

# State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION Office of Permit Coordination and Environmental Review 401 East State Street P.O. Box 423 Trenton, New Jersey 08625-0423 Phone: (609) 292-3600 Fax: (609) 777-1330

December 17, 2010

Chief, Rulemaking, Directives, and Editing Branch 26 U.S. Nuclear Regulatory Commission 27 Mail Stop T6-D59 28 Washington, D.C. 20555-0001

RE: Salem and Hope Creek Nuclear Generating Stations License Renewal Lower Alloways Creek, Salem County Draft Supplemental Environmental Impact Statement (NUREG-1437, Supplement 45, Draft)

The Office of Permit Coordination and Environmental Review of the New Jersey Department of Environmental Protection (NJDEP) has coordinated the applicable program's review of the Draft Supplemental Environmental Impact Statement (DSEIS) for the Salem and Hope Creek Nuclear Generating Stations License Renewal. We offer the following comments.

#### COMMENTS

CHRIS CHRISTIE

**KIM GUADAGNO** 

10/28/2010 75FR 66398

Lt. Governor

Governor

#### **BUREAU OF NUCLEAR ENGINEERING**

General comment: The Draft Supplemental Environmental Impact Statement for Hope Creek does mention a discussion of the amendment to PSEG's license allowing the pilot program to produce Cobalt-60 prior to use on a production basis. While the pilot program was approved in October of 2010, following the NRC's evaluation of plant operations and accident scenarios, should the pilot move into production mode various impacts of ongoing production should be evaluated and discussed. This would include an assessment of radioactive emissions (the contribution of Cobalt-60 to dose received by offsite members of the public) and future evaluations of the production impacts on plant structure and operation (i.e., the spent fuel pool). The Bureau of Nuclear Engineering (BNE) expects that this would be included in a future license amendment should the

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**BOB MARTIN** Commissioner

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decision be made to produce Cobalt-60 and that the license amendment would include an environmental impact statement.

### 1. Radioactive Waste Management / Page 2-11 Line(s) 16-18:

Is the current Independent Spent Fuel Storage Installation (ISFSI) capable of providing storage for all three nuclear generating stations (Salem 1 & 2 and Hope Creek) plus the proposed new plant? Will there be an addition to the existing pad or will a separate new pad be built? How will the cumulative effects of all this storage of spent fuel be assessed? In the Early Site Permit SEIS?

# 2. Radioactive Liquid Waste / Page 2-11, Line(s) 22-24:

"However, because the Salem units are cooled by a once-through RCS and the HCGS unit is cooled by a closed-cycle RCS, the management of potentially radioactive liquids is different".

It appears you mean Circulating Water System (CWS) not RCS?

# 3. Mixed Waste / Page 2-13 Lines 19-21:

The draft SEIS states that there are no processes in which mixed waste can be generated. Mixed waste includes hazardous substances/liquids (non-radiological) and radioactive materials.

While there may be no *routine* processes where mixed wastes are generated at Salem or Hope Creek, the possibility of human error and inadvertent mixing of wastes may occur, especially during refuel and maintenance outages. In fact, discussions of mixed waste are part of the routine General Employee Training given to all of your employees and contractors, including instructions on how to minimize the amount of mixed wastes that could be created due to the high costs associated with processing the waste and the potential spread of contamination both inside and beyond the Radiological Control Areas.

# 4. Cooling and Auxiliary Water Systems / Salem Generating Station Page 2-23 Lines 6-12:

The Salem Generating Station Service Water System (SWS) intake does not contain a modified Ristroph travelling screen or fish discharge system. There is no explanation provided as to why they were are not used.

#### Page 2-23 Lines 13-15 and Lines 28-29:

Contradict each other regarding the use of sodium hypochlorite.

## Page 2-23 and 2-26 appear to conflict:

Page 2-23 Lines 10-12: "The SWS intake structure is equipped with trash racks, travelling screens, and filters to remove debris and biota from the intake water stream, but do not have a modified Ristroph-type travelling screen or fish return system".

Page 2-26 Line 42: "The Salem SWS intake is also fitted with trash racks, travelling screens, and fish return troughs".

# 5. Cooling and Auxiliary Water Systems / Hope Creek Generating Station / Page 2-24 Lines 4-9:

Are the travelling screens utilized at this single intake structure (SWS water at HC) modified Ristroph screens? In addition, with the possibility of utilizing the empty bays for the proposed second unit on the Hope Creek site, would an upgrade to the travelling screens and Ristroph system be needed during the relicensing period if a new plant was built during that time period/

## 6. Groundwater Resources / Available Volume / Page 2-34 Lines 1-7:

Large-scale withdrawals of water in the area (through the 1970's) led to the NJDEP placing limits on water withdrawal from the aquifer. Since that time, general recovery of the Potomac-Raritan-magothy (PRM) aquifer has occurred. Salem and Hope Creek were excluded from the limiting water withdrawal. Even though outside the "critical area", future population growth and a potential new plant would have a serious impact as evidenced by the current plant water levels in the middle PRM of about -70 feet and the lower PRM of about -45 feet. (USGS Report). Future restrictions on water usage would have to be approved by the NJDEP's Division of Water Supply.

# 7. Environmental Impacts of Refurbishment / Meteorological Tower / Page 3-2

Aside from the Category 1 and Category 2 issues presented in this section on refurbishment, is the cement pad on the meteorological tower intact? A number of years ago there were reports of some cracking or degradation that required maintenance. If the licensee has completed the repairs, could they provide the approximate date and contractor which performed said repairs and inspection?

The meteorological tower is a safety related structure. Meteorological data from the tower is used for dose projection in case of an accident at the facility. The issue becomes more relevant if the Salem and Hope Creek nuclear plants intend on operating for an additional 20 years.

# 8. Ground Water Use Conflicts (plants using greater than 100 gpm) / Page 4-3 Lines 33-38:

"The reason for the declining water levels in the upper PRM Aquifer over the last decade cannot be determined from the limited data set, but they could indicate that long term production is resulting in dewatering of the aquifer, which could potentially cause groundwater use conflicts" **Comment 1:** Since the Spring and Summer of 2010 were periods of drought over the State of New Jersey, does the NRC plan on including measurements in 2010 to augment/update its dataset? Levels may have dropped even further due to those drought conditions. The PRM is considered a large aquifer of regional importance for municipal and domestic water supply. The most accurate data is needed in light increasing population.

**Comment 2:** As it relates to the ESP and proposed additional unit at Hope Creek, how does the trend of declining water levels in the upper PRM affect the potential water use with the proposed new unit? Will there need to be deeper wells in the mid-levels of the PRM?

# 9. Radiological Impacts of Normal Operation / Radioactive Effluent Release Program / Page 4-56:

Based on the flow of material (aquatic biota such as seagrass, weeds, etc) along the Delaware River, and the fact that the liquid discharge point (both Salem and Hope Creek blow-down discharge) is further upstream of the intake structure at Salem, is it possible that debris potentially exposed to radionuclide discharge can be re-circulated back into the plant? Does PSEG routinely sample aquatic biota that is captured on trash racks at the Salem intake structure (such as seaweed and grasses) and perform radionuclide analyses on the material? How often is that done?

Although not likely an impact with regard to the 10CFR50, Appendix I dose limits, effluent release to the environment is an issue of public concern and should be considered during the relicensing period.

# 10. SAMA – Breakdown of Population Dose by Containment Release Mode for Salem Generating Station / Table 5-4 / Page 5-6 / Line 10:

For the "Basemat Melt Through (BMT)", population dose is considered negligible. The BMT is a protection system for the basemat of reactor containment buildings in nuclear power stations. The system comprises a structure located in a cavity below the reactor vessel and submerged in water. The structure comprises staggered layers of stainless steel beams for intercepting molten material escaping from the reactor vessel during meltdown of the reactor core. The system is designed so that the molten material is distributed in thin layers over wings of the beams and transfers its heat to the surrounding water thus affording a rapid quenching of the molten core and safeguarding the integrity of the basemat.

**Comment 1:** Would there be any chance, even within the basemat system of staggered layers of steel beams, of a flash to steam of the molten material and potential release to the atmosphere augmenting/causing a potential contribution to population dose? Have there been model studies done to confirm the report's claims of negligible contribution to population dose? The steam generated during this core melt must be relieved somewhere.

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**Comment 2:** Why is there no basemat system present at HCGS? Is it related to the design of the HCGS BWR?

# 11. SAMA – Evaluation of Risk Reduction and Costs of Improvements / Section 5.3.4 / Page 5-9 Lines 20-22:

"PSEG evaluated the risk-reduction potential of the remaining 25 SAMA's for SGS, as well as four additional SAMA's that were added in response to an NRC staff request for additional information."

What were the four added SAMA's at SGS and the bases for their inclusion? Can they affect potential offsite individual or population dose during the relicensing period?

## 12. SAMA – Cost-Benefit Comparison / Section 5.3.5 / Page 5-10 Lines 14-15:

"SAMA 2 – Re-configure Salem 3 to provide a more expedient backup to AC power source for Salem 1 and 2"

A member of the public and/or casual reader should be made aware that "Salem 3" is fossil fuel back-up generator and not a third nuclear plant on the Salem footprint. A reference to the definition of Salem 3 could not be found in the document. It could lead to confusion.

# 13. SAMA – Cost-Benefit Comparison / Section 5.3.5 / Page 5-11

"SAMA 5A – Install portable diesel generators to charge station battery and circulating water barriers"

**Comment 1:** What is PDP and what is the sensitivity basis behind SAMA 5A? Both are based on the generic installation of the Portable Diesel Generator.

**Comment 2:** From a Clean Air Act (CAA) standpoint, do the additional diesel generators, compressors, or any other fuel source equipment pose an issue with the existing Title V permit at the site – still maintaining a cost beneficial environment?

# **BUREAU OF ENVIRONMENTAL RADIATION**

The Bureau of Environmental Radiation (BER) does not have regulations governing the exposure to 60 Hertz electric and magnetic fields. Similarly, BER does not regulate induced or contact currents. What we do have is a guideline that states that the electric field at the edge of the right of way (ROW) should be no greater than 3 kilovolts per meter, measured at a height of 1 meter above the ground. This is a recommendation adopted in 1981 by resolution of the Commission on Radiation Protection. It would be advisable but not mandatory that the utility conduct periodic measurements along ROW's to document electric field levels.

Regarding magnetic fields, at this point in time, the consensus among the scientific community is that there is inconclusive evidence to suggest that long-term exposure to magnetic fields from power lines would result in adverse health outcomes. However, for new or modified lines, many health-based organizations are still recommending reducing magnetic fields if low or no-cost options exist. In a June 2007 fact sheet put forth from the World Health Organization (WHO Fact sheet No. 322), the following guidance is issued: "When constructing new facilities and designing new equipment...low-cost ways of reducing exposures may be explored." Therefore, in light of such uncertainty, if there are any future changes made to the power delivery system that would lower the existing magnetic fields from the power lines, it may be prudent to explore such options. Likewise, if new lines are installed, it would be advisable to construct the lines so that magnetic fields at ground level are as low as reasonably achievable.

#### **NEW JERSEY GEOLOGICAL SURVEY**

The New Jersey Geological Survey has reviewed the sections of the DSEIS pertaining to geology and ground water and offer the following comments. The comments are by section and page.

## Hope Creek Generating Station License Renewal Application, Environmental Report

Pages 2-58 and 3-6. Under Section 2.12.2.1 Salem Nuclear Generating Station and Section 3.1.3.2 Ground Water. There are conflicting amounts given for the approved ground water diversion for Hope Creek and Salem, 164 billion liters (43.2 billion gallons) vs. 163 million liters (43.2 million gallons) per month.

Pages 3-7 3-9. In the section on Ground Water Usage they indicate the ground water levels in the PRM aquifer system in the plant area are the result of the pumping centers north of the Chesapeake and Delaware Canal. On page 3.8 they reference USGS (2001b) as the report which "...clearly shows that the pumping centers north of the Chesapeake and Delaware Canal influence the levels in the lower PRM in the Artificial Island vicinity." This report according to their references is Simulation of Ground-Water Flow in the Potomac-Raritan-Magothy Aquifer System Near the Defense Supply Center Philadelphia, and the Point Breeze Refinery, Southern Philadelphia County, Pennsylvania, US Geological Survey Water-Resources Investigations Report 01-4218. The report and model is very specific only to the area around the Philadelphia Navy yard and Camden over 35 miles NNE of Artificial Island. Therefore this report obviously does not indicate the PRM ground water levels are the result of pumping centers north of the canal. Then on page 3-9 they indicate that according to USGS (2009) the Delaware withdrawals have reduced the regional water levels and that the information in the report suggests that the decrease in water levels at Artificial Island in the lower and middle PRM are the result of the regional lowering.

According to 3-7 and 3-8 and Table 3.1-3 the Salem and Hope Creek wells are in the upper and middle PRM, not the middle and lower PRM as implied on 3-9. Also, if USGS (1983) Plate 1 is examined there is a distinct cone of depression, at the plant site (PW 5), in the <u>lower PRM</u> which according to page 12 of the report "...includes essentially all

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water-bearing zones within the aquifer system below the upper aquifer." There is no information shown in USGS (1983) for the upper aquifer at the plant site. Table 2 indicates a water level for PW5 in 1978 at -78 feet. The well record for PW5 indicates static water levels of 35' (8/27/74) and 32' (11/4/75). The land surface at the well is about 17' above sea level which would indicate the water levels at Artificial Island in 1974-75 was -18 to -15 feet. Three years after the plant started pumping out of the to -78 feet or a decline of 60 feet in three years. aquifer the water levels dropped That indicates the plant is causing the low levels not a pumping center over 10 miles USGS WRI 96-4206 Water levels in, Extent of Freshwater in, and Water awav. Withdrawal from Eight Major Aquifers, New Jersey Coastal Plain, 1993, by Pierre J. Lacombe and Robert Rosman, 1997, also shows the same cone of depression on Plate 7 of 8, Middle and undifferentiated Potomac-Raritan-Magothy aquifer. This report has separated the PRM into three aquifers. The water level on the plate is PW5 at -75 feet, the same well as in USGS (1983) Plate 1. The USGS reports above and in USGS (2009) show no wells at Artificial Island as being in the upper PRM. In the USGS reports and in their database lists PW5 as middle PRM and PW6 as being in the lower PRM, not upper and middle respectively. Based on the depths of HC-1 and HC-2 would likely be in the middle and lower PRM respectively. Without having the construction of the other wells on Table 3.1-3 the NJGS can't tell which aquifer each is in, but the USGS (2009) shows pumpage from the upper aquifer at the site.

Page 4.11, Section 4.5 Ground-Water Use Conflicts (Plants Using >100 gpm of Ground-Water). Here again they indicate PW5 and PW6 are in the upper and middle PRM aquifers, where as the USGS indicates the wells are in the middle and lower PRM. They also indicate the impacts from the pumpage at the current rates at the site are "...SMALL and would not warrant mitigation." Examination of the synoptic data down through the years since PW5 was installed shows the plant has caused a deep cone of depression in the middle PRM which is also now being affected by pumpage from Delaware. If the plant ever pumped at the current diversion approval the affect would be felt in Delaware. The plant is the only diversion within 8 to 10 miles of the plant and yet the water levels in the PMR middle PRM are about -70 feet and the lower PRM are about -45 feet.

Based on the various synoptic water level measurements from 1978 to 2003 the plant has caused significant water level declines which are reaching out an unknown distance from the plant. There needs to be a detailed study much like USGS (2001b) to determine the impacts of all the pumpage in the PRM around Artificial Island with a cluster of observation wells, offsite in each of the PRM aquifers.

Pages 4-25 and 4-26, Section 4.15 **Public Water Supply**. The analysis is based on the assumption that the pumpage at the site has not affected the water levels off site. Without offsite PRM monitoring wells between the nearby pumping centers and the plant it is not possible to know where the limit of the plant's affect ends and that from the Delaware pumping centers start.

Salem Nuclear Generating Station License Renewal Application, Environmental Report

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Pages 3-7 and 3-8, Section 3.1.3-2 **Ground Water**. Comments for this section are the same as for Hope Creek, Section 2.12.2.1 and Section 3.1.3.2 above.

Pages 4-19, Section 4.5 Ground-Water Use Conflicts (Plants Using >100 gpm of Ground-Water). Comments for this section are the same as for Hope Creek Section 4.5 above.

Pages 4-34 and 4-35, Section 4.15 Public Water Supply. Comments for this section are the same as for Hope Creek, Section 4.5 above.

#### **DIVISION OF WATER QUALITY**

The Division of Water Quality manages the NJPDES permits for PSEG-Salem and PSEG-Hope Creek and therefore is providing the following comments on the Draft Supplemental Environmental Impact Statement. In most instances, an excerpt from the Draft Supplemental Environmental Impact Statement was included with any suggested changes where underlined text indicates an addition and strikethrough indicates a deletion.

#### <u>Page 1-13</u>

**Comment:** NJPDES Permit NJ0025411 (Responsible Agency – NJDEP) should be included in the list of permits. This permit is referenced elsewhere in the document.

#### Page 2-37

**Comment:** There are other regulatory sources besides the DRBC Stream Quality Objectives used in establishing effluent limits. As such, this language should be clarified as follows:

The <u>NJPDES Regulations at N.J.A.C. 7:14A-1 et seq. and the DRBC Stream Quality</u> Objectives are used by the NJDEP to establish effluent discharge limits for discharges within the basin.

#### Page 2-38

**Comment:** Effluent is discharged through the discharge structure, not the intake. Suggested change:

The once-through cooling water, service water, non-radiological liquid waste, radiological liquid waste, and other effluents are discharged through the cooling water system intake-discharge.

#### Page 2-49

**Comment:** NJDEP's findings are being cited in a PSEG document and it is unlikely that NJDEP determined that benthic invertebrates would not be substantially affected. We would prefer that this language be changed as follows:

As a result of the PSEG studies, NJDEP determined that benthic invertebrates would not be substantially affected by plant operations, and these organisms were no longer needed to be sampled as part of the monitoring effort (PSEG, 1984).

**Comment:** Again, NJDEP's findings are being cited in a PSEG document. Also, it is unlikely that NJDEP determined that such species are "unaffected" by the facility. We would prefer that this language be changed as follows:

These species were selected as target species during PSEG's early ecological studies with respect to the operation of Salem Units 1 and 2, but NJDEP and PSEG later determined that there was no need for them to continue to be that they were unaffected by the facility and they were no longer specifically monitored (PSEG, 1999)

#### Page 2-53

**Comment:** There is no permitting rule at this time for Section 316(b) as noted on page 4-7. Rather it is the 1977 draft EPA Development Document (originally issued to provide guidance for the 1976 EPA Section 316(b) Final Regulations) which sets forth the representative species methodology. Therefore, this language should be modified as follows:

The 1977 <u>EPA Draft Development Document</u> permitting rule for Section 316(b) of the CWA included a provision to select representative species (RS) to focus such investigations...

#### Page 4-9

**Comment:** There is no permitting rule at this time for Section 316(b) as noted on page 4-7. Rather it is the 1977 draft EPA Development Document which sets forth the representative important species methodology. Therefore, this language should be modified as follows:

The 1977 <u>EPA Draft Development Document</u> <u>316(b) rule for Section 316(b) of the</u> <u>CWA</u> included a provision to select Representative Important Species (RIS) to focus the investigations, and previous demonstrations....

#### Page 4-9

**Comment:** There is no permitting rule at this time for Section 316(b). Therefore, this language should be modified as follows:

The 2006 CDS used the term Representative Species (RS) to comprise both RIS and target species and to be consistent with the then effective <del>published</del> Phase II Rule.....

Page 4-31

**Comment:** Year is cited incorrectly:

PSEG (1999a) reports estimates of impingement mortality with the modified screens were....

#### Page 4-46

**Comment:** Because EPA delegated the NPDES permit program to NJDEP, NJDEP makes the best professional judgment determination for Section 316(b) of the Clean Water Act. This should be changed as follows:

EPA's Phase II Rule has been suspended, and compliance with CWA Section 316(b) is presently based on <u>NJDEP's EPA's</u> best professional judgment.

#### **DIVISION OF FISH AND WILDLIFE**

The New Jersey Division of Fish & Wildlife (DFW) continues to be concerned with the issue of impacts to the eggs, larval forms, juveniles and adults of the fish, shellfish and other invertebrate species which exist in the Delaware River Estuary.

The DFW was initially concerned with the statement in section 9.1 (lines 21-23), however because one of the overall goals of the Estuary Enhancement Program is to minimize the effects of the Salem Generating Station (Station) on Delaware Estuary biota, these issues can be addressed anytime.

Also the DFW feels that this line should include "Additionally, the Staff concludes that impacts to fish and shellfish from entrainment, impingement, and heat shock at Salem and HCGS would not warrant additional mitigation beyond the Estuary Enhancement Program *for the purposes of this license renewal.*"

#### **HISTORIC PRESERVATION OFFICE**

The Historic Preservation Office (HPO) provided comment on July 9, 2009 that the Salem and Hope Creek Generating Stations license renewal would not adversely effect historic properties. The post-license renewal activities (stations expansion, access roads and possible power line upgrades) were subject to a separate review for impacts on historic properties. In your letter dated November 5, 2010, you have identified that the license renewal and post-license renewal activities are in fact one undertaking. In consequence, the following consultation comments for the above-referenced undertaking are provided.

#### 800.4 Identifying Historic Properties

The initial cultural resource surveys for expanding the Salem and Hope Creek Generating Stations as part of post-license renewal activities have identified the following archaeological and historic properties within the above-referenced undertaking's area of potential effects (APE). Previous HPO comment on post-license renewal activities is attached and summarized below:

# Archaeology

# Proposed Barge Facility and Water Intake

Underwater survey identified four probably shipwreck locations (Clusters 1, 2, 3, & 4). If avoidance is not possible, Phase II archaeological survey will be necessary for each cluster to assess their eligibility for listing on the National Register of Historic Places. To date, the HPO has not received any site avoidance documentation, avoidance plan, or Phase II archaeological survey.

#### Money Island Road Access Alternative Alignment

Phase I archaeological survey for the proposed Money Island Road Access Alternative Alignment identified the following archaeological sites:

Sites 28-Sa-179, 28-Sa-180, 28-Sa-182, 28-Sa-183, and 28-Sa-186

If avoidance is not possible, Phase II archaeological survey will be necessary for each site to assess their eligibility for listing on the National Register of Historic Places. To date, the HPO has not received any site avoidance documentation, avoidance plan, or Phase II archaeological survey.

#### Alloway Creek Neck Road Access Alternative Alignment

Phase I archaeological survey for the proposed Alloway Creek Neck Road Access Alternative Alignment did not identify any archaeological deposits eligible for listing on the National Register of Historic Places. In consequence, no additional archaeological survey is required unless the alignment, as defined in the 2009 submission, changes in the future.

#### **Historic Architecture**

On January 11, 2010, the HPO received:

Brown, J. Emmett

July 31, 2009 Draft, Historic Properties Visual Impact Assessment PSEG Early site Permit application, Salem New Jersey. Prepared for PSEG Power, LLC. Prepared by MACTEC Engineering and Consulting, Inc., Knoxville, TN.

The submitted report does not meet the NJ SHPO's guidelines for Architectural Survey. The methodology section of this draft report notes that only known properties listed on the National Register of Historic Places were considered for assessment of visual impacts within the APE. Section 106 of the National Historic Preservation Act requires that the applicant identify all listed and <u>eligible</u> properties within the APE, and then provide an assessment of effects and proposed mitigation, if applicable, pursuant to 36 CFR Part 800.5. To complete the Section 106 process, the applicant must complete the identification of historic properties, and then provide an assessment of the project's effect on the identified properties.

#### Summary

In consequence, the HPO cannot concur at this time with your November 5, 2010 letter stating that the above-referenced undertaking will not adversely affect historic properties. Pursuant to 36 CFR Part 800.4, Phase II archaeological survey and intensive level architectural survey will provide for evaluation of the National Register eligibility of the sites/structures and assessment of project impacts. For properties on or eligible for National Register inclusion, recommendations must be provided for avoidance of impacts. If impacts cannot be avoided, analyses must be provided exploring alternatives to minimize and/or mitigate impacts. Means to avoid, minimize and/or mitigate impacts to National Register eligible properties will need to be developed and undertaken prior to project implementation.

Thank you for providing the NJDEP the opportunity to comment on the Supplemental Draft Environmental Impact Statement for the Salem and Hope Creek Generating Stations license renewal.

Sincerely,

Scott Brubaker, Director Office of Permit Coordination and Environmental Review

C: Karen Tuccillo, NJDEP Richard Dalton, NJDEP Sue Rosenwinkel, NJDEP Dan Saunders, NJDEP Kelly Davis, NJDEP