

**STATE OF FLORIDA
DEPARTMENT
OF
ENVIRONMENTAL PROTECTION**



**Electric Power Plant Site Certification
Staff Analysis Report**

**Florida Power & Light Company
Turkey Point
Unit 3 & 4 Nuclear Uprate Project**

**PA 03-45A2
DEP OGC Case No. 08-0089
DOAH Case No. 08-00378 EPP**

September 10, 2008

Table of Contents

1.0	SUMMARY	1
1.1	Facilities Overview	1
1.1.1	Existing Facilities.....	1
1.1.2	Proposed Project Description.....	2
1.1.3	Pressurized Water Reactors	2
1.1.4	Nuclear Upgrading.....	3
1.2	Environmental and Social Impacts	4
1.2.1	Local Air Quality Impacts	5
1.2.2	Air Quality Impacts (Carbon Dioxide Emissions).....	5
1.2.3	Surface Water Quality Impacts.....	7
1.2.4	Groundwater Quality Impacts.....	9
1.2.5	Consumptive Use.....	10
1.2.6	Wastewater Disposal.....	10
1.2.7	Solid and Hazardous Waste Disposal	11
1.2.8	Biological Impacts	11
1.2.9	Transportation Impacts	11
1.2.10	Socioeconomic Impacts	12
2.0	SITE CERTIFICATION PROCESS	12
2.1	Determination of Need.....	12
2.2	Site Certification Application Review	12
3.0	PROPOSED GENERATION AND TRANSMISSION FACILITIES.....	14
3.1	Generation Facility.....	14
3.1.1	Site Location	14
3.1.2.1	Power Generation.....	14
3.1.2.2	Fuel and Fuel Handling.....	14
3.1.2.3	Cooling.....	14
3.1.2.4	Air Pollution Control	15
3.1.2.5	Wastewater Treatment	15
3.1.2.6	Solid and Hazardous Waste Handling	15
3.2	Ancillary and Associated Facilities	15
3.3	Nuclear Regulatory Commission Licensing	15

3.4	Emergency Management Plans	16
4.0	Comments	16
4.1	Affected Agency Reports.....	16
4.1.1	<i>Public Service Commission</i>	16
4.1.2	<i>Department of Community Affairs</i>	17
4.1.3	<i>South Florida Water Management District</i>	17
4.1.4	<i>Miami-Dade County</i>	18
4.1.5	<i>Florida Fish and Wildlife Conservation Commission</i>	18
4.1.6	<i>South Florida Regional Planning Council</i>	19
4.1.7	<i>Department of Transportation</i>	19
4.2	Agency Comments (Other than Affected Agencies) and Comments From the Public	19
4.2.1	<i>Division of Emergency Management</i>	19
4.2.2	U.S. Department of the Interior, National Park Service, Biscayne Bay National Park	19
4.2.3	Comments from the Public	20
5.0	GENERAL SITE SUITABILITY CONCERNS	20
5.1	Area Land Use	20
5.2	Impact On Land Use And Surrounding Populations	20
6.0	FACILITY SPECIFIC CONCERNS	20
6.1	Air Quality Significance	20
6.2	Water Quality Related Impacts	20
6.2.1	<i>Direct Impacts to the CCS</i>	21
6.2.2	<i>Indirect Ground Water and Surface Water Impacts</i>	21
6.3	Impacts On Threatened Or Endangered Species	22
6.4	Archaeological and Historic Sites.....	23
6.5	Impacts on Public Lands	23
6.6	Noise Impacts.....	24
6.8	Construction and Operational Safeguards	24
7.0	COMPLIANCE AND VARIANCES	24
8.0	CONCLUSIONS AND RECOMMENDATIONS	24
8.1	Conclusions	24
8.1.1	<i>Construction Impacts</i>	24

8.1.2	<i>Operational Impacts</i>	25
8.1.3	<i>Agency Conclusions</i>	25
8.2	<i>Recommendation</i>	26

List of Figures

Figure 1.	TPP General Property Location and Site Photo. (Florida Power & Light)	1
Figure 2.	Plant Location and Property Boundary (Figure 2.1.1-1 SCA) and Certified Site Boundary (Figure 4.1.1-1 SCA)	2
Figure 3.	The Pressurized Water Reactor (PWR) (Nuclear Regulatory Commission).....	3
Figure 4.	Carbon Dioxide Emission Factors (Energy Information Administration)	7
Figure 5.	Turkey Point Plant Cooling Canal System (2008 Yahoo! Inc., identifiers added by SCO).....	8
Figure 6.	Aerial View of Turkey Point Plant Showing Intake and Discharge Structures. (2008 Yahoo! Inc., identifiers added by SCO)	9
Figure 7.	Crocodile Nest Locations 1978-2006 (SCA, Figure 2.3.6-1).....	23

List of Tables

Table 1.	CO2 Emissions Comparison.....	6
Table 2.	Agency Recommendations	25

List of Appendices

Appendix I:	Proposed Conditions of Certification
Appendix II-1:	Public Service Commission Determination of Need
Appendix II-2:	Department of Community Affairs Agency Report
Appendix II-3:	South Florida Water Management District Agency Report
Appendix II-4:	Miami-Dade County Land Use Consistency and Agency Report
Appendix II-5:	Florida Fish and Wildlife Conservation Commission Agency Report
Appendix II-6:	South Florida Regional Planning Council Agency Report
Appendix II-7:	Department of Transportation Agency Report

1.0 SUMMARY

1.1 Facilities Overview

1.1.1 Existing Facilities

The Turkey Point Plant (TPP) is an existing electrical generating facility owned and operated by Florida Power & Light Company (FPL), located on FPL's 11,000-acre Turkey Point site in unincorporated southeastern Miami-Dade County, Florida. (Figure 1) Lands surrounding and adjacent to the site are predominantly undeveloped and protected areas consisting largely of mangrove flats. The site is bordered on the west and south by the 13,000-acre Florida Power & Light Everglades Mitigation Bank, to the east by Biscayne National Park (BNP) and to the north by the BNP and Homestead Bayfront Park. The cities of Homestead and Florida City lay approximately five and one half miles and nine miles to the west of the site respectively. Refer to Figure 2 for site location and nearby geographic features.



Figure 1. TPP General Property Location and Site Photo. (Florida Power & Light)

The TPP includes two nominal 400 megawatt (MW) oil and/or gas fossil-fired steam generating units (Units 1 and 2), two nominal 700 MW pressurized water reactor nuclear units (Units 3 and 4), and one nominal 1,120 MW natural gas-fired combined cycle unit. Also included on the site are the following support facilities: service buildings, an administration building, fuel oil storage tanks, water treatment facilities, circulating water intake and outfall structures, wastewater treatment basins, a system substation, and the 5,900-acre cooling canal system. The five units and supporting equipment (excluding the cooling canal system) occupy approximately 130 acres.

The Power Plant Siting Act (PPSA) was promulgated in 1973. Units 1 and 2 were constructed in the 1960s and are not certified under the PPSA. Units 3 and 4 have been in service since 1972 and 1973 respectively and are also not currently certified under the PPSA. Unit 5, which began operation in 2007, received its site certification under the PPSA in 2005.

1.1.2 Proposed Project Description

FPL is proposing to increase the net electrical output of each existing Turkey Point nuclear unit by 104 megawatts (MW), from 700 MW to 804 MW. The increase in output (uprate) necessitates certification of both Unit 3 and Unit 4 under the PPSA, as it represents an expansion in steam generating capacity as measured by an increase in the maximum electrical generator rating as identified in 403.506 (1), Florida Statutes (F.S.) On January 18, 2008, FPL submitted an application to the Department of Environmental Protection's Site Certification Office for certification of Turkey Point nuclear Unit 3 and Unit 4 due to the proposed upratings.

Boundaries of the Turkey Point property can be seen in Figure 2. The proposed certified area for Units 3 & 4 (outlined by blue dotted line) is also shown in Figure 2 and includes the reactor buildings, turbine buildings, access/security building, auxiliary building, maintenance facilities and miscellaneous warehouses and other associated operation buildings.

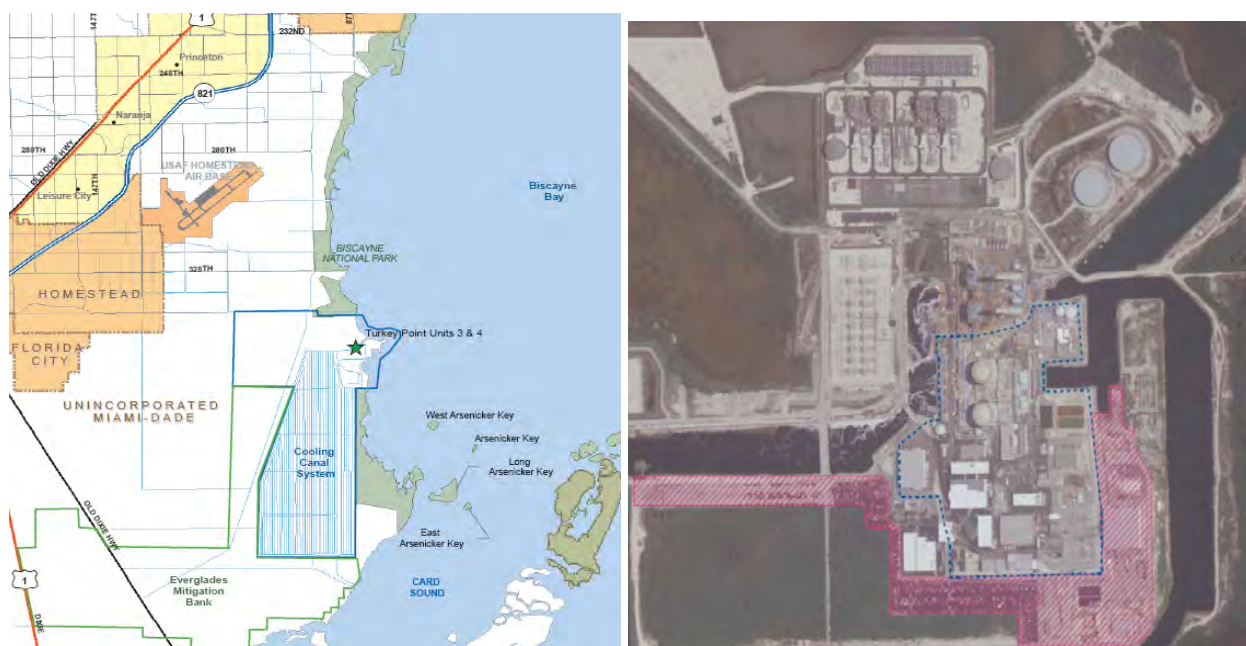


Figure 2. Plant Location and Property Boundary (Figure 2.1.1-1 SCA) and Certified Site Boundary (Figure 4.1.1-1 SCA)

1.1.3 Pressurized Water Reactors

As stated above, the Turkey Point nuclear units are pressurized water reactors (PWR). In a typical (PWR) heat is created in the reactor core by the nuclear fission (splitting) of uranium atoms. There is a pressurized primary closed water loop that resides completely within the containment structure that carries heat from the reactor core to the steam generator. The steam generator is part of a secondary water loop (also closed) that directs steam from the steam generator to the steam turbine which drives the electrical generator to produce electricity. Following the steam turbine, steam within the secondary loop is condensed back into water with the use of cooling water from a third “open” water loop and sent back to the steam generator. Figure 3 below is a simplified diagram of a pressurized Water Reactor. The Turkey Point units are configured in a two-loop, three-stage heat transfer design with two steam turbines each (four total).

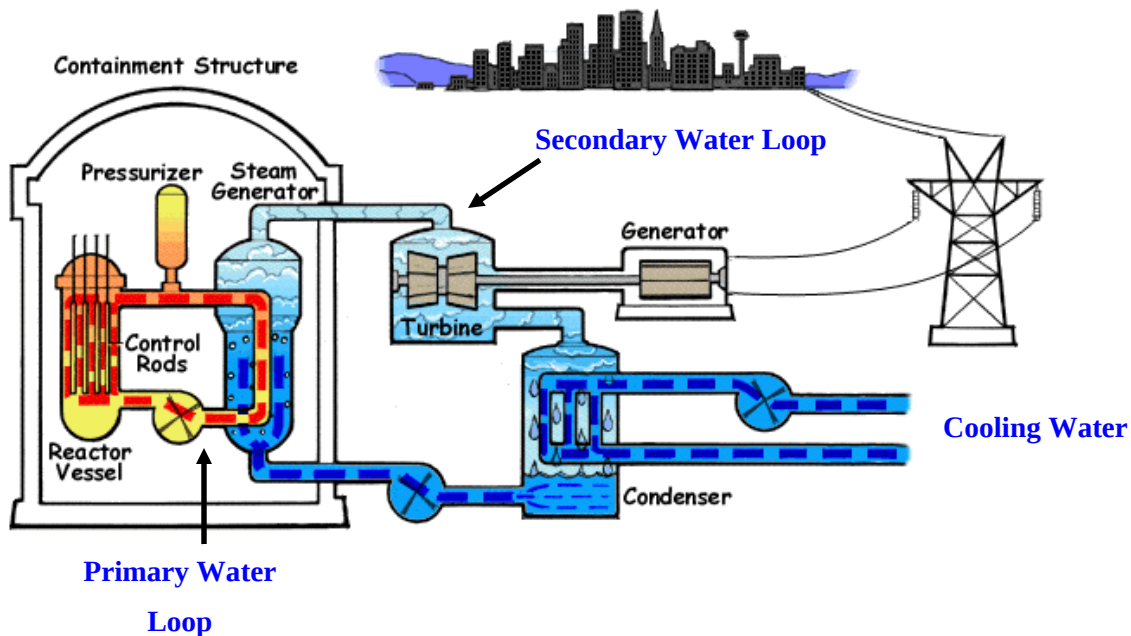


Figure 3. The Pressurized Water Reactor (PWR) (Nuclear Regulatory Commission¹)

1.1.4 Nuclear Upgrading

An increase in the maximum allowable operating power level of a nuclear power plant is known as a power “uprate”. To increase the electrical power output of a nuclear plant to the higher operating level, more steam must be produced. This is typically done by using more highly enriched uranium fuel and/or increasing the amount of fresh fuel that is used.

Depending on the extent of the uprate, various components of the unit may need to be replaced in order to support the increase in thermal energy and consequently higher amounts of steam. The United States Nuclear Regulatory Commission (NRC) has grouped uprates into three categories. Measurement Uncertainty Recapture Uprates (< 2% power increases) involve the installation of more accurate measurement devices that reduce the degree of uncertainty in the power level, allowing the plant to operate at a slightly higher level. Stretch Power Uprates (< 7% increases) are power increases that are within the design capacity of the plant and do not normally require major modifications to the plant equipment. Extended Power Uprates (up to 20% increases) require significant modifications to major plant equipment such as the high pressure turbines, condensate pumps and motors, main generators, and/or transformers.

Requests for uprates must be reviewed and approved by the NRC technical and legal staff, and involve amending the plant’s NRC operating license. The NRC’s mission is to regulate non-governmental use of byproduct, source, and special nuclear materials to ensure the protection of public health and safety, to promote the common defense and security, and to protect the environment. This specifically includes the regulation of commercial reactors that generate

¹U.S. Nuclear Regulatory Commission, *Electronic Reading Room*, available at: <http://www.nrc.gov/reading-rm.html>

electrical power, and the transportation, storage, and disposal of nuclear materials and waste, and the decommissioning of nuclear facilities from service.²

The Turkey Point uprates fall into the Extended Power Uprate category (approximately 14% increases) and will require a separate NRC license amendment for each unit. FPL indicates that they plan to submit the license amendment requests to the NRC in late 2009 with approval expected by 2011.

Specific modifications to the Turkey Point units for this project include refurbishments and improvements to the steam turbine-electric generator, electrical systems, and cooling systems. The increase in power output will be the combined result of the improved performance of the steam turbines and the use of additional fuel used in the reactor. As indicated earlier, the uprate project will result in a net increase of 104 MWe for each unit.

FPL anticipates that the power uprates at the Turkey Point Plant will be implemented in 2012. FPL plans to perform the physical work associated with the Turkey Point Uprate Project at the time of normally scheduled refueling outages in 2010, 2011 and 2012.

The physical modifications associated with the project will take place during normally scheduled refueling outages in 2010, 2011, and 2012. Construction activities associated with Unit 3 will occur during the fall outage of 2010 and spring outage of 2012. Construction activities associated with Unit 4 will take place during the spring outage of 2011 and the fall outage of 2012. The construction periods are expected to last approximately 60 days each. All upgrades and improvements associated with this project will occur within existing structures.

As specified in the affirmative Determination of Need, the Florida Public Service Commission found the expansion of Turkey Point 3 and 4 to be the most cost-effective option available to meet FPL's need for additional capacity.

1.2 Environmental and Social Impacts

The Turkey Point plant is located in unincorporated Miami-Dade County. The cities of Homestead and Florida City are located approximately five and one half miles and nine miles to the east. The Homestead Air Reserve Base is approximately four and one half miles northwest of Turkey Point Units 3 and 4 and the Homestead-Miami Speedway is approximately five miles to the northwest. The predominant existing and anticipated land uses within the plant vicinity are undeveloped and protected areas. Future land use designations are similar to existing patterns. According to FPL, the nearest residential development is located approximately four miles away from the site.

Other potential areas of concern in close proximity to the site (within 5 miles) are Biscayne National Park, Homestead Bayfront Park, Biscayne Aquatic Preserve, Model Lands Basin, Biscayne Trail, and the Everglades Mitigation Bank, all which surround the Turkey Point Plant. Biscayne Aquatic Preserve is 69,000 acres of submerged state land that has been designated as an Outstanding Florida Water, Class III. The Preserve is managed by the DEP Office of Coastal and Aquatic Managed Areas.

²U.S. Nuclear Regulatory Commission, *Power Uprates*, available at: <http://www.nrc.gov/reactors/operating/licensing/power-uprates.html>

The nearest Class I area to the Project Area is the Everglades National Park (NP) located about 21 km (13 miles) to the southeast. Federal Class I Areas are defined by the Clean Air Act and include certain national parks, national wilderness areas, and international parks that were in existence as of August 7, 1977. These areas represent natural conservation of historical landmarks in this country and are protected by more stringent air quality requirements than other regions.

1.2.1 Local Air Quality Impacts

The Department's Division of Air Resource Management regulates major air pollution sources in accordance with Florida's Prevention of Significant Deterioration (PSD) program, as defined in Rule 62-212.400, F.A.C. For new major facilities, or for modifications to existing facilities, each regulated air pollutant is reviewed for PSD applicability based on emissions thresholds known as Significant Emission Rates (SERs).

Air pollution emission sources associated with the Turkey Point nuclear units include the following emission units: four main 2.5 MW emergency generators, five smaller emergency generators, and various general purpose generators. These engines associated with the Turkey Point nuclear Units 3 & 4 are regulated under a Title V Air Operating Permit. There will be no changes in the operation or emissions of the diesel engines as a result of this project.

1.2.2 Air Quality Impacts (Carbon Dioxide Emissions)

In light of heightened concerns over global warming and Florida's recent commitment to *The Climate Registry*, it is appropriate to consider carbon dioxide (CO₂) emissions from the proposed project. The following summary is intended to put into perspective the projected CO₂ emissions from the Turkey Point plant with respect to global emissions and emissions from other types of electrical generating facilities.

Current and Predicted Levels of Carbon Dioxide Emissions

The primary source of CO₂ emissions is the combustion of fossil fuels such as coal, natural gas, and oil. Florida ranks fifth in the nation for CO₂ emissions from fossil fuel combustion, contributing almost four and one-half percent to the nation's total emissions in 2005.³ Refer to Table 1 below for a comparison of 2005 CO₂ emissions.⁴

Of the 260.74 million metric tons of energy related CO₂ produced in Florida during 2005, the electric power and transportation sectors were responsible for over 90% of the emissions, respectively contributing 125.76 (48%) and 114.08 (44%) million metric tons.

³ U.S. Environmental Protection Agency. *State CO₂ Emissions from Fossil Fuel Combustion, 1990-2005*. Available at http://epa.gov/climatechange/emissions/state_energyco2inv.html

⁴ U.S. Environmental Protection Agency. *State CO₂ Emissions from Fossil Fuel Combustion, 1990-2005*. Available at http://epa.gov/climatechange/emissions/state_energyco2inv.html

Table 1. CO₂ Emissions Comparison

Emission Origin	2005 Total CO₂ Emissions (million metric tons)
Texas	663.87
California	390.64
Pennsylvania	277.0
Ohio	269.97
Florida	260.74
United States	5,966.04
World ⁵	28,193.00

Until recently the United States was the largest emitter of carbon dioxide emissions. According to preliminary estimates China has been the top emitter since 2006.⁶

The Energy Information Administration predicts emissions of CO₂ will reach almost 8,000 million metric tons in the U.S. by the year 2030.

Efficiency and Fuel Considerations

Emissions of CO₂ directly relate to the quantity of combusted fossil fuel. The more fuel consumed, the more carbon released into the atmosphere. As technologies improve, electric generating facilities of all types are constructed with greater and greater efficiencies. Higher efficiency units require less fuel for equal amounts of energy production. This translates to fewer overall carbon emissions from the more efficient units.

Carbon emissions are also dependent upon the types of fuels combusted. To produce the same amount of energy, more CO₂ is released when burning coal, than when burning fuel oil or natural gas. “Coal combustion emits almost twice as much CO₂ per unit of energy as does the combustion of natural gas, whereas the amount from crude oil combustion falls between coal and natural gas.”⁷ Carbon emission factors for different fuel types are shown in Figure 4 below as the amount of CO₂ emitted per heat energy unit (lb/MMBtu). There are no CO₂ emissions directly associated with the use of nuclear fuels.

⁵ U.S. Energy Information Administration. *International Energy Annual 2005* (EIA 2007b)

⁶ Sci-Tech Today (2006-06-21)

⁷ U.S. Energy Information Administration. *Emissions of Greenhouse Gases in the United States 1985-1990*, DOE/EIA-0573 (Washington, DC, September 1993), p. 16.

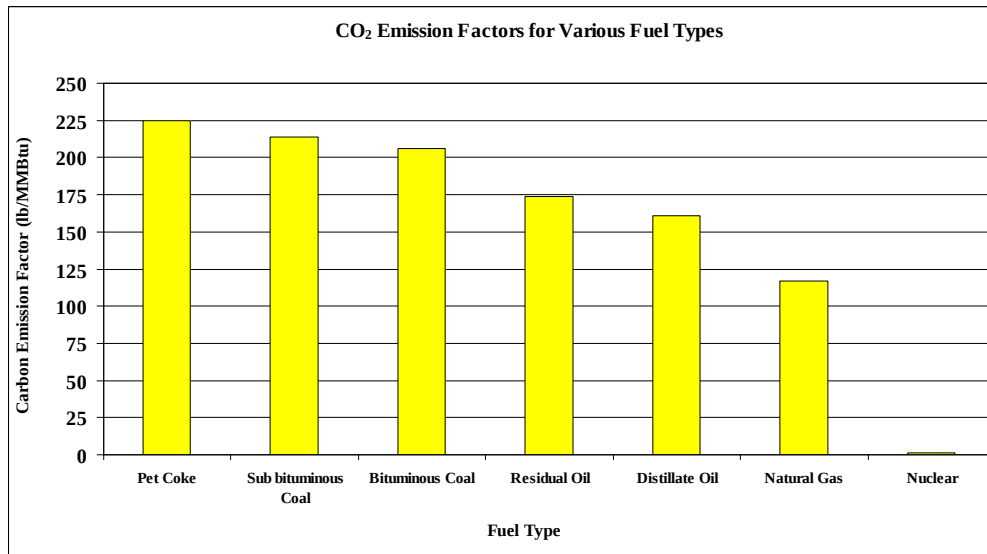


Figure 4. Carbon Dioxide Emission Factors (Energy Information Administration)

Carbon Dioxide Emissions at the Turkey Point Facility

As stated earlier, there are no CO₂ emissions directly associated with the use of nuclear fuel to generate electricity. The uprate project will result in 104 MW increases for each unit to a total of 804 MW each. For comparison, a new pulverized coal plant of comparable size (1,600 MW total) would emit approximately 12.4 million tons of CO₂ each year for the same output. Emissions from a comparable combined cycle gas unit are approximately 4.4 million tons of CO₂ per year. The uprate project alone (208 MW) will avoid approximately 0.6 million tons of CO₂ that would otherwise be emitted from a comparable natural gas-fired plant.

At the Turkey Point facility sources of CO₂ emissions include the various emergency diesel generators and equipment listed above. Implementation of the uprate project will result in no changes to the operation of the various diesel engines at the site, therefore no increase in emissions of CO₂ are expected.

1.2.3 Surface Water Quality Impacts

There are no direct withdrawals from or discharges to surface waters associated with Units 3 & 4. Cooling water for Units 3 & 4 is supplied by the Turkey Point Plant closed-cycle cooling canal system (CCS) for removal of heat from the main (turbine) condensers and the auxiliary equipment. Because the system has no surface water intake or discharge systems, an NPDES permit would not normally be required. However, a “no discharge” NPDES permit has been issued for this facility (see attached). The CCS (described below) is shared with Units 1 & 2 and occupies approximately 5,900 acres of the Turkey Point site.

The CCS is a large system of interconnected canals running north and south which are designed to dissipate heat much like a radiator in an automobile. There are 32 westernmost canals and seven eastern canals as shown in Figure 5. Water is pumped from the intake canal (shown in Figure 6) drawing water northward from the seven easternmost canals. The pumping keeps

water levels in the easternmost canals lower than the water levels in the westernmost canals. This “head difference” is what causes the water to circulate through the system.⁸

After passing through the condensers, the heated water is then discharged at the northern end of the 32 westernmost canals (also shown in Figure 6). After flowing southward to the collector canal located on the south end of the CCS, the water then flows east towards the seven easternmost canals for a northern return to the plant’s intake.

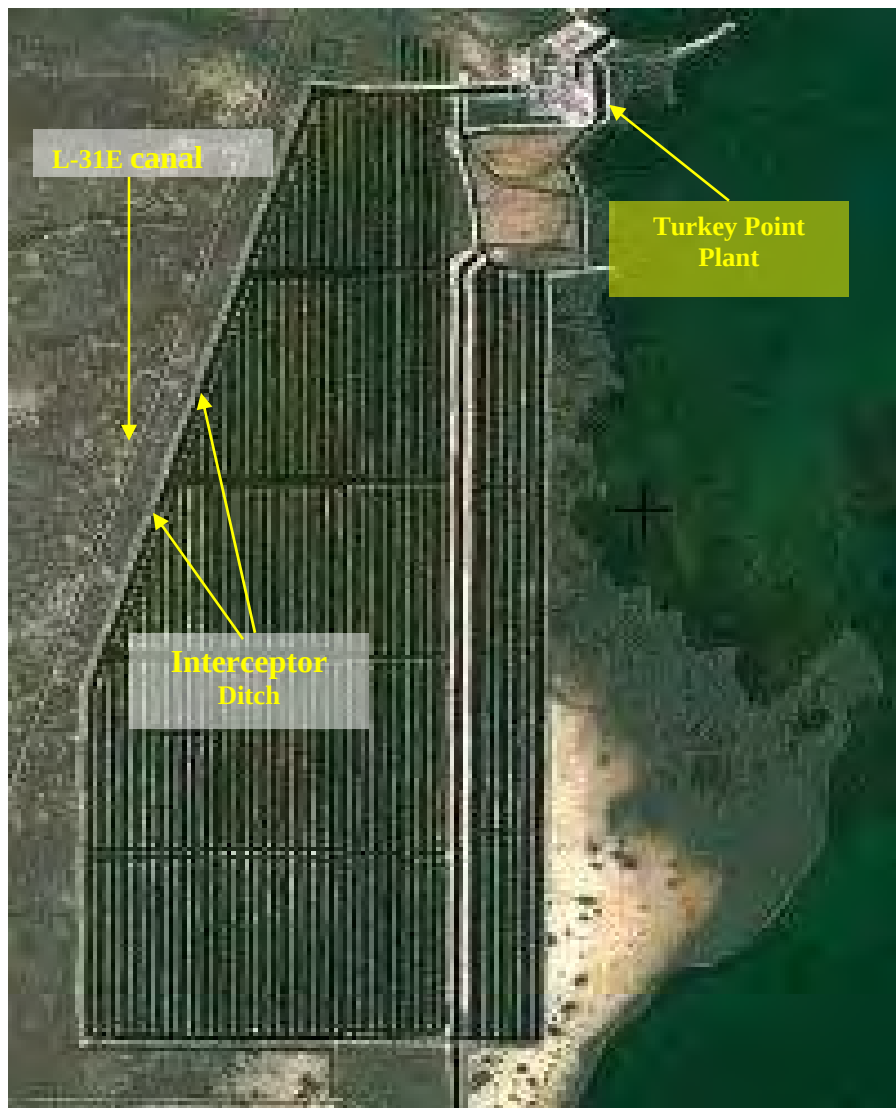


Figure 5. Turkey Point Plant Cooling Canal System (2008 Yahoo! Inc., identifiers added by SCO)

The uprate project will result in additional heat transfer to the CCS. According to the applicant, the maximum increase in water temperature entering the CCS is expected to be approximately 2.5° F. This increase in temperature will also result in a slight increase in salinity within the CCS due to increased evaporation.

⁸ Golder Associates Inc., *Cooling Canal System Modeling Report*, January 13, 2008.

There will be no external construction and no new impervious surfaces created due to the uprate project. Therefore surrounding wetlands and surface waters should not be directly impacted. However, because the canals within the cooling system are not lined, there is the potential for indirect impacts to surface waters within the Biscayne Bay area. The mechanism for this is described in subsequent sections.



Figure 6. Aerial View of Turkey Point Plant Showing Intake and Discharge Structures.
(2008 Yahoo! Inc., identifiers added by SCO)

1.2.4 Groundwater Quality Impacts

The Turkey Point plant does not directly withdraw groundwater, and will not withdraw groundwater as a result of this project. Miami-Dade County supplies water to the plant for potable water supply, source water for the plant process water treatment facility (which provides demineralized water for makeup to the reactor coolant system and the steam cycle, and emergency makeup water), and for general service water. FPL is not requesting an increase in water supply, therefore adverse impacts to offsite users are not anticipated due to increased water use at the plant. Current plant usage averages 9.12 million gallons per month.

However, groundwater does interact with the unlined CCS described in a previous section. “Measurements taken within the cooling canal system indicate that the water level within that

system rises and falls with the tidal water level in Biscayne Bay. This is because the rock in which the cooling canal system was constructed is exceptionally porous.⁹

Ground water below the Turkey Point Plant has been classified by the Department as Class G-III ground water. Uses for Class G-III ground water are designated in 62-520.410, F.A.C as non-potable water use, ground water in unconfined aquifers which has a total dissolved solids content of 10,000 mg/l or greater; or which has total dissolved solids of 3,000-10,000 mg/l and either has been reclassified by the Commission as having no reasonable potential as a future source of drinking water, or has been designated by the Department as an exempted aquifer pursuant to Rule 62-528.300(3), F.A.C. The NPDES permit for this facility authorizes “an existing discharge from the onsite closed loop cooling canal system to the surficial aquifer which is a Class-III groundwater”.

According to the application and supporting information submitted by the applicant, the CCS is designed to keep cooling canal water from influencing groundwater to the west and from entering Biscayne Bay on the East. Following is a brief description (based on applicant information) of the specific mechanisms within the system designed for those purposes.¹⁰

- An Interceptor Ditch (shown in Figure 5) located along the western edge of the CCS was constructed to prevent seepage from the CCS from moving towards the west. Pumps are used to maintain water levels in the Interceptor Ditch below water levels in the L-31E Canal located to the East (also shown in Figure 5). Pumping water from the Interceptor Ditch to the cooling canals creates a lower head to the east, thereby keeping water flowing in an easterly direction. This helps to maintain fresh or potable water to the west of the Interceptor Ditch.
- Because of the circulation water pumps, water levels in the eastern or intake side of the CCS remains lower than that of Biscayne Bay. The resulting head difference keeps water from the CCS from entering Biscayne Bay.
- Beneath the CCS is a body of warmer than ambient groundwater extending 14 feet below the bottom of the CCS. This warm groundwater reportedly stays in place and acts as if it were part of the cooling canal system.

1.2.5 Consumptive Use

There are currently no permitted groundwater withdrawals at the Turkey Point facility. FPL proposes no new groundwater use to support the increased power generation for Units 3 and 4.

1.2.6 Wastewater Disposal

Sanitary wastewater from the Turkey Point Plant (including Units 3 and 4) is treated in an onsite treatment plant, using contact stabilization.

Reverse osmosis/mixed bed (RO/MB) demineralizer systems are used to treat the raw water supplied by Miami-Dade County for use as process water in the plant. RO and electro-deionization reject is recycled to the CCS. Steam cycle blowdown, and equipment area storm

⁹ Golder Associates Inc., *Cooling Canal System Modeling Report*, January 13, 2008.

¹⁰ Golder Associates Inc., *Cooling Canal System Modeling Report*, January 13, 2008.

and wash waters (after passing through an oil/water separator) are also released to the cooling canal system.

Generation and disposal of wastewaters are not anticipated to change due to the uprate project.

1.2.7 Solid and Hazardous Waste Disposal

Minimal quantities of primarily municipal solid wastes are generated by Turkey Point Units 3 and 4. All solid wastes are disposed of by a licensed waste disposal contractor and are disposed of at Miami-Dade County facilities. No changes to the amount or type of solid wastes are expected.

Potential hazardous wastes which are associated with Units 3 and 4 are less than 100 kilograms per month. Hazardous wastes may include materials such as spent solvents and chemical cleaning wastes. All hazardous wastes are collected onsite and disposed of by a licensed hazardous waste contractor. No changes to the amounts or types of solid and hazardous wastes are expected.

The uprate project will result in a small increase in the spent nuclear fuel discharge rate. As indicated earlier, such matters are regulated by the NRC. Furthermore, no changes to the nuclear fuel-handling facilities are necessary at this time.

1.2.8 Biological Impacts

The dominant habitats immediately surrounding the Turkey Point Plant, but still within the FPL site are mangrove tidal flats, which are tidally inundated with waters from Biscayne Bay. These areas support various species of wading birds, fish, reptiles, and invertebrates. Vegetation within the CCS includes primarily widgeon grass, as well as woody vegetation along the berms. The CCS also provides breeding habitat for the American crocodile, and foraging area for several species of wading birds.

Adjacent to the site are Biscayne Bay, Card Sound, and the Everglades Mitigation Bank (EMB). Biscayne Bay and Card Sound support seagrass beds. The EMB contains relatively undisturbed freshwater and estuarine wetlands. The mangrove systems to the north and south of the site provide nursery areas for juvenile fishes and habitat for wading birds.

The existing Turkey Point Unit 3 and Unit 4 facilities are located on previously impacted areas which do not provide suitable natural areas for wildlife. Construction activities associated with Units 3 and 4 will occur within existing buildings and structures, and no external construction is required. Existing construction parking and laydown areas will be utilized for the project therefore no new areas will be directly impacted by construction.

The increase in water temperature, and the resulting rise in salinity within the CCS due to the uprate project could potentially impact the resident crocodile population. This issue is discussed in more detail in a later section.

1.2.9 Transportation Impacts

Employee and construction traffic access the Turkey Point facility from US 1 and SW 117th Avenue located to the west of the site via SW 344th Street (Palm Drive). No new access roads are proposed as a result of the uprate project. Based on the applicant's analysis, increased traffic due to the project will remain within Miami-Dade County's Traffic Concurrency Standards.

1.2.10 Socioeconomic Impacts

It is anticipated by the applicant that the Turkey Point project will result in positive economic benefits for the county and surrounding areas through employment opportunities during construction and increased revenue from sales tax from the purchase of equipment and materials in support of construction activities.

2.0 SITE CERTIFICATION PROCESS

2.1 *Determination of Need*

Chapter 80-65, Laws of Florida (1980) requires a formal "Determination of Need" be made by the Florida Public Service Commission (PSC) prior to certification of an electric power generating facility subject to the "Power Plant Siting Act" (sections 403.501-519, Florida Statutes). The issues evaluated in the PSC's determination proceedings include conservation measures that might mitigate the need for additional power, load management, load demand growth estimates and other, potentially more cost effective, alternatives for producing needed power. This determination serves as the report required of the PSC as part of the power plant site certification proceedings. The Department of Environmental Protection (DEP) must balance the determination of need with the social and environmental impacts when preparing overall recommendations for final approval or disapproval of a Site Certification Application (SCA).

On January 7, 2008 the PSC issued their Final Order Granting Petition for Determination of Need for the proposed expansion of Turkey Point (Units 3 and 4) nuclear power plant. The complete report is attached as part of Appendix II-1.

2.2 *Site Certification Application Review*

The procedures and requirements for granting or denying a certification to construct and operate an electric power generating facility in the state of Florida are set forth in the "Florida Power Plant Siting Act", Sections 403.501-518, Florida Statutes, and the "Power Plant Siting Rule", Chapter 62-17, Florida Administrative Code. The statute establishes the certification agent to be the Siting Board which is composed of the Governor and Cabinet of Florida.

The DEP has been designated as the lead agency for the review and evaluation of SCAs and is charged with preparing a SCA impact analysis report and a recommendation to the Siting Board for granting or denying the requested certification. A recommendation to grant certification shall include a Conditions of Certification statement that specifies all requirements and restrictions of the Certification that will apply to the construction and operation of the proposed facility.

Specific concerns to be addressed in the review of a SCA shall include but not be limited to:

- Determination of Need for electric power;
- nearfield and farfield impacts on air quality;
- impacts on surface water or groundwater quality;
- impacts on terrestrial and aquatic ecosystems;
- impacts from solid waste or hazardous waste disposal;
- impacts from domestic or industrial wastewater disposal;

- impacts from stormwater management;
- impacts from site modification such as noise or meteorological changes;
- impacts on water supply;
- impacts on surrounding land uses;
- impacts on traffic;
- impacts on public lands and submerged lands;
- environmental and public health risk assessments;
- impacts on archaeological sites and historic preservation areas;
- accessibility to transmission corridors;
- proximity to transportation systems;
- fuel and fuel transportation and on-site storage requirements;
- cooling system requirements;
- soil and foundation conditions;
- construction and operational safeguards; and
- any site specific concerns identified in the review process.

Although the DEP is designated as the agency to coordinate the process, many of the concerns that are to be addressed in the SCA impact assessment are outside the purview of DEP. Consequently, the Power Plant Siting Act ("Siting Act") requires several other state agencies to participate in the review process. Each of these agencies is directed to review the SCA with regard to compliance with the statutory and administrative requirements of the reviewing agency. Each of these agencies is further directed to prepare a written report to the DEP explaining their findings and specifying any restrictions or requirements that should be included in the Conditions of Certification. These agencies are:

- Public Service Commission (PSC);
- Department of Community Affairs (DCA);
- Water Management District (WMD) with jurisdiction over the site;
- all local governments with jurisdiction over the site;
- Fish and Wildlife Conservation Commission (FWCC);
- Regional Planning Council with jurisdiction over the site;
- The Department of Transportation (DOT)
- And, any other agency if requested by DEP.

Comments, concerns and issues raised by agencies, interest groups and the general public are integrated into the overall review and are addressed in the DEP report where appropriate.

Written comments received following the receipt of the application and prior to the publication date of the report are included in their entirety in Appendix II.

Throughout the course of the SCA review process there are several formal public and administrative hearings that may be required by the Siting Act. Among these are:

- An Administrative Hearing on the certification of the proposed facility;
- And, a Certification Hearing before the Siting Board.

Subsequent to the issuance of a Certification, the licensed facility is required to participate in a Post Certification Review that determines compliance with the Conditions of Certification. Furthermore, the Certification may be modified by the Siting Board or the Department. However, any modification request not initiated by the Department requires a formal application and is subject to the same scrutiny as the original SCA.

3.0 PROPOSED GENERATION AND TRANSMISSION FACILITIES

3.1 Generation Facility

3.1.1 Site Location

The Turkey Point Power Plant is located in unincorporated Miami-Dade County, just east of US 1, approximately five and one half miles to the east of Homestead, Florida. The entire complex encompasses approximately 11,000 acres. Units 3 and 4 (including support buildings) encompass approximately thirty acres.

3.1.2.1 Power Generation

The Turkey Point Plant has a total generating capacity of approximately 3,220 MW. Units 1 and 2 are oil and/or gas fossil-fired steam generating units. Units 3 & 4 are two pressurized water reactor nuclear units each with a net capacity of 700 MW. Unit 5 is a nominal 1,120 MW natural gas-fired combined cycle unit.

The Unit 3 & 4 uprate project will add an additional 208 MW (104 MW each unit).

3.1.2.2 Fuel and Fuel Handling

According to the applicant, Turkey Point Units 3 and 4 are licensed for uranium-dioxide fuel. Every 18 months approximately one third of the fuel assemblies are replaced in each reactor. There will be an increase in the amount of fuel used to supply the additional energy needed for the increase in power output, however no increase in maximum fuel enrichment and no changes in fuel-handling facilities will be required.

The various emergency generators and diesel engines utilize 0.05 percent sulfur diesel fuel. This fuel is trucked in and stored in on-site fuel storage tanks. No changes in the fuel or fuel handling for these engines are anticipated due to the uprate projects.

3.1.2.3 Cooling

As described earlier, cooling water for Units 3 & 4 is supplied by the Turkey Point Plant 5,900 acre closed-cycle cooling canal system (CCS). The cooling canal system is used to remove heat from the main (turbine) condensers, and to remove heat from other auxiliary equipment. This system is also shared with Units 1 & 2 (uncertified units).

Unit 5 uses mechanical draft cooling towers for its steam cycle. Cooling tower blowdown from Unit 5 is discharged into the CCS.

According to the applicant, the maximum increase in water temperature entering the CCS is expected to be approximately 2.5° F. This increase in temperature will also result in a slight increase in salinity within the CCS due to increased evaporation.

3.1.2.4 Air Pollution Control

Air pollutant emissions from the various onsite emergency diesel engines and generators associated with Units 3 and 4 will continue to be controlled through a fuel sulfur content limit of 0.5 percent by weight (however according to FPL, 0.05 percent diesel fuel is actually used). Nitrogen oxide emissions (NO_x) are limited under Reasonably Available Control Technology (RACT) requirements pursuant to 62-296.570(4)(b)7 F.A.C. to 4.75 lb/MMBtu. There are no expected changes to air pollutant emissions as a result of this project.

3.1.2.5 Wastewater Treatment

Most of the domestic/sanitary waste water associated with the Turkey Point Plant (including Units 3 and 4) is collected and treated in an onsite treatment plant, using contact stabilization. The treated effluent is discharged through a Class V injection well. Smaller volumes of sanitary wastes are routed to a septic tank system.

The CCS receives all treated industrial waste water from the Turkey Point facility. This includes RO and electro-deionization (EDI) reject. Contact area storm water and wash waters are released to the cooling canal system after passing through an oil/water separator.

There are no anticipated changes to the waste water types or volumes.

3.1.2.6 Solid and Hazardous Waste Handling

Solid and hazardous wastes at the Turkey Point facility are collected and disposed of off-site by licensed waste and hazardous waste disposal contractors. Solid and hazardous wastes will increase temporarily during the construction phases of the uprate project. These additional wastes will be stored and prepared for offsite disposal in accordance with applicable regulations. Construction and demolition waste materials accumulated during the construction phases will be separated for salvage and recycling.

The uprate project will result in a small increase in the spent nuclear fuel discharge rate. Fuel assemblies will continue to be stored in the onsite NRC approved spent fuel pools. Dry cask storage facilities may be installed at a future date (subject to NRC approval).

3.2 *Ancillary and Associated Facilities*

The uprate project and certification of Turkey Point Units 3 and 4 involve existing plant facilities pertaining to the refurbishment and improvement of the steam turbine-electric generators, electrical systems, and cooling systems. There will be no new off-site electrical transmission facilities or other associated facilities required for the Turkey Point project.

3.3 *Nuclear Regulatory Commission Licensing*

The Nuclear Regulatory Commission (NRC) oversees the construction, safety and operation of all nuclear power plants in the United States. The Turkey Point nuclear units 3 and 4 are currently licensed under the NRC until 2032 and 2033 respectively.

The Turkey Point uprate project (additional 208 MWe) will require NRC approval for an extended Power Uprate for which FPL plans to submit an application in 2009. FPL expects approval for the increased output by 2011.

3.4 Emergency Management Plans

Chapter 252 of the Florida Statutes establishes the means by which certain radiological emergency response plans and preparedness requirements of the United States Nuclear Regulatory Commission and the Federal Emergency Management Agency can be developed and tested by the state, the appropriate counties, and each operator licensed by the United States Nuclear Regulatory Commission to operate a commercial nuclear electric generating facility. Roles and responsibilities of those organizations that would respond to a nuclear power plant emergency are outlined in Annex A, State of Florida Radiological Emergency Management Plan included as part of the State of Florida's Comprehensive Emergency Management Plan (CEMP). According to Florida's Division of Emergency Management, the Turkey Point uprate project does not trigger a revision to this plan. Visit the following links to view a copy of Annex A, State of Florida Radiological Emergency Management Plan, FPL's Turkey Point Plant Safety Information, and the Florida Division of Emergency Management's Radiological Emergency Preparedness page.

<http://www.floridadisaster.org/documents/CEMP/REP2004/Annex%20A/AnnexAtbc.htm>

http://www.fpl.com/environment/nuclear/pdf/turkey_point.pdf

<http://www.floridadisaster.org/bpr/EMTOOLS/Nuclear/rep.htm>

4.0 COMMENTS

The following are summaries of submitted agency reports and other public or agency comments. The descriptions herein do not necessarily reflect the Department's views or positions. The actual recommendations of the Department are described in a later section.

4.1 Affected Agency Reports

Affected agencies identified in Florida Statute 403.507(2)(a)5, shall prepare and submit written reports regarding the site certification application to the Department and to the applicant. The following summarizes agencies' submitted reports discussing the FPL Turkey Point uprate project

4.1.1 Public Service Commission

Pursuant to Section 403.519, the Public Service Commission (PSC) issued Order No. PSC-08-0021-FOF-EI on January 7, 2008, determining a need for both the Turkey Point uprate project, and a second FPL nuclear uprate project at the St. Lucie Plant. In part, the Order stated that:

"There is a need for the Turkey Point Plant and St. Lucie Plant uprates, taking into account the need for adequate electricity at a reasonable cost, as this criterion is used in Section 403.519(4), Florida Statutes. The uprates will increase the amount of highly efficient nuclear-fueled generation on FPL's system, and will displace large amounts of higher-cost fossil fuel and purchase power generation, resulting in fuel savings that provide a net benefit (i.e., lower system cost) to customers. In addition, customers will benefit from reduced capacity costs due to the deferral effect of the nuclear uprates upon the timing of subsequent additional units in the 2014-2017 time period."

“Furthermore, adding incremental capacity by uprating plants maximizes use of existing sites, as compared to constructing a generating plant of equivalent capacity at a new site. FPL already owns the necessary land at Turkey Point and St. Lucie, it is permitted for electric generation plants, and most of the necessary infrastructure is already in place. The proposed project precludes these costs at a new site.”

“There are no renewable energy sources and technologies or conservation measures taken by or reasonably available to FPL which might mitigate the need for the proposed expansion of the Turkey Point and St. Lucie nuclear power plants. FPL’s forecasted need already accounts for all of the cost-effective DSM identified through the year 2014, plus a projection of continued DSM for the years 2015-2020. This DSM includes FPL’s current Commission-approved DSM goals and a significant amount of additional DSM that FPL has identified as cost-effective, and we have since approved, since the current DSM goals were approved. Additional conservation measures cannot be implemented to eliminate the need for the PTN and PSL uprates.”

The PSC’s report is attached and incorporated as Appendix II-1.

4.1.2 Department of Community Affairs

On August 7, 2008 the Department received a report from the Department of Community Affairs (attached as Appendix II-2) stating that “the proposed project represents an intensification of activity already occurring onsite and it is the Department’s recommendation that the project be approved”.

4.1.3 South Florida Water Management District

The Department received a final Agency Report from the South Florida Water Management District (SFWMD or District)) regarding certification of the Turkey Point project via email on August 14, 2008.

The district identified no consumptive use permitting issues. However in their report, the SFWMD conveyed concerns related to potential secondary impacts to the Biscayne aquifer and to Biscayne Bay. The District is involved in restoration activities through the Comprehensive Everglades Restoration Plan (CERP) Biscayne Bay Coastal Wetlands Project. As stated in the report, “The higher cooling water temperature will increase evaporation from the cooling canal system and therefore will result in a slight increase in salinity (approximately 2-3 ppt, according to FPL) in the water within the cooling canal system. This increase in salinity could result in potential impacts to water quality within the Biscayne aquifer and Biscayne Bay.”

SFWMD does not feel that information provided by FPL is adequate to determine the true impacts on regional water resources and has recommended an evaluation process to make these assessments. Their recommendations include a “two-phase” approach: 1) revised monitoring data collection and analysis; and 2) 3-dimensional modeling if necessary.

SFWMD staff concerns are similar to those of Miami-Dade County. Since the submittal of their respective agency reports, these two agencies have collaborated to develop “consolidated” surface water, ground water, and ecological monitoring conditions of certification.

The “consolidated” conditions include the execution of a Supplemental Agreement to the original 1972 Agreement between SFWMD and FPL regarding FPL’s obligation to monitor for impacts of the Turkey Point cooling canal system on the water resources of the SFWMD, and

revision of the Monitoring Provisions of a 1983 Supplemental Agreement. The “consolidated” conditions have been included in the Proposed Conditions of Certification.

The SFWMD recommends approval of the Turkey Point Uprate Project, subject to the recommended Conditions of Certification.

The SFWMD report is attached and incorporated as Appendix II-3.

4.1.4 *Miami-Dade County*

On April 7, 2008 Miami-Dade County made a determination (filed with DOAH) that the uprate project site is consistent with the County’s Land Use Plan map designation, the IU-3 zoning, and the zoning approvals reflected in Resolution Z-44-67 (a special exception permitting atomic reactors).

Miami-Dade County submitted its final agency report on August 27, 2008. The report summarizes the County’s analysis of the project’s consistency with Miami-Dade’s Comprehensive Development Master Plan (CDMP) and local environmental regulations of which the County finds applicable.

In its report, Miami-Dade County expressed concerns that the CCS may be impacting adjacent surface water, ground water and wetland resources and that increases due to the project could lead to exceedances of the County’s surface and ground water standards. Miami-Dade also stated in its report that the CDMP “requires the Project to consider the consistency with the CERP” and that “the projected increases in salinity may negate some of the Biscayne Bay Coastal Wetland CERP benefits”. The report also addressed objectives of the CDMP that the County feels pertain to the protection of the critical habitat of the American crocodile.

The County included in its report a set of conditions to ensure consistency with “applicable local ordinances, regulations, standards and criteria, including local environmental regulations”. Since the submittal of Miami-Dade’s Agency Report, the County and the SFWMD have collaborated to develop “consolidated” surface water, ground water, and ecological monitoring conditions of certification. The “consolidated” conditions have been included in the Proposed Conditions of Certification.

The County recommends approval subject to the proposed conditions.

Copies of the Miami-Dade County final agency report and land use determination are attached as Appendix II-4.

4.1.5 *Florida Fish and Wildlife Conservation Commission*

The Florida Fish and Wildlife Conservation Commission (FWC) submitted its final agency report on August 6, 2008. In its report, the FWC described the potential affects of increases in temperature and salinity on adult and juvenile crocodiles living and breeding within the CCS. Included as an attachment to the report are comments from James Perran Ross, expert on crocodilian biology, University of Florida, IFAS, Department of Wildlife Ecology and Conservation. FWC has also been in consult with U.S. Fish and Wildlife Service regarding this issue.

The FWC feels it is necessary to continue with current monitoring efforts within the system, as well as to incorporate additional monitoring in order to properly assess the impacts of the predicted changes on the crocodile population. FWC is proposing that FPL conduct both pre-

and post-uprate monitoring. If analyses show a negative effect on crocodile populations within the CCS, then it is also recommended that monitoring should be conducted outside of the system to determine the “net” effect on the Turkey Point population.

The FWC has recommended approval of the Turkey Point uprate project subject to conditions as described above. FWC’s recommended conditions have been included in the Proposed Conditions of Certification.

The FWC report is included as Appendix II-5.

4.1.6 South Florida Regional Planning Council

The Department received an agency report from the South Florida Regional Planning (Council) on August 1, 2008. Council staff reviewed the SCA for consistency with the applicable provisions of the *Strategic Regional Policy Plan for South Florida (SRPP)*. Public comments were solicited as part of the Council’s review process. While the existing footprint of the plant will not be altered and increased salinity and temperatures in the CCS will be minimal, “Council staff remains concerned about the effects on water quality, Biscayne Bay, and nearby animal and plant life”.

Council staff recommended that, if approved, impacts to the natural systems be minimized to the greatest extent feasible, and the Department determine the extent of sensitive wildlife and vegetative communities in the vicinity of the project and require protection and or mitigation of disturbed habitat. The Council’s report also stated that the project “should be consistent with the goals and policies of the Miami-Dade County Comprehensive Development Master Plan and its corresponding land development regulations.

The Council’s agency report included a recommendation neither approving nor denying the project. The report is attached as Appendix II-6.

4.1.7 Department of Transportation

On July 25, 2008, the Florida Department of Transportation (DOT) submitted their agency report (attached in Appendix II-7). The DOT recommended approval contingent upon FPL’s compliance with recommended conditions. These conditions are included in the proposed Conditions of Certification.

4.2 Agency Comments (Other than Affected Agencies) and Comments From the Public

4.2.1 Division of Emergency Management

The Division of Emergency Management was not required to file a report, but indicated that the Turkey Point uprate project does not trigger a revision to the State of Florida Radiological Emergency Management Plan included as part of the State of Florida’s Comprehensive Emergency Management Plan (CEMP).

4.2.2 U.S. Department of the Interior, National Park Service, Biscayne Bay National Park

The Department received comments from Biscayne Bay National Park Superintendent, Mark Lewis on June 2, 2008 and subsequent comments on July 8, 2008. Mr. Lewis pointed out that it is the mission of the National Park Service to conserve park resources and provide for visitor enjoyment in such a manner as will leave these resources unimpaired for the enjoyment of future generations. “Recent analyses have highlighted the importance of freshwater flows in western

Biscayne Bay to support stable estuarine conditions in Biscayne National Park.” According to Mr. Lewis, the hydrologic pattern has been altered such that surface water inflow into the Bay today originates almost entirely from canal discharges as opposed to the historical overland and ground water flows. “Many of these changes have occurred since the Turkey Point CCS was completed in 1973.” For these reasons, it was recommended that water management for the CCS and expected changes to this system be carefully considered during this application process.

4.2.3 Comments from the Public

The Department received no other comments from persons pursuant to 403.507(5)(c).

5.0 GENERAL SITE SUITABILITY CONCERNS

5.1 Area Land Use

The Turkey Point Plant site encompasses 11,000 acres. Approximately 130 acres of the site are occupied by the electrical generation and support structures (excluding the CCS), 30 of which were impacted by the construction of Units 3 and 4 and their associated facilities. Much of the remainder of the site consists of mangrove flats.

Land use adjacent to the plant is primarily undeveloped. Vegetative communities within the adjacent properties include mangrove tidal flats, and freshwater and estuarine wetlands.

The Turkey Point uprate project directly involves only portions of the site that have already been developed for electrical power facilities.

5.2 Impact On Land Use And Surrounding Populations

As stated above, much of the land surrounding the Turkey Point site is undeveloped wetlands and mangrove flats. The nearest residential development is approximately four miles to the west of the plant. Miami-Dade County has determined that the project is consistent, and in compliance with the County’s land use plans and zoning ordinances. According to FPL, due to the patterns of local employment, traffic patterns and daily commuting, the demographic impact of the uprate project is expected to be minimal.

6.0 FACILITY SPECIFIC CONCERNS

6.1 Air Quality Significance

The Turkey Point nuclear units are not sources of air pollution. Air pollution emission sources at the Turkey Point nuclear facility include four main 2.5 MW emergency generators, five smaller emergency generators, and various general purpose generators. Emissions from these engines are regulated under a Title V Air Operation Permit issued by the DEP Division of Air Resource Management.

Air emissions are not expected to change due to the uprate project.

6.2 Water Quality Related Impacts

FPL’s submittals indicate that the uprate project is not expected to impact groundwater supplies. The design of the Interceptor Ditch, and the conditions and dynamics between the hypersaline cooling water and ground water beneath the CCS are such that there will be no adverse impacts to ground water. FPL has also indicated in the application and supporting information that there should be no impacts to surface water as a result of the uprate project.

As stated earlier, there are no direct withdrawals from or discharges to surface waters associated with Units 3 & 4. Cooling water for Units 3 & 4 is supplied by the Turkey Point Plant closed-cycle cooling canal system (CCS). Because the CCS is a permitted waste water treatment facility, state and federal water quality standards do not apply to waters within the canals. The Turkey Point “no-discharge” federal NPDES permit does require some monitoring of internal outfalls to the CCS, including temperature, suspended solids, pH, Specific Conductance, recoverable copper, iron, and zinc, lead, oil, and grease.

There have been expressed concerns by reviewing agencies of the potential for indirect water quality impacts (both ground and surface water) due to the uprate project. The direct impacts to the CCS as described in the application are stated below, followed by a discussion of agency concerns over potential indirect surface and ground water impacts.

6.2.1 Direct Impacts to the CCS

According to the applicant, following the uprate project, an additional 1.5 Billion Btu per hour will be produced from Units 3 & 4 combined at full load. This translates to a maximum predicted increase in water temperature entering the CCS of 2.5°F (from 106.1 to 108.6°F), and a maximum predicted increase in temperature returning to the units of 0.9°F (from 91.9 to 92.8°F). The higher water temperatures in the system will result in an additional 2-3 million gallons per day (MGD) of evaporation from the canals. Salinity within the CCS is currently approximately twice that of the salinity of Biscayne Bay and is predicted by FPL to increase slightly (by approximately 2-3 parts per thousand) as a result of the uprate project.

6.2.2 Indirect Ground Water and Surface Water Impacts

In 1972, a ground water monitoring Agreement between the SFWMD and FPL was executed for the purpose of insuring that the cooling water within the CCS did not impact potable portions of the Biscayne aquifer to the west of the system. Over the years, the number of monitoring wells and monitoring frequencies has been reduced for this program based on indications that the interceptor ditch was functioning as designed. Monitoring to the east, south and north of the CCS occurred between 1972 and 1976 as a result of a federal lawsuit between the U.S. EPA and FPL.

FPL is currently modeling the exchange of saline water between the cooling canals, Biscayne aquifer and Biscayne Bay using available monitoring data and 2-dimensional ground water modeling. In its agency report, the SFWMD pointed out that it is working on a number of restoration activities through the Comprehensive Everglades Restoration Plan Biscayne Bay Coastal Wetlands Project and have concerns related to potential secondary impacts on both the Biscayne aquifer and Biscayne Bay. The District further indicated that the FPL modeling efforts may be insufficient due to limited data and outdated monitoring network design. Miami-Dade County has also expressed concerns regarding potential ground water impacts from the CCS and consistency of the project with the Comprehensive Everglades Restoration Project.

Both SFWMD and Miami-Dade County have recommended that FPL be required to conduct revised monitoring and analysis utilizing a more modernized approach as a condition of certification for the project. The SFWMD has also suggested the incorporation of baseline data collected prior to implementation of the uprate project.

Biscayne Bay Aquatic Preserve is managed by staff in the Miami office of the DEP's Office of Coastal and Aquatic Managed Areas (CAMA). Biscayne Bay Aquatic Preserve staff are concerned that there is a lack of water quality data to evaluate any potential flow from the cooling canals through groundwater to the surface waters of Biscayne Bay. Degradation of water quality is not permitted by 62-302.700 (1), F.A.C. CAMA has also proposed a requirement for additional monitoring to evaluate potential impacts of the CCS on Biscayne Bay.

6.3 Impacts On Threatened Or Endangered Species

According to the applicant, "adverse impacts to ecological habitat or resources, or threatened or endangered species are not expected as a result of the construction of the project". Additionally, "effects of operation of the project upon aquatic biota in the closed cooling canal system are expected to be negligible".

Due to the highly disturbed nature of the plant area immediately surrounding Units 3 & 4, FPL reported no listed species occurrence within that area. However, the areas surrounding the developed portions of the Turkey Point Plant are able to support a wide variety of plant and animal species.

Several protected bird species were observed in the mangrove habitat adjacent to the site during a 2007 field reconnaissance including the following: white ibis, snowy egret, little blue heron, roseate spoonbill, and tricolored heron. Several wood storks were observed approximately 0.5 miles to the west of the site. Other listed species known to occur in the Biscayne National Park include the peregrine falcon, mangrove rivulus, limpkin, American oystercatcher, least tern, brown pelican, and bald eagle. FPL's review of the Florida Natural Area Inventory (FNAI) database identified occurrences of the Eastern indigo snake, least turns, and the American alligator within the Turkey Point Plant boundaries. There have been small congregations of manatees observed within a system of canals accessible from the Bay and located along the south side of the CCS. Threatened or endangered plants associated with tidal mangrove flats include the giant wild-pine, banded wild-pine, and powdery strap airplant.

In addition to the above listed species information, the CCS and adjacent canals lie within the area designated as critical habitat for the American crocodile. According to FPL, adult crocodiles were first observed at Turkey Point in 1976 and nesting was first documented upon the berms within the CCS in 1978. FPL follows a crocodile management plan which focuses on the creation and enhancement of habitat for crocodile nesting, and monitoring of the reproductive success, growth, and survival of hatchlings.

FPL has documented an increase in crocodile nests from 1-2 nests in the late 1970s to 17 known nests in 2003. Hatchlings have increased from 17 hatchlings in the late 1970s to over 300 in 2003, and 316 in 2006. Figure 7 below illustrates the locations of crocodile nests in the cooling canal system from 1978 through 2006.

Both Miami-Dade County and the FWC expressed concerns over the potential negative impacts of increased water temperature and salinity within the cooling CCS on the crocodile population within their agency reports.

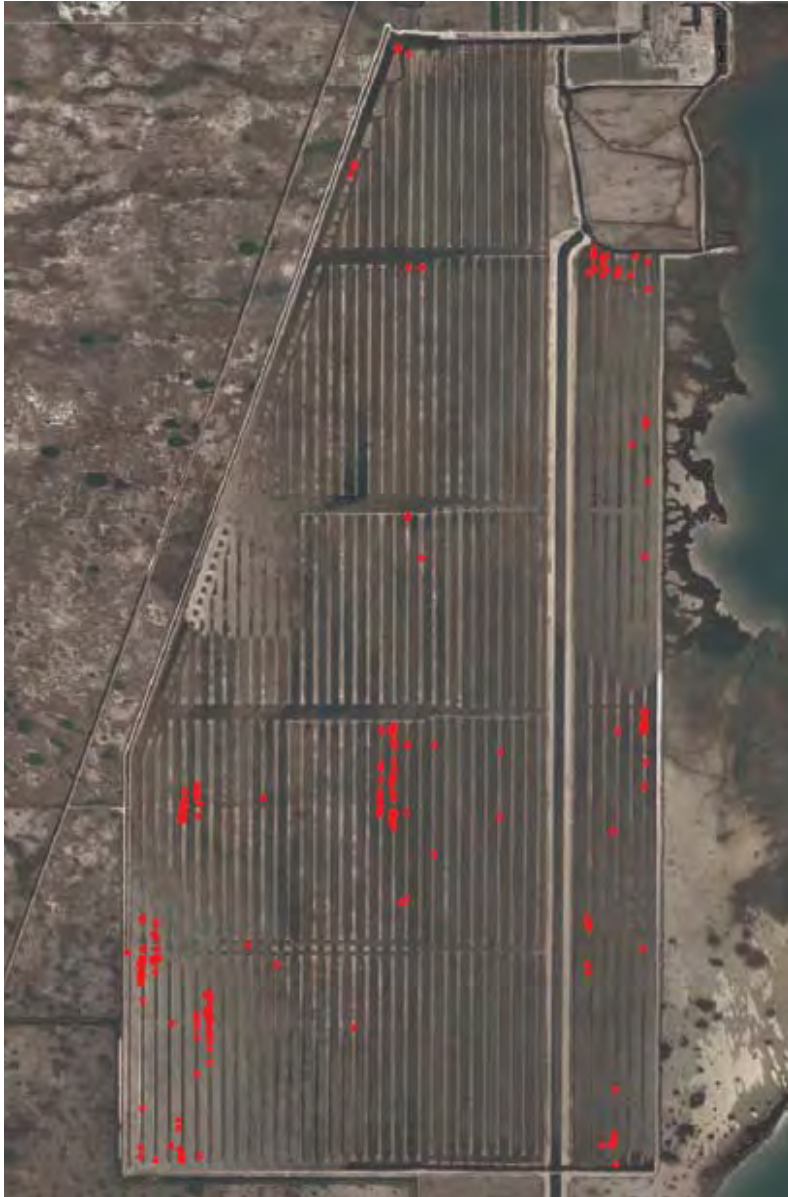


Figure 7. Crocodile Nest Locations 1978-2006 (SCA, Figure 2.3.6-1)

6.4 Archaeological and Historic Sites

According to FPL, there are no known archaeological or historic sites located within the Turkey Point Plant and none will be impacted due to the uprate project or operation of Turkey Point Units 3 and 4. Also, no sites listed or eligible for listing in the National Register of Historic Places are located on the site.

6.5 Impacts on Public Lands

This project occurs on an existing, approved power plant site. The improvements to the power plant will not displace any human populations. According to FPL, the development of the project at this site will not affect cultural resources, landmarks, or sensitive areas.

6.6 Noise Impacts

The application describes an ambient noise-monitoring program previously performed at the Turkey Point Plant. Ambient noise monitoring was performed at nine locations on or near the project site to assess the existing ambient noise levels.

Miami-Dade County currently operates under a “nuisance” noise ordinance. According to the applicant, the maximum expected impacts noise from construction are less than or equal to existing ambient conditions. Therefore the construction activities associated with the Turkey Point uprate project will not change the character of observed levels in the vicinity of the plant.

6.8 Construction and Operational Safeguards

As outlined in the application, construction procedures to minimize fugitive dust emissions will be implemented. Much of the area that will be used for construction parking and laydown are paved areas which will minimize fugitive dust emissions during construction. Due to the existing nature of the Turkey Point Plant, much of the construction during the uprate project will not have significant impacts on the surrounding area. Compliance with OSHA standards and the provisions of Section 440.56, F.S. should adequately protect construction workers and operating personnel.

7.0 COMPLIANCE AND VARIANCES

At the time of this report there were no known outstanding violations of any DEP state regulations. As currently designed, the operation of the Turkey Point Plant, including Unit 3 and Unit 4, will not contribute to a violation of air or water quality standards. No variances to non-procedural regulations of reviewing agencies would be necessary to implement the construction and operation of Turkey Point Units 3 and 4 and related facilities.

At the time of this report, the Turkey Point Plant was in full compliance with the NRC operating license. A summary of Reactor Oversight Process (ROP) Inspection Findings can be found on the NRC’s website: http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/pim_summary.html. Additionally, there have been no radiological monitoring significant findings for this facility.

8.0 CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

8.1.1 Construction Impacts

Construction of the proposed facilities necessary to implement the uprate project would have the following impacts:

- 1) The Turkey Point nuclear plant occupies approximately 30 acres including two pressurized water reactor nuclear units, intake and discharge canals, spent-fuel storage facilities, and other associated facilities. The uprate activities will occur on previously disturbed areas of the site. There will be no direct environmental impacts due to construction related activities of the uprate project.
- 2) According to the applicant, the Turkey Point project will provide economic benefits for Miami-Dade County. The project will provide up to 1,400 construction jobs during peak construction-related activities and a total construction cost for labor of an estimated \$308 million.

- 3) No new entrance roads will be constructed for the project. Based on the applicant's analysis, traffic generated by the construction of the project remains within Miami-Dade County's Traffic Concurrency Standards.

8.1.2 Operational Impacts

- 1) Completion of the Turkey Point uprate project will increase the use of the facility.
- 2) No new sources of air pollutions or increases in existing air emissions will result from the project.
- 3) No new direct water discharges will result from the project. There is a potential for indirect impacts to ground and surface water due to the project. Specific requirements for monitoring and quantifying these potential impacts have been added as proposed Conditions of this Certification.

8.1.3 Agency Conclusions

The following table includes the recommendations of approval or denial from each of the affected agencies.

Table 2. Agency Recommendations

AGENCY	APPROVAL	DENIAL
PSC	√	
DCA	√	
SFWMD	√	
Miami-Dade County	√	
FWC	√	
SFRPC	--	--
DOT	√	
DEP	√	

- 1) The Public Service Commission determined there is a specific need for the project
- 2) The Department of Community Affairs recommends approval of the project.
- 3) The South Florida Water Management District has concerns regarding potential impacts to ground and surface water and recommends approval subject to proposed Conditions of Certification.
- 4) Miami-Dade County determined that the Turkey Point project is consistent with and in compliance with the county's land use plans and zoning ordinances. The County also had concerns regarding potential impacts to ground and surface water. Approval of the project was recommended subject to proposed Conditions of Certification.
- 5) The Fish and Wildlife Conservation Commission approved the Turkey Point project subject to Conditions.

- 6) The South Florida Regional Planning Council recommended neither approval nor denial of the project.
- 7) The DOT recommended certification based on the contention that the applicant would meet all of their recommended conditions of certification.
- 8) Based on the project's design, the Department of Environmental Protection has reasonable assurance that Turkey Point Unit 3 and Unit 4 will be able to comply with applicable agency standards and criteria as long as compliance with the proposed Conditions of Certification (attached as Appendix I) is achieved.

8.2 Recommendation

The Department's recommendation is, at least in part, based upon recommendations included in the agencies' reports required by 403.507(2)(a), F.S. Neither the failure of any agency to submit a report nor the inadequacy of a report, are grounds to deny or condition certification. (403.507(6), F.S.)

If Florida Power & Light Company as the applicant agrees to abide by the conditions of certification, attached and incorporated herein, the Department would recommend certification of the Turkey Point Plant Unit 3 and Unit 4.

DONE AND ISSUED this 10th day of September 2008, at Tallahassee



Michael P. Halpin, P.E.

Siting Program Manager