

U.S. NUCLEAR REGULATORY COMMISSION

DOCKET NO. 52- 43

EARLY SITE PERMIT FOR THE

PSEG SITE

DRAFT SUMMARY RECORD OF DECISION

BACKGROUND:

On May 25, 2010, the U.S. Nuclear Regulatory Commission (NRC or Commission) received an application from PSEG Power, LLC, and PSEG Nuclear, LLC (PSEG), for an early site permit (ESP) for a site located adjacent to the existing Hope Creek Generating Station (HCGS) and Salem Generating Station (SGS) in Lower Alloways Creek Township, Salem County, New Jersey.

Section 102 of the National Environmental Policy Act of 1969, as amended (NEPA), directs that an environmental impact statement (EIS) be prepared for major Federal actions significantly affecting the quality of the human environment. The NRC's regulations in Title 10 of the *Code of Federal Regulations* (CFR), Part 51, were developed to implement the agency's responsibilities under Section 102 of NEPA. Pursuant to 10 CFR 51.20(b)(1), the NRC defines issuance of an ESP as an action for which the agency will prepare an EIS.

The NRC published a notice of acceptance of the PSEG ESP application for docketing on August 13, 2010 (75 FR 49539) and subsequently published on October 15, 2010, a notice of intent to prepare an EIS and conduct a scoping process (75 FR 63521). PSEG would also require permits from the U.S. Army Corps of Engineers (USACE) in order to perform certain site preparation activities associated with ultimately building a facility at the site.¹ To enable each agency to most efficiently meet its NEPA responsibilities for its permit decision, the NRC agreed to serve as the lead agency for preparing the EIS, with the USACE as a cooperating agency.

On November 4, 2010, the NRC held two public meetings in Carneys Point, New Jersey, to obtain public input on the scope of the environmental review. The NRC staff reviewed the oral and written comments received during the scoping process and contacted Federal, State, Tribal, regional, and local agencies to solicit comments. A Scoping Summary Report was issued on November 1, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML112150127). All comments received during the scoping comment period are included in Appendix D of the final EIS.

The NRC and USACE developed a draft EIS, and on August 22, 2014, a 75-day comment period began to allow members of the public and agencies to comment on the results of the

¹ These site preparation activities fall within the USACE's jurisdiction under [Section 10](#) of the Rivers and Harbors Appropriations Act of 1899 and [Section 404](#) of the Clean Water Act.

environmental review (79 FR 49774). In response to a member of Congress from Delaware, the NRC staff extended the comment period by 30 days to end on December 6, 2014 (79 FR 65714). On October 1, 2014, the NRC conducted two public meetings in Carneys Point, New Jersey, and on October 23, 2014, the NRC conducted two public meetings in Middletown, Delaware, to describe the results of the environmental review, respond to questions, and accept public comments. In November 2015, the NRC issued the “Environmental Impact Statement for an Early Site Permit (ESP) at the PSEG Site, Final Report” (NUREG-1937), Volumes 1, 2, and 3, (ADAMS Accession Nos. ML15316A283, ML15316A072, and ML15317A455 respectively). All comments related to the environmental review during the draft EIS comment period are included in Appendix E of the final EIS.

Pursuant to 10 CFR 51.102 and 51.103(a)(1)-(4), the NRC staff has prepared this Summary Record of Decision (ROD) to accompany its action on the ESP application. This Summary ROD incorporates by reference materials contained in the final EIS. See 10 CFR 51.103(c).

DECISION:

The NRC makes the decision to approve or deny an ESP application based on whether the applicant has met all applicable requirements, including the NRC’s safety and environmental regulations. The NRC’s safety review of the application is documented in the final safety evaluation report issued on September 25, 2015 (ADAMS Accession No. ML15229A119).

The final EIS presents the NRC staff’s analyses of the environmental impacts that could result from building and operating a new nuclear power plant that falls within the plant parameter envelope (PPE) at the PSEG Site. After weighing the environmental, economic, technical, and other benefits of the facility against environmental and other costs and considering reasonable available alternatives, the NRC concluded that issuance of the ESP subject to the conditions for protection of the environment set forth in the permit, is in accordance with NEPA and the NRC’s implementing regulations in Subpart A of 10 CFR 51, and that all applicable requirements have been satisfied. The final EIS as well as the Licensing Board’s Order dated [date], document these conclusions.

Accordingly, the NRC issued ESP [#] on [date], approving the PSEG Site in Lower Alloways Creek Township, Salem County, New Jersey, as a site suitable for constructing and operating a new nuclear power plant. In accordance with 10 CFR 52.26, the permit is valid 20 years from the date the NRC issues the ESP.

AGENCIES’ ROLES AND RESPONSIBILITIES:

The final EIS includes information on a broad range of issues that may be regulated by other Federal, State, Tribal, or local authorities. In the event the PSEG ESP is referenced in a future application to build and operate a new nuclear power plant at the PSEG Site, the applicant would have to obtain and maintain other permits and authorizations from Federal, State, Tribal, and local authorities.

Role of the NRC

The NRC was the lead agency for the environmental review of the PSEG ESP application, including the development of the final EIS. In the final EIS, the NRC evaluated the impacts of building and operating, at the PSEG Site, a new nuclear power plant that falls within the PPE documented in the final EIS. The NRC contacted Federal, State, Tribal, regional, and local

agencies to solicit comments. The NRC ensured that the NEPA process was properly conducted and completed before recommending approval for this permit. In addition to considering the environmental effects of the proposed action, the NRC considered alternatives to the proposed action, including the no-action alternative, alternative energy sources, the building and operation of new reactors at alternative sites, and alternative technologies. The NRC also documented applicable requirements and necessary permits of other Federal, State, Tribal, and local agencies in considering the environmental monitoring and mitigation that PSEG may implement if it subsequently applies for and receives authorization to build and operate a nuclear power plant at the PSEG Site.

Role of USACE

The USACE participated with the NRC in the preparation of the final EIS as a cooperating agency and participated collaboratively on the review team. As part of the review team, the USACE was included in all aspects of the environmental review, including scoping, public meetings, and public comment resolution.

PURPOSE AND NEED:

As identified in Section 1.3, "Purpose and Need for the Proposed Actions," of the final EIS, the purpose and need for the proposed action, issuance of an ESP, is to provide for early resolution of site safety and environmental issues, which provides stability in the licensing process. Although an ESP does not itself authorize a reactor to be built or operated at the PSEG Site, to resolve environmental issues the NRC staff assumed in this EIS that a reactor with the parameters specified in the PPE would be built and operated. A new nuclear plant would provide for additional electrical generating capacity to meet the need for up to 2,200 megawatts-electric (MW(e)) of baseload power in the State of New Jersey in 2021.

PROPOSED FEDERAL ACTION:

The proposed NRC Federal action is issuance, under the provisions of 10 CFR 52, of an ESP for the PSEG Site, thereby approving the site as suitable for constructing and operating nuclear power facilities that fall within the PPE. The location for the proposed PSEG Site is adjacent to the existing HCGS and SGS in Lower Alloways Creek Township, Salem County, New Jersey. An ESP does not authorize performance of NRC-regulated construction activities. In order to construct and operate a nuclear power plant, PSEG would be required to request further authorization from the NRC (i.e., applying for a construction permit and operating license, or a combined license (COL)).

The final EIS provides the NRC staff's analyses of the environmental impacts that could result from building and operating a new nuclear power plant that falls within the PPE at the PSEG Site or at one of the four alternative sites. These impacts are analyzed by the NRC to determine if the proposed site is suitable for the PPE and whether there is an alternative site that is obviously superior to the proposed site. In addition, the NRC assessed mitigation measures available for reducing or avoiding adverse environmental effects.

Environmental impacts that may arise from building and operating a new nuclear power plant that fall within the PPE at the PSEG Site were examined for the following resource areas: land use; surface water and groundwater hydrology; terrestrial and aquatic ecology; socioeconomics; environmental justice; historic and cultural resources; meteorology and air quality; geology; public and occupational health; radiological health; noise; transportation; and transmission

systems. These resource areas were also considered within a defined region of influence with other developments or activities that affect the resources cumulatively.

NRC EVALUATION OF THE PROPOSED ACTION:

Section 102(2)(C)(iii) of NEPA states that EISs are to include a detailed statement analyzing alternatives to the proposed action. Accordingly, the NRC and USACE evaluated the proposed action and numerous alternatives to the proposed action in order to make independent determinations according to each agency's regulatory authority. Evaluation criteria included land use, air quality, water use and quality, ecology, waste management, socioeconomics, human health, historic and cultural resources, and environmental justice. Alternatives were evaluated against the proposed action to determine if any of the alternatives presented were obviously superior.

To guide its assessment of the environmental impacts of the proposed action and alternatives, the NRC has established a standard of significance for impacts based on Council on Environmental Quality guidance (40 CFR 1508.27). Table B-1 of 10 CFR 51, Subpart A, Appendix B, provides the following definitions of the three significance levels established by the NRC:

SMALL – Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

MODERATE – Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

LARGE – Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

The final EIS presents the review team's analysis that considers and weighs the environmental impacts of the proposed action at the PSEG Site. Impacts associated with building and operating a nuclear power plant that fall within the PPE at the PSEG Site were considered to be SMALL for most resource areas, with the exception of impacts to land use and terrestrial and wetland resources from building activities (MODERATE); socioeconomic impacts associated with increased noise, air pollution emissions, and vehicle traffic during building activities (SMALL to MODERATE) and with economic impacts on the community and to infrastructure and services from increased traffic during building activities (SMALL to MODERATE); and impacts to historic and cultural resources from building activities (SMALL to MODERATE). Additionally, a range of SMALL to LARGE beneficial impacts was identified due to the increase of tax revenue in the region.

EVALUATION OF ALTERNATIVES:

Chapter 9, "Environmental Impacts of Alternatives," of the EIS addresses the following four categories of alternatives to the proposed action: (1) the no-action alternative, (2) energy source alternatives, (3) alternative sites, and (4) system design alternatives. As summarized below, none of the potential alternatives is environmentally preferable to the proposed action.

i. No-Action Alternative

The No-Action alternative, discussed in Section 9.1, “No-Action Alternative,” of the final EIS, refers to a scenario in which the NRC would deny the ESP requested by PSEG. Likewise, the USACE would also take no action or deny the DA Individual Permit request. Upon such a denial by the NRC or USACE, the construction and operation of a new nuclear power plant at the proposed location on the PSEG Site in accordance with the 10 CFR 52 process for referencing an approved ESP would not occur. Under the no-action alternative the NRC would not issue the ESP. There are no environmental impacts associated with not issuing the ESP. However, under the no-action alternative, none of the benefits intended by the ESP process would occur, including (1) early resolution of siting issues prior to large investments of financial capital and human resources in new plant design and construction; (2) early resolution of issues related to the environmental impacts of construction and operation of new nuclear generation units that fall within the PPE, (3) the ability to bank sites on which nuclear plants might be located, and (4) the facilitation of future decisions about whether to construct new nuclear power generation facilities.

ii. Alternative Energy Sources

The purpose and need for the proposed action as identified in Section 1.3 of the final EIS is to provide for early resolution of site safety and environmental issues, which provides stability in the licensing process. This ESP does not authorize PSEG to build and operate a new nuclear plant. But as discussed in Section 1.3.1, “NRC Proposed Action,” the EIS considers the issue of a projected shortfall in baseload capacity in the State of New Jersey in 2021. Chapter 9, “Environmental Impacts of Alternatives,” of the final EIS examines the potential environmental impacts associated with alternatives to building a new baseload nuclear generating facility.

To compare different types of energy plants with a new nuclear power plant, NRC analyzed other power-generation sources, a combination of sources, and power-generation technologies that are technically reasonable and available. The three primary energy sources for generating electric power in the United States are coal, natural gas, and nuclear energy. Coal-fired plants are the primary source of baseload power generation in the United States. Natural-gas combined-cycle power-generation plants are often used as intermediate generation sources, but can also be used for baseload power. These alternatives, which would require new generating capacity, are discussed in Section 9.2.2, “Alternatives Requiring New Generating Capacity,” of the final EIS.

In the coal-fired generation alternative, the NRC staff assumed building and operation of four pulverized coal-fired units at the PSEG Site, each with a net capacity of 580 (MW(e)) for a total capacity of 2320 MW(e). The effects of air emissions effects would be greater for a coal-fired plant than for a new nuclear power plant because of the release of carbon dioxide gas and other air pollutants. Coal combustion generates waste in the form of ash. Disposal of this waste could affect land use noticeably because of the acreage needed and could affect groundwater quality. Other environmental effects and cumulative effects would be similar to those associated with a new nuclear power plant at the PSEG Site.

For the natural-gas-fired alternative, the NRC staff assumed the building and operation of four natural-gas fired combined-cycle units at the PSEG Site, each with a net capacity of 580 MW(e) for a total capacity of 2320 MW(e). The impacts to air quality from the natural gas plant would be less than those from a coal-fired plant, but much greater than those from a nuclear plant. In addition, some adverse socioeconomic impacts for the natural gas plant would be less than those for the nuclear plant because of the smaller construction workforce; however, the property

tax benefits would also be reduced. Other environmental effects and cumulative effects would be similar to those associated with a new nuclear power plant at the PSEG Site.

Renewable energy sources such as wind and solar power were considered, but current technologies for these energy sources are not capable of reasonably producing baseload power similar to the 2200 MW(e) targeted by PSEG. With respect to wind energy, approximately 1400 off-shore wind turbines occupying 165,000 acres would be needed to produce a similar amount of energy. Solar photovoltaic and/or solar thermal technologies would require a land area of 11,000 to 22,000 acres to match the 2200 megawatt capacity rating of the nuclear plant, although such a solar array would generate less than a third of the energy of the nuclear plant on average. Wind and solar alternatives, and the basis for determining they were not viable alternatives to the proposed action, are discussed in Section 9.2.3, "Feasible Discrete New Generating Alternatives," of the final EIS. Other alternative energy sources that the NRC considered, but determined not to be viable alternatives, were: oil-fired power generation, hydroelectric power, geothermal energy, municipal solid waste, other biomass-derived fuels, fuel cells, and wood waste. Each alternative energy source eliminated from detailed study and the basis for its removal is provided in Section 9.2.3 of the final EIS.

The NRC also evaluated alternatives not requiring new generating capacity. Alternatives not requiring new generating capacity that the NRC considered, but determined not to be viable alternatives, were: purchasing power from other electricity suppliers, reactivating retired power plants, extending the life of existing power plants, and implementing conservation or demand-side management programs. Each alternative was determined not to be a viable alternative, and the basis for this determination is provided in Section 9.2.1, "Alternatives Not Requiring New Generation Capacity," of the final EIS.

Finally, the NRC considered a combination of energy alternatives that included contributions from solar and wind power, biomass (including municipal solid waste and methane from landfills), and natural-gas-fired power generation. The impacts of this alternative would be similar to those for the natural-gas-fired alternative discussed above, except there would be an increase in aesthetic impacts related to the wind turbines.

Therefore, the review team concluded that none of the alternative energy options, including the combination of alternative energy sources, were both consistent with PSEG's objective of building baseload generation units and environmentally preferable to the proposed action.

iii. Alternative Sites

The NRC independently evaluated PSEG's process for screening the potential sites, which was based on guidance in the NRC's NUREG-1555, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants: Environmental Standard Review Plan," NRC Regulatory Guide 4.7, "General Site Suitability Criteria for Nuclear Power Stations"; and the Electric Power Research Institute's Siting Guide. NRC's site-selection process guidance calls for identification of a Region of Interest (ROI), followed by successive screening to identify candidate areas, potential sites, candidate sites, and the proposed site. The ROI is the geographic area considered by the applicant in searching for candidate areas and potential sites for a new nuclear power plant. The ROI is typically the State in which the proposed site is located or the relevant service area for the applicant.

The NRC staff evaluated PSEG's methodology for selecting its ROI and candidate areas and its evaluation of potential sites, candidate sites, and alternative sites. For its ROI, PSEG chose the

State of New Jersey, which is consistent with guidance in NUREG-1555. The NRC staff also concluded that the method used to identify candidate areas, potential sites, candidate sites, and alternative sites was reasonable, logical and adequately satisfied applicable NRC guidance.

Candidate areas for siting a new nuclear power plant in New Jersey were identified by PSEG after considering the following criteria: population density, water availability, proximity to high-voltage transmission lines and load centers, access to transportation (highways, rail lines, and/or barge), and avoidance of designated lands (parks, preserves, recreation areas, and active military bases). Ultimately, five candidate sites were chosen for additional site suitability analyses, which resulted in the PSEG Site being chosen as the preferred site. The remaining four sites examined are listed as alternative sites in Section 9.3, "Alternatives Sites," of the final EIS:

- Site 4-1 in Hunterdon County, New Jersey;
- Site 7-1 in Salem County, New Jersey;
- Site 7-2 in Salem County, New Jersey; and
- Site 7-3 in Cumberland County, New Jersey

Although there are differences and distinctions between the environmental impacts of building and operating a new nuclear power plant at the proposed PSEG Site or at one of the alternative sites, these differences are not sufficient to determine that any of the alternative sites would be environmentally preferable to the proposed site. In such a case, the proposed site prevails because none of the alternative sites is obviously superior.

iv. Alternative System Designs

The NRC considered a variety of alternatives for heat-dissipation systems and cooling water systems. About two-thirds of the heat from a commercial nuclear reactor is rejected as heat to the environment. The remaining one-third of the reactor's generated heat is converted into electricity. Normal heat-dissipation systems transfer this rejected heat into the atmosphere as evaporation and/or heated discharge water to mix with nearby water bodies.

Cooling-water systems withdraw water from the source water body and return water to the receiving water body. One of the main interactions a nuclear power plant has with the environment occurs at the intake and discharge structures. The review team considered four intake alternatives, as well as alternatives to PSEG's proposed discharge system, including design modifications to the proposed system and alternative locations for the discharge pipeline; however, none of these alternatives was found to be environmentally preferable to the design proposed and described by PSEG in its ESP application.

The review team also considered alternative water sources for both the cooling-water and the service-water systems because withdrawal of water for both of these systems has the potential to affect the environment. PSEG's proposed system design would withdraw makeup water from the Delaware River using a new shoreline intake structure. The review team considered alternative sources of water including water supplies from groundwater, surface waters from streams and rivers other than the Delaware River, and municipal wastewater from nearby communities. However, the NRC staff concluded that none of these sources of water would be a viable alternative to the Delaware River. The alternative system designs considered are discussed in Section 9.4, "System Design Alternatives," of the final EIS.

MITIGATION MEASURES

Because an ESP does not provide NRC authorization to conduct construction activities, there are no necessary mitigation measures for NRC regulated activities at this stage. However, the NRC staff and the USACE evaluated the impacts of building and operating a plant at the PSEG Site under NEPA, and accordingly, considered reasonably foreseeable mitigation measures to address the impacts of building and operation. Accordingly, the mitigation measures discussed below refer to the impacts of such potential future building and operation. In the event the PSEG ESP is referenced in a future application to build and operate a new nuclear power plant at the PSEG Site, the applicant would be subject to permitting conditions from other State, local, and Federal agencies based on applicable requirements associated with certain project activities (e.g., issues related to wetlands mitigation, land-use and construction management, and species conservation).

Water Use and Quality

PSEG would be required to obtain a Clean Water Act (33 USC 1251 et seq) Section 401 certification before commencing any Federal–authorized construction activities that would result in discharge to navigable waters. PSEG would comply with Federal and State regulations and permits. PSEG would also implement best management practices (BMPs) and a site-specific Stormwater Pollution Prevention Plan (SWPPP).

Land Use

PSEG would minimize land disturbance and comply with requirements of applicable Federal, State, and local permits, regulations, and zoning.

Terrestrial and Wetland Resources

PSEG would minimize land disturbance, implement BMPs, and comply with requirements of applicable Federal and State permits and regulations. PSEG would revegetate temporarily disturbed areas. Any conditions required by the USACE, such as compensatory mitigation, would be addressed in the USACE permit, if issued. Mitigation may only be used after all appropriate and practical steps to avoid and minimize adverse impacts to aquatic resources, including wetlands and streams, have been taken. All remaining unavoidable impacts must be compensated to the extent appropriate and practicable. Onsite, in-kind mitigation such as wetland creation and enhancement would be used. PSEG would implement BMPs to limit potential impacts from vegetation control, road maintenance, and other activities.

Aquatic Ecosystem

PSEG would minimize marsh creek and Delaware River Estuary bottom disturbance and dredging, implement BMPs and a SWPPP, and comply with requirements of applicable Federal and State permits and regulations. Use of closed-cycle cooling system would reduce impingement and entrainment of aquatic biota.

Socioeconomics and Environmental Justice

PSEG would implement standard noise-control measures for construction equipment and limit the types of construction activities during nighttime and weekend hours. PSEG would control fugitive dust through watering and control vehicle emissions through regularly scheduled maintenance. PSEG would follow local ordinances that require mitigation of road degradation.

Historic and Cultural Properties

PSEG has an inadvertent discovery procedure EN-AA-602-0006, Revision 0, "Cultural and Historic Resources" (ADAMS Accession No. ML12290A144), in place to minimize impacts to historic and cultural resources during building and operating of the proposed facility. In the event that significant historic and cultural resources were encountered, this procedure would be followed. The NRC executed a Memorandum of Agreement (80 FR 53579) that identifies the process for developing the specific mitigation measures at the COL stage to address the potential adverse indirect visual effect, if natural draft cooling towers are selected. The USACE consultations with the New Jersey State Historic Preservation Office and Tribes are ongoing.

Air Quality

PSEG would implement emission-specific strategies and measures to ensure compliance with the applicable regulatory limits defined by the National Primary and Secondary Ambient Air Quality Standards and the National Emission Standards for Hazardous Air Pollutants. PSEG would implement a dust control program and require contractors, vendors, and subcontractors to adhere to appropriate Federal and State regulations governing construction activities and construction vehicle emissions. PSEG would comply with Federal, State, and local air-quality permits and regulations, including requirements of the Clean Air Act (CAA, 42 USC 7401 et seq) and of the New Jersey Department of Environmental Protection Division of Air Quality.

Radiological Health

PSEG would meet NRC and U.S. Environmental Protection Agency standards to maintain doses to members of the public and workers below the NRC limits and as low as reasonably achievable. Mitigative actions instituted for members of the public would also ensure that doses to biota other than humans would be well below National Council on Radiation Protection and International Atomic Energy Agency guidelines during operation activities.

Nonradiological Health

PSEG would comply with Federal, State, and local regulations governing construction activities and construction vehicle emissions, noise-control ordinances, and health regulations. PSEG would use a causeway for construction traffic; implement a traffic management plan; implement proposed improvements to roads and install traffic signals to improve traffic patterns during building activities. During operation activities, PSEG would adhere to permits and authorizations issued by State and local agencies. PSEG would stagger arrival and departure times and outage schedules to minimize impacts to transportation routes and control vehicle emissions by regularly scheduled maintenance. PSEG would use standard sound attenuation measures for mechanical draft cooling towers to limit the noise impact.

Nonradiological Wastes

PSEG would manage wastes according to existing practices currently used at HCGS and SGS and in compliance with Federal, State, and county regulations during building activities. PSEG would maintain compliance with National Pollutant Discharge Elimination System permit requirements; adhere to local, State, and Federal permits and regulations regarding the classification and disposition of wastes during operation activities.

Fuel Cycle, Transportation, and Decommissioning

Industrywide changes in technology are reducing fuel cycle impacts and PSEG would implement a waste-minimization program. PSEG would comply with the NRC and U.S. Department of Transportation regulations.

DETERMINATION:

Based on an independent review, analysis and evaluation contained in the final EIS; careful consideration of all the identified social, economic, and environmental factors and input received from other agencies, organizations and the public; the factors and mitigation measures outlined above; and the input received during the mandatory hearing, it is determined that the standards for issuance of an ESP as described in 10 CFR 52.24, have been met and the requirements of Section 102 of NEPA have been satisfied.

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