amendments of the Clean Air Act (CAA) Amendments. Presented information on the emissions and impacts of the activity at an EPA sponsored public hearing.

**Kaiser Aluminum-
Gramercy and Baton
Rouge Cogeneration
Plants
Baton Rouge, LA**

Project Manager for obtaining air permits on two cogeneration facilities. The facilities were required to obtain PSD approval and meet NSPS requirements.

**PSD Approval for
Cogeneration Facility at
Borden Chemical
Baton Rouge, LA**

Project Director for an 80-MW cogeneration facility constructed for Borden Chemical. The project involved obtaining PSD approval from the state agency.



**Site Certification
Application for
Orimulsion Conversion**
Manatee County, FL

Project Director for the licensing of Orimulsion firing at FPL's Manatee Power Plant. The plant consists of two nominal 800-MW units. Technical activities focused on the preparation of BACT evaluation and air pollution control aspects of the project.

**Petroleum Coke and
Title V Application for
City of Lakeland
Department of Electric
and Water Utilities**
Lakeland, FL

Project Manager and engineer-of-record for providing technical assistance to obtain approval for co-firing petroleum coke (20 percent) and coal (80 percent) at McIntosh Power Plant, Unit 3. McIntosh Unit 3 is a 364-MW coal-fired facility. Project Manager and engineer-of-record for preparation of Title V applications.

**Coal and Petroleum
Coke Co-firing Permit
for St. Johns River
Power Plant**
St. Johns County, FL

Project Manager and engineer-of-record for obtaining approval from the regulatory agencies to co-fire up to 20 percent of petroleum coke by weight with coal in two nominal 700-MW units. Permit application and supporting material prepared. Performed emissions estimates and impact analyses of potentially toxic air emissions (metals). Provided support and presentations to local chapter of Sierra Club who intervened in the permit proceeding. Performed post-test analyses to demonstrate compliance with settlement agreement.

**Title V Economic
Evaluation for Florida
Electric Power
Coordinating Group**
Tampa, FL

Performed an economic evaluation for Florida Electric Power Coordinating Group (FCG) on the cost to prepare Title V permits as initially proposed by FDEP and presented the results of the evaluation at the FDEP Title V Workshop. The presentation assisted in modifying the FDEP requirements to more closely follow EPA requirements.

**Electric Utility
Regulatory
Requirements for
Florida Electric Power
Coordinating Group**
Tampa, FL

Lead the effort to prepare a comprehensive list of regulatory requirements specific for the electric utility industry. The list, which includes all applicable and non-applicable requirements, forms the basis for compliance statements required of the responsible official.

**Title V Permit
Recommendations for
Florida Electric Power
Coordinating Group**
Tampa, FL

Providing recommendations for preparation of Title V permits for the FCG. This includes interfacing with FDEP and providing comments on insignificant activities and application form submittal. Also provided FDEP comments on data input requirements and suggestions that will make the application form easier to develop.

**Florida Power
Corporation Title V
Applications**
Multiple Sites

Project Director and engineer-of-record for Title V applications for 11 facilities. The facilities include coal-, oil-, and gas-fired fossil fuel steam generator units, simple-cycle CT units, combined-cycle unit, and diesel generators. Project involved regulatory requirements, emissions inventories, trivial activity lists and application preparation.

**Title V Permits for
Florida Power & Light
Company Facilities**
Multiple Sites

Assisting FPL in the preparation of Title V permit applications for all facilities. This includes 11 power plants and several minor facilities. Engineer-of-record for the applications, and responsible for overseeing the applications' preparation. Also providing input on regulatory requirements and emissions. Currently, one permit application has been completed in draft form.



**Title V Permit
Implementation Plan for
Tennessee Valley
Authority
Multiple Sites**

Assisted Tennessee Valley Authority (TVA) in developing a comprehensive list of applicable requirements in three states (Tennessee, Kentucky, and Alabama) for 10 facilities. Also performed site visits for four major plants (7,550- MW coal fired with CTs) to develop a list of major sources and insignificant activities. The result was a comprehensive Title V plan, which is currently being implemented by TVA. Performed reviews of Title V applications for three power facilities.

**Gulf Power Company
Title V Applications
Multiple Sites**

Project Manager and engineer-of-record for Title V applications for three coal-fired facilities. Performed site visits for each facility and developed listing of regulatory requirements.

**Title V Database for
Various Clients
Multiple Sites**

Developed a Title V database built around the FDEP Title V permit application form. The database is designed to manage the data and print out a form identical to the FDEP form. The database will provide a format suitable for electronic submittal to FDEP.

**Emissions Inventory
and Title V Applications
for Potomac Electric
Power Company
(PEPCO)
Multiple Sites in Maryland**

Project Manager for the development of a comprehensive emissions inventory and preparation of Title V applications for all of PEPCO facilities. This includes 6 power plants (4 coal-fired plants, 1 oil/gas plant, and 1 CT plant) located in three regulatory jurisdictions. The inventory will involve the development of an emission inventory management system that will manage the data.

**Site Certification
Application at Hardee
Power Station,
Seminole Electric
Cooperative
Incorporated
Hardee County, FL**

Project Director for SCA and environmental assessment (EA) for a 660-MW combined-cycle electric-generating plant. Responsible for the technical, budgetary, and scheduling aspects of the project. The permitting documents prepared were designed to fulfill requirements of the PSC and the U.S. Department of Agriculture (USDA) Rural Electrification Administration (REA). Provided expert testimony for the project.

**Transmission Line
Corridor Siting at
Hardee Power Station
for Seminole Electric
Cooperative
Incorporated
Hardee County, FL**

Project Director for siting and licensing of three 230-kilovolt (kV) transmission lines (total of 78 miles) to connect the Hardee Power Station to the Florida transmission grid. Siting of the transmission line corridors was accomplished using the PC ARC/INFO® geographic information system (GIS). Developed all required information and impact analyses for the Florida SCA to be presented to the Florida Department of Environmental Regulation (FDER) and PSC.

**Site Certification
Application and
Licensing of the
Lauderdale Repowering
Project for Florida
Power & Light
Company
Ft. Lauderdale, FL**

Project Manager for the preparation of licensing documents for the Lauderdale Repowering Project, Broward County, Florida. This project involved replacing two existing steam generators with advanced CTs and HRSGs. The repowered units were designed to have a capacity of approximately 960 MW, approximately 640 MW resulting from the addition of the advanced CTs. Environmental documents prepared include the SCA, National Pollutant Discharge Elimination System (NPDES) application, FAA obstruction to navigation application, USACE dredge and fill permit application, and air permit application (including PSD application).



**Crystal River Plant Salt
Drift Evaluations,
Florida Power
Corporation**
Citrus County, FL

Project Manager for the multi-year evaluation of salt drift from saltwater cooling towers. The project involved the analysis of salt deposition data and the effects on vegetation. The salt deposition monitoring was conducted at multiple sites in areas of various vegetation types. The salt drift data was correlated with visual inspection of vegetation. Modeling analyses of deposition patterns was also conducted.

**Test Burn of Orimulsion
Fuel for Florida Power
& Light Company**
Sanford, FL

Project Manager for a test burn to discover if Orimulsion fuel had the potential to displace No. 6 fuel oil in steam electric power plants at Sanford Unit 4. Project provided the opportunity to evaluate the technical and operational features associated with burning Orimulsion fuel under utility operating conditions.

**Air Construction Permit
Application for
TransPac, Inc.**
Santa Rosa County, FL

Project Manager for project requiring permit to construct an air pollutant source. Developed report supplementing the application to construct a minor-source waste storage and treatment facility. The objective of this report was to evaluate the impact of the facility based on a comparison of the proposed facility's impacts to the FDER's proposed toxic air pollutant guidelines.

**Air Quality Impacts of
Siting 1,050-MW CTs for
Florida Power
Corporation**
Multiple Sites

Project Manager of air quality impact analyses performed to evaluate locating CTs at six potential sites in Florida: Intercession City, DeBary, Avon Park, Turner, Bartow, and Anclote. The analyses were undertaken to determine compliance with ambient air quality standards (AAQS) and PSD increments for the maximum proposed plant size (i.e., 1,050 MW).

**Particulate Matter Air
Quality Assessment of
Helper Cooling Towers
for Florida Power
Corporation**
Citrus, FL

Project Manager of project to determine the impacts of the proposed cooling towers on ambient particulate matter (PM) levels, considering all PM emissions associated with the CT units, cooling towers, helper cooling towers, and coal- and ash-handlers already existing onsite. Impacts were addressed in regard to allowable PSD increments for PM [as total suspended PM, i.e., PM(TSP)] and AAQS for PM [as particulate with an aerodynamic diameter less than 10 micrometers (μm), i.e., PM₁₀].

**Site Evaluation of 1,000-
MW CT Project for
Florida Power
Corporation**
Multiple Sites in FL

Project Manager responsible for evaluating the availability of water-supply sources, raw water treatment requirements, and wastewater disposal options at six facilities for the 1,000-MW CT siting project. Water supply sources were evaluated to determine their feasibility for use and included existing permitted groundwater and surface water withdrawals, new groundwater sources, new surface water withdrawals, and secondary effluent from nearby municipal wastewater treatment facilities.

**CT Site Evaluation and
Chalk Point
Environmental
Assessment for
Potomac Electric Power
Company**
Chalk Point, MD

Project Manager of project to provide alternative site and environmental information required under the Maryland PSC rules for receiving a CPCN for a new generation facility. The two primary objectives of the report were to identify and evaluate suitable sites for accommodating approximately four CTs and to evaluate the environmental baseline information and potential impacts of locating the CTs at the preferred site.



**Gator Power
Cogeneration Facility
PSD Review for Florida
Power Corporation
Gainesville, FL**

Project Manager for PSD review for a cogeneration facility consisting of a CT and HRSG. The report addressed the new source review (NSR) requirements contained in air quality regulations on both the state and federal levels.

**Fog Visibility Study for
Parsons, Brinkerhoff,
Quade, and Douglas,
Inc.
Charleston, SC**

Project Manager responsible for study designed to obtain meteorological and fog/visibility data on the I-526 Cooper River Crossing in North Charleston. Objectives of the program were to document the frequency and duration of fog and the meteorological conditions during which it occurs; to identify and differentiate the fog plume created by the cooling towers from that of other sources; and to correlate the data collected with data observed at the National Weather Service (NWS) station in Charleston.

**Site-Specific
Environmental
Evaluation for Potomac
Electric Power
Company
Multiple Sites in Maryland**

Project Manager responsible for presenting the methodology and results of a site-specific environmental evaluation. The objective of the site environmental evaluation was to determine the environmental suitability of CT units with projected early 1990s in-service dates. The candidate site environmental evaluation consisted of analyzing candidate sites based on six environmental factors.

**PSD Permit Application
for Environmental
Incineration Systems,
Inc.
Duval County, FL**

Project Manager of permitting activities for proposed municipal solid waste recycling/volume reduction facility. The facility was designed to reduce the amount of solid waste input to landfills in Duval County by up to 175,200 tons per year (TPY). The proposed facility was classified as a "major" source under federal and state air pollution control regulations and was subject to the PSD provisions of the regulations.

**PSD Permit Application
for Cogeneration
Project for Tropicana
Products, Inc.
Bradenton, FL**

Project Manager responsible for permitting a cogeneration facility consisting of a CT, a HRSG, and an associated auxiliary steam generator. The report addressed the NSR requirements contained in the state and federal regulations.

**Crystal River PSD
Analysis for Florida
Power Corporation
Crystal River, FL**

Project Manager of air dispersion modeling analyses performed to determine the TSP impacts of PM emissions from the cooling towers at FPC's Crystal River facility. A modeling protocol was prepared by KBN and reviewed and commented upon by the EPA.

**EMSoft II®, Permit
Manager for Manatee
County Public Health
Unit
Manatee County, FL**

Designed and developed the EMSOFT II®, a software package for micro-computers designed to assist end users in managing environmental permits and requirements through a relational database capable of generating a series of specific reports.



**Florida Acid Deposition
Study, FCG**
Multiple Sites, FL

Project Manager and Principal Investigator for the Florida Acid deposition Study (FADS) that involved a multi-year monitoring program (4 years) and numerous assessments. FADS involved field monitoring at 14 sites across Florida with assessments of the relationships of sources and receptors, ecological effects, watersheds influences, effects on soils and material effects. The FADS was independently peer reviewed and published. This work led to the Florida Atmospheric Mercury Study (FAMS) in the that was conducted by KBN Engineering and Applied Sciences, Inc. for which Mr. Kosky was President and oversaw this important project. Mr. Kosky also managed numerous other projects related to atmospheric deposition from air emission sources. This included salt drift monitoring studies at the Crystal River Power Plant that were conducted for over 5 years and atmospheric deposition analyses for air emissions sources (air pollutant sources and cooling towers). These analyses also included consideration of water quality impacts from atmospheric deposition.

**Agrico Chemical
Company Mine**
Hillsborough County, FL

Project Manager for the EA for a phosphate mine located in eastern Hillsborough County, Florida. The project involved the development of baseline conditions including monitoring of air, water, and ecological conditions. Impact analyses involving various environmental disciplines were conducted using approved regulatory techniques.

REPRESENTATIVE PROJECT EXPERIENCE – INTERNATIONAL

**CDEEE Punta Catalina
Power Project**
Punta Catalina,
Dominican Republic

Program manager of air quality and noise impact assessment for 2-350 MW coal fired units. Project involved feasibility and scoping analysis and completion of an Environmental and Social Impact Assessment meeting IFC and World Bank standards.

**Bahamas Electric
Corporation**
Nassau, Bahamas
**BACT Assessment and
Toxic Air Emission
Evaluation for Coleson
Cove Refurbishment
Project, New
Brunswick Power
Corporation**
New Brunswick, Canada

Project Director for several air quality monitoring and impact projects at various locations to monitor existing air quality and assessing air quality impacts.

Senior consulting engineer for developing a best available control technology (BACT) assessment and toxic air emission inventory for the conversion of the 1,050-MW Coleson Cove plant from residual oil to Orimulsion. Project involved a detailed assessment of control equipment for sulfur dioxide (SO₂), PM, nitrogen oxides (NO_x) and sulfuric acid mist (SAM). Develop a toxic air emissions inventory. Provided presentations at multi- agency meetings and public hearings. Performed a life-cycle greenhouse gas comparison with residual oil and Orimulsion.

**Combined-Cycle
Projects for Southern
Energy, Inc.**
Multiple Sites in Italy

Provided technical review and assistance for two 370-MW combined-cycle projects to be located in east central Italy. Reviewed the designs and impact methodologies to provide senior oversight of projects.



- Environmental Due Diligence**
Campeche, Mexico
- Project Director for the environmental due diligence for the Cantarell Nitrogen Project located near Campeche, Mexico. Project is the largest nitrogen plant in the world with an associated 400-MW power complex to provide power for the nitrogen plant. Review licensing reports and documents for conformance with Mexican regulations and "world norms". Review being conducted for international financial institutions.
- Environmental Benchmarking of Power Facilities, Worldwide, Confidential Client**
Multiple Sites
- Project Manager assisting an international energy company in the evaluation of their environmental conformance with international accepted norms of all of their facilities worldwide. This involved evaluating over 10,000 MWs at approximately 12 different power facilities including hydro. These plants were located in Asia, South America, North America, and Europe. Evaluation was to assist with the development of an environmental management system for all of the company's facilities.
- Shanghai Municipal Electric Power Company Waigaoqiao Environmental Assessment**
Shanghai, China
- Project Manager for World Bank EA of the addition of two 1,000-MW coal-fired super-critical units to the Waigaoqiao Power Plant site. This was referred to as Phase II, while Phase I, the existing plant, consists of four 300-MW units. The EA also considered the addition of a Phase III which would be identical to Phase II (i.e., another two 1,000-MW units). The EA was prepared to meet World Bank guidelines and involved developing information and performing analyses for Phases I, II, and III.
- Baley Gold Mine Project**
Western Russia
- Task Manager for the environmental assessments relating to the potential air and noise impacts from a gold mine project located in Eastern Russia. The task involved developing emissions and impact estimates for mining 25 million tonnes of material from an open pit mine. Impacts were determined using EPA dispersion models. Noise impacts from mine activities were determined using the NOISECALC model.
- Nickel and Cobalt Mine Project**
Cupey, Cuba
- Working through Golder's Mississauga Office provided air impact analyses for a nickel and cobalt mine located in Cupey, Cuba. The major emissions from the project were from the ore processing, which contained PM and SO₂. The EPA dispersion model ISC3ST was used to estimate impacts using a 1-year meteorological data base. Impacts were compared to the World Bank ambient guidelines.
- Ambient Air Monitoring Laboratories and Training Program for the Electricity Generating Authority of Thailand**
Bangkok, Thailand
- Project Director responsible for designing and constructing two mobile laboratories as well as providing air quality and meteorological equipment. Equipment will be installed in specialty designed cubicles, and mounted on a Nino truck chassis. The intensive training program will consist of 2 months training in the United States for three EGAT engineers.
- Air Resources Studies, Mae Moh Power Plant and Lignite Mine for the Electric Generating Authority of Thailand**
Mae Moh Valley, Thailand
- General Consultant for Air Quality/Project Manager managing activities within an environmental program for one of the world's largest mine-mouth lignite fired power plants and lignite mines located in Mae Moh Valley, Northern Thailand. Ambient air monitoring data and dispersion modelling were used to assess existing conditions and the addition of new lignite fired units. Emission inventories were developed including fugitive dust associated with the mine.



**Environmental
Licensing Studies for
the Electricity
Generating Authority
of Thailand**
Bangkok, Thailand

Air Resources, Subproject Manager, responsible for studies of coal-fired power plant. Managed air resources investigations as part of overall environmental studies of proposed coal-fired power plant to be located on the Gulf of Thailand, 70 kilometers (km) southeast of Bangkok.

**Ambient Monitoring
Network for the
Electricity Generating
Authority of Thailand**
Gulf of Thailand

Project Director/Air Resources for locating ambient air quality monitoring stations associated with a 2400-MW, coal-fired plant.

**Environmental
Assessment of Gas
Turbine Electrical
Generating Facility,
World Bank**
Hunts Bay, Jamaica

Air Engineer responsible for developing mitigation and monitoring measures based on the results of air modeling to reduce the impacts from SO₂ and NO_x in the Hunts Bay area. The project involved gas turbines firing No. 2 fuel oil.

**Development of Air
Quality Standards for
the Government of
Mauritius for the World
Bank**
Mauritius

Project Manager tasked with assisting the government of Mauritius in developing air quality standards and designing appropriate monitoring programs required for regulatory enforcement.

**Environmental
Assessment for 60-MW
Diesel-Powered
Facility**
Rockfort, Jamaica

Air Engineer responsible for developing mitigation and monitoring measures based on the results of air modeling to reduce the impacts from particulate matter, sulfur dioxide and nitrogen oxides in the Rockfort project area.

**Environmental
Assessment of the
Gas/Coal Electrical
Generating Facility in
Mauritius for the World
Bank**
St. Aubin, Mauritius

Project Director responsible for conducting all field work for the environmental assessment of a coal- and gas-fired electrical generating facility at St. Aubin in air quality, water quality, and ecology. The ESIA involved the use of coal in sugar mills a portion of the year while bagasse (sugar cane waste product) was not available.

**Environmental and
Social Soundness
Assessment for 300-
MW Coal-Fired Facility**
Lakhra, Pakistan

Project Manager for an ESIA sponsored by the USAID to develop a coal-fired project in the Lakhra Desert in Pakistan. The ESIA involved multidisciplinary assessments including air quality monitoring and modelling to assess air quality.



PROFESSIONAL REGISTRATIONS

Registered Professional Engineer, State of Florida, No. 14996

PRESENTATIONS AND COURSES

1988-Present: Florida Chamber Annual Environmental Permitting Summer School; Presentations of Courses related to Air Quality Impacts, Air Pollution Control and Air Management Permitting; Professional Development Hours for Professional Engineers and Attorney's

2012-13 Semester (Fall): University of Florida; Instructor of a Graduate Level Course on Air Pollution Control – Particulate Control

PUBLICATIONS

The following are publications that have been peer reviewed.

Kosky, K.F. and Wanielista, M.P. 1975. Fugitive Particulate from Highway Construction. Proceedings of the Air Pollution Control Association.

Wilson, A.L., Kosky, K.F., and Cross, F.L. 1975. Selection, Application, and Practical Problems of Air Pollution Environmental Assessment with Mathematical Models. Proceedings of the Air Pollution Control Association.

Marks, S.R., Kosky, K.F., and Gilbert, B. 1978. Dust Storm Trends and Their Effects of Ambient Air Quality Standards. Proceedings of the Air Pollution Control Association.

Kosky, K.F., and Kohlhepp, D.H. 1979. A Resource Recovery Facility: Energy-Environmental Interactions. Proceedings of the Sixth National Conference of Energy and the Environment.

Kosky, K.F. 1980. Environmental Licensing of Electric Generating Plants, Air Requirements. Presented at American Public Power Association Engineering and Operations Workshop.

Kosky, K.F. and Sosebee, J.B. 1980. Environmental Considerations and Comparisons of Alternate Generating Systems. Proceedings of the Seventh National Conference on Energy and the Environment.

Kosky, K.F., Schumacher, A.M., and Allen, R.N. 1981. Environmental Licensing of Coal/Oil Mixtures. Presented at Coal Oil Mixture Conference, Orlando, Florida.

Kosky, K.F. 1981. Impact of Environmental Laws on Energy Policy. Presented at American Public Power Association Engineering and Operations Workshop.

Kosky, K.F., Edgerton, Pollman, C.D., McCann, et. al. 1986. Florida Acid Deposition Study Final report: A Synthesis of the Florida Acid deposition Study. Volumes I and II.

1 **BEFORE THE DIVISION OF ADMINISTRATIVE HEARINGS**

2 **FLORIDA POWER & LIGHT COMPANY**

3 **TURKEY POINT UNITS 3-5 MODIFICATION**

4 **DIRECT TESTIMONY OF JAMES LINDSAY**

5 **DOAH CASE NO.: 15-1559EPP**

6 **BACKGROUND/QUALIFICATIONS**

7 **Q. Please state your name and business address.**

8 A. My name is James R. Lindsay. My business address is 700 Universe Blvd. Juno
9 Beach Florida 33408.

10 **Q. Who is your current employer and what position do you hold?**

11 A. I am employed as a Principal Biologist/Project Manager by NextEra Energy
12 Resources, LLC. In that position, I continue to support Florida Power & Light
13 Company's projects.

14 **Q. What are your responsibilities in your current position?**

15 A. I am a staff biologist providing subject matter expertise to all Next Era Energy
16 business units on wildlife and natural resources protection as related to the
17 production, transmission and distribution of energy.

18 **Q. Please describe your educational background.**

19 A. I obtained a Bachelor of Science in Biological Oceanography from Florida
20 Institute of Technology, Class of 1980.

21 **Q. Please describe your professional work experience since obtaining your
22 academic degree.**

23 A. I was employed by FPL in an environmental capacity from March 1988 to July,

1 2015 when I became an employee of NextEra Energy Resources, LLC. Prior to
2 becoming an FPL employee, from July 1980 to March 1988, I was employed as a
3 contractor to FPL in an environmental capacity. From May 1981 to March 1988, I
4 co-managed the crocodile monitoring program at Turkey Point, among other
5 environmental responsibilities including data collection, analysis and writing for
6 the U.S. Nuclear Regulatory Commission-required Non Radiological Biological
7 Technical Specifications. These reports documented all biological, geological and
8 chemical aspects of the cooling canal system (CCS) at Turkey Point and the
9 surrounding terrestrial and aquatic habitats surrounding Turkey Point. From
10 March 1988 to August 1990 I worked as a crocodile management project
11 consultant in addition to joining FPL as a Lab Technician for the start-up of the
12 Cutler Power Plant and then moving to the Turkey Point fossil plant as an
13 Environmental Specialist. From February 1989 to August 1990, I managed a
14 multi-business unit team of fossil plant, nuclear plant and cooling canal personnel
15 to address all environmental aspects of the Turkey Point Power Plant site. From
16 August 1990 to July 1997, I held a staff position with FPL Engineering and
17 Technical Services as a Senior Environmental Specialist supporting FPL's fossil
18 fuel power plant fleet statewide, including continued support of Turkey Point
19 fossil power plant and cooling canal system. Since July 1997, I have worked for
20 Next Era Energy Environmental Services Department as a Principal
21 Biologist/Project Manager providing biological expertise to all FPL and Next Era
22 Energy Resources (NEER) business units. I have provided extensive support to

1 the ongoing crocodile management program, the relicensing of Turkey Point Units
2 3 and 4, the licensing and mitigation for Turkey Point Unit 5, the extended power
3 uprate of Turkey Point Units 3 and 4, the licensing of proposed Turkey Point
4 Nuclear Units 6 and 7, and the Everglades Mitigation Bank.

5 **Q. Do you hold any professional certifications or memberships in professional**
6 **organizations in your field of professional expertise, and if so please identify**
7 **those?**

8 A. I am a member of numerous professional organizations. Of particular relevance to
9 my testimony in this proceeding, I am a member of the International Union of
10 Nature (IUCN) and the Species Survival Commission's (SSC) Crocodile
11 Specialist Group. Other professional affiliations are identified on my resume.

12 **Q. Please describe any professional or technical publications you have authored.**

13 A. I have authored or co-authored numerous technical reports and publications and
14 given various presentations on wildlife management issues, including issues
15 related to the Turkey Point plant. Many of these are identified on my resume.

16 **Q. Have you provided technical training to others in your fields of expertise? If**
17 **yes, can you please provide a summary of those training programs you have**
18 **provided?**

19 A. Yes, I have provided technical training and technical presentations to FPL and
20 NEER employees and to professional groups, environmental Non-Governmental
21 Organizations, and Federal, State and Local environmental and wildlife agencies
22 throughout the United States since 1988. This includes numerous presentations

1 on the Turkey Point crocodile management program. I also have provided
2 training on avian power line interaction issues since 2002 to electric utility
3 employees and other stakeholders on a national level. Most recently, I
4 participated in a live, nationally broadcasted webinar hosted by the U.S. Fish and
5 Wildlife Service on the recently published Federal Land-Based Wind Energy
6 Guidelines.

7 **Q. Is Exhibit FPL-37 a true and correct copy of your resume?**

8 A. Yes.

9 **FPL OFFERS JAMES LINDSAY AS AN EXPERT IN THE FIELD OF WILDLIFE**
10 **BIOLOGY.**

11 **Q. Could you please describe the subject of your testimony in this proceeding?**

12 A. The subject of my testimony deals with the potential impacts to wildlife, including
13 threatened and endangered species, resulting from the proposed modification of
14 the Turkey Point Units 3-5 certification.

15 **Q. Are you familiar with FPL's proposed modification of the Turkey Point Units 3-**
16 **5 conditions of certification?**

17 A. Yes.

18 **Q. What has been your role in that proposed modification project?**

19 A. I have provided a support role as a wildlife subject matter expert.

20 **Q. Have you prepared or are you prepared to sponsor into evidence the sections**
21 **of the petition for modification and the completeness responses listed by your**
22 **name on Exhibit FPL-2, including any tables, figures, or attachments?**

1 A. Yes.

2 **Q. Are the materials listed on Exhibit FPL-2 that you are sponsoring true and**
3 **correct?**

4 A. Yes.

5 **Q. Do you agree with the contents of those materials listed on Exhibit FPL-2**
6 **that you are sponsoring?**

7 A. Yes.

8 **Q. How long have you been involved with wildlife issues at FPL's Turkey Point**
9 **plant?**

10 A. I have had involvement with wildlife issues at the Turkey Point plant since May
11 1981.

12 **Q. Are you familiar with the proposed modification area—i.e., the area**
13 **proposed for construction and operation of the new Upper Floridan Aquifer**
14 **wells—at Turkey Point?**

15 A. Yes.

16 **Q. What terrestrial and aquatic species are found in the proposed modification**
17 **area?**

18 A. No aquatic species occur in the proposed modification area because it is disturbed
19 upland habitat. Transient small mammals and native and non-native reptiles may
20 occasionally move through the project area, with the F-5 and F-6 well areas
21 having a higher probability of occurrences.

22 **Q. Do any species listed by the U.S. Fish & Wildlife Service (USFWS), Florida**

1 **Fish & Wildlife Conservation Commission (FWC) or Miami-Dade County**
2 **(MDC) occur within the proposed modification area?**

3 A. No listed species occur in the proposed modification area due to a lack of natural
4 vegetative communities or aquatic habitat and the highly disturbed industrial
5 nature of the areas immediately surrounding the proposed modification area.

6 **Q. For the purposes of this testimony, do you understand that the phrase “listed**
7 **species,” refers to any species listed as Endangered, Threatened, or otherwise**
8 **protected by USFWS, FWC, or MDC?**

9 A. Yes.

10 **Q. Do any listed species occur in the vicinity surrounding the proposed**
11 **modification area?**

12 A. Yes. While no listed species occur in the proposed modification area, a variety of
13 listed species are known to occur within and adjacent to the Turkey Point plant
14 property. These include the American crocodile, American alligator, eastern
15 indigo snake, West Indian manatee, Bald eagle, least tern, wading birds, and the
16 white-crowned pigeon.

17 **Q. Let’s address the American crocodile later in your testimony. With regard to**
18 **the other species you listed, do you have an opinion as to whether**
19 **construction and operation of the proposed modification will have adverse**
20 **impacts?**

21 A. Yes, I have an opinion.

22 **Q. What is your opinion?**

1 A. The proposed modification will not have adverse impacts to other listed species.

2 **Q. Beginning with the American alligator, what is the basis for your opinion?**

3 A. American alligators do not use the CCS due to the elevated salinities, and do not
4 frequent the interceptor ditch due to competition from the resident crocodile
5 population.

6 **Q. What is the basis for your opinion as it relates to eastern indigo snakes?**

7 A. Recognition and wildlife awareness training and Best Management Practices
8 specifically addressing indigo snakes will be implemented during construction.
9 There are a series of pumps in the vicinity that have been operating since the
10 1970s with no adverse impacts to indigo snakes. Based on this history, it is my
11 opinion the proposed wells pose no additional risk to indigo snakes.

12 **Q. What is the basis for your opinion as it relates to the West Indian manatee?**

13 A. The cooling canal system and other aquatic habitats in proximity to the proposed
14 modification are completely isolated and are inaccessible to manatees.

15 **Q. What is the basis for your opinion of no adverse impacts to the avian species**
16 **you identified—Bald eagle, least tern, wading birds, and white crown**
17 **pigeon?**

18 A. No bald eagles or eagles nests have been observed on or near the proposed
19 modification area. The FWC's bald eagle nest database indicates that no bald
20 eagle nests are located within 25 miles of the proposed modification area.

21 While there is some limited gravel habitat suitable for least tern nesting in the
22 proposed modification area, no least tern nesting has been observed in the

1 proposed modification area.

2 With regard to wading birds, the proposed well sites avoid wetlands and wading
3 bird habitat. No wading bird nesting or roosting areas have been documented in
4 the modification area. Similarly, no white-crowned pigeon habitat or foraging
5 vegetation is present in the modification area.

6 **Q. Turning to the American crocodile. Is the American crocodile designated as**
7 **threatened or endangered by USFWS and FWC?**

8 A. Yes. The American crocodile is listed as threatened by USFWS and endangered
9 by FWC. The American crocodile was first designated as endangered by the
10 USFWS in 1975, and reclassified (down listed) as threatened in 2007.

11 **Q. You mentioned that the American crocodile has been down listed. How has**
12 **the American crocodile population changed since 1975?**

13 A. It has increased substantially. It has been estimated that the American crocodile
14 population was approximately 100 to 400 adults in the 1960s and 1970s. The
15 USFWS estimated the total population of American crocodiles to be 500 to 1,000
16 in 1999. More recent population estimates range between 1,400 and 2,000 non-
17 hatchlings. This led to USFWS reclassifying the American crocodile from
18 endangered to threatened in 2007.

19 **Q. Has FPL taken efforts to protect the American crocodile?**

20 A. Yes.

21 **Q. Please describe those efforts?**

22 A. FPL developed a comprehensive crocodile management program for the Turkey

- 1 Point CCS in the early 1980s. That program includes, among other things:
- 2 • Habitat preservation and creation of habitat suitable for crocodile nesting and
 - 3 basking;
 - 4 • Establishment of exclusion zones at known nesting sites (nest sanctuaries);
 - 5 • Daytime and nighttime monitoring surveys to document nesting activity and
 - 6 utilization of the CCS;
 - 7 • Capture and tagging of hatchlings using AVID microchip technology;
 - 8 • Relocation of hatchlings to low-salinity habitat during early life stages to increase
 - 9 survival;
 - 10 • Recapture, monitoring, and release of individuals to document growth and survival.
- 11 FPL has been issued special purpose permits by the FWC and the USFWS to capture
- 12 American crocodiles for marking, recapture, scientific data collection, and relocation
- 13 if necessary. In addition to monitoring and habitat enhancement, FPL has enacted an
- 14 extensive crocodile public awareness program to educate the public as to the status of
- 15 the crocodile in south Florida;
- 16 • Constraints on vehicular traffic within the CCS at night and during critical periods of
 - 17 the nesting season;
 - 18 • Constraints on road maintenance and construction activities at night, during critical
 - 19 periods of the nesting season, and within known crocodile crossing sites;
 - 20 • Training requirements for site personnel handling hatchlings and using equipment in
 - 21 the area; and
 - 22 • Active removal of exotic plants.

- 1 **Q. Has the program been successful?**
- 2 A. Yes. The number of successful nests and number of hatchlings captured has
3 increased steadily since discovery of the first nest in the CCS in 1978. Since
4 1978, monitoring at Turkey Point has documented 446 successful nests and the
5 capture tag and release of 7007 hatchling crocodiles.
- 6 **Q. Is there anything about this proposed modification that would impact FPL's**
7 **existing crocodile management program?**
- 8 A. No. FPL's existing extensive crocodile management program will remain in
9 place. However, the proposed modification will improve the aquatic environment
10 of the cooling canal system which will greatly benefit the Turkey Point crocodile
11 population.
- 12 **Q. Did FPL's efforts at Turkey Point contribute to the down listing of the**
13 **American crocodile from endangered to threatened?**
- 14 A. Yes. The management activities instituted by FPL at Turkey Point have largely
15 been responsible for the increase in the American crocodile population in South
16 Florida over the last 25 years.
- 17 **Q. Has USFWS designated critical habitat for the American crocodile?**
- 18 A. Yes.
- 19 **Q. Could you please identify Exhibit FPL-38?**
- 20 A. This is a figure showing the large critical habitat area designated for the American
21 crocodile relative to the location of the Turkey Point Plant.
- 22 **Q. Could you also please identify Exhibit FPL-39?**

1 A. This is a figure zoomed in to show the designated critical habitat line relative to
2 the proposed well locations.

3 **Q. Is any of the proposed modification within designated critical habitat?**

4 A. Proposed well F-6 appears to be within 543 feet of the northern boundary of the
5 designated critical habitat. The other well locations are outside of the designated
6 critical habitat.

7 **Q. So, one of the well locations is at the very northern edge of a rather large**
8 **area?**

9 A. Yes.

10 **Q. Do crocodiles generally use this area for foraging or basking?**

11 A. No.

12 **Q. Do crocodiles use this area for nesting?**

13 A. No, not generally.

14 **Q. Please identify and describe Exhibit FPL-40.**

15 A. Exhibit FPL-40 is a figure showing nesting locations for American crocodiles at
16 the Turkey Point plant from 2010-2014. Data based on 37 years of monitoring and
17 the results of the more recent nesting data show that crocodiles do not frequent the
18 north and northwest portions of the cooling canal system. While there was one
19 nesting location in the northern portion of the CCS, in general, the vast majority
20 of nesting locations are farther south within the CCS.

21 **Q. Why are most of the nesting locations in the southern portion of the CCS?**

22 A. FPL has endeavored to enhance crocodile habitat within the CCS in these areas

1 away from the existing electrical generating units to make the southern portion of
2 the CCS more attractive to crocodiles.

3 **Q. Do you have an opinion as to whether construction and operation of the**
4 **proposed modification will adversely impact areas used by crocodiles for**
5 **nesting?**

6 A. Yes.

7 **Q. What is that opinion?**

8 A. The proposed modification will not adversely impact areas used by crocodiles for
9 nesting. Crocodiles do not generally nest, forage, or bask in the proposed
10 modification areas as they prefer the southern portion of the CCS.

11 **Q. Are you familiar with the areas American crocodiles use for movement into**
12 **and out of the cooling canal system and, if so, could you identify those areas?**

13 A. Yes. The majority of areas used by crocodiles for movement in and out of the
14 cooling canal system occur in the southern sections of the CCS.

15 **Q. Do you have an opinion as to whether construction and operation of the**
16 **proposed modification will adversely impact travel corridors used by**
17 **American crocodiles?**

18 A. Yes.

19 **Q. What is that opinion?**

20 A. I do not consider any of the proposed well locations or the water supply line route
21 to be within travel corridors. Crocodiles may occasionally move from the cooling
22 canal system or the interceptor ditch to the test canals to the north of the cooling

1 canal system, or from the interceptor ditch into the cooling canal system, but not
2 with any frequency to be considered a travel corridor.

3 **Q. What is the basis for that opinion?**

4 A. It is based on historical monitoring and the results of the more recent spatial
5 distribution analysis monitoring of crocodiles.

6 **Q. While construction of one of the wells is within designated critical habitat for
7 American crocodiles, in your opinion is that habitat critical to American
8 crocodile survival?**

9 A. No.

10 **Q. What is the basis for your opinion?**

11 A. My opinion is based on the poor quality of the habitat at the well location and the
12 availability of abundant, higher quality habitat elsewhere.

13 **Q. Turning now to wildlife and aquatic species more generally, in your opinion,
14 will the proposed modification adversely affect habitat that is critical to listed
15 species?**

16 A. No.

17 **Q. What is the basis for your opinion?**

18 A. As described previously, crocodiles do not utilize the proposed modification area
19 because of the poor quality of the habitat and the availability of higher quality
20 habitat in the area. The area likewise does not serve as habitat for any other listed
21 species. On the contrary, the proposed modification is critical to improving
22 habitat necessary to sustain a healthy crocodile population at Turkey Point.

1 **Q. In your opinion, will construction and operation of the proposed**
2 **modification impact the values of wetland or other surface water functions so**
3 **as to cause adverse impacts to the abundance and diversity of fish and**
4 **wildlife, including listed species or their habitat?**

5 A. No.

6 **Q. What is the basis for your opinion?**

7 A. The proposed modification will improve the ecological conditions in the Turkey
8 Point cooling canal system. These improvements will benefit populations of
9 wildlife and aquatic species, including listed species at Turkey Point.

10 **Q. In your opinion, will construction and operation of the proposed**
11 **modification adversely affect the conservation, environmentally sound use, or**
12 **protection of fish, marine resources, and wildlife, including listed species?**

13 A. No.

14 **Q. What is the basis for your opinion?**

15 A. The proposed modification will improve the ecological conditions in the Turkey
16 Point cooling canal system. These improvements will benefit populations of
17 listed species at Turkey Point.

18 **Q. In your opinion, will the proposed modification affect the conservation of**
19 **upland wildlife habitats?**

20 A. No.

21 **Q. What is the basis for your opinion?**

22 A. The only potential upland habitats at the proposed well sites are disturbed lime

1 rock fill areas used as roads and highly disturbed spoil areas adjacent to the roads.

2 These areas do not serve as wildlife habitat.

3 **Q. In your opinion, will the proposed modification result in a net reduction in**
4 **the number of any listed species or the size or health of any listed species**
5 **populations?**

6 A. No.

7 **Q. What is the basis for your opinion?**

8 A. As stated previously, the modification will not adversely impact any listed species
9 as the modification area is not suitable habitat for any listed species. On the
10 contrary, the proposed modification will improve the ecological conditions in the
11 Turkey Point cooling canal system. These improvements will benefit populations
12 of listed species at Turkey Point.

13 **Q. In your opinion, will the proposed modification impact any rookeries,**
14 **nesting, roosting, congregation, or feeding habitats used by listed species?**

15 A. No.

16 **Q. What is the basis for your opinion?**

17 A. There is no rookery, nesting, roosting, congregation, or feeding habitat at the
18 proposed well sites.

19 **Q. We discussed American crocodiles previously, do you have an opinion as to**
20 **whether the proposed modification will adversely impact travel corridors**
21 **used by other listed species?**

22 A. Yes.

1 **Q. What is that opinion?**

2 A. The proposed modification will not adversely impact travel corridors used by
3 other listed species.

4 **Q. What is the basis for that opinion?**

5 A. Travel corridors for other listed species do not exist in the areas of the proposed
6 modification.

7 **Q. In your opinion, will the proposed modification cause any adverse impacts,
8 including cumulative or secondary impacts, to wildlife and aquatic species,
9 including listed species?**

10 A. No.

11 **Q. What is the basis for your opinion?**

12 A. Once again, the modification will not adversely impact any listed species as the
13 modification area is not suitable habitat for any listed species. On the contrary,
14 the proposed modification will improve the ecological conditions in the Turkey
15 Point cooling canal system. These improvements will benefit populations of
16 wildlife and aquatic species, including listed species at Turkey Point.

17 **Q. Are you familiar with the FWC requirements applicable to wildlife and
18 aquatic species, included endangered and threatened species?**

19 A. Yes.

20 **Q. In your opinion, is the proposed modification consistent with those
21 requirements?**

22 A. Yes.

1 **Q. What is the basis for your opinion?**

2 A. The proposed modification will improve the ecological conditions in the Turkey
3 Point cooling canal system. These improvements will benefit populations of
4 wildlife and aquatic species, including listed species at Turkey Point. The
5 modification will not result in a violation of any applicable FWC requirements.

6 **Q. More specifically, in your opinion, will the proposed modification result in a**
7 **“take,” “possess[ion],” or sale of any listed species as defined in FWC rules?**

8 A. No.

9 **Q. What is the basis for your opinion?**

10 A. The proposed modification will improve the ecological conditions in the Turkey
11 Point cooling canal system. These improvements will benefit populations of
12 wildlife and aquatic species, including listed species at Turkey Point. The
13 modification will not result in adverse impacts of any kind to listed species.

14 **Q. In your opinion, will the proposed modification result in an “incidental take”**
15 **of any listed species as defined in FWC rules?**

16 A. No.

17 **Q. What is the basis for your opinion?**

18 A. The proposed modification will improve the ecological conditions in the Turkey
19 Point cooling canal system. These improvements will benefit populations of
20 wildlife and aquatic species, including listed species at Turkey Point. Again, the
21 modification will not result in adverse impacts of any kind to listed species.

22 **Q. Are any of the listed species you described as occurring in the vicinity of the**

1 **proposed modification subject to FWC Management Plans and, if so, which**
2 **species?**

3 A. There are FWC action plans for a number of avian species that may occasionally
4 be found in the area of the proposed modification.

5 **Q. In your opinion, is the proposed modification consistent with those**
6 **management plans?**

7 A. Yes.

8 **Q. What is the basis for your opinion?**

9 A. The proposed modification will improve the ecological conditions in the Turkey
10 Point cooling canal system. These improvements will benefit populations of
11 wildlife and aquatic species, including listed avian species at Turkey Point.

12 **Q. Overall, are you familiar with the applicable state and local nonprocedural**
13 **regulatory requirements related to protection of wildlife, including listed**
14 **species?**

15 A. Yes, I am familiar with those requirements.

16 **Q. Do you have an opinion as to whether the construction and operation of the**
17 **proposed modification will comply with those requirements?**

18 A. Yes.

19 **Q. What is that opinion?**

20 A. The proposed modification will comply with all applicable nonprocedural
21 requirements related to protection of wildlife. In fact, the proposed modification
22 will have a positive impact on wildlife and listed species utilizing the cooling

1 canal system.

2 **Q. In your opinion has FPL minimized any effects of the proposed modification**
3 **on wildlife, including listed species?**

4 A. Yes.

5 **Q. What is the basis for your opinion?**

6 A. The proposed modification will improve the ecological conditions in the Turkey
7 Point cooling canal system. These improvements will benefit populations of
8 wildlife and aquatic species, including listed species at Turkey Point. In addition
9 to the beneficial long term effects of the proposed modification, careful pre-
10 construction due diligence and the implementation of Best Management Practices
11 during construction will minimize or eliminate any adverse impacts.

12 **Q. Does this conclude your prepared written testimony?**

13 A. Yes.

**FLORIDA POWER & LIGHT COMPANY
TURKEY POINT UNITS 3-5 MODIFICATION
DOAH CASE NO. 15-1559**

PETITION FOR MODIFICATION AND COMPLETENESS WITNESS SPONSORSHIP

Witness	Petition Sections Sponsored (including figures, tables, attachments referenced in same)	Completeness Responses Sponsored
Steve Scroggs	1.0—Need for the Proposed Facility	SFWMD-5
	1.1—Facility Introduction	SFWMD-6
	1.2—The Applicant	SFWMD-7
	1.3—Overview of the Project(s)	MDC-1
	1.3.2—Fukushima Compliance	MDC-3
	1.3.3—Unit 5 Well Water Re-allocation	MDC-5
	1.4—Conditions of Certification	MDC-6
	1.5—Need for the Project	MDC-12
	1.6—Summary of Public Outreach	MDC-15
	3.1—Background	
	3.10.1—Construction Materials and Equipment	
	4.1.4—Roads and Slip	
	Appendix C	
Jim Andersen	2.1.1—Site Location	MDC-10
	2.3.1—Geogydrology	MDC-18
	2.3.2—Subsurface Hydrology	
	3.2.1—Production Well Description	
	3.3.1—Production Wells	
	3.3.2—Alternative Water Supply Line	
	4.1.1—Production Wells	
	4.1.2—Alternative Water Supply Line	
	4.1.2.1—General Construction Impacts	
	4.1.3—Alternative Water Supply Line	
Pete Andersen	1.3.1—Salinity Reduction Plan	SFWMD-1
	2.3.3—Site Water Budget and Area Users	SFWMD-2
	3.2.2—Cooling Canal System	SFWMD-3
	3.2.3—Permitted Water Withdrawals	SFWMD-4
	3.6—Plant Water Use	MDC-4
	4.3—Groundwater Impacts	MDC-7
	5.1.1—Production Wells	MDC-8
	5.1.2—Alternative Water Supply Line	MDC-9
	Appendix A	MDC-11
	Appendix B	MDC-13
		MDC-16
		MDC-17
		MDC-19
		MDC-20

		MDC-20
		MDC-21
		MDC-22
		MDC-23
		MDC-24 (including all subquestions A through)
		MDC-25
		Revised Appendix B
Greg Powell	2.3.4—Surficial Hydrology	
	3.7—Chemical and Biocide Waste	
	3.8—Solid and Hazardous Waste	
	3.9—Site Drainage	
	4.1.5—Flood Zones	
	4.2—Impact on Surface Water Bodies and Uses	
	4.2.1—Impact Assessment	
	4.2.2—Measuring and Monitoring Program	
	5.1.3—Leachate and Runoff	
	5.1.4—Measurement Programs	
	5.2—Sanitary and Other Waste Discharges	
Karl Bullock	2.3.5—Vegetation/Land Use	
	4.4.1—Impact Assessment (wetlands)	
	4.4.2—Measuring and Monitoring Programs (wetlands)	
	5.5—Ecological Impacts (wetlands)	
Jim Lindsay	2.3.6.1—Species-Environmental Relationships	MDC-14
	2.3.7—Pre-existing Stresses	
	2.3.7.1—Measurement Programs	
	4.4.1—Impact Assessment (wildlife)	
	4.4.2—Measuring and Monitoring Programs (wildlife)	
	5.5—Ecological Impacts (wildlife)	
Ken Kosky	2.3.8—Meteorological and Ambient Air Quality	
	2.3.8.1—Ambient Air Quality	
	2.3.9—Noise	
	3.4—Fuel	
	3.5—Air Emission and Controls	
	4.5—Air Impacts	
	4.5.1—Control Measures	
	4.6.1—Construction Noise Impacts	
	5.3—Air Quality Impacts	
	5.4—Noise Impacts	
Kerri Kitchen	2.2.1—Governmental Jurisdictions	MDC-2
	2.2.2.1—Future Land Use	
	2.2.2.2—Zoning	
	4.1.6—Topography and Soils	

James (Jim) Lindsay

700 Universe Blvd, Juno Beach, FL 33408 (561) 691-7032

Education Bachelor of Science: Oceanography, Florida Institute of Technology 1980

Professional Experience

7/97 to present Florida Power and Light, Environmental Services. Principal Biologist/Project Manager. Provide biological consulting services to all areas of Next Era Energy including wind, solar, fossil, and hydro, nuclear energy production, and transmission/distribution. Provide ongoing technical, biological, and field support for the Everglades Mitigation Bank. Provide technical, administrative, and regulatory support to all business units on wetlands permitting, wetlands mitigation banking, protected species management, asset acquisition due diligence for air, water and waste programs, special projects management, manufactured gas plant remediation, Operations Section Chief for corporate oil spill team, RCRA corrective action management, community environmental awareness programs.

8/90 – 7/97 Florida Power and Light, Engineering & Technical Services- West Palm Beach. Senior Environmental Specialist. Provide technical and administrative support to all FPL fossil power plants for environmental regulatory compliance programs, permit development, OSHA industrial hygiene programs, waste management and training program coordination.

2/89 – 8/90 Florida Power and Light Turkey Point Fossil Power Plant. Plant Environmental Specialist. Responsible for compliance with federal, state, and local regulations. Other responsibilities included: Chairman of Turkey Point Site Environmental Coordination Committee, member of Turkey Point Fossil Environmental Steering Committee, member of Power Plant Environmental Subcommittee, member Chemical Standards Review Board. Experienced in dealing with local environmental compliance agency (DERM) on permit development and compliance issues and waste treatment systems enhancement projects.

3/88 – 2/89 Florida Power and Light Cutler Plant Lab Technician with Lab Leader experience. Responsible for reactivation of Results Chemistry Lab including ordering and installation of all analytical equipment,

inspection of boiler, turbine, and auxiliary systems; testing and operation of water treatment plant. Laboratory analysis on environmental samples for NPDES, DER, IWW and local environmental permits. Performed asbestos condition assessment. Supervised operation of wastewater treatment systems.

5/81 - 3/88 Turkey Point Environmental Monitoring and Research Lab (Quantum Resources) Environmental Scientist. Responsible for all facets of environmental monitoring including wet chemistry, soil analysis, hydrology, groundwater monitoring, air monitoring, endangered species management, technical reports, NPDES permit requirements, underwater inspections, and QA/QC. Managed the crocodile monitoring program.

6/80 - 5/81 Sanford Power Plant Land Utilization Laboratory (T.E.I., Inc.) Lab technician. Responsible for condition assessment of closed loop cooling pond, engineering reports, NPDES permit requirements, underwater inspections, hazardous materials management, and endangered species management.

3/88 - 9/90 Turkey Point Land Utilization (Quantum Resources) Consulting Biologist. Crocodile management project consultant.

5/87 - 11/88 Koogler and Associates Pepper Steel and Alloy Project, Medley, FL. Air Monitoring Consultant. Responsible for equipment calibration and data collection for site remediation air quality monitoring project at a PCB Superfund site.

5/85 - 2/86 Environmental Sciences and Engineering, Inc., Cutler Ridge, FL. Air Monitoring Consultant. Cutler ambient air monitoring systems.

Continuing Education

1997	Environmental Permitting Summer School – Wetlands Courses
1993	DOT Hazardous Materials Transportation
1993	Advanced Incident Command Systems: The McClosky Group
1993	NREP Registered Environmental Manager Seminar and Exam
1993-99	HAZWOPPER 8 hour refresher training
1992	Environmental Audit Training: Arthur D. Little Center for Environmental Assurance
1992	Incident Management Systems: South Tech Fire Academy
1992	FPL/Coastal Fuels/Agency Open Water Oil Spill Exercise
1992	Pollution Prevention Workshop DERM/FAEP
1991	Shell Oil Incident Command System Training and Table-top Oil Spill Scenario Exercise
1991	FPL Oil Spill Response Training and Field Exercise

James R. Lindsay

Page 3

1991	Advanced Industrial Waste Water Treatment Systems
1991	National Institute for Storage Tank Management
1990	Florida DNR Oil Spill Response Training
1989, 1990	Certified Visible Emissions Evaluator
1989-99	Hazardous Waste Management
1989	1910.120 Emergency Response Train the Trainer (HAZWOPPER)
1989	St. Augustine Fire Academy Industrial Fire Fighting
1989	Asbestos Abatement Supervision
1982-83	Florida International University: Environmental Energy Flow, Waste Water Treatment

Publications *Turkey Point Plant Non-Radiological Environmental Monitoring Reports, 1981 through 1983.*

Enhancing Spill Prevention and Response Preparedness Through Quality Control Techniques. 1993 International Oil Spill Conference Proceedings.

Hurricane Andrew Causes Major Oil Spill at Florida Power and Light's Turkey Point Power Plant, Homestead, Florida. 1993 International Oil Spill Conference Proceedings.

Newman, J. R., C. M. Newman, J. R. Lindsay, B. Merchant, M. L. Avery, & S. Pruett-Jones., 2004. Monk Parakeets: An Expanding Problem on Power Lines and Other Electrical Utility Structures. Presented at the Environmental Concerns in Rights-of-Way Management 8th International Symposium; Saratoga Springs, NY; September 2004.

Pruett-Jones, S., Newman, J.R., Newman, C.M., Avery, M.L., Lindsay, J.R. 2007. Population viability analysis of monk parakeets in the United States and examination of alternative management strategies. *Human-Wildlife Conflicts* 1(1): 35-44.

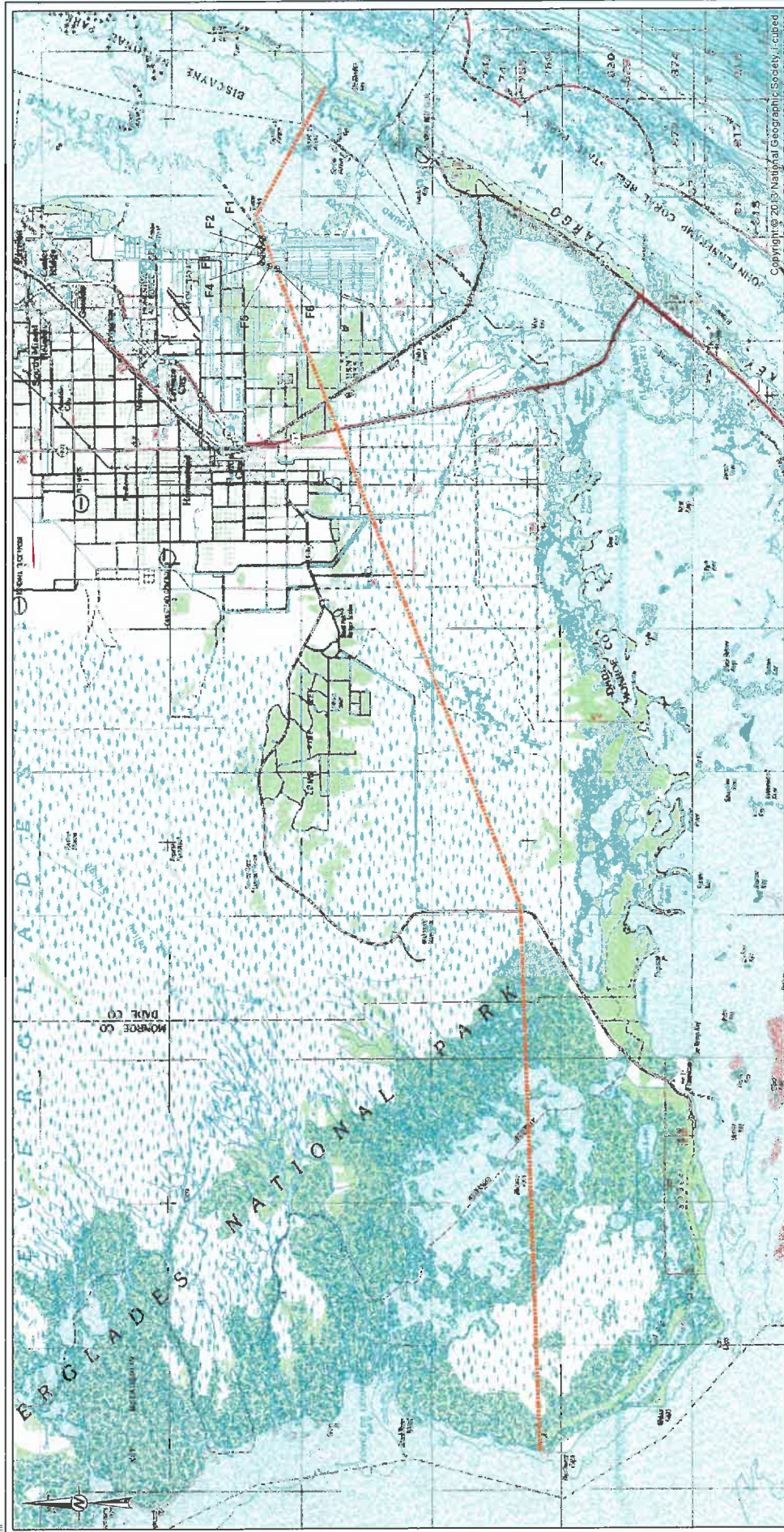
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Pruett-Jones, Stephen; Newman, James R.; Newman, Christian M.; Lindsay, James R., 2005. Population growth of monk parakeets in Florida *Field Naturalist*. 33(1). February 2005. 1-14.

Professional Affiliations

Edison Electric Institute (EEI) - Avian Power Line Interaction Committee (2002-2006)
National Wind Coordinating Collaborative (NWCC) - Wild Life Core Group; Bat/Wind Energy Cooperative Technical Committee; Grassland Shrub/Steppe Species Collaborative Technical Committee
Pennsylvania Wind/Wildlife Collaborative - Member
Midwest Habitat Conservation Plan (HCP) Team - Member
Great Plains HCP Team - Member
Land-Based Wind Energy Guidelines Federal Advisory Committee – Member
American Wind Energy Association Siting and Environmental Compliance Committee – Member
International Union of Nature (IUCN) and the Species Survival Commissions (SSC) Crocodile Specialist Group – Member
Everglades Cooperative Invasive Species Management Area Partnership – Member
Treasure Coast Invasive Species Management Area Partnership – Member
National Registry of Environmental Professionals - Registered Environmental Manager
National Association of Environmental Professionals - General Member
Florida Oceanographic Society
Utility Water Activities Group - Chlorine Working Group
Utility Solid Waste Activities Group - Oil Ash Working Group

(JRL.RESUME.6/2015)



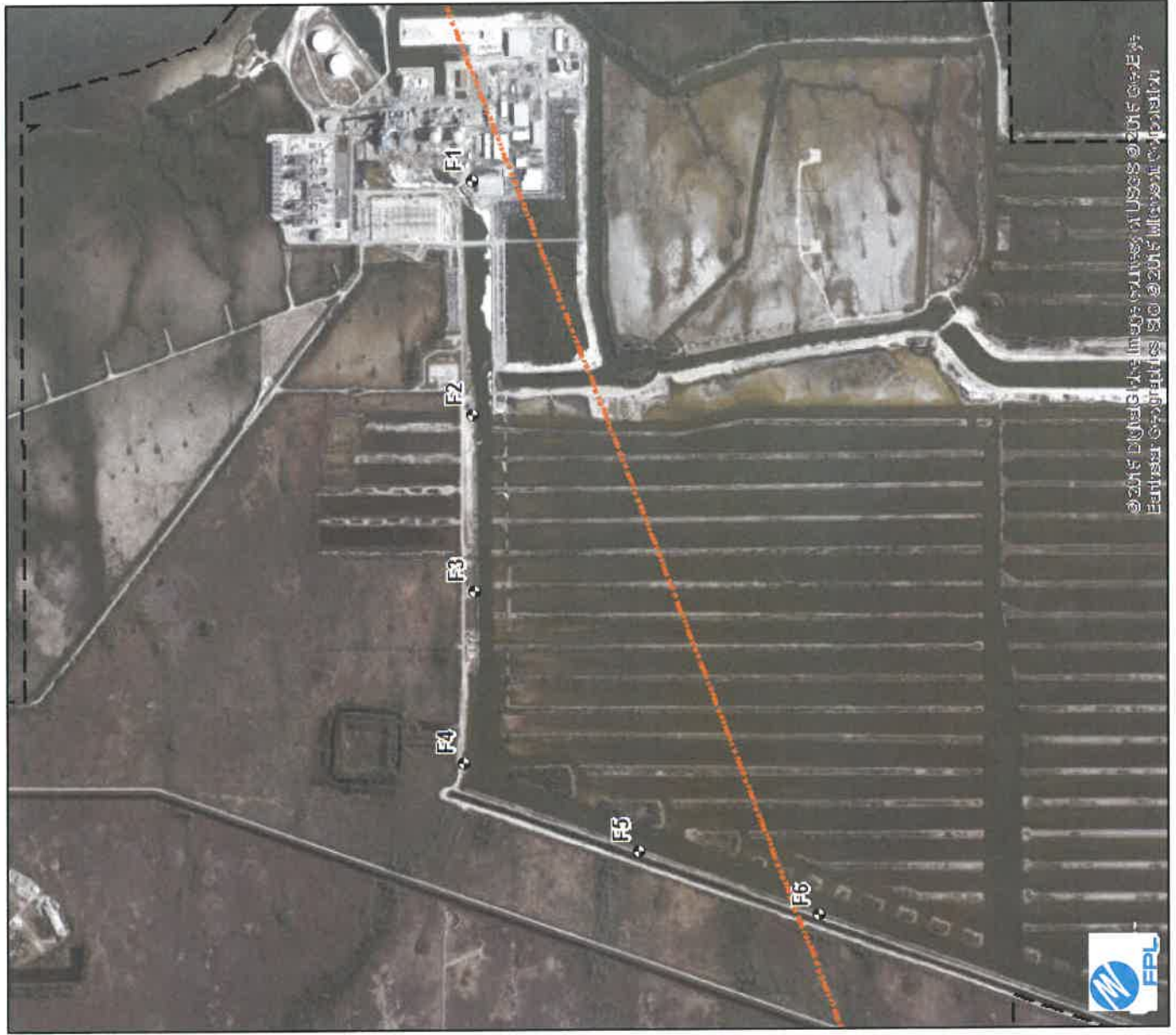
LEGEND
 ● Aquifer Well
 --- Northern Boundary of Designated Critical Habitat for American Crocodile

NOTES:
 N/A

REFERENCES:
 CRITICAL HABITAT USFWS 2005

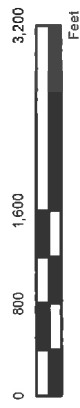
USFWS CRITICAL CROCODILE HABITAT





LEGEND

- Aquifer Well
- Turkey Point Plant Property Boundary
- Northern Boundary of Designated Critical Habitat for American Crocodile



NOTE(S)
N/A

REFERENCE(S)

WELL SITES: GOLDER ASSOCIATES, 2014-2015
TURKEY POINT PLANT PROPERTY BOUNDARY, FPL, 2015
CRITICAL HABITAT BOUNDARY, USFWS, 2005

**AERIAL WITH WELL SITES AND
CRITICAL CROCODILE HABITAT**



CROCODILE NEST LOCATIONS 2010-2014

1 **BEFORE THE DIVISION OF ADMINISTRATIVE HEARINGS**

2 **FLORIDA POWER & LIGHT COMPANY**

3 **TURKEY POINT UNITS 3-5 MODIFICATION**

4 **DIRECT TESTIMONY OF GREGORY M. POWELL**

5 **DOAH CASE NO.: 15-1559EPP**

6 **BACKGROUND/QUALIFICATIONS**

7 **Q. Please state your name and business address.**

8 A. My name is Gregory M. Powell. My business address is 9428 Baymeadows Road, Suite
9 400, Jacksonville, Florida 32256.

10 **Q. Who is your current employer and what position do you hold?**

11 A. I am currently employed by Golder Associates Inc. My position is Practice Leader and
12 Principal.

13 **Q. What are your responsibilities in your current position?**

14 A. My primary responsibility is to provide engineering and environmental consulting
15 services for our clients. I also have responsibilities for project management, business
16 development, and technical and professional leadership.

17 **Q. Please describe your educational background beginning with your undergraduate
18 degree.**

19 A. I hold a Bachelor of Science degree in Aerospace Engineering, which I received in 1972;
20 a Master of Engineering degree in Coastal and Oceanographic Engineering, which I
21 received in 1975; and a Doctor of Philosophy in Engineering Mechanics, which I
22 received in 1980. All my degrees are from the University of Florida.

23 **Q. What was the subject of your dissertation?**

24 A. My Master's thesis and Ph.D. dissertation both dealt with mixing in a density stratified

1 flow.

2 **Q. Please describe your professional work experience since obtaining your last**
3 **academic degree.**

4 A. I have worked as a consulting engineer in Florida since 1977. While I was finishing my
5 Ph.D. studies, I joined the consulting firm of Environmental Science and Engineering,
6 Inc., (ESE) in Gainesville, Florida. I stayed with ESE until 1993. During that time I
7 worked my way up to the position of Vice President and Office Manager for the
8 Gainesville Consulting Division. In 1993, I joined the firm of Reynolds, Smith and Hills,
9 Inc., as Senior Vice President of the Environmental Services Division. In 1999, I joined
10 Golder Associates Inc., where I am currently employed.

11 **Q. What disciplines or areas of specialization have you focused on in your professional**
12 **work?**

13 A. During my 30 plus years as a consulting engineer I have focused on the disciplines of
14 Civil, Coastal, Environmental and Water Resources Engineering; Mathematical and
15 Statistical Analysis; Computer Modeling and Simulation; Engineering Design; and
16 Environmental Management, Compliance and Permitting. Much of my project
17 experience involved environmental impact assessments of large-scale commercial and
18 industrial developments, including many power plants in Florida and other states.

19 **Q. Do you have experience evaluating stormwater impacts of large-scale industrial**
20 **development projects?**

21 A. Yes. I have done that for many power plants and for other industrial facilities.

22 **Q. Please describe your experience related to materials handling and disposal,**
23 **including solid and hazardous waste.**

1 A. Recently, I completed studies for FPL related to muck placement and storage at the
2 Turkey Point facility as part of the TP 6&7 Site Certification Project. I have also
3 evaluated groundwater impacts related to a C&D landfill in Putnam County and
4 evaluated groundwater impacts from coal byproduct storage areas in Glades County,
5 Florida. Early in my career I worked for several years on designing and permitting a
6 hazardous waste treatment, storage and disposal facility under RCRA in Texas. More
7 recently, I worked on permitting a treatment and storage facility in Jacksonville, Florida.

8 **Q. Please describe any professional registrations or certifications that you hold in your**
9 **field of expertise.**

10 A. I am a licensed Professional Civil Engineer in the State of Florida. I have been licensed
11 in Florida since 1981.

12 **Q. Do you hold any memberships in professional organizations in your field of**
13 **professional expertise, and if so please identify those organizations for us.**

14 A. I am a member of the American Society of Civil Engineers. At various times in the past I
15 have been a member of the American Water Resources Association, the National Society
16 of Professional Engineers and the Florida Engineering Society.

17 **Q. Have you provided technical training to others in your field of expertise? If yes, can**
18 **you please provide a summary of those training programs you have provided?**

19 A. Between 1998 and 2002, I taught courses at the graduate and undergraduate level in
20 Statistics, Technology Management and Operations Management.

21 **Q. Have you ever testified as an expert witness before?**

22 A. I have testified many times at trial, in administrative hearings, before Public Service
23 Commissions, County Commissions and in deposition.

1 **Q. In what fields of expertise have you been qualified?**

2 A. I have been recognized previously as an expert in hydraulics, surface and ground water
3 hydrology, water quality, water resources engineering, stormwater management,
4 wastewater management, earthwork and materials disposal, and computer modeling.

5 **Q. Is Exhibit FPL-29 a true and correct copy of your resume?**

6 A. Yes

7 **FPL OFFERS DR. POWELL AS AN EXPERT IN SURFACE WATER HYDROLOGY,**
8 **STORMWATER MANAGEMENT, AND SOLID AND HAZARDOUS WASTE**
9 **DISPOSAL.**

10 **INTRODUCTION**

11 **Q. Could you please describe the subject of your testimony in this proceeding?**

12 A. I will be testifying on the surface water resource aspects of the proposed modification,
13 including surface water quality and stormwater system design. I will also address issues
14 related to handling, storage and disposal of Project-related solid and hazardous wastes.

15 **Q. Are you familiar with FPL's proposed modification of certification for Turkey Point**
16 **Units 3-5?**

17 A. Yes.

18 **Q. What has been your role in the modification?**

19 A. I served as Golder's lead engineer responsible for water related aspects of the request for
20 modification. I reviewed and evaluated work products from other consultants relating to
21 water issues and was the interface with FPL and other Project consultants on engineering
22 related water issues.

23 **Q. Have you prepared or are you prepared to sponsor into evidence the sections of the**

petition for modification and the completeness responses listed by your name on Exhibit FPL-2, including any tables, figures, or attachments?

A. Yes.

Q. Are the materials listed on Exhibit FPL-2 that you are sponsoring true and correct?

A. Yes.

Q. Do you agree with the contents of those materials listed on Exhibit FPL-2 that you are sponsoring?

A. Yes.

SURFACE WATERS IN THE AREA

Q. Dr. Powell, are you familiar with the surface waters that are found at the Turkey Point plant and in the surrounding area?

A. Yes.

Q. Could you please identify Exhibit FPL-30?

A. This is a figure titled Major Tributaries that shows the Turkey Point facility and several of the existing regional surface water bodies in the vicinity.

Q. Is that figure true and correct?

A. Yes, it is

Q. Using that Figure, please describe the existing surface waters in the vicinity?

A. Yes. The Turkey Point facility includes a large closed-loop cooling canal system that is approximately 5 miles long in the north-south direction and approximately 2 miles wide in the east-west direction. The interceptor ditch runs along the western boundary of the cooling canal system. East of the Turkey Point facility is Biscayne Bay and southeast is Card Sound. The Atlantic Ocean is on the far right hand side of this figure east of the

1 barrier islands. Outside the CCS, along the western shoreline of Biscayne Bay there are a
2 number of drainage canals that flow from west to east and discharge into the bay. The L-
3 31E canal parallels the western side of the cooling canal system and the western shoreline
4 of Biscayne Bay. The Model Lands Canal (C-107) bends around the southwest corner of
5 the cooling canal system and then joins up with the remaining portion of the Sea Dade
6 Canal before flowing into Card Sound. North of the cooling canals are the Florida City
7 Canal, the North Canal and the Mowry Canal (C-103). In addition to the canals and the
8 Bay there are also extensive wetlands around the CCS.

9 **COOLING CANAL SYSTEM**

10 **Q. Dr. Powell, are you familiar with the cooling canal system at the Turkey Point Plant**
11 **site?**

12 **A.** Yes, I am.

13 **Q. How have you gained that familiarity with the CCS?**

14 **A.** In addition to the work I have done on this modification request, I worked for many years
15 on the Turkey Point Units 6 & 7 site certification. As part of this work, I visited the site,
16 and reviewed historical studies related to the CCS facility, including studies on the
17 operation of the interceptor ditch. I reviewed monitoring and modeling studies related to
18 the Turkey Point Units 3 & 4 Uprate. I evaluated hydrologic and water quality impacts
19 on the CCS from releases of stormwater, construction wastewater and dewatering
20 effluent. I have also conducted engineering feasibility studies on the potential for using
21 reclaimed water in the CCS.

22 **Q. Are you familiar with the events that led to the construction of the cooling canal**
23 **system and, if so, could you briefly describe those events?**

1 A. Yes. The Turkey Point cooling canal system was constructed as a result of a consent
2 order issued by a federal judge in September 1971. The cooling canal system became
3 operational in February 1973.

4 **Q. Are you familiar with the proposed modification area that will be impacted by the**
5 **construction of the new water wells?**

6 A. Yes, I am.

7 **Q. How is stormwater runoff currently treated in the modification area at Turkey**
8 **Point?**

9 A. Stormwater runoff from the plant, including the proposed well locations, currently drains
10 by overland flow into the cooling canal system.

11 **Q. Will the proposed modification have any adverse stormwater volume impacts?**

12 A. No. Runoff from the well sites currently drains via overland flow into the cooling canal
13 system. After the wells are constructed, stormwater will continue to be released in the
14 same area. Stormwater volumes will be approximately the same after the modification.
15 The existing 5900 acres CCS provides adequate storage capacity to retain runoff from the
16 proposed modification area of 2.5 acres total that is required for construction of the wells.

17 **Q. Will stormwater associated with the proposed modification have an adverse effect**
18 **on the quality of the water within the existing cooling canal system?**

19 A. No. The additional stormwater runoff associated with the proposed modification is
20 insignificant. The water quality will be the same or very similar to the existing
21 stormwater runoff. It will not impact water quality within the CCS.

22 **Q. Will the addition of 14 MGD of UFA water affect the storage capacity of the CCS?**

23 A. Not significantly. The CCS will still have sufficient reserve capacity to retain the 100-

1 year, 72-hour storm.

2 **Q. What is the basis for your opinion?**

3 A. Survey data collected as part of the Turkey Point Uprate Monitoring Studies shows that
4 the CCS perimeter berm elevations are at least 2 feet NAVD 88; and in most locations the
5 berm elevations are much higher. The uprate monitoring data collected from September
6 2010 through June 2012 shows that the normal wet season water level in the CCS is
7 approximately 0.3 feet NAVD 88. The 100-year 72-hour storm is 14 inches or
8 approximately 1.2 feet. The hydraulic analysis of the CCS, developed by Peter
9 Andersen, showed that adding 14 MGD to the CCS would increase the water levels by no
10 more than 0.1 feet. Therefore, the maximum water level in the CCS following a 100-year
11 72-hour storm in the wet season, after accounting for the maximum 0.1 feet increase
12 resulting from the addition of 14 MGD of water, would be 1.6 feet t NAVD 88. This is
13 0.4 feet below the perimeter berm elevation.

14 **Q. Are you familiar with the FDEP and Miami-Dade County requirements applicable**
15 **to stormwater management?**

16 A. Yes.

17 **Q. In your opinion, will the proposed modification be consistent and in compliance**
18 **with those requirements?**

19 A. Yes.

20 **Q. What is the basis for your opinion?**

21 A. My opinion is based on review of the applicable regulations and my understanding of the
22 proposed modification. More specifically, the proposed modification will have no
23 adverse impact on operation of the CCS, which is an industrial wastewater facility

designed to retain and beneficially reuse stormwater. The modification will not result in any direct discharge of stormwater to the surrounding surface waters; and the proposed modification will not cause any flooding or impair any flood protection.

Q. Are you familiar with the applicable FDEP, SFWMD and Miami-Dade County regulations related to stormwater management, as found in Chapters 62-4, 62-25, 62-40, 62-302 and 62-330, F.A.C including Volumes I and II of the Applicant's Handbook and Miami Dade County's stormwater criteria found in Chapter 24-42, Miami-Dade County Code of Ordinances and in various sections of the CDMP?

A. Yes, I am familiar with those stormwater regulations and criteria.

Q. In your opinion, is the proposed modification consistent and in compliance with the stormwater management requirements of FDEP, the South Florida Water Management District, and Miami-Dade County?

A. Yes.

Q. Could you explain the basis for your opinion?

A. All the stormwater associated with construction or operation of the modification will be appropriately treated and retained in the CCS. The CCS is an industrial wastewater treatment system designed to retain and beneficially reuse stormwater; and the system capacity will not be exceeded by the proposed modification.

Q. Have you considered whether stormwater associated with the proposed modification would adversely affect navigation, would adversely affect works of the Water Management District, would cause harmful erosion or shoaling, would adversely affect offsite water quality or quantity, or cause unacceptable cumulative impacts?

A. Yes.

1 **Q. In your opinion, will stormwater associated with the proposed modification have**
2 **any of the aforementioned effects?**

3 A. No.

4 **Q. What is the basis for your opinion?**

5 A. Again, stormwater will be released to the CCS. There will be no measurable change in
6 the quantity or quality of the water within the cooling canal system from project
7 stormwater. The CCS is not navigable waters, it is not part of any works of the District
8 and there will be no adverse impact to offsite water quality. It will not cause erosion or
9 shoaling. There will be no unacceptable cumulative impacts from stormwater.

10 **Q. Putting aside impacts within the CCS itself, will the proposed modification have any**
11 **other impacts on surface waters in the vicinity?**

12 A. No.

13 **Q. What is the basis for your opinion?**

14 A. There is no direct discharge from the CCS to the surrounding surface waters. In my
15 professional opinion, there is no reason to expect any significant interaction between the
16 groundwater discharges and the surrounding surface waters. This conclusion is validated
17 by the fact that the Pre- and Post-Upgrade Monitoring Studies show no discernible effects of
18 the CCS on surface water quality around the CCS.

19 **Q. In your opinion, will the proposed modification impair the designated uses of**
20 **contiguous surface waters via discharges to groundwater under FDEP Rule 62-**
21 **520.310(2), F.A.C.?**

22 A. No.

23 **Q. What is the basis for your opinion?**

24 A. The proposed modification will over time reduce the hypersaline conditions in the CCS

1 and make the CCS salinity similar to the surface waters in the bay. There is no direct
2 surface discharge to surface waters and groundwater discharges have not and will not
3 interact with, or impair the designated uses of the contiguous surface waters.

4 **Q. Are there any Outstanding Florida Waters or Outstanding National Resource**
5 **Waters in the vicinity of Turkey Point?**

6 A. Yes.

7 **Q. In your opinion, will the proposed modification have any impacts on those**
8 **designated waters?**

9 A. No.

10 **Q. What is the basis for your opinion?**

11 A. Along the east side of the CCS, shallow groundwater flow is from the aquifer under the
12 bay into the CCS. This is currently the case, and these conditions will remain after the
13 modification. Consequently, groundwater discharges from the CCS will not flow east
14 toward the bay in the shallow aquifer; and there will be no adverse impact or degradation
15 of water quality in the Outstanding Florida Waters of Biscayne Bay.

16 **Q. Will the modification have an adverse effect on the quality of the water within the**
17 **existing cooling canal system?**

18 A. No.

19 **Q. What is the basis for your opinion?**

20 A. The 14 MGD of Floridan Aquifer water is being released to the CCS specifically to
21 reduce salinity and improve the water quality in the canal system. The Floridan aquifer is
22 artesian and confined. Therefore, it does not have significant concentrations of
23 constituents that may be considered pollutants from human activity. The quantity and

1 quality of the storm water released to the CCS will be approximately the same after the
2 modification as it is currently. The CCS is a large treatment system designed to retain
3 and beneficially reuse stormwater and it has the capacity to handle any minor differences.

4 **Q. In your opinion will the construction and operation of the proposed modification**
5 **cause or contribute to violations of the surface water quality standards established**
6 **under Rule Chapter 62-302, F.A.C. or of Chapter 24-42 of the Miami-Dade County**
7 **Code of Ordinances?**

8 A. No.

9 **Q. Could you please explain the basis for your opinion?**

10 A. There is no direct surface water discharge from the CCS to the surrounding surface
11 waters. Groundwater releases from the CCS are primarily through the bottom of the
12 canal system. Groundwater released from the bottom will tend to move to the deeper
13 portions of the aquifer and releases to the deeper portions of the aquifer are not likely to
14 interact with surface waters. Shallow groundwater along the east side of the CCS flows
15 inward --toward the CCS, which forms a hydraulic barrier. Shallow groundwater flowing
16 out of the CCS along the west side will be captured by the Interceptor Ditch and returned
17 to the CCS. Groundwater releases along the southern and northern sides of the CCS will
18 be limited and these releases will rapidly mix with groundwater and will be insignificant
19 and non-detectable in surface waters.

20 **Q. In your opinion will the construction and operation of the proposed modification**
21 **result in any degradation of the water quality of any surface water in the vicinity of**
22 **the Project?**

23 A. No.

1 **Q. Could you please explain the basis for your opinion?**

2 A. Construction activities associated with the modification, including well construction, will
3 be conducted within the confines of the CCS. The modification is designed to improve
4 operational water quality in the CCS and the aquifer below by reducing the hypersalinity.
5 Groundwater releases from the CCS will move down to the deeper parts of the aquifer
6 and will not interact with surface waters in any significant way.

7 **Q. Could you please identify Exhibit FPL-33?**

8 A. Yes. Exhibit FPL 33 is a figure showing the Comprehensive Everglades Restoration Plan
9 (CERP) Projects in the vicinity of the Turkey Point plant.

10 **Q. Could you identify those CERP Projects, please?**

11 A. As shown on this figure, CERP Projects in the general area are the Biscayne Bay Coastal
12 Wetlands (BBCW) Phase I Project, which is north of the Turkey Point Plant, and parts of
13 the C-111 Spreader Canal Project, which is located south and west of the Turkey Point
14 Plant.

15 **Q. Do you have an opinion as to whether the proposed modification is inconsistent with**
16 **CERP?**

17 A. Yes.

18 **Q. What is that opinion?**

19 A. The proposed modification is fully consistent with the goals and objectives of CERP.

20 **Q. What is the basis for that opinion?**

21 A. The proposed modification would have no impact on surface water quality or quantity
22 outside of the CCS. Water from the Upper Floridan aquifer is not being used for CERP
23 projects. There is no surface water connection from the CCS. Those CERP projects are

1 outside of the CCS and thus would not be impacted.

2 **Q. Could you please identify Exhibit FPL-31?**

3 A. This is Figure 2.1-3 from the request for modification showing the proposed modification
4 in relation to FEMA flood hazard zones.

5 **Q. Is this Exhibit FPL-31 true and correct, in your opinion?**

6 A; Yes, it is.

7 **Q. In your opinion, will the proposed modification have an impact on flood elevations
8 or impair flood protection?**

9 A. No.

10 **Q. Are you familiar with the requirements in Chapter 11C related to flood hazards in
11 the coastal area in Miami-Dade County's Code of Ordinances?**

12 A. Yes.

13 **Q. Could you identify the purpose of those requirements?**

14 A. Chapter 11C deals with flood protection in Miami-Dade County and requirements to
15 maintain federal flood insurance.

16 **Q. In your opinion, is the proposed modification consistent and in compliance with
17 those requirements of MDC Code Chapter 11C?**

18 A. Yes.

19 **Q. What is the basis for your opinion?**

20 A. The proposed locations of the Floridan Aquifer wells are inside the CCS perimeter berm.
21 For purposes of MDC Code Chapter 11C, these proposed well locations are outside of the
22 FEMA-designated VE zone, which is the area that is subject to inundation during a 1 in
23 100 year storm and subject to additional hazards from wave action. They are, however,

1 located within the Special Flood Hazard area, defined in Chapter 11C as below the base
2 flood elevation. However, the proposed UFA wells will be constructed above the base
3 flood elevation or will be flood proofed, as necessary, to comply with the applicable
4 requirements of Chapter 11C. The proposed UFA wells are not in a floodway and will
5 not contribute to flooding in other locations. The wells would be closed at the shut-off
6 valve before a major storm event such as a hurricane.

7 **SOLID AND HAZARDOUS WASTE**
8

9 **Q. Will construction or operation of the proposed modification result in the generation**
10 **of solid or hazardous waste and, if so, could you identify those?**

11 A. Yes. There will be some construction solid waste, drill cuttings and liquid waste
12 associated with drilling the wells and building the pipeline. These solid wastes from well
13 construction will be disposed onsite. If any hazardous wastes are generated during well
14 construction, they will be handled in accordance with applicable regulations.

15 **Q. In your opinion, will the construction or operation of the proposed modification**
16 **result in adverse impacts from solid or hazardous wastes?**

17 A. No.

18 **Q. What is the basis for your opinion?**

19 A. All solid or hazardous waste will be managed and disposed of appropriately following
20 regulatory requirements and using approved facilities. The Project will not significantly
21 change the amount or type of solid or hazardous waste generated.

22 **Q. Are you familiar with the FDEP requirements applicable to solid and hazardous**
23 **wastes in Chapters 62-701 and 62-730, Florida Administrative Code?**

24 A. Yes.

1 **Q. In your opinion, will the proposed modification be consistent and in compliance**
2 **with those requirements?**

3 A. Yes.

4 **Q. What is the basis for your opinion?**

5 A. The project does not involve construction, operation or closure of any solid waste facility.
6 All non-hazardous and hazardous wastes associated with the modification will be
7 managed according to applicable regulations.

8 **Q. Are you familiar with Miami-Dade County's requirements related to handling of**
9 **solid and hazardous waste in the Comprehensive Development Master Plan**
10 **Objective CM-6G and Chapter 15 of the Miami-Dade County Code?**

11 A. Yes.

12 **Q. In your opinion, will the proposed modification be consistent and in compliance**
13 **with those requirements?**

14 A. Yes.

15 **Q. What is the basis for your opinion?**

16 A. No solid or hazardous waste will be disposed of on site. All temporary storage of solid or
17 hazardous waste and hazardous materials will be away from the coastline.

18 **PPSA CRITERIA**

19 **Q. In your opinion, as it relates to surface water quality and solid and hazardous waste,**
20 **does the proposed modification minimize adverse effects on human health, the**
21 **environment, and the ecology of the land and its wildlife and the ecology of state**
22 **waters and their aquatic life?**

23 A. Yes.

1 **Q. What is the basis for your opinion?**

2
3 A. Storm water and solid and hazardous wastes will be managed as required by applicable
4 regulations and the areas included in the modification are contained and isolated within
5 the CCS.

6 **Q. In your opinion, as it relates to surface water impacts, does the proposed**
7 **modification comply with applicable nonprocedural requirements?**

8 A. Yes

9 **Q. What is the basis for your opinion?**

10 A. The modification will have no adverse impact on surface waters.

11 **Q. In your opinion, as it relates to solid and hazardous waste, does the proposed**
12 **modification comply with applicable nonprocedural requirements?**

13 A. Yes.

14 **Q. What is the basis for your opinion?**

15 A. My understanding of the solid and hazardous waste rules and my understanding of the
16 proposed modification.

17 **Q. Does this conclude your prepared written testimony?**

18 A. Yes, it does.

**FLORIDA POWER & LIGHT COMPANY
TURKEY POINT UNITS 3-5 MODIFICATION
DOAH CASE NO. 15-1559**

PETITION FOR MODIFICATION AND COMPLETENESS WITNESS SPONSORSHIP

Witness	Petition Sections Sponsored (including figures, tables, attachments referenced in same)	Completeness Responses Sponsored
Steve Scroggs	1.0—Need for the Proposed Facility	SFWMD-5
	1.1—Facility Introduction	SFWMD-6
	1.2—The Applicant	SFWMD-7
	1.3—Overview of the Project(s)	MDC-1
	1.3.2—Fukushima Compliance	MDC-3
	1.3.3—Unit 5 Well Water Re-allocation	MDC-5
	1.4—Conditions of Certification	MDC-6
	1.5—Need for the Project	MDC-12
	1.6—Summary of Public Outreach	MDC-15
	3.1—Background	
	3.10.1—Construction Materials and Equipment	
	4.1.4—Roads and Slip	
	Appendix C	
Jim Andersen	2.1.1—Site Location	MDC-10
	2.3.1—Geogydrology	MDC-18
	2.3.2—Subsurface Hydrology	
	3.2.1—Production Well Description	
	3.3.1—Production Wells	
	3.3.2—Alternative Water Supply Line	
	4.1.1—Production Wells	
	4.1.2—Alternative Water Supply Line	
	4.1.2.1—General Construction Impacts	
	4.1.3—Alternative Water Supply Line	
Pete Andersen	1.3.1—Salinity Reduction Plan	SFWMD-1
	2.3.3—Site Water Budget and Area Users	SFWMD-2
	3.2.2—Cooling Canal System	SFWMD-3
	3.2.3—Permitted Water Withdrawals	SFWMD-4
	3.6—Plant Water Use	MDC-4
	4.3—Groundwater Impacts	MDC-7
	5.1.1—Production Wells	MDC-8
	5.1.2—Alternative Water Supply Line	MDC-9
	Appendix A	MDC-11
	Appendix B	MDC-13
		MDC-16
		MDC-17
		MDC-19
		MDC-20

		MDC-20
		MDC-21
		MDC-22
		MDC-23
		MDC-24 (including all subquestions A through)
		MDC-25
		Revised Appendix B
Greg Powell	2.3.4—Surficial Hydrology	
	3.7—Chemical and Biocide Waste	
	3.8—Solid and Hazardous Waste	
	3.9—Site Drainage	
	4.1.5—Flood Zones	
	4.2—Impact on Surface Water Bodies and Uses	
	4.2.1—Impact Assessment	
	4.2.2—Measuring and Monitoring Program	
	5.1.3—Leachate and Runoff	
	5.1.4—Measurement Programs	
	5.2—Sanitary and Other Waste Discharges	
Karl Bullock	2.3.5—Vegetation/Land Use	
	4.4.1—Impact Assessment (wetlands)	
	4.4.2—Measuring and Monitoring Programs (wetlands)	
	5.5—Ecological Impacts (wetlands)	
Jim Lindsay	2.3.6.1—Species-Environmental Relationships	MDC-14
	2.3.7—Pre-existing Stresses	
	2.3.7.1—Measurement Programs	
	4.4.1—Impact Assessment (wildlife)	
	4.4.2—Measuring and Monitoring Programs (wildlife)	
	5.5—Ecological Impacts (wildlife)	
Ken Kosky	2.3.8—Meteorological and Ambient Air Quality	
	2.3.8.1—Ambient Air Quality	
	2.3.9—Noise	
	3.4—Fuel	
	3.5—Air Emission and Controls	
	4.5—Air Impacts	
	4.5.1—Control Measures	
	4.6.1—Construction Noise Impacts	
	5.3—Air Quality Impacts	
	5.4—Noise Impacts	
Kerri Kitchen	2.2.1—Governmental Jurisdictions	MDC-2
	2.2.2.1—Future Land Use	
	2.2.2.2—Zoning	
	4.1.6—Topography and Soils	

**Education**

Ph.D. Engineering
Mechanics, University of
Florida, Gainesville, 1980

M.E. Coastal and
Oceanographic
Engineering, University of
Florida, Gainesville, 1975

B.S. Aerospace
Engineering, University of
Florida, Gainesville, 1972

Certifications

Registered Professional
Engineer - Florida

Golder Associates Inc. – Jacksonville**Employment History****Golder Associates Inc. – Jacksonville, Florida**

Practice Leader and Principal (1999 to Present)

Responsibilities include: civil, environmental, coastal and water resources engineering; and project management and business development. Technical areas of specialization and expertise include: hydraulics, hydrology, water quality; mathematical analysis, statistics and computer modeling; engineering design; stormwater management; environmental site assessment (Phase I); contamination assessment and site remediation; regulatory compliance and permitting; and environmental management.

University of Phoenix – Jacksonville, Florida

Adjunct Faculty Member (1998 to 2002)

Teaching graduate and undergraduate level courses in Technology Management, Operations Management and Statistics.

Reynolds, Smith and Hills, Inc. – Jacksonville, Florida

Senior Vice President (1993 to 1998)

Responsibilities included management of the Public Infrastructure Program, the Environmental Services Division and the Corporate Quality function. As Program Director, functional responsibilities included strategic planning, business development, operations management, project management, technical oversight of engineering services, team building and supervision of staff. As Director of Environmental Services, supervised engineers, scientists and technicians working in the disciplines of civil, environmental and water resources engineering, ecology, geology and industrial hygiene. Project experience included environmental compliance, Phase I site assessments, contamination assessment and site remediation, risk management planning, and permitting. Technical assignments involved storm water and watershed modeling, contamination assessments, engineering design of groundwater remediation systems (pump and treat, air sparging and vacuum extraction) and off-site consequence analysis for a hazardous waste storage facility. As Director of Quality, developed and implemented corporate quality system based on concepts of Total Quality Management (TQM) and ISO9000 and trained staff in project management and QA/QC procedures.

Environmental Science and Engineering, Inc. – Gainesville, Florida

Vice President, Associate Vice President, Division Manager, Group Leader, Engineer (1977 to 1993)

Office Manager for the Environmental Consulting Division, which included over 200 staff members with professional practices in engineering, geology, industrial hygiene and the environmental sciences. Responsibilities included operations management, project management for large multi-disciplinary projects, technical supervision and training, quality improvement (Corporate Director of Quality), marketing and business development. Project experience included



environmental site assessments, regulatory compliance and permitting under NEPA, CAA, CWA, CERCLA, RCRA, UIC and related State regulations. Technical practice areas included: environmental, civil, coastal, and water resources engineering; mathematical analysis and computer modeling of hydrologic, geohydrologic, hydraulic, water quality, and sediment transport processes; design of site remediation, stormwater management, and water supply systems; and hazardous waste management (TSD) facilities. Successfully provided expert testimony in seven administrative hearings on topics related to modeling, hydrologic processes, water quality, stormwater management, dredge and fill impacts, and water resources.

University of Florida – Gainesville, Florida

Graduate Research Assistant (1972 to 1977)

Responsible for designing and conducting the experiments on the Structure of the Mixing Layer between Two Fluids of Differing Density and Velocity, Coastal and Oceanographic Engineering Laboratory. This work involved basic research into phenomena related to oceanic and estuarine mixing processes. As co-principle investigator on independent research into the flow field near an ocean thermal-energy conversion plant, determined the potential for entrainment of cold bottom water into the warm water intake resulting from the wake of the large cold water pipe.

**PROJECT EXPERIENCE – VARIOUS****FPL Turkey Point Units
6 & 7 Power Plant SCA**
Miami-Dade County,
Florida

Dr. Powell was the water resources lead for Golder Associates responsible for developing sections of the FPL Turkey Point Units 6 & 7 Project Site Certification Application relating to topics on water supply, wastewater treatment and discharge, hydrologic and water quality impacts and stormwater system design. The Project evaluated construction and operational impacts for two nuclear power plants located in south Florida between Biscayne Bay and the Everglades National Parks. Dr. Powell developed the NPDES permit application and stormwater management plan and permit. He also evaluated impacts from large radial collector wells and deep injection (UIC) wells. Dr. Powell provided expert testimony at the administrative hearing before Judge D.R. Alexander in July 2013.

**JEA Northside
Generating Station
316(a) Study Plan**
Duval County, Florida

Dr. Powell was Project Manager and technical lead on thermal plume surveys conducted in the St. Johns River as part of 316(a) studies that were required by the NPDES permit. The thermal plume data was used to develop a monitoring program for the facility. The monitoring plan was accepted by the regulatory agency on first submission.

**Jacksonville Port
Authority, Interim
Remedial Action Plan**
Duval County, Florida

Dr. Powell was Project Director for development of the Interim Remedial Action Plan (IRAP) for the Talleyrand facility on the St. Johns River. This project involved groundwater monitoring and modeling and design of a hydraulic containment system to control arsenic contamination from reaching the river. The IRAP was accepted by the FDEP and the system is currently being constructed.

**FPL Port Everglades
Energy Center**
Broward County, Florida

Task Manager responsible for the Water Resource sections of the Site Certification Applications for the FPL Port Everglades Energy Center pursuant to the Florida Electrical Power Plant Siting Act. The repowered facility includes a 3-on-1 natural gas-fired combined cycle unit generating 1250 MW of electricity. The water resource evaluations included a water alternatives study; a dewatering impacts analysis; and evaluations of the once-through cooling system in the context of Clean Water Act Section 316(b) (impingement and entrainment) and 316(a) (thermal discharges). The water alternatives evaluation considered the engineering, environmental and economic feasibility of using reclaimed water from municipalities. Designed and permitted a temporary Manatee heating system to protect Manatees during the multi-year construction period. The SCA application was submitted in January 2012 and it has been approved.



**SFWMD Hillsboro ASR
Pilot Project
Operational Monitoring
South Florida**

Comprehensive Everglades Restoration Plan (CERP) identifies ASR technology as one of the principal storage mechanisms to capture water currently lost to tide during wet periods for subsequent recovery during dry periods for environmental and water supply purposes. Dr. Powell was Golder's Project Manager for Operational Monitoring of the Hillsboro ASR Project. The objective of the work is to conduct the necessary monitoring in accordance with the Florida Department of Environmental Protection (FDEP) Comprehensive Everglades Restoration Plan Regulation Act (CERPRA) permit, Underground Injection Control (UIC) permit and other regulatory and research requirements. Information gathered during the testing program was critical to evaluating the ASR technology. An extensive list of water quality parameters were collected at several sampling locations and sampling frequencies during recharge, storage and recovery phases of the operations.

**SFWMD/PBS&J O&M
of the Hillsboro ASR
System
Palm Beach County,
Florida**

Dr. Powell was Golder's Project Manager for the Hillsboro ASR System Operations and Maintenance contract, which was authorized through a subcontract with PBS&J. The project required routine inspection and operational checks of the Hillsboro ASR system during recharge, storage and recovery phases. The project also required system modifications and transition between phases.

**FPL Cape Canaveral
Energy Center
Brevard County, Florida**

Task Manager responsible for the Water Resource sections of the Site Certification Applications for the FPL Cape Canaveral Energy Center pursuant to the Florida Electrical Power Plant Siting Act. The repowered facility includes a 3-on-1 natural gas-fired combined cycle unit, with a generating capacity of 1250 MW. The water resource evaluations included storm water, water supply and dewatering impacts analyses; and evaluations of the once-through cooling system in the context of Clean Water Act Section 316(b) (impingement and entrainment) and 316(a) (thermal discharges). Application submitted in December 2008.

**SFWMD / Phase II
Floridan Aquifer Model
Florida**

Golder under contract to the South Florida Water Management District developed the Phase II East Coast Floridan Aquifer Model in 2008. The Phase II model combined two regional models density dependent models into one. As Project Director, Dr. Powell provided technical review of all work and statistical time-series analysis of data used for model calibration.

**FPL Glades Power
Park SCA
Glades County, Florida**

Task Manager responsible for the Water Resource sections of the Site Certification Applications for the Power Park pursuant to the Florida Electrical Power Plant Siting Act. The Glades Power Park facility included two 980 MW solid fuel-fired generating units. The water resource evaluations included development of an integrated water supply plan; groundwater modeling of well field impacts in the Floridan and the surficial aquifers; and a geohydrologic evaluation of potential impacts from wastewater injection through Class I Underground Injection Control (UIC) wells.



**FPL West County
Energy Center**
Palm Beach County,
Florida

Task Manager responsible for the Water Resource sections of the Site Certification Applications for Units 1, 2 and 3 pursuant to the Florida Electrical Power Plant Siting Act. The West County Energy Center facility is a natural gas fired, combined cycle facility. The water resource evaluations included groundwater modeling of well field impacts in the Floridan and the surficial aquifers; and a geohydrologic evaluation of potential impacts from wastewater injection through Class I Underground Injection Control (UIC) wells. Provided written testimony for Power Plant Siting Application No. PA 05-47 (DOAH Case No. 05-1493EPP) related to storm water and water resource related topics. Units 1 & 2 were approved by the Governor and Cabinet on December 2006. Unit 3 is currently under review.

**Confidential Client
Major Power Utility
Siting Study**
Florida

Dr. Powell was Task Manager for the water resource evaluations of a statewide siting study for a new baseload generation Project. The goal of the investigation was to identify multiple sites for three different generating technologies: Nuclear, Natural Gas-fired Combined Cycle (NGCC) and Integrated Gasification Combined Cycle (IGCC). The siting study considered economic, environmental (water, air, geologic, ecologic and wet lands), land use and infrastructure (roads, rail, gas pipelines, reclaimed water sources and transmission) variables. The study identified more than 150 sites for the three technologies using GIS mapping and data analysis techniques. Potential sites were ranked against each other using multiple criteria and weighting factors.

FPL Manatee Unit 3
Manatee County, Florida

Task Manager responsible for the Water Resource sections of the Site Certification Application pursuant to the Florida Electrical Power Plant Siting Act. The Manatee Plant Unit 3 facility is a 1150 MW natural gas-fired, four-on-one combined cycle facility. The Unit 3 facility uses the existing 4,000-acre Manatee Plant cooling pond for heat dissipation. The water resource evaluations considered the potential impacts of additional water withdrawal from the Little Manatee River, and the benefits derived from modification of the existing water withdrawal schedule. The water resource evaluations also considered impacts on flows and water levels in the river and salinity changes in the estuary. The results supported the conclusion that the proposed 10-percent diversion schedule, which would be implemented with the addition of Unit 3, would be more protective of the river and the estuary. Other water resource evaluations considered potential impacts to groundwater resources and the impacts from dewatering operations. Dr. Powell provided testimony in support of the project in the public hearing before Judge Charles Stampelos, as an expert in the disciplines of hydrology and geohydrology. The project was approved by the Governor and Cabinet.

**FPL Manatee Plant
Groundwater Modeling**
Manatee County, Florida

Project Engineer responsible for groundwater modeling and an aquifer impact evaluation for three proposed supply wells at the FPL Manatee power plant, which is located in the Southern Water Use Caution Area. The study generally followed procedures outlined in the rules and guidance documents of the Southwest Florida Water Management District. The computer code MODFLOW 2000 was used to simulate impacts of pumping in a three layer aquifer system that includes the upper and lower permeable zones of the Upper Floridan aquifer and leakage from the Lower Floridan aquifer. The transient simulation was run for eleven scenarios to account for uncertainty in the aquifer parameters.



**FPL Martin Plant
Groundwater Modeling**
Martin County, Florida

Project Engineer responsible for groundwater modeling and an aquifer impact evaluation for six proposed Floridan aquifer supply wells at the FPL Martin power plant. The study generally followed procedures outlined in the rules and guidance documents of the South Florida Water Management District. The computer code MODFLOW 2000 was used to simulate impacts of pumping in a two layer aquifer system that includes the upper and lower permeable zones of the Upper Floridan aquifer and leakage from the Lower Floridan aquifer. The transient simulation was run for eleven scenarios to account for uncertainty in the aquifer parameters.

**St. Johns Center
Partnership**
Duval County, Florida

Project Manager and Engineer for the contamination assessment and development of the Brownfield Site Redevelopment Agreement (BSRA). This project involved removing an underground tank, assessing arsenic and benzene in soil and groundwater and negotiating with regulatory agencies to obtain approval for the remedial measures and the BSRA. After construction began, the project involved oversight and environmental testing of soils to ensure that conditions of the BSRA were met.

**JEANorthside
Generating Station
316(b) Studies**
Duval County, Florida

Project Manager and Engineer responsible for developing the Compliance Implementation Plan, the Proposal for Information Collection and the Impingement Mortality and Entrainment Characterization for this facility, which must comply with the 316(b) Phase II Rule under the Clean Water Act. As part of this project, Dr. Powell developed background information on the source waterbody, the cooling water intake structure, existing impingement and entrainment reduction technologies and the facility cooling water system. He also conducted a preliminary feasibility evaluation of alternative technologies; developed estimates of the hydraulic zone of influence; and evaluated compliance strategies.

**FPL 316(b) Compliance
Implementation Plan
and PIC Development**
Florida

Dr. Powell was Project Engineer with responsibility for developing the engineering sections of Compliance Implementation Plans and Proposals for Information Collection for four power plants that are required to comply with the Phase II Rule under Section 316(b) of the Clean Water Act. The facilities included Riviera, Cape Canaveral, Fort Myers and St. Lucie.

**Progress Energy
316(b) Implementation
Plan and PIC
Development**
Florida

Project Engineer with responsibility for developing the engineering sections of Compliance Implementation Plans and Proposals for Information Collection for four power plants that are required to comply with the Phase II Rule under Section 316(b) of the Clean Water Act. The facilities included the Crystal River Energy Complex, Anclote, Bartow and Suwannee River.

**Engineering
Assessment of
Flooding**
Southern West Virginia

On July 8, 2001, portions of Southern West Virginia experienced a heavy rainfall event and many homes were flooded. A number of the home owners that experienced flooding filed suits against the timber and mining industries alleging that these industries caused and/or aggravated the flooding. Dr. Powell reviewed numerous sources of information, visited the site, evaluated mining operations in the Oceana sub-watershed and provided an engineering assessment of the flooding issues. The evaluation included hydrologic modeling of rainfall-runoff events before and after mining using the HEC-HMS model. The expert report was submitted to Weinberg Wheeler Hudgins Gunn & Dial in March 2006.



**Palm Pointe Golf and
Country Club
Development**
Pasco County, Florida

Conducted water resource evaluations for MeadowWoods, Inc. (the project owner) in support of an application for a Water Use Permit from the Southwest Florida Water Management District (SWFWMD). The project was located in the Hillsborough River drainage basin and in the Northern Tampa Bay Water Use Caution Area. A numerical model (MODFLOW) was set-up and calibrated to simulate groundwater flow patterns and to evaluate drawdown impacts to existing users, on-site wetlands and nearby minimum flows and levels (MFL) wetlands. The MODFLOW model-results showed no drawdown in the surficial aquifer due to pumping from the Floridan aquifer. A water budget model was used to evaluate the benefits of substituting reclaimed water during the wet season for irrigation and supplemental hydration. The water budget analysis showed that a positive "net benefit" to the water resources of the area could be developed when Floridan aquifer wells are used together with reclaimed water. Based on the results of this evaluation, the SWFWMD issued the permit.

**South Pond Energy
Park, LLC**
Hardee County, Florida

Developed a mass-balance model to evaluate impacts from co-utilization of a settling/cooling pond by a power plant and a phosphate mine. Also developed, evaluated and modeled a water supply plan that integrated reclaimed water from the City of Wauchula, surface water from the Peace River and well water from Floridan aquifer. The plan took advantage of under-utilized pipeline capacity in the reuse pipeline from the City of Wauchula to the mine. The model used stochastic simulation and considered surface water availability, pipeline capacity, historical and projected well water demand and on-site storage to determine the "net benefit" to the groundwater resources under various scenarios. The model results quantified the benefits of the integrated supply plan.

**Terrabrook-Connerton
Development**
Pasco County, Florida

Conducted water resource evaluations in support of a water use permit for a 3,071-acre land development project in central Pasco County, Florida. The Connerton Development is located in the Northern Tampa Bay Water Use Caution Area and is near the most impacted areas from two major well fields. The objectives of the hydrogeologic and water budget modeling were to evaluate the integrated water supply plan and to provide reasonable assurance to the regulatory agency that a positive "net benefit" to the water resources of the area will result from the development project. The water use permit for the project was issued by the SWFWMD.

**Mirant Dickerson
Development, LLC**
Dickerson, Maryland

Task Manager responsible for Water Resource Evaluations related to the Application for Certificate of Public Convenience and Necessity for Units Four and Five. The water resource evaluations considered water supply, consumptive use and water quality impacts from stormwater and industrial discharges. A statistical analysis of the Potomac River flow was conducted to evaluate the potential for operational restrictions during low-flow events. Based on this analysis, the plant design was modified and a low-flow agreement was successfully negotiated between Mirant and the Water Supply Authorities, which minimize impacts of the project on existing users. Provided expert testimony before Public Service Commission (PSC Case 8888, November 2001).



**Nestle Engineering
Support for Utility Well
Permits**
Madison County, Florida

Conducted a literature review of aquifer characteristics in Madison County, Florida in support of the Nestle Waters North America facility, which was to be constructed near Blue Springs on the Withlatchoochee River. Worked with The Haskell Company, which is the general contractor for the project and reviewed existing well records from the Suwannee River Water Management District and other available data from the USGS. Conducted preliminary analysis of potential consumptive use impacts. Attended the Planning and Zoning Board meeting held on December 12, 2002 in Madison County, Florida to address questions, as necessary, related to water supply issues. Also researched the environmental permitting requirements and schedule for the potable water supply (utility) well, and developed a project plan for constructing the utility and construction wells.

**Nestle Utility Well
Permitting and
Installation**
Madison County, Florida

Golder worked with The Haskell Company Project Team providing engineering services for permitting, design, well-driller bidding and contracting, construction oversight and testing of the utility water supply well at the Nestle Waters North America Madison County (Blue Springs) facility. The well was designed to provide 400 gpm of water for construction, potable and process water supply. The production zone is the Suwannee Formation in the Floridan aquifer. The total depth of the well is about 160 ft and the inner casing diameter is 10 inches. The well was permitted through the Suwannee River Water Management District and the Florida Department of Environmental Protection.

**Southwest Florida
Water Management
District**
Florida

Consultant providing expert consulting and litigation support services to the Southwest Florida Water Management District Office of General Counsel through a task order contract. Under this contract, Dr. Powell provided technical analysis, internal peer review and expert testimony on matters related to the establishment of Minimum Flows and Levels (MFL) Rules in the Northern Tampa Bay area as required by Sections 373.042 and 373.0421, F.S., and on matters related to water use permits. These efforts involved reviewing and critiquing methods, assumptions and analyses for studies supporting the establishment of MFLs in isolated cypress wetlands, cypress-wetland fringed lakes (Category 1 & 2 lakes), non-cypress fringed lakes (Category 3 lakes) and tidal estuaries (lower Hillsborough River). Litigation support services were provided for water use permitting cases related to the Crystal Springs Project, Terrabrook Harbor Bay Development Project and the Three Sisters Springs Water Company. The technical issues involved lake level fluctuations, surface water/groundwater interactions, water quality, salinity intrusion in estuaries and hydrologic modeling.

**Southwest Florida
Water Management
District**
Southwest Florida

Consultant providing engineering services to the Hydrologic Evaluation Section of the Resource Conservation and Development Department. These efforts relate to the Northern Tampa Bay Phase II Investigation (NTB II) and the Southern District Water Resources Assessment (SWRA) Project. Much of the work on this project focused on a statistical analysis of water levels in lakes along the Lake Wales Ridge, and development of a self-calibrating water-budget model for analyzing the relative contribution of meteorological and Floridan Aquifer influences (i.e., forcing functions) on lake levels. These investigations are part of an overall effort to evaluate water supply potential and to establish minimum levels in lakes and aquifers.



Resumé

GREGORY POWELL, PH.D., P.E.

**Couch Construction,
LP**
Lake City, Florida

Consultant responsible for providing hydrologic analysis, litigation support and expert testimony for a zoning hearing and variance related to construction of an asphalt plant. Issues involved were stormwater management practices, surface drainage, wetland hydrology, groundwater recharge through sinkholes, water quality, and compliance with the Regional Master Plan. Client received approval from the Board.

**Hunter Industrial
Facilities, Inc.**
Liberty, Texas

Project Manager responsible for facility and process design. Prepared RCRA A&B permit and SPCC plan for a major commercial hazardous waste facility. The facility was designed to treat, solidify and dispose of hazardous waste in geologically stable salt domes. Project included field investigations, as well as design, permitting, community relations, and expert witness testimony. Project involved eight subcontractors and intensive negotiations and interaction with the Texas Water Commission and EPA Region VI.

**Fairfield Communities,
Inc.**
Fort George Island,
Florida

Project Manager responsible for data collection, analysis, report preparation, agency negotiations, and expert testimony in support of a consumptive use permit (CUP) and a Management and Storage of Surface Waters (MSSW) permit from the St. Johns River Water Management District. Field efforts included monitoring of hydrologic conditions for one year; soil boring, monitor well installation, water level and water quality measurements; geophysical logging, test well drilling, and aquifer testing. The surficial and Floridan aquifers were modeled using USGS 2-D flow and transport models. Data from the field and modeling efforts were used to design an integrated stormwater management/water supply system that reduced consumptive use of potable water and virtually eliminated stormwater discharge from the island. The project concept and technical work was successfully defended before an administrative hearing officer, and the two permits were issued to Fairfield Communities.

**Jacksonville
Shipyards, Inc.**
Jacksonville, Florida

Project Manager responsible for Dredge and Fill Permit Application. Conducted field measurements, analysis, and numerical modeling of turbidity and dissolved oxygen impacts associated with proposed dredging of a ship basin on the Intracoastal Waterway near the St. John's River. Provided expert testimony during the administrative hearing. The dredge and fill permit was issued to Jacksonville Shipyards, Inc.

**Jacksonville
Shipyards, Inc.**
Jacksonville, Florida

Project Manager responsible for D&F Permit Opposition. Conducted field measurements, analysis, and numerical modeling of turbidity and dissolved oxygen impacts associated with proposed dredging of a private access canal on the Intracoastal Waterway near the Jacksonville Shipyards facility. Provided expert testimony during the administrative hearing in opposition to permit issuance. The dredge and fill permit was denied.

Villages of Vilano
Vilano Beach, Florida

Project Manager responsible for Marina Permitting. Hydraulic flushing and water quality impacts from a proposed marina development, adjacent to Class II waters, were assessed using a dual entrance tidal flushing model. Dr. Powell provided expert testimony during the administrative hearing (DOAH Case 88-1994). The hearing officer, Diane Kiesling, ruled in favor of the proposed marina.



Potomac Electric Power Company Washington, D.C.	Project Manager/Engineer responsible for Water Availability Study. Evaluated the feasibility of using the Potomac River as makeup water source for the Station H expansion at the Dickerson site. Compared the regional water supply, for several drought duration and recurrence intervals, to the water demand projections through the year 2030, with and without the proposed power station. Provided expert testimony at public hearing before Public Service Commission.
Champion International Paper Cantonment, Florida	Project Manager for water quality assessment and mitigation. Conducted an extensive hydrologic and water quality evaluation of the 11-mile creek drainage system, Perdido River and Perdido Bay, in support of a water quality variance request for discharges from the industrial facility. The studies evaluated low dissolved oxygen levels in the creek and determined impacts on the downstream Bay. Provided expert testimony on the need for additional studies, developed the plan-of-study for the hydrologic and water quality investigation, and evaluated the EPA WASP-4 model for use on this project.
AES Warrior Run, Inc. West Virginia	Project Manager/Engineer responsible for Water Availability Analysis. Evaluated the likelihood of forced outage days for the facility as a function of water augmentation storage from the Jennings-Randolf Reservoir. Also, determined the probable duration of the outages. The analysis used statistical simulation based on historical records and incorporated various reservoir operational criteria.
Potomac Electric Power Company Washington, D.C.	Project Manager responsible for Dickerson Site Low Flow Augmentation Study. Conducted statistical analyses of the Potomac River flows, reviewed previous studies and low flow augmentation regulations, and conducted cost/benefit analyses for three alternatives: no action, on-site augmentation and off-site augmentation. Provided technical consultation to PEPCO during negotiations with Corps of Engineers and private reservoir owners.
American Environmental Services Jacksonville, Florida	Project Director for Hazardous Waste Storage Facility. Developed approach methodology for off-site consequence analysis. Reviewed EPA methodology and participated in negotiations with FDEP to finalize technical approach. Developed project-specific fire release model to determine chemical release rates. Coordinated the work of two other subconsultants who conducted air dispersion modeling, chemical fate, and risk assessments. Produced final report for agency review. Provided deposition testimony related to the project.
ENRON Corporation Brooker, Florida	Project Officer/Engineer responsible for Groundwater and Soil Remediation. Conducted contamination assessment of 26-acre petroleum-contaminated groundwater plume. Evaluated alternative remediation technologies considering cost, feasibility, risk, and schedule. Conducted pilot test for air sparging and vacuum extraction method. Modified remedial action plan (RAP) and received agency approval. Evaluated alternative air emissions control technologies. Completed final design for the system, bid subcontracts, constructed system, operated and maintained system. System performance exceeded expectations. This approach saved the client several million dollars and several years in remediation costs over the pump and treat approach recommended by previous consultants.



Resumé

GREGORY POWELL, PH.D., P.E.

Belfort 500 Partners, Contamination Assessment Jacksonville, Florida	Project Manager for Phase I and Phase II environmental site assessments and a contamination assessment for a property located adjacent to an old landfill. The results of the study showed that the contamination originated in the landfill, and the client was able to sell the property and recover losses.
City of St. Petersburg, Florida St. Petersburg, Florida	Task Manager responsible for analysis of sediment transport for North Shore Beach Project. Evaluated existing sediment transport processes and fate of beach sand for proposed beach renourishment project.
City of Valdosta, Georgia Valdosta, Georgia	Modeling Director for Master Drainage Plan. Directed and supervised the work of other engineers. Developed the approach and methodology; reviewed hydrologic assumptions and the model setup, calibration and verification; evaluated problems and proposed solutions; reviewed the final products and recommendations. The model used in this study was XP-SWIM.
Confidential Client Sarasota County	Provided consulting services. Reviewed previous studies and a proposed plan-of-study for a wastewater utility wet-weather discharge. Developed hydraulic rating curves and longitudinal flow profiles for the receiving stream. Setup, calibrated, and ran a dissolved oxygen sag model (Streeter-Phelps) for several scenarios. Provided opinions on the validity of previous works and made recommendations for future actions. Assisted in negotiations with regulatory agency.
Florida Power Corporation Lake Rousseau, Florida	Project Engineer for Lake Rousseau Water Supply Investigation. Designed potential flow hydrodynamic model for use in evaluating alternative sites for proposed water intake structure.
Gardinier Inc. Tampa, Florida	Project Manager/Engineer responsible for Copper and Iron Mixing Zone Analysis. Fluorescent dye survey was conducted over four tidal phases: high slack water, low ebb, maximum flood, and maximum ebb to determine the extent and size of the mixing zone required for the Gardinier discharge into the Alafia River. The results were used to calibrate the CAFE-1 and DISPER-1 finite element models for analysis of the Farfield mixing zone.
Tampa Electric Company Tampa Bay, Florida	Project Manager responsible for Big Bend Station Thermal Plume Modeling. Verification modeling of thermal plume mixing and dispersion of once-through cooling system discharges from a coal-fired power plant. Study included model set-up, calibration, verification, and evaluation of thermal plume geometry during critical meteorological, tidal and hydrological conditions. The model results were submitted to EPA Region IV and accepted.
United States Department of Interior Gulf of Mexico, Florida	Task Manager for Southwest Florida Outer Continental Shelf Benthic Communities Study. Responsible for sophisticated statistical and spectral analyses of wave and current data for a large multidisciplinary oceanographic study. These and other data were used to describe the physical processes and how they relate specifically to sediment transport and the various biological communities.



Resumé

GREGORY POWELL, PH.D., P.E.

Seminole Asphalt Company St. Marks, Florida	Project Manager responsible for Mixing Zone and Fluorescent Dye Studies. Conducted fluorescent dye studies to determine the mixing and dispersion of plant effluent in the tidal St. Marks River. A convolution integral method was used to calculate the long-term quasi-steady concentrations of effluent from the 72-hour economic means of determining the ultimate concentration of effluent in a dynamic system with a very long response time.
Tampa Electric Company Tampa, Florida	Technical Director for Big Bend, Hooker Point, and Gannon Effluent Studies. Conducted slag settling pond detention time studies and mixing zone studies using fluorescent dye; developed conceptual plans to modify Big Bend settling pond circulation to increase retention time by preventing thermal stratification. The pond modifications proved very successful. The discharge met suspended solids requirements specified by DER.
Kiawah Island Development Kiawah Island, South Carolina	Subproject Manager for Hydrological and Water Quality Studies. Evaluated the tidal flushing potential and water quality impacts of several operational scenarios for an enclosed lock-harbor. A hydraulic lock was used to maintain water levels and allow boat traffic to enter and leave an otherwise closed system. The water quality analysis included numerical modeling of dissolved oxygen and chlorophyll at levels to determine potential impacts of impounding estuarine waters with high nutrient levels.
Atlantic City Electric Atlantic City, New Jersey	Subproject Manager for Surface Water Resource Analyses for the Site Certification Application for Atlantic City Electric Proposed Coal-Fired Steam Electric Units. Responsible for all aspects of the estuarine and riverine hydraulic studies, field monitoring programs to determine baseline conditions, and the set-up, calibration and verification of the numerical models used for the analysis of potential impacts resulting from fresh water withdrawal and heated water discharge.
Florida Power Corporation Gulf County, Florida	Subproject Manager for Surface Water Resource Analyses for the Site Certification Application for Proposed Mid-1980s Power Plant. Responsible for all aspects of the estuarine hydraulic studies, the set-up, calibration and verification of the numerical models for the analysis of potential impacts and the field monitoring program to determine baseline conditions. The impact analysis involved a determination of environmental impacts from the dredging of the Gulf County canal and an associated turning basin and from the discharge of heated effluent.
United States Army Corps of Engineers Wilmington, North Carolina	Project Manager for Analysis of Coastal Sediment Transport Processes from Wrightsville Beach to Fort Fisher, North Carolina. Responsible for analysis of offshore and nearshore wave data to determine the wave climate using an improved Dobson's 1967 wave refraction model to include the effects of bottom friction. Model results were used to compute the longshore energy flux, the resulting longshore sediment transport, and the accretion or erosion rates.
Monsanto Textiles Company Pensacola, Florida	Task Manager for Escambia River Water Quality and Mixing Zone Analysis. Designed and conducted fluorescent dye and water quality studies to determine mixing zone lengths and long-term effluent concentrations from discharges into the Escambia River.



Georgia DNR Flint River, Georgia	Technical Director for the Water Quality Survey of the Flint River. Responsible for determining time-of-travel by fluorescent dye tracing and simultaneously measured BOD and DO for three reaches of the Flint River. Also collected hydrologic and morphologic data. The data was collected for use in the calibration of a DOSAG numerical model.
Florida Institute of Phosphate Research Bartow, Florida	Water Resources Task Manager for a Study of Reclaimed Lakes. Collected hydrologic, morphologic, and water quality data on several natural and reclaimed lakes in various stages of reclamation. Other members of the team collected biological data. Determined water budgets, flushing times, and other criteria and conducted a statistical comparison between the natural and reclaimed lakes.
Mobil Chemical Company Southwest Florida	Engineer for Peace River Dissolved Oxygen Alternative Criteria Study. Reviewed available water quality and hydrologic data, evaluated point and non-point sources and loadings, and evaluated dissolved oxygen conditions in the river using a DO-Sag model.
South Carolina Coastal Council Charleston, South Carolina	Coastal Engineer for Coastal Marina Permit Guidance Manual. Developed technical guidelines to assess the engineering merits and environmental impacts of marina proposals, and to guide permit applicants for coastal marina facilities. Included guidance on calculating flushing times, sedimentation rates, shore protection, stormwater management, and other related issues.
Confidential Client St. Petersburg, Florida	Technical Director for Placido Bayou Water Quality Assessment and Modeling. Conducted field-monitoring program for hydrology and water quality. Setup, calibrated, and verified the RECEIV model for the existing canal system to evaluate a proposed marina and stormwater management system for a residential development.
Southwest Florida Water Management District Brooksville, Florida	Hydrology Task Manager for Green Swamp Watershed Management Studies. Setup, calibrated, and ran HEC-1 and HEC-2 models of the river system to evaluate flood damage potentials for alternative management scenarios, as part of an overall cost/benefit resource management study.
State of Florida Apopka, Florida	Project Engineer for Lake Apopka Drawdown Investigations. Analyzed the potential for the scour and entrainment of flocculent material from the bottom of Lake Apopka during pumpage of 500 mgd to Lake Dora.
Brevard Engineering Company Cape Canaveral, Florida	Civil Engineer responsible for computer-aided design and analysis of flood routing for a Central Florida housing development using the HEC2 and TR-20 models.
Baptist Medical Center Jacksonville, Florida	Technical Director responsible for Environmental Assessment. Conducted hydrodynamic, water quality, and sediment field sampling studies and analysis for a proposed medical center to be built on piles over the St. Johns River. The analysis evaluated the potential for changes in flow patterns, water quality, and sedimentation patterns using the CAFE-1 finite-element hydrodynamic model. The study also evaluated aquatic ecological impacts.



**Jacksonville Electric
Authority**
Jacksonville, Florida

Assistant Project Engineer for Model Study of Proposed Power Plant Retention Basin. Studied the potential for the formation of an air-entraining vortex at the discharge pipe and proposed alternative design configuration. Evaluated the hydraulic surging in the standpipes and recommended design changes that reduced surging without reducing flow capacity.

**Miscellaneous Air
Force Bases**

Technical Operations Manager for RI/FS at USAF installations. Responsible for technical performance of more than 120 personnel performing RI/FS projects at Maxwell AFB, Alabama; Keesler AFB, Mississippi; Patrick AFB, Florida; Cape Canaveral AFB, Florida; Dobbins AFB, Georgia; Plant 78, Utah; Hickam AFB, Hawaii; and Wheeler AFB, Hawaii.

PROJECT EXPERIENCE – EXPERT WITNESS

**FPL Turkey Point Units
6 & 7 Power Plant SCA**
Miami-Dade County,
Florida

Dr. Powell was the water resources lead for Golder Associates responsible for developing sections of the FPL Turkey Point Units 6 & 7 Project Site Certification Application relating to topics on water supply, wastewater treatment and discharge, hydrologic and water quality impacts and stormwater system design. The Project evaluated construction and operational impacts for two nuclear power plants located in south Florida between Biscayne Bay and the Everglades National Parks. Dr. Powell developed the NPDES permit application and stormwater management plan and permit. He also evaluated impacts from large radial collector wells and deep injection (UIC) wells. Dr. Powell provided expert testimony at the administrative hearing before Judge D.R. Alexander in July 2013.

**MacCorkle, Lavender &
Sweeney PLLC. City of
Huntington.**
West Virginia

Beginning in June 2009, Dr. Powell provided engineering evaluation, deposition, expert testimony and litigation support to attorney Arden J. Cogar, Jr. in support of the City of Huntington in civil action No. 08-C-185 before Judge Pratt, Circuit Court of Wayne County. Issues involved flooding of approximately 20 homes that occurred in the Spring Valley Drive area during storms on July 13, 2006 and August 30, 2006 and hydraulic design of downstream culverts along Krouts Creek.

**McNair Law Firm, P.A.
Lindsey v. Palmetto
Land Partners, LLC et
al**
South Carolina

Provided testimony in Fifteenth Judicial Circuit Court before Judge Breeden in South Carolina on issues relating to storm water drainage and erosion, including hydrologic and hydraulic modeling, engineering design, and geohydrologic analysis. Attorneys with McNair Law Firm were Mr. Robert Dibble and Mr. Ethan Ware. On April 29, 2009, the case was decided in favor of our client Palmetto Land Partners, LLC.

**Arbitration
Proceedings Siemens
Communications, Inc.
v. MONI Holdings LLC**
Lake Mary, Florida

In 2007, provided expert opinion testimony in an arbitration proceeding regarding soil and groundwater contamination at the manufacturing facility at 400 Rinehart Road, Lake Mary, Florida. In 2008, provided an expert statement and testimony before tribunal in New York on geohydrologic issues relating to the extent, presence, migration, and remediation of chlorinated solvents, or dense non-aqueous phase liquids (DNAPLs), at the Lake Mary facility.



FPL West County Energy Center Palm Beach County, Florida	Provided written testimony for Power Plant Siting Application No. PA 05-47 (DOAH Case No. 05-1493EPP) related to storm water and water resource related topics. The project was approved by the Governor and Cabinet on December 2006.
Catoctin Power, LLC Frederick County, Maryland	Testimony before Hearing Examiner Joel M. Bright, Public Service Commission of Maryland (PSC Case No. 897), filed June 3, 2004. Case was for a Certificate of Public Convenience and Necessity to construct a 600 MW electric generating facility. Provided testimony relating to the hydrology of the Potomac River, water supply, consumptive water use and Catoctin's strategies for complying with low flow augmentation requirements of Maryland under COMAR 26.17.01.
FPL Manatee Unit 3 Manatee County, Florida	Provided testimony in January 2003 in support of the project at the public hearing before Judge Charles Stampelos, as an expert in the disciplines of hydrology and geohydrology. The project was approved by the Governor and Cabinet on April 8, 2003.
Mirant Chalk Point Development, LLC Maryland	Testimony before the Public Service Commission of Maryland (PSC Case No. 8912 / 2002). Issues related to water supply availability and water resource impacts for a power plant development project. Lead Attorney for client was Deborah Jennings with firm of Piper Marbury Rudnick & Wolfe LLP, Baltimore Maryland.
Mirant Dickerson Development, LLC Maryland	Testimony before the Public Service Commission of Maryland (PSC Case No. 8888 / November 2001). Issues related to water supply availability and water resource impacts for a power plant development project. Lead Attorney for client was Deborah Jennings with firm of Piper Marbury Rudnick & Wolfe LLP, Baltimore Maryland.
Southwest Florida Water Management District Florida	Deposition given on January 28, 2000 for Administrative Hearing in Hillsborough County, Florida. Hillsborough County & HCEPC v. SWFWMD & Tampa Bay Water (Case No.99-4490RP). Issues related to Minimum Flows and Levels Rule. Lead Attorney for Client was Dominick Graziano from firm of Bavor Bush & Sisco, P.A., Tampa, Florida.
American Environmental Services, Inc. Jacksonville, Florida	Dr. Powell provided and expert report (February 11, 1999) and deposition testimony on issues related to potential impacts from a hazardous waste storage and transfer facility to be built in Jacksonville, Florida. Lead Attorneys for the client were Richard Maguire and Emily Pierce with the firm of Rogers, Towers, Bailey, Jones & Gay, Jacksonville, Florida.
Couch Construction, Columbia County Columbia County, Florida	Testimony before Lake City / Columbia County Zoning Board (about August 1999). Issues related to potential impacts from a proposed asphalt plant and to stormwater management, water quality, local and regional drainage, wetland hydrology, groundwater recharge through sinkholes and compliance with the Regional Master Plan. Lead Attorneys for Client were Jay Adams and Donna Stinson from law firm of Broad and Cassel, Tallahassee, Florida.



PROFESSIONAL AFFILIATIONS

Florida Institute of Consulting Engineers Board of Directors (1995 to 1998)
Representative for Civil and Environmental Engineering
Leadership Jacksonville (1997)
Leadership Gainesville XIX (1992)
University of Florida Engineering Advisory Council (1991-1993)
National Society of Professional Engineers
Florida Engineering Society
American Society of Civil Engineers

PUBLICATIONS

Refereed Journal Articles

Powell, G.M.. "Laboratory Optical Internal Wave Gauge". *Review of Scientific Instrumentation*, Volume 46, Number 1 (1975)

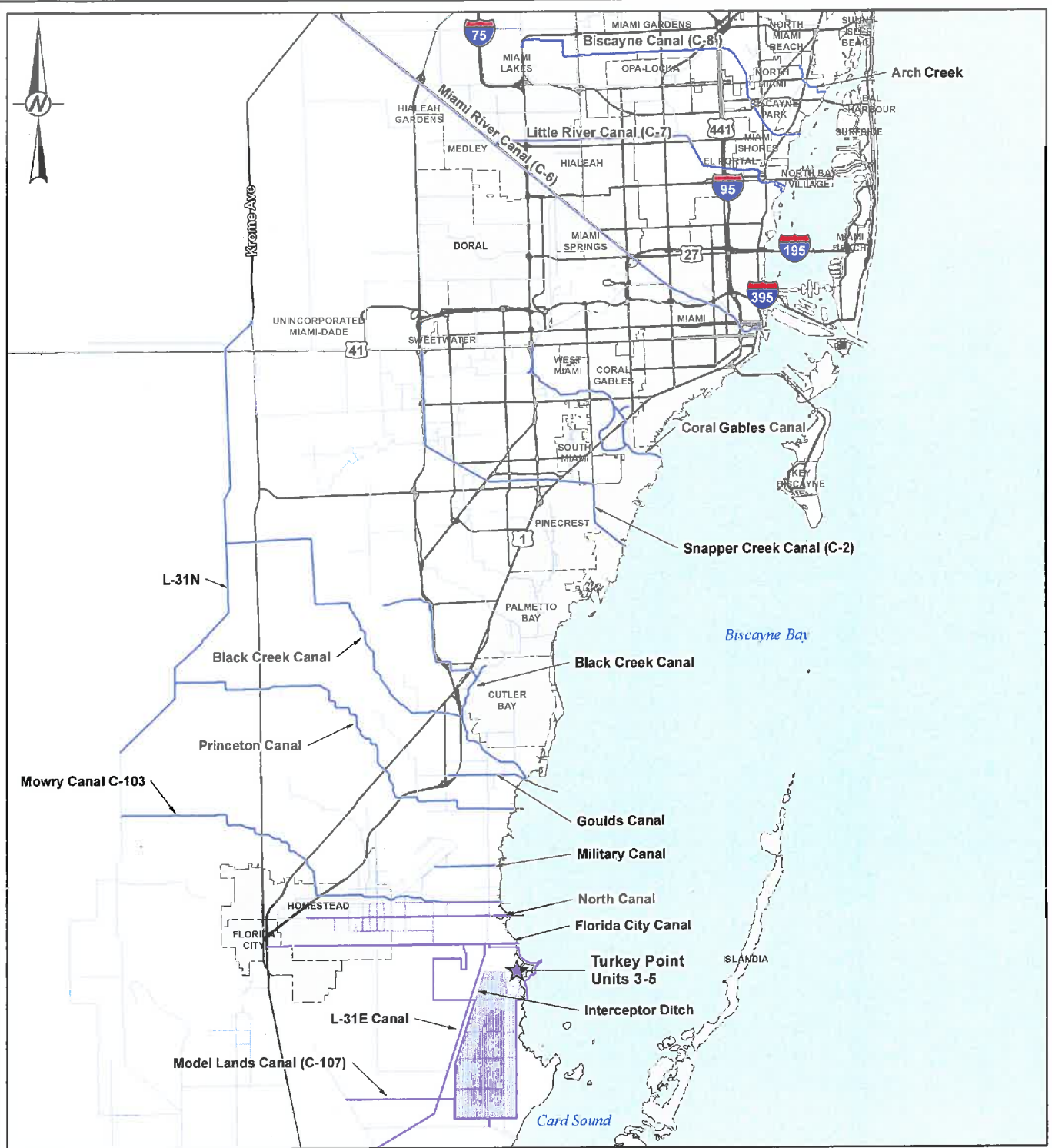
Other

Winton, T.C.; Chou, I.B.; Powell, G.M; and Crane, J.D. 1981. Analysis of Coastal Sediment Transport Processes from Wrightsville Beach to Fort Fisher, North Carolina, Misc. Report No. 81-6, U.S. Army Corps of Engineers Coastal Engineering Research Center.

Powell, G.M. 1980. The Structure of Velocity and Density Interfaces in a Weakly Turbulent Stratified Shear Flow. Ph.D. Dissertation, University of Florida, Gainesville, Florida.

Powell, G.M. 1975. An Experimental Investigation of the Richardson Number Profile in a Stratified Shear Flow. ME Thesis: University of Florida, Gainesville, Florida.

Powell, G.M. and Sheppard, D.M. 1975. "Instability and Mixing in a Stratified Shear Flow." Conference paper presented at the fall meeting of the American Geophysical Union, San Francisco, California.



LEGEND

- ★ Turkey Point Units 3-5
- Major Tributaries
- Other Waterways
- ▭ Turkey Point Plant Property Boundary
- ▭ Municipal Boundaries
- ▭ Unincorporated Miami-Dade

REFERENCE(S)

TURKEY POINT UNITS 3-5, TURKEY POINT PLANT PROPERTY BOUNDARY, FPL, 2015
MAJOR TRIBUTARIES, MUNICIPAL BOUNDARIES, MIAMI-DADE COUNTY, 2007-2015

MAJOR TRIBUTARIES





LEGEND

- Aquifer Well
- Turkey Point Plant Property Boundary
- Flood Hazard Zones
- A: Areas subject to inundation by the 1-percent-annual-chance flood event. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown.
- AE: Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. BFEs are shown within these zones. (Zone AE is used on new and revised maps in place of Zones A1-A30.)
- Open Water: A body of open water, such as a large pond, lake, bay, ocean, etc., located within a community's jurisdictional limits that have no defined flood hazard.
- VE: Areas along coasts subject to inundation by the 1-percent-annual-chance flood event with additional hazards due to storm-induced velocity wave action. BFEs derived from detailed hydraulic coastal analyses are shown within these zones. (Zone VE is used on new and revised maps in place of Zones V1-V30.)
- X: Minimal risk areas outside the 1-percent and .2-percent-annual-chance floodplains. No BFEs or base flood depths are shown within these zones. (Zone X (unshaded) is used on new and revised maps in place of Zone C.)

REFERENCE

FACILITY LAYOUT, GOLDBER ASSOCIATES INC., 2009-2014

CLIENT

FPL
MIAMI-DADE COUNTY, FLORIDA

PROJECT

FPL TURKEY POINT CCS SALINITY REDUCTION PROJECT

TITLE

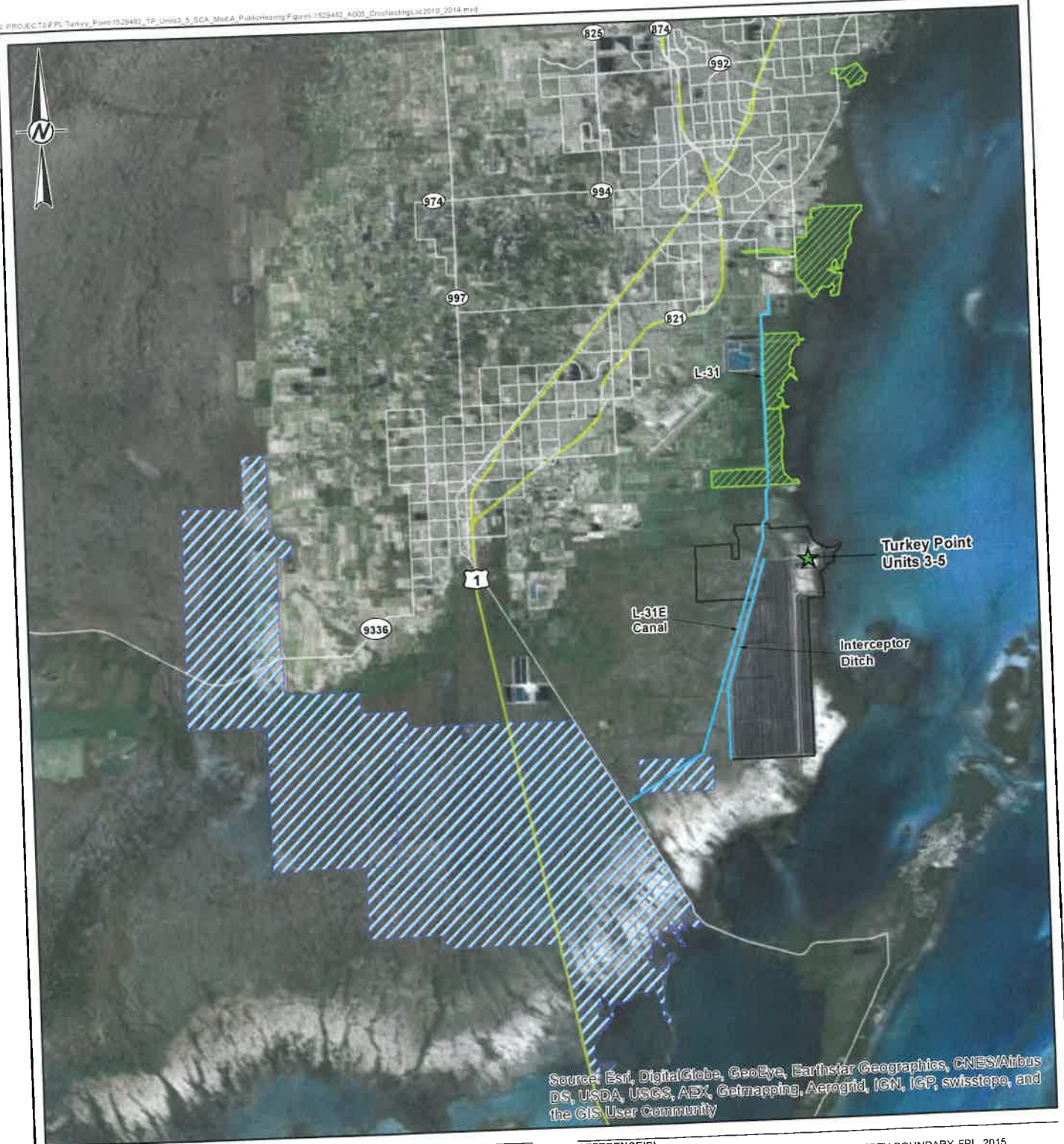
FEMA FLOOD HAZARD ZONES

CONSULTANT



YYYY-MM-DD	2014-05-13
PREPARED	NRL
DESIGN	NRL
REVIEW	KJK
APPROVED	KFK

PROJECT No.	CONTROL	Rev.	FIGURE
1303064	A003	0	2.1-3



LEGEND

- ★ Turkey Point Units 3-5
- Canals
- ▭ Turkey Point Plant Property Boundary
- ▨ Biscayne Bay Coastal Wetlands (Phase 1)
- ▨ C-111 Spreader Canal

REFERENCE(S)
 TURKEY POINT UNITS 3-5, TURKEY POINT PLANT PROPERTY BOUNDARY, FPL, 2015
 MODEL LANDS BASIN, FDEP, 1998-2015
 BISCAYNE BAY COASTAL WETLANDS (PHASE 1), C-111 SPREADER CANAL, SFWMDC
 COMPREHENSIVE EVERGLADES RESTORATION PLAN (CERP), 2011-2013

**CERP BISCAYNE BAY COASTAL WETLANDS AND
 C-111 SPREADER CANAL**

