



LR-E16-0118

F.O.L. App. B, Sec. 3.2

NOV 04 2016

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United States Nuclear Regulatory Commission  
Document Control Desk  
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SALEM GENERATING STATIONS, UNITS 1 AND 2  
RENEWED FACILITY OPERATING LICENSE NOS. DPR-70, DPR-75  
NRC DOCKET NOS. 50-272 & 50-311

SUBJECT: SUBMISSION OF MINOR MODIFICATION TO NJPDES PERMIT  
NO. NJ0005622

In accordance with Section 3.2 of the Salem Environmental Protection Plan, we are providing you with a copy of a minor modification dated October 6, 2016 and received October 20, 2016 to the Salem Generating Station's New Jersey Pollutant Discharge Elimination System Permit (NJPDES) No. NJ0005622. The Environmental Protection Plan is Appendix B to Facility Operating License DPR-70 and DPR-75 (Dockets No. 50-272 and 50-311).

If you have any questions or require additional information, please do not hesitate to contact Tom Adams at (856) 339-1715 or by email at [thomas.adams@pseg.com](mailto:thomas.adams@pseg.com).

Sincerely,

A handwritten signature in cursive script that reads "Helen Gregory".

Helen Gregory  
Compliance Manager – Nuclear Environmental Affairs

Enclosure- NJPDES Permit No. NJ0005622

IEZ5  
NRR

Cc: Mr. William Dean, Administrator - Region I  
U. S. Nuclear Regulatory Commission  
475 Allendale Road  
King of Prussia, PA 19406

Carleen Parker, Licensing Project Manager  
U. S. Nuclear Regulatory Commission  
One White Flint North  
11555 Rockville Pike  
Mail Stop 8B1  
Rockville, MD 20852

USNRC Senior Resident Inspector - Salem  
Mail Code (X24)

Mr. Patrick Mulligan, Manager IV  
Bureau of Nuclear Engineering  
P.O. Box 415  
Trenton, NJ 08625-0415



## State of New Jersey

CHRIS CHRISTIE  
Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION  
Mail Code – 401-02B  
Division of Water Quality  
Bureau of Surface Water Permitting  
P.O. Box 420 – 401 E State St  
Trenton, NJ 08625-0420  
Phone: (609) 292-4860 / Fax: (609) 984-7938

BOB MARTIN  
Commissioner

KIM GUADAGNO  
Lt. Governor

**CERTIFIED MAIL**  
**RETURN RECEIPT REQUESTED**

7011 2970 0003 7284 2016  
October 6, 2016

John F. Perry, Vice President Salem  
PSEG Nuclear LLC  
80 Park Plaza  
Newark, NJ 07101

Re: Final Surface Water Minor Modification Permit Action  
Category: B -Industrial Wastewater  
NJPDES Permit No. NJ0005622  
PSEG NUCLEAR LLC SALEM GENERATING STATION  
Lower Alloways Creek Twp, Salem County

Dear Mr. Perry:

Enclosed is a **final** New Jersey Pollutant Discharge Elimination System (NJPDES) permit action identified above which has been issued in accordance with N.J.A.C. 7:14A. This action modifies Custom Requirement G.1.b., which requires PSEG to measure pump flows by conducting a dye test once per year using Rhodamine Dye. This permit package contains those sections of the permit that are directly affected by this permit action (i.e. Part IV). This modification makes the following changes in Part IV.G.1 (additions shown with underline; deletions shown with strikethrough):

- b. Circulating water system intake flow shall be calculated in accordance with Part IV.G.10. The flow rate for each individual circulating water pump shall be determined ~~every year using a dye tracer evaluation ("the Tracer Evaluation")~~. Tracer Evaluation testing shall be performed as follows: based on pump curves provided by the pump manufacturer(s), consistent with the methodology described in a report provided to PSEG in July 2016, prepared by MPR Associates, Inc. in September 2015, entitled Salem Circulating Water Pump Flow Rate Evaluation.
  - i. ~~Prior to performing each annual test, the appropriate Enforcement Region must be notified regarding the use of any dye. Oral notification satisfies this requirement.~~
  - ii. ~~Upon completion of the Tracer Evaluation for each individual pump, the permittee shall report the following to the Department; 1) Date of dye tracer evaluation; 2) Final concentration of dye in discharge; 3) Total dye discharged; and 4) Flow rate of circulating water pump(s) tested.~~
  - i. ~~iii. The report required to be submitted pursuant to G.1.b.ii. above shall be submitted in accordance with the DMR schedule for the month which follows the month that the Tracer Evaluation is performed. The individual circulating water pump flow rates determined for each pump shall be used in calculating the~~

circulating water system intake, as required for FAC C in Part III, ~~for the month which follows the month that the Tracer Evaluation was performed.~~

iv. ~~Either Rhodamine WT or Uranine dye are approved for this testing. The Department may approve other dyes for use after reviewing product information including MSDS.~~

ii. ~~v.~~ The Department reserves the right to review and approve an alternate flow verification methodology via a minor modification to this permit.

In Part IV, Section G.10.a.i specifies the methodology for calculating effluent flow by summing the circulating water flow and the service water flow. Each respective system's flow is calculated by multiplying the number of operating hours by the flow rates for each pump. No changes have been made to section G.10.a.i; however the flow rates specified in this section will now refer to the revised method at Part IV G.1.b. which relies on pump curves, rather than dye testing. Inclusion of this minor change is being incorporated based on Part IV.G.1.b.v as contained in the June 30, 2015 draft permit as well as the June 10, 2016 final permit. Note that no parties commented on this permit condition.

As per N.J.A.C. 7:14A-4.2(e)3, any person planning to continue discharging after the expiration date of an existing NJPDES permit shall file an application for renewal at least 180 calendar days prior to the expiration of the existing permit.

All monitoring shall be conducted in accordance with 1) the Department's "Field Sampling Procedures Manual" applicable at the time of sampling (N.J.A.C. 7:14A-6.5(b)4), and/or 2) the method approved by the Department in Part IV of the permit. The Field Sampling Procedures Manual is available at <http://www.nj.gov/dep/srp/guidance/fspm/>.

Questions or comments regarding the final action should be addressed to Heather Genievich at (609) 292-4860.

Sincerely,



Susan Rosenwinkel  
Section Chief  
Bureau of Surface Water Permitting

Enclosures

cc: Permit Distribution List  
Masterfile #: 15647; PI #: 46814



# NEW JERSEY POLLUTANT DISCHARGE ELIMINATION SYSTEM

The New Jersey Department of Environmental Protection hereby grants you a NJPDES permit for the facility/activity named in this document. This permit is the regulatory mechanism used by the Department to help ensure your discharge will not harm the environment. By complying with the terms and conditions specified, you are assuming an important role in protecting New Jersey's valuable water resources. Your acceptance of this permit is an agreement to conform with all of its provisions when constructing, installing, modifying, or operating any facility for the collection, treatment, or discharge of pollutants to waters of the state. If you have any questions about this document, please feel free to contact the Department representative listed in the permit cover letter. Your cooperation in helping us protect and safeguard our state's environment is appreciated.

**Permit Number: NJ0005622**

**Final: Surface Water Minor Mod Permit Action**

**Permittee:**

PSEG Nuclear, LLC  
P.O. Box 236  
Hancocks Bridge, NJ 08038

**Property Owner:**

PSEG Nuclear, LLC  
P.O. Box 236  
Hancocks Bridge, NJ 08038

**Location Of Activity:**

PSEG Nuclear LLC Salem Generating Station  
Alloway Creek Neck Rd  
Lower Alloways Creek Township, Salem County

Authorization(s) Covered Under This Approval	Issuance Date	Effective Date	Expiration Date
B - Industrial Wastewater	6/10/2016	8/1/2016	7/31/2021
Minor Modification to incorporate flow calculation procedures.	10/6/2016	8/1/2016	7/31/2021

*Susan Rosenwinkel*

**By Authority of:  
Commissioner's Office**

**DEP AUTHORIZATION**  
Susan Rosenwinkel, Section Chief  
Bureau of Surface Water Permitting  
Water Pollution Management Element  
Division of Water Quality

(Terms, conditions and provisions attached hereto)

**Division of Water Quality**

## PART IV

### SPECIFIC REQUIREMENTS: NARRATIVE

#### Notes and Definitions

**A. Footnotes**

**B. Definitions**

## Industrial Wastewater

### A. MONITORING REQUIREMENTS

#### 1. Standard Monitoring Requirements

- a. Each analysis required by this permit shall be performed by a New Jersey Certified Laboratory that is certified to perform that analysis.
- b. The permittee shall perform all water/wastewater analyses in accordance with the analytical test procedures specified in 40 CFR 136 unless other test procedures have been approved by the Department in writing or as otherwise specified in the permit.
- c. When more than one test procedure is approved for the analysis of a pollutant or pollutant parameter, the test procedure must be sufficiently sensitive as defined at 40 CFR 136, 122.21(e)(3), and 122.44(i)(1)(iv).
- d. All sampling shall be conducted in accordance with the Department's Field Sampling Procedures Manual, or an alternate method approved by the Department in writing.
- e. All monitoring shall be conducted as specified in Part III.
- f. All sample frequencies expressed in Part III are minimum requirements. Any additional samples taken consistent with the monitoring and reporting requirements contained herein shall be reported on the Monitoring Report Forms.
- g. Annual and semi-annual wastewater testing shall be conducted in a different quarter of each year so that tests are conducted in each of the four permit quarters of the permit cycle. Testing may be conducted during any month of the permit quarters.
- h. The permittee shall comply with 40 CFR 423 regarding the discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid. There shall be no discharge of PCB compounds as analyzed by conventional methods.

### B. RECORDKEEPING

#### 1. Standard Recordkeeping Requirements

- a. The permittee shall retain records of all monitoring information, including 1) all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation (if applicable), 2) copies of all reports required by this NJPDES permit, 3) all data used to complete the application for a NJPDES permit, and 4) monitoring information required by the permit related to the permittee's residual use and/or disposal practices, for a period of at least 5 years, or longer as required by N.J.A.C. 7:14A-20, from the date of the sample, measurement, report, application or record.
- b. Records of monitoring information shall include 1) the date, locations, and time of sampling or measurements, 2) the individual(s) who performed the sampling or measurements, 3) the date(s) the analyses were performed, 4) the individual(s) who performed the analyses, 5) the analytical techniques or methods used, and 6) the results of such analyses.

### C. REPORTING

#### 1. Standard Reporting Requirements

## Industrial Wastewater

- a. The permittee shall submit all required monitoring results to the Department on the forms provided to them. The Monitoring Report Forms (MRFs) may be provided to the permittee in either a paper format or in an electronic file format. Unless otherwise noted, all requirements below pertain to both paper and electronic formats.
- b. Any MRFs in paper format shall be submitted to the following addresses:
  - i. NJDEP  
Mail Code 401-02B  
Division of Water Quality  
Office of Permit Management  
P.O. Box 420  
Trenton, New Jersey 08625-0420.
  - ii. Delaware River Basin Commission (DRBC)  
P. O. Box 7360  
West Trenton, New Jersey 08628.
  - iii. (if requested by the Water Compliance and Enforcement Bureau)  
NJDEP: Southern Bureau of Water Compliance and Enforcement  
One Port Center  
2 Riverside Drive, Suite 201  
Camden, New Jersey 08103
- c. Any electronic data submission shall be in accordance with the guidelines and provisions outlined in the Department's Electronic Data Interchange (EDI) agreement with the permittee. Paper copies must be available for on-site inspection by DEP personnel or provided to the DEP upon written request.
- d. All monitoring report forms shall be certified by the highest ranking official having day-to-day managerial and operational responsibilities for the discharging facility.
- e. The highest ranking official may delegate responsibility to certify the monitoring report forms in his or her absence. Authorizations for other individuals to sign shall be made in accordance with N.J.A.C. 7:14A-4.9(b).
- f. Monitoring results shall be submitted in accordance with the current Discharge Monitoring Report Manual and any updates thereof.
- g. If monitoring for a parameter is not required in a monitoring period, the permittee must report "CODE=N" for that parameter.
- h. For intermittent discharges, the permittee shall obtain a sample during at least one of the discharge events occurring during a monitoring period.
- i. If there are no discharge events during an entire monitoring period, the permittee must notify the Department when submitting the monitoring results. This is accomplished by placing a check mark in the "No Discharge this monitoring period" box on the paper or electronic version of the monitoring report submittal form.

### D. SUBMITTALS

#### 1. Standard Submittal Requirements



- a. The permittee shall amend the Operation & Maintenance Manual whenever there is a change in the treatment works design, construction, operations or maintenance which substantially changes the treatment works operations and maintenance procedures.

## 2. Delaware River Basin PCB Requirements

- a. On December 15, 2003, the U.S. EPA, Regions 2 and 3, adopted a Total Maximum Daily Load (TMDL) for PCBs for Zones 2, 3, 4, and 5 of the tidal Delaware River. On December 15, 2006, the U.S. EPA, Regions 2 and 3, adopted a Total Maximum Daily Load (TMDL) for PCBs for Zone 6 (Delaware Bay). The TMDLs require the facilities identified as discharging PCBs to these zones of the Delaware River or to the tidal portions of tributaries to these zones to conduct monitoring for 209 PCB congeners, and prepare and implement a PCB Pollutant Minimization Plan (PMP).
- b. Subsequent monitoring required by DRBC in 2005 confirmed the presence of PCBs, and indicates that this facility does not contribute to 99% of the cumulative loadings from all point sources. Therefore, the permittee shall collect one 24-hour composite or a grab (as determined by DRBC Sampling protocol) sample annually during a wet weather flow and one 24-hour composite sample annually during a dry weather flow at DSN 489. In addition, one dry weather samples shall be collected annually at DSN 48C.
- c. All sample analyses shall be performed using EPA Method 1668A, Revision A: Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by HRGC/HRMS. EPA-821-R-00-002, December 1999 as supplemented or amended, and results for all 209 PCB congeners shall be reported. Project-specific, sample collection protocols, analytical procedures, and reporting requirements at <http://www.state.nj.us/drbc/quality/toxics/pcbs/monitoring.html> shall be followed. Monitoring information, sample data, and reports associated with PCB monitoring shall be submitted to the Department and DRBC in the form of two compact discs in the format referenced at <http://www.nj.gov/drbc/library/documents/PCB-EDD011309.pdf>.
- d. In accordance with the U.S. EPA Regions 2 and 3 Total Maximum Daily Loads (TMDLs) for PCBs for Zones 2-5 of the Tidal Delaware River, the permittee submitted a Pollutant Minimization Plan (PMP) which was approved on April 25, 2006. The permittee shall continue to comply with the requirements of Section 4.30.9 of DRBC's Water Quality Regulations. Therefore, the permittee shall:
  - i. Continue to implement the PMP to achieve PCB loading reduction goals, and;
  - ii. Submit an Annual Report on the yearly anniversary of the commencement of the PMP to DRBC and the Department consistent with the guidance specified at <http://www.state.nj.us/drbc/programs/quality/pmp.html>.
- e. The PCB data shall be submitted to the DRBC only, The PMP (if needed) and PMP Annual Reports shall be submitted to the following:
  - i. Delaware River Basin Commission  
Modeling, Monitoring & Assessment Branch  
P.O. Box 7360  
West Trenton, NJ 08628

## E. FACILITY MANAGEMENT

### 1. Discharge Requirements

- a. The permittee shall discharge at the locations specified in PART III of this permit.
- b. The permittee shall not discharge foam or cause foaming of the receiving water that: 1) Forms objectionable deposits on the receiving water, 2) Forms floating masses producing a nuisance, or 3) Interferes with a designated use of the waterbody.
- c. The permittee's discharge shall not produce objectionable color or odor in the receiving stream.
- d. The discharge shall not exhibit a visible sheen.
- e. The Permittee is authorized to use the following corrosion inhibitors, biocides, or other cooling water additives:
  - i. DSNs 481-486: Sodium hypochlorite may be used in the service water system, if needed, in excess of two hours per day to allow for continuous chlorination to control macroinvertebrate fouling.
  - ii. DSNs 481-486: Sodium hypochlorite may also be added to the circulating water system to control biofouling, upon prior notification to the Department. As part of this notification, the permittee shall provide the Department with a methodology for sodium hypochlorite addition. Upon approval by the Department, in writing, chlorine produced oxidants may not be discharged from DSNs 481-486 for more than two hours per day where chlorine produced oxidants shall be monitored three times per day at DSNs 481-486 during this two hour period. A daily maximum effluent limitation of 0.2 mg/L would apply during the chlorination of the main condensers where the permittee would be required to maintain a log noting the time and duration of chlorination of the main condensers.
  - iii. DSN 48C: The permittee is authorized to use the following additives in the steam plant and the non-radioactive liquid waste disposal system: ammonium hydroxide, hydrazine, ethanolamine, and polyacrylic acid (PAA), which are used for corrosion control in the plant steam systems; sodium hypochlorite, hydrogen peroxide, sodium hydroxide, and a coagulant aid, which are used in the non-radioactive liquid waste disposal treatment system; and sodium hydroxide and sulfuric acid, which are used to regulate demineralizers.
  - iv. DSN 487B: Ammonia and hydrazine are used for corrosion control in the auxiliary boiler blowdown.
  - v. All outfalls: If the permittee decided to begin using additional agents or replace the above agents in the future for any outfalls, the permittee must notify the Department at least 180 days prior to use so that the permit may be reopened, if necessary, to incorporate any additional limitations deemed necessary. ADDRESS PAA?

## 2. Applicability of Discharge Limitations and Effective Dates

- a. Surface Water Discharge Monitoring Report (DMR) Form Requirements
  - i. The final effluent limitations and monitoring conditions contained in Part III for all outfalls apply for the full term of this permit action.
- b. Wastewater Characterization Report (WCR) Form Requirements
  - i. The final effluent monitoring conditions contained in Part III for all outfalls apply for the full term of this permit action.

**3. Operation, Maintenance and Emergency conditions**

- a. The permittee shall operate and maintain treatment works and facilities which are installed or used by the permittee to achieve compliance with the terms and conditions of this permit as specified in the Operation & Maintenance Manual.
- b. The permittee shall develop emergency procedures to ensure effective operation of the treatment works under emergency conditions in accordance with NJAC 7:14A-6.12(d).

**4. Toxicity Testing Requirements - Acute Whole Effluent Toxicity**

- a. The permittee shall conduct toxicity tests on its wastewater discharge in accordance with the provisions in this section. Such testing will determine if appropriately selected effluent concentrations adversely affect the test species.
- b. Acute toxicity tests shall be conducted using the test species and method identified in Part III of this permit.
- c. Any test that does not meet the specifications of N.J.A.C. 7:18, laboratory certification regulations, must be repeated within 30 days of the completion of the initial test. The repeat test shall not replace subsequent testing required in Part III.
- d. The permittee shall resubmit an Acute Methodology Questionnaire within 60 days of any change in laboratory.
- e. Submit an acute whole effluent toxicity test report: within twenty-five days after the end of every 6 month monitoring period beginning from the effective date of the permit (EDP). The permittee shall submit toxicity test results on appropriate forms. (Activity #: DSW000003 - Effective: 8/1/2016)
- f. Test reports shall be submitted to:
  - i. New Jersey Department of Environmental Protection  
Mail Code 401-02B  
Division of Water Quality  
Bureau of Surface Water Permitting  
401 East State Street  
P.O. Box 420  
Trenton, New Jersey 08625-0420.

**5. Toxicity Reduction Implementation Requirements (TRIR)**

- a. The permittee shall initiate a tiered toxicity investigation if two out of six consecutive WET tests demonstrate that the effluent does not comply or will not comply with the toxicity limit or action level specified in Part III of this permit.
  - i. If the exceedence of the toxicity limit or action level is directly caused by a documented facility upset, or other unusual event which has been identified and appropriately remedied by the permittee, the toxicity test data collected during the event may be eliminated when determining the need for initiating a TRIR upon written Department approval.
- b. The permittee shall begin toxicity characterization within 30 days of the end of the monitoring period when the second toxicity test exceeds the toxicity limits or action levels in Part III. The monitoring frequency for toxicity testing shall be increased to monthly. Up to 12 additional tests may be required.

- i. The permittee may return to the toxicity testing frequency specified in Part III if four consecutive toxicity tests conducted during the Toxicity Characterization do not exceed the toxicity limit or action level.
- ii. If two out of any six consecutive, acceptable tests again exceed the toxicity limit or action level in Part III, the permittee shall repeat the Toxicity Reduction Implementation Requirements.
- c. The permittee shall initiate a preliminary toxicity identification (PTI) upon the third exceedence of the toxicity limit or action level specified in Part III during toxicity characterization.
  - i. The permittee may return to the monitoring frequency specified in PART III while conducting the PTI. If more frequent WET testing is performed during the PTI, the permittee shall submit all biomonitoring reports to the DEP and report the results for the most sensitive species on the DMR.
  - ii. As appropriate, the PTI shall include:
    - (1) treatment plant performance evaluation,
    - (2) pretreatment program information,
    - (3) evaluation of ammonia and chlorine produced oxidants levels and their effect on the toxicity of the discharge,
    - (4) evaluation of chemical use and processes at the facility, and
    - (5) an evaluation of incidental facility procedures such as floor washing, and chemical spill disposal which may contribute to effluent toxicity.
  - iii. If the permittee demonstrates that the cause of toxicity is the chlorine added for disinfection or the ammonia concentration in the effluent and the chlorine and/or ammonia concentrations are below the established water quality based effluent limitation for chlorine and/or ammonia, the permittee shall identify the procedures to be used in future toxicity tests to account for chlorine and/or ammonia toxicity in their preliminary toxicity identification report.
  - iv. The permittee shall submit a Preliminary Toxicity Identification Notification within 15 months of triggering TRIR. This notification shall include a determination that the permittee intends to demonstrate compliance OR plans to initiate a Comprehensive Toxicity Investigation (CTI).
- d. The permittee must demonstrate compliance with the WET limitation or action level in four consecutive WET tests to satisfy the requirements of the Toxicity Reduction Investigation Requirements. After successful completion, the permittee may return to the WET monitoring frequency specified in PART III.
- e. The permittee shall initiate a CTI if the PTI does not identify the cause of toxicity and a demonstration of consistent compliance with the toxicity limit or action level in Part III can not be made.
  - i. The permittee shall develop a project study plan identifying the party or parties responsible for conducting the comprehensive evaluation, establish a schedule for completing the study, and a description of the technical approach to be utilized.
  - ii. If the permittee determines that the PTI has failed to demonstrate consistent compliance with the toxicity limit or action level in Part III, a Comprehensive Toxicity Investigation Workplan must be prepared and submitted within 90 days.
  - iii. The permittee shall summarize the data collected and the actions taken in CTI Quarterly Reports. The reports shall be submitted within 30 calendar days after the end of each quarter.

- iv. The permittee shall submit a Final CTI Report 90 calendar days after the last quarterly report. The final CTI report shall include the corrective actions identified to reduce toxicity and a schedule for implementing these corrective actions.
- f. Upon receipt of written approval from the Department of the corrective action schedule, the permittee shall implement those corrective actions consistent with that schedule.
  - i. The permittee shall satisfy the requirements of the Toxicity Reduction Implementation Requirements and return to the original toxicity monitoring frequency after corrective actions are implemented and the permittee demonstrates consistent compliance with the toxicity limit or action level in Part III in four consecutive toxicity tests.
  - ii. If the implemented corrective measures do not result in consistent compliance with the toxicity limit or action level in Part III, the permittee shall submit a plan for resuming the CTI.
  - iii. Documents regarding Toxicity Investigations shall be sent to the following:  
New Jersey Department of Environmental Protection  
Mail Code 401-02B  
Division of Water Quality  
Bureau of Surface Water Permitting  
401 East State Street  
P.O. Box 420  
Trenton, New Jersey 08625-0420.

## **F. CONDITIONS FOR MODIFICATION**

### **1. Causes for Modification**

- a. The Department may modify or revoke and reissue any permit to incorporate 1) any applicable effluent standard or any effluent limitation, including any effluent standards or effluent limitations to control the discharge of toxic pollutants or pollutant parameters such as acute or chronic whole effluent toxicity and chemical specific toxic parameters, 2) toxicity reduction requirements, or 3) the implementation of a TMDL or watershed management plan adopted in accordance with N.J.A.C. 7:15-7.
- b. The permittee may request a minor modification to eliminate the monitoring requirements associated with a discharge authorized by this permit when the discharge ceases due to changes at the facility.

## **G. Custom Requirement**

### **1. Intake Flow Limit and Dye Tracer Evaluation**

- a. The permittee shall limit the circulating water system intake flow to a monthly average rate not to exceed 3024 million gallons per day. This limit is included in Part III under FAC C. Reporting and compliance with this limitation shall be determined in accordance with the calculations described under item G.10.c.i. below for FAC C, as well as in item G.1.b. below.
- b. Circulating water system intake flow shall be calculated in accordance with Part IV.G.10. The flow rate for each individual circulating water pump shall be determined based on pump curves provided by the pump manufacturer(s), consistent with the methodology described in a report provided to PSEG in July 2016, prepared by MPR Associates, Inc. in September 2015, entitled Salem Circulating Water Pump Flow Rate Evaluation.

- i. The individual circulating water pump flow rates determined for each pump shall be used in calculating the circulating water system intake, as required for FAC C in Part III.
- ii. The Department reserves the right to review and approve an alternate flow verification methodology via a minor modification to this permit.

## **2. Intake Screens and Fish Return System**

### **a. Circulating Water System.**

- i. The permittee shall ensure proper operation and maintenance of its Ristroph Traveling Screens at all times to minimize impingement effects on aquatic life.
- ii. The permittee shall post signs in two commonly accessed locations in the Circulating Water Intake Structure to describe the basic function of the traveling screens and how the screens reduce impingement mortality.
- iii. The permittee shall submit a listing of fragile and non-fragile species to the Department by EDP + 3 months. Fragile species are defined at 40 CFR 125.92(m) and are relevant to 40 CFR 122.21(r)4.

### **b. Service Water System.**

- i. The permittee shall comply with 40 CFR 122.21(r)(6) to evaluate options to address impingement at the service water system. A study shall be submitted by EDP + 3 years as described in Part IV.G.7.d.
- ii. The permittee shall submit a list of fragile and non-fragile species to the Department by EDP + 3 years. Fragile species are defined at 40 CFR 125.92(m).
- iii. The permittee shall comply with 40 CFR 125.94(c) and implement the chosen technology by EDP + 4 years. In the event that this installation schedule cannot be adhered to due to issues relating to United States Nuclear Regulatory Commission (USNRC) procedure and protocol, the Department can extend the schedule via a subsequent permit action provided documentation from the USNRC is provided.

## **3. Wetland Restoration and Enhancement Efforts**

- a. The permittee shall continue to implement the Estuary Enhancement Program in restoring, enhancing and/or preserving wetlands within the region of the Delaware Estuary. The permittee shall continue to restore an aggregate of no less than 10,000 acres of: (1) diked wetlands; and/or (2) wetlands dominated by common reed (*Phragmites australis*) to *Spartina* species with other naturally occurring marsh grasses; and/or (3) upland buffer.
- b. The permittee shall continue to implement the Management Plans for the Dennis, Commercial, Maurice River Township, the Bayside Tract, Cohansey, Alloways, the Rocks (in Delaware), Cedar Swamp (in Delaware), Dennis Wildlife Management Area, New Sweden Wildlife Management Area, Heislerville Wildlife Management Area and Millville Wildlife Management Area. The Management Plans and any necessary revisions are automatically incorporated as conditions of this NJPDES permit. The permittee must continue to implement the Management Plan(s) with respect to maintenance during any period of time the NJPDES permit is extended, including any lands that have met the success criteria.

- c. The permittee shall continue to manage an Estuary Enhancement Program Advisory Committee (EEPAC) to serve as a body to provide technical advice to the permittee concerning any continuing implementation of the existing Management Plans. Any future Management Plan(s) must be submitted to the EEPAC for technical advice prior to submission to the Department for approval. Conditions regarding the EEPAC are as follows:
- i. The permittee shall submit notification to the Department regarding selected members of the EEPAC. The EEPAC shall consist of representatives from two federal agencies that have jurisdiction over wetland restoration activities or fisheries; four scientists with appropriate wetlands expertise; and two representative of either Cape May, Cumberland, or Salem Counties (as appointed by the governments of Cape May, Cumberland, or Salem Counties). The Department shall designate one representative to serve on the EEPAC. The permittee shall designate a representative to serve on the EEPAC and to serve as the EEPAC's chair. These are the minimum requirements where the permittee can expand on this list if desired.
  - ii. A complete list of EEPAC members shall be submitted to the Department within 3 months from the effective date of the permit (EDP). The Department reserves the right to deny any member where any such denial will be within 30 days of submission of such list.
  - iii. The EEPAC shall meet at least once per year and can terminate once all success criteria have been met.

#### **4. Fish Ladders**

- a. The permittee has installed twelve fish ladders as described in the Biological Monitoring Program Annual Reports. The permittee shall operate and maintain these ladders unless the ladders have been removed or replaced by other parties responsible for dam maintenance or repair in accordance with the developed operations and maintenance manuals or by ensuring that agreements exist that require other parties to be responsible for operations and maintenance.
- b. The permittee shall perform inspections during the upstream adult migration period to ensure that the ladders are operating as designed. The permittee shall provide formal notification to the ladder owner of any maintenance issues identified during routine inspections.
- c. Documentation concerning inspection and any maintenance issues shall be made available to the Department upon request.

#### **5. Biological Monitoring Program**

- a. The permittee shall continue to implement the improved biological monitoring program and incorporate any updates as set forth in this permit. The biological monitoring program shall include, at a minimum: impingement and entrainment monitoring; bay-wide abundance monitoring (PSEG Baywide Beach Seine Survey, PSEG Baywide Bottom Trawl Survey, and PSEG River Ichthyoplankton Survey); vegetative cover mapping (aerial photography) and geomorphology mapping (aerial photography) of sites that have not attained success criteria; and other special monitoring studies as may be required by the Department.
- b. The permittee shall continue to comply with the terms and conditions of the April 4, 2002 letter to ensure that the sampling objectives of the PSEG Beach Seine program and the Delaware River Striped Bass Recruitment Beach Seine Sampling are satisfied without duplication of sampling effort. Conditions of the sampling protocol have been slightly modified as follows:

- i. The Department's Division of Fish and Wildlife (NJFW) shall sample twice per month (August to October) at 32 fixed stations as well as additional sampling at these stations during June and July. Sampling shall be performed once per month in June and twice per month during July. A total of nine beach seine survey events will be conducted during the June to October period.
- ii. In order to satisfy the objectives of both programs without duplication of sampling efforts, NJFW will conduct striped bass recruitment beach seine sampling to include measurement of individual length (nearest millimeter) for up to 30 specimens per haul of the following species: American shad, blueback herring, alewife, Atlantic menhaden, bay anchovy, Atlantic silversides, striped bass, white perch, bluefish, Atlantic croaker, spot, weakfish, and blue crab.
- iii. PSEG will provide its seine data to the NJFW by March 1 and conversely NJFW will provide its seine data to PSEG by March 1.
- c. The updated Biological Monitoring Program Work Plan shall be submitted within EDP + 3 months. Not later than 60 days after the Department's approval of the Work Plan, the permittee shall implement the Work Plan. The improved Biological Monitoring Program Work Plan is automatically incorporated as a condition of this permit upon final approval by the Department.
- d. Results of the Biological Monitoring Program shall be submitted to the Department as follows:
  - i. Annually by June 30 of the following year in an annual report to be submitted to the Bureau of Surface Water Permitting.
  - ii. Audited raw data from all biological monitoring activities shall be provided to the Department's Marine Fisheries Administration in an appropriate electronic format, including all appropriate supporting tables and documents. This submittal shall include raw data from the current year and shall be submitted annually by June 30 of the following year. Data from all previous years of monitoring shall be provided by June 30, 2016. Results shall be sent to:

NJ Division of Fish and Wildlife  
Mail Code 501-03, PO Box 420  
Trenton, NJ 08625-0420

DE Division of Fish and Wildlife  
89 Kings Highway  
Dover, DE 19901

## 6. Entrainment and Impingement Monitoring

- a. Entrainment Monitoring for Circulating Water System.
  - i. Entrainment sampling shall be conducted three days per week at a frequency of seven samples per day during January through March and August through December (non-peak entrainment periods), conditions permitting. Sampling shall also be conducted four days per week at a frequency of fourteen samples per day during the period April through July (peak entrainment periods), conditions permitting.



- ii. Specimens collected will be identified to the lowest practical taxon and life stage, and counted. The sampling protocol shall be suitable to capture identifiable oyster and horseshoe crab larvae in the 0.75 mm to 3 mm range. Total length shall be measured to the nearest millimeter for a representative subsample of each target species and life stage per sample. For each sample, additional data collected will include circulator status (on/off), air temperature, water temperature, and salinity.
- b. Impingement Monitoring for Circulating Water System.
  - i. Impingement sampling collections shall be made three days per week. Ten samples shall be collected per 24-hour period, conditions permitting.
  - ii. All fish collected shall be sorted by species and counted and the condition (live, dead, or damaged) of each specimen will be recorded. Length of each specimen will be measured for a subset of each target species, along with the total aggregate weight for all specimens of each species and condition code. For each sample, additional data collected will include circulator status (on/off), air temperature, water temperature, and salinity.
- c. Entrainment and Impingement Monitoring at Service Water System.
  - i. The permittee shall comply with 40 CFR 122.21(r)(6) and 40 CFR 122.21(r)(9) for the service water system. The permittee can conduct impingement and entrainment sampling at the service water intake or can develop a methodology for adapting data from the circulating water system to the service water system. The permittee shall summarize its methodology for sampling the service water in a revised biological monitoring program as per Part IV.G.5.c.

#### 7. Section 316(b) Application Components for All Facilities

- a. Source water physical data (40 CFR 122.21(r)(2)); Cooling water intake structure data (40 CFR 122.21(r)(3)); and Cooling water system data (40 CFR 122.21(r)(5)) - These requirements have been fully satisfied based on information provided in the 2006 NJPDES renewal application at Sections 4-II and 5-II. However, any updated operational information pertaining to these requirements that is relevant to the period of study represented with the application components at 40 CFR 122.21(r) can be submitted along with those submissions at that time.
- b. Source water baseline biological characterization data - The requirements at 40 CFR 122.21(r)(4)(i) through (viii) have been satisfied based on previous application submissions. However, the 2014 rule contains new requirements at 40 CFR 122.21(r)(4)(x) – (xii). The permittee shall submit either an update of current information or new information relevant to these three items below within EDP + 6 months. These requirements are as follows:
  - i. Identification of protective measures and stabilization activities that have been implemented and a description of how these measure and activities affected the baseline water condition in the vicinity of the intake.
  - ii. A list of fragile species applicable to the Station that are not already identified as fragile at 40 CFR 125.92(m).
  - iii. Any information submitted in order to obtain an incidental take exemption or authorization for its cooling water intake structure(s) from the U.S. Fish and Wildlife Service or the National Marine Fisheries Service. Exemption or authorization may be used to satisfy the permit application information requirement of paragraph 40 CFR 122.95(f) if included in the application.

- c. Chosen method(s) of compliance with impingement mortality standard for the circulating water system (40 CFR 122.21(r)(6)) - The permittee shall submit a determination for the circulating water system within EDP + 3 years along with any study components that are required based on the chosen option. If 40 CFR 125.94 (c)(5) or (6) is chosen, an impingement technology performance optimization study shall also be submitted as follows:
  - i. The impingement technology performance optimization study must include at least two years of biological data collection measuring the reduction in impingement mortality achieved by the modified traveling screens as defined at 40 CFR 125.92(s) and demonstrating that the operation has been optimized to minimize impingement mortality. A description of any biological data collection and data collection approach used in measuring impingement mortality must be included. This shall also include the percent impingement mortality reflecting optimized operation of the modified traveling screen and all supporting calculations.
- d. Chosen method(s) of compliance with impingement mortality standard for the service water system (40 CFR 122.21(r)(6)) - The permittee shall submit a determination for the service water system within EDP + 3 years along with the identification of any study components that are required based on the chosen option and a proposed time schedule. If 40 CFR 125.94 (c)(5) or (6) is chosen, an impingement technology performance optimization study shall also be submitted as follows:
  - i. The impingement technology performance optimization study must include at least two years of biological data collection measuring the reduction in impingement mortality achieved by the modified traveling screens as defined at 40 CFR 125.92(s) and demonstrating that the operation has been optimized to minimize impingement mortality. A description of any biological data collection and data collection approach used in measuring impingement mortality must be included. The Department would consider a proposal to utilize data from the circulating water system for the service water system.
- e. Entrainment Performance Studies (40 CFR 122.21(r)(7)) - The permittee shall submit any previously conducted entrainment performance studies that address technology efficacy, through-facility entrainment survival, and other entrainment studies within EDP + 3 years. Any such submittals must include a description of each study, together with underlying data, and a summary of any conclusions or results. Any studies conducted at other locations must include an explanation as to why the data from their locations are relevant and representative of conditions at the Station. In the case of studies more than 10 years old, the applicant must explain why the data are still relevant and representative of conditions at the facility and explain how the data should be interpreted using the definition of entrainment at 40 CFR 125.92(h).
- f. Operational Status (40 CFR 122.21(r)(8)) - The permittee shall submit a description of the operational status of each generating, production, or process unit that uses cooling water. The permittee shall submit the necessary information within EDP + 3 years so that the information corresponds with the impingement and entrainment study components. Additionally, the operational status information must address both the circulating water system and the service water system, including but not limited to:

- i. For power production or steam generation, descriptions of individual unit operating status including the age of each unit; capacity utilization rate (or equivalent) for the previous 5 years (including any extended or unusual outages that significantly affect current data for flow); impingement, entrainment, or other factors (including identification of any operating unit with a capacity utilization rate of less than 8 percent averaged over a 24-month block contiguous period); and any major upgrades completed within the last 15 years (including but not limited to boiler replacement, condenser replacement, turbine replacement or changes to fuel type).
  - ii. Descriptions of completed, approached, or scheduled upgrades and Nuclear Regulatory Commission relicensing status of each unit at nuclear facilities.
  - iii. Descriptions of plans or schedules for any new units planned within the next 5 years.
- g. Entrainment Characterization Study (40 CFR 122.21(r)(9)) - The permittee shall submit the Entrainment Characterization Study where the period of data collection shall span for at least 2 years. This shall include entrainment at both the circulating water system and the service water system which may be based on sampling at both systems, or based on data obtained from the circulating water system that is adapted to estimate entrainment at the service water system. This two year data collection period shall correspond with the benefits valuation study period at 40 CFR 122.21(r)(11). Species included in the Entrainment Characterization Study shall not be limited to RIS but shall include characterization of all life stages of fish, shellfish, and any species protected under Federal, State, or Tribal law (including threatened or endangered species). The Entrainment Characterization Study must include the following components:
- i. Identification and documentation of the data collection period and frequency. The study should identify and document organisms collected to the lowest taxon possible of all life stages of fish and shellfish that are in the vicinity of the cooling water intake structure(s) and are susceptible to entrainment, including any organisms identified by the Director, and any species protected under Federal, State, or Tribal law, including threatened or endangered species with a habitat range that includes waters in the vicinity of the cooling water intake structure. Biological data collection must be representative of the entrainment at the intake subject to this provision. The study shall identify and document how the location of the cooling water intake structure in the waterbody and the water column are accounted for by the data collection locations;
  - ii. Characterization of all life stages of fish, shellfish, and any species protected under Federal, State, or Tribal law (including threatened or endangered species), including a description of their abundance and their temporal and spatial characteristics in the vicinity of the cooling water intake structure(s). This characterization shall be based on sufficient data to characterize annual, seasonal, and diel variations in entrainment, including but not limited to variations related to climate and weather differences, spawning, feeding and water column migration. This characterization may include historical data that are representative of the current operation of the facility and of biological conditions at the site. Identification of all life stages of fish and shellfish must include identification of any surrogate species used, and identification of data representing both motile and non-motile life-stages of organisms;

- iii. Documentation of the current entrainment of all life stages of fish, shellfish, and any species protected under Federal, State, or Tribal law (including threatened or endangered species). The documentation may include historical data that are representative of the current operation of the facility and of biological conditions at the site. Entrainment data to support the facility's calculations must be collected during periods of representative operational flows for the cooling water intake structure, and the flows associated with the data collection must be documented. The method used to determine latent mortality along with data for specific organisms mortality or survival that is applied to other life-stages of species must be identified. The owner or operator of the facility must identify and document all assumptions and calculations used to determine the total entrainment for that facility together with all methods and quality assurance/quality control procedures for data collection and data analysis. The proposed data collection and data analysis methods must be appropriate for a quantitative survey.
- iv. The Entrainment Characterization Study shall be submitted by EDP + 3 years.

**8. Section 316(b) Application Components for Facilities with Actual Intake Flow > 125 MGD**

- a. Comprehensive Technical Feasibility and Cost Evaluation Study (40 CFR 122.21 (r)(10)) - The permittee shall submit an engineering study of the technical feasibility and incremental costs of candidate entrainment control technologies. This includes an evaluation of the technical feasibility of closed-cycle recirculating systems as defined at 40 CFR 125.92(c), fine mesh screens with a mesh size of 2 millimeters or smaller, and water reuse or alternate sources of cooling water. In addition, this study shall include:
  - i. A description of all technologies and operational measures considered (including alternate designs of closed-cycle recirculating systems such as natural draft cooling towers, mechanical draft cooling towers, hybrid designs, and compact or multi-cell arrangements);
  - ii. A discussion of land availability, including an evaluation of adjacent land and acres potentially available due to generating unit retirements, other buildings and equipment retirements, and potential for repurposing of areas developed for transmission yards, and parking lots;
  - iii. A discussion of available sources of process water, grey water, waste water, reclaimed water, or other waters of appropriate quantity and quality for use as some or all of the cooling water needs of the facility;
  - iv. Documentation of factors other than costs that may make a candidate technology impractical or infeasible for further evaluation; and.
  - v. The study must include engineering cost estimates of all technologies considered in Part IV.G.8.a(i)-(iv) above. Facility costs must also be adjusted to estimate social costs. All costs must be presented as the net present value (NPV) and the corresponding annual value. Costs must be clearly labeled as compliance costs or social costs. The permittee must separately discuss facility level compliance costs and social costs, and provide documentation as described at 40 CFR 122.21(r)(10)(iii).
  - vi. The Comprehensive Technical Feasibility and Cost Evaluation study shall be completed by EDP +3 years and is then subjected to peer review as per Part IV.G.8.d below.

- b. Benefits Valuation Study (40 CFR 122.21(r)(11)):- The permittee must submit an evaluation of the benefits of the candidate entrainment reduction technologies and operational measures evaluated in paragraph (r)(10) including using the Entrainment Characterization Study completed as per 40 CFR 122.21(r)(9). Each category of benefits must be described narratively, and when possible, benefits should be quantified in physical or biological units and monetized using appropriate economic valuation methods. The benefits valuation study must include, but is not limited to, the following elements:
- i. Incremental changes in the numbers of individual fish and shellfish lost due to impingement mortality and entrainment as defined in 40 CFR 125.92, for all life stages of each exposed species;
  - ii. Description of basis for any estimates of changes in the stock sizes or harvest levels of commercial and recreational fish or shellfish species or forage fish species;
  - iii. Description of basis for any monetized values assigned to changes in the stock size or harvest levels of commercial and recreational fish or shellfish species, forage fish, and to any other ecosystem or non use benefits;
  - iv. A discussion of mitigation efforts completed prior to October 14, 2014 including how long they have been in effect and how effective they have been;
  - v. Discussion, with quantification and monetization, where possible, of any other benefits expected to accrue to the environment and local communities, including but not limited to improvements for mammals, birds, and other organisms and aquatic habitats; and.
  - vi. Discussion, with quantification and monetization, where possible, of any benefits expected to result from any reductions in thermal discharges from entrainment technologies.
- c. Non-water Quality Environmental and Other Impacts Study (40 CFR 122.21(r)(12)) - The permittee must submit a detailed facility-specific discussion of the changes in non-water quality environmental and other impacts attributed to each technology and operational measure considered in the Comprehensive Technical Feasibility and Cost Evaluation Study above. The study should detail both impacts increased and impacts decreased. The study shall be completed by EDP + 3 years and is then subject to peer review as per Part IV.G.8.d below. The study must include the following:
- i. Estimates of changes to energy consumption, including but not limited to auxiliary power consumption and turbine backpressure energy penalty;
  - ii. Estimates of air pollutant emissions and of the human health and environmental impacts associated with such emissions;
  - iii. Estimates of changes in noise;
  - iv. A discussion of impacts to safety, including documentation of the potential for plumes, icing, and availability of emergency cooling water;
  - v. A discussion of facility reliability, including but not limited to facility availability, production of steam, impacts to production based on process unit heating or cooling, and reliability due to cooling water availability;
  - vi. Significant changes in consumption of water, including a facility-specific comparison of the evaporative losses of both once-through cooling and closed-cycle recirculating systems, and documentation of impacts attributable to changes in water consumption.

- vii. A discussion of all reasonable attempts to mitigate these factors.
- d. Peer Review (40 CFR 122.21(r)(13)) - The permittee shall conduct an external peer review of each report as follows:
  - i. The permittee must select peer reviewers and notify the Department by EDP + 2 years. The Department may disapprove of a peer reviewer or require additional peer reviewers within 90 days of receipt of this information.
  - ii. The Director may confer with EPA, Federal, State and Tribal fish and wildlife management agencies with responsibility for fish and wildlife potentially affected by the cooling water intake structure, independent system operators, and state public utility regulatory agencies, to determine which peer review comments must be addressed.
  - iii. The permittee must provide an explanation for any significant reviewer comments not accepted. Peer reviewers must have appropriate qualifications and their names and credentials must be included in the peer review report.
  - iv. The permittee shall complete the Non-Water Quality Environmental and Other Impacts Study by EDP + 3 years. The study shall then be sent to the selected peer reviewer to be completed and submitted to the Department by EDP + 4 years.

#### 9. Section 316(a) Variance Conditions

- a. Notwithstanding any other provision of this permit, the Department reserves the right to seek termination of the Section 316(a) variance granted or termination of this permit based on the permittee's noncompliance with any term or condition of this permit. Further, the Department specifically reserves the right to seek penalties pursuant to N.J.S.A. 58:10A-10 et seq. based on the permittee's noncompliance with any term or condition of this permit.
- b. If upon renewal, the permittee wants the Section 316(a) variance to be continued, the request for the variance along with a basis for its continuance must be submitted at the time of application for the renewal permit. The Department's Section 316(a) determination shall include, but not be limited to: 1) a review of whether the nature of the thermal discharge or the aquatic population associated with the Station has changed; 2) whether the protection and propagation of the balanced indigenous population is assured; 3) whether the best scientific methods to assess the effect of the permittee's cooling system have changed; 4) whether the technical knowledge of stresses caused by the cooling system has changed.

#### 10. Custom NJPDES Monitoring Requirements

- a. DSNs 481-486.
  - i. Effluent flow- Effluent flow is calculated daily as the sum of the circulating water flow and the service water flow. The circulating water flow for each outfall is calculated as the number of operating hours of the circulating water pumps and the flow rates for each pump. The service water contribution is calculated from the service water pump operating hours times the design flow rate of the service water pumps. The flow rates measured over the course of a calendar day shall be averaged on a daily basis consistent with the definition of daily discharge pursuant to N.J.A.C. 7:14A-1.2. These daily discharge points shall be utilized for the purposes of completing discharge monitoring reports as well as for calculation purposes.

- ii. Effluent Temperature- Effluent temperature shall be measured at DSNs 481-486 on a continuous basis. Effluent flow for DSNs 481-486 is reported on DMRs as indicated in Part III. The effluent temperature values measured over the course of a calendar day shall be averaged on a daily basis consistent with the definition of daily discharge pursuant to N.J.A.C. 7:14A-1.2. These daily discharge points shall be utilized for the purposes of completing discharge monitoring reports as well as for calculation purposes.
  - iii. Chlorine Produced Oxidants- Option 1: The daily maximum limitation of 0.5 mg/L and the monthly average limitation of 0.3 mg/L shall apply when only service water system non-contact cooling water is discharged through DSNs 481-486. Option 2: The daily maximum limitation of 0.2 mg/L shall apply when predominantly circulating water system water is being discharged through DSNs 481-486. Under normal operating conditions (i.e. no outage), the permittee discharges under an Option 2 scenario.
  - iv. Intake pH- One sample of intake water shall be analyzed for pH and shall be reported as intake pH for DSNs 481-486.
- b. FAC A and FAC B.
- i. Intake Temperature- Intake temperature shall be measured at the intake to the main circulating water system for Units 1 and 2 on a continuous basis. The intake temperatures from Units 1 and 2 shall be averaged to obtain the intake temperature for FAC A (Unit 1) as well as the intake temperature for FAC B (Unit 2). In the event that one of the temperature monitoring devices is out of service (such as for calibration and maintenance) the other temperature monitoring device will be applied to both units for reporting intake temperature.
  - ii. Effluent temperature for FAC A and FAC B shall be calculated and reported as follows:  
  
$$\text{Effluent Temperature for FAC A} = \frac{(\text{Eff. Temp. at DSN 481} \times \text{Eff. Flow at DSN 481}) + (\text{Eff. Temp. at DSN 482} \times \text{Eff. Flow at DSN 482}) + (\text{Eff. Temp. at DSN 483} \times \text{Eff. Flow at DSN 483})}{(\text{Eff. Flow at DSN 481} + \text{Eff. Flow at DSN 482} + \text{Eff. Flow at DSN 483})}$$
  
  
$$\text{Effluent Temperature for FAC B} = \frac{(\text{Eff. Temp. at DSN 484} \times \text{Eff. Flow at DSN 484}) + (\text{Eff. Temp. at DSN 485} \times \text{Eff. Flow at DSN 485}) + (\text{Eff. Temp. at DSN 486} \times \text{Eff. Flow at DSN 486})}{(\text{Eff. Flow at DSN 484} + \text{Eff. Flow at DSN 485} + \text{Eff. Flow at DSN 486})}$$
  
  
  - iii. Differential Temperature- Differential temperature shall be calculated by subtracting the daily intake temperature from the daily effluent temperature where the values for intake temperature and effluent temperature values are explained above. The permittee calculates differential temperature on an hourly basis where the daily differential temperature is an arithmetic average of the values obtained during the course of the day. This is consistent with the definition of "daily discharge" in accordance with N.J.A.C. 7:14A-1.2.
- c. FAC C.

- i. Intake Flow- Intake flow for the circulating water system is calculated as the sum of the twelve individual circulating water system intakes and reported as a monthly average in million gallons per day. The flow of each individual circulating water pump shall be calculated as the product of the number of operating hours for that pump for the reporting period and the flow rate for that pump. The flow rate for each respective pump shall be assessed on an annual basis in accordance with the Tracer Evaluation Requirement in item G.1. For the purposes of DMR reporting, the intake flow values measured over the course of a calendar day shall be averaged on a daily basis consistent with the definition of daily discharge pursuant to N.J.A.C. 7:14A-1.2.
- ii. Thermal Discharge- Thermal discharge in MBTU/Hr is the total heat released from Unit 1 (FAC A) and Unit 2 (FAC B) where it shall be calculated as follows:

$$\text{Thermal Discharge FAC C (MBTU/Hr)} = \frac{[M1Cp(T_{\text{eff}} - T_{\text{int}})]\text{Unit 1} + [M2Cp(T_{\text{eff}} - T_{\text{int}})]\text{Unit 2}}{1,000,000}$$

Where:

M1 = Mass flow rate of water from Unit 1 in lbs/hour (includes circulating water flow as well as service water flow)

M2 = Mass flow rate of water from Unit 2 in lbs/hour (includes circulating water flow as well as service water flow)

Mass flow rate is equal to flow in gal/hour x 8.34 lb/gallon

T<sub>eff</sub> = effluent temperature from Unit (e.g. Unit 1)

T<sub>int</sub> = intake temperature from Unit

C<sub>p</sub> is the specific heat capacity of water which is 1 BTU/lb degrees Fahrenheit.

- d. DSN 48C and DSN 489: During periods of maintenance, calibration or failure of the flow meter, flow can be calculated using the operating hours of the discharge pumps times the flow rate of the discharge pumps.

## 11. Other Regulatory Requirements

- a. The permittee shall discharge so as not to violate the Delaware River Basin Commission Water Quality Regulations as amended for Zone 5 waters. This includes the stream quality objectives for radioactivity, namely: alpha emitters- maximum 3 pc/L (picocuries per liter) and beta emitters- maximum 1,000 pc/L. The permittee shall ensure compliance with the heat dissipation area set forth in any current DRBC docket. Compliance may be determined by the DRBC based on its own sampling events.
- b. The permittee shall comply with all regulations set forth in N.J.S.A. 26:2D-1 et seq. regarding Radiation Protection. All radioactive wastes shall be collected, removed, and disposed of in accordance with N.J.S.A. 7:28-11.1 et seq.
- c. The permittee is licensed by the U.S. Nuclear Regulatory Commission (USNRC) and responsible to that agency for compliance with radiological effluent limitations, monitoring requirements, and other licensing conditions.



- d. The permittee is required to comply with Section 4.2 of Appendix B to the NRC Facility Operating Licenses Nos. DPR-70 and DPR-75 which includes National Marine Fisheries Service's (NMFS) Section 7 Consultation Biological Opinion related to the operation of Salem Units 1 and 2 Generating Stations, including attachments, and all subsequent amendments as may be approved by NMFS. All correspondence between the permittee and the NMFS specifically related to Salem's effects on threatened and endangered species shall be sent to the Department at the following address:

Director, Division of Fish and Wildlife  
501 East State Street, P.O. Box 400  
Trenton, NJ 08625-0400.

- e. As per 40 CFR 125.98(j), this permit does not authorize the take, as defined at 16 U.S.C. 1532(19), of threatened or endangered species of fish or wildlife. Such take is prohibited under the Endangered Species Act unless it is exempted pursuant to 16 U.S.C. 1536(o) or permitted pursuant to 16 U.S.C. 1539(a). Absent such exemption or permit, any facility operating under the authority of this regulation must not take threatened or endangered wildlife.



## TYPICAL LICENSING AND REGULATORY AFFAIRS CORRESPONDENCE CONCURRENCE FORM

Station(s): Salem Units 1 and 2 Correspondence No.: LR-E16-0118Subject/Document: Submission of minor NJPDES permit modificationDocument Due Date: 11/6/2016 Regulatory Driven Due Date: YES / ~~NO~~Document Prepared by: Tom Adams Extension: 1715If Routine NRC report, then document SAP recurring task or generate notification: NA

Required Review and Disciplines Assigned by: \_\_\_\_\_ / \_\_\_\_\_ Title

Type of Review Required: ☐ Technical Verification Team Review(Reference LS-AA-117) ☒ Individual or Series Review☐ No Technical Review**Disciplines Required:**

- |   |   |   |  |
|---|---|---|--|
| <input type="checkbox"/> Maintenance    | <input type="checkbox"/> Radiation Protection | <input type="checkbox"/> Chemistry            | <input type="checkbox"/> Training                              |
| <input type="checkbox"/> Operations     | <input type="checkbox"/> Engineering - I&C    | <input type="checkbox"/> Radwaste             | <input type="checkbox"/> Reg Assurance / Licensing             |
| <input type="checkbox"/> Rx Engineering | <input type="checkbox"/> Design Engineering   | <input type="checkbox"/> Engr - Mech Systems  | <input type="checkbox"/> Programs Engineering                  |
| <input type="checkbox"/> Nuclear Fuels  | <input type="checkbox"/> Work Management      | <input type="checkbox"/> Engr - Elect Systems | <input checked="" type="checkbox"/> Other: <u>Env. Affairs</u> |

**NOTE**

The following signatures indicate and affirm that technical inputs for this regulatory correspondence are technically correct, complete, and accurate in all material respects.

Print Name / Signature	Discipline	Date
<i>T.C. Adams</i>	Preparer	11/4/16
<i>Luís (Adams) Amato</i>	Peer Review	11/4/16
<i>Helen Gregory</i>		11/4/16

**Required Reviews and Signatures (check as appropriate):**

- |  |             |
|--|-------------|
| <input type="checkbox"/> Station Qualified Review Required: <u>NA</u>                        | Date: _____ |
| <input type="checkbox"/> Corporate Licensing Concurrence Required: <u>NA</u>                 | Date: _____ |
| <input type="checkbox"/> Station Regulatory Assurance Concurrence Required: <u>NA</u>        | Date: _____ |
| <input type="checkbox"/> PORC Approval Required: PORC Meeting No. <u>NA</u> PORC Chair _____ |             |
| <input type="checkbox"/> Plant Manager Approval Required: <u>NA</u>                          | Date: _____ |
| <input type="checkbox"/> Site Vice President Approval Required: <u>NA</u>                    | Date: _____ |

<b>Correspondence Quality Checklist</b>	
<b>Letter Number:</b> LR-216-0118	
<b>Format</b>	Initials
o Cover letter formatted IAW LS-AA-117-1003	TCA
o Letter number on all pages, as appropriate	TCA
o Pagination and page count	TCA
o Attachments and Enclosures referenced to the letter	RA
o CC and/or BC list are complete and accurate	TCA
o Enclosures or attachments are readable	RA
o Special requirements noted such as Public Withholding with pages marked as appropriate	NA/TCA
o Correct Addressee	TCA
o Spelling and Grammar	TCA
o Docket and License Numbers as required	TCA
o Margins consistent	RA
o Fonts consistent	TCA
<b>Content</b>	Initials
o Summary paragraph as introduction, which clearly states purpose of correspondence (what we wish to accomplish or what we need from addressee)	RA
o Appropriate regulatory references included	RA
o Body text flows, has a logical sequence and supports the conclusions	TCA
o Follows any regulatory guidance regarding content	RA
o Extraneous material is not included	RA
o References cited as appropriate and necessary	RA
o Conclusion states who has the action and what the action is including due dates as appropriate	RA
o PSEG contact provided for any follow-up	RA
o Paragraph structure complete and consistent	RA
o Affidavit or "affirmation" as required	RA
o Statements supporting withholding included as appropriate	RA
o Summary of Commitments included as appropriate. (ref: LS-AA-117-1003)	TCA
<b>Transmission</b>	Initials
o Letter signed by appropriate individual	TCA
o Envelope(s) correctly addressed.	RA
o SGI envelopes properly protected.	TCA
o Document page checked	TCA
o Document transmitted to Records Management	RA
o PDF File of signed and dated letter created for NRC electronic submission	—
o OCR and Preflight PDF file	—
o Submit document to NRC and retain electronic submittal confirmation	—
o Traveler (per LS-AA-117-1002) is complete (including appropriate discipline signatures)	RA
o Commitments entered into Tracking Database	—
o Correspondence log updated	TCA
o Distribution timely	RA

**Attachment 2  
Verification Completion Form  
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Verification Documentation

Correspondence/Letter number: LR-E16-0118 Origination Date: 10/14/16

Agency/External Stakeholder: \_\_\_\_\_ Submittal Due Date: 11/5/16

Recipient of Correspondence: Nuclear Regulatory Commission  
(name and title if known)

Purpose of Submittal: Salem NJPDES minor permit modification

Originating Office: ☒ Salem ☐ Hope Creek ☒ PSEG Nuclear Corporate

Preparer: Tom Adams (print) \_\_\_\_\_ (sign) 10/14/16 (date)

Peer Reviewer: Michael Pego (print) \_\_\_\_\_ (sign) 10/14/16 (date)

Certified Mail Return Receipt Requested: ☒ Yes ☐ No

Approvals (check box if applicable)

	Applicable	Date Review Needed	Signature of Reviewer	Date of Review
<b>Site Departments</b>				
Nuclear Environmental Affairs – H. Gregory	<input checked="" type="checkbox"/>		<u>Helen Gregory</u>	<u>10/03/16</u>
Chemistry	<input type="checkbox"/>			
Operations	<input type="checkbox"/>			
Engineering	<input type="checkbox"/>			
Regulatory Assurance	<input type="checkbox"/>			
<b>Corporate</b>				
CFAM-	<input type="checkbox"/>			
<b>Site Management</b>				
Plant Manager	<input type="checkbox"/>			
Site Vice President	<input type="checkbox"/>			
Other:	<input type="checkbox"/>		<input type="checkbox"/> Report Signed and Approved	
Other:	<input type="checkbox"/>			

Attach additional page for comments.