



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

October 25, 2019

Mr. Christopher A. Militscher  
U.S Environmental Protection  
Agency - Region 4  
61 Forsyth Street  
Atlanta, GA 20555-0001

SUBJECT: NOTICE OF AVAILABILITY OF THE FINAL PLANT-SPECIFIC SUPPLEMENT 5, SECOND RENEWAL, TO THE GENERIC ENVIRONMENTAL IMPACT STATEMENT REGARDING SUBSEQUENT LICENSE RENEWAL FOR TURKEY POINT NUCLEAR GENERATING UNIT NOS. 3 AND 4 (EPID L-2018-LNE-0001) (DOCKET NUMBERS: 50-250 AND 50-251)

Dear Mr. Militscher:

The U.S. Nuclear Regulatory Commission (NRC) has completed the enclosed final NUREG-1437, Supplement 5, Second Renewal, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Regarding Subsequent License Renewal for Turkey Point Nuclear Generating Unit Nos. 3 and 4." The final Supplemental Environmental Impact Statement (SEIS) is being issued in accordance with the National Environmental Policy Act of 1969, as part of the NRC's process to decide whether to issue a renewed operating license to Florida Power & Light Company for Turkey Point Nuclear Generating Unit Nos. 3 and 4 (Turkey Point). The National Park Service (NPS) participated in the environmental review of the subsequent license renewal for Turkey Point as a cooperating agency. The NPS does not have any specific regulatory actions related to the proposed subsequent license renewal. The NPS's participation in preparing this SEIS was primarily centered on data gathering and information sharing regarding the environment in and around Biscayne National Park and does not imply NPS concurrence. Therefore, impact determinations made in this SEIS should only be attributed to the NRC.

The final Supplement 5 to NUREG-1437 will be submitted to the U.S. Environmental Protection Agency (EPA) via e-NEPA no later than October 25, 2019. In addition, a copy of the final Supplement 5 is being mailed or e-mailed to interested Federal and State agencies, industry organizations, interest groups, and members of the public. One electronic copy of final Supplement 5 to NUREG-1437 is enclosed with this letter. Bound copies will be forwarded separately when available. A copy of this document has also been placed in the NRC Public Document Room, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852, and in the NRC Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible on the NRC's website at <http://www.nrc.gov/reading-rm/adams.html>. The final Supplement 5 to NUREG-1437 is available in ADAMS under Accession No. ML19290H346.

C. Militscher

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NRC's responses to EPA's recommendations provided by its letter dated May 20, 2019 (ADAMS Accession No. ML19157A200) during the public comment period for draft Supplement 5 to NUREG-1437 are enclosed. These responses can also be found in Appendix A of Supplement 5.

If further information is required, please contact Mr. Robert Schaaf, Senior Project Manager for the environmental review of the Turkey Point license renewal application, by telephone at 301-415-6020 or via e-mail at [Robert.Schaaf@nrc.gov](mailto:Robert.Schaaf@nrc.gov).

Sincerely,

**/RA/**

Robert B. Elliott, Chief  
Environmental Review License Renewal Branch  
Division of Rulemaking, Environmental,  
and Financial Support  
Office of Nuclear Material Safety  
and Safeguards

Docket Nos. 50-250 and 50-251

Enclosure:  
As stated

SUBJECT: NOTICE OF AVAILABILITY OF THE FINAL PLANT-SPECIFIC SUPPLEMENT 5, SECOND RENEWAL, TO THE GENERIC ENVIRONMENTAL IMPACT STATEMENT REGARDING SUBSEQUENT LICENSE RENEWAL FOR TURKEY POINT NUCLEAR GENERATING UNIT NOS. 3 AND 4 (EPID L-2018-LNE-0001) (DOCKET NUMBERS: 50-250 and 50-251)

DATED: October 25, 2019

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ADAMS Accession Nos.

1. Package: ML19295F526

2. Letter: ML19295F527

3. GEIS Supplement 5: ML19290H346

\*via email

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DATE	10/22/19	10/22/19	10/22/19	10/25/19

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**Responses to U.S. Environmental Protection Agency Recommendations on  
NUREG-1437, Supplement 5, Second Renewal, to the Generic Environmental Impact  
Statement for License Renewal of Nuclear Plants, Turkey Point Unit Nos. 3 and 4**

**Comment 1: License Renewal Process**

The U.S. Environmental Protection Agency EPA has provided technical comments and recommendations as outlined in the enclosure (See enclosure). The Proposed Action will entail the operating license renewal of Units 3 and 4 from 2032 to 2052. Consistent with long-term remediation approaches to environmental issues employed by other agencies, the EPA recommends the NRC consider a reopening term and/or condition in the license should the corrective measures in the Florida Department of Environmental Protection (FDEP) and Miami-Dade County Department of Environmental Resources Management (DERM) consent agreements not be met. The EPA requests that the technical comments and recommendations be addressed in the Final Supplemental Environmental Impact Statement (FSEIS).

***Response:** The commenter requests that technical comments and recommendations be addressed in the final SEIS. The NRC acknowledges the comment and agrees that a thorough analysis of public comments and input are critical to the NRC's environmental review process. The NRC staff's responses to comments received from the public and from regulatory agencies on the draft SEIS are contained in Section A.2 of this Appendix. The staff has carefully considered and responded to comments provided on the draft SEIS and the final SEIS incorporates appropriate comments and recommendations.*

*This comment provides no new information, and no changes have been made to the SEIS.*

**Comment 2: Groundwater Hydrology and Quality**

License Renewal Term: As outlined in the comments below, the EPA identified numerous issues from the review of the SD EIS regarding many aspects of the Proposed Action or relicensing renewal. Most significant of these issues is the hypersalinity plume in the aquifer related to the Canal Cooling System (CCS). The EPA notes that the Florida Department of Environmental Protection (FDEP) and the Miami-Dade County Department of Environmental Resources Management (DERM) have entered into various consent agreements with Florida Power and Light (FPL) regarding issues related to the CCS. The EPA supports the FDEP and DERM's efforts to work with FPL to remediate the adverse impacts of the hypersalinity plume in the aquifer and the ammonia releases to surface waters. The EPA notes that these consent agreements have outlined various corrective actions to address the issues related to the CCS. However, these corrective measures have only recently been implemented.

Recommendations: Given the many unknowns related to the CCS corrective measures effectiveness and the timing and length of the license renewal, the EPA recommends the NRC consider a reopening term and/or condition in the license should the corrective measures in the FDEP and DERM consent agreements not be met. As part of this reopening term and/or condition, we recommend that the NRC and the licensee re-evaluate the alternative corrective measures to include the Cooling Water System Alternative. The EPA recommends the NRC, in

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consultation with FPL, FDEP and DERM, take an adaptive management approach to ensure the facility's compliance with the applicable consent agreements. The EPA further recommends that the NRC coordinate closely with FDEP and DERM to ensure that the FDEP and DERM are sufficiently satisfied with the progress of the CCS corrective measures before the license renewal begins in 2032.

**Response:** *As described throughout Sections 3.5.1.4 and 3.5.2.2 of the SEIS, which have been revised in this SEIS based on the latest available information, including from annual surface water, groundwater, and ecological monitoring surveys, the staff has considered the development of regulatory actions addressing cooling canal system (CCS) operational effects on groundwater quality and the adjacent surface waters. The staff considered the results achieved to date, the regulatory authority exercised by State and County regulatory agencies, and the likely effectiveness of the mitigative actions undertaken by FPL under the Miami-Dade County Consent Agreement and the Florida Department of Environmental Protection Consent Order to remediate the hypersaline plume and reduce the impact of CCS operation on groundwater quality and surface water quality via the groundwater pathway.*

*In the NRC staff's impacts analysis presented in Section 4.5.1.2 of the SEIS, the staff determined that impacts on groundwater quality are MODERATE for the current license renewal term based on the fact that current and ongoing operations have noticeably degraded groundwater quality in the vicinity of the Turkey Point site and contributed to migration of the saltwater interface. Without mitigative actions, continued operation of the CCS is likely to result in continued degradation of groundwater quality. In its analysis, however, the NRC staff further acknowledges that groundwater remediation activities are now ongoing and have had and are likely to continue to have beneficial effects on groundwater quality.*

*The staff's impacts projection that the impacts would be "SMALL" during the subsequent license renewal period is based upon the continuance of FPL's ongoing mitigative actions (freshening and plume recovery) to reduce the effects of past and ongoing operations on groundwater quality. Because the predicted success of the mitigative actions is based on groundwater modeling and regulatory oversight of the responsible State and local agencies, the staff acknowledges as part of its assessment that there is uncertainty in the projected impacts under the proposed action. The staff determined in Section 4.5.1.2 of the SEIS that, while there is uncertainty in timing and the ultimate effectiveness of the mitigative actions, the success of FPL's mitigation efforts is subject to regulatory oversight by county and state agencies and is continually evaluated through a comprehensive water quality monitoring program. Section 3.5.2.2 of this SEIS has been revised to reflect the latest published groundwater monitoring data for the Turkey Point site, including the results from the 2018 continuous surface electromagnetic survey designed to track changes in the hypersaline plume, as well as the latest published data on CCS freshening and recovery well operation effectiveness. The NRC staff has considered and acknowledged this new information in its impact assessment as presented in revised Section 4.5.1.2 of the SEIS (see "New Information, Category 1 Issue, Groundwater Quality Degradation" ('Plants with Cooling Ponds in Salt Marshes')) while acknowledging that uncertainty remains. If FPL's monitoring results show that water quality improvements are not being made because corrective actions are not as effective as projected, FPL must develop and submit alternative remediation plans to the regulatory agencies. Because the regulatory oversight is anticipated to remain in place and the regulatory agencies retain the authority to require FPL to continue its current freshening activities, the NRC*

*staff concluded that the proposed action would have SMALL impacts on water resources during the period of subsequent license renewal, despite the existence of uncertainty as referenced above.*

*With respect to commenter concerns that the NRC should include a reopening clause and/or condition in the renewed reactor operating licenses, if issued, for Turkey Point Units 3 and 4 in the event that FPL is unable to achieve the mandated groundwater remediation objectives, the staff notes that the NRC does not have regulatory authority to require FPL to comply with consent agreements or consent orders issued by the State of Florida's Department of Environmental Protection or the Miami-Dade County DERM, and therefore cannot make compliance with orders issued by other agencies a condition of the NRC license. Miami-Dade County and the Florida Department of Environmental Protection have the authority and responsibility for enforcing applicable provisions of their environmental regulations and the referenced consent order and consent agreement. Issuance of a renewed license, however, does not foreclose or restrict the ability of other regulatory authorities to take such actions as they deem necessary to ensure compliance with the orders, consent agreements, or other regulatory requirements under their jurisdiction.*

### **Comment 3: License Renewal Process**

Environmental Impact and Alternatives Analysis: The EPA has identified the following issues related to the environmental impact and alternatives analysis as discussed in Chapter 4 of the SDEIS.

Nature of Categories: The NRC has divided environmental impacts to the different resources into categories of small, small to moderate, moderate, moderate to large and large (Table 2-2, page 2-22). It does not appear that sufficient supportive data or quantitative analysis has been provided to support these determinations.

Recommendation: The EPA recommends that NRC provide a quantitative approach including data and analysis which better define the levels of impact described in Chapter 4.

**Response:** *The NRC staff uses the SMALL, MODERATE, and LARGE significance levels to communicate the results of its assessment of the environmental impacts of the proposed action and alternatives. The structure for these significance levels is based on Council on Environmental Quality (CEQ) terminology for "significantly" (see 40 CFR 1508.27). Since the significance and severity of an impact can vary with the setting of the proposed action, both "context" and "intensity," as defined in CEQ regulations 40 CFR 1508.27, were considered. Context is the geographic, biophysical, and social context in which the effects will occur. In the case of license renewal, the context is the environment surrounding the nuclear power plant. Intensity refers to the severity of the impact in whatever context it occurs. Based on this, the NRC established its three levels of significance for potential impacts. The definitions of the three significance levels are presented in the footnotes to Table B-1 of 10 CFR Part 51, in Appendix B to Subpart A, and which are provided Section 1.4 of this SEIS.*

*CEQ's regulations implementing NEPA (40 CFR 1500-1508) require that EISs be concise, clear, to the point, and supported by evidence that agencies have made the necessary environmental analyses. The NRC staff uses SMALL, MODERATE, and LARGE to communicate the results of*

*its environmental impact analyses in a concise manner. The staff's impacts analyses presented in Chapter 4 of the SEIS are contained in the paragraphs preceding the significance determinations of SMALL, MODERATE, or LARGE, as appropriate. In compliance with CEQ regulations, the SEIS identifies the methodologies used in the environmental analyses, and explicitly references sources relied upon for conclusions. For some analyses, a separate appendix is included that contains additional detailed calculations and numerical data. This comment provides no new information, and no change was made to the SEIS.*

#### **Comment 4: Alternatives-No-Action**

\* Rationale for Constructing Facilities Onsite: On page 2-9 of the SD EIS, the NRC states, "For the new nuclear alternative, the replacement power facility would be located within the Turkey Point property, but outside the proposed footprint of the not-yet-constructed Turkey Point Units 6 and 7." Also, the NRC provides in sections 2.2.2.2 Natural Gas Combined-Cycle Alternative (page 2-1) and 2.2.2.3 Combination Alternative (Natural Gas Combined-Cycle and Solar) (page 2-11) that the natural gas combined cycle facility would be constructed on or adjacent to the Turkey Point footprint. However, the NRC does not provide an alternative to site the new build alternatives at other offsite locations. This requires the new onsite facilities to impact a footprint of 75 acres to 360 acres (depending on the alternative) (Table 2-1, page 2-7). Siting the build alternatives in another location might lessen environmental impacts, especially if they are located in an industrial area that does not impact valuable natural resources.

Recommendations: The EPA recommends the NRC provide the rationale for constructing the new alternative facilities onsite in the Final Supplemental Environmental Impact Statement (FSEIS). The EPA also recommends the NRC more robustly evaluate the potential for placing the build alternatives offsite. This evaluation should be factored into the alternatives analysis and environmental impact analysis in the FSEIS.

**Response:** *Section 2.2.2 of the SEIS has been revised to provide the rationale for assessing the impacts of constructing and operating replacement power facilities onsite rather than offsite. When assessing the impacts of new alternative facilities in an environmental impact statement (EIS) for license renewal (as opposed to an environmental impact statement (EIS) for a combined operating license (COL) or an early site permit, the NRC staff evaluates onsite construction and operation to maximize use of the applicant's existing infrastructure. Further, for the Turkey Point site, the applicant identified onsite construction and operation as the most likely scenario for replacement power facilities.*

#### **Comment 5: Groundwater Hydrology and Quality**

[The EPA has identified the following issues related to the environmental impact and alternatives analysis as discussed in Chapter 4 of the SDEIS....]

\*Minimization of CCS Impacts: Descriptions of the CCS environmental impacts are not provided in a cohesive manner in the SD EIS. An explanation for the characterization approach is found in a table footnote on page 199 of the document (Table 4-1, footnote b, pg 4-4,5):

"(b) The NRC staff recognizes that the current impacts on this issue are greater than SMALL (i.e., the impacts are MODERATE). However, as discussed in Section 4.5.1.2 of this chapter, in response to a 2015 consent agreement with the Miami-Dade County Department of

Environmental Resource Management (DERM) (MDC 2015a) and a 2016 consent order from the Florida Department of Environmental Protection (FDEP) (FDEP 2016e), FPL has implemented a recovery well system to halt and retract the hypersaline plume and to abate and remediate the effects of the hypersaline plume from the cooling canal system. These efforts are expected to remediate the hypersaline plume prior to the commencement of the subsequent license renewal term. In addition, FPL's actions to remediate the plume are subject to continued regulatory oversight by the DERM and the FDEP. Therefore, the NRC staff expects that groundwater quality degradation impacts resulting from subsequent license renewal will be SMALL."

The EPA is concerned that the Proposed Action is placed in the "small" impact category. The EPA supports the FDEP and DERM's efforts to work with FPL to remediate the adverse impacts of the hypersalinity plume and ammonia releases. However, there is much unknown regarding the hypersalinity plume and ammonia releases and it is uncertain that these measures will provide the long-term results as modeled. Additionally, the water withdrawal impacts to drinking water sources and the Comprehensive Everglades Restoration Plan projects (CERP) (See comment below) when determining the impact category should be considered.

Recommendation: The EPA recommends the NRC reevaluate the impacts to groundwater by including impacts associated with water withdrawals and evaluating the impacts of the CCS in the existing condition. The EPA recommends the NRC reconsider placing groundwater and surface waters in the "Moderate to Large" impact category.

**Response:** *The NRC staff evaluated the potential groundwater use conflicts resulting from groundwater extraction for the recovery well system (RWS) and the cooling canal system (CCS) salinity reduction in Section 4.5.1.2 (see "Groundwater Use Conflicts (Plants That Withdraw More Than 100 Gallons per Minute)") of this SEIS. Impacts on the Biscayne aquifer, including on drinking water sources, were determined to be SMALL. RWS groundwater withdrawals associated with hypersaline plume recovery and other FPL withdrawals from the saline portion of the aquifer would be unlikely to interact with any offsite wells withdrawing water from the inland portions of the Biscayne aquifer. Offsite reductions in groundwater elevations due to RWS pumping were also evaluated by the staff on the basis of groundwater modeling by FPL and the South Florida Water Management District (SFWMD) and were determined to have minimal potential to impact wetlands to the west of the L-31E Canal. This modeling (Tetra Tech 2016) included the pumping effects of known municipal, industrial, and agricultural wells pumping at their maximum permitted withdrawal rates. The NRC staff considers the modeling assumption that wells would operate at their maximum permitted rates to be conservative and acceptable, considering potential regional population growth and associated water demands during the projected remediation timeframe.*

*Groundwater withdrawal impacts on the Upper Floridan aquifer were determined to be MODERATE during the subsequent license renewal term. The modeling analysis considered by the NRC staff (Tetra Tech 2014b) assumed that FPL's freshening wells withdrawing from the Upper Floridan aquifer would operate at maximum permitted rates, combined with other existing permitted withdrawals in the region withdrawing at permitted rates. As for the Biscayne aquifer, the NRC staff also considers the modeling assumption to be conservative and acceptable, considering potential regional population growth and associated water demands.*



*The NRC staff's response to comments specific to the likely effectiveness of the mitigative actions undertaken by FPL to remediate the hypersaline plume and reduce the impact of CCS operation on groundwater quality and surface water quality is provided in its response to Comment 2, above.*

#### **Comment 6: License Renewal Process**

Comparison of CCS with other Alternatives (Table 2-2): As previously stated, the SDEIS does not adequately characterize the impacts associated with the CCS. The SDEIS did not adequately describe impacts in a contextual, definitive manner with respect to the Cooling Water System Alternative and other build alternatives' impact assessments. The description of the existing impacts with respect to the Cooling Water System Alternative and other build alternatives' impact assessments should be more robust. For example, the Proposed Action has an overall "small" environmental impact for aquatic resources and terrestrial resources, yet the SDEIS did not evaluate the Proposed Action's impacts to species living in the Biscayne aquifer. The EPA also notes that SDEIS does not discuss the temporary nature of the noise impacts related to construction of the Cooling Water System or other build alternatives or that the visual resources impact is already compromised with the existing power plants (including the cooling towers and future nuclear units 6 and 7).

Recommendations: Overall, the EPA recommends the NRC provide a more balanced, data-driven, comprehensive environmental impact assessment and alternatives analysis in the FSEIS.

**Response:** *The commenter is concerned that the SEIS does not adequately characterize the impacts associated with the CCS, alternative cooling water system, or replacement power alternatives, recommends that SEIS be more data-drive, and specifically provides two examples pertaining to Aquatic Resources and Noise impacts where the analysis can be improved. The NRC staff performed its environmental review and developed the draft SEIS in accordance with NEPA and NRC's requirements in 10 CFR Part 51. The SEIS evaluates the potential environmental impacts of the proposed action (subsequent license renewal) and designates the environmental impacts from the proposed action as SMALL, MODERATE, or LARGE. The NRC established the three levels of significance using the Council on Environmental Quality terminology for "significantly" (40 CFR 1508.27). CEQ's regulations implementing NEPA (40 CFR 1500-1508) require that EISs be concise, clear, to the point, and supported by evidence that agencies have made the necessary environmental analyses. The NRC staff uses SMALL, MODERATE, and LARGE to communicate the results of its environmental impact analyses in a concise manner. In compliance with CEQ regulations, the SEIS identifies the methodologies used in the environmental analyses, and explicitly references sources relied upon for conclusions. For some analyses, a separate appendix is included that contains additional detailed calculations and numerical data.*

*Chapter 4 of the SEIS evaluates the environmental consequences and impacts associated with continued operations of Turkey Point Units 3 and 4, including the impacts associated with the CCS. Chapter 2 of the SEIS describes the NRC staff's process for developing a range of reasonable alternatives to the proposed action and the replacement power alternatives that the staff selected for detailed analysis, including supporting assumptions and data. The NRC staff's analysis of the alternative cooling water system draws upon an application that FPL submitted*

to the NRC in 2009, to build and operate two new onsite nuclear reactors (Turkey Point Units 6 and 7). The Units 3 and 4 alternative cooling water system would have the general design, construction, and operating characteristics as the cooling water system associated with Turkey Points Units 6 and 7. Where numeric data were available and supported by reference sources (e.g., land acreage, water consumption), they were provided and considered as part of impact analyses for the alternatives considered. When quantifiable information was not available, in accordance with 10 CFR 51.71(d), the analysis was discussed in qualitative terms. Chapter 4 of the SEIS describes and assesses the potential direct, indirect, and cumulative environmental impacts of the replacement power alternatives and alternative cooling water system.

Specifically, the commenter states that the SEIS did not evaluate the impacts of the proposed action on species living in the Biscayne aquifer. The NRC did not consider the impacts of the proposed action on species living in the Biscayne aquifer because there are no known species living in the Biscayne aquifer. The staff addressed the impacts of the proposed action on aquatic and terrestrial resources, including species inhabiting Biscayne Bay, in Sections 4.6.1, 4.7.1, and 4.8.1 of the SEIS. No change was made to the SEIS in response to this comment.

Further, the commenter states that the SEIS could be improved in that it does not discuss the temporary nature of noise impacts from construction of the replacement power alternatives, and does not consider the baseline conditions for the visual resource impact analysis for the alternatives. Common construction-related noise impacts for replacement power facilities and the cooling water system alternative are discussed in Section 4.3.3.2. The discussion in Section 4.3.3.2 of the SEIS has been revised to identify the temporary nature of construction activities in response to this comment. Section 4.2.3.2 of the SEIS indicates that the visual impact analysis focuses on the degree of contrast between the replacement power plant and the surrounding landscape and the visibility of the alternative.

#### **Comment 7: Ecological Resources**

The EPA recommends the NRC describe the Cooling Water System in terms of numeric acreage and consider this footprint when determining terrestrial and aquatic impacts. Furthermore, the relatively small footprint of the cooling towers should be considered in comparison with the known adverse environmental impacts of the CCS. The EPA recommends the Cooling Water System Alternative and other build alternatives be evaluated further to include a data-driven noise assessment study rather than relying on ratings of "small to large". The temporary nature of the construction of the build alternatives should be considered in the noise impact assessment.

**Response:** In Section 2.2.3, "Cooling Water System Alternative," of the SEIS, the NRC staff explains that in formulating the cooling water system alternative, the staff drew upon FPL's 2009 application to the NRC to build and operate two new nuclear reactors on the Turkey Point site (i.e., Turkey Point Units 6 and 7). The cooling water system alternative for Turkey Point Units 3 and 4 would have the general design, construction, and operating characteristics as the cooling water system associated with Turkey Points Units 6 and 7. Where numeric data were available and supported by reference sources (e.g., land acreage, water consumption), these data were provided and considered as part of the staff's impact analyses in Chapter 4 of the SEIS for the various environmental resource areas.

*With respect to noise, the NRC staff addresses the potential impacts of noise associated with the proposed subsequent license renewal in Section 4.3.1.2, "Noise," of the SEIS. The impacts of noise associated with alternatives are addressed in Sections 4.3.3.2, 4.3.4.2, 4.3.5.2, and 4.3.6.2 of the SEIS. In response to the U.S. Environmental Protection Agency's comment, the NRC staff revised Section 4.3.3.2 of the SEIS to identify the temporary nature of construction activities. The staff addresses the potential impacts of noise on wildlife in Section 4.6.1 of the SEIS (for the proposed action) and Section 4.6.3 of the SEIS (for alternatives to the proposed action). Notably, these sections consider the impacts of construction noise on wildlife. With specific respect to the National Park Service's concern related to least terns, the NRC staff added the following text to Section 4.6.3 of the SEIS: "Limiting construction in areas near known bird nests, rookeries, or colonies (e.g., CCS berms on which least terns are known to nest) to the non-breeding season would limit behavioral avoidance and other potential impacts to locally breeding bird populations."*

#### **Comment 8: Land Use and Visual Resources**

It is recommended that all alternatives be given the same impact category assessment for visual resources because the skyline is already impacted with the existing facility.

**Response:** *As explained in Section 4.2.1 of the SEIS, nuclear power plant operations at Turkey Point Units 3 and 4 have not changed appreciably with time, and no change in land use and visual impacts are expected during the subsequent license renewal term. Therefore, people living in the vicinity of Turkey Point and visitors to the Biscayne National Park, Biscayne Bay, Homestead Bayfront Park, and the Dante Fascell Visitor Center would not experience any visual changes in the appearance of Turkey Point Units 3 and 4 during the subsequent license renewal term beyond what is currently being experienced. Section 3.2.2 points out that Turkey Point power units can be clearly seen from Biscayne National Park, including much of Biscayne Bay. Denial of the requested licensing action would not diminish the visual impacts, as the structures would remain in place for some time, before eventually being dismantled, as discussed in Section 4.2.2.2 (no-action alternative/visual resources). The comments did not introduce any new information that has not already been considered in the analysis. No changes were made to the SEIS as a result of these comments.*

#### **Comment 9: Ecological Resources**

The EPA recommends that the NRC consult with the Florida Fish and Wildlife Conservation Commission (FWC), U.S. Fish and Wildlife Service (USFWS), and National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) to evaluate each alternative's impacts to terrestrial and aquatic species and also consider the current consent agreement regarding ammonia releases to Biscayne Bay. Additionally, the EPA recommends the NRC conduct a quantitative evaluation of each alternatives' impacts to terrestrial and aquatic resources. For a more comprehensive evaluation of impacts, the EPA also recommends the NRC develop additional impact area categories to reflect a holistic approach to assessing each alternatives' environmental impacts. These impact areas could be climate resiliency (to include sea level rise, droughts and hurricane/storm impacts), and state and Federal resources including Everglades National Park, Biscayne National Park, Biscayne Bay Aquatic Preserve and CERP.

**Response:** As part of its environmental review, the NRC staff has consulted with both the FWS and NMFS under Section 7 of the Endangered Species Act. On July 25, 2019, the FWS issued a biological opinion (ADAMS Accession No. ML19221B583), which concluded consultation between the NRC and FWS. The NRC's Endangered Species Act Section 7 consultation with the NMFS is currently ongoing. Appendix C of the SEIS describes the NRC staff's consultations with these agencies, and the staff has updated this appendix to reflect the current status of each consultation. The NRC staff will conclude its consultation with the NMFS and report the results of this consultation in the Record of Decision prior to making a license renewal decision. The NRC staff also considered whether Essential Fish Habitat (EFH) consultation with the NMFS under the Magnuson–Stevens Act or Section 304(d) consultation with the National Oceanic and Atmospheric Administration under the National Marine Sanctuaries Act is required for the proposed Turkey Point subsequent license renewal. The staff determined that these consultations are not required because the proposed action would not result in any impacts to EFH and the proposed action is not likely to destroy, cause the loss of, or injure any sanctuary resources of the Florida Keys National Marine Sanctuary. In correspondence dated April 1, 2019, the NRC (ADAMS Accession No. ML19091A131) notified the NMFS of its EFH findings and the NRC's determination that EFH consultation is not required for the proposed action. The NMFS provided no specific response concerning EFH. The NRC considers its obligations related to EFH consultation under the provisions of the Magnuson–Stevens Act to be fulfilled with respect to the proposed Turkey Point license renewal. This information is summarized in Appendix C of the SEIS. The NRC staff added information to the SEIS to address consultation under the National Marine Sanctuaries Act in Sections 1.8, 3.8.3, 4.8.1.3, and Appendix C.3. For more information on National Marine Sanctuaries Act consultation, see the NRC's response to Comment 0018-4 and 0018-7.

With respect to the Florida Fish and Wildlife Conservation Commission, the NRC has no statutory requirement to consult with this agency; however, the staff used information from this agency's online databases to obtain shorebird and State-listed species information presented in Sections 3.6.2 and 3.6.3 of the SEIS. With respect to the Consent Agreement, the NRC has no authority over water quality issues. The Consent Agreement is between FPL and Miami-Dade County. However, the NRC staff describes the Consent Agreement in detail and considers the Consent Agreement, as well as the 2016 FDEP Consent Order, among other factors, in its resource-specific analyses in Chapter 4 of the SEIS.

With respect to the NRC's approach for addressing impacts to terrestrial and aquatic resources, NRC regulations in 10 CFR Part 51 implement NEPA and provide the framework for the NRC's environmental review. In Table B-1 in Appendix B to Subpart A of 10 CFR Part 51, the NRC identifies 78 issues to be evaluated for license renewal of nuclear plants during the environmental review process. Of these issues, 23 apply to terrestrial resources, aquatic resources, or special status species and habitats. In the GEIS, the NRC staff determined that 17 of these 23 issues are generic (Category 1) and that the impact of license renewal on those resource areas would be SMALL. Absent "new and significant information" that the NRC staff may obtain during its site-specific environmental review, Category 1 issues are not reevaluated in the SEIS; new information is considered, however, and its significance is evaluated. The remaining six ecological issues are site-specific and are specifically analyzed with respect to subsequent license renewal of Turkey Point Units 3 and 4 in Chapter 4 of the SEIS. Because the NRC's NEPA process for license renewal is established by regulation and tiers from the GEIS, the NRC staff did not revise the impact area categories, as suggested by the

*commenter. However, the topics recommended by the commenter are addressed in the SEIS, except for the commenter's suggestion that "climate resiliency" be included as a factor in comparing alternatives, as no such comparison is possible without knowing the design and siting characteristics of the replacement power and cooling water system alternatives. State and Federal natural resources, including Everglades National Park, Biscayne National Park, Biscayne Bay Aquatic Preserve, and the Comprehensive Everglades Restoration Program are described in Sections 3.6 and 3.7 of the SEIS. Additionally, the staff's impact conclusions for terrestrial and aquatic resources in Chapter 4 of the SEIS are inclusive of these State and Federal natural resources.*

#### **Comment 10: Groundwater Hydrology and Quality**

Conflict Analysis: On page 4-30, Conflicts Analysis for the Upper Floridan Aquifer section, the SDEIS discusses the groundwater impacts for the Proposed Action related to FPL's freshening well system and states, "For offsite, non-FPL wells, the model projects a maximum drawdown of 2.26 feet (0.7 m) at the MD WSD's South Miami Heights wellfield, located approximately 10.3 mi (16.6 km) north, northwest of the center point of FPL's freshening well system." The EPA notes that there appears to be no evaluation in this conflict analysis that considers possible impacts to the U.S. Army Corps of Engineers (USACE) or South Florida Water Management District's (SFWMD) CERP projects. Also, there appears to be no water use conflict analysis for the other alternatives (no action, new nuclear, natural gas combined-cycle, combination alternative or cooling water system), which does not adequately portray how the other alternatives would potentially impact groundwater and drinking water resources.

Recommendation: The EPA recommends the NRC conduct a groundwater use conflict analysis for the FSEIS (as described for the Proposed Action, pages 4-28-4-35) and comparatively evaluate each alternative's impacts related to water withdrawals. Furthermore, the EPA recommends the NRC consider the water withdrawal impacts to include impacts to CERP when determining the Proposed Action's groundwater impacts.

**Response:** *Section 3.5.2.1 of the SEIS describes that the Biscayne aquifer is separated from the Upper Floridan aquifer by the Intermediate Confining Unit, which serves as an effective aquiclude for the Floridan aquifer system. Due to the low permeability of the confining unit, extraction of water from the Upper Floridan aquifer is not expected to affect uses of Biscayne aquifer water. As a result, the scope of the NRC staff's groundwater use conflicts analysis in Section 4.5.1.2 (see "Groundwater Use Conflicts (Plants That Withdraw More Than 100 Gallons per Minute)") of the SEIS with respect to FPL freshening operations for the CCS was restricted to users extracting water from the Upper Floridan aquifer. However, the NRC staff's conflicts analysis for the Biscayne aquifer is separately presented in Section 4.5.1.2, which considers the effects of FPL's recovery well system. This analysis considers and quantifies projected impacts on groundwater elevations, offsite sawgrass marsh wetlands, and on existing users of the Biscayne aquifer.*

*With respect to alternatives, as described in Sections 4.5.2.2 and 4.5.7.2 of the SEIS for the no-action and the cooling water system alternatives, respectively, the staff expects that groundwater demands for CCS freshening would decrease over time commensurate with the reduction in thermal discharge to the CCS from Turkey Point Units 3 and 4, so that potential water use conflicts would also be reduced for these alternatives, compared to the proposed*

*action. Because thermal discharges to the CCS would also be reduced for the replacement power alternatives, potential water use conflicts would also be reduced for these alternatives. Sections 4.5.2.2, 4.5.3.2, and 4.5.7.2 were revised where appropriate to provide a discussion of these and related considerations.*

#### **Comment 11: Surface Water Hydrology and Quality**

National Pollution Discharge Elimination System (NPDES): On page 3-1 (line 41) of the SDEIS states, "This network of canals forms a closed, recirculating source of water ... "This discussion should clarify that cooling canal system is a closed-cycle cooling system -but not a closed hydrologic system. This is because the current NPDES permit allows for seepages from the canals to groundwater. Surface water sampling data from Biscayne Bay detected the presence of tritium, which indicates that the canals may be hydraulically connected to surface waters. Additionally, data indicate there is a westward migration of the hypersaline groundwater plume from the canal. The SD EIS does not address the structural integrity of the CCS to retain releases of nutrient-rich wastewater in the canal to waters of the United States nor does it discuss the impact of these releases on surface water quality and aquatic life in Biscayne Bay. Recommendations: The EPA recommends that a water balance calculation for the site that shows all the potential sources of water supplying the site, and discharges and other releases from the site under normal operating conditions be included in the FSEIS. This balance should include seepages from the canal system and changes in evaporative losses. The EPA also recommends the NRC address the structural integrity of the CCS to retain nutrient-rich wastewater and associated impacts to surface water quality and aquatic life in Biscayne Bay.

**Response:** *A 1971 consent decree by the Federal District Court for the Southern District of Florida required FPL to discharge all cooling water from Turkey Point facilities into a closed-cycle cooling canal system, as referenced in Section 3.1.3.2 of the SEIS. Section 3.1.3.2 also notes that the CCS does not have a direct surface water connection to any outside surface water body. Further, Sections 3.1.3.2, 3.5.1.3, and 3.5.1.4 state that water is exchanged between the CCS and the Biscayne aquifer. Section 3.5.1.3 of this SEIS, which has been revised in this final SEIS, contains a description of the current and the draft NPDES permit issued by the State of Florida, including a description of the permit's requirements related to CCS impoundment design, construction, operation, and maintenance. A discussion of FPL's aging management program for the CCS has also been added to Section 3.5.1.3 of this final SEIS.*

*Section 3.1.3.2, "Cooling Canal System Operation," describes the components of the water budget. In light of this comment, Section 3.1.3.2 has been updated to include a typical water budget schematic for the CCS, which shows components of the CCS water budget based on modeling predictions during the June 2015 through May 2017 period.*

#### **Comment 12: Groundwater Hydrology and Quality**

Groundwater: Regarding groundwater, the SDEIS provides the following:  
3.1.3.2, (pg 3-11). States: "FPL estimates that the inflow of groundwater from the Biscayne aquifer into the CCS is about twice the volume of outflow of water from the CCS into the Biscayne aquifer (FPL 2018f).e"

The EPA is concerned that discussing inflows/outflows apart from concentration can create a potential misunderstanding. To a lay person, a positive inflow/outflow volume ratio may appear to be a 'positive' indicator. However, when considering that dissolved solids are retained apart from volume, this ratio can be problematic. Volume exchange is a factor that must be considered in the system characterization, but it is the total mass and concentrations of dissolved constituents that determine the water quality impacts. The analysis in the SDEIS is lacking these refined distinctions.

**Response:** *The comment refers to a subsection in Section 3.1.3.2 of the SEIS that describes the operation of the cooling canal system (CCS) in terms of the water flows into and out of the CCS. A comprehensive discussion of the water and salt budgets of the CCS, the water quality of the CCS, the transport of dissolved constituents from the CCS to adjacent water bodies, and the management of salinity in the CCS is included in Section 3.5.1.4 of the SEIS. This comment provides no new information, and no changes were made to the SEIS in response to this comment.*

### **Comment 13: Surface Water Hydrology and Quality**

3.1.3.2, (pg 3-11, 12). States: "Sediments can build up in the channels of the CCS. These sediments can obstruct the lateral flow of water through the CCS and can also lower the rate of water movement into the CCS from the Biscayne aquifer. Therefore, CCS maintenance activities include the removal of accumulated sediments as required to maintain adequate water flow in the CCS (FPL 2018j).e"

Accumulated sediments do obstruct the rate of lateral flow across the CCS boundary but would also obstruct vertical flow if not removed. In actuality, CCS isolation is being sacrificed for the sake of maintaining volumetric capacity. Removal of low permeability sediments to maintain depth in the canals can be a 'net negative' from an environmental perspective.

**Response:** *As stated in Section 3.1.3.2, "Cooling Canal System Operation," of the SEIS, sediment build-up in the CCS canals can obstruct the lateral flow of water through the CCS and can also lower the rate of water movement into the CCS from the Biscayne aquifer. As described in Section 3.5.1.4, "Temperatures within the Cooling Canal System" and "Thermal Efficiency Plan for the Cooling Canal System," maintaining adequate water flow through the CCS is essential for safe and efficient operation of the CCS. FPL is required to monitor surface water, groundwater, and porewater quality in and around the CCS and to report them to State regulatory agencies so that they can take timely actions under their respective jurisdictions. This comment provides no new information and no changes were made to the SEIS as a result.*

### **Comment 14: Surface Water Hydrology and Quality**

3.5.1.4, (pg 3-48). States: "The study considered technical, environmental, economic, and social criteria. Relative to the ranking criteria, it ranked Alternative Five as the best overall and the most balanced alternative. It also identified that Alternatives One and Seven should be maintained as short-term backup water options to be used when appropriate and as needed during extreme conditions. It further determined that Alternatives Two, Four, Six, and Eight did

not provide a significant advantage and should not be evaluated further unless conditions change."

Stating that direct treatment of CCS water to remove salinity (Option 6) "did not provide significant advantage and should not be evaluated further" seems to negate the environmental impact of contamination migration in the groundwater without providing supportive data or information. The underlining problem is salt concentration in the CCS. The language above states that economics was considered in these characterizations. However, the SDEIS does not define what is considered too expensive or detail any significant advantage. Also, if cost is the major factor in characterizing an option, then this should be stated with supporting estimates and data.

**Response:** *The commenter is concerned that Section 3.5.1.4 of the SEIS does not define or discuss the factors considered in determining viable alternatives to offset CCS water deficits. The discussion quoted and provided in Section 3.5.1.4 summarizes FPL's evaluation of alternative sources of water conducted to reduce CCS salinities in response to the 2017 Consent Agreement between Miami-Dade County and FPL.*

*The purpose of this discussion in the SEIS is to provide a summary of an alternative study that was developed by FPL and reviewed by Miami-Dade County. The study was reviewed by Miami-Dade County approximately 2 years prior to the NRC's receipt of the Turkey Point subsequent license renewal application. The NRC did not have a role in evaluating or approving that study, nor does the NRC have the regulatory authority to approve it. As discussed in the SEIS, Miami-Dade County reviewed the evaluation and made a recommendation as to which alternative could provide a long-term, sustainable source of water to offset CCS water deficits. The process and factors that were considered by Miami-Dade County in providing a recommendation on the alternative to offset CCS water deficits are reflected in its report (MDC 2016a). The comments provide no new information, and no change to the SEIS was made in response to this comment.*

#### **Comment 15: Surface Water Hydrology and Quality**

3.5.1.4, (pg 3-51). States: "The study and its conclusions are contained in an assessment published on March 17, 2017(FPL 2017c). The report concluded that the elevated ammonia values are attributable to the degradation of plant and animal material under anoxic (low oxygen) conditions in areas with little or no mixing with other surface waters. The occurrence of ammonia appears to be limited to the locations of deep stagnant anoxic water bodies. " of Ammonia may result from degradation of organics in an anoxic environment, but the occurrence an anoxic environment in Bay waters (typically oxygenated) may be indicative of a nutrient source. Samples only collected from surface water (as opposed to sampling from bottom sediments or groundwater) could yield different results.

Recommendations: The EPA recommends the NRC critically evaluate statements taken from references describe the complexity and reflect that evaluation within the FSEIS. The EPA recommends that the FSEIS of pertinent systems in enough detail to provide readers of this document with understandings without referencing separate documents. Additionally, the EPA recommends the NRC provide comprehensive system component range, property, and interaction descriptions in a concise, localized manner in the FSEIS.



**Response:** *The SEIS has been updated with respect to data on salinity and nutrients, including ammonia, phosphorus, nitrogen and chlorophyll-a, in the CCS and nearby surface waters. The local and regional hydrology including Biscayne Bay and Card Sound is described in Section 3.5.1.1, "Surface Water Hydrology." In addition to the descriptions within the SEIS, several detailed descriptions were incorporated into the SEIS by reference from the final environmental impact statement (FEIS) for the Turkey Point Units 6 and 7 combined licenses (NRC 2016a). For example, the following information from the FEIS for Units 6 and 7 was incorporated by reference:*

- 1. A description of the South Florida Hydrologic System and how it has changed over time from FEIS Section 2.3.1.1 on pages 2-25 to 2-30, including Figures 2-8, 2-9, 2-10, and 2-11.*
- 2. The regional surface water system west of Biscayne Bay and how it has changed over time from FEIS Section 2.3.1.1 on Pages 2-31 and 2-32, including Figure 2-12.*
- 3. A description of the hydrology and hydrodynamics of Biscayne Bay from FEIS Section 2.3.1.1 on pages 2-33 through 2-38, including Figures 2-14, and 2-15, and Table 2-8.*

*The SEIS points out that the Florida legislature has designated Biscayne Bay and Card Sound, including Biscayne National Park, as Outstanding Florida Waters. This affords these waters the highest water quality protection. The SEIS also points out that "...pollution from human activities also impacts the water quality of Biscayne Bay. Sections of the shoreline of Biscayne Bay are highly developed. The southern end of Biscayne Bay and Card Sound is less urbanized than the northern section of Biscayne Bay. Pollutants can potentially enter Biscayne Bay from multiple sources, including boats, canals, quarrying operations, landfills, military operations, a sewage-treatment plant, urban and agricultural runoff, and submarine groundwater springs (USGS 2008b)."*

*Section 3.5.1.4 ("Adjacent Surface Water Quality and Cooling Canal System Operation") of this SEIS describes recent studies to evaluate potential effects of CCS operations via the movement of groundwater from the CCS to adjacent surface water bodies. This section also includes a description of monitoring data and mitigative actions for ammonia and nutrients within Biscayne Bay and Card Sound. The text points out that "If the concentration of nutrients in either Biscayne Bay or Card Sound get too high, they can negatively impact the ecological environment. Excess nutrients can cause algae blooms (thick green algae mats that can be toxic), deplete oxygen in the water, and reduce water clarity."*

*The State of Florida (with the approval of the EPA) has established numeric nutrient criteria for Biscayne Bay and Card Sound. Section 3.5.1.4 ("Ammonia and Nutrients within Biscayne Bay and Card Sound") of the SEIS also states, "The numeric nutrient criteria include criteria for phosphorus, chlorophyll, and total nitrogen, of which ammonia is a contributor." Furthermore, the SEIS states, "Biscayne Bay waters are generally low in plant nutrients. This means the aquatic ecosystems respond very rapidly to small nutrient enrichment, especially to increases of phosphorus. The concentrations of ammonia from runoff tends to be higher in urban runoff than in wetland or agricultural runoff. The Biscayne Bay watershed has a diverse agricultural, urban, and wetland land use. This results in lateral differences in bay water nutrient*

concentrations.” The text also points out that “in general, ammonia concentrations are higher in the northern portion of Biscayne Bay, which is most urbanized, while the lowest values are next to the Turkey Point site in Biscayne Bay and in Card Sound.”

Commenting on the draft SEIS, the National Park Service produced isopleth maps of total nitrogen and chlorophyll-a concentrations for surface water bodies including the CCS, Card Sound, Biscayne Bay, and local canals. The maps indicate that they represent 2017 data. The isopleth maps unrealistically treated the separate surface water bodies like they were one contiguous surface water body. However, the main point of these maps was to illustrate that in Biscayne Bay and Card Sound, chlorophyll-a and total nitrogen concentrations increased from east to west as the CCS was approached. The chlorophyll-a isopleth map was based only on data from Biscayne Bay and Card Sound. The NRC staff and its contractors evaluated the 2016, 2017, and 2018 data available in FPL’s Electronic Data Management System (EDMS; <https://www.ptn-combined-monitoring.com>) and in annual monitoring reports covering the same time period (FPL 2018o, FPL 2017a, FPL 2016b). However, the staff was unable to match the chlorophyll-a values in the map either from specific sampling events or yearly averaged values.

Looking at specific sampling events and yearly averages, the NRC staff and its contractors did not find a consistent trend in the data from 2016, 2017, and 2018 that were in FPL’s Electronic Data Management System (EDMS; <https://www.ptn-combined-monitoring.com>). The NRC staff observed that moving away from the CCS, chlorophyll-a concentrations could either decrease or increase. Within Biscayne Bay, sometimes concentrations increased or decreased moving either east or west from the center of the bay, with no apparent relation to the CCS.

The isopleth map of total nitrogen used values for the CCS, Biscayne Bay, Card Sound, and local canals. The NRC staff and its contractors were able to match the values in the map for total nitrogen values used to represent Biscayne Bay and Card Sound. The match for these values came from a single sampling event on September 12, 2016. As with the chlorophyll-a data, the NRC staff and its contractors could not find a consistent trend in the data from 2016, 2017, and 2018 in FPL’s Electronic Data Management System (EDMS; <https://www.ptn-combined-monitoring.com>).

To better characterize the water quality conditions in Biscayne Bay and Card Sound and its relationship to biologic communities, Section 3.5.1.4 of this SEIS was updated, in part, in response to these comments.

#### **Comment 16: Surface Water Hydrology and Quality**

Executive Summary: In Table ES-I (page xviii), the NRC summarizes site-specific environmental impact characterizations related to the Turkey Point license renewal. The "Groundwater Resources" and "Aquatic Resources" categories include reference to volume withdrawal, radionuclide releases, organism entrainment, and thermal impacts, but omits "Water Resources" category, which addresses the hypersalinity plume and nutrient impacts that result from the CCS discharges. As previously discussed, the EPA is concerned that these impacts are not adequately discussed and would be better categorized as 'Moderate to Large' impacts for water resources. The EPA is also concerned that the omission of the most important environmental impact of the license renewal (especially in the Executive Summary) is

problematic and does not adequately describe environmental impacts to readers seeking an overview of the SD EIS.

Recommendation: The EPA recommends the NRC provide an entry in Table ES-I in the FSEIS and briefly describes the water resource impacts from the CCS.

**Response:** *The category, "Water Resources," has not been omitted from Table ES-1 in the Executive Summary of the SEIS. Rather, the NRC separates water resources-related NEPA issues into the categories of "surface water" or "groundwater." The NRC's Category 1 (generic) issues for the analysis of environmental impacts associated with license renewal of nuclear power plants reflect the generic impacts codified in the NRC's regulations in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B. Table ES-1 in this SEIS only summarizes the NRC staff's impacts determinations for applicable Category 2 (site-specific) issues for the proposed action (subsequent license renewal) for Turkey Point Units 3 and 4, in accordance with 10 CFR 51.53(c)(3), 51.71, and 51.95(c). Table ES-1 is similar to, but not as detailed as, Table 4-2 in Section 4.1 of the "Environmental Consequences and Mitigating Actions" chapter of the SEIS. Impact levels (SMALL, MODERATE, and LARGE) for each resource area are established in accordance with the definitions in Section 1.4 of the SEIS, consistent with the NRC's definition of those levels in the GEIS for license renewal.*

*Separately, in Table 4-1 of Section 4.1, the NRC lists the Category 1 (generic) NEPA issues that the NRC staff found to be applicable to Turkey Point. However, Category 1 issues are not included in the Executive Summary, and there are no Category 2 surface water resources issues applicable to Turkey Point Units 3 and 4. Regardless, the tables are intended to reflect the staff's final impact determination for each resource-specific issue, rather than to provide a synopsis of the myriad aspects of each resource that the staff considered as part of its impacts analysis. The NRC staff's detailed impacts analyses for the listed Category 2 issues are presented in Sections 4.2 through 4.16 of the SEIS, as applicable. Similarly, a synopsis of the NRC staff's generic analyses for Category 1 issues, and a description of the consideration of new and potentially significant information related to those issues, are also presented in Chapter 4.*

*This comment provides no new information, and no changes have been made to this SEIS as a result.*

#### **Comment 17: Climate Change**

Climate Resiliency: The EPA notes that the NRC has provided a discussion regarding climate change, adaptation and resiliency, current projections of climate change in Florida and the southeast (including acceleration of sea level rise, storm surge, decreased availability of fresh water and the resulting freshwater demands on aquifers, and increases in wind and rainfall due to extreme weather events). The analysis, however, did not discuss how these changes would potentially impact Nuclear Generating Units 3 and 4. On page 4-110, the analysis specifically indicated:

"The effects of climate change on Turkey Point Unit 3 and 4 structures, systems, and components are outside the scope of the NRC staff's license renewal environmental review. The environmental review documents the potential effects from continued nuclear power plant

operation on the environment .... The NRC conducts safety reviews prior to allowing licensees to make operational changes due to changing environmental conditions. Additionally, the NRC evaluates nuclear power plant operating conditions and physical infrastructure to ensure ongoing safe operations under the plant's initial and renewed operating licenses, through the NRC's Reactor Oversight Program. If new information about changing environmental conditions (such as rising sea levels that threaten safe operating conditions or challenge compliance with the plant's technical specifications) becomes available, the NRC will evaluate the new information to determine if any safety-related changes are needed at licensed nuclear power plants. This is a separate and distinct process from the NRC staff's subsequent license renewal environmental review that it conducts in accordance with the National Environmental Policy Act (NEPA). "

The NRC has indicated that the scheduled public release of both the FSEIS and the Final Safety Evaluation Report (FSER) will be August 2019<sup>1</sup>. It is important that the pertinent hurricane and storm resiliency information from the FSER be included in the FSEIS.

<sup>1</sup> Eric R. Oesterle, "Schedule Revision for the Review of the Turkey Point Nuclear Generating Unit Nos. 3 and 4 Subsequent license Renewal Application (EPID NOS. L-2018-LNE-000IIL-2018-RNW-0002) ", Nuclear Regulatory Commission, Washington D.C., May 3, 2019.

Recommendation: For NEPA disclosure, the EPA recommends the NRC evaluate potential impacts that climate change might have on the nuclear units and supporting facilities such as the CCS, transportation routes (roads, barge traffic) etc. The EPA also recommends the NRC provide any preliminary findings from the FSER within the FSEIS. The EPA recommends adding climate resiliency as an impact area for the comparison of the alternatives.

**Response:** *As observed by the EPA, Section 4.15.3.2 of this SEIS includes the NRC staff's evaluation of observed trends in and effects of climate change on environmental resources as well as the potential implications of future changes in climate change indicators. However, the NRC staff has not provided an evaluation of the potential impacts of climate change on nuclear power plant operations because the purpose of the NRC's SEIS is to evaluate the potential environmental impacts of the proposed action (subsequent license renewal) and alternatives to the proposed action. Evaluation of potential climate change impacts, including sea level rise, flooding, and storm surge on nuclear power plant operations and physical infrastructure are outside the scope of the NRC's license renewal environmental review. However, with the context of the environmental review, the NRC takes into consideration external hazards, such as flooding, as part of the NRC's severe accident mitigation alternatives (SAMA) analysis. Specifically, the NRC staff conducted an evaluation of any new and significant information with respect to external hazards. This is referenced in Section 4.11.1.3 of this SEIS and further documented in Appendix E. Separately, however, the NRC addresses potential hazards such as from natural phenomena to safe operation of a nuclear power plant through its ongoing oversight of operating licenses, as noted by EPA in its comments and as referenced in Section 4.15.3.2 of this SEIS.*

*The NRC's safety evaluation report for license renewal does not specifically evaluate topics such as hurricane and storm resiliency as these issues, along with other natural phenomena, are evaluated on an ongoing basis outside the scope of the NRC's license renewal safety and environmental reviews. As described in 10 CFR Part 54 of the NRC's regulations, the focus of the NRC staff's license renewal safety review as documented in the safety evaluation report is*

*to verify that the license renewal applicant has identified aging effects that could impair the ability of structures and components within the scope of license renewal to perform their intended functions, and to demonstrate that these effects will be adequately managed during the proposed period of extended operation.*

*No changes were made to the SEIS as a result of this comment.*

**Comment 18: Climate Change**

Hurricane and Storm Impacts: As noted in the previous comment, the NRC intends to discuss information regarding hurricane and storm surge impacts in the FSER. On page 3-36, the SD EIS states, "Components vital to safety, with the exception of the intake cooling water (JCW) pumps, which are protected to 22.5 feet (6.9 m) MSL, are protected against flood tides and waves up to 22 feet (6.7 m) MSL on the east side of Turkey Point (FPL 20181). "As a part of the FSER for the Turkey Point Nuclear Units 6 and 7 Combined Operating License (COL)2, the NRC conducted various hurricane and storm impact evaluations for the proposed nuclear units and supporting facilities. The EPA notes that on page 2-138 of the FSER the NRC states:

"The applicant noted that the estimated PMSS [Probable Maximum Storm Surge Analysis] still-water level at Turkey Point Units 6 and 7, combined with coincidental wind-wave run-up, of approximately 24.8ft (7.6 m) NAVD 88 is lower than the design plant grade elevation of 26 ft (7.9 m) NAVD 88 for safety-related facilities. Therefore, the applicant concluded that the postulated PMH {Probable Maximum Hurricane} event does not affect the safety functions of the plant, and debris, waterborne projectiles, and sediment erosion and deposition are not of concern to the safety-related facilities.e"

**Response:** *See response to comment 19, below.*

**Comment 19: Climate Change**

As written in the SDEIS, it would appear that "components vital to safety" could be compromised because vital facilities at the existing plant would have protection up to 22-22.5' while the PMSS from the FSER for proposed Nuclear Units 6 and 7 indicates a possible storm surge of up to 24.8'. The EPA acknowledges and defers to the NRC on matters of nuclear safety. However, there is a concern that the SDEIS does not adequately disclose storm surge impacts to the facility and potential damaging environmental impacts that could result from the facility being compromised during a hurricane or severe storm event.

The EPA has provided past technical comments on hurricane and storm analysis (Reference: Turkey Point Nuclear Units 6 and 7 COL's DEIS (July 17, 2015) and the FEIS (December 22, 2016). One particular issue that is applicable to this SD EIS is the lack of discussion and evaluation regarding potential damages that might be incurred to the nuclear units and supporting facilities (i.e., wave erosion and undercutting of the facility, damage due to debris impacts, etc.). In addition, the SDEIS did not factor in reasonably foreseeable future land use and population growth in considering the potential impacts of a catastrophic storm event and its environmental impacts on the facility and surrounding areas.

There is no distinct section within the SDEIS that describes potential damaging impacts that hurricane and storms could have on Nuclear Units 3 and 4 and supporting facilities. Additionally, there is no discussion regarding the adverse impacts on the surrounding environment or habitat associated with facility failures related to hurricane and storm events. An example is that there is no discussion regarding the potential impacts that a hurricane or storm could have on flooding the CCS. Presumably, heavy precipitation and/or storm surge could potentially impact the hypersalinity plume within the Biscayne aquifer or release harmful nutrients and contaminants to the surrounding environment which could adversely impact water quality and aquatic species.

Recommendations: The EPA recommends that a section in the FSEIS regarding hurricane and storm impacts be included and be considered a discrete "impact area" to be used in evaluating each alternative's impacts. The EPA recommends the NRC disclose potential 'reasonable and foreseeable' hurricane and storm impacts (heavy precipitation, storm surge, wave erosion/undercutting and debris impacts) to the nuclear units and supporting facilities. Additionally, the EPA recommends the NRC disclose impacts to the surrounding environment (i.e., ecosystems and water quality of Biscayne Bay, impacts to Biscayne Aquifer including the hypersalinity plume, etc.) should the CCS be flooded during a hurricane or severe storm event.

**Response:** *The NRC understands that the EPA is concerned about the impacts of storm surge on Turkey Point Units 3 and 4, citing the Probable Maximum Storm Surge (PMSS) estimate prepared for proposed Units 6 and 7. The effects of external hazards on Turkey Point Units 3 and 4 structures, systems, and components are outside the scope of the NRC staff's subsequent license renewal environmental review. This SEIS, which was prepared as part of the environmental review, provides a thorough assessment of the environmental impacts of the proposed action and alternatives in accordance with CEQ regulations and the NRC's regulations for implementing NEPA at 10 CFR Part 51. Operating plants must deal with the effects of external hazards (e.g., heavy precipitation, storm surge, flooding, and associated effects) through the requirements of their licenses, including technical specifications, to ensure that structures, systems, and components important to safety comply with applicable regulations and license requirements, as described in Sections 3.5.1.1 and 4.15.3.2 of this SEIS. As part of the NRC staff's description of Turkey Point's hydrologic environment, flood protection and the potential for flooding at Turkey Point are discussed in Section 3.5.1.1, "Surface Water Hydrology," of the SEIS (see "Potential for Flooding at the Turkey Point Site"). The NRC staff has revised and expanded this subsection to address commenter concerns about flooding, storm surge, and sea level rise. Also, as discussed in Sections 3.5.1.1 and 4.15.3.2, FPL has proposed an aging management program for the CCS berms, providing for the inspection and maintenance of the berms throughout the period of subsequent license renewal.*

*An evaluation of impacts over the period of subsequent license renewal, from CCS flooding is discussed in response to the comment titled "Failure to Analyze Impacts of Sea Level Rise and Storm Surge." The evaluation concludes that over the period of subsequent license renewal, overtopping of the CCS or a release of CCS waters into adjacent surface waters due to flood damage to the CCS could occur infrequently. Flooding and flood damage to the CCS is not likely to occur except in the event of a hurricane. However, if it occurs it is likely to cause only small changes to the water quality in Biscayne Bay and Card Sound. A hurricane would dilute the impact of CCS releases and would likely cause greater impacts to the water quality of Biscayne Bay or Card Sound than any flooding caused by a release of CCS waters.*

*The difference between storm surge water surface elevations for Turkey Point Units 3 and 4 and proposed Units 6 and 7 is described in Section 3.5.1.1, "Surface Water Hydrology," ("Potential for Flooding at the Turkey Point Site"). The flood analysis for Units 3 and 4 contained a maximum storm surge projection of 19.1 ft (5.8 m). In a separate and independent analysis, the maximum storm surge projection for the design of proposed Units 6 and 7 at the Turkey Point site was 24.8 ft (7.6 m). In the analysis for Units 3 and 4, FPL used a detailed model that contained more realism than the less detailed deterministic model used by FPL for Units 6 and 7. To account for the less detailed evaluation, more conservative assumptions were incorporated into the analysis for the Units 6 and 7 model. For example, the assumptions in the model used for Units 6 and 7 included (1) a hypothetical hurricane with an intensity much greater than has ever been observed in the Atlantic Ocean and (2) an additional 20 percent added margin to the final computed storm surge water level. This resulted in a higher maximum storm surge projection in the Units 6 and 7 analysis.*

*As stated earlier, operating plants' structures, systems, and components are continually evaluated for external hazards under the NRC's Reactor Oversight Process where emerging safety and security issues are addressed. On an ongoing basis, this oversight assesses the adequacy of structures, systems, and components of a nuclear power plant, including their exposure to hazards such as flooding. The NRC's reactor oversight program will continue in effect throughout the period of subsequent license renewal.*

*This comment provides no new information and no changes were made to this SEIS as a result.*

## **Comment 20: Environmental Justice**

Environmental Justice (EJ): Pursuant to Executive Order 12898, the SDEIS includes demographic and impact information related to minority and low-income populations. Turkey Point Nuclear Unit Nos. 3 and 4 are located within an area containing substantive minority and low-income populations within a 50-mile radius of the proposed project. Thresholds and census data are used to compare race and income data at the block group level to the reference population. The SDEIS identifies minority populations using the meaningfully greater analysis (i.e., 78% or greater) and low-income populations are identified using the % of individual living below the Federal poverty threshold (18% or greater). The SDEIS evaluates the potential for disproportionately high and adverse health and environmental impacts and concludes that there are no disproportionately high and adverse environmental or health impacts on low-income and minority populations due to the proposed project license renewal.

Recommendations: The SDEIS identifies minority populations using the meaningfully greater analysis. Typically, minority populations are identified using the meaningfully greater analysis along with the 50% percent analysis. At the 50% percent or greater threshold, the project area includes a substantive minority population that should be meaningfully engaged throughout the NEPA process to help identify potential benefits and burdens associated with licensing permitting decisions. The EPA recommends the NRC include the 50% percent or greater and analysis in the EJ evaluation in the FSEIS. Additionally, the EPA recommends the EJ section include information about the public outreach efforts to minority and low-income populations and participation (i.e., receiving community input) of these communities in the proposed project (i.e., scoping, planning, impact assessment, etc). Because there is a high Hispanic population as well as migrant populations within the vicinity of the project, the EPA recommends the FSEIS

discuss outcomes of efforts to engage these populations and describe efforts made to address issues related to limited English proficiency. The EPA also recommends that Native American tribes and populations that may utilize area resources as part of their cultural practice or for subsistence should also be coordinated with and efforts to engage them should also be discussed.

**Response:** *The commenter recommends that the NRC staff include the Fifty-Percent Analysis in combination with the Meaningfully Greater Analysis in identifying minority populations as part of the Environmental Justice evaluation in the SEIS. The NRC staff conducted its Environmental Justice review in accordance with guidance contained in the Commission's Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions (69 FR 52040) and Appendix D to LIC-203 (ADAMS Accession No. ML12234A708). The NRC staff is aware that the identification of minority populations can be conducted in various ways, including the No-Threshold analysis, Fifty Percent analysis, the Meaningfully Greater analysis, or both the Fifty Percent analysis and the Meaningfully Greater analysis in concert. However, in accordance with NRC's policy statement and guidance, minority and low-income populations are identified when the minority and/or low-income population of an impacted areas exceeds 50 percent or the minority and/or low-income population is meaningfully greater than the minority and/or low-income population percentage than the minority and/or low-income population within a 50-mi (80-km) radius of the nuclear power site.*

*The NRC staff determined that the Meaningfully Greater analysis is appropriate to identify minority populations as a result of the substantial aggregate minority population within the geographic area (50 mi (80 km)). The Meaningfully Greater analysis allows for the Environmental Justice analysis to focus on the potential effects occurring where the concentration of minority populations is the greatest when compared to the geographic area (50-mi (80-km)) radius). If the Fifty-Percent threshold were to be applied to identify minority populations, the analysis would result in approximately 81 percent of the census block groups (1,743 out of 2,152) within a 50-mi (80-km) radius of Turkey Point as minority population block groups. Given that 78 percent of the population within a 50-mi (80-km) radius of Turkey Point are minority individuals, the 50 percent threshold would not distinguish the location of higher concentrations of minority populations when compared to the aggregate minority individuals residing within a 50-mi (80-km) radius of Turkey Point. Additionally, the Fifty-Percent analysis would not change how the NRC staff considered Environmental Justice matters in the SEIS as this would confirm a majority minority population (already noted in the SEIS). In applying the Meaningfully Greater analysis, the SEIS documents the extent to which minority populations reside within a 50-mi (80-km) radius of Turkey Point (discussed in Section 3.12 of the SEIS) and did not preclude Environmental Justice matters from being considered in greater detail as these are addressed in Section 4.12 of the SEIS. No changes were made to the SEIS in response to this comment.*

*For the scoping and issuance of the draft SEIS public meetings, paper copies of the presentation material was available in Spanish (ADAMS Accession Nos. ML18150A255 and ML19116A258) and an NRC Spanish-speaking representative was available at the meetings to address questions from members of the public. Consistent with 36 CFR 800.8(c), the NRC staff consulted with potentially affected Indian tribes as part of the "National Historic Preservation Act of 1966, as Amended" (NHPA) Section 106 process. Consultation under Section 106 of NHPA*



*is presented in Section 4.9.1.2 of the SEIS. As part of consultation, subsistence activities conducted by Indian tribes were not identified. Section 4.12.1 of the SEIS was revised to include the NRC's outreach efforts to minority populations.*

#### **Comment 21: Ecological Resources**

Everglades National Park, Biscayne National Park and Biscayne Bay Aquatic Preserve: As noted in previous comments, the EPA has raised concerns with respect to the Proposed Action's potential impacts to Everglades National Park, Biscayne National Park and Biscayne Bay Aquatic Preserve. The EPA also identified the potential impacts to CERP projects (i.e., potential drawdown of groundwater, ecosystem and water quality impacts should the CCS be flooded during a hurricane or severe storm event, potential continuation or worsening of the hypersalinity plume, etc.).

Recommendation: The EPA recommends the NRC consider a separate impact area (to be reflected in Table 2-2 of the FSEIS) for significant state and Federal resources to include Everglades National Park, Biscayne National Park and Biscayne Bay Aquatic Preserve and CERP projects which would better reflect the potential impacts to these valuable and high quality resources.

**Response:** *These comments concern the potential effects of continued operation of Turkey Point and the CCS on the ecological environment. Many of the comments specifically address impacts on seagrass in Biscayne Bay, Card Sound, and other nearby areas. Some of the comments concern the impacts of water quality on federally and State-managed natural resources, including Biscayne Bay National Park, the Comprehensive Everglades Restoration Plan (CERP), the Biscayne Bay Coastal Wetlands Project, and the Florida Keys National Marine Sanctuary. Other comments express general opposition to the proposed subsequent license renewal because of concern for the potential impacts of license renewal on the ecological environment.*

*During its review, the NRC staff considered the impacts of the proposed action on the ecological environment, including those impacts that may be experienced by sensitive and important ecological resources within nearby federally and State-managed lands and waters, and whether CCS waters could impact the ecology of neighboring surface waters through groundwater exchange. Within the SEIS, the NRC staff describes terrestrial resources, aquatic resources, and special status species and habitats in Sections 3.6, 3.7, and 3.8, respectively. The NRC staff evaluates effects to these resources in Sections 4.6, 4.7, and 4.8, respectively. Within these sections of the SEIS, the NRC staff has incorporated additional information and several new subsections in response to these public comments and newly available monitoring data, among other information, as follows.*

- *Section 3.6.2, "Marsh, Mangrove, and Tree Island Semiannual Monitoring," has been updated to reflect FPL data from the 2018 monitoring period. The NRC staff also generally expanded this section to describe methods and results of FPL's marsh and mangrove monitoring in more detail. Additionally, the staff updated certain figures and added new figures and graphs that depict sawgrass and mangrove monitoring results from Biscayne Bay and surrounding areas.*

- *Section 3.7.4, “Biscayne Bay and Card Sound Semiannual Monitoring,” has been updated to reflect FPL data from the 2018 monitoring period. The NRC staff also generally expanded this section to describe methods and results of FPL’s aquatic monitoring in more detail. The staff added discussions of submerged aquatic vegetation monitoring results and seagrass leaf nutrient analysis results. The NRC staff also incorporated new figures and graphs to support this discussion.*
- *Section 3.8.3, “Marine Sanctuary Resources Protected Under the National Marine Sanctuaries Act,” is a new section in the SEIS. In this section, the staff describes sanctuary resources of the Florida Keys National Marine Sanctuary. The staff included a new figure within this section that depicts the geographic boundaries of the sanctuary.*
- *Section 4.6.1, “Proposed Action,” has been updated to reflect FPL marsh and mangrove monitoring data from the 2018 monitoring period. The staff also clarified language pertaining to its assessment of new information for the License Renewal GEIS Category 1 issue of “Cooling system impacts on terrestrial resources (plants with once-through cooling systems or cooling ponds.”*
- *Section 4.8.1.1, “Federally Listed Species and Critical Habitat Protected Under the Endangered Species Act,” has been updated to reflect the outcome of the NRC’s formal consultation with the FWS and the current status of the NRC’s informal consultation with the NMFS. The staff revised its effect determinations for several species under FWS jurisdiction in Table 4-4. The staff also significantly expanded its written assessment of potential water quality impacts on federally listed species under NMFS jurisdiction. The Kemp’s ridley sea turtle (*Lepidochelys kempii*) is now addressed in this section in addition to the four species of sea turtles included in the DSEIS.*
- *Section 4.8.1.3, “Marine Sanctuary Resources Protected Under the National Marine Sanctuaries Act,” is a new section in the FSEIS. In this section, the staff evaluates the impacts of the proposed action on sanctuary resources of the Florida Keys National Marine Sanctuary and makes a determination that consultation is not required.*
- *Appendix C.3, “National Marine Sanctuaries Act Consultation,” is a new section in the SEIS. In this section, the staff describes consultation requirements under the National Marine Sanctuaries Act that pertain to Federal action agencies and summarizes the staff’s determination that consultation is not required.*

*Ecological variations and fluctuations are typical in Southern Florida due to harsh physiological conditions, storm patterns, and other natural factors. For instance, during the 2018 reporting period, FPL observed some seasonally and meteorologically driven ecological changes. As described in Section 3.6.2 of the SEIS, one freshwater marsh plot (F1-1) experienced a complete die-off of sawgrass in connection with Hurricane Irma, which made landfall in September 2017. Mangrove plots, on the other hand, continued to exhibit stable structure and composition during the 2018 reporting period. As described in Section 3.7.4 of the SEIS, seagrass cover and composition monitoring and leaf nutrient analyses have yielded no clear trends and no evidence of ecological degradation. With respect to the commenters’ specific concerns regarding the impacts of the CCS on ecological resources, in the above-referenced*

*sections of the SEIS, the NRC staff explains that current data indicate no discernable ecological impact on the areas surrounding the CCS and no clear evidence of CCS water in the surrounding marsh and mangrove areas or in Biscayne Bay from a groundwater pathway. Ecological monitoring data collected during the 2018 reporting period continue to support this conclusion. Thus, available data do not support commenters' statements that the CCS is contributing salt, tritium, and nutrients to Biscayne Bay, Card Sound, or other neighboring surface waters; that nearby marshes are being adversely affected; or that seagrass beds are exhibiting die-off attributable to CCS operation.*

*With respect to flooding, the NRC's evaluation of such impacts is discussed in response to Comment 0023-15. The staff's evaluation concludes that over the period of subsequent license renewal, flooding and flood damage to the CCS is not likely to occur except in the event of a hurricane. Such an event would only cause insignificant changes to Biscayne Bay and Card Sound water quality.*

*With respect to sea level rise, climate change, and other potential cumulative impacts, the NRC staff addresses these impacts in Sections 4.15.3, 4.16.3, and 4.16.4 of the SEIS.*

*With respect to potential impacts on sanctuary resources of the Florida Keys National Marine Sanctuary, the NRC staff documents its determination that the proposed action is not likely to destroy, cause the loss of, or injure any sanctuary resources in Section 4.8.1.3 of the SEIS. For more information on this topic, see the NRC's response to Comment 0018-4 and 0018-7.*