

# Memorandum



**Date:** March 7, 2016

**To:** Honorable Chairman Jean Monestime  
and Members, Board of County Commissioners

**From:** Carlos A. Gimenez  
Mayor

A handwritten signature in blue ink, appearing to read "Carlos A. Gimenez", written over the printed name of the Mayor.

**Subject:** Report on Recent Biscayne Bay Water Quality Observations associated with Florida  
Power and Light Turkey Point Cooling Canal System Operations – Directive 152884

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The following is provided to the Board of County Commissioners (Board) pursuant to a request by Commissioner Levine Cava at the December 15, 2015 Board meeting for a report regarding preliminary information on water quality impacts to Biscayne Bay associated with operations of the Florida Power and Light Turkey Point Power Plant Cooling Canal System.

If you have any questions or concerns, please contact Lee N. Hefty, Assistant Director, Division of Environmental Resources Management, Department of Regulatory and Economic Resources, at (305)372-6754 or at [heftyl@miamidade.gov](mailto:heftyl@miamidade.gov).

## Attachment

- c: Abigail Price-Williams, County Attorney  
Office of the Mayor Senior Staff
- Lourdes M. Gomez, Deputy Director, Department of Regulatory and Economic Resources
- Lee N. Hefty, Assistant Director, Environmental Resources Management, Department of  
Regulatory and Economic Resources
- Charles Anderson, Commission Auditor
- Eugene Love, Agenda Coordinator

**Report on Recent Biscayne Bay Water Quality Observations  
associated with  
FPL Turkey Point Cooling Canal System Operations**

**Background**

FPL owns and operates a Cooling Canal System consisting of an approximately 5,900 acre network of unlined canals at the Turkey Point Power Plant. The Cooling Canal System was constructed in the early 1970s and serves as Turkey Point's Industrial Waste Water Treatment Facility. In that function, the Cooling Canal System serves as the heat sink for the power plant and it also receives industrial waste water discharges from plant operations. The Cooling Canal System water removes excess heat from power plant operations and is then returned to the Cooling Canal System where it cools by evaporation. As a result of the evaporation process, chemical constituents in cooling canal water such as dissolved salts become more concentrated. Historical data indicate that initial salinity (dissolved salts) levels in the Cooling Canal System in 1973 were less than 30 practical salinity units and were lower than levels typical of marine waters such as Biscayne Bay. However, long term monitoring data indicate that water quality within the Cooling Canal System has deteriorated over time. The Cooling Canal System is a "closed loop" system because it is not directly connected to adjoining surface waters. However, the porous geology of the underlying Biscayne Aquifer allows water from the Cooling Canal System to move freely through the ground beyond the limits of the Cooling Canal System and beyond the property boundaries of the Turkey Point Power Plant. This creates concerns with potential impacts of the poorer quality Cooling Canal System water reaching sensitive water resources beyond the boundaries of the Cooling Canal System.

**History**

In October 2008, FPL received approval from the State of Florida to modify the existing nuclear power plant units to increase their power generating capacity (referred to as an "Uprate" or the "Uprate project"). As a condition of that approval, FPL implemented an enhanced monitoring plan to evaluate the potential water quality impacts associated with implementation of the Uprate and the Cooling Canal System. Following commencement of construction on the power plant uprate work at Turkey Point in early 2012, water quality in the Cooling Canal System further deteriorated ultimately affecting the heat exchange capacity of the water in the Cooling Canal System. By the summer of 2014, salinity levels in the Cooling Canal System had reached a record high of more than 100 practical salinity units, which is approximately three (3) times the salinity levels typical for Biscayne Bay. In addition, intake water temperature in the Cooling Canal System had exceeded the federal operating license criteria of 100 degrees Fahrenheit, reaching nearly 102 degrees Fahrenheit and requiring FPL to seek and obtain approval from the Nuclear Regulatory Commission for a new intake operating temperature limit of 104 degrees Fahrenheit.

In order to address emerging operational concerns with the Cooling Canal System, FPL proposed to improve water quality by pumping additional water into the Cooling Canal System. Under this approach, FPL sought approval for use of water from the L-31E Canal as a temporary source of freshwater to improve water quality in the Cooling Canal System. In August 2014, the South Florida Water Management District issued an Emergency Order to FPL authorizing the temporary installation of pipelines and associated equipment to transfer water from the L-31E Canal to the Cooling Canal System to moderate the unusually high temperatures and salinity in the Cooling Canal System. In September 2014, the Board of County Commissioners (Board) approved Class I permit application CLI-2014-0312 authorizing 0.24 acres of temporary impacts to halophytic (salt tolerant) wetlands for the temporary installation of two, 36-inch above ground pipelines to facilitate the transfer of water from the L-31E Canal to the Cooling Canal System in an attempt to address the higher salinity and higher



temperatures in the Cooling Canal System. As a condition of the approval and pursuant to the Class I permit, the temporary pumping activities ceased October 15, 2014, and the pipes were removed.

Monitoring data indicates that the Cooling Canal System salinity and temperature began to temporarily improve in late summer of 2014 with salinity decreasing to near 60 practical salinity units by October of that year. However, salinity and temperature began to increase over the winter months and early spring of 2015. FPL subsequently sought approval to reinstall the pipes to again convey water from the L31E into the Cooling Canal System. In April 2015, the South Florida Water Management District issued a Final Order to FPL, authorizing the temporary pump installation and water withdrawal from the L-31E Canal as a temporary measure to occur June 1 through November 30, 2015, and June 1 through November 30, 2016. The Final Order required that the state-mandated daily water reservation for Biscayne Bay (504 acre feet/day) be achieved prior to FPL's use of water from the L31E.

In May 2015, the Board approved a modification to the Class I permit to authorize reinstallation of the pipelines in wetlands to facilitate an additional period of water transfer from the L-31E to the Cooling Canal System, but the Board approval limited the authorized time period to one (1) season from May 26, 2015 through January 1, 2016. As a result, the Class I permit required that the pipelines be removed by January 1, 2016. In addition, the permit required that additional water quality monitoring stations be established to further evaluate any potential impact associated with pumping additional water into the Cooling Canal System, and the permit required that FPL develop a long term plan to address water quality issues associated with the Cooling Canal System. By December 2015, salinity levels in the Cooling Canal System decreased to 34 practical salinity units following the pumping of additional water from the L31E and unusually heavy rain. FPL requested a second modification to the Class I permit in November 2015 to allow the pipes to remain in wetlands through May 2016, but not allow use of the pipes for pumping water from the L31E during that timeframe. The request would allow the pipelines to remain in wetlands over the winter months while FPL evaluated emerging water quality data and considered the need for use of the pipelines for pumping additional water during the summer of 2016. The Board approved the modification request allowing the pipes to remain until May 31, 2016, during such time when pumping of water from the L31E is not authorized. It should be noted that FPL will need further approval from the Board for the pipelines to remain beyond the May 31, 2016 date and for use of the pipelines to pump any additional water from the L31E Canal into the Cooling Canal System.

#### **Impact on Biscayne Bay**

As noted above, long term monitoring data indicate that water quality within the Cooling Canal System has deteriorated over time (Attachment A). Due to the porous nature of the Biscayne Aquifer underlying the Cooling Canal System, a hyper-saline plume of Cooling Canal System water has migrated outside the boundaries of the Cooling Canal System through the groundwater and has moved beyond the boundaries of the Turkey Point facility property. Pursuant to Florida law, the siting and permitting of power plants are reviewed and approved by the State under the Power Plant Siting Act. In its role as an affected agency, Miami-Dade County participated in the State's Power Plant Siting Act process and provided comments to the state on conditions of certification for the Uprate Project at Turkey Point. The Power Plant Siting Act certification for the Uprate Project includes a condition that requires FPL to take additional measures if the State concludes the project is causing harm to waters of the State or exceeding State or County water quality standards. Following review of monitoring data from the uprate monitoring program, County staff advised the State of concerns with water quality impacts associated with the Cooling Canal System and of impacts to water resources of the County and the State. On December 23, 2014, the State of Florida Department of Environmental Protection issued an Administrative Order to FPL regarding water quality issues



associated with the Cooling Canal System. However, County staff did not agree that the Administrative Order adequately addressed concerns related to these impacts. Therefore, on February 9, 2015, Miami-Dade County filed an objection to the Administrative Order and requested an administrative hearing on the matter. In addition, County staff advised FPL of the County's intention to pursue corrective action under Miami-Dade County's own regulatory authority.

On October 2, 2015, the Division of Environmental Resources Management (DERM) within the Department of Regulatory and Economic Resources issued FPL a Notice of Violation and Notice for Corrective Action for violations of the County's water quality standards for chloride in groundwater outside of the Cooling Canal System and beyond the boundaries of the property (Attachment B). FPL expressed a willingness to address the County's concerns by implementing corrective actions, and DERM and FPL met to discuss required actions. On October 7, 2015, FPL entered into a Consent Agreement with Miami-Dade County (Attachment C). The Consent Agreement includes components of a long term plan for FPL to address water quality issues associated with the Cooling Canal System. The Consent Agreement requires FPL to implement actions to abate water quality within the Cooling Canal System to reduce the threat the system poses to adjoining water resources. To address this issue, FPL proposes to use water from wells constructed into the Florida Aquifer to supply water to the Cooling Canal System to control salinity that would otherwise continue to increase due to evaporation. In addition, the Consent Agreement requires FPL to remediate water quality impacts of the hyper-saline plume that has migrated landward outside the boundaries of the property. To address this issue, FPL is obligated under the Consent Agreement to design and construct a network of groundwater extraction wells along the landward boundary of the facility to capture, contain, and retract the hyper-saline plume. The wells will extract hyper-saline water from the surficial Biscayne Aquifer and dispose of it via deep well injection into the boulder zone of the Floridan Aquifer. Other components of the Consent Agreement require FPL to: a) evaluate other sources of water to control salinity in the Cooling Canal System including the use of reuse water from the County's South District Waste Water Treatment Plant; b) evaluate existing operations of the Cooling Canal System Interceptor Ditch originally implemented to control the westward migration of saline water from the Cooling Canal System to identify improvements or alternatives; c) modify water management operations at their neighboring FPL-owned Everglades Mitigation Bank to minimize overdrainage of the basin, which is under existing pressure of salt intrusion exacerbated by the westward migration of the hyper-saline Cooling Canal System groundwater plume; d) provide flowage easements to the South Florida Water Management District if required; and e) agree to work cooperatively with agencies involved in regional restoration efforts related to the Comprehensive Everglades Restoration Plan Biscayne Bay Coastal Wetlands Project and other hydrologic improvement projects. FPL is presently implementing the requirements of the Consent Agreement.

As previously stated, monitoring data indicate that a hyper-saline groundwater plume originating from the Cooling Canal System has migrated landward and is impacting water quality. Factors that affect movement of Cooling Canal System water and the groundwater plume include water elevation (or stage) in the areas surrounding the Cooling Canal System, the stage of the water in the Cooling Canal System, and the density of the various water segments. In addition to the existing water quality monitoring network associated with previous State and County approvals (and due to concerns with potential offsite migration of Cooling Canal System water as a result of pumping additional water from the L31E Canal and other sources into the Cooling Canal System), the modified Class I permit required that additional monitoring stations be established. In particular, the permit required that FPL establish water quality monitoring stations immediately adjacent to the Cooling Canal System in surface waters tidally connected to Biscayne Bay. Additional surface water stations were established in June 2015.



Monitoring data from these stations has documented changes in water quality over several months since the sampling began. In particular, the data indicate that concentrations of nutrients such as phosphorous and ammonia began to increase in September 2015 and continued to increase over the next few months. For example, data results for ammonia at station TPBBSW-7B were below the County's water quality standard of 0.5 milligrams per liter during initial sampling from early June through late August 2015, but these values increased to as much as 3.29 milligrams per liter by December 2015. Elevated levels of phosphorous were also detected in excess of the state numeric nutrient criteria of seven (7) parts per billion with results typically ranging from three (3) to 230 parts per billion with one (1) result as high as 893 parts per billion. Other sample results included higher than normal salinities and temperatures, as well as higher than expected levels for chlorophyll, which can be an indication of algal blooms. The data indicate that the observed increases coincide with increases in the water stage within the Cooling Canal System (Attachment D). It should be noted that unusually heavy localized rain in the fall of 2015, combined with FPL's pumping of additional water from the L-31E Canal, as well as additional water associated with operation of the Cooling Canal System Interceptor Ditch pumping lead to record high water stage in the Cooling Canal System in December 2015 (Attachment E). This record high water stage in the Cooling Canal System would be expected to result in increased seepage of water from the Cooling Canal System into surrounding ground waters and perhaps surface waters.

In late December 2015/early January 2016, DERM staff conducted a special sampling event jointly with FPL to further evaluate and confirm these earlier findings. Because the existing stations are sampled at the bottom of the water column, additional water samples were also collected at multiple depths at each station to better evaluate the potential influence of groundwater on surface water at these sites. In addition to resampling the existing stations, additional locations with similar site characteristics were also sampled in the vicinity of the Cooling Canal System. These stations are characterized by being deeper dredged areas located near the Cooling Canal System. Water depths at these sites are as much as 24 feet deep in some areas. It is likely that the groundwater plume associated with the Cooling Canal System is intersecting these deeper areas. As part of this sampling effort, DERM also collected surface water samples for tritium analysis. Tritium is an isotope of hydrogen that is frequently associated with the operation of nuclear power plants. Water in the Cooling Canal System has higher levels of tritium than levels found naturally in the environment and tritium is therefore being used as a tracer to track the movement of Cooling Canal System water in this area. Over the past five-year period, tritium levels in the Cooling Canal System typically ranged between 1,200 and 16,500 picocuries (measurement of radioactive elements) per liter (pCi/L), while levels for tritium in the surface waters of Biscayne Bay were typically less than 20 pCi/L.

Data results from the special sampling event confirmed earlier results showing elevated levels of nutrients at these stations as well as at other similar deeper areas located in the vicinity of the Cooling Canal System. Data results indicate that surface water quality at these sites is stratified with better water quality at the surface and decreasing water quality with increasing depth. Although most stations met County water quality standards for ammonia at the surface, nearly all of these stations exceeded the County's water quality standard for ammonia at the bottom with results typically ranging between 1.3 to 2.6 milligrams per liter with one (1) sample result as high as 9.5 milligrams per liter. Results for tritium were also stratified through the water column based on sample depth, however all samples were higher than background levels typical for Biscayne Bay. Most notably, tritium results for bottom samples at locations nearest to the Cooling Canal System ranged from 2,652 to 4,317 pCi/L. The results for tritium provide the most compelling evidence that water originating from the Cooling Canal System is reaching these tidal surface waters connected to Biscayne Bay.

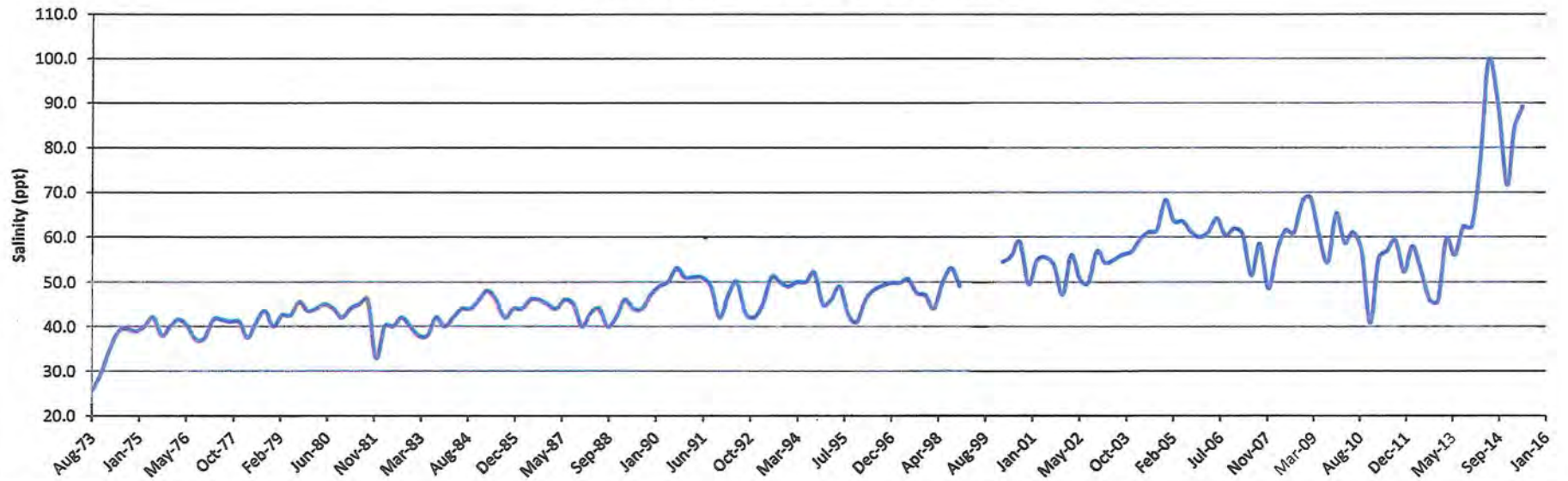
In summary, water from the Cooling Canal System is migrating outside the boundaries of the Cooling Canal System away from the Turkey Point facility property with impacts measured in both surface and groundwater. FPL is required to implement provisions of the Consent Agreement to address the landward migration of the hyper-saline plume. However, further evaluation and action is needed to address the recent discovery of impacts to surface waters tidally connected to Biscayne Bay. This includes further evaluation of the relationship between the Cooling Canal System and its associated groundwater plume and impacts to tidally connected surface waters. In response to the recent data, FPL is performing additional modeling to further review the Cooling Canal System and groundwater flux under various water stage scenarios. The outcome of this effort will be needed to inform and refine FPL's long term plan for managing water quality in the Cooling Canal System through the addition of other water sources. DERM will continue to pursue resolution of these issues through provisions of the existing Consent Agreement or through a subsequent enforcement action.

Attachments: Attachment A: Graph Historical Data for CCS  
Attachment B: Notice of Violation  
Attachment C: Consent Agreement  
Attachment D: Graph Increasing Ammonia in Tidal Surface Water  
Attachment E: Cooling Canal System Water Level and Water Inputs



**Turkey Point Power Plant Cooling Canal System Maximum Quarterly Salinity****September 1973 to June 2015**

(Data source: FPL0001562 NPDES Permit Monitoring)



## ATTACHMENT B



Carlos A. Gimenez, Mayor

Department of Regulatory and Economic Resources  
Environmental Resources Management  
701 NW 1st Court, 6th Floor  
Miami, Florida 33136-3912  
T 305-372-6902 F 305-372-6630

miamidade.gov

October 2, 2015

Randall R. LaBauve, Vice President  
Environmental Services  
NextEra Energy, Inc.  
700 Universe Blvd.  
Juno Beach, Florida 33408

Certified Mail No. 7009 0080 0000 1050 7878  
Return Receipt Requested

Eric E. Silagy, President  
Florida Power & Light Company  
700 Universe Blvd.  
Juno Beach, Florida 33408

Certified Mail No. 7009 0080 0000 1050 7861  
Return Receipt Requested

Re: FPL Turkey Point power plant facility located at, near or in the vicinity of 9700 SW 344 Street, Unincorporated, Miami-Dade County, Florida.

### NOTICE OF VIOLATION AND ORDERS FOR CORRECTIVE ACTION

Dear Messrs. LaBauve and Silagy:

Miami-Dade County Department of Regulatory and Economic Resources, Division of Environmental Resources Management (DERM) has reviewed data submitted in monitoring reports related to the Florida Power & Light (FPL) power plant at Turkey Point. This review revealed levels of chloride in samples collected from groundwater monitoring wells, including but not limited to TPGW-L3, TPGW-L5, TPGW-1 and TPGW-12. These wells are located outside of the FPL Cooling Canal System (CCS) and beyond the boundaries of the property. The chloride levels constitute violations of the water quality standards in Section 24-42(4) of the Code of Miami-Dade County.

In addition, these elevated chloride levels exceed the applicable groundwater clean-up target level set forth in Section 24-44 and therefore constitute water pollution as defined in Section 24-5. On September 26, 2012, the South Florida Water Management District identified tritium as the tracer for determining the presence of CCS water. A review of tritium data shows that the groundwater originating from the CCS has expanded beyond FPL property boundaries. Based on the foregoing information, DERM maintains that hypersaline water attributable to FPL exists in the groundwater outside the CCS and outside the property boundaries.

Be advised that the above constitutes violations of Chapter 24 of the Code of Miami-Dade County, specifically:

Section 24-42(3), of said Ordinance, inasmuch as it shall be unlawful for any person to dewater or to discharge sewage, industrial wastes, cooling water and solid wastes, or any other wastes into the waters of this County, including but not limited to surface water, tidal salt water estuaries, or ground water in such quantities, and of such characteristics as may cause the receiving waters, after mixing with the waste streams, to be of poorer quality than the water quality standards set forth in Section 24-42(4), or cause water pollution as defined in Section 24-5 or cause a nuisance or sanitary nuisance as herein defined and

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October 2, 2015

Section 24-42(4), of said Ordinance, inasmuch as it shall be unlawful for any person to breach the values set forth within this section.

This Notice is to advise FPL of violations of the Code of Miami-Dade County attributable to the Turkey Point power plant and, as discussed, to seek an agreement which will provide a vehicle to correct said violations.

Based on the above and pursuant to the authority granted to me under Chapter 24, of the Code of Miami-Dade County, I am hereby ordering you to:

1. Upon receipt of this NOTICE, take immediate action to address water quality violations or water pollution which is in violation of Chapter 24 of the Code of Miami-Dade County.
2. In order to resolve the violations outlined above, the Department will at this time, provide you with the opportunity to enter into an *Administrative Consent Agreement* within **thirty (30) days** of receipt of this correspondence. If you choose to enter into an agreement you must notify the undersigned within **ten (10) days** of receipt of this Notice.

Any person aggrieved by any action or decision of the DERM Director, may appeal said action or decision to the Environmental Quality Control Board (EQCB) by filing a written notice of appeal along with submittal of the applicable fee, to the Code Coordination and Public Hearings Section of DERM within fifteen (15) days of the date of the action or decision by DERM.

If you have any questions concerning the above, please contact me at 305-372-6514 or email [brownb@miamidade.gov](mailto:brownb@miamidade.gov).

Sincerely,



Barbara Brown  
Code Enforcement Officer  
Regulatory Service

cc: Mike Kiley, Site Vice President  
Florida Power & Light Company  
Turkey Point Nuclear Power Plant  
9760 SW 344 Street  
Homestead, Florida 33035

Certified Mail No. 7009 0080 0000 1050 7854  
Return Receipt Requested

## ATTACHMENT C

MIAMI-DADE COUNTY, through its  
DEPARTMENT OF REGULATORY AND  
ECONOMIC RESOURCES, DIVISION OF  
ENVIRONMENTAL RESOURCES  
MANAGEMENT,

Complainant,

v.

FLORIDA POWER & LIGHT COMPANY,

Respondent.

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### CONSENT AGREEMENT

This Consent Agreement, entered into by and between the Complainant, MIAMI-DADE COUNTY, through its DEPARTMENT OF REGULATORY AND ECONOMIC RESOURCES, DIVISION OF ENVIRONMENTAL RESOURCES MANAGEMENT ("DERM"), and the Respondent FLORIDA POWER & LIGHT COMPANY ("FPL"), pursuant to Section 24-7(15)(c) of the Code of Miami-Dade County, shall serve to redress alleged violations of Chapter 24 of the Code of Miami-Dade County located near, surrounding, or in the vicinity of the Cooling Canal System located at Turkey Point on FPL's property, as further described herein, in Miami-Dade County, Florida.

DERM and FPL enter into the following Consent Agreement:

#### FINDINGS OF FACT

1. DERM is a division of Miami-Dade County, a political subdivision of the State of Florida, which is empowered to control and prohibit pollution and protect the environment within Miami-Dade County pursuant to Article VIII, Section 6 of the Florida Constitution, the Miami-Dade County Home Rule Charter and Section 403.182 of the Florida Statutes.
2. Florida Power & Light Company ("FPL") is the owner and operator of the Turkey Point Power Plant, and FPL is the owner and operator of approximately a 5,900-acre network of unlined canals (the "Cooling Canal System" or "CCS") on the FPL property described in the map in Exhibit A (the "Property").



3. In 1971, FPL signed a Consent Decree with the U.S. Department of Justice that required the construction, after permitting, of a closed-loop cooling configuration, with no discharge to surface waters.
4. The Florida Department of Pollution Control (later to become the Florida Department of Environmental Protection), in 1971, issued Construction Permit No. IC-1286 for the CCS. In 1972, Dade County issued Zoning Use Permit No. W-49833 for the excavation of the proposed Alternate Cooling Water Return Canal. FPL represents that in 1973, the construction of the CCS was completed; and the CCS was closed from the surface waters of both Biscayne Bay and Card Sound, becoming a closed-loop system.
5. An approximate 18 foot deep interceptor ditch located along the west side of the CCS was designed and constructed to create a hydraulic barrier to keep water in the CCS from migrating inland or westward.
6. In 1972, FPL entered into an agreement with the Central and Southern Florida Flood Control District (later to become the South Florida Water Management District or "District") addressing the operations and impacts of the CCS. The agreement has been updated several times, with the most recent version being the Fifth Supplemental Agreement between the District and FPL entered into on October 16, 2009 ("Fifth Supplemental Agreement") which included an extensive monitoring program for the CCS, entitled the Turkey Point Plant Groundwater, Surface Water and Ecological Monitoring Plan ("2009 Monitoring Plan"), incorporated as Exhibit A of the Fifth Supplemental Agreement.
7. In a letter dated April 16, 2013, the District notified FPL of their determination that saline water from the CCS has moved westward of the L-31E Canal in excess of those amounts that would have occurred without the existence of the CCS, and pursuant to the provisions of the Fifth Supplemental Agreement, initiated consultation with FPL for the mitigation, abatement or remediation of the saline water movement.
8. DERM issued a Notice of Violation dated October 2, 2015 (the "NOV") to FPL, alleging violations of Chapter 24 of the Code of Miami-Dade County, for alleged violations of County water quality standards and criteria in groundwater attributable to FPL's actions, and specifically for groundwaters outside the boundaries of FPL's Cooling Canal System and beyond the boundaries of the Property.

9. The phrase "hypersaline water" as used herein is defined as water that exceeds 19,000 mg/L chlorides.
10. DERM maintains there is hypersaline water attributable to FPL's actions in the groundwaters outside the boundaries of the Property, which exceeds County water quality standards and criteria. FPL acknowledges the presence of hypersaline water in certain areas outside the boundaries of the Property. For waters that do not reach the level of hypersalinity, DERM and FPL do not agree on the applicable "background" standards for chlorides.
11. In 2013 and 2014, FPL experienced water quality issues within the CCS, including increases in temperature and salinity, and FPL sought approvals from various regulatory agencies for actions to improve the water quality within the CCS.
12. DEP issued an Administrative Order, No. 14-0741, on December 23, 2014, requiring FPL to, among other things, reduce and maintain the annual average salinity of the CCS at a practical salinity of 34, and that Administrative Order is currently the subject of an Administrative Hearing.
13. Both DERM and FPL agree and acknowledge that it would be beneficial to improve the water quality within the Cooling Canal System itself, and FPL has already undertaken some efforts to improve the CCS water quality.
14. This Consent Agreement requires FPL to take action to address the County's alleged violations of County water quality standards and criteria in groundwaters outside the CCS as described in the NOV. As part of these actions, this Consent Agreement also requires FPL to take into account its efforts to improve CCS water quality and the potential and actual impacts of such actions on water resources outside the CCS, to not cause or contribute to (i) the exacerbation of alleged violations of County water quality standards or criteria or (ii) future violations of County water quality standards or criteria in the groundwaters or surface waters outside the CCS.
15. FPL hereby agrees to the terms of this Consent Agreement without admitting the allegations made by the above-mentioned NOV.



16. In an effort to expeditiously resolve this matter and to ensure compliance with Chapter 24 of the Code of Miami-Dade County, and to avoid time consuming and costly litigation, the parties hereto agree to the following, and it is ORDERED:

#### REQUIREMENTS

17. FPL shall undertake the following activities to specifically address water quality impacts associated with the CCS, as alleged in the NOV. The objective of this Consent Agreement will be for FPL to demonstrate a statistically valid reduction in the salt mass and volumetric extent of hypersaline water (as represented by chloride concentrations above 19,000 mg/L) in groundwater west and north of FPL's property without creating adverse environmental impacts. A further objective of this Consent Agreement is to reduce the rate of, and, as an ultimate goal, arrest migration of hypersaline groundwater. Recognizing other factors beyond FPL's control may influence movement of groundwater in the surficial aquifer, FPL shall reasonably take into account such factors when developing and implementing remedial actions to minimize the timeframe for achieving compliance with this Consent Agreement.

a. Abatement.

- i. DERM acknowledges that FPL is planning to undertake the following:

1. pursue permitting, construction and operation of up to six Upper Floridan Aquifer System wells in accordance with the Site Certification Modification that is the subject of DOAH Case No. 15-1559EPP.
2. continue the use of the existing marine wells (SW-1, SW-2, and PW-1) as a short term resource to lower and maintain salinities. FPL shall work to avoid the use of the marine wells, except under extraordinary circumstances.
3. continue operation of the authorized L-31E canal pumps as a short term resource only, in accordance with the terms and conditions of the applicable approvals. FPL acknowledges that the use of water from the L-31E canal is intended only as a short term resource to lower CCS salinity. FPL anticipates the need for this resource for the next two years to reduce salinity as it transitions into the long term resources that are intended to maintain the lower salinity in the CCS. FPL acknowledges that additional regulatory

approvals will be required for continuation of this activity beyond the expiration of the existing approvals.

ii. FPL shall evaluate alternative water sources to offset the CCS water deficit and reduce chloride concentration in the CCS, and as a means of abating the westward movement of CCS groundwater. FPL will consider the practicality and appropriateness of using reclaimed wastewater from the Miami-Dade County South District Waste Water Treatment Plant as an alternative water source. FPL will provide DERM a summary of its Alternative Water Supply plan within 180 days of executing the Consent Agreement. FPL recognizes the importance and potential for reuse water, and FPL will make good faith efforts to implement the use of reuse water where practicable.

iii. FPL shall also conduct a review of the Interceptor Ditch operations to determine if current design and/or operations can be practicably modified to improve its function recognizing the current status of the CCS and surrounding wetlands. FPL will provide a summary of its Interceptor Ditch Review within 180 days of executing the Consent Agreement.

iv. The alternative water sources and any modifications to Interceptor Ditch design or operation shall be authorized through the appropriate regulatory processes and shall be demonstrated to not create adverse impacts to surface waters, groundwater, wetland or other environmental resources consistent with the Fifth Supplemental Agreement.

b. Remediation. FPL shall develop and implement the following actions to intercept, capture, contain, and retract hypersaline groundwater (groundwater with a chloride concentration of greater than 19,000 mg/L) to the Property boundary to achieve the objectives of this Consent Agreement.

i. Phase I. FPL shall design, permit, and construct a Biscayne Aquifer Recovery Well System (RWS) based on the results of a variable density dependent groundwater model which shall be sufficient to support the design of the RWS to intercept, capture, and contain the hypersaline plume; support authorization through the appropriate regulatory processes; and demonstrate that it will not create adverse



impacts to groundwater, wetland (hydroperiod or water-stage), or other environmental resources. Final operation and design will be informed by an Aquifer Performance Test (APT). FPL shall provide its design and supporting information for the Recovery Well System and associated monitoring wells for DERM review and approval within 180 days of executing the Consent Agreement. FPL shall proceed with implementation within one year of executing the Consent Agreement, subject to regulatory timelines not in FPL's control. The initial design will be based on up to 12 MGD disposal capacity recognizing existing on-site capability. Efficacy of this design constraint will be reviewed in Phases 2, 3, and 4.

- ii. Phase 2. FPL shall operate the RWS in accordance with all local, state, and federal regulatory requirements, collect data as required by the monitoring program, and employ the data to inform and reduce the uncertainty of the groundwater model. Status and efficacy of the system operation in meeting the objectives of this Consent Agreement and results of continued groundwater model refinement will be provided in the annual reports required in Paragraph 17d.
- iii. Phase 3. After five years, FPL shall evaluate the effectiveness of the RWS in achieving the goal to intercept, capture, contain, and ultimately retract the hypersaline groundwater plume. This evaluation shall include estimated milestones and be based on the results of the monitoring data and refined groundwater/surfacewater model, which will be submitted to DERM. If the analysis indicates that the RWS is not anticipated to achieve the goal to intercept, capture, contain, and ultimately retract the hypersaline groundwater plume, FPL shall make recommendations for modifications to the project components and/or designs to ensure the ability of the system to achieve the objectives of the Consent Agreement. The evaluation and any proposed revisions shall be submitted to DERM for review and approval.
- iv. Phase 4. After ten years, FPL shall review the results of the activities and progress to achieve the objectives of this Consent Agreement, and this evaluation shall be submitted to DERM. If monitoring demonstrates that the activities are not achieving the objectives of this Consent Agreement, FPL shall revise the project components and/or designs to ensure the ability of the system to achieve the objectives of this

Consent Agreement. The proposed revisions shall be submitted to DERM for review and approval.

c. Regional Hydrologic Improvement Projects. In addition, FPL agrees to undertake the following:

- i. Raise control elevations in the Everglades Mitigation Bank. Within 30 days of the effective date of this Consent Agreement, FPL shall raise the control elevations of the FPL Everglades Mitigation Bank ("EMB") culvert weirs to no lower than 0.2 feet lower than the 2.4 foot trigger of the S-20 structure and shall maintain this elevation. After the first year of operation, FPL shall evaluate the change in control elevation, in regards to improvements in salinity, water quality, and lift in the area, and if FPL determines that the change in control elevations is not effective, or that FPL is negatively impacted in receiving mitigation credits as a result of this action, FPL will consult with DERM and propose potential alternatives.
- ii. Fill portions of the Model Lands North Canal within the Everglades Mitigation Bank. Within 30 days of the effective date of the Consent Agreement, FPL shall seek all necessary regulatory approvals to place excavated fill from the adjoining roadway into the Model Lands North Canal within FPL's Everglades Mitigation Bank. Upon issuance of such regulatory approvals, FPL shall, starting on the east end, fill the Model Lands North Canal. This Consent Agreement only requires FPL to fill to the extent the fill is available from the adjoining roadway permitted to be degraded.
- iii. If the District determines that flowage easements are needed from FPL in order to increase the operational stages of the S-20 water control structure as planned and approved by CERP, FPL agrees to provide such flowage easements for FPL owned land within the Everglades Mitigation Bank, in favor of the District within six months of the determination.
- iv. FPL acknowledges the benefit of hydrologic restoration projects contemplated by the Comprehensive Everglades Restoration Project ("CERP"), as well as other government entities, adjacent and to the west of the CCS in controlling movement of hypersaline and saline waters in the Biscayne Aquifer. FPL commits to working with

local, state and federal agencies to facilitate implementation of these projects to promote improved hydrologic conditions.

d. Monitoring and Reporting. FPL shall conduct monitoring to evaluate the progress made in achieving the objectives of this Consent Agreement. This includes actions that result from satisfying the abatement, remediation and hydrologic improvement components of this Consent Agreement. FPL shall initiate the monitoring and reporting requirements identified below within 30 days of executing the Consent Agreement. The monitoring shall include the following:

- i. FPL shall facilitate DERM access to all data from continuous electronically monitored stations.
- ii. FPL shall continue to provide monthly and quarterly reports substantially consistent with those required in M-D Class I permit CLI-2014-0312, beyond the expiration of the permit.
- iii. FPL shall employ Continuous Surface Electromagnetic Mapping (CSEM) methods to assess the location and orientation of the hypersaline plume west and north of the CCS.
- iv. FPL shall add three groundwater monitoring clusters (shallow, mid and deep) to monitor groundwater conditions in the model lands basin. The well clusters shall be similar in design and function to existing groundwater monitoring wells in the region as part of the CCS monitoring program, and shall be geographically located in consultation with DERM.
- v. FPL shall submit annual reports providing an evaluation of progress in achieving the objectives of this Consent Agreement, status of implementing projects identified above, and the results of monitoring to determine the impacts of these activities. Recommendations for refinements to the activities will be included in the annual report. This may include deletions of monitoring that is demonstrated to no longer be needed, or additional monitoring that is warranted based on observations.



#### SAFETY PRECAUTIONS

18. FPL shall maintain the subject property during the pendency of this Consent Agreement in a manner which shall not pose a hazard or threat to the public at large or the environment and shall not cause a nuisance or sanitary nuisance as set forth in Chapter 24 of the Code of Miami-Dade County, Florida.

#### VIOLATION OF REQUIREMENTS

19. This Consent Agreement constitutes a lawful order of the DERM Director and is enforceable in a civil court of competent jurisdiction. Violation of any requirement of this Consent Agreement may result in enforcement action by DERM. Each violation of any of the terms and conditions of this Consent Agreement by FPL shall constitute a separate offense.

#### SETTLEMENT COSTS

20. FPL hereby certifies that it has the financial ability to comply with the terms and conditions herein and to comply with the payment of settlement costs specified in this Agreement.
21. DERM has determined that due to the administrative costs incurred by DERM for this matter, a settlement of \$30,000.00 is appropriate. FPL shall, within sixty (60) days of the effective date of this Consent Agreement, submit to DERM a check in the amount of \$30,000.00 for full settlement payment. The payment shall be made payable to Miami-Dade County and sent to the Division of Environmental Resources Management, c/o Barbara Brown, 701 NW 1<sup>st</sup> Court, 6<sup>th</sup> Floor, Miami, FL 33136-3912.
22. In the event that FPL fails to submit, modify, implement, obtain, provide, operate and/or complete those items listed in paragraph 17 herein, FPL shall pay DERM a civil penalty of one hundred dollars (\$100.00) per day for each day of non-compliance and FPL may be subject to enforcement action in a court of competent jurisdiction for such failure pursuant to those provisions set forth in Chapter 24 of the Code of Miami-Dade County. Any such payments shall be made by FPL to DERM within ten days of receipt of written notification and shall be sent to the Division of Environmental Resources Management, 701 NW 1<sup>st</sup> Court, 6<sup>th</sup> Floor, Miami, FL 33136-3912.

#### GENERAL PROVISIONS

23. FPL shall allow any duly authorized representative of DERM, with reasonable notification, to enter and inspect the CCS, Floridan wells, extraction wells, or any other relevant facilities, at any reasonable time for the purpose of ascertaining the state of compliance with the terms and conditions of this Consent Agreement. DERM shall comply with the plant safety and security precautions. FPL shall provide and maintain a point of contact at the Turkey Point Power Plant to assist DERM in accessing the facilities to be inspected.
24. On a quarterly basis (January, April, July, and October), DERM may collect surface and/or groundwater samples at the discretion of DERM at various monitoring locations in accordance with monitoring referenced in Paragraph 17 above.
25. FPL and DERM agree to cooperate and use best efforts moving forward related to this Consent Agreement.
26. Disputes related to or arising out of this Consent Agreement shall be construed consistent with the laws of the State of Florida and the United States, as applicable, and shall be filed in the state or federal courts of the State of Florida, as appropriate. Proceedings shall take place exclusively in the Circuit Court for Miami-Dade County, Florida or the United States District Court for the Southern District of Florida.
27. In consideration of the complete and timely performance by FPL of the obligations contained in this Consent Agreement, DERM waives its rights to seek judicial imposition of damages or civil penalties for the matters alleged in Notice of Violation and Consent Agreement.
28. Where FPL cannot meet timetables or conditions due to circumstances beyond FPL's control, FPL shall provide written documentation to DERM which shall substantiate that the cause(s) for delay or non-compliance was not reasonably in FPL's control. DERM shall make a determination of the reasonableness of the delay for the purpose of continued enforcement pursuant to paragraph 22 of this Consent Agreement.
29. DERM expressly reserves the right to initiate appropriate legal action to prevent or prohibit future violations of applicable laws, regulations, and ordinances or the rules promulgated thereunder.

30. Entry of this Consent Agreement does not relieve FPL of the responsibility to comply with applicable federal, state or local laws, regulations, and ordinances.
31. FPL acknowledges that this Consent Agreement is within the jurisdiction of Miami-Dade County. Nothing in this Consent Agreement is intended to expand, nor shall this Consent Agreement be construed to expand, the regulatory authority or jurisdiction of Miami-Dade County.
32. This Consent Agreement shall neither be evidence of a prior violation of this Chapter nor shall it be deemed to impose any limitation upon any investigation or action by DERM in the enforcement of Chapter 24 of the Code of Miami-Dade County.
33. This Consent Agreement shall become effective upon the date of execution by the DERM Director, or the Director's designee.

October 6, 2015

Date



Eric E. Silagy  
President & CEO  
Florida Power & Light Company  
700 Universe Boulevard  
Juno Beach, FL 33408  
Respondent

Before me, the undersigned authority, personally appeared Eric Silagy, who after being duly sworn, deposes and says that they have read and agreed to the foregoing.

Subscribe and sworn to before me this 6<sup>th</sup> day of October, 2015 by

Eric Silagy (name of affiant).



Personally known ✓ or Produced Identification \_\_\_\_\_.  
(Check one)

Type of Identification Produced: \_\_\_\_\_



LISA GROVE  
MY COMMISSION # FF 154741  
EXPIRES: December 14, 2016  
Bonded Thru Budget History Services

Lisa Grove  
Notary Public Signature

Lisa Grove  
Notary Public Printed Name

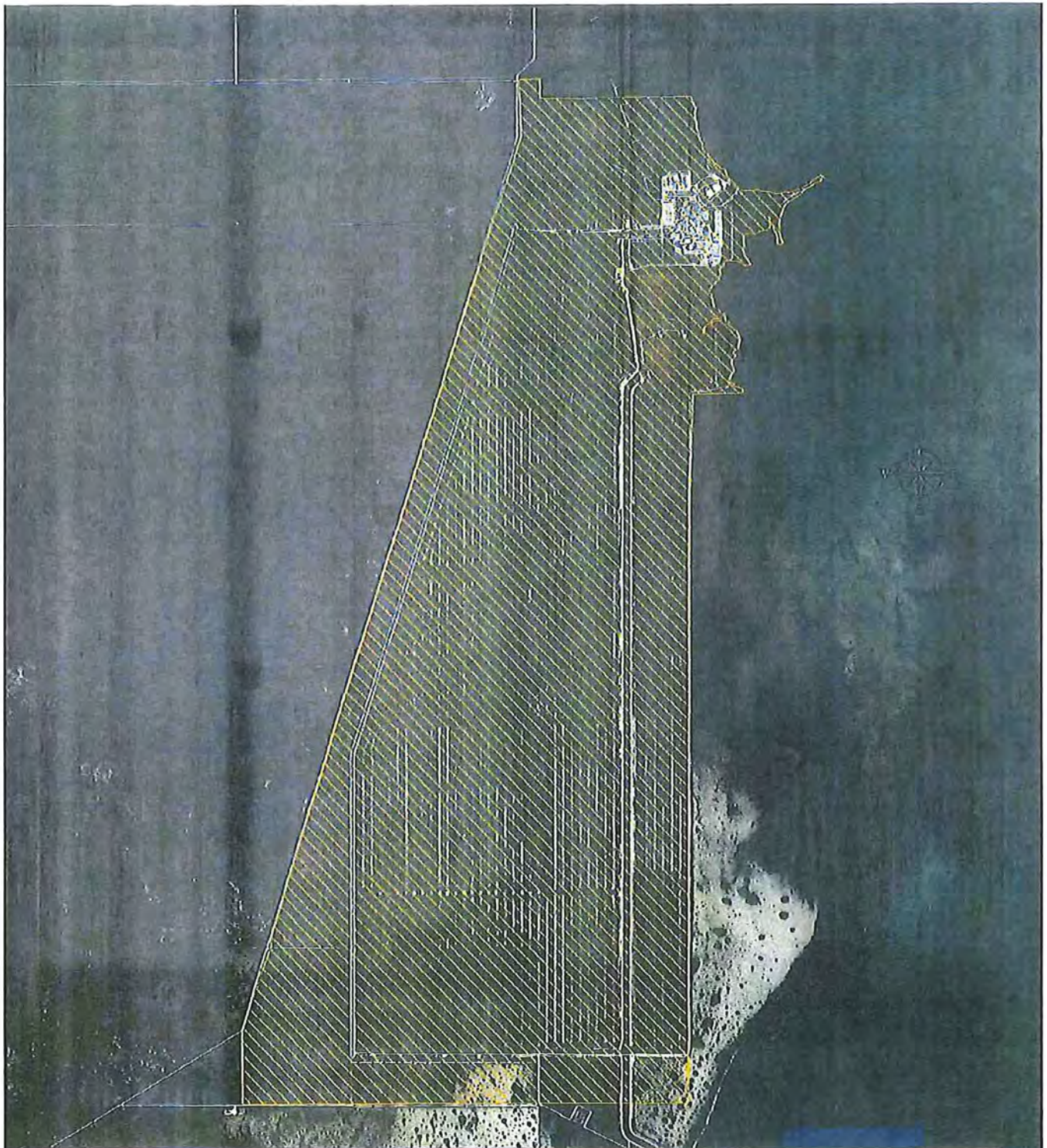
DO NOT WRITE BELOW THIS LINE – GOVERNMENT USE ONLY

OCT 7, 2015  
Date

Lee N. Hefty  
Lee N. Hefty, DERM Director  
Miami-Dade County

[Signature]  
Witness

Barbara Brown  
Witness



**Exhibit A**  
**FPL Turkey Point Property Boundary**  
**for Purposes of Consent Agreement (~9000 acres)**

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Miles

2015\_FPL\_TP\_facility\_bnd90K.mxd - October 6, 2015



