UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
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	)	
PROGRESS ENERGY FLORIDA, INC.	)	Docket Nos. 52-029 and 52-030
	)	
	)	
(Combined License Application for Levy County Nuclear Power Plant, Units 1 and 2)	)	

NRC STAFF REBUTTAL STATEMENT OF POSITION

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July 31, 2012

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INTRODUCTION

Pursuant to 10 C.F.R. §§ 2.337(g)(2) and 2.1207(a)(1), and the Atomic Safety and Licensing Board's (Board) Initial Scheduling Order,[1] as modified by the Board's May 23, 2012, Memorandum and Order,[2] the NRC Staff (Staff) hereby presents its Rebuttal Statement of Position, together with its pre-filed rebuttal testimony, exhibits and affidavits regarding the

[1] Progress Energy Florida, Inc. (Levy County Nuclear Power Plant, Units 1 and 2), LBP-09-22, 70 NRC 640, 647 (2009).

[2] Licensing Board Memorandum and Order (Ruling on Motions for Extension of Time and Motion to Change the Trigger Date for the Evidentiary Hearing) at 12 (May 23, 2012) (unpublished).

Intervenors'[3] Contention 4A. For the reasons discussed below and in the attached rebuttal testimony, Contention 4A lacks merit, and the Board should rule in favor of the Staff.

BACKGROUND

A more thorough recitation of the background of this case is provided in the Staff's Initial Statement of Position. On June 26, 2012, the Intervenors, Progress Energy Florida (PEF or Applicant) and the Staff filed their pre-filed direct testimony in this case, along with exhibits and initial statements of position. The Staff's Pre-filed Direct Testimony was entitled "NRC Staff Testimony Of Mallecia A. Sutton, Ann L. Miracle, Michael T. Masnik, J. Peyton Doub, Lara M. Aston Dan O. Barnhurst, Lance W. Vail, Rajiv Prasad, Vince R. Vermeul, Kevin R. Quinlan, Larry K. Berg Concerning Contention 4A" ("Staff Direct Testimony"). The Intervenors' Pre-filed Direct Testimony included the testimony of Mr. Gareth Davies ("Davies Direct Testimony"), Dr. Timothy Hazlett ("Hazlett Direct Testimony"), Mr. David Still ("Still Direct Testimony") and Dr. Sydney Bacchus ("Bacchus Direct Testimony"). The Applicant's Pre-filed Direct Testimony included the testimony of Dr. Mitchell L. Griffin ("Griffin Testimony"), Mr. James O. Rumbaugh, III ("Rumbaugh Testimony"), Mr. Jeffery M. Lehnen ("Lehnen Testimony"), Dr. William J. Dunn ("Dunn Testimony"), Dr. Kevin M. Robertson ("Robertson Testimony"), and Dr. Eldon C. Blancher II ("Blancher Testimony"). On July 6, 2012, the Intervenors filed errata to their direct testimony, statement of position and exhibits, and they filed a motion to admit six new exhibits. On July 9, 2012, the Intervenors filed redline versions of their statement of position and

[3] The Intervenors were, at the time they filed their intervention petition, the Ecology Party of Florida, the Green Party of Florida, and the Nuclear Information and Resource Service. On May 17, 2012, the Intervenors filed a notice that the Green Party of Florida was withdrawing from the proceeding.

testimony, a second erratum to their testimony, and a motion to admit the new versions of their direct testimony and exhibits. On July 18, 2012, the Board issued a Memorandum and Order admitting Intervenors' new exhibits, corrected exhibits and corrected testimony. Licensing Board Memorandum and Order (Ruling and Instructions Regarding Evidentiary Filings) at 3-5 (July 18, 2012) (unpublished).

DISCUSSION

I. Legal and Regulatory Requirements

Two legal issues arise repeatedly in the Intervenors' Pre-filed Direct Testimony and Initial Statement of Position. First, the Intervenors claim that the Staff inappropriately delayed its environmental review. Specifically, the Intervenors claim that the Staff assigned to the Florida Department of Environment Protection (FDEP), a state agency, the NRC's independent National Environmental Policy Act (NEPA) analysis responsibility by relying, in part, on the FDEP's Conditions of Certification ("FDEP COCs"). Intervenors' Initial Statement of Position at 13-15. Second, throughout their testimony, the Intervenors question the adequacy of the Staff's review and suggest further research or other techniques that the Staff could have used. For the reasons discussed below, and in the Staff's Rebuttal Testimony, both of these claims lack merit.

In their statement of position, the Intervenors make several arguments with respect to the Staff's consideration of the FDEP COCs in the FEIS. Intervenors assert that the Staff used the FDEP COCs to compensate for an inadequate water use impacts analysis, that the Staff left its NEPA obligation to analyze environmental impacts to a state agency, and that the Staff did not analyze alternative sources of water supply in the FEIS. See Intervenors Initial Statement of Position at 13-14. These arguments demonstrate a misunderstanding of the FEIS and the Staff's analysis.

As described throughout its Initial Statement of Position and below, the Staff disagrees with the Intervenors' assertion that the Staff's analysis of impacts from groundwater usage was deficient. Additionally, the Intervenors are mistaken to divorce the Staff's consideration of the Conditions of Certification from the rest its analysis. The Staff independently considered the terms and requirements laid out in the Conditions of Certification before determining which aspects could be relied upon for the purposes of the NEPA review. Then, as explained in its Initial Statement of Position, the Staff used the Conditions of Certification to provide the Staff with a realistic picture of potential future environmental impacts in order to further inform its independent analysis. See Staff Initial Statement of Position at 17. It would make little sense for the Staff to have ignored other agencies' requirements that are legally binding and directly applicable to the subject matter the Staff analyzed. In short, the Staff has not deferred or delegated its NEPA responsibilities, but has simply ensured that its own review takes into account certain binding measures that other agencies have indicated they intend to impose. Thus, Intervenors' references to cases holding that "environmental impacts of agency action must be considered before the action is taken, not afterwards" and that an agency "may not assign to a state agency its own independent responsibility under NEPA for evaluating environmental impacts" are inapposite. Intervenors Initial Statement of Position at 13-14.

In its ruling on the admissibility of Contention 4A, the Board explicitly ruled that alternatives were outside the scope of the admitted contention; thus, the Board should not consider the Intervenors' argument that the Staff impermissibly relied on future actions in place of conducting a full alternatives analysis. Licensing Board Memorandum and Order (Admitting Contention 4A), at 17 (Feb. 2, 2011) (unpublished) (Rejecting Intervenors' assertions regarding alternatives as untimely and inadmissible). However, should the Board consider this argument, the Staff did analyze service water supply alternatives in the FEIS in Section 9.4.3 of the FEIS,

contrary to Intervenors' statements. After considering a range of alternatives (e.g., desalination, reclaimed wastewater, and fresh surface water), the Staff concluded that none was environmentally preferable based on current information. See NRC001B at 9-249 to 9-251. As described above, the Staff did not use the Conditions of Certification to defer an analysis of alternatives, but rather the Staff's analysis of alternatives was conducted in recognition of what the Conditions of Certification require.

Regarding the Intervenors' numerous examples of further testing or research the NRC could have performed, the NRC is free to select its own methodologies in evaluating environmental impacts, as long as they are reasonable. Entergy Nuclear Generation Co. (Pilgrim Nuclear Power Station), CLI-10-11, 71 NRC 287, 315-16 (2010). In addition, NEPA must be construed "in the light of reason if it is not to demand virtually infinite study and resource." Id. (quoting Natural Res. Def. Council v. Hodel, 865 F.2d 288, 294 (D.C. Cir. 1988)). It is not enough for the Intervenors to say more research could have been done, or to point out small mistakes in the FEIS. If there are mistakes in the FEIS, "in an NRC adjudication it is the Intervenors' burden to show their significance and materiality." Exelon Generating Co. (Early Site Permit for Clinton ESP Site), CLI-05-29, 62 NRC 801, 811 (2005).

II. Witnesses

The professional qualifications and background of the Staff's witnesses that provided initial pre-filed testimony were included in the Staff's Initial Statement of Position and in the Staff's Direct Testimony. For rebuttal testimony, the Staff also presents testimony from Dr. Gerry Stirewalt. Dr. Stirewalt is a Senior Geologist in the Geosciences and Geotechnical Engineering Branch, of the Division of Site Safety and Environmental Reviews in the NRC's Office of New Reactors. Staff Rebuttal Testimony at A3. Dr. Sitrewalt was the lead geologist for the Staff's review of the Levy County Nuclear Power Plant (LNP) combined license (COL).

Id. at A4. Dr. Stirewalt has over 40 years of experience in surface and subfurface geological site characterizations. Id. at A5. While at the NRC, he has reviewed Final Analysis Evaluation Report Sections 2.5.1, "Basic Geology and Seismic Information", and 2.5.3, "Surface Faulting", for nine Early Site Permit (ESP) or COL applications, and has provided testimony at uncontested hearings for the Vogtle ESP and V.C. Summer COLs. Id. Dr. Stirewalt has a Doctor of Philosophy in Structural Geology from the University of North Carolina at Chapel Hill. NRC070.

III. The Inadequacies Asserted by the Intervenors Lack Merit

In their pre-filed direct testimony, the Intervenors' witnesses made numerous claims regarding the adequacy of the FEIS. In the Staff's Rebuttal Testimony, the Staff responds to these claims. The Staff's Rebuttal Testimony separates the Intervenors' claims into those regarding dewatering and those regarding salt drift and salt deposition. For the reasons discussed in the Staff's Rebuttal Testimony, and as described below, none of the Intervenors' claims has merit, and the Board should find in the Staff's favor for Contention 4A.

A. The Intervenors' Claims Regarding Impacts Due to Dewatering Lack Merit

1. The Staff's Hydrology Analysis was Adequate

The Staff's Rebuttal Testimony discusses claims from the Intervenors related to both groundwater and surface-water hydrology. The Staff's Rebuttal Testimony first discusses why the Intervenors' criticisms of the Staff's use of groundwater modeling lack merit. Before discussing many of the Intervenors specific claims, the Staff's Rebuttal Testimony reiterates that the Applicant's models were only one part of the Staff analysis, and that the models alone were not sufficient to make impact determinations. Staff Rebuttal Testimony at A7; Staff Direct Testimony at A38, A42, A44, A45. Instead, the Staff appropriately used information from the models in conjunction with the requirements imposed by the State of Florida in the FDEP COCs

to make impact determinations. Id. As the Staff explained in its direct testimony, there can be several appropriate conceptual models at a site, and some of the Intervenors' suggestions may be appropriate conceptual models. However, adding additional conceptual models would not have changed the Staff's determination that the model alone is an insufficient tool for making wetlands impact determinations, and would not have changed the Staff's conclusions. Id. at A8; Staff Direct Testimony at A31-35.

Many of the Intervenors claims challenge whether the type of model used by the Applicant, and reviewed by the Staff, was appropriate at the LNP site. Specifically, the Intervenors challenge the use of an equivalent porous medium model, and assert that the Staff should have incorporated additional hydrologic complexity into the model. Id. at A9. An equivalent porous medium model assumes a continuum of porous media instead of discrete fracture or dissolution channel networks within a porous matrix. Id. As the Staff explains in its Rebuttal Testimony, equivalent porous media models, like the one developed by the Applicant, can be used in an environment like that at the LNP site. Id. at A10. This is the approach used by the Southwest Florida Water Management District (SWFWMD) in these areas, and is a standard industry practice as described in the published literature included as Staff exhibits. Id.; NRC071; NRC072. Attempts to model discrete fractures or dissolution features, as suggested by the Intervenors, over an area as large as that encompassed by the Applicant's model would be technically difficult and even if successful, the model would still be subject to significant uncertainty. Id. Therefore, adding the complexity sought by the Intervenors would not change the Staff's approach of only using the model as one piece of information in its analysis and it would not change the Staff's impact determinations. Id. "NEPA should be construed in the light of reason if it is not to demand virtually infinite study and resources." Pilgrim, CLI-10-11, 71 NRC at 315 (internal citations omitted). As such, the Staff can select its own methodology, as

long as it is reasonable. Id. at 316. Here, because the model reviewed by the Staff is used by the SWFWMD in this area, is commonly used in the industry in similar settings, is only one part of the Staff's analysis, and because the Intervenors' proposed approach would not change the Staff's approach or conclusions, the Staff's review of groundwater was reasonable and meets the requirements of NEPA.

Further, it is unclear whether the recommendations made by the Intervenors' witnesses could be implemented at the LNP site. Mr. Davies recommends using tracing experiments and florescent dyes, and Mr. Still also recommends mapping preferential flow paths. Davies Direct Testimony at A.3, A.14; Still Direct Testimony at A.3. However, as noted in the Staff's Direct Testimony, there is no evidence of well-developed karst or large-scale preferential flow pathways at the LNP site, so it is unclear how the recommended tracing experiments could be performed there. Staff Rebuttal Testimony at A11. Mapping studies using dyes and tracers are more commonly performed on a smaller scale area or where conduit-dominated flow is known to occur. Id. Similarly, Dr. Hazlett states that the model has shortcomings because it omits salinity interactions with the nearby barge canal. Hazlett Direct Testimony at A.3. However, adding Dr. Hazlett's proposal to the conceptual model would only add an additional layer of uncertainty to the model, and would not change the Staff's approach to determining impacts, or its impacts determinations. Staff Rebuttal Testimony at A15. Further, the criticisms that the model should have included information from the Tarmac Mine, Knight Sand Mine, and Adena Ranch lack merit, because the cumulative effects from the water use from these projects in addition to the LNP will not be noticeable, and their explicit inclusion into the groundwater model would not change any of the Staff's findings in the FEIS. Id. at A16.

In Answers 17-24 of the Staff's Rebuttal Testimony, the Staff describes several more inaccuracies in the Intervenors' testimony regarding the Staff's use of modeling. These errors

largely concern the Intervenors misreading of the FEIS or their misunderstanding of how the Staff used the Applicant's groundwater models. The Staff's Rebuttal Testimony makes clear that the Intervenors' criticisms are inaccurate, and the Staff's use of the groundwater models was reasonable.

Another consistent error in the Intervenors' direct testimony is how they characterize the underlying geology of the LNP site. For example, Mr. Davies states that the Florida Geological Survey (FGS) indicated that the "whole area including the LNP site is a karst terrain." Davies Direct Testimony at A.9. In fact, the FGS shows the LNP site to be in a region where limestone is bare or thinly covered and, sinkholes are few in number, are generally shallow and broad, and develop only gradually. Staff Rebuttal Testimony at A25. Further, Mr. Davies' argument that most of the flow in the area goes through preferential pathways is inaccurate. Id. at A26. There is considerable evidence -- including studies by the United States Geological Survey and borehole, geophysical and hydrogeologic information from the LNP site characterization -- that shows that LNP is not in an area of well-developed interconnected karst features. Id. Further, the LNP site overlays the Avon Park Formation, not the Ocala Formation as claimed by the Intervenors. Id. at A26, A29. Because the Avon Park Formation is comprised of dolomitized limestone, and not pure limestone, it is not as susceptible to the development of well-developed karst systems as the Ocala Formation. Id. at A26.

Even if there were preferential flowpaths beneath the LNP site, this could potentially reduce impacts to wetlands because it would limit the amount of wetlands drawdowns at the site, reducing the total radial extent of wetlands impacts. Id. at A31. A model with preferential pathways is more conservative the purposes of a safety assessment than it is for an environmental assessment. Id. The Intervenors do not state how their conceptual model, which postulates well-developed preferential flow paths, would show overall wetlands impacts that are

greater than what the Staff considered in the FEIS. But in any event, as discussed above, the available site evidence shows a lack of preferential flowpaths. Id. at A28, A32.

The Staff's Rebuttal Testimony next addresses inaccuracies in the Intervenors' direct testimony regarding surface-water impacts. First, the Staff states that two of Dr. Bacchus' claims, regarding the location of freshwater springs and salinity data, are difficult to evaluate because it is unclear how or from what source Dr. Bacchus derives her data. Id. at A37-38. But as the Staff describes in its Rebuttal Testimony, its analysis of impacts related to springs and salt water intrusion was adequate. Id. Further, several of Dr. Bacchus' statements demonstrate a misreading of the FEIS and the FSAR. Id. at A39-42. The Staff's Rebuttal Testimony specifies why Dr. Bacchus' statements are incorrect; consequently, none of these alleged inaccuracies shows any error in the Staff's review. Even if the Intervenors find some inaccuracies, in NRC licensing proceedings regarding NEPA contentions, the Intervenors must do more than point to information that could be included in an FEIS, they must show why any inaccuracies identified are material. See Exelon Generation Co. (Early Site Permit for Clinton ESP Site), CLI-05-29, 62 NRC 801, 811 (2005) (Stating that "[t]here may, of course, be mistakes in the DEIS, but in an NRC adjudication, it is Intervenors' burden to show their significance and materiality."). Here, the Intervenors do not attempt to meet this threshold.

Dr. Bacchus' statements regarding the Staff's analysis of salinity are similarly without merit. Dr. Bacchus states that the Staff only addressed salinity in the Withlacoochee Canal (CFBC), when in fact the Staff evaluated salinity in the entire water system. Staff Rebuttal Testimony at A43. Dr. Bacchus also incorrectly states that the FEIS did not consider seasonal variations when determining salinity. Bacchus Direct Testimony at A.47. In fact, the Staff conservatively chose the lowest monthly data from 13 weather stations when doing its analysis, thereby taking into account seasonal variations. Staff Rebuttal Testimony at A44. Further, Dr.

Bacchus makes many inaccurate statements regarding the discussion of salinity in the FEIS. As explained in the Staff's Rebuttal Testimony in answers 43, 44, and 46, Dr. Bacchus either misreads the FEIS or ignores sections of the FEIS that discuss topics that she claims were not discussed.

Similarly, Dr. Bacchus' claims regarding climate change are unfounded. Dr. Bacchus does not acknowledge or state why the Staff's assessment of cumulative impacts from climate change included in Chapter 7 of the FEIS was incorrect. Id. at A48-49. While the Staff agrees with Dr. Bacchus that both climate change and consumptive use of groundwater and surface water can lead to saltwater intrusion, currently there is uncertainty in future changes in conditions related to climate change. Id. at A48. If these changes start to show impacts, then the COCs allow the FDEP to require the Applicant to take corrective measures to prevent noticeable impacts. Id. This is another positive to adopting the monitoring, testing, and adaptive management strategies included in the FDEP COCs. Id. at A49.

For the reasons described in the Staff's Direct Testimony and Rebuttal Testimony, the Staff's analysis of hydrology impacts in the FEIS was adequate. Because the Intervenors' claims lack merit, the Board should find in the Staff's favor for Contention 4A.

2. The Staff's Terrestrial Ecology Analysis was Adequate

The Intervenors' Direct Testimony and Exhibits concerning the effects of dewatering on terrestrial ecology and wetlands do not support their assertion that the FEIS is inadequate. The Staff conducted an interdisciplinary review to analyze impacts from building and operating the proposed LNP units, including impacts to wetlands and terrestrial species from changes to hydroperiods—the focus of Dr. Bacchus' Direct Testimony. As discussed in the Staff's Direct Testimony, the terrestrial ecology review considered many areas of terrestrial habitat, including wetlands, potentially affected by building or operating the proposed LNP facilities. Staff Direct

Testimony at A70. Further, the Staff's review was conservative with respect to defining the scope of wetlands for review—all wetlands meeting the Federal or Florida definition were included in the analysis. Id. at A67. As described below, the FEIS satisfies NEPA, and the Intervenors' claims lack merit.

The Staff's terrestrial ecology review incorporated analyses of impacts from alterations to hydrology; this encompasses the concept of changes to wetland "hydroperiod," the term used by Dr. Bacchus throughout her direct testimony. Staff Rebuttal Testimony at A53. Evaluating drawdown is an effective means of evaluating change in hydroperiod because the wetlands in the vicinity of the proposed LNP site are in direct contact with the underlying surficial aquifer system so that drawdown of the water table directly decreases the wetlands' hydroperiod. Id. at A55. The Staff does not agree with Dr. Bacchus' direct testimony that alterations to wetland hydrology from the proposed activities will result in irreversible LARGE impacts. See Bacchus Direct Testimony at A.11.

The Staff analysis showed that impacts related to the withdrawal of groundwater, during the building phase would be limited by the temporary duration of dewatering, the use of techniques to isolate the excavations from the surrounding groundwater, and the expected return of groundwater to predisturbance levels after dewatering ceases. Staff Rebuttal Testimony at A53. Potentially affected wetlands are adapted to surviving in a range of conditions, including periodic droughts that may cause substantial hydroperiod fluctuations for years at a time and high seasonal and annual variability in groundwater levels. Id. at A56. The effects on wetland vegetation would likely be the same whether the temporary fluctuation in hydroperiod is a natural phenomenon or caused by human activity. Id. Based on this information, as described in Section 4.3.1 of the FEIS, the Staff determined that wetlands on the

site and surrounding landscape would not be irreversibly altered by temporary alterations to hydrology. Id.

For the period of operations, the Staff acknowledged in the FEIS that, based on its quantitative analysis and comprehensive literature review, hydrological alterations due to groundwater pumping could adversely affect (i.e., result in drawdown of greater than 0.5 ft) up to 2092.9 ac of wetlands over 60 years. Id. at A53. The wetland drawdown map at Figure 5-5 in Section 5.3.1 of the FEIS was not confined by any spatial boundaries, as Dr. Bacchus suggests in her direct testimony, but extended as far from the proposed well locations as groundwater modeling revealed that there would be possible effects. Id. at A55. This wetland impact map is conservative because, while the literature review suggested that 0.6 ft of drawdown is the threshold for adverse wetland impacts, the Staff applied 0.5 ft of drawdown as the adverse impact threshold. Id. at A53 and A55; See NRC001A at 5-27.

Additionally, however, the Staff considered that groundwater pumping would be subject to the FDEP COCs, which require PEF to mitigate or cease pumping and utilize an alternative water source should adverse wetland impacts occur. Staff Rebuttal Testimony at A55. Among the performance review standards that would trigger this responsive action by PEF include requirements to ensure that wet season water levels remain within their normal range and that wetland hydroperiods remain in a range such that adverse impacts to wetland function and wetland plant and animal species do not occur. Id. at A54. Because the Conditions of Certification are legal requirements, the standards they establish provide a reasonable basis for predicting the maximum level of impact due to hydrological alterations from operating the LNP units. See id. at A55. Thus, the Staff expects that no LARGE impacts to these wetlands would occur. Id.

Dr. Bacchus also asserts that the Staff did not consider that hydrological alterations could have greater effects on species during certain seasons when water availability is traditionally low. See Bacchus Direct Testimony at A.15. The Staff noted in the FEIS that long-term data suggest that seasonal groundwater fluctuations of as much as 7 to 8 ft occur at wetlands around the LNP site. Staff Rebuttal Testimony at A56. This seasonal variability suggests that the systems and some species have likely adapted to a variety of hydroperiod conditions. Id. But Dr. Bacchus argues, in her direct testimony at A.15, that any alteration of the natural duration, extent, and timing of wetland water levels may result in fatal consequences to a number animal species. Regarding potentially sensitive terrestrial species, the FEIS accounted for the protection accorded by the Conditions of Certification, which require the maintenance of normal wetland hydroperiods for the preservation of plant species and habitat functions (e.g., providing cover, breeding, and feeding areas) for wetland animals. Id. at A57.

In a related argument, Dr. Bacchus states that the Staff must reinitiate consultation with the U.S. Fish and Wildlife Service (FWS) under Section 7 of the Endangered Species Act because the FEIS did not adequately consider hydroperiod impacts in the FEIS, and thus, she suggests, provided insufficient information for FWS' consideration. See Bacchus Direct Testimony at A.39. As discussed above, the Staff is confident that that the FEIS adequately considered possible impacts from building and operating the proposed LNP units on wetland hydroperiods. Id. at A60. The Staff also kept FWS informed regarding the site and vicinity and potential impacts to them, including potential effects on wetlands, throughout the Staff's environmental review. Id. The Staff submitted the draft EIS and the biological assessment to the FWS before it issued its Biological Opinion, and the FWS did not respond with any questions or comments after it received the FEIS. Id. FWS' issuance of the Biological Opinion

and incidental take statement, which is presented in Appendix F of the FEIS, concludes the formal Section 7 consultation for the EIS. Id.

For similar reasons, the Staff disagrees with Dr. Bacchus' assertion that the FEIS has not adequately considered the effects of hydroperiod alterations on Federally listed species such as the red-cockaded woodpecker, indigo snake, and Florida scrub jay. As discussed above, the Staff's consideration of potential impacts due to alterations to hydrology during the building and operation of the proposed LNP units was systematic and thorough. The FWS, after considering information in the biological assessment and the draft EIS, concluded that the LNP "may affect" but is "not likely to adversely affect" the red-cockaded woodpecker and the eastern indigo snake. Id. at A61; See NRC001C at F-196 and F-197. In fact, FWS' Biological Opinion states that FWS believes that the Applicant's proposed wetland mitigation would benefit the red-cockaded woodpecker. Staff Rebuttal Testimony at A61; NRC001C at F-198, F-199. While FWS found that the Florida scrub jay is likely to be adversely affected, the Biological Opinion indicates that the effects on this species would be due to clearing of habitat to build portions of transmission lines, not due to the effects of dewatering. Staff Rebuttal Testimony at A61.

Dr. Bacchus makes a number of assertions regarding wildfires being exacerbated by dewatering associated with the development or operation of the proposed LNP units and causing harmful nutrient loading to wetlands. See e.g. Bacchus Direct Testimony at A.36, A.37. There would be little potential for an increase in risk of or effects from wildfires due to hydrological alterations during the building of the LNP units because the effects on wetland hydroperiod would be temporary and localized. Staff Rebuttal Testimony at A58. As discussed above, the FDEP Conditions of Certification would preclude adverse effects to wetland hydroperiod that might result in an increased risk of major wildfires. Id. Moreover, as a part of its proposed Wetland Mitigation Plan, PEF proposes to conduct a prescribed fire regime, but

not, as Dr. Bacchus asserts, to attempt to recreate a natural fire regime. Id. at A59. The Staff agrees that it would be impossible to recreate a natural fire regime in this environment, which has been disturbed by decades of active forest management and suppression of the natural fire cycle. Id. But the Staff notes that prescribed fires have been used successfully throughout the State of Florida to prevent the buildup of undergrowth that is capable of fueling catastrophic wildfires and to promote the restoration of native plant species in the environment. Id. Because the effects of the LNP on wetland hydroperiod are expected to be minimal, the wetland mitigation would reduce conditions conducive to catastrophic wildfires on many of the undeveloped forest lands remaining on the LNP site, and PEF could be expected to rapidly act to suppress any fires to protect its facilities, the Staff determined that the risk of catastrophic wildfires is minimal. Id. at A58, A59.

The Staff also disagrees with Dr. Bacchus' direct testimony that the FEIS has not considered the effects of saltwater intrusion caused by regional groundwater drawdown. See Bacchus Direct Testimony at A.40-A.43. The Staff concluded in the FEIS that the potential effects of building and operating the proposed LNP units on the surficial aquifer that determines the hydroperiod of wetlands on and around the LNP site would be minimal or limited by the Conditions of Certification. Staff Rebuttal Testimony at A53, A62. Because of these limited alterations to hydrology, the potential for saltwater intrusion would be minimized. See id. at A62. With respect to the photographs taken by Dr. Bacchus of dead or dying trees (INT304-INT330), the Intervenors offer no evidence to confirm the cause of this tree mortality (nor, if it were attributable to saltwater intrusion, the source of that intrusion), although the Staff acknowledges that some regional wetlands may currently be experiencing stress from saltwater intrusion. See id. The FEIS does address the potential for impacts due to saltwater intrusion

into the Cross Florida Barge Canal, but it is anticipated that these water quality changes would result in only minor changes in the existing sparse, emergent shoreline vegetation. Id.

In her direct testimony regarding PEF's proposed Wetland Mitigation Plan, Dr. Bacchus asserts that the Applicant's proposed mitigation locations are not appropriate because the hydroperiod of these locatations will be so altered by water table drawdowns that they will be ineffective to compensate for lost wetland functions on an off the site. See Bacchus Direct Testimony at A.51. Although the onsite mitigation areas are close in proximity to where the LNP facilities would be built, the Staff does not agree that there is a likelihood of substantial adverse effect on these areas from operation of the proposed facilities. Staff Rebuttal Testimony at A65. The Staff considered the proposed requirements in the Wetland Mitigation Plan, which will become effective if USACE issues PEF a Section 404 permit. Id. The Plan calls for at least five years of monitoring to ensure that the wetland is developing in accordance with expectations regarding, among other things, hydrological conditions, robust native plant community, and wildlife utilization. Staff Rebuttal Testimony at A65. If direct or cumulative impacts inhibit the success of the Wetland Mitigation Plan, the Staff expects that the monitoring will so indicate and that the Federal and state agencies responsible for overseeing compliance with the plan will require PEF to take steps to ensure the plan's success. Id.

The Staff recognizes that there are a number of plans designed to protect particular environmental resources that are not yet fully developed (e.g., the Environmental Monitoring Plan required by the FDEP Conditions of Certification, the Avian Protection Plan, and the Stormwater Management Plan), but that are relied on to mitigate impacts in the FEIS. Id. at A63. The Staff understands that the Applicant cannot effectively prepare these plans until the final stages of project design, which are typically not completed until after issuance of an NRC license. Id. The Staff has reviewed the specific requirements for developing each of these

plans as outlined in the FDEP Conditions of Certification and knows what to expect once the plans are developed. Id. The FDEP Conditions of Certification mandate the development and implementation of the plans mentioned above, but PEF cannot effectively prepare some of them until the final stages of the project design, after the NRC issues a license. Id. Because the Staff reviewed the standards under which these plans will be prepared, and because the development and implementation of the plans is legally required, the Staff determined that it was reasonable to consider their effect when drawing conclusions on impacts. Id.

The Staff's Direct and Rebuttal Testimony demonstrate that the Staff took a hard look at terrestrial and wetland impacts as required by NEPA. Therefore, none of the Intervenors' challenges to the Staff's conclusions has merit.

3. The Staff's Aquatic Ecology Analysis was Adequate

None of the Intervenors' arguments in their direct testimony concerning aquatic ecology show any deficiencies in the FEIS; thus, this portion of Contention 4A lacks merit. First, Dr. Bacchus claimed that the Waccassasa River is an Outstanding Florida Water (OFW). Bacchus Direct Testimony at A.3, A.33, A.47. As the Staff's Rebuttal Testimony explains, the Waccassasa River is not an OFW. Only the Waccassasa Bay, as part of the Waccassasa Bay State park is designated as an OFW. Staff Rebuttal Testimony at A66. Dr. Bacchus also criticizes the Staff's analysis of salinity impacts to essential fish habitat (EFH). Bacchus Direct Testimony at A.18. Dr. Bacchus' argument only selectively quotes from the FEIS, and her argument is incorrect. Staff Rebuttal Testimony at A67. The full quote from the FEIS includes the statement that "[t]here are no habitat areas of particular concern near the CREC discharge area or the CFBC." In their review of the Staff's EFH assessment, the National Marine Fisheries Service expressed no concerns regarding EFH due to salinity. Staff Rebuttal Testimony at A67. Additionally, Dr. Bacchus' concerns regarding salinity impacts to vegetation important for

manatees and green sea turtles lack merit. Bacchus Testimony at A.19. As described in the Intervenors' own exhibit, the CFBC does not provide a significant source of food for manatees. Staff Rebuttal Testimony at A68; INT383 at 8. Therefore, the minor salinity changes to the CFBC from the LNP will have only a minor affect on any areas that manatees use for feeding. Staff Rebuttal Testimony at A68. Similarly, Dr. Bacchus' claims regarding salinity impacts to vegetation consumed by green sea turtles lack merit. As explained in the Staff's Rebuttal Testimony, turtle grasses, a preferred food of the green sea turtle, thrive in coastal waters at higher salinities, and do not tolerate influxes of fresh water. Staff Rebuttal Testimony at A68; NRC045 at 20. Thus, a reduction in freshwater due to the LNP would be advantageous to turtle grass. Staff Rebuttal Testimony at A68.

Dr. Bacchus also makes several incorrect claims regarding other threatened and endangered species. First, Dr. Bacchus claims that water quality impacts to OFWs will affect threatened and endangered species; however, as the Staff explains in its Rebuttal Testimony, the CFBC is the only area where water quality impacts are expected and the CFBC is not an OFW. Staff Rebuttal Testimony at A69. LNP effects on water quality impacts to actual OFWs will be not be measurable and will not affect threatened and endangered species. Id. Regarding Dr. Bacchus' claim that threatened and endangered species are not properly addressed, the Staff explained in detail in its Direct Testimony the process used to address threatened and endangered species; the Staff followed a reasonable process, and its conclusions were agreed upon by the FWS and the National Marine Fisheries Service (NMFS), the agencies tasked with implementing this portion of the Endangered Species Act. Staff Rebuttal Testimony at A70; Staff Direct Testimony at A251. Additionally, Dr. Bacchus' claim that the Staff did not consider the smalltooth sawfish is incorrect. Bacchus Direct Testimony at A.39. The Staff discussed the smalltooth sawfish in chapters two, four and five of the FEIS, and

provided more detailed information in Appendix F of the FEIS. Staff Rebuttal Testimony at A72. Thus, this claim lacks merit.

Nothing provided by the Intervenors changes the Staff's aquatic ecology conclusions in the FEIS. As described in the Staff's Direct Testimony, the Staff's review was reasonable, and the FEIS complies with the NRC's regulations and NEPA. Thus, this portion of Contention 4A lacks merit.

B. The Intervenors' Claims Regarding Salt Drift and Deposition Lack Merit

Dr. Bacchus makes several claims regarding the Staff's salt drift and deposition review. For the reasons set forth below, none of her claims has merit. First, Dr. Bacchus erroneously asserts that the Staff relied on wind data from Tampa, Florida to assess wind speed and direction for purposes of analyzing salt drift and deposition rates. Bacchus Direct Testimony at A38. Rather, as stated in the Staff Direct Testimony, the Staff relied on surface National Weather Service meteorological data at Gainesville, Florida Regional Airport (GNV) to compare wind speed and wind direction between the onsite observations at the LNP site and GNV. Staff Rebuttal Testimony at A72; NRC038. From this comparison, the Staff meteorologists found that when comparing wind speeds greater than 1.5 meters per second (m/s), the two stations showed little variation from each other. Staff Direct Testimony at A87-88; NRC001A at 5-86.

Dr. Bacchus also criticized the Staff for not considering the supporting measurements of salt concentration for the LNP or any other site. Bacchus Testimony at A38. The Staff's analysis was reasonable and accurate, however, because the Staff analyzed salt deposition at the LNP according to the heat dissipation systems description in NUREG-1555. Staff Rebuttal Testimony at A73. NRC001A at 5-85; NRC013 at 5.3.3.2-4,5. Pursuant to NUREG-1555, the Staff's analysis should "use maps of the site and vicinity showing drift isopleths that were produced by a recognized drift-dispersion model." NRC013 at 5.3.3.2-4,5.

Further, the Staff relied on the AERMOD dispersion model, which is regularly used in air quality permit applications and uses data from a wide range of detailed field studies. Staff Rebuttal Testimony at A73; Staff Direct Testimony at A86; NRC080 at 29-34. The Staff did not directly use measurements from other sites in its analysis. Relying on such measurements can be speculative as the meteorological conditions at other sites would not necessarily be representative of the conditions at the LNP site. Staff Rebuttal Testimony at A73; NRC080 at 29-34. Thus, the Staff concluded that it was reliable to use AERMOD to anticipate dispersion of gases and particulates associated with operation of any facility. Staff Rebuttal Testimony at A73. Specifically, for the analysis in the FEIS, the Staff used the AERMOD model to estimate the salt deposition in lieu of direct observations. Id.; NRC001A at 5-86. The Staff's analysis is consistent with the process described in NUREG-1555. NRC013 at 5.3.3.2-4,5.

Dr. Bacchus also contends that the Staff failed to consider the background salt concentration at the LNP site. However, the Staff did consider this issue by looking at two factors relevant to background salt concentration. The first factor examined was naturally occurring salt deposition. Staff Rebuttal Testimony at A74. Construction and operation of the LNP would not impact the value of background salt deposition because it would not change the general meteorological conditions that transport the naturally occurring salt to the site. As for the second factor, the Staff considered the concentration of sea salt at the site. Id. Sea-salt decreases rapidly with distance from the coast. Therefore, the deposition of naturally occurring salt is also expected to be small at the LNP site. Id.; Staff Direct Testimony at A197; NRC054 at 76. Based on these two factors, the Staff was able to conclude that its analysis in the FEIS provides an accurate and sufficient analysis of the likely salt deposition at the LNP site. Staff Rebuttal Testimony at A74; NRC001A at 5-86.

Lastly, Dr. Bacchus asserts that the Staff inaccurately characterized the location of maximum salt deposition at the LNP site. Bacchus Direct Testimony at A.38. Specifically, Dr. Bacchus argues that given the prevailing wind direction during that single year of data collected at the LNP site, the location of the maximum salt deposition should be to the southwest, rather than to the west of the cooling towers. However, her assertion is incorrect, as the Staff predicted the location of the maximum salt deposition by using AERMOD. Staff Rebuttal Testimony at A75; Staff Direct Testimony at A87; NRC001A at 5-86. This approach is consistent with the wind directions observed at Gainesville over a five-year period of 2001-2005. NRC001A at 5-86. Staff Rebuttal Testimony at A75. As stated in the Staff Direct Testimony at A87, the Staff found that the LNP data collected during 2008, shows an increased frequency of winds from the northeast, east-northeast, and east compared to the same one-year period at Gainesville. Staff Rebuttal Testimony at A75; Staff Direct Testimony at A87; NRC038 at 1-2. Further, the winds measured at both Gainesville and the LNP Site can have a significant amount of year-to-year variability. This variability lends itself to changes in the location of the year-to-year peak salt deposition at the LNP site. Staff Rebuttal Testimony at A75. In order to minimize the impact of this year-to-year variability in its analysis, the Staff relied on meteorological data from Gainesvillle during years 2001-2005. The Staff's analysis is thus accurate because the Staff applied AERMOD, which is a recognized dispersion model, as well as wind data that is representative of the LNP site. Id.

In A38 of her direct testimony, Dr. Bacchus also contends that because the supply wells are situated south of the nuclear islands, this will cause dewatering which will increase groundwater contamination from salt drift deposition. She goes on to state that the FEIS fails to consider cumulative damage from the synergistic effects of droughts, changes to natural hydroperiods, and stress to vegetation from salt drift. The Staff's analysis is accurate. To

determine salt deposition patterns, the Staff used multi-year wind direction data from 2001-2005 and used the maximum areal salt deposition rate of 10.75 kg/ha/mo uniformly for onsite and offsite areas to determine surface water salinity. Staff Rebuttal Testimony at A75-76; NRC001A at 5-86, 5-24; Staff Direct Testimony at A198-200. Because the maximum areal salt deposition rate was used uniformly for all areas, the Staff concluded that it was not necessary to consider variations in the salt deposition pattern. Staff Rebuttal Testimony at A76. Further, the Staff employed a conservative estimate of surface water salinity because it relied on a uniform maximum salt deposition rate on LNP onsite and offsite areas during a one-month dry period. Staff Rebuttal Testimony at A76; Staff Direct Testimony at A198-200. Adding to the Staff's conservative analysis, the Staff's estimation of surface water salinity of 0.026 ppt is much smaller than the salinity rate that is commonly used for brackish water (1 ppt). Staff Rebuttal Testimony at A76. This conservative estimate of surface water salinity results from a low rainfall amount that then dissolves all salt deposited during a preceding dry period. Id. Because the Staff found that surface water salinity on the LNP site does not approach the salinity of brackish water, it was able to conclude that Dr. Bacchus incorrectly asserted that there would be adverse effects to the ecology of wetlands, floodplains, and other habitats on and surrounding the LNP site. Id. Therefore, Dr. Bacchus inappropriately characterizes the Staff's analysis and conclusions in the FEIS with respect to meteorology and salt deposition.

With regards to the terrestrial ecological effects of salt deposition, Dr. Bacchus asserts that the Staff's conclusions regarding the effects of salt drift on vegetation are flawed because they are based on a CREC report that analyzed salt water cooling towers that are located on the coast and not inland like the LNP site. This assertion, however, is incorrect. Although the Staff relied upon the CREC report as supplemental evidence, its analysis was primarily informed by an independent quantitative study of habitat types potentially affected by salt deposition and a

review of scientific literature in NUREG-1437 that summarizes vegetation monitoring studies at various power-plant sites. Staff Rebuttal Testimony at A77; NRC001A at 5-19 to 5-23; NRC057 at 4-42 to 4-45. The Staff considered the CREC report, however, because it provided "the geographically closest record observations of possible salt drift injury to vegetation relative to the LNP site." Staff Rebuttal Testimony at A77; Staff Direct Testimony at A204. Both sites also have similar habitats and the CREC report indicated that only minor salt drift damage occurred to some species present at both sites. Staff Rebuttal Testimony at A77, A79; NRC001A at 5-23. Moreover, the Staff referenced NUREG-1555, which discusses thresholds for leaf damage, as well as the AERMOD for determining onsite maximum deposition rates of 10.75 kg/ha/mo. Staff Rebuttal Testimony at A77; NRC013 at 5.3.3.2-5; NRC001A at 5-21. These were conservative estimates as they were based on the worst year (2004) for climatological conditions within a four year period between 2001 and 2005. Staff Rebuttal Testimony at A77. Because the offsite deposition rate is lower than the threshold for visible leaf damage and this will decrease with increasing distance from the LNP site, the Staff concluded that no adverse impacts to vegetation in areas outside the LNP are expected. Id. at 5-21.

Further, Dr. Bacchus contends that using data regarding the response of corn to salt drift is not relevant to an analysis of potential salt drift impacts on native vegetation surrounding the LNP site. The Staff based its analysis on salt deposition monitoring studies that were conducted at eighteen power plants across various locations over several years. Staff Rebuttal Testimony at A78; NRC057 at 4-39 to 4-40. This study, which referenced both cultivated species (such as corn) and native species (such as dogwood and red maple), found that vegetation damage from salt drift was only observed at three of the eighteen plants surveyed. Staff Rebuttal Testimony at A78; NRC057 at 4-43 and 4-37. The Staff's analysis was based on the best available data for analyzing the effects of salt drift on cultivate and native vegetation in

different areas and thus, could be applied to the LNP site. Staff Rebuttal Testimony at A78. Use of corn as an indicator species for estimating the response of vegetation to salt drift is a conservative approach and thus, supports the Staff's salt drift impact findings in the FEIS. Id.

Dr. Bacchus goes on to criticize the Staff's reliance on the CREC study, as she contends that the CREC monitoring reports are not based on an adequate number of years of operational monitoring. Again, the Staff relied on the CREC study as supplemental evidence only. Staff Rebuttal Testimony at A79; NRC001A at 5-23; Staff Direct Testimony at A204. For its primary analysis in the FEIS, the Staff relied on the AERMOD results on terrestrial vegetation maps. AERMOD is based on conservative meteorological conditions. Staff Rebuttal Testimony at A79; NRC001A at 5-20 to 5-21. Although CREC and the LNP site have different settings (coast versus inland), they share many of the same plant communities. Staff Rebuttal Testimony at A79.

Lastly, Dr. Bacchus takes issue with the FEIS' analysis of cumulative impacts from salt drift because she erroneously contends that the FEIS fails to consider the effects on vegetation from introduction to the soil of salt originating from the LNP cooling tower drift. Bacchus Direct Testimony at A38. This assertion is incorrect, because the FEIS states that there would be no overlap of the CREC cooling tower drift and the predicted LNP cooling tower drift. Staff Rebuttal Testimony at A80; NRC001B at 7-24. Also, because no similar projects are planned in the geographic area of the LNP site, there would not be additional contributions to cumulative effects of cooling tower drift. Staff Rebuttal Testimony at A80. Further, in Section 5.3.1.1 of the FEIS, the Staff considered the potential effects on vegetation from soil salinization and concluded that no adverse impacts are expected because sufficient rainfall would occur to dilute the salt in the soil. Staff Rebuttal Testimony at A81-82; NRC001A at 5-22. In addition, the Staff found that because annual precipitation is approximately 53 in/yr (NRC001A at 5-22) and no

current projects involving cooling towers are planned in the geographic area of interest, it is unlikely that there will be adverse cumulative impacts to vegetation from soil salinization at the LNP site. Staff Rebuttal Testimony at A83-84; NRC001B at 7-24. For the reasons discussed above, the Intervenors' direct testimony does not show that the Staff's FEIS analysis of salt drift is erroneous. Thus, Contention 4A lacks merit.

C. Intervenors' Assertion Regarding Staff's Response to FEIS Comments Lacks Merit

Lastly, in the Intervenors' Statement of Position they claim that the Staff did not adequately respond to comments submitted by the Intervenors' expert witnesses, because the Staff did not "undertake to gather any additional data." Intervenors' Statement of Position at 14. However, as described in detail above, the Staff's analysis was adequate. As such, the Intervenors' claim that the Staff did not adequately address their FEIS comments by not gathering additional data lacks merit. Furthermore, the Intervenors never raised this assertion in their contention or pleadings, nor did they attempt to raise it after publication of the FEIS as allowed by Section 2.309(f)(2). Hence they are foreclosed from raising it at this time. The Intervenors "may not 'freely change the focus of an admitted contention at will' to add a host of new issues and objections that could have been raised at the outset. Where warranted [the Commission does] allow for amendment of admitted contentions, but [the Commission does] …not allow distinctly new complaints to be added at will as litigation progresses, stretching the scope of admitted contentions beyond their reasonably inferred bounds." Pilgrim, CLI-10-11, 71 NRC at 309.

CONCLUSION

As discussed above, the NRC Staff performed a thorough review to develop an FEIS that complies with all agency requirements and NEPA. Nothing in Contention 4A shows that

this analysis was inadequate. Thus, Contention 4A lacks merit, and the Board should find in favor of the Staff.

Respectfully submitted,

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Dated at Rockville, Maryland
The 31ST Day of July 2012

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
	)	
PROGRESS ENERGY FLORIDA, INC.	)	Docket Nos. 52-029 and 52-030
	)	
	)	
(Levy County Nuclear Site, Units 1 and 2)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of the NRC Staff's Pre-filed Rebuttal Testimony and Exhibits have been served on the following persons by Electronic Information Exchange on this 31st day of July 2012:

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ATTACHMENT 1

Submitted: July 31,2012

Progress Energy Florida, Inc.
(Levy County Nuclear Power Plant, Units 1 and 2)
Docket Nos. 52-029-COL and 52-030-COL
October 2012 Evidentiary Hearing
NRC Staff Exhibit List

NRC Exhibit #	Witness/Panel	Description
NRC001A	Sutton	NUREG-1941 Environmental Impact Statement for Combined Licenses (COLs) for Levy Nuclear Plant Units 1 and 2, Final Report (April, 2012) Volume 1 (Chapters 1-5).
NRC001B	Sutton	NUREG-1941 Environmental Impact Statement for Combined Licenses (COLs) for Levy Nuclear Plant Units 1 and 2, Final Report (April, 2012) Volume 2 (Chapters 6-10).
NRC001C	Sutton	NUREG-1941 Environmental Impact Statement for Combined Licenses (COLs) for Levy Nuclear Plant Units 1 and 2, Final Report (April, 2012) Volume 3 (Appendixes).
NRC002	Sutton	Professional Qualifications of Mallecia A. Sutton
NRC003	Miracle	Professional Qualifications of Ann L. Miracle
NRC004	Masnik	Professional Qualifications of Michael T. Masnik
NRC005	Doub	Professional Qualifications of Joseph Peyton Doub
NRC006	Aston	Professional Qualifications of Lara M. Aston
NRC007	Barnhurst	Professional Qualifications of Dan O. Barnhurst
NRC008	Vail	Professional Qualifications of Lance W. Vail
NRC009	Prasad	Professional Qualifications of Rajiv Prasad
NRC010	Vermeul	Professional Qualifications of Vince R. Vermeul
NRC011	Quinlan	Professional Qualifications of Kevin R. Quinlan
NRC012	Berg	Professional Qualifications of Larry K. Berg

NRC013	All	NUREG-1555 Standard Review Plans for Environmental Reviews for Nuclear Power Plants ("ESRP") (2000) Sections: 2.3, 2.4, 2.6, 2.7, 2.8, 3.3, 3.4, 4.2, 4.3, 5.2, 5.10, 6.3, 6.5, 10.1, and 10.2.
NRC014	All	NUREG-1555 Standard Review Plans for Environmental Reviews for Nuclear Power Plants ("ESRP") Draft Rev. 1 (2007) Sections: 4.7, 5.3, 5.11, and 9.4.
NRC015	Prasad, Vail, Vermeul, Barnhurst	NUREG-0800 Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition, ("SRP") Rev. 3 (2007) Sections: 2.4.1, and 2.4.13.
NRC016	Prasad, Vail, Vermeul, Barnhurst	Application for Combined License for Levy Nuclear Plant, Units 1 and 2, Part 2, Final Safety Analysis Report, Revision 3, portions of section 2.5 (2012).
NRC017	Prasad, Vail, Vermeul, Barnhurst	Exhibit created by Staff showing four maps and figures of the region around the LNP site and focusing on specific features discussed in the testimony.
NRC018	Prasad, Vail, Vermeul, Barnhurst	Excerpts from U.S. Geological Survey (USGS): Ground Water Atlas of the United States: Alabama, Florida, Georgia, and South Carolina HA 730-G. Ed. J.A. Miller, Reston, Virginia (1990).
NRC019	Prasad, Vail, Vermeul, Barnhurst	Excerpts from Randazzo, A.F. and D. Jones, editors: The Geology of Florida. University Press of Florida, Gainesville, Florida (1997).
NRC020	Prasad, Vail, Vermeul, Barnhurst	Excerpts from Miller, James A., Hydrogeologic Framework of the Floridan Aquifer System in Florida, and in Parts of Georgia, Alabama and South Carolina. USGS Professional Paper 1403-B, Washington, D.C (1986).
NRC021	Prasad, Vail, Vermeul, Barnhurst, Berg	Levy Nuclear Plant Units 1 and 2 COL Application, Part 3, Environmental Report – Combined License Stage, Revision 1 (2009) Excerpts from Section 2.4 and Sections 4.1 and 5.3.

NRC022	Prasad, Vail, Vermeul, Barnhurst	Excerpts from letter from Garry Miller, Progress Energy Florida, Inc. (PEF), to NRC, dated July 29, 2009, regarding Supplement 3 to Response to Request for Additional Information Regarding the Environmental Review.
NRC023	Prasad, Vail, Vermeul, Barnhurst	Letter from John Elnitsky, PEF, to NRC, dated December 14, 2009, regarding Response to Supplemental Request for Additional Information Regarding the Environmental Review. The technical memorandum from CH2M Hill attached to this letter is exhibit PEF210.
NRC024	Prasad, Vail, Vermeul, Barnhurst	Southwest Florida Water Management District (SWFWMD), Environmental Resource Permitting Information Manual, Part D: Project Design Aids. West Palm Beach, Florida (1996).
NRC025	Prasad, Vail, Vermeul, Barnhurst	SWFWMD, Environmental Resource Permitting Information Manual, Part B: Basis of Review (December 29, 2011).
PEF005		Florida Department of Environmental Protection (FDEP), Levy Nuclear Power Plant Units 1 and 2, Progress Energy Florida, Proposed Conditions of Certification, Plant and Associated Facilities and Transmission Lines. PA08-51, Tallahassee, Florida (as amended on January 25, 2011).
NRC027	Miracle	Florida Department of Natural Resources (FDNR), St. Martins Marsh Aquatic Preserve Management Plan. Tallahassee, Florida (1987).
NRC028	Miracle	Estevez, E.D. and M.A. Marshall. 1993 Summary Report for: Crystal River 3 Year NPDES Monitoring Project. Mote Marine Laboratory, Sarasota, Florida (1993) (NRC028).
NRC029	Miracle	Estevez, E.D. and M.A. Marshall. 1994 Summary Report for: Crystal River 3 Year NPDES Monitoring Project. Mote Marine Laboratory, Sarasota, Florida (1994).
NRC030	Miracle	Estevez, E.D. and M.A. Marshall. 1995 Summary Report for: Crystal River 3 Year NPDES Monitoring Project. Mote Marine Laboratory, Sarasota, Florida (1995).
NRC031	Miracle	Letter from B.L. Mozafari, National Marine Fisheries Service (“NMFS”) to D. Young, “Crystal River Unit 3 – Section 7 Consultation under the Endangered Species Act Regarding Sea Turtles at the Crystal River Energy Complex (Sept. 19, 2002).
NRC032	Miracle	Excerpts from NMFS, Sea Turtle Strandings and Salvage Network (STSSN) Reports (2009).

NRC033	Miracle	Eaton, C., E. McMichael, B. Witherington, A. Foley, R. Hardy, and A. Meylan, In-water Sea Turtle Monitoring and Research in Florida: Review and Recommendations. National Oceanic and Atmospheric Association (NOAA) Technical Memorandum NMFS-OPR-38, Silver Spring, Maryland (2008).
NRC034	Miracle	FWS, West Indian Manatee (Trichechus manatus): 5-yr review: Summary and Evaluation. Jacksonville Ecological Services Office, Boqueron, Puerto Rico (2007).
NRC035	Miracle	FFWCC (Florida Fish and Wildlife Conservation Commission), Basic Recreational Saltwater Fishing Regulations. Tallahassee, Florida. (2009).
NRC036	Miracle	FFWCC, 2008 Annual Landings Summary Edited Landings Data Through Batch 1015 (Closed 12/22/2008). Marine Fisheries Information System, Tallahassee, Florida 2009.
NRC037	Berg	Excerpts from Reisman, J., and G. Frisbie: Calculating realistic PM10 emissions from cooling towers. *Environmental Progress*, 21, (2002).
NRC038	Berg, Quinlan	Staff created exhibit showing a comparison of atmospheric conditions at Gainesville, FL and the LNP site. This graph was created by using atmospheric conditions from the National Oceanographic and Atmospheric Administration, 2008 National Climatic Data Center, Climate Data website and comparing them to data from the LNP site.
NRC039	Berg	Letter from J. Scarola, Progress Energy Carolinas, Inc. (PEC) to NRC, "Supplemental Meteorological Data in Support of Combined License Application for Levy Nuclear Power Plants Units 1 and 2 NRC Project Number 756." (July 28, 2008).
NRC040	Berg	Letter from G.D. Miller, PEC, to NRC "Supplemental Meteorological Data in Support of Combined License Application – Second Year Data." (Mar. 17, 2009).
NRC041	Doub, Aston	Mortellaro, S., S. Krupa, L. Fink and J. VanArman, Literature Review on the Effects of Groundwater Drawdowns on Isolated Wetlands, South Florida Water Management District, West Palm, Florida (1995).
NRC042	Miracle, Masnik	CH2M HILL, Aquatic Ecology Sampling Report Levy Nuclear Plant. 338884-TMEM-087, Revision 1, Denver, Colorado (2009).
NRC043	Miracle, Masnik	Stone and Webster Engineering Corporation, Crystal River 316 Studies, Final Report, Stoughton, Mass. (1985).

NRC044	Miracle, Masnik	Gosselink, J., Tidal Marshes: The Boundary Between Land and Ocean. U.S. Fish and Wildlife Service, Biological Services Program, Washington, D.C. (1980).
NRC045	Miracle, Masnik	Zieman, J.C. and R.T. Zieman, The Ecology of the Seagrass Meadows of the West Coast of Florida: A Community Profile. Biological Report 85, U.S. Fish and Wildlife Service, Slidell, Louisiana (1989).
NRC046	Miracle, Masnik	Mattson, R.A., T.K. Frazer, J. Hale, S. Blitch, and L. Ahijevych. "Florida Big Bend." In Seagrass Status and Trends in the Northern Gulf of Mexico: 1940-2002. L. Handley, D. Altsman, and R. DeMay, editors, Scientific Investigations Report 2006-5287 and U.S. Environmental Protection Agency 855-R-04-003, U.S. Geological Survey, Reston, Virginia (2007).
NRC047	Doub, Aston	Environmental Protection Agency ("EPA")/United States Army Corps of Engineers ("USACE"), Draft Guidance on Identifying Waters Protected by the Clean Water Act, Washington, D.C. (2011).
NRC048R	Doub, Aston	Excerpts from Environmental Services, Inc. and Taylor Engineering, Inc., Levy Nuclear Plant and Associated Transmission Lines Wetland Mitigation Plan Comprehensive Design Document. Jacksonville, Florida (2011).
PEF504		FDEP, Division of Air Resource Management, Air Permit No. PSD-FL-403 , "Levy Nuclear Plant Units 1 and 2 Cooling Towers" (NRC049).
NRC050	Berg	Excerpts from Monahan, E.C., D.E. Spiel and K.L. Davidson, "A Model of Marine Aerosol Generation Via Whitecaps and Wave Disruption" in "Oceanic Whitecaps and Their Role in Air-Sea Exchange Processes; Proceedings of the 1983 Galway Whitecap Workshop", Hingham, MA (1986) (NRC050).
NRC051	Berf	Excerpts from Gong, S.L., L.A. Barrie, J.P. Blanchet, "Modeling sea-salt aerosols in the atmosphere-Model development (Abstract)." *Journal of Geophysical Research* 102(D3):3805, Washington, D.C. (1997).
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NRC057	Doub, Aston	NUREG-1437 Generic Environmental Impact Statement for License Renewal of Nuclear Plants, (1996) Section 4.3.
NRC058	Doub, Aston	Letter from Garry Miller, PEF, to NRC, regarding Supplement Information Related to Environmental Review – Future Native Files and CREC 1993/1994 Annual Salt Drift Report, (Aug. 31, 2009).
NRC059	Miracle, Masnik	Letter from R. Hoffman, NMFS to NRC regarding "List of federally-protected species under the jurisdiction of NMFS for the State of Florida." (Dec. 11, 2008).
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NRC062	Doub, Aston	Staff created figure depicting the salt deposition model output overlaid onto a habitat map of the proposed LNP site and vicinity.
NRC63	Prasad, Vail, Vermeul, Barnhurst	USGS Water Resources Data, USGS Surface-Water Annual Statistics from "USGS 02313100 RAINBOW RIVER AT DUNNELLON, FL" (retrieved June 20, 2012).

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