PSEG POWER, LLC AND PSEG NUCLEAR, LLC

PSEG SITE EARLY SITE PERMIT

DOCKET NO. 52-043

EARLY SITE PERMIT

Early Site Permit No. ESP-005

1. The U.S. Nuclear Regulatory Commission (the NRC or the Commission) has found the following:

   A. The application for an early site permit (ESP), filed by PSEG Power, LLC and PSEG Nuclear, LLC (PSEG), meets the applicable standards and requirements of the Atomic Energy Act of 1954, as amended ("Act"), and the Commission's regulations.

   B. All required notifications to other agencies or bodies have been duly made.

   C. There is reasonable assurance that the permit holders will comply with the regulations in Title 10 of the *Code of Federal Regulations* (CFR) Chapter I and the health and safety of the public will not be endangered.

   D. There is reasonable assurance that the site is in conformity with the provisions of the Act and the Commission's regulations.

   E. PSEG is technically qualified to engage in the activities authorized.

   F. Issuance of the ESP will not be inimical to the common defense and security or to the health and safety of the public.

   G. The proposed complete and integrated emergency plans are in accordance with the applicable standards of 10 CFR 50.47, and the requirements of Appendix E to 10 CFR Part 50, and provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.

   H. The proposed inspections, tests, analyses and acceptance criteria (ITAAC) on emergency planning are necessary and sufficient, within the scope of the ESP, to provide reasonable assurance that the facility has been constructed and will be operated in conformity with the license, the provisions of the Act, and the Commission's regulations.

   I. The issuance of this ESP, subject to the Environmental Protection Plan (EPP) and the conditions for the protection of the environment set forth herein, is in accordance with the National Environmental Policy Act of 1969, as amended, and with the applicable sections of 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related

Regulatory Functions," as referenced by Subpart A, "Early Site Permits," of 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," and all applicable requirements therein have been satisfied.

2. Based on the foregoing findings, and pursuant to Sections 103 and 185 of the Atomic Energy Act of 1954, as amended, 10 CFR 52, and the Initial Decision of the Atomic Safety and Licensing Board, dated April 26, 2016 (LBP-16-04), the NRC hereby issues Early Site Permit No. ESP-005 to PSEG for a site located on the southern part of Artificial Island on the east bank of the Delaware River in Lower Alloways Creek Township, Salem County, New Jersey. The site is 15 miles south of the Delaware Memorial Bridge, 18 miles south of Wilmington, Delaware, 30 miles southwest of Philadelphia, Pennsylvania, and 7.5 miles southwest of Salem, New Jersey, adjacent to the existing Salem Generating Station (SGS) Units 1 and 2 and Hope Creek Generating Station (HCGS) Unit 1, for one or two nuclear power units, designed to operate at an individual rated power of no more than 4614 megawatts thermal and a combined rated power of no more than 6830 megawatts thermal, as described in the application and supplements thereto (the application) filed in this matter by the permit holders, and as described in the evidence received at the public hearing on that application.

3. This ESP shall be deemed to contain and is subject to the conditions specified in the Commission's regulations in 10 CFR Chapter I; is subject to all applicable provisions of the Act and the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the following conditions specified or incorporated below:

    A. The characteristics of the PSEG ESP site set forth in Appendix A to this ESP are hereby incorporated into this ESP.

    B. The bounding design parameter values set forth in Appendix B to this ESP are hereby incorporated into this ESP.

    C. The combined license (COL) action items set forth in Appendix C to this ESP are hereby incorporated into this ESP. These COL action items identify certain matters that an applicant submitting an application that references this ESP shall address in the final safety analysis report (FSAR). These items constitute information requirements but are not the only acceptable set of information in the FSAR. An applicant may depart from or omit these items, provided that it identifies and justifies the departure or omission in the FSAR. In addition, these items do not relieve an applicant from any requirement in 10 CFR Chapter I that governs the application. After issuance of a construction permit (CP) or COL, these items are not requirements for the permit holder or licensee unless such items are included in a permit or license condition.

    D. The site characteristics, design parameters, and site interface values considered in the environmental review of the application and set forth in Appendix D to this ESP are hereby incorporated into this ESP.

    E. The ITAAC set forth in Appendix E to this ESP are hereby incorporated into this ESP.

    F. The following conditions apply:

1) An applicant for a COL or CP referencing this ESP shall notify the NRC staff when the COL applicant has acquired the required authority and control over the Exclusion Area (prior to issuance of any combined license that references this ESP) and shall provide confirmation that the basis for that conclusion includes the following:

   i. The COL or CP applicant shall complete the acquisition of 0.34 km^2 (85 ac.) of land, including mineral rights, from the U.S. Army Corps of Engineers (USACE) that is currently part of the confined disposal facility north of the site.

   ii. The COL or CP applicant shall modify the existing PSEG Site Radiological Emergency Response Plan and the existing PSEG Site Security Plan, and reach agreements with the U.S. Coast Guard, to extend the protections for the Delaware River portion of the existing Salem and Hope Creek Exclusion Area Boundary (EAB) to cover the Delaware River portion of the Exclusion Area related to the ESP.

   iii. The COL or CP applicant shall reach agreement with the USACE for any land within the EAB that will not be owned by the COL applicant to obtain legal authority from the USACE to either allow the COL applicant and its surrogates to determine all activities including exclusion or removal of personnel and property from the area or require that the USACE exercise that control in the manner specified by the COL or CP applicant.

2) An applicant for a COL or CP referencing this ESP shall demonstrate that the nearest structures, systems, and components (SSCs) important to safety of the selected plant design can withstand the effects of potential explosions associated with the relocated gasoline storage tank and the gasoline delivery tanker truck. The applicant shall demonstrate this by using the methodologies provided in Regulatory Guides 1.91 and 1.78 for direct explosion and vapor cloud explosion, respectively, to confirm that a minimum safe distance exists between the nearest plant SSCs important to safety and the relocated gasoline storage tank and the gasoline delivery tanker truck such that the SSCs would not experience an overpressure in excess of 1.0 psi in the event of an explosion.

3) An applicant for a COL or CP referencing this ESP shall perform detailed geologic mapping of excavations for safety-related structures; examine and evaluate geologic features discovered in those excavations; and notify the Director of the Office of New Reactors, or the Director’s designee, once excavations for safety-related structures are open for examination by NRC staff.

4) An applicant for a COL or CP referencing this ESP shall remove and replace the soils directly above the Vincentown Formation for soils under or adjacent to Seismic Category I structures to minimize any liquefaction potential.

5) An applicant for a COL or CP referencing this ESP shall propose a license condition for the licensee to perform the following: (i) No later than 18 months before the latest date set forth in the schedule submitted in accordance with 10 CFR 52.99(a) for completing the inspections, tests, and analyses in the ITAAC, the licensee shall have performed an assessment of on-site and augmented staffing capability for responding to a multi-unit event. The staffing assessment shall be performed in accordance with the latest NRC-endorsed revision of Nuclear Energy Institute (NEI) 12-01, "Guidance for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities," and (ii) At least 180 days before the date scheduled for initial fuel loading, as set forth in the notification submitted in accordance with 10 CFR 52.103(a), the licensee shall complete implementation of corrective actions identified in the staffing assessment described above and identify how the augmented staff will be notified given degraded communications capabilities, including any related emergency plan and implementing procedure changes and associated training.

6) An applicant for a COL or CP referencing this ESP shall propose a license condition for the licensee to perform the following: (i) No later than 18 months before the latest date set forth in the schedule submitted in accordance with 10 CFR 52.99(a) for completing the inspections, tests, and analyses in the ITAAC, the licensee shall have performed an assessment of on-site and off-site communications systems and equipment relied upon during an emergency event to ensure communications capabilities can be maintained during an extended loss of ac power. The communications capability assessment shall be performed in accordance with the latest NRC-endorsed revision of NEI 12-01 and (ii) At least 180 days before the date scheduled for initial fuel loading, as set forth in the notification submitted in accordance with 10 CFR 52.103(a), the licensee shall complete implementation of corrective actions identified in the communications capability assessment described above, including any related emergency plan and implementing procedure changes and associated training.

7) An applicant for a COL or CP referencing this ESP shall revise the emergency plan to describe on-shift personnel assigned emergency plan implementing functions associated with the chosen reactor technology and the number of proposed reactor units. In addition, the COL or CP applicant shall propose a license condition for the licensee to perform the following: (i) No later than 18 months before the latest date set forth in the schedule submitted in accordance with 10 CFR 52.99(a) for completing the inspections, tests, and analyses in the ITAAC, the licensee shall have performed an on-shift staffing analysis in accordance with the latest NRC-endorsed revision of NEI 10-05, "Assessment of On-Shift Emergency Response Organization Staffing and Capabilities," and (ii) At least 180 days before the date schedule for initial fuel loading, as set forth in the notification submitted in accordance with 10 CFR 52.103(a), the licensee shall incorporate any

changes to the emergency plan needed to bring staffing to the required levels.

8) An applicant for a COL or CP referencing this ESP and the AP1000 standard design shall propose a license condition for the licensee to develop an Emergency Action Level (EAL) scheme with fully developed site-specific EALs, in accordance with the latest NRC-endorsed revision of NEI 07-01, "Methodology for Development of Emergency Action Levels, Advanced Passive Light Water Reactors," with few or no deviations or differences. All deviations or differences from NEI 07-01 must be fully described in the COL application, including providing the initiating condition, operating modes, notes, EAL threshold(s), basis information, and developer guidance for how a particular setpoint is (or will be) determined. The EALs shall have been discussed and agreed upon with State and local officials. The fully developed site-specific EAL scheme shall be submitted to the NRC at least 180 days before the date scheduled for initial fuel loading, as set forth in the notification submitted in accordance with 10 CFR 52.103(a).

9) An applicant for a COL or CP referencing this ESP and the U.S. EPR, ABWR, or US-APWR standard design shall propose a license condition for the licensee to develop an EAL scheme with fully developed site-specific EALs, in accordance with the latest NRC-endorsed revision of NEI 99-01, "Methodology for Development of Emergency Action Levels," with few or no deviations or differences, other than those attributable to the specific reactor design. All deviations or differences from NEI 99-01 must be fully described in the COL application, including providing the initiating condition, operating modes, notes, EAL threshold(s), basis information, and developer guidance for how a particular setpoint is (or will be) determined. The EALs shall have been discussed and agreed upon with State and local officials. The fully developed site-specific EAL scheme shall be submitted to the NRC at least 180 days before the date scheduled for initial fuel loading, as set forth in the notification submitted in accordance with 10 CFR 52.103(a).

4. An applicant for a COL or CP referencing this ESP shall develop an EPP for construction and operation of the proposed plant and include the EPP in the application. The portion of the EPP directed to operation shall include any environmental conditions derived in accordance with 10 CFR 50.36b, “Environmental Conditions.”

5. The holders of this ESP are subject to the requirements of 10 CFR 21, “Reporting of Defects and Noncompliance,” and are subject to the requirements of 10 CFR 50.55(e), as of the date of issuance of this ESP.

6. This ESP is effective as of its date of issuance and shall expire at midnight on May 5, 2036.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Jennifer Uhle, Director,
Office of New Reactors

Attachments:	Appendix A:	Characteristics of the PSEG ESP Site
	Appendix B:	Bounding Design Parameters
	Appendix C:	Combined License Action Items
	Appendix D:	Site Characteristics and Plant Parameter Envelope Values Considered in the Environmental Review of the Application
	Appendix E:	Inspections, Tests, Analyses, and Acceptance Criteria
	Appendix F:	Site Redress Plan
	Appendix G:	Environmental Protection Plan (Nonradiological)

Attachments:

Appendix A: Characteristics of the PSEG ESP Site

Appendix B: Bounding Design Parameters

Appendix C: Combined License Action Items

Appendix D: Site Characteristics and Plant Parameter Envelope Values Considered in the Environmental Review of the Application

Appendix E: Inspections, Tests, Analyses, and Acceptance Criteria

Appendix F: Site Redress Plan

Appendix G: Environmental Protection Plan (Nonradiological)

ADAMS No.: ML16084A798 *via E-mail

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Appendix A: Characteristics of the PSEG ESP Site

Site Characteristic	Value	Definition
2.1 - Geography and Demography		
Exclusion Area Boundary	Since PSEG has not selected a specific reactor design, only boundaries of the power block area and a theoretical plant center point within the power block area are shown within the proposed Exclusion Area Boundary (EAB). The proposed EAB is a circle at least 600 meters (1968 feet) from the edge of the power block area in all directions, and extends beyond the PSEG Site property line to the west into the Delaware River and to the north and northeast. The total area encompassed by the EAB is 743 acres, of which 224 acres is in the Delaware River and 288 acres is in land currently owned by PSEG. No public roads, railroads, or structures other than existing Salem and Hope Creek power plant facilities are located within any part of the EAB. See Figure A.3-1.	The area surrounding the reactor(s), in which the reactor licensee has the authority to determine all activities including exclusion or removal of personnel and property from the area.
Low Population Zone	The area falling within a 5-mile radius around the center point of the new plant. This area is dominated by the open waters of Delaware Bay and low coastal wetlands to the east and west of the bay.	The area immediately surrounding the exclusion area that contains residents.
Population Center Distance	The population center nearest to the PSEG Site containing more than about 25,000 residents is the city of Wilmington, DE, with the nearest boundary 14.8 miles (23.8 km) north of the new plant center point.	The minimum allowable distance from the reactor to the nearest boundary of a densely populated center containing more than about 25,000 residents is 1 and 1/3 times the distance from the reactor to the outer boundary of the Low Population Zone (LPZ).
2.3 - Meteorology		

Site Characteristic		Value	Definition
Ambient Air Temperature and Humidity			
Maximum Dry-Bulb Temperature	2% annual exceedance	88 ºF / 73 ºF	The ambient dry-bulb temperature (and mean coincident wet-bulb temperature) that will be exceeded 2% of the time annually.
	1% annual exceedance	90 °F / 75 °F	The ambient dry-bulb temperature (and mean coincident wet-bulb temperature) that will be exceeded 1% of the time annually.
	0.4% annual exceedance	93 ºF / 76 ºF	The ambient dry-bulb temperature (and mean coincident wet-bulb temperature) that will be exceeded 0.4% of the time annually.
	0% annual exceedance (record)	108 ºF / 79 ºF	The highest recorded ambient dry-bulb temperature and mean coincident wet-bulb temperature.
	100-year return period	105.9 °F / 82.4 ºF	The ambient dry-bulb temperature (and mean coincident wet-bulb temperature) that has a 1% annual probability of being exceeded (100-year mean recurrence interval).
Minimum Dry-Bulb Temperature	99% annual exceedance	14 °F	The ambient dry-bulb temperature below which dry-bulb temperatures will fall 1% of the time annually.
	99.6% annual exceedance	10 °F	The ambient dry-bulb temperature below which dry-bulb temperatures will fall 0.4% of the time annually.
	100% annual exceedance (record)	-15 °F	Lowest recorded dry-bulb temperature.

Site Characteristic		Value	Definition
	100-year return period	-18.7 °F	The ambient dry-bulb temperature for which a 1% annual probability of a lower dry-bulb temperature exists (100-year mean recurrence interval).
Maximum Wet-Bulb Temperature	1% annual exceedance	77 °F	The ambient wet-bulb temperature that will be exceeded 1% of the time annually.
	0.4% annual exceedance	79 °F	The ambient wet-bulb temperature that will be exceeded 0.4% of the time annually.
	0% annual exceedance (record)	86.2 °F	Highest recorded wet-bulb temperature.
	100-year return period	87.4 °F	The ambient wet-bulb temperature that has a 1% annual probability of being exceeded (100-year mean recurrence interval).
UHS Ambient Air Temperature and Humidity			
Meteorological Conditions Resulting in the Minimum Water Cooling During any 1 Day		82.69°F WBT 87.12°F DBT	Historic worst 1-day daily average wet-bulb temperature and coincident dry-bulb temperature.
Meteorological Conditions Resulting in the Minimum Water Cooling During any Consecutive 5 Days		78.02°F WBT 83.47°F DBT	Historic worst 5-day daily average wet-bulb temperature and coincident dry-bulb temperature.
Meteorological Conditions Resulting in the Minimum Water Cooling During any Consecutive 30 Days		75.87°F WBT 82.65°F DBT	Historic worst 30-day daily average wet-bulb temperature and coincident dry-bulb temperature.

Site Characteristic		Value	Definition
Basic Wind Speed			
3-Second Gust		117.7 mi/h	The nominal 3-second gust wind speeds in miles per hour (mph) at 33 ft. above ground associated with a 100-year return period.
Importance Factors		1.15	Multiplication factor applied to basic wind speed used to assess wind impacts on structures.
Hurricane			
Hurricane Wind Speed		159 mi/h	Maximum nominal 3-second gust wind speed at 33 ft. above ground over open terrain having a probability of exceedance of 10-7 per year.
Hurricane Missiles	Schedule 40 Pipe	6.625 in dia x 15 ft long 287-lb pipe at 99 ft/sec Horizontal	Design-Basis Hurricane Missile Spectrum from RG 1.221.
	Automobile	16.4 ft x 6.6 ft x 4.3 ft 4000-lb. automobile at 130 ft/sec Horizontal	Design-Basis Hurricane Missile Spectrum from RG 1.221.
	Solid Steel Sphere	1 in diameter sphere at 86 ft/sec Horizontal	Design-Basis Hurricane Missile Spectrum from RG 1.221.
Tornado			
Maximum Wind Speed		200 mi/h	Maximum wind speed resulting from passage of a tornado having a probability of occurrence of 10^{-7} per year.

Site Characteristic		Value	Definition
Maximum Translational Speed		40 mi/h	Translation component of the maximum tornado wind speed.
Rotational Speed		160 mi/h	Rotation component of the maximum tornado wind speed.
Radius of Maximum Rotational Speed		150 feet	Distance from the center of the tornado at which the maximum rotational wind speed occurs.
Pressure Drop		0.9 lbf/in.^{2}	Decrease in ambient pressure from normal atmospheric pressure resulting from passage of the tornado.
Rate of Pressure Drop		0.4 psi/s	Rate of pressure drop resulting from the passage of the tornado.
Tornado Missiles	Schedule 40 Pipe	6.625 in dia x 15 ft long 287-lb pipe at 112 ft/sec Horizontal	Design-Basis Tornado Missile Spectrum from RG 1.76, Revision 1.
	Automobile	16.4 ft x 6.6 ft x 4.3 ft 4000-lb. automobile at 112 ft/sec Horizontal	Design-Basis Tornado Missile Spectrum from RG 1.76, Revision 1.
	Solid Steel Sphere	1 in diameter sphere at 23 ft/sec Horizontal	Design-Basis Tornado Missile Spectrum from RG 1.76, Revision 1.
Winter Precipitation			
100-Year Snowpack		24 lb/ft^2	Weight of the 100-year return period snowpack (to be used in determining normal precipitation loads for roofs).
48-Hour Probable Maximum Winter Precipitation		21 inches of water	PMP during the winter months (to be used in conjunction with the 100-year snowpack in determining extreme winter precipitation loads for roofs).

Site Characteristic	Value	Definition
Normal Winter Precipitation Event	24 lb/ft^2	The highest ground-level weight (in lb/ft^2) among: (1) the 100-year return period snowpack; (2) the historical maximum snowpack; (3) the 100-year return period two-day snowfall event; or (4) the historical maximum two-day snowfall event in the site region. (to be used in determining the precipitation load for roofs).
Extreme Frozen Winter Precipitation Event	20.51 lb/ft^2	The highest of (1) the 100-year return period two-day snowfall event; and (2) the historical maximum snowfall event in the site region. (to be used in determining the precipitation load for roofs).
Short-Term (Accident Release) Atmospheric Dispersion		
0-2 hr χ/Q Value @ EAB	4.71×10^{-4} s/m^3	The 0-2 hour atmospheric dispersion factor to be used to estimate dose consequences of accidental airborne releases at the EAB.
0-8 hr χ/Q Value @ LPZ outer boundary	8.47×10^{-6} s/m^3	The 0-8 hour atmospheric dispersion factor to be used to estimate dose consequences of accidental airborne releases at the LPZ.
8-24 hr χ/Q Value @ LPZ outer boundary	5.50×10^{-6} s/m^3	The 8-24 hour atmospheric dispersion factor to be used to estimate dose consequences of accidental airborne releases at the LPZ.
1-4 day χ/Q Value @ LPZ outer boundary	2.15×10^{-6} s/m^3	The 1-4 day atmospheric dispersion factor to be used to estimate dose consequences of accidental airborne releases at the LPZ.
4-30 day χ/Q value @ LPZ outer boundary	5.60×10^{-7} s/m^3	The 4-30 day atmospheric dispersion factor to be used to estimate dose consequences of accidental airborne releases at the LPZ.

Site Characteristic	Value	Definition
Long-Term (Routine Release) Atmospheric Dispersion		
Annual Average Undepleted/No Decay χ/Q Value @ Site Boundary, east-northeast, 0.24 mile	1.00×10^{-5} s/m^3	The maximum annual average site boundary undepleted/2.26-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Undepleted/ 2.26-day Decay χ/Q Value @ Site Boundary, east-northeast, 0.24 mile	1.00×10^{-5} s/m^3	The maximum annual average site boundary undepleted/2.26-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Depleted/ 8.00-day Decay χ/Q Value @ Site Boundary, east-northeast, 0.24 mile	9.50×10^{-6} s/m^3	The maximum annual average site boundary depleted/8.00-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average D/Q Value @ Site Boundary, east-northeast, 0.24 mile	4.10×10^{-8} 1/m^2	The maximum annual average site boundary relative deposition factor (D/Q) value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Undepleted/No Decay χ/Q Value @ Nearest Resident, northwest, 2.8 mile	2.40×10^{-7} s/m^3	The maximum annual average resident undepleted/no decay atmospheric dispersion factor (χ/Q) value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Undepleted/ 2.26-day Decay χ/Q Value @ Nearest Resident, northwest, 2.8 mile	2.40×10^{-7} s/m^3	The maximum annual average resident undepleted/2.26 day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual.

Site Characteristic	Value	Definition
Annual Average Depleted/ 8.00-day Decay χ/Q Value @ Nearest Resident, northwest, 2.8 mile	1.90×10^{-7} s/m^3	The maximum annual average resident depleted/8.00-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average D/Q Value @ Nearest Resident, northwest, 2.8 mile	9.60×10^{-10} 1/m^2	The maximum annual average resident relative deposition factor (D/Q) value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Undepleted/No Decay χ/Q Value @ Nearest Farm, northwest, 4.9 mile	1.10×10^{-7} s/m^3	The maximum annual average farm undepleted/no decay atmospheric dispersion factor (χ/Q) value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Undepleted/ 2.26-day Decay χ/Q Value @ Nearest Farm, northwest, 4.9 mile	1.10×10^{-7} s/m^3	The maximum annual average farm undepleted/2.26-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Depleted/8.00-day Decay χ/Q Value @ Nearest Farm, northwest, 4.9 mile	8.20×10^{-8} s/m^3	The maximum annual average farm depleted/8.00-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average D/Q Value @ Nearest Farm, northwest, 4.9 mile	3.50×10^{-10} 1/m^2	The maximum annual average farm relative deposition factor (D/Q) value for use in determining gaseous pathway doses to the maximally exposed individual.
2.4 – Hydrologic Engineering		
Hydrology		
Proposed Facility Boundaries	Figure A.3-1 (taken from SSAR Figure 1.2-3) depicts the proposed facility boundary.	PSEG Site boundary areas within which all safety-related SSCs will be located.

Site Characteristic	Value	Definition
Highest Ground Water	3.05 m (10 ft) NAVD88	The maximum elevation of groundwater at the PSEG Site.
Maximum Stillwater Flood Elevation (Storm Surge) + 10% Astronomical High Tide	7.53 m (24.7 ft) NAVD88	The stillwater elevation, without accounting for wind-induced waves, the water surface reaches during a flood event.
Wave Runup (Storm Surge)	2.26 m (7.4 ft)NAVD88	The height of water reached by wind-induced waves running up on the site.
Combined Effects Maximum Flood Elevation (Design Basis Flood)	9.78 m (32.1 ft) NAVD88	The water surface elevation at the point in time where the combination of the still water level and wave runup is at its maximum.
Local Intense Precipitation	46.7 cm (18.4 in.) per hour	The depth of PMP for duration of 1 hour on a 1 square-mile drainage area. The surface water drainage system should be designed for a flood produced by the local intense precipitation.
Frazil, Surface or Anchor Ice	The PSEG Site has the potential for frazil and surface ice.	Potential for accumulated ice formation in a turbulent flow condition.
Minimum River Water Surface Elevation	-4.85 m (-15.9 ft) NAVD88 for less than 6 hours	The river surface water elevation and duration for which the low water level conditions exist at the PSEG Site.
Maximum Ice Thickness	45.2 cm (17.8 in.)	Maximum potential ice thickness on the Delaware River at the PSEG Site.
Hydraulic Conductivity	SSAR Table 2.4.12-9	Groundwater flow rate per unit hydraulic gradient.
Hydraulic Gradient	SSAR Tables 2.4.12 -7 and 2.4.12-8	Slope of groundwater surface under unconfined conditions or slope of hydraulic pressure head under confined conditions.

Site Characteristic	Value	Definition
2.5 – Geology, Seismology, and Geotechnical Engineering		
Basic Geologic and Seismic Information		
Capable Tectonic Structures	No capable tectonic structures were identified in the site vicinity that could generate surface deformation or vibratory ground motion.	In SSAR Section 2.5.3.3, the applicant concluded no data suggest there are capable tectonic sources that could generate surface deformation or vibratory ground motion in the site vicinity. Based on review of SSAR Section 2.5.3.3, independent examination of references cited in the SSAR, and direct geologic field observations performed during a site audit, the staff confirmed the applicant's conclusion that no data suggested the presence of capable tectonic sources which could generate surface deformation or vibratory ground motion in the site vicinity.
Vibratory Ground Motion		
Ground Motion Response Spectra (Site Safe Shutdown Earthquake)	Appendix A, Figure A.3-2	Site specific response spectra.
Stability of Subsurface Materials and Foundations		
Liquefaction	Soils below the competent layer are not susceptible to liquefaction.	Liquefaction potential for the subsurface material at the site.
Minimum ultimate bearing capacity	420,000 psf	Load bearing capacity of the competent soil layer supporting the loads exerted by plant structures without soil failure.
Minimum shear wave velocity	1613 ft/sec	The minimum propagation velocity of shear waves through the foundation materials.

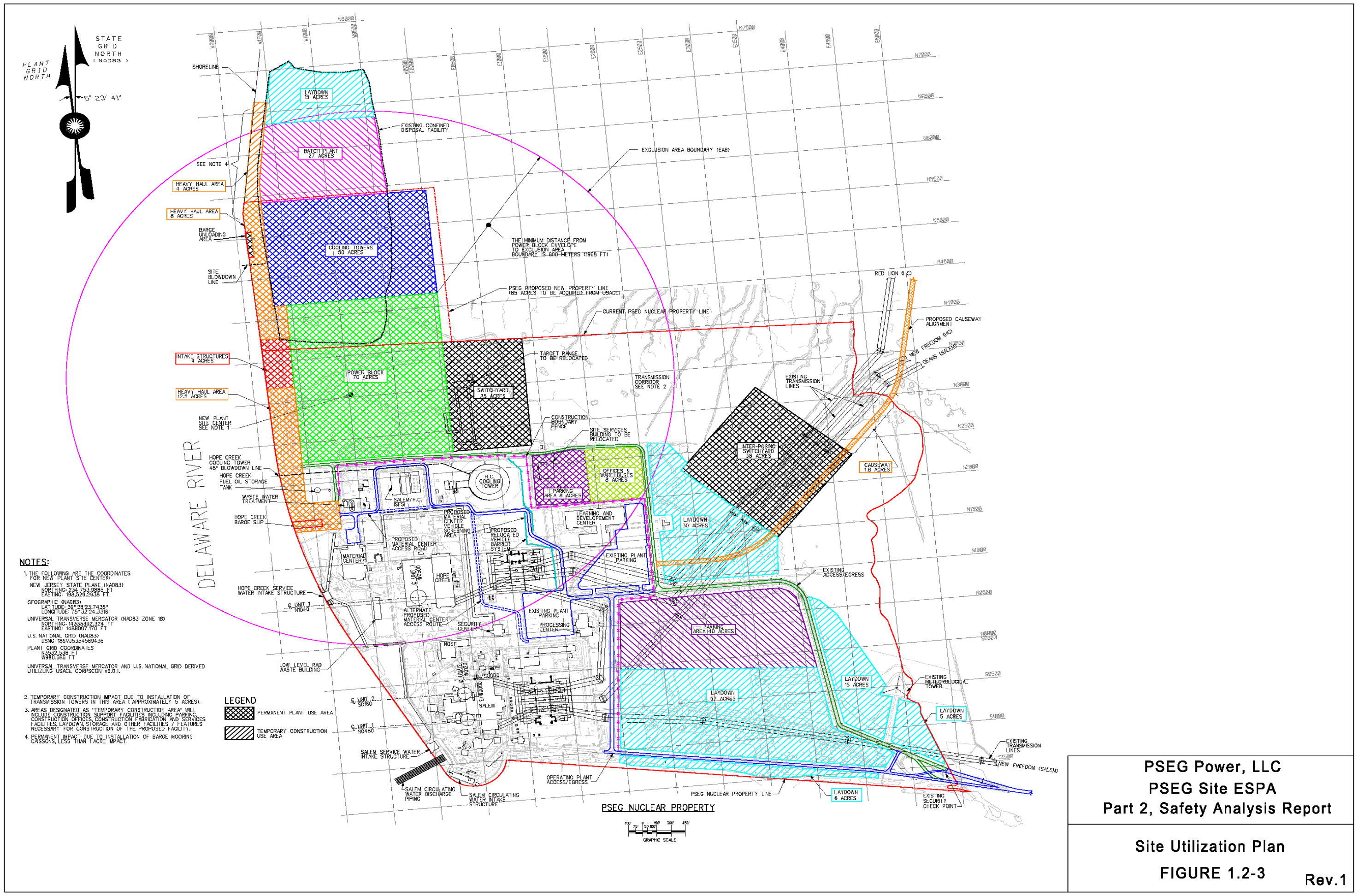

Figure A.3-1 – The proposed facility boundary for the PSEG Site (from SSAR Figure 1.2-3)

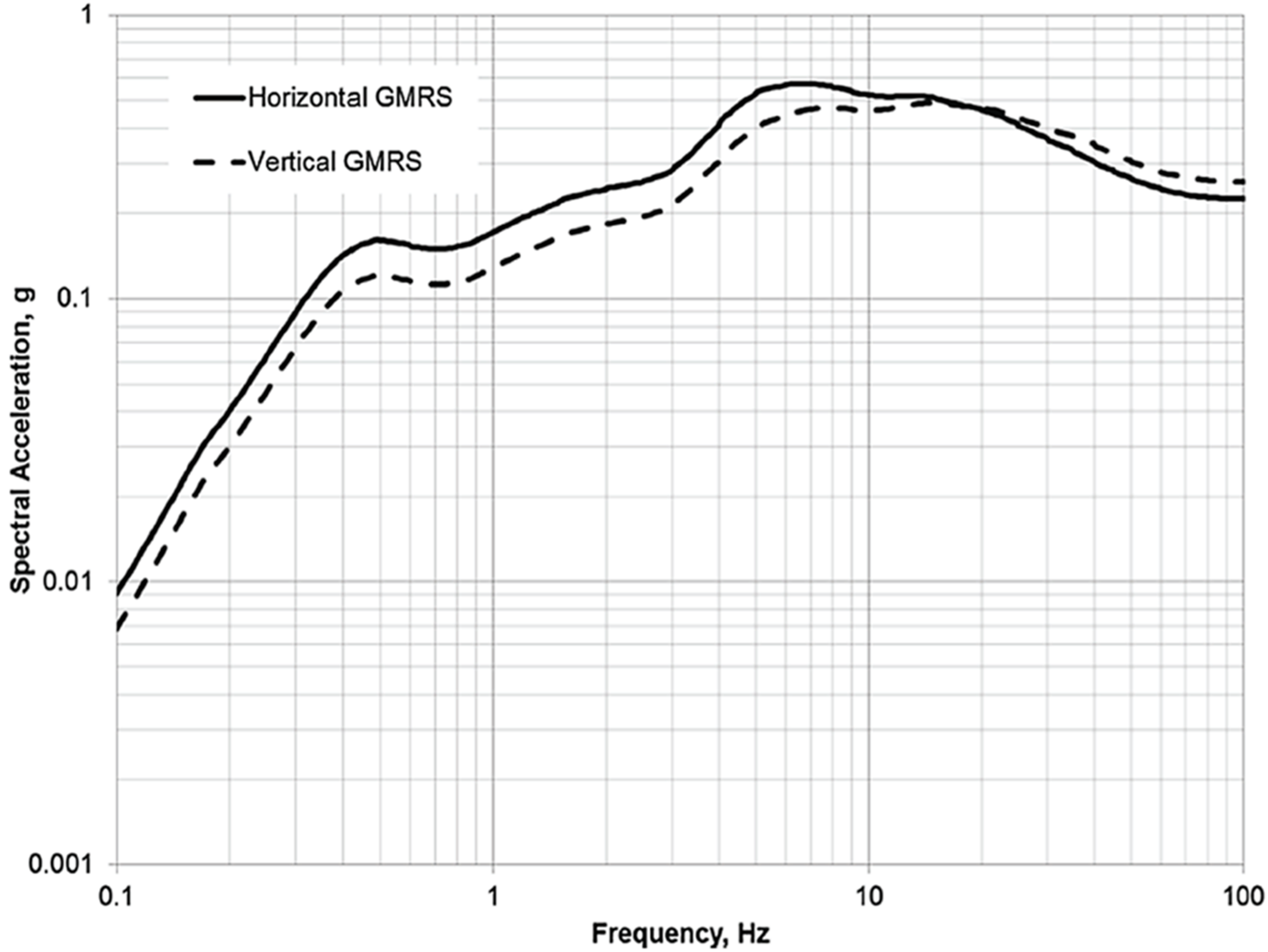

Figure A.3-2 – Plots of the horizontal and vertical GMRS
(Reproduced from SSAR Revision 3 Figure 2.5.2-54)

Appendix B: Bounding Design Parameters

Bounding Design Parameters	Value	Definition
2.4 – Hydrologic Engineering		
Site Grade	11.25 m (36.9 ft) NAVD88	Finished plant grade for the power block area on the PSEG Site.

Note: Since PSEG has not selected a reactor design, accident source terms (activity by isotope, contained in post-accident airborne effluents) specific to the reactor design that will be selected are not available at the ESP stage.

Appendix C: Combined License Action Items

Action Item No.	SER Section	Subject To Be Addressed	Reason For Deferral
2.2 – Nearby Industrial, Transportation, and Military Facilities			
2.2-1	2.2.3.4.2	An applicant for a combined license (COL) or construction permit (CP) referencing this early site permit (ESP) will, after selecting a reactor technology, evaluate the impact on the proposed plant at the PSEG Site of toxic chemicals processed, stored, used, or transported within the vicinity of the PSEG Site, to identify chemicals that lead to concentration above the Immediately Dangerous to Life and Health (IDLH) at the power block boundary, and provide a detailed control room habitability assessment.	The ESP applicant used a Plant Parameter Envelope (PPE) instead of a specific plant design, and as such no control room is identified on site. Since the design of the control room at the proposed ESP site is not available, it is expected to be evaluated at the COL stage.
2.2-2	2.2.3.4.2	An applicant for a COL or CP referencing this ESP will, after selecting a reactor technology, identify potentially toxic, flammable, or explosive hazardous materials to be stored onsite, and evaluate their possible impact on the proposed plant at the PSEG Site.	The ESP applicant used a PPE instead of a specific plant design, and as such no control room is identified on site. Since the quantities of the chemicals used are not available, and the design of the control room is not available, it is expected to be evaluated at the CP or COL stage.
2.3 – Meteorology			
2.3-1	2.3.5.4.2	An applicant for a COL or CP referencing this ESP should verify specific release point characteristics and specific locations of receptors of interest used to generate the long-term (routine release) atmospheric dispersion site characteristics. Any different exposure pathways and dose receptor locations, including those in sectors adjacent to the Delaware River, should be identified and discussed in order to demonstrate that long-term release	The ESP applicant screened out specific receptors of interest adjacent to the Delaware River, many of which contained the highest χ/Q values. A COL or CP applicant should ensure that any new potential exposure

Action Item No.	SER Section	Subject To Be Addressed	Reason For Deferral
		atmospheric dispersion estimates fall within the site characteristic values in the ESP and to provide assurance of compliance with NRC dose requirements.	pathways are identified and considered in these sectors at the COL stage.
2.4 – Hydrologic Engineering			
2.4-1	2.4.2.4	An applicant for a COL or CP referencing this ESP should design the site grading to provide flooding protection to safety-related structures at the ESP site based on a comprehensive flood water routing analysis for a local Probable Maximum Precipitation (PMP) event without relying on any active surface drainage systems that may be blocked during this event.	Detailed design of the site grading plan and storm water management system are beyond the scope of an ESP review. As such, final site drainage patterns are not yet known.
2.4-2	2.4.10.4	An applicant for a COL or CP referencing this ESP should address whether the intake structure of the selected design is a safety-related SSC. If so, the applicant should address necessary flooding protection for a safety-related intake structure at the ESP site based on the design basis flooding event and associated effects.	Detailed site flooding protection requirements are beyond the scope of an ESP review as the ESP applicant has not selected a reactor technology.
2.4-3	2.4.12.4	An applicant for a COL or CP referencing this ESP should refine hydrogeologic parameters and model estimates of dewatering rates and drawdowns beneath existing site structures after determination of the final excavation geometry consistent with a selected reactor technology.	Additional groundwater characterization information, not yet known at the ESP stage, will be provided at the COL stage.

Action Item No.	SER Section	Subject To Be Addressed	Reason For Deferral
2.5 – Geology, Seismology, and Geotechnical Engineering			
2.5-1	2.5.4.4.1	An applicant for a COL or CP referencing this ESP should perform additional investigations in order to provide additional information on the extent, thickness, and nature of the oxidized material in the Vincentown Formation beneath the area of Seismic Category I structures for the selected reactor technology. The applicant should also remove less dense soils with considerably lower SPTN-values in order to meet the soil condition requirements.	The ESP applicant used a PPE instead of a specific plant design, and as such, Seismic Category I structures for the proposed site are not identified and the location and extent of these structures is not known at the ESP stage. At the COL stage, additional subsurface investigations along with corresponding analyses and testing will be necessary for soils under these specific structures based on the selected reactor technology.
2.5-2	2.5.4.4.2	An applicant for a COL or CP referencing this ESP should conduct additional subsurface investigations to evaluate and fully characterize the engineering properties of the Vincentown and Hornerstown Formations and their potential lateral and vertical variation. The applicant should also perform additional strength tests to further evaluate the soil shear strength parameter for the Vincentown and Hornerstown Formations.	The ESP applicant used a PPE instead of a specific plant design, and as such, Seismic Category I structures for the proposed site are not identified and the location and extent of these structures is not known at the ESP stage. At the COL stage, additional subsurface investigations along with corresponding analyses and testing will be necessary for soils under these specific structures based on the selected reactor technology.
2.5-3	2.5.4.4.2	An applicant for a COL or CP referencing this ESP should perform additional borings to provide information for further evaluation of the shear strength properties of the Navesink formation.	The ESP applicant used a PPE instead of a specific plant design, and as such, Seismic Category I structures for the proposed site are not identified and the location and extent of these structures

Action Item No.	SER Section	Subject To Be Addressed	Reason For Deferral
			is not known at the ESP stage. At the COL stage, additional subsurface investigations along with corresponding analyses and testing will be necessary for soils under these specific structures based on the selected reactor technology.
2.5-4	2.5.4.4.2	An applicant for a COL or CP referencing this ESP should perform additional borings and unit weight determinations for the materials underlying the Mount Laurel Formation.	The ESP applicant used a PPE instead of a specific plant design, and as such, Seismic Category I structures for the proposed site are not identified and the location and extent of these structures is not known at the ESP stage. At the COL stage, additional subsurface investigations along with corresponding analyses and testing will be necessary for soils under these specific structures based on the selected reactor technology.
2.5-5	2.5.4.4.3	An applicant for a COL or CP referencing this ESP should perform additional subsurface investigations and correlate the plot plans and profiles of each Seismic Category I structure with the subsurface profile and material properties, and ensure placement of safety-related structures on competent foundation bearing material.	The ESP applicant used a PPE instead of a specific plant design, and as such, Seismic Category I structures for the proposed site are not identified and the location and extent of these structures is not known at the ESP stage. At the COL stage, additional subsurface investigations along with corresponding analyses and testing will be necessary for soils under these specific structures based on the selected reactor technology.

Action Item No.	SER Section	Subject To Be Addressed	Reason For Deferral
2.5-6	2.5.4.4.5	An applicant for a COL or CP referencing this ESP should provide specific details regarding the lateral and vertical extent of the excavation consistent with the selected reactor technology.	The ESP applicant used a PPE instead of a specific plant design, and as such, Seismic Category I structures for the proposed site are not identified and the location and extent of these structures is not known at the ESP stage. At the COL stage, additional subsurface investigations along with corresponding analyses and testing will be necessary for soils under these specific structures based on the selected reactor technology.

Action Item No.	SER Section	Subject To Be Addressed	Reason For Deferral
2.5-7	2.5.4.4.5	An applicant for a COL or CP referencing this ESP should evaluate the method of excavation support and the stability of temporary excavation slopes or support.	The ESP applicant used a PPE instead of a specific plant design, and as such, Seismic Category I structures for the proposed site are not identified and the location and extent of these structures is not known at the ESP stage. At the COL stage, additional subsurface investigations along with corresponding analyses and testing will be necessary for soils under these specific structures based on the selected reactor technology.
2.5-8	2.5.4.4.5	An applicant for a COL or CP referencing this ESP should include in the COL application, an ITAAC for the soil backfill, with specifications to ensure a V_s of 304.8 m/s (1,000 ft/s) or higher below Seismic Category I structures.	The ESP applicant used a PPE instead of a specific plant design, and as such, Seismic Category I structures for the proposed site are not identified and the location and extent of these structures is not known at the ESP stage. At the COL stage, additional subsurface investigations along with corresponding analyses and testing will be necessary for soils under these specific structures based on the selected reactor technology.

Action Item No.	SER Section	Subject To Be Addressed	Reason For Deferral
2.5-9	2.5.4.4.5	An applicant for a COL or CP referencing this ESP should provide, consistent with the selected reactor technology, (i) details for the backfill quantities, types and sources; (ii) lateral loading conditions; (iii) information on the type and characteristics of backfill materials; and (iv) lateral pressure evaluation from backfill materials.	The ESP applicant used a PPE instead of a specific plant design, and as such, Seismic Category I structures for the proposed site are not identified and the location and extent of these structures is not known at the ESP stage. At the COL stage, additional subsurface investigations along with corresponding analyses and testing will be necessary for soils under these specific structures based on the selected reactor technology.
2.5-10	2.5.4.4.5	An applicant for a COL or CP referencing this ESP should include the geotechnical instrumentation plan and heave monitoring schedule in the COL application.	The ESP applicant used a PPE instead of a specific plant design, and as such, Seismic Category I structures for the proposed site are not identified and the location and extent of these structures is not known at the ESP stage. At the COL stage, additional subsurface investigations along with corresponding analyses and testing will be necessary for soils under these specific structures based on the selected reactor technology.

Action Item No.	SER Section	Subject To Be Addressed	Reason For Deferral
2.5-11	2.5.4.4.6	An applicant for a COL or CP referencing this ESP should evaluate and implement, during the COL application stage, design measures appropriate for the chemical characteristics of the Category 1 fill, site soils and site groundwater.	The ESP applicant used a PPE instead of a specific plant design, and as such, Seismic Category I structures for the proposed site are not identified and the location and extent of these structures is not known at the ESP stage. At the COL stage, additional subsurface investigations along with corresponding analyses and testing will be necessary for soils under these specific structures based on the selected reactor technology.
2.5-12	2.5.4.4.6	An applicant for a COL or CP referencing this ESP should perform, consistent with the selected reactor technology, evaluation of groundwater conditions as they affect the loading and stability of foundation materials, and also provide detailed dewatering and groundwater control plans.	The ESP applicant used a PPE instead of a specific plant design, and as such, Seismic Category I structures for the proposed site are not identified and the location and extent of these structures is not known at the ESP stage. At the COL stage, additional subsurface investigations along with corresponding analyses and testing will be necessary for soils under these specific structures based on the selected reactor technology.

Action Item No.	SER Section	Subject To Be Addressed	Reason For Deferral
2.5-13	2.5.4.4.7	An applicant for a COL or CP referencing this ESP should develop the foundation input response spectra (FIRS) and the Soil Structure Interaction (SSI) analysis at the COL application stage.	The ESP applicant used a PPE instead of a specific plant design, and as such, Seismic Category I structures for the proposed site are not identified and the location and extent of these structures is not known at the ESP stage. At the COL stage, additional subsurface investigations along with corresponding analyses and testing will be necessary for soils under these specific structures based on the selected reactor technology.
2.5-14	2.5.4.4.8	An applicant for a COL or CP referencing this ESP should perform additional geotechnical investigation, consistent with RG 1.132, including the performance of additional borings and a detailed liquefaction assessment to determine if zones of lower blow counts, which might indicate a potentially weak liquefiable zone, are present underneath the competent layer. If the additional borings and analyses identify areas where potential for liquefaction may be present, the applicant should remove unsuitable materials and either replace it with competent material or improve it to eliminate liquefaction potential.	The ESP applicant used a PPE instead of a specific plant design, and as such, Seismic Category I structures for the proposed site are not identified and the location and extent of these structures is not known at the ESP stage. At the COL stage, additional subsurface investigations along with corresponding analyses and testing will be necessary for soils under these specific structures based on the selected reactor technology.

Action Item No.	SER Section	Subject To Be Addressed	Reason For Deferral
2.5-15	2.5.4.4.8	An applicant for a COL or CP referencing this ESP should evaluate non-seismic liquefaction.	The ESP applicant used a PPE instead of a specific plant design, and as such, Seismic Category I structures for the proposed site are not identified and the location and extent of these structures is not known at the ESP stage. At the COL stage, additional subsurface investigations along with corresponding analyses and testing will be necessary for soils under these specific structures based on the selected reactor technology.
2.5-16	2.5.4.4.10	An applicant for a COL or CP referencing this ESP should analyze the stability of all planned safety-related facilities, including static and dynamic bearing capacity, rebound, settlement, and differential settlements under dead loads of fills and plant facilities, as well as lateral loading conditions.	The ESP applicant used a PPE instead of a specific plant design, and as such, Seismic Category I structures for the proposed site are not identified and the location and extent of these structures is not known at the ESP stage. At the COL stage, additional subsurface investigations along with corresponding analyses and testing will be necessary for soils under these specific structures based on the selected reactor technology.

Action Item No.	SER Section	Subject To Be Addressed	Reason For Deferral
2.5-17	2.5.4.4.10	An applicant for a COL or CP referencing this ESP should conduct laboratory testing on intact samples and conduct consolidation testing for materials having a high percentage of fine-grained particles.	The ESP applicant used a PPE instead of a specific plant design, and as such, Seismic Category I structures for the proposed site are not identified and the location and extent of these structures is not known at the ESP stage. At the COL stage, additional subsurface investigations along with corresponding analyses and testing will be necessary for soils under these specific structures based on the selected reactor technology.
2.5-18	2.5.4.4.11	An applicant for a COL or CP referencing this ESP should describe the design criteria and methods, including the factors of safety (FSs) from the design foundation stability analyses consistent with the selected reactor technology.	The ESP applicant used a PPE instead of a specific plant design, and as such, Seismic Category I structures for the proposed site are not identified and the location and extent of these structures is not known at the ESP stage. At the COL stage, additional subsurface investigations along with corresponding analyses and testing will be necessary for soils under these specific structures based on the selected reactor technology.

Action Item No.	SER Section	Subject To Be Addressed	Reason For Deferral
2.5-19	2.5.4.4.12	An applicant for a COL or CP referencing this ESP should improve subsurface conditions in cases where foundation soils do not provide adequate bearing capacity for safety-related structures.	The ESP applicant used a PPE instead of a specific plant design, and as such, Seismic Category I structures for the proposed site are not identified and the location and extent of these structures is not known at the ESP stage. At the COL stage, additional subsurface investigations along with corresponding analyses and testing will be necessary for soils under these specific structures based on the selected reactor technology.
2.5-20	2.5.5.4	An applicant for a COL or CP referencing this ESP should perform a slope stability analysis consistent with the selected reactor technology. Slope stability analysis will include the evaluation of deep slope failure surfaces that may extend into the Delaware River and various water level considerations.	The ESP applicant used a PPE instead of a specific plant design, and as such, Seismic Category I structures for the proposed site are not identified and the location and extent of these structures is not known at the ESP stage. At the COL stage, additional subsurface investigations along with corresponding analyses and testing will be necessary for soils under these specific structures based on the selected reactor technology.

Action Item No.	SER Section	Subject To Be Addressed	Reason For Deferral
3.5.1.6 – Aircraft Hazards			
3.5.1.6-1	3.5.1.6.4	An applicant for a COL or CP referencing this ESP (ESP), should evaluate and demonstrate compliance with the design-basis aircraft accident probability acceptance criterion of 1 x 10^{-7} per year or less, in accordance with the probabilistic risk assessment (PRA) guidance provided in NUREG-0800, Chapter 19 ("Probabilistic Risk Assessment and Severe Accident Evaluation for New Reactors"), and should provide the determined core damage frequency (CDF) based on the design selected.	Conditional core damage probability (CCDP) is determined based on design-specific Probabilistic Risk Assessment (PRA), as part of the "Severe Accidents" section, the technical review of which is conducted in conjunction with a COL application review.
11.4 – Liquid and Gaseous Waste Management Systems			
11-1	11.4	An applicant for a COL or CP referencing this ESP should verify that the calculated radiological doses to members of the public from radioactive gaseous and liquid effluents for one or more new units which may be built at the PSEG Site are bounded by the radiological doses included in the ESP application, and must address and justify any discrepancies. This includes any changes made to address differences in reactor design used to calculate radiological doses (e.g., basis of the liquid and gaseous radiological source terms, and liquid effluent discharge flow rates and site-specific dilution flow rates). The COL or CP applicant should also provide detailed information, reflecting plant and site-specific COL design considerations, on the solid waste management system used to process radioactive gaseous and liquid effluents.	The ESP applicant used a PPE instead of a specific plant design. Details on control, monitoring, and maintenance of radioactive gaseous and liquid effluents are not known at the ESP stage.
13.3 – Emergency Planning			
13.3-1	13.3.4.2	An applicant for a COL or CP referencing this ESP should submit to the NRC updated letters of agreement or memoranda of	The ESP applicant used a PPE instead of a specific plant design.

Action Item No.	SER Section	Subject To Be Addressed	Reason For Deferral
		understanding with offsite support organizations to reflect the chosen plant design.	
13.3-2	13.3.4.3.6	An applicant for a COL or CP referencing this ESP should revise the emergency plan to describe the components, availability, and power supplies for the Federal Telecommunications System (FTS), including all required communications and data links associated with the chosen reactor technology.	The ESP applicant used a PPE instead of a specific plant design. Details associated with FTS are not known at the ESP stage.
13.3-3	13.3.4.3.8	An applicant for a COL or CP referencing this ESP and the US-APWR standard design should revise the emergency plan to describe the location and capabilities of the Operations Support Center (OSC).	The ESP applicant used a PPE instead of a specific plant design. Description of OSC cannot reflect US-APWR specific design at the ESP stage. A COL applicant will select a specific plant design in conjunction with the COL application.
13.3-4	13.3.4.3.9	An applicant for a COL or CP referencing this ESP should revise the emergency plan to describe the radiation monitoring and other systems and equipment, including potential major release points from the plant and river water level monitoring requirements, associated with the chosen reactor technology that support accident assessment activities. The emergency plan should also identify the specific monitoring capability for the radiological parameters identified in NRC Regulatory Guide 1.97, Revision 2, and dose assessment and projection modeling system.	The ESP applicant used a PPE instead of a specific plant design. Details on radiation monitoring and related systems are not known at the ESP stage.
13.3-5	13.3.4.3.10	An applicant for a COL or CP referencing this ESP should revise the emergency plan to describe the availability of a proposed causeway for use as an alternate route for evacuating the site. If appropriate, the applicant should update the evacuation time estimate (ETE) analysis for the PSEG Site to reflect the causeway, and provide confirmation that the ETE update was	The ESP applicant is not required to and is not planning to build the proposed causeway at the ESP stage.

Action Item No.	SER Section	Subject To Be Addressed	Reason For Deferral
		provided to State and local governmental authorities for use in developing offsite protective action strategies.	
13.3-6	13.3.4.3.11	An applicant for a COL or CP referencing this ESP and the US-APWR design control document (DCD) should revise the emergency plan to identify the location of the onsite personnel decontamination facility.	The ESP applicant used a PPE instead of a specific plant design. A COL applicant will select a specific plant design in conjunction with the COL application.
13.3-7	13.3.4.3.13	An applicant for a COL or CP referencing this ESP should revise the emergency plan to describe the method for determining atmospheric transport and diffusion throughout the 10-mile plume exposure emergency planning zone during emergency conditions, including the ability to periodically estimate total population exposure.	The ESP applicant used a PPE instead of a specific plant design. A method for determining atmospheric transport and diffusion will be adopted following the selection of a reactor technology by the COL applicant.
13.3-8	13.3.4.3.17	An applicant for a COL or CP referencing this ESP should explain how any updated evacuation time estimate (ETE) information for the PSEG Site interfaces with any ETE updates that may have been provided for the nearby Salem and Hope Creek units.	The ESP applicant used the year 2000 U.S. Census Bureau data - the most current available at the ESP application submission - to develop the ETE, which is required to be updated at the COL application stage.

Appendix D: Site Characteristics and Plant Parameter Envelope Values Considered in the Environmental Review of the Application

The specific early site permit (ESP) site characteristics and plant parameter envelope (PPE) values are from the following parts of the applicant's Early Site Permit Application (revision 4): Part 3, Environmental Report, Chapter 3, and Part 2, Site Safety Analysis Report, Tables 1.3-1 and 2.0-1, unless otherwise specified. These characteristics and parameters were used by the Nuclear Regulatory Commission (NRC) staff in its independent evaluation of the environmental impacts of the proposed new units, and are tabulated in Tables I-1 and I-2 of the FEIS as well as below. In some cases, as noted, the staff substituted values based on its own analysis.

Table D-1. PSEG Site Characteristics

Site Characteristic		PSEG Power, LLC, and PSEG Nuclear, LLC (PSEG) Site Value	Site Safety Analysis Report (SSAR) Section	Definition
Geography and Demography				
Exclusion Area Boundary (EAB)		The EAB is a circle at least 600 m (1,968 ft) from the edge of the power block area in all directions	2.1.1.2	The area surrounding the reactor(s), in which the reactor licensee has the authority to determine all activities, including exclusion or removal of personnel and property from the area
Low Population Zone		The area falling within a 5-mi radius circle from the PSEG Site's new plant site center	2.1.3.4	The area immediately surrounding the exclusion area that contains residents
Population Center Distance		14.8 mi (Wilmington, DE)	2.1.3.5	The distance from the reactor to the nearest boundary of a densely populated center containing more than about 25,000 residents
Meteorology				
Ambient Air Temperature and Humidity				
Maximum Dry-Bulb Temperature (DBT)	2% annual exceedance	88°F (DBT) 73°F (MCWB)	Table 2.3-14	The ambient DBT (and mean coincident wet-bulb temperature [MCWB]) that will be exceeded 2% of the time annually
	1% annual exceedance	90°F (DBT) 75°F (MCWB)	Table 2.3-14	The ambient DBT (and MCWB) that will be exceeded 1% of the time annually
	0.4% annual exceedance	93°F (DBT) 76°F (MCWB)	Table 2.3-14	The ambient DBT (and MCWB) that will be exceeded 0.4% of the time annually
	0% annual exceedance (record)	108°F (DBT) 79°F (MCWB)	2.3.1.7	The highest recorded ambient DBT and MCWB

Table D-1. (continued)

Site Characteristic		PSEG Power, LLC, and PSEG Nuclear, LLC (PSEG) Site Value	Site Safety Analysis Report (SSAR) Section	Definition
	100-year return period	105.9°F (DBT) 82.4°F (MCWB)	2.3.1.7; Table 2.3-13	The ambient DBT (and MCWB) that has a 1% annual probability of being exceeded (100-year mean recurrence interval)
Minimum DBT	99% annual exceedance	14°F	Table 2.3-14	The ambient DBT below which DBTs will fall 1% of the time annually
	99.6% annual exceedance	10°F	Table 2.3-14	The ambient DBT below which DBTs will fall 0.4% of the time annually
	100% annual exceedance (record)	-15°F	2.3.1.7	Lowest recorded DBT
	100-year return period	-18.7°F	Table 2.3-13	The ambient DBT for which a 1% annual probability of a lower DBT exists (100-year mean recurrence interval)
Maximum Wet-Bulb Temperature (WBT)	1.0% annual exceedance	77°F	Table 2.3-14	The ambient WBT that will be exceeded 1.0% of the time annually
	0.4% annual exceedance	79°F	Table 2.3-14	The ambient WBT that will be exceeded 0.4% of the time annually
	0% annual exceedance (record)	86.2°F	Table 2.3-13	Highest recorded WBT
	100-year return period	87.4°F	Table 2.3-13	The ambient WBT that has a 1% annual probability of being exceeded (100-year mean recurrence interval)
Ultimate Heat Sink (UHS) Ambient Air Temperature and Humidity				
Meteorological conditions resulting in the minimum water cooling during any 1 day		82.69°F (WBT) 87.12°F (DBT)	2.3.1.6	Historic worst 1-day daily average WBT and coincident DBT
Meteorological conditions resulting in the minimum water cooling during any consecutive 5 days		78.02°F (WBT) 83.47°F (DBT)	2.3.1.6	Historic worst 5-day daily average WBT and coincident DBT
Meteorological conditions		75.87°F (WBT)	2.3.1.6	Historic worst 30-day daily average WBT and

Table D-1. (continued)

Site Characteristic	PSEG Power, LLC, and PSEG Nuclear, LLC (PSEG) Site Value	Site Safety Analysis Report (SSAR) Section	Definition
resulting in the maximum evaporation and drip loss during any consecutive 30 days	82.65°F (DBT)		coincident DBT
Basic Wind Speed			
3-Second Gust	117.7 mph	2.3.1.5.1	The nominal 3-s gust wind speeds in miles per hour at 33 ft above ground associated with a 100-year return period
Importance Factors	1.15	2.3.1.5.1	Multiplication factor applied to basic wind speed used to assess wind impacts to structures
Hurricane			
Hurricane Wind Speed	159 mph	2.3.1.5.3	Maximum nominal 3-s gust wind speed at 33 ft above ground over open terrain having a probability of exceedance of 10^{-7} per year
Tornado			
Maximum Wind Speed	200 mph	Table 2.3-5	Maximum wind speed resulting from the passage of a tornado having a probability of occurrence of 10^{-7} per year
Maximum Translational Speed	40 mph	Table 2.3-5	Translation component of the maximum tornado wind speed
Maximum Rotational Speed	160 mph	Table 2.3-5	Rotation component of the maximum tornado wind speed
Radius of Maximum Rotational Speed	150 ft	Table 2.3-5	Distance from the center of the tornado at which the maximum rotational wind speed occurs
Maximum Pressure Drop	0.9 psi	Table 2.3-5	Decrease in ambient pressure from normal atmospheric pressure resulting from passage of the tornado
Rate of Pressure Drop	0.4 psi/s	Table 2.3-5	Rate of pressure drop resulting from the passage of the tornado
Winter Precipitation			
100-year Snowpack	24 lb/ft^2	2.3.1.5.4	The weight of the 100-year return period snowpack (to be used in determining normal precipitation

Table D-1. (continued)

Site Characteristic	PSEG Power, LLC, and PSEG Nuclear, LLC (PSEG) Site Value	Site Safety Analysis Report (SSAR) Section	Definition
			loads for roofs)
48-hr Probable Maximum Winter Precipitation	21 in. of water	2.3.1.5.4	Probable maximum precipitation during the winter months (to be used in conjunction with the 100-year snowpack in determining extreme winter precipitation loads for roofs)
Normal Winter Precipitation Event	24 lb/ft^2	2.3.1.5.4	The highest ground-level weight (in lb/ft^2) among: (1) the 100-year return period snowpack; (2) the historical maximum snowpack; (3) the 100-year return period two-day snowfall event; or (4) the historical maximum two-day snowfall event in the site region (to be used in determining the precipitation loads for roofs)
Extreme Frozen Winter Precipitation Event	20.51 lb/ft^2	2.3.1.5.4	The highest of: (1) the 100-year return period two-day snowfall event; and (2) the historical maximum snowfall event in the site region (to be used in determining the precipitation loads for roofs)
Short-Term (Accident Release) Atmospheric Dispersion			
0–2 hr χ/Q (atmospheric dispersion factor) (EAB)	4.71×10^{-4} s/m^3	Table 2.3-30	The 0–2 hour atmospheric dispersion factor to be used to estimate dose consequences of accidental airborne releases at the EAB
0–8 hr χ/Q (low population zone [LPZ])	8.47×10^{-6} s/m^3	Table 2.3-30	The 0–8 hour atmospheric dispersion factor to be used to estimate dose consequences of accidental airborne releases at the LPZ
8–24 hr χ/Q (LPZ)	5.50×10^{-6} s/m^3	Table 2.3-30	The 8–24 hour atmospheric dispersion factor to be used to estimate dose consequences of accidental airborne releases at the LPZ
1–4 day χ/Q (LPZ)	2.15×10^{-6} s/m^3	Table 2.3-30	The 1–4 day atmospheric dispersion factor to be used to estimate dose consequences of accidental airborne releases at the LPZ

Table D-1. (continued)

Site Characteristic	PSEG Power, LLC, and PSEG Nuclear, LLC (PSEG) Site Value	Site Safety Analysis Report (SSAR) Section	Definition
4-30 day χ/Q (LPZ)	5.60×10^{-7} s/m^3	Table 2.3-30	The 4–30 day atmospheric dispersion factor to be used to estimate dose consequences of accidental airborne releases at the LPZ
Long-Term (Normal Release) Atmospheric Dispersion			
Annual Average Undepleted/No Decay χ/Q Value at Site Boundary, east-northeast, 0.24 mi	1.00×10^{-5} s/m^3	Table 2.3-34	The maximum annual average site boundary undepleted/no decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual
Annual Average Undepleted/ 2.26-Day Decay χ/Q Value at Site Boundary, east-northeast, 0.24 mi	1.00×10^{-5} s/m^3	Table 2.3-34	The maximum annual average site boundary undepleted/2.26-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual
Annual Average Depleted/ 8.00-Day Decay χ/Q Value at Site Boundary, east-northeast, 0.24 mi	9.50×10^{-6} s/m^3	Table 2.3-34	The maximum annual average site boundary depleted/8.00-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual
Annual Average Relative Deposition Factor (D/Q) Value at Site Boundary, east-northeast, 0.24 mi	4.10×10^{-8} 1/m^2	Table 2.3-34	The maximum annual average site boundary relative D/Q value for use in determining gaseous pathway doses to the maximally exposed individual
Annual Average Undepleted/No Decay χ/Q Value at Nearest Resident, northwest, 2.8 mi	2.40×10^{-7} s/m^3	Table 2.3-34	The maximum annual average resident undepleted/no decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual
Annual Average Undepleted/ 2.26-day Decay χ/Q Value at Nearest Resident, northwest, 2.8 mi	2.40×10^{-7} s/m^3	Table 2.3-34	The maximum annual average resident undepleted/2.26-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual

Table D-1. (continued)

Site Characteristic	PSEG Power, LLC, and PSEG Nuclear, LLC (PSEG) Site Value	Site Safety Analysis Report (SSAR) Section	Definition
Annual Average Depleted/8.00-day Decay χ/Q Value at Nearest Resident, northwest, 2.8 mi	1.90×10^{-7} s/m^3	Table 2.3-34	The maximum annual average resident depleted/8.00-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual
Annual Average D/Q Value at Nearest Resident, northwest, 2.8 mi	9.60×10^{-10} 1/m^2	Table 2.3-34	The maximum annual average resident D/Q value for use in determining gaseous pathway doses to the maximally exposed individual
Annual Average Undepleted/No Decay χ/Q Value at Nearest Farm, northwest, 4.9 mi	1.10×10^{-7} s/m^3	Table 2.3-34	The maximum annual average farm undepleted/no decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual
Annual Average Undepleted/2.26-day Decay χ/Q Value at Nearest Farm, northwest, 4.9 mi	1.10×10^{-7} s/m^3	Table 2.3-34	The maximum annual average farm undepleted/2.26-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual
Annual Average Depleted/8.00-day Decay χ/Q Value at Nearest Farm, northwest, 4.9 mi	8.20×10^{-8} s/m^3	Table 2.3-34	The maximum annual average farm depleted/8.00-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual
Annual Average D/Q Value at Nearest Farm, northwest, 4.9 mi	3.50×10^{-10} 1/m^2	Table 2.3-34	The maximum annual average farm D/Q value for use in determining gaseous pathway doses to the maximally exposed individual
Hydrology			
Proposed Facility Boundaries	SSAR Figure 1.2-3 presents the proposed facility boundary	1.2	PSEG Site boundary map
Maximum Groundwater	10 ft North American Vertical Datum of 1988 (NAVD88)	2.4.12.5	The maximum elevation of groundwater at the PSEG Site
Maximum Stillwater Flood Elevation (including 10 percent exceedance high tide)	24.7 ft NAVD88	Table 2.4.5-4	The stillwater elevation, without accounting for wind-induced waves, that the water surface reaches during a flood event
Wave Run-Up	7.4 ft	Table 2.4.5-4	The height of water reached by wind-induced waves running up on the site
Combined Effects Maximum	32.1 ft NAVD88	Table 2.4.5-4	The water surface elevation at the point in time

Table D-1. (continued)

Site Characteristic	PSEG Power, LLC, and PSEG Nuclear, LLC (PSEG) Site Value	Site Safety Analysis Report (SSAR) Section	Definition
Flood Elevation			where the combination of the still water level and wave run-up is at its maximum
Local Intense Precipitation	18.4 in./hr	Table 2.4.2-5	The depth of probable maximum precipitation for duration of 1 hr on a 1-mi^2 drainage area. The surface-water drainage system should be designed for a flood produced by the local intense precipitation
Frazil, Surface, or Anchor Ice	The PSEG Site has the potential for frazil and surface ice	2.4.7.1	Potential for accumulated ice formation in a turbulent flow condition
Minimum River Water Surface Elevation	-15.9 ft NAVD88 for less than 6 hr	2.4.11.7	The river surface-water elevation and duration for which the low water level conditions exist at the PSEG Site
Maximum Ice Thickness	17.8 in.	2.4.11.3.3	Maximum potential ice thickness on the Delaware River at the PSEG Site
Hydraulic Conductivity	Table 2.4.12-9	2.4.12	Groundwater flow rate per unit hydraulic gradient
Hydraulic Gradient	Tables 2.4.12-7 and 2.4.12-8	2.4.12	Slope of groundwater surface under unconfined conditions or slope of hydraulic pressure head under confined conditions
Geology, Seismology, and Geotechnical Engineering			
Basic Geological and Seismic Information			
Capable Tectonic Structures	No capable tectonic structures within the site region	2.5.1	The presence of a fault or structure capable of producing both tectonic surface deformation and earthquakes
Vibratory Ground Motion			
Ground Motion Response Spectra (Site Safe Shutdown Earthquake)	SSAR Figure 2.5.2-54	2.5.2	Site specific response spectra
Stability of Subsurface Materials and Foundations			
Liquefaction	Soils below the competent layer are not susceptible to liquefaction	2.5.4.8	Liquefaction potential for the subsurface soils at a site
Minimum Ultimate Bearing	420,000 lb/ft^2	2.5.4.10	Load bearing capacity of the competent soil layer

Table D-1. (continued)

Site Characteristic	PSEG Power, LLC, and PSEG Nuclear, LLC (PSEG) Site Value	Site Safety Analysis Report (SSAR) Section	Definition
Capacity			supporting the loads exerted by plant structures without soil failure
Minimum Shear Wave Velocity	1,613 ft/sec	Table 2.5.4.7-3	The minimum propagation velocity of shear waves through the foundation materials

Table D-2. Plant Parameter Envelope (PPE) Values

Item	Design Parameter	Site Safety Analysis Report (SSAR) Section	Description and References
Structure Height	234 ft	Table 1.3-1	The height from finished grade to the top of the tallest power block structures, excluding cooling towers
Structure Foundation Embedment	39 to 84.3 ft	Table 1.3-1	The depth from finished grade to the bottom of the basemat for the most deeply embedded power block structure
Normal Plant Heat Sink			
• **Condenser**			
Max Inlet Temp Condenser	91°F	Table 1.3-1	Design assumption for the maximum acceptable circulating water temperature at the inlet to the condenser
Condenser Heat Rejection	1.508×10^{10} Btu/hr	Table 1.3-1	Design value for the waste heat rejected to the circulating water system (CWS) across the condensers
Maximum Cooling Water Flow Rate Across Condenser	1,200,000 gpm	Table 1.3-1	Design value for the maximum flow rate of the CWS through the condenser tubes
Maximum Cooling Water Temperature Rise Across Condenser	25.2°F	Table 1.3-1	Design value for the maximum temperature differential across the condenser
• **Mechanical Draft Cooling Towers (MDCT)—CWS**			
Acreage	50 ac	Table 1.3-1	The land required for cooling towers, including support facilities
Approach Temperature	14.4°F	Table 1.3-1	The difference between the cold water temperature and the ambient wet-bulb temperature (WBT)
Blowdown Constituents and Concentrations	Various (see SSAR Table 1.3-2)	Table 1.3-2	The maximum expected concentrations for anticipated constituents in the CWS blowdown to the receiving water body

Table D-2. (continued)

Item	Design Parameter	Site Safety Analysis Report (SSAR) Section	Description and References
Blowdown Flow Rate (Normal)	50,516 gpm	Table 1.3-1	The normal flow rate of the blowdown stream from the CWS to the receiving water body for closed system designs during normal operations
Blowdown Temperature (Normal)	91°F	Table 1.3-1	The maximum expected blowdown temperature at the point of discharge to the receiving water body during normal operations
Cycles of Concentration	1.5	Table 1.3-1	The ratio of total dissolved solids in the CWS blowdown to the total dissolved solids in the makeup water
Evaporation Rate (Normal)	25,264 gpm	Table 1.3-1	The expected 1% exceedance design rate at which water is lost by evaporation from the CWS during normal operations
Makeup Flow Rate (Normal)	75,792 gpm	Table 1.3-1	The expected rate of removal of water from a natural source to replace water losses from a closed CWS during normal operations
Noise	58 dBA at 1,000 ft	Table 1.3-1	The maximum expected sound level produced by operation of cooling towers, measured in feet from the noise source
Cooling Tower Temperature Range (Normal)	25.2°F	Table 1.3-1	The temperature difference between the cooling water entering and leaving the towers during normal operations
Cooling Water Flow Rate (Normal)	1,200,000 gpm	Table 1.3-1	The total cooling water flow rate through the condenser/heat exchangers during normal operations
Heat Rejection Rate (Normal)	1.508×10^{10} Btu/hr	Table 1.3-1	The expected heat rejection rate to a receiving water body during normal operations

Table D-2. (continued)

Item	Design Parameter	Site Safety Analysis Report (SSAR) Section	Description and References
Drift	12 gpm	Table 1.3-1	Rate of water lost from the tower as liquid droplets entrained in the vapor exhaust air stream
Exhaust Stack Exit Velocity	1,730 fpm	Table 1.3-1	The exit velocity of water vapor through the cooling tower exhaust stack
Exhaust Stack Exit Diameter	68 cells at 31.6 ft each	Table 1.3-1	The diameter of the cooling tower exhaust stack
Exhaust Stack Height	46 ft	Table 1.3-1	The vertical height above finished grade of cooling towers associated with the CWS
Natural Draft Cooling Towers (NDCTs)—CWS			
Acreage	50 ac	Table 1.3-1	The land required for cooling towers, including support facilities
Approach Temperature	14.4°F	Table 1.3-1	The difference between the cold water temperature and the ambient WBT
Blowdown Constituents and Concentrations	Various (see SSAR Table 1.3-2)	Table 1.3-2	The maximum expected concentrations for anticipated constituents in the CWS blowdown to the receiving water body
Blowdown Flow Rate (Normal)	50,516 gpm	Table 1.3-1	The normal flow rate of the blowdown stream from the CWS to the receiving water body for closed system designs during normal operations
Blowdown Temperature (Normal)	91°F	Table 1.3-1	The maximum expected blowdown temperature at the point of discharge to the receiving water body during normal operations
Cycles of Concentration	1.5	Table 1.3-1	The ratio of total dissolved solids in the CWS blowdown to the total dissolved solids in the makeup water
Evaporation Rate (Normal)	25,264 gpm	Table 1.3-1	The expected 1% exceedance design rate at which water is lost by evaporation from the CWS during normal operations

Table D-2. (continued)

Item	Design Parameter	Site Safety Analysis Report (SSAR) Section	Description and References
Makeup Flow Rate (Normal)	75,792 gpm	Table 1.3-1	The expected rate of removal of water from a natural source to replace water losses from a closed CWS during normal operations
Noise	50 dBA at 1,000 ft	Table 1.3-1	The maximum expected sound level produced by operation of cooling towers, measured in feet from the noise source
Cooling Tower Temperature Range (Normal)	25.2°F	Table 1.3-1	The temperature difference between the cooling water entering and leaving the towers during normal operations
Cooling Water Flow Rate (Normal)	1,200,000 gpm	Table 1.3-1	The total cooling water flow rate through the condenser/heat exchangers during normal operations
Heat Rejection Rate (Normal)	1.508×10^{10} Btu/hr	Table 1.3-1	The expected heat rejection rate to a receiving water body during normal operations
Drift	12 gpm	Table 1.3-1	Rate of water lost from the tower as liquid droplets entrained in the vapor exhaust air stream
Exhaust Stack Exit Velocity	995 fpm	Table 1.3-1	The exit velocity of water vapor through the cooling tower exhaust stack
Exhaust Stack Exit Diameter	242 ft	Table 1.3-1	The diameter of the cooling tower exhaust stack
Exhaust Stack Height	590 ft	Table 1.3-1	The vertical height above finished grade of cooling towers associated with the CWS
• **Fan Assisted NDCT—CWS**			
Acreage	50 ac	Table 1.3-1	The land required for cooling towers, including support facilities
Approach Temperature	14.4°F	Table 1.3-1	The difference between the cold water temperature and the ambient WBT
Blowdown Constituents and Concentrations	Various (see SSAR Table 1.3-2)	Table 1.3-2	The maximum expected concentrations for anticipated constituents in the CWS

Table D-2. (continued)

Item	Design Parameter	Site Safety Analysis Report (SSAR) Section	Description and References
			blowdown to the receiving water body
Blowdown Flow Rate (Normal)	50,516 gpm	Table 1.3-1	The normal flow rate of the blowdown stream from the CWS to the receiving water body for closed system designs during normal operations
Evaporation Rate (Normal)	25,264 gpm	Table 1.3-1	The expected 1% exceedance design rate at which water is lost by evaporation from the CWS during normal operations
Blowdown Temperature (Normal)	91°F	Table 1.3-1	The maximum expected blowdown temperature at the point of discharge to the receiving water body during normal operations
Cycles of Concentration	1.5	Table 1.3-1	The ratio of total dissolved solids in the CWS blowdown to the total dissolved solids in the makeup water
Makeup Flow Rate (Normal)	75,792 gpm	Table 1.3-1	The expected rate of removal of water from a natural source to replace water losses from a closed CWS during normal operations
Noise	60 dBA at 1,000 ft	Table 1.3-1	The maximum expected sound level produced by operation of cooling towers, measured in feet from the noise source
Cooling Tower Temperature Range (Normal)	25.2°F	Table 1.3-1	The temperature difference between the cooling water entering and leaving the towers during normal operations
Cooling Water Flow Rate (Normal)	1,200,000 gpm	Table 1.3-1	The total cooling water flow rate through the condenser/heat exchangers during normal operations
Heat Rejection Rate (Normal)	1.508×10^{10} Btu/hr	Table 1.3-1	The expected heat rejection rate to a receiving water body during normal operations

Table D-2. (continued)

Item	Design Parameter	Site Safety Analysis Report (SSAR) Section	Description and References
Drift	12 gpm	Table 1.3-1	Rate of water lost from the tower as liquid droplets entrained in the vapor exhaust air stream
Exhaust Stack Exit Velocity	902 fpm	Table 1.3-1	The exit velocity of water vapor through the cooling tower exhaust stack
Exhaust Stack Exit Diameter	255 ft	Table 1.3-1	The diameter of the cooling tower exhaust stack
Exhaust Stack Height	224 ft	Table 1.3-1	The vertical height above finished grade of cooling towers associated with the CWS
UHS			
• **Heat Exchangers**			
Maximum Inlet Temperature to Component Cooling Water (CCW) Heat Exchanger	95°F	Table 1.3-1	The maximum temperature of safety-related service water at the inlet of the UHS component cooling water heat exchanger
CCW Heat Exchanger Duty	2.06×10^8 Btu/hr (Normal) 4.72×10^8 Btu/hr (Peak)	Table 1.3-1	The heat transferred to the safety-related service water system for rejection to the environment in UHS heat removal devices
• **UHS Cooling Towers**			
Blowdown Constituents and Concentrations	Various (see SSAR Table 1.3-2)	Table 1.3-2	The maximum expected concentrations for anticipated constituents in the UHS blowdown to the receiving water body
Blowdown Flow Rate (Normal)	1,140 gpm	Table 1.3-1	The maximum flow rate of the blowdown stream from the UHS system to the receiving water body for closed system designs during normal operations
Blowdown Flow Rate (Accident)	2,280 gpm	Table 1.3-1	The maximum flow rate of the blowdown stream from the UHS system to the receiving water body for closed system designs during accident conditions

Table D-2. (continued)

Item	Design Parameter	Site Safety Analysis Report (SSAR) Section	Description and References
Blowdown Temperature (Normal)	< 95°F	Table 1.3-1	The maximum expected UHS blowdown temperature at the point of discharge to the receiving water body during normal operations
Blowdown Temperature (Accident)	95°F	Table 1.3-1	The maximum expected UHS blowdown temperature at the point of discharge to the receiving water body during accident conditions
Cycles of Concentration	2	Table 1.3-1	The ratio of total dissolved solids in the UHS system blowdown to the total dissolved solids in the makeup water streams
Evaporation Rate (Normal)	1,142 gpm	Table 1.3-1	The maximum rate at which water is lost by evaporation from the UHS system during normal operations
Evaporation Rate (Accident)	2,284 gpm	Table 1.3-1	The maximum rate at which water is lost by evaporation from the UHS system during accident conditions
Cooling Tower Deck Height	63 ft	Table 1.3-1	The height of the cooling tower deck above grade
Exhaust Stack Height	35 ft	Table 1.3-1	The height of the exhaust stacks above the deck
Makeup Flow Rate (Normal)	2,404 gpm	Table 1.3-1	The maximum rate of removal of water from a natural source to replace water losses from the UHS system during normal operations
Makeup Flow Rate (Accident)	4,808 gpm	Table 1.3-1	The maximum rate of removal of water from a natural source to replace water losses from the UHS system during accident conditions

Table D-2. (continued)

Item	Design Parameter	Site Safety Analysis Report (SSAR) Section	Description and References
Noise	57 dBA at 200 ft	Table 1.3-1	The maximum expected sound level produced by operation of mechanical draft UHS cooling towers, measured in feet from the noise source
Cooling Water Flow Rate (Normal)	26,125 gpm	Table 1.3-1	The total cooling water flow rate through the UHS system during normal operations
Cooling Water Flow Rate (Shutdown/Accident)	52,250 gpm	Table 1.3-1	The total cooling water flow rate through the UHS system during shutdown/accident conditions
Heat Rejection Rate (Normal)	2.06×10^8 Btu/hr	Table 1.3-1	The maximum expected heat rejection rate to the atmosphere during normal operations
Heat Rejection Rate (Accident)	3.95×10^8 Btu/hr	Table 1.3-1	The maximum expected heat rejection rate to the atmosphere during accident conditions
Stored Water Volume	30,600,000 gal	Table 1.3-1	The quantity of water stored in the UHS impoundments
Drift	2 gpm	Table 1.3-1	Rate of water lost from the tower as liquid droplets entrained in the vapor exhaust air stream
Potable/Sanitary Water System			
• **Discharge to Site Water Bodies**			
Flow Rate (Normal)	93 gpm	Table 1.3-1	The expected effluent flow rate from the potable and sanitary water systems to the receiving water body
Flow Rate (Maximum)	93 gpm	Table 1.3-1	The maximum effluent flow rate from the potable and sanitary water systems to the receiving water body

Table D-2. (continued)

Item	Design Parameter	Site Safety Analysis Report (SSAR) Section	Description and References
• **Raw Water Requirements**			
Maximum Use	216 gpm	Table 1.3-1	The maximum short-term rate of withdrawal from the water source for the potable and sanitary waste water systems
Monthly Average Use	93 gpm	Table 1.3-1	The average rate of withdrawal from the water source for the potable and sanitary waste water systems
Demineralized Water System			
• **Discharge to Site Water Bodies**			
Flow Rate	27 gpm	Table 1.3-1	The expected (and maximum) effluent flow rate from the demineralized system to the receiving water body
• **Raw Water Requirements**			
Maximum Use	107 gpm	Table 1.3-1	The maximum short-term rate of withdrawal from the water source for the demineralized water system
Monthly Average Use	107 gpm	Table 1.3-1	The average rate of withdrawal from the water source for the demineralized water system
Fire Protection System			
• **Raw Water Requirements**			
Maximum Use	625 gpm	Table 1.3-1	The maximum short-term rate of withdrawal from the water source for the fire protection water system
Monthly Average Use	5 gpm	Table 1.3-1	The average rate of withdrawal from the water source for the fire protection water system

Table D-2. (continued)

Item	Design Parameter	Site Safety Analysis Report (SSAR) Section	Description and References
Miscellaneous Drain			
• **Discharge to Site Water Bodies**			
Flow Rate (Expected)	39 gpm	Table 1.3-1	The expected effluent flow rate from miscellaneous drains to the receiving water body
Flow Rate (Maximum)	55 gpm	Table 1.3-1	The maximum effluent flow rate from miscellaneous drains to the receiving water body
• **Raw Water Requirements**			
Maximum Use	5 gpm	Table 1.3-1	The maximum short-term rate of withdrawal from the water source for miscellaneous activities, such as floor washing
Monthly Average Use	5 gpm	Table 1.3-1	The average rate of withdrawal from the water source for miscellaneous activities, such as floor washing
Unit Vent/Airborne Effluent Release Point			
• **Release Point**			
Elevation (Normal)	Ground level	Table 1.3-1	The elevation above finished grade of the release point for routine operational releases
Elevation (Post Accident)	Ground level	Table 1.3-1	The elevation above finished grade of the release point for accident sequence releases
• **Source Term**			
Gaseous (Normal)	Various (see SSAR Table 1.3-7)	Table 1.3-7	The expected single unit annual activity, by isotope, contained in routine plant airborne effluent streams

Table D-2. (continued)

Item	Design Parameter	Site Safety Analysis Report (SSAR) Section	Description and References
Gaseous (Post-Accident)	Various (see SSAR Section 15.3)	Section 15.3	The activity, by isotope, contained in post-accident airborne effluent streams
Tritium	Various (see SSAR Table 1.3-7)	Table 1.3-7	The expected single unit annual activity of tritium contained in routine plant airborne effluent streams
Liquid Radwaste System			
• **Release Point**			
Flow Rate	11 gpm	Table 1.3-1	The discharge flow rate of potentially radioactive liquid effluent streams from plant systems to the receiving water body
Minimum Blowdown Rate	20,000 gpm	Table 1.3-1	Minimum flow rate of the effluent stream discharging potentially radioactive liquid effluent to the receiving water body during normal operations
• **Source Term**			
Liquid	Various (see SSAR Table 1.3-8)	Table 1.3-8	The annual activity, by isotope, contained in routine plant liquid effluent streams
Tritium	Various (see SSAR Table 1.3-8)	Table 1.3-8	The annual activity of tritium contained in routine plant liquid effluent streams
Solid Radwaste System			
• **Solid Radwaste**			
Activity	Various (see SSAR Table 1.3-3)	Table 1.3-3	The expected single unit annual activity, by isotope, contained in solid radioactive wastes generated during routine plant operations
Principal Radionuclides	Various (see SSAR Table 1.3-3)	Table 1.3-3	The principal radionuclides contained in solid radioactive wastes generated during routine plant operations.
Volume	16,721.5 ft^3/yr	Table 1.3-1	The expected volume of solid radioactive wastes generated during routine plant operations

Table D-2. (continued)

Item	Design Parameter	Site Safety Analysis Report (SSAR) Section	Description and References
Auxiliary Boiler System			
Exhaust Elevation	150 ft	Table 1.3-1	The height above finished plant grade at which the flue gas effluents are released to the environment
Flue Gas Effluents	Various (see SSAR Table 1.3-4)	Table 1.3-4	The expected combustion products and anticipated quantities released to the environment due to operation of the auxiliary boilers
Fuel Type	No. 2 Fuel Oil	Table 1.3-1	The type of fuel required for proper operation of the auxiliary boilers
Heat Input Rate (Btu/hr)	1.56×10^8 Btu/hr	Table 1.3-1	The average heat input rate (fuel consumption rate)
Onsite/Offsite Electrical Power System			
Switchyard Acreage	63 ac	Table 1.3-1	The land usage required for the high voltage switchyard used to connect the plant to the transmission grid
Standby Power System			
• **Diesel**			
Diesel Capacity (kW)	10,130 kW/unit (emergency diesel generator [EDG]) 5,000 kW/unit (station blackout [SBO] diesel generator)	Table 1.3-1	The total generating capacity of the diesel generating system
Diesel Exhaust Elevation	50 ft	Table 1.3-1	The elevation above finished grade of the release point for standby diesel exhaust releases
Diesel Flue Gas Effluents	Various (see SSAR Table 1.3-5)	Table 1.3-5	The expected combustion products and anticipated quantities released to the environment due to operation of the emergency standby diesel generators

Table D-2. (continued)

Item	Design Parameter	Site Safety Analysis Report (SSAR) Section	Description and References
Diesel Noise	55 dBA at 1,000 ft	Table 1.3-1	The maximum expected sound level produced by operation of diesel generators, measured in feet from the noise source
Diesel Fuel Type	No. 2	Table 1.3-1	The type of diesel fuel required for proper operation of the diesel generator
Exhaust Stack Diameter	68 in.	Table 1.3-1	The nominal diameter of the exhaust stack
Flue Gas Flow Rate	68,960 actual cubic feet per minute (acfm)	Table 1.3-1	The maximum flue gas flow rate exiting the exhaust stack
Flue Gas Temperature	665°F	Table 1.3-1	The temperature of the flue gas exiting the exhaust stack
Number of Units	EDG—4 SBO—2	Table 1.3-1	The number of generator units
Diesel Usage	150 hr/yr per unit (EDG) 100 hr/yr per unit (SBO)	Table 1.3-1	The expected duration of usage for each diesel
Heat Input Rate (Btu/hr)	77,384,160 Btu/hr	Table 1.3-1	The average heat input rate (fuel consumption rate)
• **Gas Turbine**		Table 1.3-1	
Gas Turbine Capacity (kW)	26,000 kW	Table 1.3-1	The total generating capacity of the gas turbine generating system
Gas Turbine Exhaust Elevation	50 ft	Table 1.3-1	The elevation above finished grade of the release point for standby gas turbine exhaust releases
Gas Turbine Flue Gas Effluents	Various (see SSAR Table 1.3-6)	Table 1.3-6	The expected combustion products and anticipated quantities released to the environment due to operation of the standby gas turbine generators
Gas Turbine Noise	64.3 dBA at 1,000 ft	Table 1.3-1	The maximum expected sound level produced by operation of gas turbine generators, measured in feet from the noise source

Table D-2. (continued)

Item	Design Parameter	Site Safety Analysis Report (SSAR) Section	Description and References
Gas Turbine Fuel Type	Diesel oil	Table 1.3-1	The type of fuel required for proper operation of the gas turbines
Exhaust Stack Diameter	59.1 in.	Table 1.3-1	The nominal diameter of the exhaust stack
Flue Gas Flow Rate	128,899 acfm	Table 1.3-1	The maximum flue gas flow rate exiting the exhaust stack
Flue Gas Temperature	940°F	Table 1.3-1	The temperature of the flue gas exiting the exhaust stack
Number of Units	4 (Class 1E); 2 (Non-Class 1E)	Table 1.3-1	The number of generator units
Gas Turbine Usage	48 hr/yr	Table 1.3-1	The expected duration of usage for each gas turbine
Heat Input Rate (Btu/hr)	71,513,906 Btu/hr	Table 1.3-1	The average heat input rate (fuel consumption rate)
Plant Characteristics			
• **Permanent Acreage**			
Parking Lots	8 ac	Table 1.3-1	The land area required to provide space for parking lots
Permanent Support Facilities	8 ac	Table 1.3-1	The land area required to provide space for permanent support facilities
Power Block	70 ac	Table 1.3-1	The land area required to provide space for power block facilities. Power block is defined as all structures, systems, and components that perform a direct function in the production, transport, or storage of heat energy, electrical energy, or radioactive wastes. Also included are structures, systems, and components that monitor, control, protect, or otherwise support the above equipment

Table D-2. (continued)

Item	Design Parameter	Site Safety Analysis Report (SSAR) Section	Description and References
Other Areas	26.4 ac	Table 1.3-1	The land area required to provide space for plant facilities not included above in the categories of parking lots, permanent support facilities, and power block
• **Megawatts Thermal (MW[t])**	4,614 MW(t) (single unit); 6,830 MW(t) (dual unit)	Table 1.3-1	The thermal power generated by the nuclear steam supply system
• **Megawatts Electric (MW[e]) (net)**	1,350 to 1,600 MW(e) (single unit) 2,200 MW(e) (dual unit)	Table 1.3-1	The nominal electric output to the electrical grid. This value does not include the plant's house loads
• **Plant Design Life**	60 yr	Table 1.3-1	The operational life for which the plant is designed
• **Plant Population**			
Operation	600 people	Table 1.3-1	The number of people required to operate the plant
Refueling/Major Maintenance	1,000 people	Table 1.3-1	The additional number of temporary staff required to conduct refueling and major maintenance activities
• **Station Capacity Factor**	85 to 96.3%	Table 1.3-1	The percentage of time that a plant is capable of providing power to the grid. Values within this range are conservatively applied as necessary in the ER analyses
• **Plant Operating Cycle**	18 or 24 mo	Table 1.3-1	The normal plant operating cycle length
Construction			
• **Acreage**			
Laydown Area	128 ac	Table 1.3-1	The land area required to provide space for the construction laydown area
Temporary Construction Facilities	77 ac	Table 1.3-1	The land area required to provide space for temporary construction support facilities
• **Noise**	102 dBA at 50 ft	Table 1.3-1	The maximum expected sound level due to construction activities, measured in feet from the noise source

Table D-2. (continued)

Item	Design Parameter	Site Safety Analysis Report (SSAR) Section	Description and References
• **Construction Population**	3,950–4,100 people	Table 1.3-1	The number of onsite workers for construction of the new plant
Miscellaneous Parameters			
• **Maximum Fuel Enrichment**	5 wt %	Table 1.3-1	Concentration of ^{235}U in the fuel
• **Maximum Average Assembly Burnup**	54,200 MWd/MTU	Table 1.3-1	Maximum assembly average burnup at end of assembly life
• **Peak Fuel Rod Burnup**	62,000 MWd/MTU	Table 1.3-1	Peak fuel rod exposure at end of life
• **Rated Thermal Power**	4,590 MW(t) (single unit); 6,800 MW(t) (dual unit)	Table 1.3-1	Maximum core thermal power
• **Liquid-Containing Tank Failure Radionuclide Concentrations**	Various (see SSAR Table 1.3-9)	Table 1.3-9	The concentrations of radionuclides and associated tank volumes for the analysis of liquid-containing tank failure

Appendix E: Inspections, Tests, Analyses, and Acceptance Criteria

ITAAC for the ESP:

PSEG Site ESP Plant Emergency Planning ITAAC

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
1.0 Emergency Classification System			
10 CFR 50.47(b)(4) A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and state and local response plans for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.	1.1 A standard emergency classification and emergency action level (EAL) scheme exists, and identifies facility system and effluent parameters constituting the bases for the classification scheme. [D.1**] [**D.1 corresponds to NUREG-0654/ FEMA-REP-1 evaluation criteria.]	1.1 An inspection of the Control Room, Technical Support Center (TSC), and Emergency Operations Facility (EOF) will be performed to verify that they have displays for retrieving facility system and effluent parameters as specified in the Emergency Classification and EAL scheme, and the displays are functional.	1.1(a) The parameters referenced in the Emergency Classification and EAL scheme are retrievable in the Control Room, TSC and EOF. 1.1(b) The ranges of the displays encompass the values specified in the Emergency Classification and EAL scheme.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
2.0 Notification Methods and Procedures			
10 CFR 50.47(b)(5) – Procedures have been established for notification, by the licensee, of State and local response organizations and for notification of emergency personnel by all organizations; the content of initial and follow-up messages to response organizations and the public has been established; and means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established.	2.1 The means exist to notify responsible State and local organizations within 15 minutes after the licensee declares an emergency. [E.1]	2.1 A test will be performed to demonstrate the capabilities for providing initial notification to the offsite authorities after a simulated emergency classification.	2.1 The States of Delaware and New Jersey, and Kent, New Castle, Cumberland, and Salem Counties received notification within 15 minutes after the declaration of an emergency from the Control Room, TSC, or EOF.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
	2.2 The means exist to notify emergency response personnel. [E.2]	2.2 A test of the primary and backup emergency response organization (ERO) notification systems will be performed	2.2 A test of the primary and backup ERO notification system resulted in: a. ERO personnel received the notification message; b. Mobilization communication validated by personnel response to the notification system or by telephone; c. Response to electronic notification and plant public address system demonstrated during normal working hours, and off hours
	2.3 The means exist to notify and provide instructions to the populace within the plume exposure emergency planning zone (EPZ). [E.6]	2.3 A full test of the Prompt Alerting and Notification System and the Emergency Alert System capabilities will be conducted.	2.3 Notification and clear instructions to the public accomplished in accordance with the emergency plan requirements.
3.0 Emergency Communications			
10 CFR 50.47(b)(6) – Provisions exist for prompt communications among principal response organizations to emergency personnel and to the public.	3.1 The means exist for communications among the Control Room, TSC, EOF, principal State and local emergency operations centers (EOCs), and field monitoring teams. [F.1.d]	3.1(a) A test will be performed to demonstrate (both primary and secondary methods/systems) the ability to communicate from the Control Room, TSC and the EOF to responsible State and local government agencies. 3.1(b) A test will be performed to demonstrate (both primary and secondary methods /systems) the ability to communicate from the TSC	3.1(a) Demonstrated (both primary and secondary methods/systems) the ability to communicate from the Control Room, TSC and the EOF to responsible State and local government agencies. 3.1(b) Demonstrated (both primary and secondary methods/systems) the ability to communicate from the TSC and the EOF to PSEG field monitoring teams.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
		and the EOF to PSEG field monitoring teams	
	3.2 The means exist for communications from the Control Room, TSC, and EOF to the NRC headquarters and regional office EOCs (including establishment of the Emergency Response Data System (ERDS) [or its successor system] between the onsite computer system and the NRC Operations Center.) [F.1.f]	3.2 A test will be performed to demonstrate the ability to communicate from the Control Room, TSC and the EOF to the NRC Operations Center utilizing the Emergency Notification System (ENS). The Health Physics Network (HPN) is tested to ensure communications between the TSC and EOF with the NRC Operations Centers. ERDS is established [or its successor system] between the onsite computer systems and the NRC Operations Center.	3.2 Communications are established between the Control Room, TSC and EOF to the NRC headquarters and regional office EOCs utilizing the ENS. The TSC and EOF demonstrated communications with the NRC Operations Center using the HPN. The access port for ERDS [or its successor system] is provided and successfully completes a transfer of data from the Unit to the NRC Operations Center.
4.0 Public Education and Information			
10 CFR 50.47(b)(7) – Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors), the	4.1 The licensee has provided space which may be used for a limited number of the news media. [G.3.b]	4.1 An inspection of the as-built facility/area provided for the news media will be performed in the Emergency News Center/Joint Information Center (ENC/JIC).	4.1 The ENC/JIC included equipment to support the ENC/JIC operations, including communications with: a. TSC and EOF b. Principal State and local EOCs c. The news media Designated space is available for news media briefings.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) are established in advance, and procedures for coordinated dissemination of information to the public are established.			
5.0 Emergency Facilities and Equipment			
10 CFR 50.47(b)(8) – Adequate emergency facilities and equipment to support the emergency response are provided and maintained.	5.1 The licensee has established a TSC and an onsite Operations Support Center (OSC). [H.1, H.9]	5.1 An inspection of the as-built TSC and OSC will be performed, including a test of their capabilities.	5.1.1 The TSC has at least 1875 ft^2 of floor space (75 ft^2 per person for a minimum of 25 persons).
			5.1.2 Communication equipment is installed in the TSC and OSC, and voice transmission and reception are accomplished.
			5.1.3 The TSC ventilation system includes a high-efficiency particulate air (HEPA), and charcoal filter and radiation monitors are installed.
			5.1.4 The TSC has the means to receive, store, process, and display plant and environmental information, and enable the initiation of emergency measures and the conduct of emergency assessment. These capabilities are demonstrated during testing and acceptance activities.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			5.1.5 A reliable and backup electrical power supply is available for the TSC.
			5.1.6 There is an OSC located inside the Protected Area.
	5.2 The licensee has established an EOF. [H.2]	5.2 An inspection of the EOF will be performed, including a test of the capabilities.	5.2.1 Demonstrated communications between the Control Room, TSC, EOF, field monitoring teams, NRC, responsible State and county agencies, and the ENC/JIC.
			5.2.2 The parameters referenced in the Emergency Classification and EAL scheme are retrievable in the EOF.
			5.2.3 Demonstrated the capability of the EOF to respond to events at two or more reactors on the site in accordance with emergency plan implementing procedures (EPIPs), including the capabilities to discriminate plant data, staffing and operation of the facility.
6.0 Accident Assessment			
10 CFR 50.47(b)(9) – Adequate methods, systems and equipment for assessing and monitoring actual or potential off-site consequences of a radiological emergency condition are in use.	6.1 The means exist to provide initial and continuing radiological assessment throughout the course of an accident. [I.2].	6.1 A test of the Emergency Plan will be conducted by performing a drill or exercise to verify the capability to perform accident assessment.	6.1 Using selected monitoring parameters specified in the PSEG Site Emergency Plan, including EALs (ITAAC Acceptance Criteria 1.1), simulated degraded plant conditions are assessed and protective actions are initiated in accordance with the following criteria: a. Demonstrated the ability to obtain onsite radiological surveys and samples. b. Demonstrated the ability to continuously monitor and control radiation exposure to emergency workers. c. Demonstrated the ability to assemble and deploy field monitoring teams within 60 minutes from the decision to do so. d. Demonstrated the ability to satisfactorily collect and disseminate field team data.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			e. Demonstrated the ability to develop dose projections. f. Demonstrated the ability to make the decision whether to issue radioprotective drugs (KI) to onsite emergency workers. g. Demonstrated the ability to develop appropriate protective action recommendations (PARs) and notify appropriate authorities within 15 minutes of development.
	6.2 The means exist to determine the source term of releases of radioactive material within plant systems, and the magnitude of the release of radioactive materials based on plant system parameters and effluent monitors. [I.3]	6.2 A test will be performed to demonstrate that the means exist to determine the source term of releases of radioactive material within plant systems, and the magnitude of the release of radioactive materials based on plant system parameters and effluent monitors.	6.2 Demonstrated through training or drills that Emergency Plan Implementing Procedures (EPIPs) provide direction to accurately calculate the source terms and the magnitude of the release of postulated accident scenario releases.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
	6.3 The means exist to continuously assess the impact of the release of radioactive materials to the environment, accounting for the relationship between effluent monitor readings, and onsite and offsite exposures and contamination for various meteorological conditions. [I.4]	6.3 A test will be performed that provides evidence that the impact of a radiological release to the environment can be assessed by using the relationship between effluent monitor readings, and onsite and offsite exposures and contamination for various meteorological conditions.	6.3 Demonstrated through training or drills that EPIPs provide direction to continuously assess the impact of the release of radioactive materials to the environment, accounting for the relationship between effluent monitor readings, and onsite and offsite exposures and contamination for various meteorological conditions.
	6.4 The means exist to acquire and evaluate meteorological information. [I.5]	6.4 A test will be performed to acquire and evaluate meteorological data/ information.	6.4 Demonstrated that meteorological data necessary to implement the EPIPs is retrievable in the Control Room, TSC and EOF.
	6.5 The means exist to determine the release rate and projected doses if the instrumentation used for assessment is off-scale or inoperable. [I.6]	6.5 A test will be performed of the capabilities to determine the release rate and projected doses if the instrumentation used for assessment if off-scale or inoperable.	6.5 Demonstrated through training or drills that EPIPs provide direction to determine release rate and projected dose rates when instruments are off-scale or inoperable.
	6.6 The means exist for field monitoring within the plume exposure EPZ. [I.7]	6.6 A test will be performed of the capabilities for field monitoring within the plume exposure EPZ.	6.6 Demonstrated through training or drills that the field monitoring teams were dispatched and able to locate and monitor a radiological release within the plume exposure EPZ during a radioactive release scenario.
	6.7 The means exist to make rapid assessment of actual or potential	6.7 A test will be performed of the capabilities to make rapid assessments of	6.7 Demonstrated through training or drills using EPIPs:

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
	magnitude and locations of radiological hazards through liquid or gaseous release pathways, including activation, notification means, field team composition, transportation, communication, monitoring equipment, and estimated deployment times. [I.8]	actual or potential magnitude and locations of radiological hazards through liquid or gaseous release pathways, including activation, notification means, field team composition, transportation, communication, monitoring equipment, and estimated deployment times.	a. A qualified field monitoring team was promptly notified, activated, briefed and dispatched from the EOF during a radiological release scenario. b. The team used monitoring equipment, transportation, communication from the field and located specific sampling locations. c. The team made rapid assessment of actual or potential magnitude and locations of any radiological hazards from simulated liquid or gaseous releases.
	6.8 The capability exists to detect and measure radioiodine concentrations in air in the plume exposure EPZ, as low as 10^{-7} µCi/cc (microcuries per cubic centimeter) under field conditions. [I.9]	6.8 A test will be performed of the capabilities to detect and measure radioiodine concentrations in air in the plume exposure EPZ, as low as 10^{-7} µCi/cc under field conditions.	6.8 A field monitoring team demonstrated, in accordance with the appropriate EPIP(s), the use of sampling and detection equipment for air concentrations in the plume exposure EPZ during a radioactive release scenario as low as 10^{-7} µCi/cc.
	6.9 The means exist to estimate integrated dose from the projected and actual dose rates, and for comparing these estimates with the Environmental Protection Agency (EPA) protective action guides (PAGs). [I.10]	6.9 A test will be performed of the capabilities to estimate integrated dose from the projected and actual dose rates, and for comparing these estimates with the EPA PAGs.	6.9 Personnel demonstrated the ability to estimate integrated dose from the dose assessment program and the field monitoring team reading during a radioactive release scenario. The results were successfully compared with the EPA PAGs.
7.0 Protective Response			

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
10 CFR 50.47(b)(10) – A range of protective actions has been developed for the plume exposure EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate. Guide-lines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure EPZ appropriate to the locale have been developed.	7.1 The means exist to warn and advise onsite individuals of an emergency, including those in areas controlled by the operator, including: [J.1] 1. Employees not having emergency assignments. 2. Visitors. 3. Contractor and construction personnel. 4. Other people who may be in the public access areas, on or passing through the site, or within the owner controlled area.	7.1 A test will be performed of the capabilities to warn and advise onsite individuals of an emergency, including those in the Owner Controlled Area and the immediate vicinity.	7.1 Demonstrated the ability to warn and advise onsite individuals including: 1. Non-essential employees. 2. Visitors. 3. Contractor and construction personnel. 4. Other personnel within the Owner Controlled Area and the immediate vicinity.
8.0 Exercises and Drills			
10 CFR 50.47(b)(14) – Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be)	8.1 Licensee conducts a full participation exercise to evaluate major portions of emergency response capabilities, which includes participation by the State and local agency	8.1 A full participation exercise (test) will be conducted within the specified time periods of 10 CFR Part 50, Appendix E.	8.1.1 The exercise is completed within the specified time periods of 10 CFR Part 50, Appendix E; onsite exercise objectives have been met, and there are no uncorrected onsite exercise deficiencies.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills are (will be) corrected.	within the plume exposure EPZ, and each State within the ingestion control EPZ. [N.1]		
			A. Accident Assessment and Classification 1. Demonstrated the ability to identify initiating conditions, determine EAL parameters, and correctly classify the emergency throughout the exercise. Standard Criteria: a. Determined the correct highest emergency classification level based on events which were in progress, considering past events and their impact on the current conditions, within 15 minutes from the time the initiating condition(s) or EAL is identified.
			B. Notifications 1. Demonstrated the ability to alert, notify and mobilize site emergency response personnel. Standard Criteria: a. Completed the designated checklist and performed the plant page announcement of the emergency classification. b. Activated the Emergency Outdial System following the initial event classification for an Alert or higher. 2. Demonstrated the ability to notify responsible State agencies within 15 minutes and the NRC within 60 minutes after declaring an emergency.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			Standard Criteria: a. Transmitted information using the designated checklist, in accordance with approved Emergency Plan documents within 15 minutes of event classification b. Transmitted follow-up notification information using the designated checklist, in accordance with approved Emergency Plan documents. c. Transmitted information using designated checklist within 60 minutes of event classification to the NRC. 3. Demonstrated the ability to warn or advise onsite individuals of emergency conditions. Standard Criteria: a. Initiated notification of onsite individuals (via public address, Owner Controlled Area sirens or telephone) using designated checklist. 4. Demonstrated the capability of the Prompt Alerting System to operate properly for public notification when required. Standard Criteria: a. $\geq$90 percent of the sirens operate properly as indicated by the siren feedback system.
			C. Emergency Response 1. Demonstrated the capability to direct and control emergency operations. Standard Criteria: a. Overall emergency command and control demonstrated in the Control Room (simulator) in the

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			early phase of the emergency and by the TSC within 90 minutes from initial event classification of Alert or higher. 2. Demonstrated the ability to transfer Emergency Coordinator function from the Shift Manager in the Control Room (simulator) to the Emergency Duty Officer in the TSC and later to the Emergency Response Manager in the EOF. Standard Criteria: a. Briefings were conducted prior to turnover responsibility. Personnel documented transfer of duties. 3. Demonstrated the ability to prepare for 24-hour staffing requirements. Standard Criteria: a. Completed 24-hour staff assignments. 4. Demonstrated the ability to perform assembly and accountability for all personnel in the Protected Area within 30 minutes of an emergency (after accountability message has been announced) requiring Protected Area accountability. Standard Criteria: a. Protected Area personnel accountability completed within 30 minutes of an emergency (after accountability message has been announced) requiring Protected Area accountability.
			D. Emergency Response Facilities 1. Demonstrated activation of the Operations Support

			Center (OSC) and full functional operation of the TSC and EOF within 90 minutes of event classification. Standard Criteria: a. The TSC and OSC activated within 90 minutes of the initial classification of an Alert or higher. b. The EOF activated within 90 minutes of the initial classification of Site Area Emergency or higher. 2. Demonstrated the adequacy of the equipment, security provisions, and habitability precautions for the TSC, OSC, EOF and ENC/JIC, as appropriate. Standard Criteria: a. Demonstrated the adequacy of the emergency equipment in the emergency response facilities including availability and general consistency with the EPIPs. b. Personnel assigned to the ERO implemented and followed applicable EPIPs. c. The Shift Radiation Protection Technician (on-shift), Radiological Assessment Coordinator (TSC), and Radiological Support Manager (EOF) implemented the designated checklist if an onsite/offsite release occurred. 3. Demonstrated the adequacy of communications for all emergency support resources. Standard Criteria: a. Emergency response communications listed in the EPIPs are available and operational. b. Communications systems are tested in accordance with the TSC, OSC and EOF activation checklists. c. Emergency response facility personnel are able to operate all specified communications systems.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			d. Clear primary and backup communications links are established and maintained for the duration of the exercise.
			E. Radiological Assessment and Control 1. Demonstrated the ability to obtain onsite radiological surveys and samples. Standard Criteria: a. Radiation Protection Technicians demonstrated the ability to obtain appropriate instruments (range and type) and perform surveys. b. Airborne samples taken when the conditions indicate the need for the information. 2. Demonstrated the ability to continuously monitor and control radiation exposure to emergency workers. Standard Criteria: a. Emergency workers issued self-reading dosimeters when radiation levels require, and exposures controlled to 10 CFR Part 20 limits (unless the Shift Manager or Emergency Duty Officer, or designee, authorizes emergency limits). b. Exposure records are available from the site database (primary), a personal computer database (backup), or a hard copy report (backup). 3. Demonstrated the ability to assemble and dispatch field monitoring teams. Standard Criteria: a. An onsite Field Monitoring Team is ready to be deployed within 60 minutes of being requested from

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			the declaration of an Alert or higher. 4. Demonstrated the ability to satisfactorily collect and disseminate field team data. Standard Criteria: a. Field team data to be collected is dose rate or counts per minute (cpm) from the plume, both open and closed window, and air sample (gross/net cpm) for particulate and iodine, if applicable. b. Radiological data disseminated from the Field Team to the Offsite Field Team Coordinator/ Communicator. 5. Demonstrated the ability to develop dose projections. Standard Criteria: a. The Shift Radiation Protection Technician performed timely and accurate dose projections, in accordance with the EPIPs. 6. Demonstrated the ability to develop appropriate protective action recommendations (PARs), and notified New Jersey and Delaware within 15 minutes of a General Emergency declaration or of an update of the previously issued PARs. Standard Criteria: a. Total Effective Dose Equivalent (TEDE) and Committed Dose Equivalent (CDE) dose projections from the dose assessment computer code, established in accordance with the EPIPs. b. PARs developed within 15 minutes of data availability.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			c. PARs transmitted via voice, fax, or electronically within 15 minutes, as required by the EPIPs.
			F. Public Information 1. Demonstrated the capability to develop and disseminate clear, accurate, and timely information to the news media. Standard Criteria: a. Media briefings provided within approximately 60 minutes of activation of the ENC/JIC. 2. Demonstrated the capability to establish and effectively operate rumor control in a coordinated fashion. Standard Criteria: a. Calls answered in a timely manner with the correct information. b. Calls returned or forwarded, as appropriate, to demonstrate responsiveness. c. Rumors identified and addressed.
			G. Evaluation 1. Demonstrated the ability to conduct a post-exercise critique, to determine areas requiring improvement and corrective action. Standard Criteria: a. Drill and Exercise objectives developed to allow for performance evaluation. b. Significant problems in achieving the objectives discussed to ensure understanding of why objectives were not fully achieved.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			8.1.2 Onsite emergency response personnel were mobilized in sufficient numbers to fill emergency response positions identified in Emergency Plan Section 3, Emergency Organization, and they successfully performed assigned responsibilities.
			8.1.3 The exercise was completed within the specified time periods of Appendix E to 10 CFR Part 50, offsite exercise objectives were met, and there were no uncorrected offsite exercise deficiencies; or a license condition requires offsite deficiencies to be corrected prior to operation above 5 percent of rated thermal power.
9.0 Implementing Procedures			
10 CFR Part 50, Appendix E.V - No less than 180 days before the scheduled issuance of an operating license for a nuclear power reactor or a license to possess nuclear material, the applicant's detailed implementation procedures for its emergency plan shall be submitted to the Commission.	9.1 The licensee has submitted detailed implementation procedures for its emergency plan no less than 180 days before fuel load.	9.1 An inspection of the submittal letter will be performed.	9.1 The licensee has submitted detailed EPIPs for the onsite emergency plan no less than 180 days before fuel load.

Appendix F: Site Redress Plan

PSEG did not submit a Site Redress Plan as part of the ESP application

PSEG did not request a Limited Work Authorization as part of the ESP Application

Appendix G: Environmental Protection Plan (Nonradiological)

1.0 Objective of the Environmental Protection Plan

The Environmental Protection Plan (EPP) objective is to ensure compliance with Biological Opinions issued pursuant to the Endangered Species Act of 1973, as amended (ESA), and to ensure that the Commission is kept informed of other environmental matters. The EPP is intended to be consistent with Federal, state, and local requirements for environmental protection.

2.0 Environmental Protection Issues

In the Final Environmental Impact Statement (FEIS) dated November 2015, the staff considered the environmental impacts associated with the issuance of an early site permit (ESP), including consideration of the impacts of construction and operation of a new nuclear plant at the PSEG Site. This EPP applies to the permit holder's actions affecting the environmental resources evaluated in the FEIS and the permit holder's actions that may affect any newly discovered environmental resources.

2.1 Aquatic Resources Issues

Federal agencies other than the U.S. Nuclear Regulatory Commission (NRC), such as the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (USACE), have jurisdiction to regulate aquatic resources under the Federal Water Pollution Control Act (Clean Water Act or CWA) and the Rivers and Harbors Appropriation Act of 1899 (RHA). Nothing within this EPP shall be construed to place additional requirements on the regulation of aquatic resources except the imposition of the requirements in a Biological Opinion under the ESA (see Section 2.3).

2.2 Terrestrial Resources Issues

Several statutes govern the regulation of terrestrial resources. For example, the U.S. Fish and Wildlife Service (FWS) regulate matters involving migratory birds and their nests in accordance with the Migratory Bird Treaty Act. Activities affecting migratory birds or their nests may require permits under the Migratory Bird Treaty Act. The FWS also regulates matters involving the protection and taking of bald and golden eagles in accordance with the Bald and Golden Eagle Protection Acts.

2.3 Endangered Species Act of 1973

The NRC may be required to protect some aquatic resources and terrestrial resources in accordance with the ESA. If a Biological Opinion has been issued to the NRC in accordance with ESA Section 7 prior to the issuance of a construction permit or combined license referencing the ESP, the permit holder shall comply with the Terms and Conditions set forth in the Incidental Take Statement of such a Biological Opinion. If any Federally listed species or critical habitat occurs in an area affected by construction that was not previously identified as occurring in such areas, including species and critical habitat that were not previously Federally listed, the permit holder shall inform the NRC within four hours of discovery. Similarly, the permit holder shall inform the NRC within four hours of discovery of any take, as defined in the ESA, of a Federally listed species or destruction or adverse modification of critical habitat. These notifications shall be made to the NRC Operations Center via the Emergency Notification System. The permit holder shall provide any necessary information to the NRC if the NRC initiates consultation under the ESA.

Unusual ESA-Related Event - The permit holder shall inform the NRC of any onsite mortality, injury, or unusual occurrence of any species protected by the ESA within four hours of discovery, followed by a written report in accordance with Section 4.1. Such incidents shall be reported regardless of causal relation to construction.

3.0 Consistency Requirements

The permit holder shall notify the NRC of proposed changes to permits or certifications concerning aquatic or terrestrial resources by providing the NRC with a copy of the proposed change at the same time it is submitted to the permitting agency. The permit holder shall provide the NRC with a copy of the application for renewal of permits or certifications at the same time the application is submitted to the permitting agency.

Changes to or renewals of these permits or certifications shall be reported to the NRC within 30 days following the later of the date the change or renewal is approved or the date the change becomes effective. If a permit or certification, in part or in its entirety, is appealed and stayed, the NRC shall be notified within 30 days following the date the stay is granted.

4.0 Administrative Procedures

4.1 Plant Reporting Requirements: Non-routine Reports

A written report shall be submitted to the NRC within 30 days of occurrence of any unusual ESA-related event described in Section 2.3 of this EPP. The report shall (a) describe, analyze, and evaluate the event, including extent and magnitude of the impact and plant operating characteristics at the time of the event; (b) describe the probable cause of the event; (c) indicate the action taken to correct the reported event; (d) indicate the corrective action taken to preclude repetition of the event and to prevent similar occurrences involving similar components or systems; and (e) indicate the agencies notified and their preliminary responses.

4.2 Review and Audit

The permit holder shall provide for review and audit of compliance with Section 2.3 of the EPP. The audits shall be conducted independently of the individual or groups responsible for performing the specific activity. A description of the organizational structure utilized to achieve the independent review and audit function and results of the audit activities shall be maintained and made available for inspection.

4.3 Records Retention

Records required by this EPP shall be made and retained in a manner convenient for review and inspection. These records shall be made available to the NRC on request. The records, data, and logs relating to this EPP shall be retained for five years or, where applicable, in accordance with the requirements of other agencies.

4.4 Changes in Environmental Protection Plan

A request for a change in the EPP shall include an assessment of the environmental impact of the proposed change and a supporting justification. Implementation of such changes in the EPP shall not commence prior to NRC approval of the proposed changes in the form of a license amendment incorporating the appropriate revision to the EPP.

The permit holder shall request a license amendment to incorporate the requirements of any Terms and Conditions set forth in the Incidental Take Statement of Biological Opinions issued subsequent to the effective date of this EPP.