



Photo courtesy of PSEG Power, LLC

DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR AN EARLY SITE PERMIT (ESP) AT THE PSEG SITE

Reader's Guide

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INTRODUCTION

On May 25, 2010, PSEG Power, LLC, and PSEG Nuclear, LLC (collectively known as PSEG) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) for an early site permit at a proposed site in Salem County, New Jersey. The proposed PSEG Site is located adjacent to PSEG's existing nuclear reactor units at the Hope Creek Generating Station and Salem Generating Station.

WHAT IS AN EARLY SITE PERMIT?

An early site permit is a Commission approval of a site for one or more nuclear power facilities. The early site permit application and review process makes it possible to evaluate and resolve safety and environmental issues related to siting before the applicant makes a large commitment of resources. If the early site permit is approved, the applicant can "bank" the site for up to 20 years for future reactor siting and can conduct certain site preparation and preliminary construction activities as authorized by the NRC. ***An early site permit does not, however, authorize the actual construction and operation of a new nuclear power plant.*** To construct and operate a nuclear power plant, the holder of an early site permit must obtain from the NRC a construction permit and an operating license, or a combined license, each of which are separate actions that require their own safety and environmental reviews.

WHAT IS THIS READER'S GUIDE?

The NRC has reviewed the early site permit application submitted by PSEG and has prepared a draft environmental impact statement as part of its review of that application. This Reader's Guide summarizes the impacts of building and operating a new nuclear power plant at the PSEG Site as presented in the draft environmental impact statement. This Reader's Guide also summarizes the cumulative impacts and alternatives evaluated.

WHERE CAN I FIND MORE INFORMATION?

NUREG-2168 is a three-volume document containing the NRC's draft *Environmental Impact Statement for an Early Site Permit (ESP) at the PSEG Site*.

- Review the electronic version of the entire environmental impact statement found on the compact disc included with this summary.
- View an online version at <http://www.nrc.gov/reactors/new-reactors/esp/pseg/documents/nrc-2014.html>.
- Review a printed copy or compact disc at Salem Free Public Library at 112 West Broadway, Salem, New Jersey.
- Contact the U.S. Nuclear Regulatory Commission Environmental Project Manager, Allen Fetter, at allen.fetter@nrc.gov to obtain a copy.

WHAT IS BEING PROPOSED AND WHY?

PSEG is seeking approval from the NRC of the proposed PSEG Site for possible future use in building and operating a new nuclear power plant at the site to provide additional electricity for use in the State of New Jersey. While no new nuclear reactors are being proposed for

ENVIRONMENTAL IMPACT STATEMENT

An environmental impact statement is required for any action that may have significant effects on the environment.

An environmental impact statement describes the potential for project effects on the environment and is used to inform Federal decision making.

construction at the site at this time, PSEG envisions that any new reactors eventually built at the site would be capable of providing a maximum of approximately 2200 megawatts of baseload-generating capacity. The growing population and development in the State of New Jersey requires additional sources of electricity to meet the anticipated demand for power in 2021. Any new reactors built at the PSEG Site would assist in meeting that need.

As part of its evaluation of the environmental aspects of the early site permit application, the NRC prepares an **environmental impact statement** in accordance with the NRC's regulatory requirements. Even though no new nuclear reactors are being proposed for construction or operation at this time, the environmental impact statement describes the effects on the environment of building and operating a new nuclear power plant at the PSEG Site.

NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act establishes the basis for considering environmental issues in the conduct of Federal activities.

The Act requires the following:

- Use a systematic, interdisciplinary approach for decision making on actions that may affect the human environment.
- Inform and involve the public in the decision-making process.
- Consider significant environmental impacts associated with the action.
- Consider alternatives and their impacts on the proposed action.

The environmental impact statement provides the necessary information required under this Act.

WHO IS LEADING THE REVIEW OF THE PSEG PROJECT?

The NRC is the lead Federal agency for granting early site permits. The U.S. Army Corps of Engineers is cooperating with the NRC in the preparation of information in a single environmental impact statement for both agencies' decision-making processes. The NRC decision relates to the issuance of an early site permit for the possible future use of the PSEG Site to construct and operate a new nuclear power plant. Permits from the U.S. Army Corps of Engineers are necessary to perform building and operation activities that may affect nearby water bodies. Both agencies must ensure that the **National Environmental Policy Act** process is properly

conducted and completed before they issue their respective permits. Because the reviews

necessary for both agencies are similar, having both agencies work together saves time when reviewing an application. Both agencies have therefore worked together to produce the environmental impact statement on PSEG's early site permit application.

The NRC staff (including its contractor staff at Oak Ridge National Laboratory, Argonne National Laboratory, Brookhaven National Laboratory, and Pacific Northwest National Laboratory) and U.S. Army Corps of Engineers staff reviewed PSEG's application and environmental information and collectively determined the environmental impact levels. The NRC staff, the U.S. Army Corps of Engineers staff, and the contractor staff are known collectively as the "review team."

The following sections contain a detailed description of how the NRC determines whether to issue an early site permit to PSEG. After the U.S. Army Corps of Engineers has completed its review, it will issue a separate Record of Decision.

WHAT IS THE U.S. NUCLEAR REGULATORY COMMISSION'S PROCESS FOR ISSUING AN EARLY SITE PERMIT?

Once an application for an early site permit has been accepted, two separate reviews—a safety review and an environmental review—are conducted by the NRC.

Exhibit A shows the complete review process for an early site permit. The final product from the safety review is a safety evaluation report that details reactor design and safety issues. The final product from the environmental review is an environmental impact statement that describes the environmental effects of building and operating a new nuclear plant.

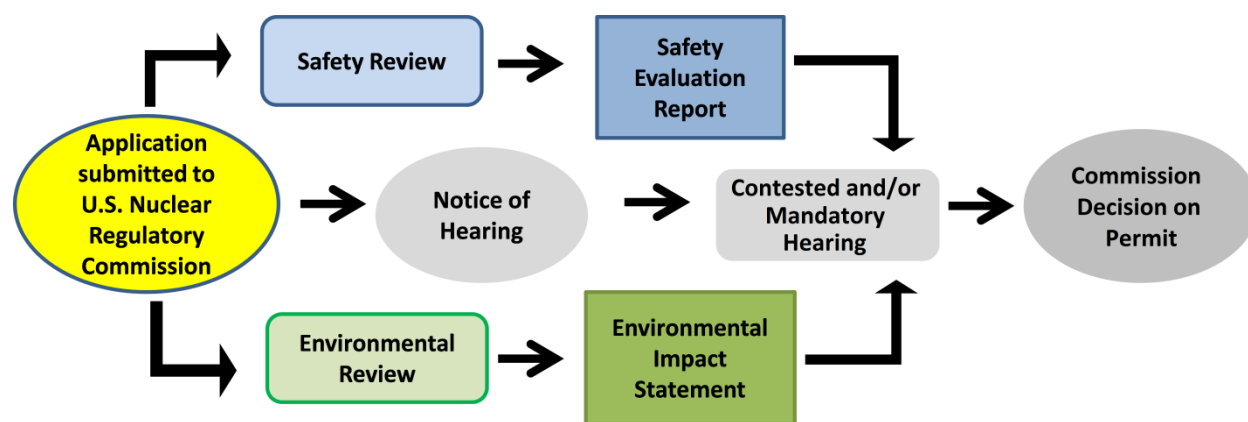


EXHIBIT A. REVIEW AND APPROVAL PROCESS FOR EARLY SITE PERMITS.

Both reviews are addressed in a mandatory hearing. The **Atomic Safety and Licensing Board (ASLB)** also may conduct a contested hearing if an outside party successfully files a petition that raises safety or environmental concerns about the early site permit. The final decision on whether to grant the early site permit will be made by the NRC's five-member **Commission**.

ATOMIC SAFETY AND LICENSING BOARD

The members of the Atomic Safety and Licensing Board panel are employees of the U.S. Nuclear Regulatory Commission who act as administrative judges on behalf of the Commission.

NRC'S SAFETY REVIEW PROCESS

The purpose of the safety review is to ensure that any new reactors will be safely built and operated according to NRC regulations and requirements. The review includes an evaluation of the design of the facility, siting requirements, quality assurance programs, physical security, and emergency preparedness. Additional information included in the analysis describes radioactive waste management and radiation protection. There are opportunities for public participation during the safety review process. The NRC's analysis is documented in the safety evaluation report.

THE COMMISSION

The U.S. Nuclear Regulatory Commission has five Commissioners who are selected by Presidential appointment. The Commission develops policies and regulations for nuclear reactors and nuclear materials safety, issues licenses, and rules on legal matters.

The **Advisory Committee on Reactor Safeguards** reviews each application and the NRC's safety evaluation report (see Exhibit B), and provides advice to the NRC's five-member Commission about the potential hazards for the new nuclear plant and the acceptability of the proposed safety standards.

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

The Advisory Committee on Reactor Safeguards is composed of non-U.S. Nuclear Regulatory Commission technical experts. It is structured so that experts representing many technical areas can provide independent advice to the U.S. Nuclear Regulatory Commission.

Exhibit B shows the steps involved in the safety review process leading up to the mandatory hearing and potential issuance of an early site permit.

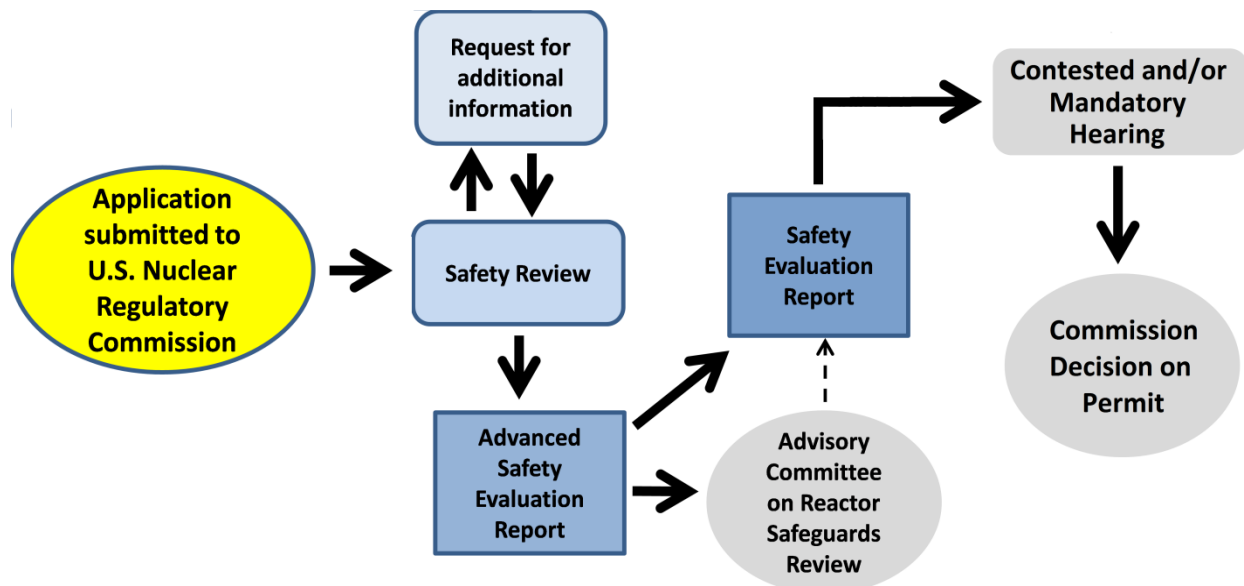


EXHIBIT B. SAFETY REVIEW PROCESS.

NRC's ENVIRONMENTAL REVIEW PROCESS

The environmental review includes a careful look at the potential environmental impacts of building and operating new nuclear reactors and the potential mitigation measures for reducing environmental effects. The NRC applies the National Environmental Policy Act and the NRC's Environmental Standard Review Plan, which provides detailed instructions for the review of each environmental subject area (e.g., water, human health, ecology). Environmental effects are explained using descriptions from the **Council on Environmental Quality**.

The environmental review includes consultation and coordination with local, State, and Federal agencies and tribal nations, as well as independent evaluations by the NRC, U.S. Army Corps of Engineers, and contractor experts (i.e., the review team). These experts review the applicant's information on the environment; visit and tour the proposed site; request further information from the applicant as needed; review other published studies and reports; and, when necessary, perform additional analyses to confirm the applicant's conclusions. The review team's analysis of the environmental impacts is documented in the environmental impact statement.

COUNCIL ON ENVIRONMENTAL QUALITY

The Council coordinates environmental efforts between Federal agencies and the White House offices to develop environmental policies. The Chair of the Council serves as the environmental policy advisor to the President.

In addition, the environmental review includes input from the public by inviting comments before the draft environmental impact statement is prepared, and again after the draft environmental impact statement is issued. Impacts are categorized as **SMALL, MODERATE, LARGE**, or a

IMPACT CATEGORIES

- **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.

range of these categories, which are the accepted descriptions from the Council on Environmental Quality.

Exhibit C shows a more detailed process flow for the environmental review leading up to the mandatory hearing and potential issuance of an early site permit.

COMMISSION REVIEW AND DECISION

A mandatory hearing examining both safety and environmental issues will be conducted prior to a decision on the issuance of an early site permit. In addition, if an outside party successfully files a petition that raises safety or environmental concerns about the early site permit, the ASLB also could conduct a contested hearing. Following a contested

hearing, the ASLB would also make a recommendation to the Commission about whether to grant the early site permit.

The NRC's five-member Commission makes the final decision about whether to grant an early site permit.

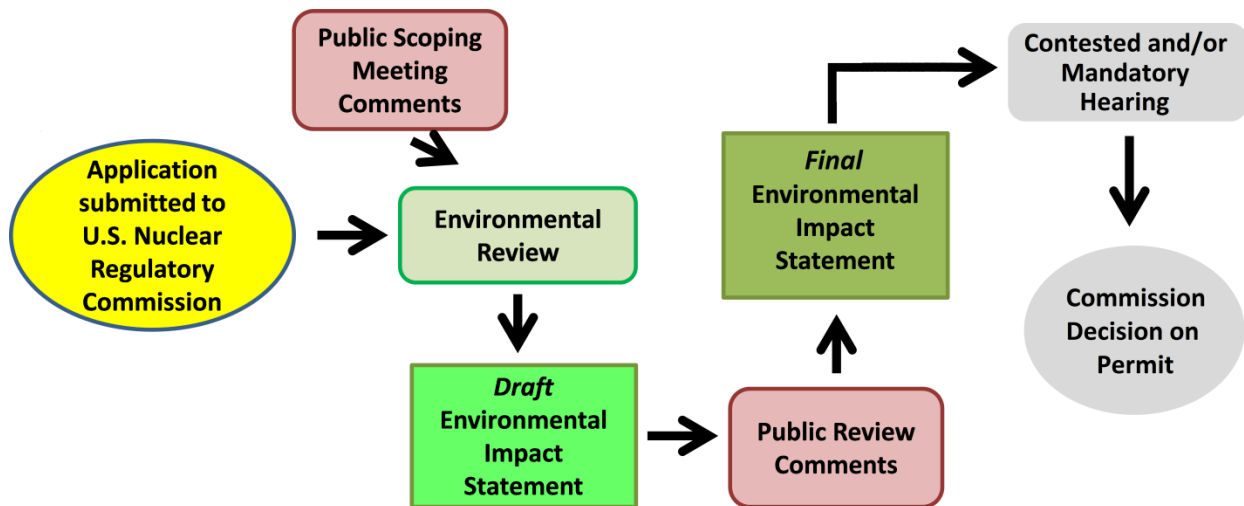


EXHIBIT C. ENVIRONMENTAL REVIEW PROCESS.

WHO ELSE DID THE U.S. NUCLEAR REGULATORY COMMISSION WORK WITH DURING THE ENVIRONMENTAL REVIEW?

A large number of Federal, State of New Jersey, State of Delaware, tribal and local agencies, and community organizations were contacted during the development of the draft environmental impact statement. These parties provided comments and information used to develop a good understanding of the environmental resources in the area and the potential for environmental impacts.

See Appendix C of the draft environmental impact statement for more information about how this project has coordinated with Federal, States of New Jersey and Delaware, tribal, and local agencies. Detailed information about consultations can be found in Appendix F of the draft environmental impact statement.

In addition to the licenses it may receive from the NRC, PSEG will need many other environmental permits and authorizations to begin building and operating a new nuclear plant at the PSEG Site. Some of these permits are listed in Exhibit D. Appendix H of the draft environmental impact statement contains a comprehensive list of all the permits and requirements PSEG will need to build and operate a new nuclear plant at the PSEG Site.

AGENCIES AND TRIBES CONTACTED FOR THIS PROJECT

- Advisory Council on Historic Preservation, Office of Federal Agency Programs, Washington, D.C.
- Borough of Penns Grove, Salem County, New Jersey
- Cherokee Nation of New Jersey, Newark, New Jersey
- City of Salem, Salem County, New Jersey
- Cumberland County, New Jersey
- Delaware Department of Natural Resources and Environmental Control, Dover, Delaware
- Delaware River Basin Commission, Trenton, New Jersey
- Delaware State Historic Preservation Office, Dover, Delaware
- Delaware Tribe of Indians, Bartlesville, Oklahoma
- Eastern Delaware Nation, Troy, Pennsylvania
- Federal Emergency Management Agency, Region II, New York, New York
- Gloucester County, New Jersey
- Nanticoke Lenni-Lenape Indians of New Jersey, Bridgeton, New Jersey
- Nanticoke Tribe Association, Millsboro, Delaware
- National Marine Fisheries Service, Northeast Regional Office, Gloucester, Massachusetts
- New Castle County, Delaware
- New Jersey Department of Environmental Protection, Trenton, New Jersey
- New Jersey Historic Preservation Office, Trenton, New Jersey
- Salem County, New Jersey
- South Jersey Transportation Planning Organization, Vineland, New Jersey
- Taino Tribal Council of Jatibonico, Vineland, New Jersey
- The Delaware Nation–Delaware Tribe of Western Oklahoma, Anadarko, Oklahoma
- Township of Carneys Point, Salem County, New Jersey
- Township of Elsinboro, Salem County, New Jersey
- Township of Lower Alloways Creek, Salem County, New Jersey
- Township of Pennsville, New Jersey
- U.S. Army Corps of Engineers, Philadelphia District, Philadelphia, Pennsylvania
- U.S. Environmental Protection Agency, Region 2, New York, New York
- U.S. Fish and Wildlife Service, Northeast Regional Office, Hadley, Massachusetts

EXHIBIT D. EXAMPLES OF PERMITS AND AUTHORIZATIONS THAT WOULD BE REQUIRED IF A NEW NUCLEAR POWER PLANT WERE TO BE BUILT AT THE PSEG SITE.

Federal level	<ul style="list-style-type: none"> • Construction permit and operating license; Nuclear Regulatory Commission • Department of the Army Section 404 Permit and Section 10 Permit; U.S. Army Corps of Engineers • Section 9 Permit for causeway construction; U.S. Coast Guard • Spill Prevention, Control, and Countermeasures Plan; U.S. Environmental Protection Agency
State level	<ul style="list-style-type: none"> • Section 401 Water Quality Certification; New Jersey Department of Environmental Protection • Consultation concerning potential impacts on state-listed terrestrial and aquatic species; New Jersey Department of Environmental Protection, Division of Fish & Wildlife • Compliance with National Historic Preservation Act; New Jersey State Historic Preservation Office and Delaware State Historic Preservation Office • National Pollutant Discharge Elimination System Permit; New Jersey Department of Environmental Protection • Water Allocation Permit; New Jersey Department of Environmental Protection • Construction Permit; New Jersey Department of Community Affairs
Local level	<ul style="list-style-type: none"> • Site Plan Approval; Salem County • Construction Permit; Lower Alloways Creek Township • Soil Erosion and Sediment Control Plan; Salem County Soil Conservation District

WHAT IS THE ASSESSMENT OF ENVIRONMENTAL IMPACTS BASED UPON?

The action evaluated in the environmental impact statement is for the NRC to either issue or deny an early site permit for the possible future use of the PSEG Site for a new nuclear power plant; however, the issuance of an early site permit does not, by itself, authorize the actual construction and operation of any such plant. Because the NRC must evaluate the environmental impacts of the action proposed, and because site suitability encompasses construction and operational parameters, the NRC review team examined the impacts of both

PLANT PARAMETER ENVELOPE

A set of plant design parameters that an early site permit applicant expects will bound the design characteristics of the reactor or reactors that might be constructed at a given site. The plant parameter envelope values, therefore, serve as a bounding surrogate for a potential nuclear power plant.

building and operating hypothetical nuclear reactors and their associated facilities at the PSEG Site. The design for such a hypothetical new plant was based upon nuclear reactor and power plant designs identified and specified by PSEG in a **plant parameter envelope**. Consequently, the NRC review team's evaluation focused upon the environmental effects of constructing and operating one or more reactors that have characteristics falling within the postulated plant parameter envelope. The plant parameter envelope is discussed in greater detail in Appendix I of the environmental impact statement. It is assumed that a new nuclear power plant at the

PSEG Site would generate a maximum of approximately 2200 megawatts of electricity that would be available to the service area in New Jersey, as well as to the regional wholesale power market.

Multiple, high-voltage transmission lines currently connect the PSEG Site to the power transmission grid. A new onsite electrical switchyard would need to be constructed to support the operation of a new nuclear power plant. While the existing transmission lines have adequate capacity to accommodate the additional power to be generated by a new nuclear power plant at the PSEG Site, an independent assessment by PJM Interconnection recommended that a new transmission line be added to address current congestion and grid stability issues near the PSEG Site. Therefore, the review team did not consider any new transmission lines in its evaluation of the potential impacts of building and operating a new nuclear power plant at the PSEG Site, but it did consider the potential impacts of constructing and operating new grid stability transmission lines in assessing cumulative impacts.

PSEG has stated that additional access road capacity is necessary to address future transportation needs for the PSEG Site. To provide this additional access road capacity, PSEG has proposed a new three-lane causeway that would be constructed on elevated structures for its entire 5-mile length through the coastal wetlands. The proposed causeway would extend northeast from the PSEG property along or adjacent to the existing transmission-line corridor to the intersection of Money Island Road and Mason Point Road. The review team included an evaluation of the impacts of building and operating the proposed causeway as part of the impacts of building and operating a new nuclear power plant at the PSEG Site.

WHAT PARTS OF THE ENVIRONMENT MIGHT BE AFFECTED?

Exhibit E shows the location of the PSEG Site in New Jersey.

The PSEG Site is located on the southern part of Artificial Island on the east bank of the Delaware River, about 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. The PSEG Site is located adjacent to the existing Hope Creek Generating Station and Salem Generating Station on the northwestern portion of the existing property owned by PSEG.

The Delaware River borders the western and southern sides of the existing PSEG property. The portion of the river flowing adjacent to the site is 2.5 miles wide.



*Tidal marsh near the PSEG Site
(Photo courtesy of PSEG)*

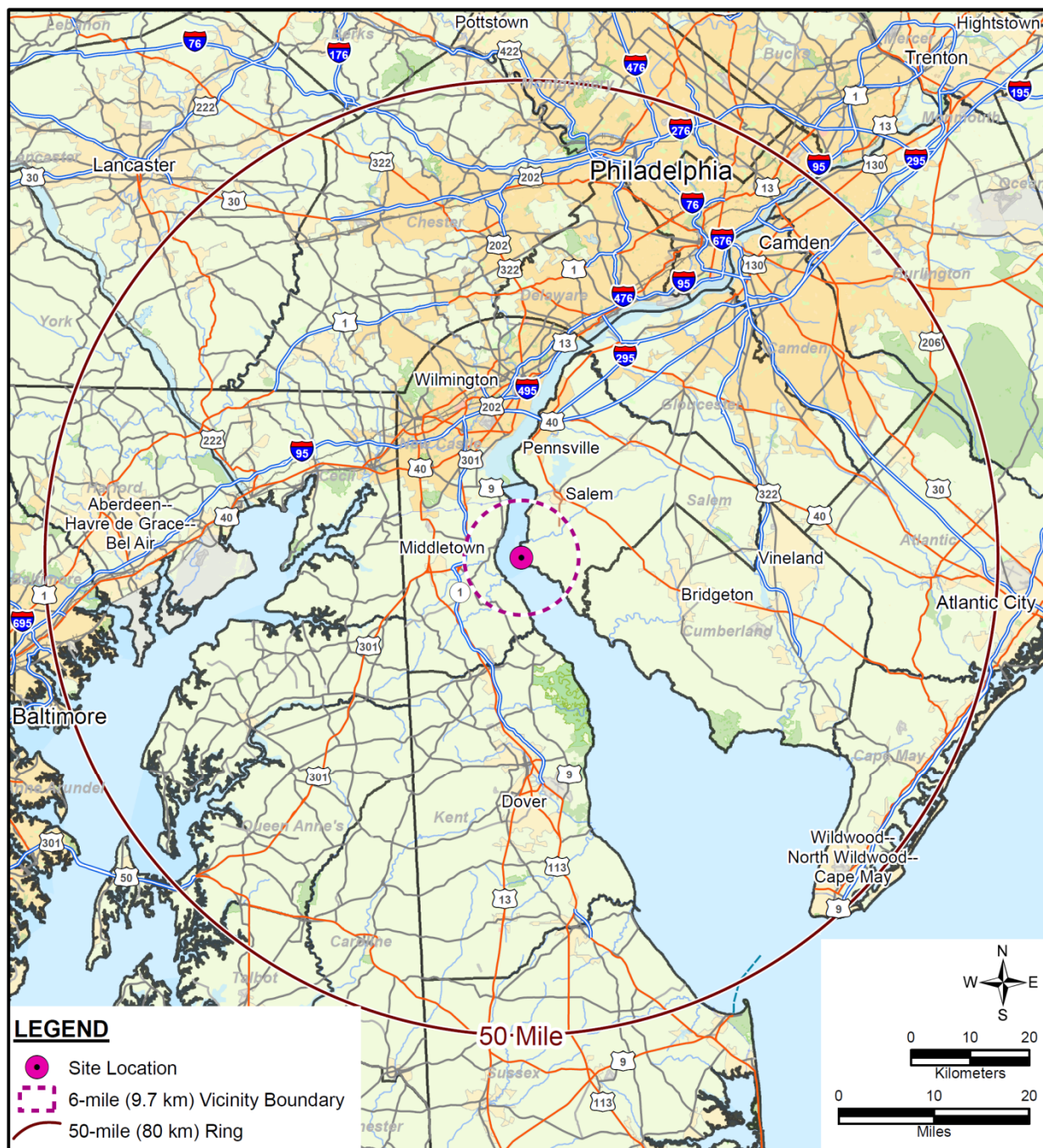


EXHIBIT E. LOCATION OF THE PSEG SITE IN NEW JERSEY.

Lands developed by the U.S. Army Corps of Engineers (i.e., the Artificial Island Confined Disposal Facility for the placement of material dredged from the Delaware River) are located immediately north of the PSEG property along the east bank of the river. Lands consisting of tidal marsh are located to the north and east of the PSEG property. The proposed 5-mile causeway would cross this tidal marsh area and would be constructed on elevated piers.

Water for cooling any new reactors to be constructed at the site would be withdrawn from the Delaware River. The drinking-water supply and water for the demineralized water distribution system, fire protection, construction activities, and other minor plant operating systems would be provided by groundwater from new or existing wells at the PSEG Site.

WHAT ARE PEOPLE'S CONCERNS?

To learn about the concerns of interested groups and individuals across the country, public comments were invited for 75 days through a notice in the *Federal Register*, mailings, and news releases. Many of the concerns that were within the scope of the environmental impact statement centered on the following issues:

- What is the cumulative impact on water use and availability in the Delaware River due to the addition of a new nuclear power plant at the site of the existing Hope Creek Generating Station and Salem Generating Station?
- What are the impacts of water withdrawal and discharge upon aquatic communities in the Delaware River, including potentially negative impacts to fisheries?
- How will the proposed causeway in combination with a new nuclear power plant affect estuary ecosystems, coastal wetland areas, and visual resources?
- What is the economic benefit to the region from building and operating a new nuclear power plant?
- Were other energy alternatives, including the use of renewable energy sources, considered for power generation?

PUBLIC PARTICIPATION

- A 75-day public scoping process began on October 15, 2010.
- On November 4, 2010, two public scoping meetings were held at the Salem Community College in Carneys Point, New Jersey. All environmental impact statement topics were discussed.
- All scoping comments received and their corresponding responses are included as Appendix D in the draft environmental impact statement.
- The draft environmental impact statement has been released for a 75-day public review and comment period. Comments received and their corresponding responses will be included as Appendix E in the final environmental impact statement.

HOW DOES THE PROJECT AFFECT THE ENVIRONMENT?

Building and operating a new nuclear power plant at the PSEG Site would have effects on multiple environmental and regional resources. The environmental impact statement considers the potential for impact on each resource.

LAND-USE IMPACTS

The PSEG Site covers 819 acres, of which PSEG owns 734 acres as part of the existing Salem Generating Station/Hope Creek Generating Station site. PSEG has developed an agreement in principle with the U.S. Army Corps of Engineers to acquire an additional 85 acres adjacent to the existing PSEG property to complete the 819-acre PSEG Site. This 85-acre tract is located within the Artificial Island Confined Disposal Facility immediately north of Hope Creek Generating Station. In addition, during project construction, PSEG would temporarily lease from the U.S. Army Corps of Engineers another 45 acres within the Artificial Island Confined Disposal Facility north of the PSEG Site for use as a laydown area while building the new nuclear power plant.

Building a new nuclear power plant would disturb about 430 acres on the PSEG Site and in the immediate vicinity (excluding the proposed causeway). Of this total, 225 acres on the PSEG Site would be permanently disturbed, and 205 acres would be temporarily disturbed for laydown and construction areas (160 acres on the PSEG Site and 45 acres off the site). The most significant land-use impact on the PSEG Site would be the loss of dredge spoil disposal capacity at the Artificial Island Confined Disposal Facility, which could result in the U.S. Army Corps of Engineers developing other confined disposal facility sites in the region. However, the review team believes that this land-use impact would not be destabilizing.

Building the proposed causeway would disturb up to 69.0 acres, of which 45.5 acres would be permanently disturbed and 23.5 acres would be temporarily disturbed for laydown and construction areas. The most significant land-use impact associated with the causeway would be the permanent land disturbance that would occur on undeveloped wetlands protected under Deeds of Conservation Restriction within the Alloway Creek Watershed Wetland Restoration Site, the Abbott's Meadow Wildlife Management Area, and the Mad Horse Creek Wildlife Management Area. However, the review team believes that these land-use impacts would not be destabilizing.

WATER-RELATED IMPACTS

Building a new nuclear power plant at the PSEG Site and the proposed causeway would affect nearby surface water resources, primarily in the Delaware River and its associated marsh creeks. Alterations potentially affecting surface-water resources at and near the PSEG Site may occur from filling shallow artificial ponds, filling coastal marshes and creeks, building activities within the Delaware River, and building in floodplains. Building the new intake and discharge structures would include dredging and the removal of sediment in the Delaware River. The implementation of best management practices during such building activities would result in the minimization of any impacts to surface water resources.

Operation of the new cooling-water intake system would withdraw about 0.7 percent of the Delaware River's minimum monthly flow near the site. The majority of the water withdrawn would be consumptively used by the new nuclear power plant for station cooling.

The impacts to surface-water quality in the Delaware River during operations would be minor because (1) the volume of stormwater runoff from the site would be small compared with the volume of the river; (2) the thermal plume for the new nuclear power plant would be completely contained within the heat dissipation area for the existing Salem Generating Station; (3) discharges from the plant would meet State of New Jersey permit requirements; (5) the river bottom near the outlet of the discharge pipe would be designed to prevent scour; and (6) maintenance dredging of the intake would be infrequent, and any disturbed sediment would quickly settle.

Groundwater would be used at a new nuclear power plant for the potable and sanitary water system, the fire protection system, the demineralized water distribution system, and other minor uses. The average withdrawal rate during operations would be 210 gallons per minute, with a maximum withdrawal rate of about 950 gallons per minute. Two new wells would be installed on the site to supply groundwater for a new nuclear power plant. The impact on nearby groundwater users from the operational use of groundwater by a new nuclear power plant at the PSEG Site would be minimal.

TERRESTRIAL ECOLOGY AND WETLANDS IMPACTS

The majority of terrestrial ecology and wetlands impacts would result from site-preparation and activities related to building a new nuclear power plant and the proposed causeway. Impacts would result from clearing, leveling, excavating, and placing fill. Most of the permanent land disturbance (108 acres of a total of 225 acres) for a new nuclear power plant would occur in wetland areas. Likewise, most of the land disturbance (45.5 acres of a total of 69.0 acres) for the construction of the proposed causeway would be permanent and would have a noticeable impact because it would occur in undeveloped wetland areas; however, the impacts would not be expected to destabilize important attributes of wetland resources. Proposed compensatory actions could offset some of the impacts to wetlands.



Black-crowned night-heron
(Photo courtesy of Alain Carpentier/
Wikimedia Commons)

Clearing of vegetation and other site-preparation activities at the PSEG Site have the potential to affect wildlife adversely, either through direct harm or by forcing wildlife to move to nearby habitats where they would have to compete with other wildlife for resources. However, habitat available for terrestrial wildlife that currently exists at the PSEG Site where building activities would occur is more common elsewhere in the

vicinity. Impacts to terrestrial and wetland wildlife and plant species, including important terrestrial and wetland species and habitat, would therefore be minor.

AQUATIC ECOLOGY IMPACTS

Aquatic resources in the Delaware River would be affected mainly by building the cooling-water intake and discharge systems for a new nuclear power plant. Potential impacts on aquatic biota in the onsite ponds and small marsh creeks, the marsh creek systems, and the Delaware River



Short-nosed sturgeon
(Photo courtesy of U.S. Fish and
Wildlife Service)

Estuary because of building activities would be temporary, localized, and minor.

However, the impacts would involve some physical alteration of habitat (e.g., infilling, cofferdam placement, dredging, pile driving) including temporary or permanent removal of associated benthic organisms, sedimentation, changes in hydrological regimes, and changes in water quality.

The review team has reviewed the potential impacts of operating a new nuclear power plant and the associated Delaware River intake system, discharge system, and proposed causeway on aquatic resources.

Because the proposed intake structure for a

new nuclear power plant would be located flush with the eastern shoreline of the Delaware River and would use a closed-cycle cooling system, a low through-screen intake velocity (less than 0.5 feet per second), and a fish screening system designed to increase the survival of impinged fish, entrainment and impingement impacts on aquatic resources are expected to have minor impacts on the aquatic resources in the area. Impacts on aquatic organisms in the Delaware River due to the discharge could result from thermal, chemical, and physical effects on the substrate, as well as hydrological changes, but these impacts were found to be minimal. Other impacts from operational activities, such as maintenance dredging and causeway maintenance, also are expected to be minor.

PROTECTED SPECIES

No areas on the PSEG Site are Federally designated as critical habitat for any Federally-listed threatened or endangered terrestrial species. However, four Federally-listed terrestrial species may occur or have the potential to occur on the PSEG Site or in the immediate vicinity, and all four species are Federally-listed as threatened. These species include one reptile—the bog turtle (*Gytemys muhlenbergii*)—

PROTECTED SPECIES

Species and/or critical habitat that are protected by Federal laws, such as the Endangered Species Act of 1973. If a listed, protected species is found, the Federal agency must consult with either the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, or both, to determine if there is an adverse effect on the species or habitat.

and three plant species: the sensitive joint-vetch (*Aeschynomene virginica*), the swamp pink (*Helonias bullata*), and the small whorled pogonia (*Isotria medeoloides*). Of these four species, only the bog turtle has been recorded as actually occurring on the site or in the immediate vicinity. The northern long-eared bat (*Myotis septentrionalis*) is proposed for Federal-listing as endangered and is known to occur in the northern and central portions of Salem County, New Jersey, within 6 miles of the PSEG Site.

An additional number of terrestrial species (20 bird species and one salamander) that are State-listed as either threatened or endangered may occur or have the potential to occur in the vicinity of the PSEG Site. However, during qualitative surveys at the site, only three State-listed species—the cattle egret (*Bubulcus ibis*), black-crowned night-heron (*Nycticorax nycticorax*), and osprey (*Pandion haliaetus*)—were actually observed on the site, near the existing site access road.

Federally-listed threatened or endangered aquatic species that may occur or have the potential to occur near the PSEG Site include two fish [the shortnose sturgeon (*Acipenser brevirostrum*) and the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*)] and five sea turtle species [the leatherback (*Dermochelys coriacea*), hawksbill (*Eretmochelys imbricata*), Kemp's ridley (*Lepidochelys kempi*), loggerhead (*Caretta caretta*), and Atlantic green sea turtle (*Chelonia mydas*)]. The National Marine Fisheries Service considers the estuarine portion of the Delaware River Estuary and tidal waters near the PSEG Site to be **essential fish habitat** for 15 species.

ESSENTIAL FISH HABITAT

Waters and substrate necessary for spawning, breeding, feeding, or growth to maturity for marine, estuarine, and anadromous animals.

Appendix F in the draft environmental impact statement displays the correspondence between the NRC and the U.S. Fish and Wildlife Service and the National Marine Fisheries Service to consult with those two Federal agencies on the potential for adverse impacts to Federally-protected terrestrial and aquatic species, respectively. The final environmental impact statement will present the conclusions reached by each of these Federal agencies.

SOCIOECONOMIC IMPACTS

The review team considered the entire region within a 50-mile radius of the PSEG Site when assessing socioeconomic impacts. However, because of expected commuter patterns, the distribution of residential communities in the area, and the likely socioeconomic impacts, the review team identified a primary economic impact area composed of the four counties nearest the site—Salem, Cumberland, and Gloucester Counties in New Jersey and New Castle County in Delaware—as the area with the greatest potential for economic impacts.

The review team concludes that the physical impacts of building and operating a new nuclear power plant at the PSEG Site on workers and the local public from noise, on air quality, and on buildings would be minor. However, the physical impacts on the road network during building would be noticeable, so PSEG would provide resources to mitigate road degradation near the site. In addition, the addition of new cooling towers and new reactor domes at the PSEG Site and the proposed causeway would noticeably affect the aesthetic qualities from viewpoints in

New Castle and Salem Counties. The review team concludes that these physical impacts on aesthetic resources from a new nuclear power plant and causeway would not be amenable to mitigation.

PSEG estimates that 4100 workers could be required during the peak construction period. For most socioeconomic resources, the review team analyzed only the impacts of this peak construction workforce as an upper bound to potential impacts, recognizing that impacts would likely be smaller during the remainder of the building period. PSEG records indicate that of current Hope Creek Generating Station and Salem Generating Station employees who live in the economic impact area, 12.1 percent reside in Cumberland County, 17.7 percent in Gloucester County, 49.6 percent in Salem County, and 20.6 in New Castle County. The review team assumes that in-migrating workers involved in building a new nuclear power plant at the PSEG Site would follow this same distribution pattern. The in-migration of workers and their families to support building a new plant would increase the population of the economic impact area by less than about 0.2 percent during the peak construction period. The increase would be most pronounced in Salem County, which would experience about a 1.24 percent increase in population. The review team considers such population increases to be minor.

PSEG anticipates it would need 600 employees for operations-related activities for a new nuclear plant at the PSEG Site. Based on the current residential distribution of the Hope Creek Generating Station and Salem Generating Station operations workforces, PSEG estimated 82.6 percent of the operations workforce for a new plant would live in the economic impact area. The in-migration of operations workers and their families would increase the population of the economic impact area by about 0.05 percent. The increase would be most pronounced in Salem County, which would experience a population increase of about 0.4 percent. The review team considers such population increases to be minor.

The review team concludes that economic impacts in the economic impact area from building a new nuclear plant at the PSEG Site would be minor and beneficial, with the exception of noticeable and large beneficial economic impacts to Salem County. Tax impacts during the project building period would be minor and beneficial throughout the region and economic impact area. The review team concludes that economic impacts from operations at the PSEG Site would be minor and beneficial for the region and the economic impact area. During operations, the review team predicts minor and beneficial impacts to sales and excise tax, as well as to income tax receipts, in the economic impact area and region. However, the review team predicts noticeable and beneficial impacts to the State of New Jersey from PSEG corporate tax payments and large beneficial impacts to Salem County from property tax payments.

Infrastructure and community services impacts span issues associated with traffic, recreation, housing, public services, and education. Impacts from building and operating a new nuclear power plant at the PSEG Site on housing, public services, and education would be minor. Traffic impacts during building are expected to be localized and short-term, but noticeable and adverse. These traffic impacts could be reduced by further planning and mitigation measures similar to those discussed in PSEG's Transportation Impact Analysis. Recreational impacts would be noticeable and adverse during building because of impacts to roadways around

recreational resources, and during both building and operations because of the aesthetic impacts on viewsheds from the increased industrial character of the PSEG Site.

ENVIRONMENTAL JUSTICE IMPACTS

The review team determined there are no environmental, health, or socioeconomic pathways by which the identified minority or low-income populations in the 50-mile region would be likely to suffer disproportionately high and adverse environmental or health impacts because of building or operation activities. There are no minority or low-income Census block groups in the vicinity of the PSEG Site, as the closest are located 8 miles north of the site in the City of Salem. The review team expects that potential adverse socioeconomic impacts from building or operation activities for a new nuclear power plant would not affect the low-income and minority populations in the region disproportionately because the review team found no evidence of any unique characteristics or practices among those communities that could lead to a disproportionately high and adverse impact.

HISTORIC AND CULTURAL RESOURCES

Building and operating a new nuclear power plant at the PSEG Site could affect either known or undiscovered historic and cultural resources. In accordance with the provisions of the National Historic Preservation Act and the National Environmental Policy Act, the NRC and the U.S. Army Corps of Engineers are required to make a reasonable and good faith effort to identify historic properties and cultural resources in the **Areas of Potential Effect** and permit areas and, if present, determine whether any significant impacts are likely.

AREA OF POTENTIAL EFFECT

A geographic area in which an action may change the character or use of a historic property.

Because the NRC and the U.S. Army Corps of Engineers each has separate regulatory authority, neither agency is responsible for all aspects of the project. The NRC is responsible for considering potential effects on historic and cultural resources on Artificial Island and any potential visual impacts resulting from the construction and operation of a new nuclear power plant. Because Artificial Island is a human-made island, there is no potential for impacts to archaeological remains. However, six historic properties in New Jersey and 18 historic properties in Delaware listed in the National Register of Historic Places are visible in the 4.9-mile Area of Potential Effect. Two additional properties with the potential for listing have been noted in New Jersey, and one property with the potential for listing has been found in Delaware. Because the PSEG Site is adjacent to the existing Salem Generating Station and Hope Creek Generating Station, development of a new nuclear power plant would be consistent with the existing landscape. Therefore, the NRC determined that the visual impacts of a new nuclear power plant would not have an adverse effect on historic properties. The Delaware State Historic Preservation Office has concurred that no adverse effects to historic resources under its jurisdiction would result from the project, and the New Jersey State Historic Preservation Office has concurred that no adverse effects would result from the visual effects of the project.

The U.S. Army Corps of Engineers is responsible for considering the effects on historic and cultural resources of dredging for a new barge facility, water intakes for a new nuclear power plant, and construction of a new causeway. An assessment of submerged resources near Artificial Island identified three possible historic resources, but they were determined to be ineligible for listing in the National Register of Historic Places. The New Jersey State Historic Preservation Office has concurred with the finding that no historic properties would be affected by dredging, but the U.S. Army Corps of Engineers has yet to make its eligibility and effects determinations concerning the submerged resources.

An archaeological survey of the proposed causeway route identified six archaeological sites, but it did not deem any of the sites as eligible for listing on the National Register of Historic Places either individually or as contributing resources to the Elsinboro-Lower Alloways Creek Rural Agricultural District or the John Mason House. The New Jersey State Historic Preservation Office has not concurred with this assessment and has requested that additional research be conducted. The U.S. Army Corps of Engineers has yet to make its eligibility and effects determinations concerning the six sites within the permit area for the proposed causeway.

Overall, the review team believes that potential impacts on historic and cultural resources would be minor. However, consultations between the U.S. Army Corps of Engineers and the New Jersey State Historic Preservation Office on permit areas are ongoing. The New Jersey State Historic Preservation Office has concurred with the finding of no effects on submerged resources; however, the U.S. Army Corps of Engineers has yet to issue its finding.

METEOROLOGICAL AND AIR QUALITY IMPACTS

Building activities for a new nuclear power plant at the PSEG Site would result in temporary impacts on local air quality because of the emissions associated with ground-clearing activities and the use of a concrete batch plant. Air emissions during operation would primarily be generated by vehicles and diesel generators; however, the diesel generators would be used only intermittently and for brief durations. Release of heat and moisture from operation of the cooling-water system also may affect air quality via the condensation of heated water discharged from the cooling towers that may result in visible steam clouds, ground fogging and icing, plume shadowing, and salt deposition. However, any impacts to meteorology and air quality from these phenomena would be minimal.

Car and truck emissions would vary based on time of day and number of workers driving to and from the PSEG Site, but the overall effects of these traffic emissions would be localized and temporary and would have a minimal impact on air quality.

NONRADIOLOGICAL HEALTH IMPACTS

Nonradiological public health concerns would include occupational injuries and exposure to dust, vehicle exhaust, noise, and electromagnetic fields, as well as possible health effects from operation of the cooling-water system. Occupational injuries to workers would be mitigated through training and the use of appropriate equipment and protective clothing. A safety and medical program would be provided for workers, including regular health and safety monitoring.

Building activities that generate dust and vehicle exhaust would occur on the site; however, the nearest residence is located almost 3 miles away. Therefore, the effects of dust and noise upon nearby populations would be minor. During operation, noise levels for plant operation are also expected to be minor.

The cooling-water discharge would carry heated water from the nuclear power plant through a diffuser in the Delaware River. Some harmful bacteria and pathogens may grow in warm waters; however, potential health effects on the public and workers from microorganisms that favor warmer water were found to be unlikely.

RADIOLOGICAL HEALTH IMPACTS

If a new nuclear power plant is built at the PSEG Site, the sources of radiation exposure from normal operations for plant workers would include direct radiation exposure as well as gas and liquid effluent releases. The nearby public and biota other than humans also could receive a radiation dose from the new nuclear power plant through direct exposure, gas effluent releases (breathing or by eating food grown or raised in the vicinity upon which radioactive material dispersed in the atmosphere may have been deposited), and liquid effluent releases (eating aquatic foods where discharged radioactive material became mixed with local surface water and groundwater), as shown in Exhibits F and G.

Contained sources of radiation for a new nuclear power plant at the PSEG Site would be shielded and, therefore, would provide a negligible contribution to the external dose to the population from direct radiation from the containment building and other plant buildings. The maximum total body dose a member of the public might receive within a 50-mile radius of a new nuclear power plant at the PSEG Site would be less than 5 millirem per year. This amount is approximately 60 times less than the average background radiation one receives in a year in the United States, which is 311 millirem per year. The review team concluded there would be no observable health impacts on the public from normal operation of any new nuclear power plant at the PSEG Site.

NONRADIOLOGICAL WASTE IMPACTS

Nonradioactive waste that would be generated, handled, and disposed of during building activities for a new nuclear power plant at the PSEG Site includes construction debris, dredged spoils, stormwater runoff, municipal and sanitary waste, dust, and air emissions. The types of nonradioactive waste that would be generated, handled, and disposed of during the operation of a new nuclear power plant at the PSEG Site include solid wastes, liquid effluents, and air emissions. Solid wastes include municipal waste, sewage-treatment sludge, and industrial wastes. Liquid waste includes discharges such as effluents containing chemicals or biocides, wastewater effluents, site stormwater runoff, and other liquid wastes such as used oils, paints, and solvents that require offsite disposal. In addition, small quantities of hazardous waste and mixed waste (i.e., waste with both hazardous and radioactive characteristics) may be generated during plant operations. PSEG would be required to follow all regulations related to gaseous, liquid, and air nonradioactive wastes during building and operations. The review team found the impacts would be minimal based on compliance with State and Federal Regulations.

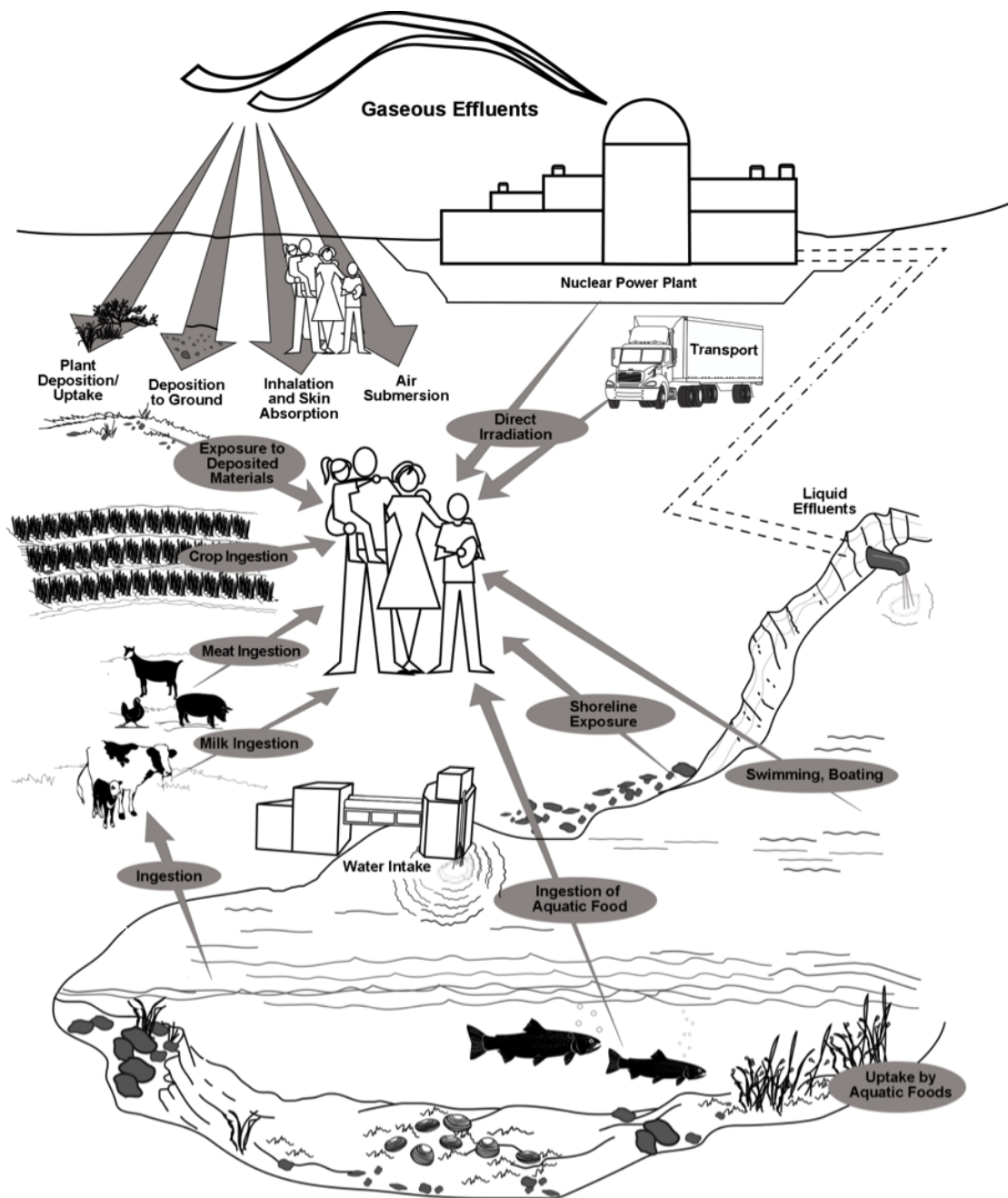


EXHIBIT F. EXPOSURE PATHWAYS TO HUMANS.

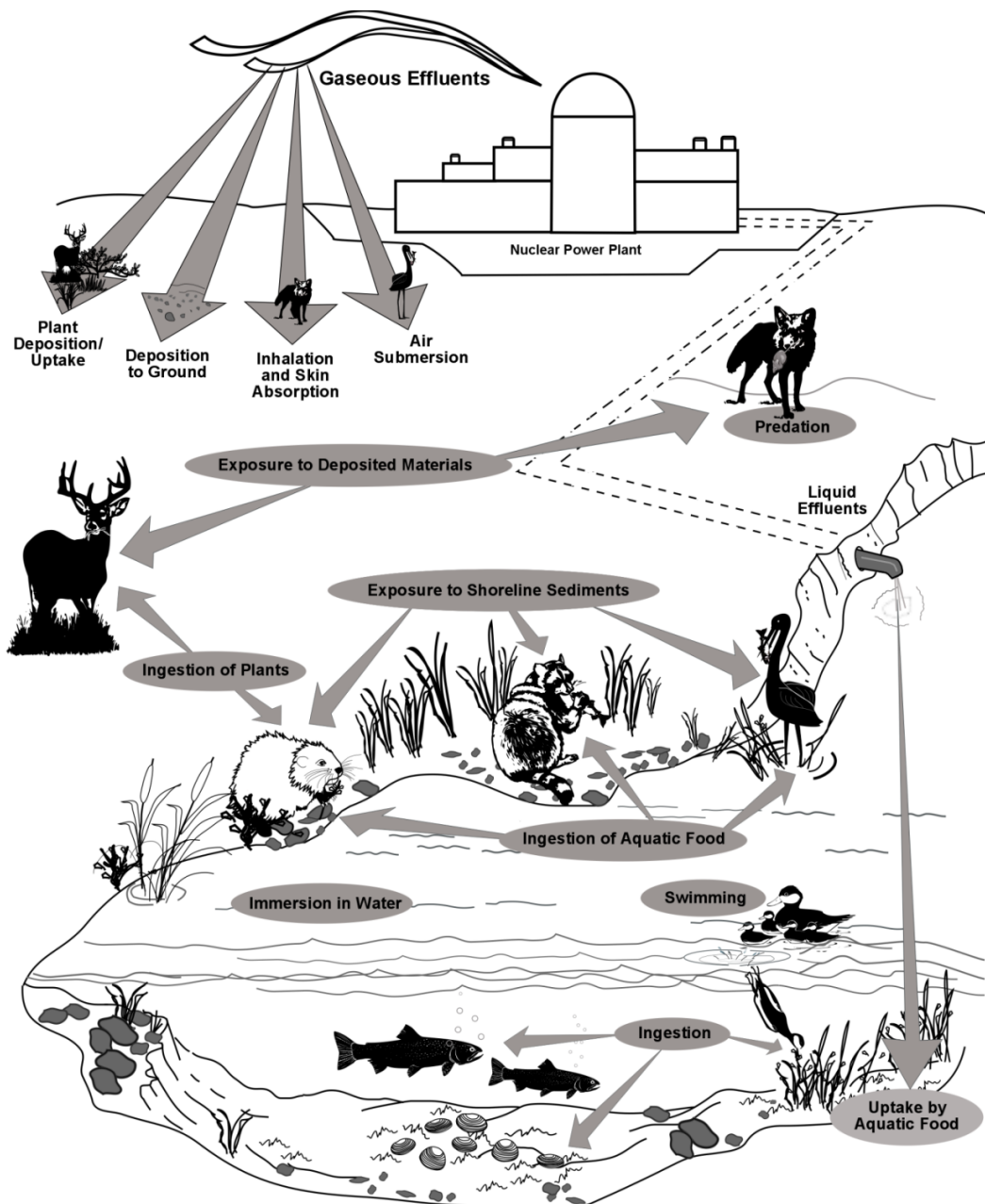


EXHIBIT G. EXPOSURE PATHWAYS TO WILDLIFE AND PLANTS.

SUMMARY OF ENVIRONMENTAL IMPACT LEVELS

Exhibit H summarizes the level of impacts to each resource category from building and operating a new nuclear power plant at the PSEG Site.

EXHIBIT H. LEVELS OF IMPACTS ON RESOURCES.

Resource Category	Building	Operation
Land use	MODERATE (430 acres disturbed for new nuclear plant; 69 acres disturbed for proposed causeway)	SMALL
Water-related		
Surface-water use	SMALL	SMALL
Groundwater use	SMALL	SMALL
Surface-water quality	SMALL	SMALL
Groundwater quality	SMALL	SMALL
Ecology		
Terrestrial and wetland ecosystems	MODERATE (loss or disturbance of wetland habitat)	SMALL
Aquatic ecosystems	SMALL	SMALL
Socioeconomic Resources		
Physical impacts	SMALL to MODERATE (aesthetic impacts from new cooling towers, reactor domes, and proposed causeway)	SMALL to MODERATE (aesthetic impacts from new cooling towers, reactor domes, and proposed causeway)
Demography	SMALL	SMALL
Economic impacts on the community	SMALL to MODERATE (beneficial; increased revenue)	SMALL to LARGE (beneficial; increased tax payments)
Infrastructure and community services	SMALL to MODERATE (impacts to traffic on local roads; reduced recreational enjoyment due to aesthetics of new structures)	SMALL to MODERATE (reduced recreational enjoyment due to aesthetics of new structures)
Environmental justice	None	None
Historic and cultural resources	SMALL	SMALL
Air quality	SMALL	SMALL
Nonradiological health	SMALL	SMALL
Radiological health	SMALL	SMALL
Nonradiological waste	SMALL	SMALL

HOW CAN THE IMPACTS BE REDUCED?

Many of the SMALL impacts are considered minimal because monitoring and the appropriate use of environmental practices and safeguards would reduce any negative effects on the environmental resource. However, some of the impacts determined to be greater than SMALL could be reduced or compensated or could be prevented from becoming disruptive.

LAND USE IMPACTS

The 85-acre parcel north of the PSEG property supports U.S. Army Corps of Engineers dredging operations as part of the Artificial Island Confined Disposal Facility. Land-use impacts to this parcel due to building a new nuclear power plant would result in the need for the U.S. Army Corps of Engineers to replace some or all of this disposal capacity by using an alternate existing facility or by developing a new facility at another location. PSEG has developed an agreement in principle to assist the U.S. Army Corps of Engineers in acquiring property for such replacement disposal capacity.

WETLANDS IMPACTS

Mitigation of impacts to terrestrial and wetland resources may include restoration of disturbed habitats, creation of new habitat in previously disturbed areas, and enhancement of other natural habitat. Any mitigation plans would be developed in consultation between PSEG and the applicable Federal, State, and local agencies. Following the implementation of reasonable measures to avoid or minimize impacts to wetlands, compensation for the unavoidable loss of wetlands could be undertaken with the execution of an approved wetland restoration and/or rehabilitation program. PSEG has identified compensatory lands that could offset some of the impacts to wetlands, including candidate areas in portions of the existing PSEG Site, Mannington Meadow, Mason's Point, and additional areas of the PSEG Alloway Creek Watershed Wetland Restoration site.

TRAFFIC IMPACTS

A deteriorating service level currently exists on some roads and intersections in Salem County, New Jersey. Impacts to traffic because of a new nuclear power plant could be mitigated by changing the three Grieves Parkway intersections from two-way stop sign controls to traffic light controls, construction of turn bays at the Grieves Parkway–Oak Street intersection, and adding another turn bay at the Front Street–New Jersey Route 49 intersection.

MEASURES AND CONTROLS TO LIMIT ADVERSE IMPACTS

In its evaluation of potential environmental impacts from building and operating a new nuclear power plant at the PSEG Site, the review team considered PSEG's stated intention to comply with the following measures and controls that would limit adverse environmental impacts:

- compliance with applicable Federal, State, and local laws, ordinances, and regulations intended to prevent or minimize adverse environmental impacts (e.g., solid waste

management, erosion and sediment control, air emissions, noise control, stormwater management, spill response and cleanup, and hazardous material management);

- compliance with applicable requirements of permits or licenses required for building and operation of a new nuclear power plant (e.g., Department of the Army Section 404 Permit, National Pollutant Discharge Elimination System permit);
- compliance with existing PSEG processes and/or procedures applicable for environmental compliance activities during building and operation of a new nuclear plant at the PSEG Site (e.g., solid waste management, hazardous waste management, and discharge prevention and response);
- incorporation of environmental protection provisions into construction contracts; and
- management and minimization of solid, radiological, chemical, and hazardous wastes.

Examples of PSEG's stated measures to minimize impacts and protect the environment include the following:

- using best management practices for construction activities;
- implementing plans to manage stormwater and to prevent and appropriately address accidental spills;
- managing and/or restoring wetlands and marsh creek channels; and
- adhering to Federal, State, and local permitting requirements.

The review team considered these measures and controls—as presented in Sections 4.11 and 5.12 of the environmental impact statement—in its evaluation of the impacts of building and operating a new nuclear power plant at the PSEG Site. For each environmental resource area, some kind of coordination with another Federal, State, or local agency is required to obtain permission to build and operate a new nuclear power plant. The required permits and certifications are listed in Appendix H of the environmental impact statement. Exhibit I provides a summary of planned activities to help minimize environmental effects from building and operating a new nuclear power plant at the PSEG Site.

EXHIBIT I. SUMMARY OF MEASURES AND CONTROLS TO MINIMIZE ENVIRONMENTAL IMPACTS.

Resource Area	Impact Minimization Plan
Land Use	<ul style="list-style-type: none"> • Perform ground-disturbing activities in accordance with regulatory and permit requirements to control and to minimize impacts. • On the site and in the vicinity: limit ground disturbances to the smallest area necessary, minimize work in wetlands and floodplains, and minimize potential spills of hazardous wastes/materials through training and rigorous compliance with applicable regulations. • In the causeway and pipeline corridors and other offsite areas: locate new corridors to avoid critical or sensitive habitat and species, limit ground-disturbing activities to defined corridors and areas, minimize work in wetlands and floodplains, and minimize impacts via avoidance and compliance with permitting requirements.

EXHIBIT I. (CONTINUED)

Resource Area	Impact Minimization Plan
Water-related Impacts	<ul style="list-style-type: none"> • For hydrological alterations: construct causeway as an elevated structure, minimize sizes of cleared areas; use design features to minimize and stabilize affected areas including areas where shoreline modifications and dredging activities occur; reconnect isolated marsh creek channels by developing supplemental connecting channels; restore affected marsh creek channels as part of wetland mitigation program implementation; design discharge structure to minimize outfall scour and to promote rapid mixing to minimize thermal and chemical impacts; prepare and maintain a stormwater pollution prevention plan; and comply with New Jersey Pollutant Discharge Elimination System permits. • For water use and water quality: install/construct cofferdams and silt curtains to limit mixing and transport of suspended sediments and/or use other standard engineering controls to protect affected water bodies; design and implement site grading to manage runoff for controlled discharge to the Delaware River; limit construction to shallow aquifers to avoid impacts to deeper aquifers; use stormwater management plans during construction to minimize erosion and sedimentation; limit planned effluent discharges in compliance with applicable state and Federal permit specifications; implement spill prevention control plans to minimize the impacts of any spills; and prepare and maintain a stormwater pollution prevention plan and a New Jersey Pollutant Discharge Elimination System permit to minimize releases.
Terrestrial Ecosystems	<ul style="list-style-type: none"> • Obtain a Department of the Army permit and comply with requirements to avoid, minimize, restore, and/or compensate impacts on wetlands, including development of a mitigation action plan. • Maintain ongoing efforts to avoid and minimize impacts to wetlands as part of design and permitting process. • Phase the building activities to minimize the duration of soil exposure and implement soil-stabilization measures as quickly as possible after disturbance to minimize erosion and sedimentation. • Consult with State and Federal agencies to minimize potential unavoidable impacts to listed species as part of offsite proposed causeway development. • Limit clearing to the smallest amount of area necessary to construct the plant and the causeway and conduct land clearing to minimize disturbance of vegetation and substrate.
Aquatic Ecosystems	<ul style="list-style-type: none"> • Obtain and comply with the Department of the Army permit and State 401 water quality certification requirements to avoid and minimize impacts on aquatic resources from dredging and in-water installation activities. • Use best management practices to minimize erosion and sedimentation based on New Jersey stormwater pollution prevention requirements. • Use cofferdams and/or silt curtains to limit mixing and transport of suspended sediments. • Maintain ongoing efforts to avoid and minimize impacts to aquatic ecosystems as part of design and permitting process. • Aquatic resources on the site and in offsite corridors are protected during maintenance activities with best management practices that comply with Federal and State permits to prevent degradation to water quality. • Design the water intake screens to minimize impingement or entrainment of fish and other large aquatic organisms. • Treat effluents according to State of New Jersey discharge permit specifications. • Use of cooling towers and a closed-loop cooling cycle would significantly reduce the thermal plume effects on aquatic organisms.

EXHIBIT I. (CONTINUED)

Resource Area	Impact Minimization Plan
Socioeconomics and Environmental Justice	<ul style="list-style-type: none"> • Comply with Occupational Safety and Health Administration regulations for worker safety and health. • Manage major high noise construction activities to limit and minimize noise impacts to residences in the vicinity. • Install traffic controls and additional turning capacity to mitigate traffic delays in and around the city of Salem. • Implement three shifts for construction workforce to spread additional construction traffic volume over a 24-hour period. • Stagger shifts, encourage carpooling, and schedule the time of deliveries to minimize traffic impacts to shift changes or commute times. • Erect signs alerting drivers of construction and potential for increased construction traffic. • Use procedures and employee training program to reduce potential for traffic accidents.
Historic and Cultural Resources	<ul style="list-style-type: none"> • Conduct cultural resource surveys, including subsurface sampling and visual impact assessments prior to initiating proposed and future ground-disturbing activities to identify historic properties and cultural resources. • Conduct Phase II survey and consult with the New Jersey State Historic Preservation Office to define mitigation requirements, as appropriate, for construction of the causeway. • Follow established procedures to halt work and consult with New Jersey State Historic Preservation Office if a potential unanticipated historic, cultural, or paleontological resource is discovered.
Air Quality	<ul style="list-style-type: none"> • Use dust control measures (e.g., surface watering, stabilizing disturbed areas and spoils areas, and covering trucks) during building. • Maintain operational effectiveness of pollution control devices installed on construction vehicles and emissions-generating equipment. • Obtain air permits, operate systems within permit limits, and monitor emissions as required.
Nonradiological Health	<ul style="list-style-type: none"> • Adhere to all Occupational Safety and Health Agency and State safety standards, practices, and procedures. • Implement a site-wide Safety and Medical Program, including safety policies and safe work practices, as well as general and topic-specific training.
Radiological Health	<ul style="list-style-type: none"> • Maintain doses to construction workers below NRC public dose limits. • Maintain doses to members of the public below the NRC's and the Environmental Protection Agency's regulatory standards. • Maintain occupational doses below NRC standards and ensure implementation of a program to maintain plant worker doses as low as reasonably achievable.
Nonradioactive Waste	<ul style="list-style-type: none"> • Manage generated waste including sanitary waste in accordance with local, State, and Federal requirements. • Use existing landfills for disposal of waste. • Implement a waste-minimization plan, including beneficial reuse and recycling of building debris. • Implement both a stormwater pollution prevention plan as required by the New Jersey Pollutant Discharge Elimination System permit and a spill control plan to reduce impacts from site runoff and spills.

WHAT IS THE RELATIONSHIP OF THIS PROJECT WITH OTHER PROJECTS IN THE AREA?

Cumulative impacts may result when the environmental effects associated with the proposed action are added to the temporary or permanent effects associated with past, present, and near-future projects. Cumulative impacts can result from the combination of effects that might have been minor by themselves but that become more noticeable when affecting the same resource over a period of time.

A number of projects exist near or are proposed for areas near the PSEG Site. These projects may be complete or in various stages of development. If project information was available and the project had the potential to contribute to cumulative impacts, it was detailed in the draft environmental impact statement. Exhibit J lists projects considered in the cumulative impacts assessment.

EXHIBIT J. LIST OF PAST, PRESENT, OR NEAR-FUTURE PROJECTS NEAR THE PSEG SITE.

Project Name	Summary of Project/Activity
<i>Energy projects</i>	
Hope Creek Generating Station, Unit 1	The station consists of a single operating reactor rated at 3840 megawatts-thermal, adjacent to the Salem Generating Station
Salem Generating Station, Units 1 and 2	The station consists of two operating reactors rated at 3459 megawatts-thermal each, adjacent to the Hope Creek Generating Station
Peach Bottom Atomic Power Station, Units 2 and 3	The station consists of two operating reactors rated at 3514 megawatts-thermal each, and one permanently shut down unit (Unit 1)
Limerick Generating Station, Units 1 and 2	The station consists of two operating reactors rated at 3515 megawatts-thermal each
Oyster Creek Nuclear Generating Station	The station consists of a single operating reactor rated at 1930 megawatts-thermal
Three Mile Island Nuclear Station, Unit 1	The station consists of a single operating reactor rated at 2568 megawatts-thermal and one permanently shut down reactor (Unit 2)
Calvert Cliffs Nuclear Power Plant Units 1 and 2	The station consists of two operating reactors rated at 2737 megawatts-thermal each
Calvert Cliffs Nuclear Power Plant Unit 3	The proposed station would consist of a single U.S. Evolutionary Power Reactor rated at 4590 megawatts-thermal
Delaware City Refinery	The refinery is located on 5050 acres, and the refining operations occupy about 1000 acres; the facility processes crude oils and currently produces about 180,000 barrels of petroleum product a day
Deepwater Energy Center	158-megawatt two-unit natural gas peaking facility
Carneys Point Generating Plant	Cogeneration power plant
Pedricktown Combined Cycle Cogeneration Plant	120-megawatt peaking facility
Cumberland County Landfill Gas-to-Energy Plant	Methane gas input, provides 6.4 megawatts of baseload power

EXHIBIT J. (CONTINUED)

Project Name	Summary of Project/Activity
Vineland Municipal Electric Utility	Utility owns two natural gas units: Howard M. Down Substation and West Substation, combined 86 megawatts
Sherman Ave. Energy Center	92-megawatt natural gas peaking facility
Carl's Corner Energy Center	84-megawatt two-unit natural gas peaking facility
Cumberland Generating Station	99-megawatt natural gas fired power plant
Grid stability transmission line for Artificial Island	Line needed to support the grid in the area around the island; no specific route is known at this time
<i>New developments/redevelopment</i>	
Camp Pedricktown Redevelopment	Site redevelopment due to Base Realignment and Closure
Millville Municipal Airport Improvements	Infrastructure upgrades
Agricultural Products Business Park	A new business park
Gateway Business Park	Partially built site
<i>Parks, national forests, and historic sites</i>	
Mad Horse Creek Wildlife Management Area	Restoration of approximately 200 acres
Supawna Meadows National Wildlife Refuge	Approximately 3000-acre refuge with some walking and boating trails
Fort Mott State Park	124-acre park built around a historical site
Parvin State Park	2092-acre park with trails, camping, boating, fishing, and hunting
<i>Other actions/projects</i>	
U.S. Army Corps of Engineers Delaware River Main Channel Deepening Project	Deepening of river channel in Reach D (Delaware River Mile 55 to 41)
Salem County Solid Waste Landfill	Regional landfill for solid waste
Air emissions sources	Nearby air emissions sources include small-scale commercial facilities (emissions below reporting limits), on-road mobile sources (cars and trucks), non-road mobile sources (airplanes, boats, tractors, etc.), and industrial stationary point emissions sources (Mannington Mills, Inc., flooring manufacturer; DuPont Dow Performance Elastomers, LLC, synthetic rubber manufacturer)
Shieldalloy site decommissioning	Shieldalloy conducted smelting and alloy production at the site from 1940 through 2001; one of the raw materials used by the company was a niobium ore called pyrochlore, which contains uranium and thorium and is subject to NRC licensing requirements; the company has submitted a decommissioning plan that proposes to use a possession-only license for long-term control via an onsite disposal cell
Surface water withdrawals and discharges	Surface water withdrawals for public water supply and other potable use; wastewater treatment plant discharges

EXHIBIT J. (CONTINUED)

Project Name	Summary of Project/Activity
Groundwater withdrawals	Groundwater withdrawals throughout the region supply the majority of freshwater needs; major pumping centers in Salem, Gloucester, and Camden Counties in New Jersey, and New Castle County in Delaware affect groundwater heads and groundwater flow paths throughout the region
Various hospitals and industries that use radioactive materials	Use of medical and other isotopes
Future urbanization	Construction of housing units and associated commercial buildings; roads, bridges, and rail; and water and/or wastewater treatment and distribution facilities and associated pipelines, as described in local land use planning documents

Exhibit K summarizes the cumulative impact levels that would be expected if a new nuclear power plant is constructed at the PSEG Site or at any of the alternative sites evaluated in the draft environmental impact statement. (Note that alternative sites are discussed in detail later in this Reader's Guide.)

EXHIBIT K. COMPARISON OF CUMULATIVE ENVIRONMENTAL IMPACTS BETWEEN PROPOSED SITE AND ALTERNATIVE SITES.

Resource Areas	Proposed Site ^(a)	Alternative Sites ^(b)			
	PSEG	Site 4-1	Site 7-1	Site 7-2	Site 7-3
Land Use	MODERATE	MODERATE	MODERATE	MODERATE	MODERATE
Surface Water	MODERATE	MODERATE	MODERATE	MODERATE	MODERATE
Groundwater	MODERATE	SMALL	MODERATE	MODERATE	MODERATE
Terrestrial Ecology	MODERATE	MODERATE	MODERATE	MODERATE	MODERATE
Aquatic Ecology	MODERATE to LARGE	MODERATE	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE
Socioeconomics	LARGE (beneficial) to MODERATE (adverse)	LARGE (beneficial) to LARGE (adverse)	LARGE (beneficial) to LARGE (adverse)	LARGE (beneficial) to LARGE (adverse)	LARGE (beneficial) to LARGE (adverse)
Environmental Justice	None	None	Potential	None	None
Historic and Cultural Resources	MODERATE	LARGE	MODERATE	MODERATE	MODERATE
Air Quality	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE
Human Health	SMALL	SMALL	SMALL	SMALL	SMALL
Waste Management	SMALL	SMALL	SMALL	SMALL	SMALL

(a) Cumulative impact determinations taken from Table 7-4 in the draft environmental impact statement.

(b) Cumulative impact determinations taken from Table 9-24 in the draft environmental impact statement.

DISCUSSION OF DIFFERENCES WHEN CUMULATIVE IMPACTS ARE CONSIDERED

A few of the impacts to environmental resource areas (see Exhibit H) were determined to change from minor effects to more noticeable effects when considered in combination with other past, present, and near-future projects near the PSEG Site (see Exhibit K).

- Surface-water use and quality—There would be noticeable cumulative impacts, primarily due to the extensive past and present use of water from the Delaware River and other activities in the Delaware River Basin. However, the contribution to these impacts from building and operating a new nuclear power plant at the PSEG Site would, by itself, be minor because the consumptive water use would be a small percentage of the river flow, even under drought conditions, and because the volume of discharge would be small relative to the volume of the Delaware River.
- Groundwater use and quality—There would be noticeable cumulative impacts, primarily because of the extensive past and present regional groundwater withdrawals from the aquifer system that lies beneath the PSEG Site and because of increases in aquifer salinity due to those regional withdrawals. However, the contribution to these impacts from building and operating a new nuclear power plant at the PSEG Site would, by itself, be minor because of the relative isolation of the site from the nearest groundwater users and because of the limits on the maximum permitted withdrawal quantities.
- Aquatic ecology—The significant history of the degradation of the Delaware River Estuary has had a noticeable and sometimes destabilizing effect on many aquatic species and communities. However, the construction and operation of a new nuclear power plant at the PSEG Site would, by itself, contribute minimally to such impacts.
- Historic and cultural resources—The upgrading and/or installation of new transmission lines connecting the PSEG Site to far away substations would have noticeable impacts along the routes of those new lines. However, building a new nuclear plant at the PSEG Site would, by itself, have minimal effects on historic and cultural resources.
- Air quality—The national and worldwide cumulative impacts of greenhouse gas emissions have noticeable effects. However, a new nuclear power plant at the PSEG Site would not contribute significantly to greenhouse gas emissions in the region.

WHAT ALTERNATIVES WERE CONSIDERED?

No ACTION

The no-action alternative would result in the early site permit not being granted by the NRC or permits not being issued by the U.S. Army Corps of Engineers. Upon such denials, construction and operation of a new nuclear power plant at the PSEG Site would not occur and the predicted environmental impacts would not take place. If no other power-generating facility were to be built and no other strategy implemented to take its place, the benefits of the additional electrical capacity and electricity generation to be provided by a new nuclear plant at the PSEG Site would also not occur, and the need for baseload power would not be met.

ALTERNATIVE SITES

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). Further review of the candidate areas looked at site-specific features and characteristics. The principal considerations at this step included (1) reasonably flat terrain and undeveloped land of sufficient size to accommodate a new nuclear power plant and (2) avoiding any of the following: urban areas; residential developments; public institutions; designated parks, preserves, and recreational areas; listed historic sites; extensive wetland or floodplain areas; public drinking water intakes; protected groundwater resources; and airports.

To identify potential sites, PSEG used additional criteria, including

- (1) environmental acceptability, as gauged by the presence of major environmental issues such as proximity to designated lands or waters and potential encroachment on sensitive land uses;
- (2) nuclear licensing, as gauged by potential licensing issues such as proximity to capable faults, proximity to hazardous land uses, and proximity to population centers; and
- (3) engineering, as gauged by potentially major engineering issues such as the length and difficulty of required water, transmission, and rail connections; cooling water pumping head; and ability to deliver large components to the site.

Ultimately, five candidate sites—as shown in Exhibit L—were chosen for additional site suitability analyses, which resulted in the PSEG Site being chosen as the preferred site. The remaining four sites are listed and evaluated as alternative sites in the environmental impact statement:

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

The review team concluded that, 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 for building and operating a new nuclear power plant. In such a case, the proposed site prevails because none of the alternative sites is clearly environmentally preferable.

ALTERNATIVE ENERGY SOURCES

To compare different types of energy plants with a new nuclear power plant that has the capability to generate a maximum of 2200 megawatts of

BASELOAD POWER

The minimum amount of power that a utility must make available to its customers all of the time.

electricity, the review team 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 also can be used for baseload power.

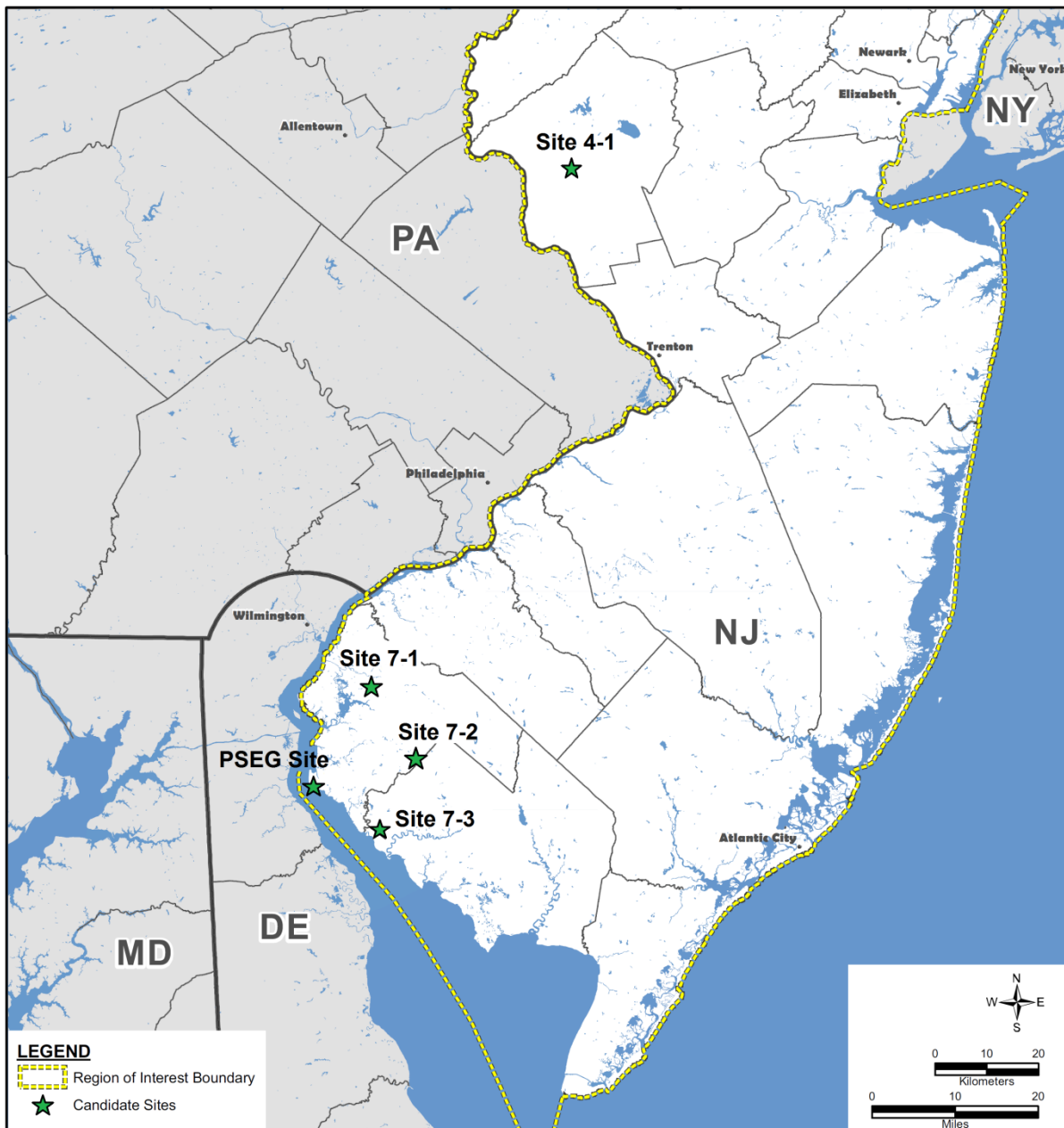


EXHIBIT L. LOCATIONS OF CANDIDATE SITES.

For the coal-fired generation alternative, the review team assumed the building and operation of four pulverized coal-fired units at the PSEG Site, each with a net capacity of 580 megawatts-electric for a total capacity of 2320 megawatts-electric. The effects of air emissions 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 review team assumed the building and operation of four natural-gas combined-cycle units at the PSEG Site, each with a net capacity of 580 megawatts-electric for a total capacity of 2320 megawatts-electric. Air emissions would be similar to those for a coal-fired plant, but in lower amounts. There would be fewer ecological impacts than for a new nuclear power plant because less land would be required. Building a new underground gas pipeline to the site could result in permanent loss of some ecological resources. Other environmental effects and cumulative effects would be similar to those associated with a new nuclear power plant at the PSEG Site.



*Wind farm in Texas
(Photo courtesy of Llano Estacado/
Panoramio)*

The review team also analyzed a combination of energy sources. An installed capacity of 1400 megawatts-electric of natural-gas combined-cycle units with contributions of 560 megawatts-electric from solar, 890 megawatts-electric from wind, and 800 megawatts-electric from biomass sources would be required to match the output of a 2200-megawatt-electric nuclear power plant when the operating capacity factors of each alternative energy source are taken into consideration. This combination of alternatives would have environmental effects similar to natural-gas-fired units.



*Solar power station in California
(Photo courtesy of Bureau of Land
Management)*

Renewable energy sources such as wind and solar power were considered, but current technologies for these energy sources by themselves are not reasonably capable of producing baseload power similar to the 2200 megawatts-electric targeted by PSEG. With respect to wind energy, approximately 1400 wind turbines occupying 165,000 acres would be needed to produce a similar amount of power. Solar photovoltaic and/or solar thermal technologies would require a land area of 11,000 to 22,000 acres.

ALTERNATIVE SYSTEM DESIGNS

The review team 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. The review team considered four alternative heat-dissipation systems but found none of these alternatives would be environmentally preferable to the wet, closed-loop cooling towers proposed and described by PSEG in its early site permit application. Each cooling tower would be up to 590 feet high.

Cooling-water systems withdraw (intake) water from the source water body and return (discharge) a slightly reduced volume of water to the receiving water body at a higher temperature. 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 early site permit 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 review team concluded that none of these sources of water would be a viable alternative to the Delaware River.

WHAT ARE THE UNAVOIDABLE ENVIRONMENTAL IMPACTS?

The National Environmental Policy Act requires that an environmental impact statement include information about any negative environmental effects that cannot be avoided if a new nuclear power plant is built and operated. These impacts are usually the building activities involved with clearing the land, excavating, filling wetlands, installing roads, and dredging. Exhibit M lists the negative environmental impacts from building and operating a new nuclear plant at the PSEG Site. The impacts discussed are based on information presented in Tables 10-1 and 10-2 of the draft environmental impact statement.

EXHIBIT M. UNAVOIDABLE IMPACTS.

Environmental Resource		Unavoidable Impact	Impact Level	
			Building	Operation
Land Use		About 430 acres on and adjacent to the PSEG Site would be committed to the project throughout preconstruction and construction, of which 225 acres would not be available for use after construction is complete. About 69 acres would be committed during preconstruction for the causeway, of which 45.5 acres would not be available for use after the causeway is built.	MODERATE	SMALL
Water	Use	Small amounts of surface water from stormwater retention ponds would be used for dust suppression during building of the new nuclear power plant. Groundwater would be obtained from existing wells used for the Hope Creek and Salem Generating Stations. Temporary and localized groundwater impacts would result from dewatering for power block construction and preconstruction and construction support (including concrete batch plant supply and dust suppression). During operations, surface-water withdrawals from the Delaware River could exceed the PSEG current storage allocation of water in the Merrill Creek reservoir. Minor groundwater consumption for sanitary and potable water systems and for demineralized makeup water.	SMALL	SMALL
	Quality	Surface-water quality would be affected by clearing vegetation; disturbing the land surface; inadvertent release of contaminants associated with building materials and equipment; building activities in the tidal marsh and tidal stream areas; and dredging activities in the Delaware River. Temporary and localized groundwater-quality impacts would result from dewatering for power block construction and discharge of groundwater to adjacent surface water bodies.	SMALL	SMALL

EXHIBIT M. (CONTINUED)

Environmental Resource		Unavoidable Impact	Impact Level	
			Building	Operation
		During operations, impacts to the Delaware River from thermal discharge and discharge of nonradioactive liquid effluents from the cooling water system, as well as potable and sanitary discharges. Possible groundwater impacts from chemical or radiological spills that could migrate to shallow water (brackish) zones or saline intrusion to deep aquifers due to groundwater withdrawals.		
Ecology	Terrestrial and Wetland Resources	<p>Construction and preconstruction would disturb about 430 acres on and adjacent to the PSEG Site and 69 acres along the proposed causeway. About 225 acres on the site would be permanently disturbed and 205 acres on and adjacent to the site would be temporarily disturbed. Permanent disturbance on the site would include 108 acres of wetland habitat and 9 acres of old field and brush/shrubland habitat. Temporary disturbance on the site would include 80 acres of old field and <i>Phragmites</i>-dominated old field habitat and 32 acres of wetland habitat. Temporary disturbance adjacent to the site would include 30.2 acres of wetland habitat.</p> <p>Preconstruction would disturb 69.0 acres along the proposed causeway; of this, 45.5 acres would be permanently disturbed and 23.5 acres would be temporarily disturbed. Permanent disturbance would include 23 acres of wetland habitat and 3.5 acres of forestland habitat. Temporary disturbance would include 20.1 acres of wetland habitat. Increased risk of bird collisions with structures, wildlife avoidance due to increased noise and artificial light, and potential impacts of salt deposition on vegetation near the cooling towers.</p>	MODERATE	SMALL

EXHIBIT M. (CONTINUED)

Environmental Resource		Unavoidable Impact	Impact Level	
			Building	Operation
Aquatic Resources		Physical alteration of habitat (e.g., infilling, cofferdam placement, dredging, pile driving), including temporary or permanent removal of associated benthic organisms, sedimentation, changes in hydrological regimes, and changes in water quality. Aquatic habitats affected would include artificial ponds and small marsh creeks; habitats associated with the Delaware River and Delaware River Estuary; and the interconnected system of tidal wetlands and marsh creeks primarily north of the PSEG Site.	SMALL	SMALL
		During operations, impacts to aquatic biota in the Delaware River from impingement and entrainment due to cooling system operations, heat stress due to the thermal discharge plume, and chemicals in the discharged blowdown from the new nuclear power plant.		
Socioeconomic	Physical	Minor physical impacts associated with increased noise, air pollution emissions, and vehicle traffic. Building and operating new cooling towers and new reactor domes at the PSEG Site and an elevated causeway to the PSEG Site would noticeably affect aesthetic qualities from sensitive viewpoints.	SMALL (most) to MODERATE (aesthetics)	SMALL (most) to MODERATE (aesthetics)
	Demography	The in-migration of workers and their families to support building a new nuclear power plant would increase the population of the economic impact area by about 0.16 percent. The increase would be most pronounced in Salem County, New Jersey, which would experience about a 1.24 percent increase in population. The in-migration of workers and their families to support operating a new nuclear power plant would increase the population of the economic impact area by about 0.05 percent. The increase would be most pronounced in Salem County, New Jersey, which would experience about a 0.4 percent increase in population.	SMALL	SMALL

EXHIBIT M. (CONTINUED)

Environmental Resource	Unavoidable Impact	Impact Level	
		Building	Operation
Economic and Tax	None	SMALL to LARGE (beneficial)	SMALL to LARGE (beneficial)
Infrastructure and Community Services	Increase in local traffic during building, resulting in increased congestion. Aesthetic impacts near recreational resources, specifically on the Delaware River and PSEG Estuary Enhancement Program viewing platforms, would not be amenable to mitigation for the increased industrialization at the PSEG Site.	SMALL (most) to MODERATE (traffic and recreation)	SMALL (most) to MODERATE (recreation)
Environmental Justice	None	None	None
Historic and Cultural Resources	No unavoidable adverse impacts to historic and cultural resources are anticipated.	SMALL	SMALL
Meteorology and Air Quality	Fugitive dust and emissions of criteria pollutants; hazardous air pollutants; and greenhouse gases from land disturbing and building activities and equipment and from additional vehicle traffic, but impacts would be temporary. Criteria pollutant, hazardous air pollutant, greenhouse gas, and cooling system emissions. Operations would increase gaseous and particulate emissions by a small amount, primarily from equipment associated with auxiliary systems and the cooling towers. The primary sources of emissions from auxiliary systems would be the auxiliary boilers; standby power units such as diesel generators or gas turbines; and engine-driven emergency equipment. The cooling towers would be the primary source of particulate emissions.	SMALL	SMALL
Nonradiological Health	Fugitive dust; occupational injuries; noise; and the transport of materials and personnel to the site. Exposure to etiologic microorganisms through cooling systems; noise generated by unit operations; and accidents during transportation of operations and outage workers to and from the site.	SMALL	SMALL

EXHIBIT M. (CONTINUED)

Environmental Resource	Unavoidable Impact	Impact Level	
		Building	Operation
Radiological Health	Radiological doses to the public and to construction workers at the PSEG Site from the adjacent Salem Generating Station and Hope Creek Generating Station would be below the NRC public dose limits. During operations, small radiation doses to members of the public, operations workers, and biota other than humans.	SMALL	SMALL
Nonradioactive Waste	Solid, liquid, and gaseous wastes would be generated when building a new nuclear power plant at the PSEG Site. Minor decrease in capacity of waste treatment and disposal facilities. During operations, increased consumption of landfill space for disposition of wastes; increased consumption of fuels for the transportation and disposition of wastes.	SMALL	SMALL
Fuel Cycle, Transportation, and Decommissioning	Minor impacts from fuel cycle as presented in Table S-3, 10 CFR Part 51. Small impacts from carbon dioxide, radon, and technetium-99. Small radiological doses that are within the NRC and U.S. Department of Transportation regulations from transportation of fuel and radioactive waste. Small impacts from decommissioning as presented in NUREG-0586.	SMALL	SMALL

WHAT ARE THE IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES?

The term “irreversible commitments of resources” refers to environmental resources that would be permanently changed and could not be restored later by the building or operation activities authorized by the NRC and U.S. Army Corps of Engineers permitting and licensing decisions.

Exhibit N lists the irreversible environmental resources from building and operating a new nuclear power plant at the PSEG Site. The term “irretrievable commitments of resources” refers to environmental resources that would be used or consumed by a new nuclear power plant in such a way that they could not be recycled or restored for other uses. The review team expects that the use of building materials in the quantities needed for a new nuclear power plant at the PSEG Site would be irretrievable but would be of small significance with respect to the overall availability of such resources.

EXHIBIT N. IRREVERSIBLE COMMITMENTS.

Environmental Resource	Irreversible Commitment
Land Use	Land committed to the disposal of radioactive and nonradioactive wastes is committed to that use and cannot be used for other purposes.
Water Use	Approximately 26,420 gallons per minute of brackish water and an equivalent 4756 gallons per minute of freshwater would be lost from the Delaware River Basin through consumptive use during the operation of a new nuclear power plant at the PSEG Site. The amount of groundwater lost through consumptive use during operations would average 210 gallons per minute with a maximum rate of about 950 gallons per minute.
Terrestrial Biota and Ecosystems	Construction of a new nuclear power plant would result in the permanent loss of about 108 acres of wetlands and 9 acres of old field and brush/shrubland habitat on the PSEG Site, as well as 23 acres of wetlands and 3.4 acres of old field habitat along the route of the proposed causeway.
Aquatic Biota and Ecosystems	Permanent losses of aquatic habitats at the PSEG Site include filling of 40 acres of artificial ponds and 7265 linear feet of creek channels, and isolation of 2320 linear feet of marsh creek channels. Dredging activities for the installation of the cooling water intake structure and installation of a new barge unloading facility that would result in the loss of benthic organisms present in these sediment habitats.
Socioeconomics	No irreversible commitments
Historic and Cultural Resources	No irreversible commitments
Air Quality	No irreversible commitments

WHEN WILL THE U.S. NUCLEAR REGULATORY COMMISSION DECIDE?

After considering the environmental impacts of the proposed action, the review team's preliminary recommendation to the Commission is that the early site permit be issued as proposed. This preliminary recommendation was determined using the criteria in Exhibit O.

The Commission will make a decision on whether to issue the ESP following the issuance of the staff's final environmental impact statement and final safety evaluation report and the conclusion of the hearing process.

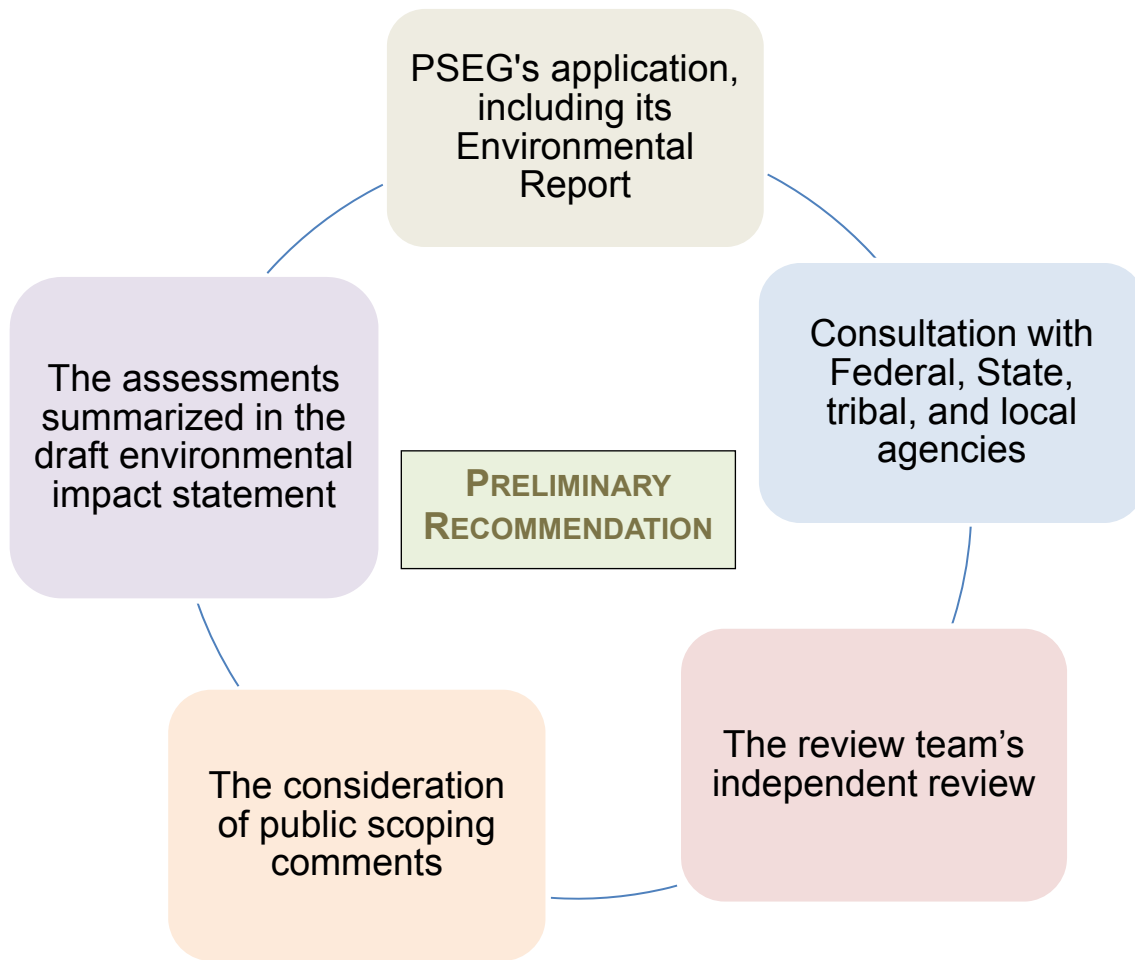


EXHIBIT O. BASIS OF THE REVIEW TEAM'S PRELIMINARY RECOMMENDATION.

WHAT IS IN THE ENVIRONMENTAL IMPACT STATEMENT?

CHAPTER 1—INTRODUCTION

This introductory chapter defines the proposed action and the purpose of and need for the proposed action; it also provides a brief outline of the NRC and U.S. Army Corps of Engineers environmental review processes.

CHAPTER 2—AFFECTED ENVIRONMENT

This chapter describes the location of the PSEG Site and the existing conditions at the site and surrounding area that provide the “baseline” for the analysis.

CHAPTER 3—SITE LAYOUT AND PLANT DESIGN

This chapter describes the proposed site layout and the key plant characteristics that are used for the impact analysis of the proposed actions.

CHAPTER 4—ENVIRONMENTAL IMPACTS OF CONSTRUCTION

This chapter describes the potential impacts from building a new nuclear power plant at the PSEG Site and the safeguards and controls that would limit the adverse impacts of building a new nuclear power plant.

CHAPTER 5—ENVIRONMENTAL IMPACTS OF OPERATION

This chapter examines the potential impacts from operating a new nuclear power plant at the PSEG Site and the safeguards and controls that would limit the adverse impacts during operation over a hypothetical 40-year license period.

CHAPTER 6—FUEL CYCLE, TRANSPORTATION, AND DECOMMISSIONING

This chapter addresses the environmental impacts from (1) the uranium fuel cycle and solid waste management, (2) the transportation of radioactive material, and (3) the decommissioning of a new nuclear power plant at the PSEG Site.

CHAPTER 7—CUMULATIVE IMPACTS

This chapter describes the cumulative impacts that may result when the effects of building and operating a new nuclear power plant at the PSEG Site are added to, or interact with, other past, present, and reasonably foreseeable future actions on the same resources.

CHAPTER 8—NEED FOR POWER

This chapter discusses the staff's evaluation of the need for baseload-generating capacity within the region of interest.

CHAPTER 9—ALTERNATIVES

This chapter contains the evaluation of energy alternatives, site location alternatives, and nuclear plant design alternatives.

CHAPTER 10—CONCLUSIONS AND RECOMMENDATIONS

The final chapter provides the staff's preliminary recommendation on whether the early site permit should be issued to PSEG.

WHAT ARE THE NEXT STEPS?

The draft environmental impact statement has been issued for a 75-day public review and comment period. All comments received on the draft statement will be considered and addressed in a final version of the environmental impact statement, which will be issued in mid-2015. A mandatory hearing will be held after both the final environmental impact statement and the final safety evaluation report are issued. The schedule for the completion of both documents can be found on the NRC public website. For additional information, please contact Allen Fetter, Environmental Project Manager, at allen.fetter@nrc.gov or visit the NRC's website for the PSEG early site permit.



(Courtesy of NRC/Flickr)



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