



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
WILMINGTON DISTRICT, CORPS OF ENGINEERS  
69 DARLINGTON AVENUE  
WILMINGTON, NORTH CAROLINA 28403-1343

April 15, 2010

Regulatory Division

Action ID Number SAW-2007-01748

Dr. Donald Palmrose, PhD  
Sr. Project Manager  
Office of New Reactors  
U.S. Nuclear Regulatory Commission  
Mail Stop T7-E18  
Washington, DC 20555

Dear Dr. Palmrose:

Please reference the additional information provided by Progress Energy in response to our letter dated June 19, 2009. This information was contained within the documents entitled "Harris Advanced Reactor Section 404 (b)(1) Alternatives Analysis Revision 1" dated September 2009, and "Technical Memorandum 107, Determination of Harris Reservoir Storage Requirements, Revision 1" dated September 9, 2009. These documents support the proposal by Progress Energy Carolinas, Inc. (PEC) to create new sources of electricity in and around North Carolina. PEC's preferred alternative for this is to expand the Shearon Harris Nuclear Power Plant by adding two new reactors. The U.S. Army Corps of Engineers (Corps) is acting as a cooperating agency, with the Nuclear Regulatory Commission (NRC) acting as the lead agency in the development of an Environmental Impact Statement under the National Environmental Policy Act (NEPA). We supplied both documents to the United States Environmental Protection Agency (EPA) for comments. Please find the EPA's letter attached for your consideration. In addition, we offer the following comments to ensure the decision document contains all aspects required by NEPA and the Corps 404 (b)(1) Guidelines.

The first document is the "Technical Memo 107" (TM 107) which details the applicant's proposal to raise the normal pool of Harris Lake from 220 MSL to 240 MSL. Because this component comprises the majority of impacts associated with the Harris alternative, any minimization measure to the proposed water level increase could protect a substantial amount of aquatic resources. The attached EPA letter requests several valid items for review and clarification and requests that the North Carolina Division of Water Resources staff review the TM 107 and the supporting information for concurrence with the assumptions and model results.

We agree and believe that coordination with the state will provide a level of assurance with this approach and may find ways to minimize this portion of the alternative. In short, we believe that further exploration of lower pool levels may be necessary before the Corps can concur that a 240 MSL elevation is the minimum practicable pool level for the project.

The second document, "Harris Advanced Reactor Section 404 (b)(1) Alternatives Analysis Revision 1" (Alternatives, rev1) examines the practicable alternatives and begins a more detailed analysis to determine which alternative is least damaging on the aquatic environment. The requirement for this analysis is found within 40 CFR Part 230.10(a), which states: "Except as provided under section 404(b)(2), no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences." The analysis presented is an effort to assess aquatic impacts of the various alternatives to allow a fair comparison between alternatives. We understand that Geographic Information Systems (GIS) and Data Management Tasks were completed using the MS Access GeoDatabases and ESRI ArcGIS software (with Spatial Analyst and 3D Analyst Extensions) to ascertain impacts within the 400-acre power block, localized watersheds, and transmission lines for all four viable alternatives. The wetland component of this approach was further refined by conducting site visits and by utilizing the dichotomous key for the North Carolina Wetlands Assessment Method.

The results of this assessment found that the Marion and Robinson sites would result in higher impacts to the aquatic environment when compared to the Shearon Harris site as presented. The same drought requirement was used at these sites as was used at the Harris site, which provided a consistent review across alternatives. It is unclear, however, if the drought requirement used at Harris could be minimized, thus resulting in lower impacts to the aquatic environment. Since this drought requirement is used for the other alternatives, it is possible that this change could reflect different impact amounts from the various alternatives and may require a re-evaluation.

The two remaining alternatives, Brunswick and Harris, were carried forward for additional study because their aquatic impacts were somewhat comparable. As you are aware, in order to fully satisfy our requirements relative to the 404 (b) (1) Guidelines, we must describe and compare the loss of aquatic function(s) associated with the flooding of existing streams and wetlands (Harris alternative) vs. the loss of aquatic function, including habitat loss associated with the removal of mature trees (Brunswick alternative) within an existing wetland. We acknowledge that the magnitude of loss between the two alternatives is different; however, we believe that the flooding of existing wetlands and streams could result in greater functional loss than the removal of trees from an existing forested wetland. Accordingly, the EIS must adequately describe both the magnitude of loss associated with each of the alternatives (in acres and feet) as well as the expected loss (or changes) of aquatic function associated with each. In addition, the document must adequately describe practicable actions that further minimize these impacts. Given that significant functional differences exist between the Brunswick and Harris

alternatives, and that PEC has not adequately demonstrated that 240 MSL is the minimum practicable pool level, we concur with EPA and cannot agree that the Harris alternative is the least environmentally damaging practicable alternative.

We offer the following comments and concerns, and request that PEC develop information to respond to these concerns.

The topic of water quality, page 27 of the Alternatives rev1, finds that the Harris alternative will have no adverse consequence on water quality and that all state water quality permits will be in compliance. However, the results of water quality modeling studies for Harris Lake have not been approved by the North Carolina Department of Environment and Natural Resources (NCDENR) which makes the finding of 'no consequence' premature. Also, since the amount of potential increase in elevation of Harris Lake is still uncertain, model results should clearly disclose the elevation of the lake used and discuss whether a lower lake level would change the water quality expectations. Since minimizing the lake level increase is still a possibility and would affect the overall dilution potential, water quality expectations might be uncertain. Additional coordination with state and federal agencies on water quality should continue.

On page 28 of the Alternatives rev1, flood control, storm, and wave impacts are discussed and the Brunswick alternative is listed as having the potential for an adverse impact during extreme storm events, but not during normal weather conditions. This statement is based on the elevation of the current facility, 20 MSL, and the elevation of the maximum storm of 22 MSL. Current flood control levees and waterproofed buildings alleviate the potential for flood damage due to this 2 foot elevation difference. Current NEPA requirements call for an assessment of climate change and the potential for sea level rise. It is unclear if this requirement was incorporated within this evaluation. If it was not, please describe and re-evaluate these topics because it appears that sea level rise may have major implications to this alternative. The climate assessment should also be extended to the other viable alternatives.

Page 30 describes expected changes to baseflow from each alternative. As you are aware, there is an on-going instream flow study to determine future releases from Harris dam into Buckhorn Creek if the Harris alternative is permitted. The NCDENR has indicated the results of this study will require a minimum flow release into Buckhorn Creek in addition to a prescribed release schedule based on percentage of inflow. Current water release regulations on Harris dam do not require a minimum flow release, or even a structured release schedule which might benefit existing ecological features. This could be considered a beneficial effect with this alternative; however it is not discussed within this document. NEPA and the 404(b)(1) analysis allows for the discussion of positive influences that may be incurred from a component of an alternative. Please address this, and any additional positive impacts associated with other alternatives.

Within the topic of special aquatic sites on pages 32-35 and again on page 37, the re-establishment of marsh wetlands along the proposed flooded fringe area of Harris Lake is discussed as a potential mitigation measure. We have surveyed other Corps Districts within the southeast to see whether any other District has approved of the use of newly formed wetlands as

compensatory mitigation for flooding similar features. To date, we are unable to find a previous circumstance where this was successfully used and the Districts were not in favor of this type of passive approach to mitigation. Moreover, operations of the proposed reactors would prohibit PEC from providing these newly-created wetlands with the level of protection that would be expected for wetlands used as compensatory mitigation. As stated earlier, flooding a wetland is a loss of waters. Because of this, we are unable to agree that flooding is both an impact and yet self-mitigating.

We can concur that the existing Harris dam is a structure that would affect and sever the biological connection to downstream ecosystems. It should be a factor when weighing this alternative. However, we cannot concur with some of the other functional changes (on page 34) that the applicant expects to occur by raising Harris Lake. Therefore, we ask that PEC provide further explanation or reference the literature supporting the claims for:

- 1) the lower aquatic functional value on intermittent streams and how this affects the proposal.
- 2) the upslope migration of aquatic life when gradual flooding occurs (as listed within 3 or more functional bullets).
- 3) the shifting ephemeral/intermittent/perennial continuum and the conclusions reached within the document.
- 4) the watershed size supporting an intermittent stream and how this relates to the Harris alternative.
- 5) please expand to include functional losses expected by flooding wetlands.

There is an appearance of contradictory conclusions between the ER rev1 and the current Alternatives rev1 at the Brunswick site with respect to impingement and entrainment of aquatic species and impacts to federally listed species. For example, the ER rev1 (page 9-69) concludes that the impingement of fish, both adult and larval, would be minimal due to the small additional volume of water needed and the deepwater location of the intake. It also states that the operation of additional reactors would not adversely affect listed species. However, the Alternatives rev1 states that an increase in entrainment and impingement makes Brunswick less attractive an alternative (page 36). This discussion is extended to impacts to federally listed species which finds that increased impingement rates might increase the incidental take of listed turtles, and may also pertain to essential fish habitat. The differences between documents may be due to the Alternatives rev1 reflecting the most up-to-date information on the project. However, we need a clear evaluation of all impacts associated with the need for additional cooling water.

Please include a map showing all transmission line routes and impacts to environmental features (including federal property) for the two alternatives. Please ensure that impacts from all expected line routes are included. We realize that functional impacts to forested wetlands from transmission lines are a major component with these alternatives. Because of this, please continue to evaluate alternative means of line location to minimize impacts. For example, co-locating lines on existing poles could reduce a substantial amount of aquatic impacts. Document all attempts at minimizing impacts and list the reasons why, or why not, a particular minimization attempt is viable.

We understand that the State Historic Preservation Officer (SHPO) is engaged for coordination on issues related to National Historic Preservation Act within the Area of Potential Effect on the Harris site. This includes the 400-acre site, the area within the expanded reservoir site, and the make-up water line. To comply with Section 404 of the Clean Water Act, there is a possibility that coordination with the SHPO will also be required on areas not included within the NRC's license area, but within the 404 permit area. These areas might included but not be limited to: transmission corridors, areas indicated for roadway construction/improvements, etc.

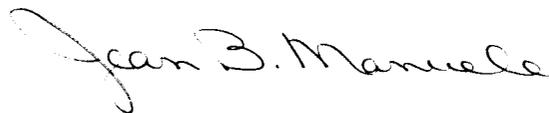
Please provide a breakdown of impacts for all major components of the preferred alternative. Table 4 of the Alternatives rev1 shows a partial breakdown, but anticipated impact amounts for additional components are needed. Examples would include items such as interchange construction, roadway improvements, blowdown lines, rail line extensions, transmission lines, staging areas, drinking and waste water treatment plant upgrades, make-up water lines, power block impacts, drought mitigation measures (i.e. lake elevation increase), water make-up lines, blasting, and re-establishment of park and other public facilities.

Also, please expand the no action alternative to describe the project going forward without a 404 permit (i.e. no impacts to waters of the U.S.) even if licensed by the Nuclear Regulatory Commission. Finally, please provide a report summary showing structural integrity of the existing Harris dam with respect to the potential for expanding the normal pool.

Please realize that with the information provided to date, we are unable to concur that the Harris site has the least amount of aquatic impacts of the alternatives considered. PEC's development of information addressing these comments and those presented by EPA will help ascertain the alternative with the least aquatic impacts.

Should you have any further regulatory information on this project, please contact Mr. Monte Matthews, Raleigh Regulatory Field Office, at (919) 554-4884, Ext 30.

Sincerely,

A handwritten signature in cursive script that reads "Jean B. Manuele".

Jean B. Manuele  
Chief, Raleigh Regulatory  
Field Office

Enclosure

Copy Furnished: (w/enclosures)

Ms. Rebecca Fox  
US Environmental Protection Agency  
Wetlands Section – Region IV  
1307 Firefly Road  
Whittier, NC 28789-8783

Mr. Ian McMillan  
NC Department of Environmental & Natural Resources  
Division of Water Quality 401 Unit  
2321 Crabtree Blvd.  
Raleigh, NC 27604

Mr. Mark Bowers  
US Fish & Wildlife Service  
Post Office Box 33726  
Raleigh, NC 27636-3726

Mr. Vann Stancil  
NCWRC - Division of Inland Fisheries  
Habitat Conservation Program  
215 Jerusalem Church Road  
Kenly, NC 27542

Ms. Renee Gledhill-Earley  
NC State Historic Preservation Office  
4617 Mail Service Center  
Raleigh, NC 27699-4617

Mr. Justin McCorcle  
US Army Corps of Engineers  
69 Darlington Avenue  
Wilmington, NC 28403



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 4  
ATLANTA FEDERAL CENTER  
61 FORSYTH STREET  
ATLANTA, GEORGIA 30303-8960

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Regulatory Branch

March 19, 2010

Mr. Monte Matthews  
U.S. Army Corps of Engineers  
3331 Heritage Trade Drive, Suite 105  
Raleigh, North Carolina 27587

Subject: Shearon Harris Alternatives Analysis (Revision 1) and Technical Memorandum 107  
(Determination of Harris Reservoir Storage Requirement) Wake and Chatham  
Counties, North Carolina

Dear Mr. Matthews:

Progress Energy Carolinas (PEC) is proposing to construct two additional reactor units at the Shearon Harris Nuclear Power Plant in Wake County, North Carolina (NC). The project, as proposed includes the construction of an intake structure and pipeline to supply water from the Cape Fear River to Harris Reservoir, placement of a second discharge structure within Harris Lake, upgrades to transmission lines and roads and increasing the normal pool elevation of Harris Lake from 220 feet to 240 feet mean sea level (MSL). The Environmental Protection Agency (EPA) has reviewed the Alternatives Analysis (Revision 1) and the Technical Memorandum (Determination of Harris Reservoir Storage Requirement) documents. It is our understanding that Revision 1 of the Alternatives Analysis document was revised in response to comments from the U.S. Army Corps of Engineers (Corps). We have also reviewed Enclosure 2 which provides a response to the Corps' comments. The Technical Memorandum (TM) was prepared for PEC by CH2M Hill to respond in greater detail to the concern raised in the Corps' comments concerning the justification of raising Harris Lake level from 220 feet to 240 feet MSL. We have the following comments:

#### **TM 107 (Determination of Harris Reservoir Storage Requirement)**

PEC is proposing to raise the level of the cooling reservoir (Harris Lake) at the Shearon Harris facility from its current elevation of 220 feet to 240 feet MSL as part of the expansion of the current facility to provide sufficient cooling water for the two new reactors in the event of an extreme extended drought. The proposed increase in elevation will flood approximately 500 acres of wetlands and 24.4 miles of streams. [There is some discrepancy as to what actual level the current dam, as designed, can safely accommodate. Different levels are cited in the material provided, i.e., 239.1, 240, 250. Since the level of 240 is most frequently cited, for the purpose of this discussion, we are assuming this to be the both the level that can be safely accommodated by the current dam and the applicant preferred level, but this issue needs to be resolved.]

After reviewing both the TM and the responses to the Corps in Enclosure 2, we continue to have concerns with the proposal to raise the level of Harris Lake to 240. This process seems to have been conducted in reverse, in that 240 was selected because this is the level the current dam can safely accommodate and Shearon Harris owns the land to the 243 MSL contour. There was no discussion of beginning this process from the other end and determining what would be the minimum rise in cooling lake elevation that would be the least environmentally damaging practicable alternative. EPA is concerned with the very large aquatic environmental impacts (loss of waters) associated with raising the lake to the 240 contour level. Some of the questions and concerns we have are:

- The lake elevation rise appears to be only needed in the case of a severe drought, i.e., 220 would be sufficient except in a severe extended drought situation. From the information presented, even the 240 level would not be sufficient in a very severe extended drought. Although some extrapolations can be made, there was no discussion of what raising the lake to 225, 230, 235, etc. would provide as far as operation in drought and the environmental impacts associated with these levels. There needs to be a comparison and in depth discussion as to what would be provided by levels other than 240 and the associated environmental impacts.
- The Western Wake Partners' new Water Reclamation Facility (WRF) will be releasing an estimated 25 million gallons per day (mgd) by 2020 and 38 mgd by 2050 somewhere (most likely the Cape Fear River). How have these numbers been incorporated into the modeling of water in the Cape Fear? The TM states the new reactors will require 63 cubic feet per second (cfs) or 40.7 mgd for replacement water for evaporation from the cooling towers. We understand Shearon Harris has investigated the possibility of having the WRF water discharged directly to Harris Lake, so less water would need to be pumped from the Cape Fear River but this would also necessitate raising the lake level and would have similar flooding impacts as withdrawing the water from the Cape Fear. We are aware that the current NC Department of Environment and Natural Resources approved discharge point for the WRF water may be below Buckhorn dam but it appears there is still some flexibility in the location of the discharge point. Could it be moved to accommodate the Shearon Harris withdrawal needs from the Cape Fear or could Shearon Harris have a withdrawal pump below the WRF discharge point? These issues concerning the impact of the WRF discharge into the Cape Fear and how this might impact the ability for Shearon Harris to withdraw without the increased storage to 240 should be addressed.
- We recommend the NC Division of Water Resources (NCDWR) review the TM and supporting information, including the Sargent and Lundy 2009 report, modeling assumptions, WRF input, etc., and provide their analysis of the information contained in the TM. One of the model assumptions utilizes the maximum withdrawal rates from the Cape Fear based on future demands. EPA Region 4 is currently finalizing Water Efficiency guidelines. Any proposed water supply reservoir will be required to use these guidelines where practicable. These water efficiency measures have the ability to greatly reduce water needs. Although, this is not directly applicable to this project, these

measures, once approved, should become widely used for any water supply provider (not just new reservoir projects) and may influence future demands on the Cape Fear River.

- The TM states the proposed project will provide the applicant with the ability to operate with reduced withdrawals from the Cape Fear during drought conditions and thereby minimize adverse impacts to aquatic life. This statement fails to address the very large impacts to aquatic life that will occur from flooding 500 acres of wetlands and 24.4 miles of streams. We do not believe this project to be a net gain for aquatic life.
- The TM discusses the use of NCDWR's model for the Cape Fear River. The discussion states modeled inflows are primarily due to rainfall runoff and point discharges. There is no mention of the future WRF discharge which will be a significant inflow and should be considered. Although the WRF project has not yet been permitted, the final environmental impact statement (EIS) was released in December 2009 and the WRF is scheduled to be operational as of the third quarter of 2013. Although this project has not yet been permitted, we believe the WRF potential inflow to the Cape Fear should be considered in the modeling for the Shearon Harris project. To be able to include the years from October 2004 to December 2008 (where NCDWR data was not available), data was used from the U. S. Geological Survey gage at Lillington to be able to capture the extreme drought of 2007. We believe the model should be rerun to include 2009 data which was a very wet year.
- The last section of the TM discusses the benefits from the increased reservoir level, including increased shoreline and lake habitat. As we stated earlier the proposed elevation of the lake level to the 240 contour will result in the flooding of 500 acres of wetlands and 24.4 miles of streams. EPA considers this a very significant net loss of aquatic resources. The information reviewed to date does not provide a compelling justification that the anticipated benefits of water supply during a severe extended drought outweighs the magnitude of the impacts associated with raising Harris Lake to the 240 contour level.

## **Alternatives Analysis**

The alternatives analysis evaluated eleven potential sites to fulfill the project's purpose to develop new nuclear baseload generating capacity to supply electricity to PEC's service area. Of those sites, seven were eliminated during the siting study. The four sites carried forward for further consideration were Marion, Robinson, Brunswick and Harris. Of these four, the Marion and Robinson sites were dropped from further evaluation because the alternatives analysis indicated they would have significantly higher impacts to wetlands and streams than the applicant preferred site (Harris). There was not an alternative which evaluated constructing the two new reactors at the Shearon Harris site but without raising Harris Lake to the 240 contour. With the information we have been presented to date, we believe an expansion alternative operating at a 220 level or somewhere less than 240 to be a viable alternative and should be evaluated. The Brunswick and Harris sites were carried forward for a more detailed evaluation.

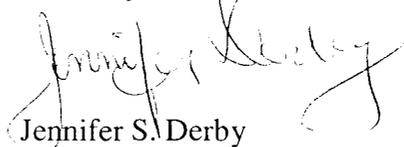
The Brunswick site is located on the lower Cape Fear estuary and currently has two existing nuclear reactors. Due to the water supply at the site location, a reservoir is not required and consequently no loss of waters of the U.S. would occur from flooding impacts. This alternative would require approximately 360 miles of transmission lines and a conversion of approximately 1450 acres of wetlands from forested to herbaceous in the right of way areas. Although the Brunswick site would result in greater impacts to wetlands than the Harris site, it would be a conversion of wetlands from forested to herbaceous. The transmission lines will span streams and no direct impacts to stream channels are expected. The increase of Harris Lake from 220 to 240 would result in a loss of waters of approximately 500 acres of wetlands and 24.4 miles of stream due to inundation. In addition, there would a transmission line right of way conversion of approximately 99 acres of wetlands from forested to herbaceous associated with the Harris alternative. We have the following comments on the alternatives analysis:

- A Geographic Information System (GIS) desktop analysis was conducted to determine aquatic impacts for the four sites carried forward. The Harris site is the only site which has had extensive field level impact analysis. We believe the GIS level analysis was sufficient to estimate potential impacts for a rough comparison of alternatives to be able to tell which alternatives should be carried further in the analysis. At this point, we think it may be appropriate to collect more field based delineation data for the Brunswick alternative. We do not agree with the executive summary conclusion that, "...the Brunswick alternative does not constitute an alternative demonstrating less adverse impact on the aquatic ecosystem in comparison to the preferred alternative, the Harris site." Although the Brunswick site converts 1450 acres of wetlands from forested to herbaceous, the Harris site permanently inundates 500 acres of wetlands, 24.4 miles of streams and converts 99 acres from forested to herbaceous. The alternatives analysis states that most of the 24.4 miles of stream impacts is not perennial, however information presented at the September 29, 2009, interagency review team meeting shows the breakdown to be almost evenly divided between perennial and intermittent with slightly more perennial impacts. This should be corrected in the alternatives analysis.
- Based on the information we have reviewed, we believe the Brunswick site to be a viable alternative. There are several issues associated with the Brunswick site which we believe require additional information to allow us to conduct a better review. Besides a better understanding of the actual impacts, we recommend the following items be addressed in greater detail for the Brunswick alternative:
  1. Entrainment and impingement impacts from the increased volume of cooling water to aquatic organisms, including sea turtles. The discussion comparing the aquatic impacts from increased cooling water flow from adding two reactors to either facility should be better quantified to help weigh the costs between the two facilities, including information that quantifies the current aquatic impacts of the facility, along with those anticipated with project impacts.
  2. Because of the location of the Brunswick facility on the Cape Fear estuary, we recommend Sections 5 (Flood Control Functions) and 6 (Storm, Wave and Erosion Buffers) be expanded to provide a more thorough discussion concerning both potential sea level rise and hurricane impacts.

3. It would also be useful in evaluating the two alternatives to include a conceptual discussion of mitigation for the impacts associated with each alternative, including conversion and flooding impacts.

EPA appreciates the opportunity to review and comment on the TM and Alternatives Analysis documents during the EIS development process. We recommend the alternatives issues discussed above be further addressed to provide us with a better understanding of the alternatives and to enable us to provide further input in the determination of the least environmentally damaging practicable alternative. Should you have questions, feel free to coordinate with Becky Fox of my staff at 828.497.3531 or at [fox.rebecca@epa.gov](mailto:fox.rebecca@epa.gov).

Sincerely,



Jennifer S. Derby

Chief,

Wetlands and Marine Regulatory Section