



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

March 24, 2014

Mr. Michael J. Pacilio  
President and Chief Nuclear Officer  
Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3 - FINAL ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT RELATED TO THE PROPOSED EXTENDED POWER UPRATE (TAC NOS. ME9631 and ME9632)

Dear Mr. Pacilio:

Enclosed is a copy of the Final Environmental Assessment and Finding of No Significant Impact related to your application for an amendment dated September 28, 2012, as supplemented by letters dated February 15, 2013, May 7, 2013, May 24, 2013, June 4, 2013, June 27, 2013, July 30, 2013, July 31, 2013, August 5, 2013, August 22, 2013, August 29, 2013, September 13, 2013, October 11, 2013, October 15, 2013, October 31, 2013, December 6, 2013, December 20, 2013, January 17, 2014, January 31, 2014 (two letters), February 20, 2014, February 28, 2014, March 10, 2014, and March 17, 2014, for Peach Bottom Atomic Power Station, Units 2 and 3. The proposed amendment would authorize an increase in the maximum power level from 3514 megawatts thermal (MWt) to 3951 MWt. The requested change, referred to as an extended power uprate, represents an increase of approximately 12.4 percent above the current licensed thermal power level.

The assessment is being forwarded to the Office of the Federal Register for publication.

Sincerely,

A handwritten signature in cursive script that reads "RB Ennis".

Richard B. Ennis, Senior Project Manager  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-277 and 50-278

Enclosure:  
Environmental Assessment

cc w/encl: Distribution via Listserv

**NUCLEAR REGULATORY COMMISSION**

**[Docket Nos. 50-277 and 50-278; NRC-2013-0232]**

**Environmental Assessment and Finding of No Significant Impact for Peach Bottom**

**Atomic Power Station, Units 2 and 3**

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Environmental assessment and finding of no significant impact; issuance.

**SUMMARY:** The U.S. Nuclear Regulatory Commission (NRC) is considering issuance of amendments to Renewed Facility Operating License Nos. DPR-44 and DPR-56, issued to Exelon Generation Company, LLC (Exelon, the licensee), for operation of the Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, located in York and Lancaster Counties, Pennsylvania. The proposed amendments would authorize an increase in the maximum reactor power level from 3514 megawatts thermal (MWt) to 3951 MWt. The NRC staff is issuing a final Environmental Assessment (EA) and final Finding of No Significant Impact (FONSI) associated with the proposed license amendments.

**ADDRESSES:** Please refer to Docket ID NRC-2013-0232 when contacting the NRC about the availability of information regarding this document. You may access publicly-available information related to this document using any of the following methods:

- **Federal Rulemaking Web Site:** Go to <http://www.regulations.gov> and search for Docket ID NRC-2013-0232. Address questions about NRC dockets to Carol Gallagher; telephone: 301-287-3422; e-mail: [Carol.Gallagher@nrc.gov](mailto:Carol.Gallagher@nrc.gov). For technical questions, contact

the individual(s) listed in the FOR FURTHER INFORMATION CONTACT section of this document.

- **NRC's Agencywide Documents Access and Management System (ADAMS):**

You may access publicly available documents online in the NRC Library at

<http://www.nrc.gov/reading-rm/adams.html>. To begin the search, select "ADAMS Public

Documents" and then select "Begin Web-based ADAMS Search." For problems with ADAMS,

please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209,

301-415-4737, or by e-mail to [pdr.resource@nrc.gov](mailto:pdr.resource@nrc.gov). The ADAMS accession number for each

document referenced in this document (if that document is available in ADAMS) is provided the

first time that a document is referenced. The application for amendments is dated

September 28, 2012, and is supplemented by letters dated February 15, 2013, May 7, 2013,

May 24, 2013, June 4, 2013, June 27, 2013, July 30, 2013, July 31, 2013, August 5, 2013,

August 22, 2013, August 29, 2013, September 13, 2013, October 11, 2013, October 15, 2013,

October 31, 2013, December 6, 2013, December 20, 2013, January 17, 2014, January 31, 2014

(two letters), February 20, 2014, February 28, 2014, March 10, 2014, and March 17, 2014

(ADAMS Accession Nos. ML122860201, ML13051A032, ML13129A143, ML13149A145,

ML13156A368, ML13182A025, ML13211A457, ML13213A285, ML13217A431, ML13240A002,

ML13241A418, ML13260A076, ML13289A191, ML13289A300, ML13308A331, ML13345A687,

ML13358A083, ML14023A659, ML14031A422, ML14035A158, ML14051A629, ML14070A141,

ML14072A016, and ML14076A082, respectively). The application and some of the

supplements contain Sensitive Unclassified Non-Safeguards Information (proprietary

information) and, accordingly, the proprietary information has been withheld from public

disclosure. Redacted versions of the documents containing proprietary information have been

made publicly available and can be accessed via the applicable ADAMS accession numbers listed above.

- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

**FOR FURTHER INFORMATION CONTACT:** Richard B. Ennis, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington DC 20555-001, telephone: 301-415-1420, e-mail: [Rick.Ennis@nrc.gov](mailto:Rick.Ennis@nrc.gov).

**SUPPLEMENTARY INFORMATION:**

**I. Introduction.**

In accordance with §50.92 of Title 10 of the *Code of Federal Regulations* (10 CFR), the NRC is considering issuance of amendments to Renewed Facility Operating License Nos. DPR-44 and DPR-56, issued to Exelon, for operation of PBAPS, Units 2 and 3, located in York and Lancaster Counties, Pennsylvania. The proposed amendments would increase the maximum licensed thermal power level, for each reactor, from 3,514 MWt to 3,951 MWt. This change, referred to as an extended power uprate (EPU), represents an increase of approximately 12.4 percent above the current licensed thermal power level.

Consistent with the NRC guidance for this type of license amendment, RS-001, "Review Standard for Extended Power Uprates," dated December 2003 (ADAMS Accession No. ML033640024), the NRC staff prepared a draft EA and a draft FONSI. The draft EA and draft

FONSI were published in the *Federal Register* on October 24, 2013 (78 FR 63506) with a 30-day period for public comment.

Two sets of comments were received by the NRC staff in response to the *Federal Register* notice dated October 24, 2013. The NRC staff has reviewed and resolved the comments as discussed below. Based on resolution of the comments, the NRC staff has prepared a final EA and a final FONSI for publication in the *Federal Register*, as shown below, pursuant to the requirements in 10 CFR 51.21, 10 CFR 51.32, and 10 CFR 51.35.

In response to the *Federal Register* notice dated October 24, 2013, comments were submitted by: (1) Exelon, in a letter dated November 22, 2013 (ADAMS Accession No. ML13339A807); and (2) the Pennsylvania Department of Environmental Protection (PADEP), in a letter dated November 22, 2013 (ADAMS Accession No. ML13343A150).

Exelon's letter dated November 22, 2013, provided suggested wording changes to clarify the draft EA. The NRC staff incorporated each of these comments into the final EA using the words proposed in Exelon's letter.

PADEP's letter dated November 22, 2013, stated, in part, that "PADEP does not have specific detailed comments at this time because Exelon just recently submitted a water quality certification request for this project. Under the Clean Water Act, water quality certification is required prior to the issuance of the license amendment. Pennsylvania has detailed regulations concerning water quality certification and it would be premature to comment on this project prior to having an opportunity to review the environmental assessment required by those regulations." On January 28, 2014, the NRC staff held a conference call with the PADEP staff to discuss PADEP's letter. The NRC confirmed that PADEP has no comments on the draft EA and draft FONSI and that it has no objections to the NRC staff issuing a final EA and final FONSI.

Based on the results of the EA that follows, the NRC has determined not to prepare an environmental impact statement for the proposed amendments, and is issuing a final FONSI.

## **II. Environmental Assessment.**

### *Plant Site and Environs*

PBAPS consists of Units 1, 2, and 3 located on approximately 620 acres of land in Peach Bottom Township, York County, Pennsylvania on the west bank of the Susquehanna River. The site is approximately 38 miles north of Baltimore, Maryland; 19 miles southwest of Lancaster, Pennsylvania; and 30 miles southeast of York, Pennsylvania. The area within 6 miles of the site includes parts of York and Lancaster Counties in Pennsylvania and parts of Harford and Cecil Counties in Maryland. The property around the site is predominantly rural, characterized by farmland and woods.

Units 2 and 3 are General Electric Type 4, Mark I boiling-water reactors. In addition to Units 2 and 3, the site contains turbine buildings, intake and discharge canals, auxiliary buildings, switchyards, an interim spent fuel storage installation, a training center, a public boat ramp, a picnic area, and the retired Unit 1 reactor. Unit 1 is located adjacent to Units 2 and 3. It was a prototype, high-temperature, gas-cooled reactor which operated from 1966 to 1974. Unit 1 is permanently shut down, defueled, and is maintained in a safe storage, surveillance, security, and maintenance condition. It is not part of this application and will be decommissioned in the future.

Units 2 and 3 at PBAPS have a common once-through heat dissipation system that draws water from and discharges to the Conowingo Pond. The Conowingo Pond is a reservoir on the Susquehanna River formed by the Conowingo Dam (located approximately 8.5 miles downstream of the PBAPS site) and the Holtwood Dam (located approximately 6 miles

upstream of the PBAPS site). The Conowingo and Holtwood Dams each provide hydroelectric generation.

The Conowingo Pond has a surface area of approximately 9,000 acres with 35 miles of shoreline. It has a width that varies from 0.5 to 1.3 miles and a maximum depth of 98 feet (ft). In addition to providing cooling water for PBAPS, Conowingo Pond is used as a fish and wildlife resource, for recreation, and as a source of public water.

Units 2 and 3 use six circulating water pumps (three per unit), each rated at 250,000 gallons per minute (gpm), which draw water from Conowingo Pond at a rate of 1.5 million gpm when all six pumps are running. Water drawn from Conowingo Pond passes through a series of intake structures before it is circulated through two main condensers. From these condensers, water passes through a series of discharge structures and then flows to Conowingo Pond where the heat is dissipated to the environment. Exelon also maintains three mechanical draft helper cooling towers that have the capacity to handle approximately 60 percent of the cooling water circulating through Units 2 and 3. Water drawn from Conowingo Pond flows into a 487 ft long outer intake structure along the west bank of Conowingo Pond. Trash racks protect 32 outer intake openings and prevent large floating debris and ice floes from reaching 24 traveling screens. This cooling water intake structure is designed to reduce impingement by preventing fish and small debris from entering the system. The intake structure allows fish to avoid the screens by having a low approach velocity. The screens are made of 3/8-inch square mesh and are placed approximately 40 ft behind the outer trash racks in the outer intake structure. From the outer intake structure, water enters two, 700 ft-long and 200 ft-wide, intake basins. The cooling water for the condensers is drawn from these two intake basins.

Cooling water discharges from the condensers into a 700 ft-long and 400 ft-wide discharge basin where the heated cooling water then flows through a 4700 ft-long discharge canal. Three discharge gates at the end of the discharge canal control the flow to Conowingo Pond and maintain a discharge velocity between 5 and 8 ft/second.

*Description of the Proposed Action*

The proposed action is the issuance of amendments to the licenses for PBAPS, Units 2 and 3, which would increase the maximum licensed thermal power level, for each reactor, from 3,514 MWt to 3,951 MWt. This change, referred to as an extended power uprate (EPU), represents an increase of approximately 12.4 percent above the current licensed thermal power level. This change is considered an EPU by the NRC because it exceeds the typical 7 percent power increase that can be accommodated with only minor plant changes. An EPU usually requires significant modifications to major plant equipment. The proposed EPU for PBAPS, Units 2 and 3, will require significant modifications as discussed in Attachment 9 to the licensee's application dated September 28, 2012 (ADAMS Accession No. ML12286A011).

If approved, these amendments would allow the heat output of each reactor to increase, which would increase the flow of steam to the turbines. This would increase the production of electricity, increase the amount of waste heat delivered to the condensers, and slightly raise the temperature of the water discharged into Conowingo Pond.

Plant modifications to implement the EPU are expected to occur during normal refueling outages that occur for each reactor once every 24 months and typically last for 30 to 40 days. If the EPU is approved, Units 2 and 3 are expected to begin operating at the EPU core power level of 3,951 MWt in 2014 and 2015, respectively.

*Need for the Proposed Action*

The current licenses for PBAPS, Units 2 and 3, contain a maximum authorized thermal power level for each reactor. The licensee desires to increase this power level in order to increase the electrical output of the plant without the need to site and construct new facilities. To allow this to occur, the NRC must amend the licenses for each unit to authorize the proposed new maximum thermal power level.

*Environmental Impacts of the Proposed Action*

At the time of issuance of the operating license for PBAPS, Units 2 and 3, the NRC staff noted that any activity authorized by the license would be encompassed by the overall action evaluated in the Final Environmental Impact Statement (FEIS) for the operation of the PBAPS reactors. This FEIS was issued in 1973, by the U.S. Atomic Energy Commission (predecessor agency to the NRC). The NRC revisited and updated the FEIS in January 2003, when the NRC published Supplement 10 to NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants," that addressed the license renewal of PBAPS, Units 2 and 3 (ADAMS Accession No. ML030270059).

The radiological and non-radiological impacts on the environment that may result from the proposed EPU are summarized below.

**Non-Radiological Impacts**

*Land Use and Aesthetic Impacts*

Potential land use and aesthetic impacts for the proposed action include impacts from construction and plant modifications. All plant modifications will be implemented within existing buildings. No new permanent expansion of buildings, roads, parking lots, equipment storage areas, or transmission facilities on site will be required to either complete the proposed EPU modifications or operate PBAPS at EPU conditions. Exelon will use existing parking lots, road

access, equipment lay-down areas, offices, workshops, warehouses, and restrooms during plant modifications. Therefore, land use conditions and visual aesthetics would not change significantly at PBAPS from EPU plant modifications. The EPU plant modifications are discussed in Attachment 9 to the licensee's application dated September 28, 2012 (ADAMS Accession No. ML12286A011).

The plant cooling towers are not "routinely used" (see "Aquatic Resource Impacts") and are not planned to be "routinely used" during and after implementation of the EPU. Therefore, consistent with the discussion in NUREG-1437, Supplement 10, Section 2.2.8.4, "Visual Aesthetics and Noise," there should not be any significant impacts from the EPU, such as icing, fogging, plume, or noise impacts from the operation of cooling towers. No significant impacts should occur to land use and aesthetic resources in the vicinity of PBAPS from EPU plant modifications.

#### *Non-Radioactive Waste Impacts*

As described in NUREG-1437, Supplement 10, Section 2.1.5, "Nonradioactive Waste Systems," the principal non-radioactive effluents from PBAPS, Units 2 and 3, consists of hazardous (chemical) wastes, lubrication oil wastes, and sanitary wastes. The PBAPS site is a small quantity generator of hazardous waste. Lubrication oils are normally injected into the auxiliary boiler fuel feed with a small quantity sent offsite for disposal. Spent batteries and discarded fluorescent lights are recycled. Sanitary waste is sent to the onsite sewage treatment plant. Implementation of the EPU will likely result in a short-term temporary increase in construction related solid waste and sanitary waste. The proposed EPU is not expected to cause a significant impact from the generation of nonradioactive waste.

### *Air Quality Impacts*

Major air pollution emission sources at the PBAPS site are regulated by the Pennsylvania Department of Environmental Protection (PADEP). Nonradioactive emission sources at PBAPS result primarily from diesel generators that are routinely tested and used when needed to supply backup power. The other major source is from boilers used for space heating and to help with unit startups. Emissions from these sources are regulated by Pennsylvania's Permit Operating Program State Only Permit number 67-05020. There will be no changes to the emissions from these sources as a result of the EPU. However, some minor and short duration air quality impacts would occur during implementation of the EPU. The main source of air emissions would come from the vehicles driven by outage workers needed to implement the EPU. This source will be short-term and temporary. Therefore, the proposed EPU is not expected to cause a significant impact on air quality.

### *Water Use Impacts*

The facility is authorized by the Susquehanna River Basin Commission to draw up to 2,363.62 million gallons/day of water from Conowingo Pond and to consume up to 49 million gallons/day. Consumptive water use at PBAPS consists of two key components: evaporation and drift in the helper cooling towers when the towers are in operation; and in-stream evaporation from Conowingo Pond due to the additional thermal loading from the plant. The PADEP National Pollutant Discharge Elimination System (NPDES) permit issued to PBAPS (PA 0009733) requires that cooling towers must be available to prevent unwanted discharges of high-temperature water. If the three helper cooling towers are operated, water would be lost by evaporation at an approximate rate 5.5 to 22 ft<sup>3</sup>/sec. This evaporative loss represents less than 2 percent of the minimum monthly average river flow. Once the EPU has been implemented, water consumption for plant cooling will not significantly change from pre-EPU operation.

The PBAPS site also uses Conowingo Pond as a source of potable water for the PBAPS site. During the planned outages and modifications, the consumption of potable water will increase to support the temporary workforce. After the EPU has been implemented, there should not be any significant increase in the consumption of potable water. Since groundwater is not used as a source of water, there should not be any consumptive use of groundwater as a result of the EPU.

The proposed EPU would not significantly increase water consumption. Therefore, the proposed EPU is not expected to cause a significant impact on water use.

#### *Water Quality Impacts*

Since plant modifications will take place inside of existing buildings, construction activities should not result in groundwater or surface water pollution. The intake of water from Conowingo Pond for cooling will not increase as a result of the proposed EPU. Therefore, the discharge rates to Conowingo Pond should not increase. In turn, there should not be any changes to Conowingo Pond from increased turbidity, scouring, erosion, or sedimentation as a result of cooling water discharge. All plant wastewaters are managed in accordance with the NPDES permit issued by the PADEP. Plant wastewaters include discharges from the water treatment wastewater settling basin, auxiliary boiler blowdown, dredging/rehandling basin, and sewage treatment plant. The volume of discharge from the sewage treatment plant may temporarily increase during construction, but will remain within permitted levels. Implementation of the proposed EPU will not alter the quality or quantity of plant waste water discharges. The proposed EPU would not increase the impacts to Conowingo Pond water quality. Therefore, the proposed EPU is not expected to cause a significant impact to water quality.

#### *Aquatic Resource Impacts*

The potential impacts to aquatic resources from the proposed action could include impingement of aquatic life on barrier nets, trash racks, and traveling screens; entrainment of

aquatic life through the cooling water intake structures and into the cooling water systems; and effects from the discharge of chemicals and heated water. However, the proposed EPU would not affect aquatic resources in a manner or to a degree that exceeds the analysis of effects in NUREG-1437, Supplement 10.

The NRC staff concluded in NUREG-1437, Supplement 10, Section 4.1.3, "Impingement of Fish and Shellfish," that, during the continued operation of PBAPS, the potential impacts caused by the impingement of fish and shellfish on the debris screens of the cooling water intake system would be small (i.e., not detectable or so minor that they will neither destabilize nor noticeably alter any important attribute of the resource) and that impingement losses would not be great enough to adversely affect Susquehanna River aquatic populations. The NRC staff also concluded in NUREG-1437, Supplement 10, Section 4.1.3, that, in the early life stages in the cooling water system, the potential impacts of entrainment of fish and shellfish would be small, and that there are no demonstrated, significant effects to the aquatic environment related to entrainment. Regarding the potential impacts of thermal discharges, in NUREG-1437, Supplement 10, Section 4.1.4, "Heat Shock," the NRC staff concluded that the impacts are small and that the heated water discharged to Conowingo Pond does not change the temperature enough to adversely impact balanced, indigenous populations of fish and wildlife. Additionally, the NRC has generically determined that the effects from discharge of chlorine or other biocides, as well as accumulation of contaminants in sediments or biota, would be small for continued operations during a renewed license period at all plants as discussed in Section 4.5.1.1, "Surface Water Resources, Discharge of Biocides, Sanitary Wastes, and Minor Chemical Spills," of the "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," NUREG-1437, Volume 1, Revision 1, dated June 2013 (ADAMS Accession No. ML13106A241).

The proposed EPU would not increase the volume or rate of water that is drawn from Conowingo Pond, and water withdrawals and consumptive use would continue to be regulated by the Susquehanna River Basin Commission with no changes to the current withdrawal authorizations. PBAPS's cooling water intake structure (described previously under "Plant Site and Environs") is designed to reduce impingement and entrainment of aquatic organisms, and the proposed EPU would not require any modifications to the current cooling system design. Thus, NRC staff concludes that compared to current operations, the proposed EPU would not change the impingement or entrainment rate of fish, shellfish, or other aquatic organisms.

Chemical effluents discharged from PBAPS would not change in type or quantity under EPU conditions, and effluent discharges to Conowingo Pond will continue to be regulated by PADEP under the site's NPDES permit. Thus, NRC staff concludes that compared to current operations, the proposed EPU would not change the type or concentration of chemical effluents that could impact aquatic resources.

The proposed EPU would increase the temperature of discharged water. Under current operating conditions, cooling water passing through the condensers can increase by as much as 22°F. Under the proposed EPU conditions, Exelon estimates that cooling water temperatures would increase by approximately 3°F, which would result in an increase of up to 25°F as water passes through the condensers. The NPDES permit for PBAPS limits the instantaneous maximum effluent temperature in the discharge canal (Outfall 001) to 110°F. Heated effluent water released into the discharge canal travels 4,700 ft south to a spillway, at which point it enters Conowingo Pond. A thermal study at PBAPS, conducted from June through October of 1999 under zero cooling tower operation conditions, reported the daily average water temperatures at the discharge canal outfall ranged from 66.7°F to 106.5°F.

Prior to the current NPDES permit (effective January 1, 2011), helper cooling towers at PBAPS were used only during extreme low flow and high temperature conditions in Conowingo Pond. The current NPDES permit requires PBAPS to operate one to three of its cooling towers from June 15 to September 15 as part of the permit's thermal and biological study. Exelon began the required sampling in 2010 and continued the sampling through 2013. The study will, among other things, evaluate the changes in the thermal plume during helper cooling tower operation and create a model of these changes that takes into account proposed EPU conditions and other environmental influences to Conowingo Pond.

In NUREG-1437, Supplement 10, Section 4.1.4, "Heat Shock," the NRC staff concluded that for the continued operation of Units 2 and 3, the impacts from thermal effluents would be small. However, this conclusion was made assuming station conditions under the previous NPDES permit. As discussed on page 4 of Attachment 1 to the licensee's letter dated February 17, 2011 (ADAMS Accession No. ML110490533), which transmitted the current NPDES permit and an evaluation of the modifications to the permit to the NRC, the previous permit did not require an instantaneous maximum effluent temperature action level. However, the current technical specifications in the NRC operating licenses for PBAPS, Units 2 and 3, require that plants be shut down when the instantaneous intake temperature exceeds 92°F. As discussed in Attachment 1 to the licensee's letter, in this circumstance, and based on the condenser maximum temperature rise of 21.66°F, the discharge canal should not exceed a maximum of 113.66°F. Thus, the current NPDES permit, which stipulates an instantaneous maximum effluent temperature action level of 110°F, is inherently more protective of the environment. The previous NPDES permit did not require the operation of helper cooling towers. Use of helper cooling towers in the summer months has likely reduced this already small impact. Once completed, the thermal and biological studies will determine to what degree

the helper cooling towers mitigate effluent temperatures and the character of the thermal plume. After the study is completed and based on the study results, Exelon will submit to PADEP an application to modify the NPDES permit. These modifications may include actions to manage the thermal discharge under EPU conditions. For any such future modifications, the PADEP must, in accordance with Section 316(a) of the Clean Water Act, ensure thermal effluent limitations assure the protection and propagation of a balanced, indigenous community of shellfish, fish, and wildlife in and on Conowingo Pond.

In NUREG-1437, Supplement 10, Section 4.1.5, "Microbiological Organisms (Public Health)," the NRC staff concluded that the potential effects of microbiological organisms on human health from the operation of the plant's cooling water discharge to the aquatic environment on or in the vicinity of the site are small. As discussed in NUREG-1437, Supplement 10, Section 4.1.5, discharge temperatures from Units 2 and 3 do not exceed 110°F in late summer. This is below the temperatures known to be conducive to growth and survival of thermophilic pathogens. The ongoing disinfection of the sewage effluent from PBAPS reduces the likelihood that a seed source or inoculants would be introduced to the station's heated discharge or to Conowingo Pond. As previously discussed, the current NPDES permit will continue to assure that there will not be any significant impacts on human health from microbiological organisms.

The current NPDES permit includes thermal limitations and operating conditions that are more protective than the previous NPDES permit (considered in Section 4.1.4. "Heat Shock," of NUREG-1437, Supplement 10). The PADEP will continue to regulate and enforce PBAPS thermal discharges in a manner that will assure the protection and propagation of a balanced, indigenous community of shellfish, fish, and wildlife in and on Conowingo Pond. Therefore, the

increase in thermal effluent under proposed EPU conditions would not result in a significant impact to aquatic resources.

#### *Terrestrial Resource Impacts*

During EPU-related upgrades and plant modifications, impacts that could potentially affect terrestrial resources could come from noise, lighting, and other disturbances to wildlife. However, noise and lighting would not impact terrestrial species beyond what would be experienced during normal operations. This is because EPU-related upgrades and plant modifications would take place during normally planned outage periods, which are already periods of heightened activity. Habitat loss or fragmentation would not occur, because the proposed EPU would not involve any new construction outside of the existing facility footprint (discussed previously under "Land Use and Aesthetic Impacts") and would not require transmission system upgrades or modifications. No changes in transmission line maintenance and vegetation removal are anticipated. The EPU will increase electric current flowing through the transmission system. This will increase the strength of the electromagnetic field around the transmission lines. However, as discussed on pages 4-21 and 4-24 of Supplement 10 NUREG-1437, the NRC has determined that a scientific consensus has not been reached on the chronic effects of the electromagnetic field on humans, and that significant impacts to the terrestrial biota have not been identified. Sediment transport and erosion is not a concern because EPU-related activities would only take place on previously developed land. Therefore, the proposed EPU is not expected to cause a significant impact on terrestrial resources.

#### *Threatened and Endangered Species Impacts*

Under Section 7 of the Endangered Species Act of 1973, as amended (ESA), Federal agencies, in consultation with the U.S. Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (as appropriate), must ensure that actions the agency authorizes, funds, or

carries out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat.

The NRC staff has identified two federally listed species that occur in York County, Pennsylvania: the bog turtle (*Glyptemys muhlenbergii*) and the Indiana bat (*Myotis sodalis*), which are discussed below. The NRC staff also considered the possibility of the shortnose (*Acipenser brevirostrum*) and Atlantic (*Acipenser oxyrinchus oxyrinchus*) sturgeons to occur above Conowingo Dam in Conowingo Pond because, historically, sturgeon likely inhabited the Susquehanna River upstream of the location of the Conowingo Dam prior to its construction. Currently, sturgeons are known to occur in the lower Susquehanna River and the Maryland Department of Natural Resources has noted the occurrence of sturgeon at Conowingo Dam. However, given the size of the dam and the fact that shortnose and Atlantic sturgeon typically do not use fish lifts that were designed for other species (Conowingo Dam's fish lift was designed for the passage of American shad (*Alosa sapidissima*)), the NRC reasonably concludes that neither the shortnose nor Atlantic sturgeon occur in Conowingo Pond.

The FWS listed the northern population of the bog turtle as threatened under the ESA in 1997 (62 FR 59605). The FWS has not designated critical habitat for this species. Bog turtles inhabit early to mid-successional wetlands fed by groundwater or associated with the headwaters of streams and dominated by emergent vegetation. Pennsylvania counties identified by the FWS as containing extant bog turtle populations occur in the southeastern part of the state, and many occur within the Delaware River and Susquehanna River watersheds. In 2000, Exelon commissioned bog turtle habitat (Phase 1) surveys in the vicinity of PBAPS, but no areas of suitable habitat were identified during the surveys. The potential for adverse effects at the PBAPS site and along transmission line corridors to bog turtles was evaluated in Section 2.2.6, "Terrestrial Resources," of NUREG-1437, Supplement 10. The NRC staff

concluded in Section 4.6.2, "Terrestrial Species," that continued operations during the license renewal term would have no effect on bog turtles due to the lack of suitable habitat. The NRC staff requested the FWS's concurrence with this determination in a letter, dated January 17, 2002 (ADAMS Accession No. ML020180445). The FWS concurred with this determination in a letter, dated April 17, 2002 (ADAMS Accession No. ML021510200). The PBAPS site continues to lack suitable habitat for bog turtles, and the proposed EPU would not involve any habitat loss or fragmentation or any other significant impacts to the terrestrial environment. Therefore, the proposed EPU would have no effect on the bog turtle.

The FWS listed the Indiana bat as endangered wherever found in 1967 under the ESA's predecessor, the Endangered Species Preservation Act of 1966 (32 FR 4001). The FWS has not designated critical habitat for the species in Pennsylvania (41 FR 41914). Areas of the PBAPS site that could serve as potential Indiana bat habitat include forested areas, forest edges, and riparian areas. The Pennsylvania Game Commission (PGC) reports that Indiana bats use habitat within York County during the summer. However, no hibernation or maternity sites occur in the county. The Supplemental Environmental Impact Statement did not consider the effects of continued operation of PBAPS during the license renewal term on Indiana bats. The proposed EPU would not disturb or alter any natural habitats on the PBAPS site or along any transmission line corridors, and other impacts such as noise and lighting during EPU-related upgrades. Furthermore, plant modifications would not result in a significant impact on the terrestrial environment. Therefore, the proposed EPU would have no effect on the Indiana bat.

The NRC did not identify any designated critical habitat that could be affected by the proposed EPU, nor has the FWS proposed the listing or designation of any new species or

critical habitat that could be affected by the proposed EPU. Therefore, the proposed EPU would have no effect on designated critical habitat, proposed species, or proposed critical habitat.

*Essential Fish Habitat*

Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act includes requirements for Federal agencies to consider the impact of Federal actions on essential fish habitat (EFH) and to consult with the National Marine Fisheries Service (NMFS) if any activities may adversely affect EFH. According to the EFH Mapper and the NMFS's "Guide to Essential Fish Habitat Designations in the Northeastern United States," NMFS has not designated any EFH under the Magnuson-Stevens Fishery Conservation and Management Act within the affected water bodies. Thus, the proposed EPU would have no effect on designated essential fish habitat.

*Species Protected by the Commonwealth of Pennsylvania*

Within the Commonwealth of Pennsylvania, the PGC, the Pennsylvania Fish and Boat Commission (PFBC), and the Pennsylvania Department of Conservation and Natural Resources (PDCNR) oversee the protection of Commonwealth-listed species under the Pennsylvania Endangered Species Program. The PGC, PFBC, and PDCNR manage the recovery efforts for wild birds and mammals (34 Pa. Code 133); fish, amphibians, reptiles, and aquatic organisms (30 Pa. Code 75); and native plants (17 Pa. Code 45), respectively.

As part of preparing its EPU application, Exelon performed a Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review through the Pennsylvania Natural Heritage Program's website. The survey results indicated no known impacts to species of concern within the oversight of the PGC and FWS. No further review by these two agencies was required. Exelon also directly contacted some of the Pennsylvania agencies listed above to determine potential impacts to Commonwealth-listed species that could result from the proposed EPU.

Exelon's PNDI Environmental Review indicated that there would be no impact to species under the PDCNR's jurisdiction and that no further project review from this agency was required. The PNDI Environmental Review indicated three terrestrial plant species under the PDCNR's purview could occur in the vicinity of PBAPS: the lobed spleenwort (*Asplenium pinnatifidum*), the harbinger-of-spring (*Erigeron bulbosa*), and the American holly (*Ilex opaca*). The PNDI Environmental Review also included recommended conservation measures from the PDCNR, which included practices that could avoid the introduction of invasive species. Exelon contacted the PDCNR directly via a letter dated January 23, 2012, requesting that the PDCNR confirm Exelon's conclusion that the proposed EPU would not adversely affect any Commonwealth-listed threatened or endangered species. In their response, dated February 21, 2012, the PDCNR indicated that the proposed EPU would not result in impacts to species under its jurisdiction. For species under the PFBC's purview, the PNDI Environmental Review indicated that further review was required to determine potential impacts. Exelon contacted the PFBC in a letter, dated January 23, 2012. Subsequently, the PFBC indicated in a letter, dated February 24, 2012, that no adverse impacts are expected to species under its jurisdiction from the proposed EPU. Each of the letters referenced in this paragraph are included in Exelon's supplemental environmental report, which was submitted as Attachment 8 to the EPU application.

The NRC staff reviewed the information discussed above in Exelon's EPU application concerning Commonwealth-listed species. The appropriate Pennsylvania agencies have confirmed the proposed EPU would not affect any species under their purview and NRC staff has not identified any impacts to the terrestrial or aquatic environment beyond those previously considered by each Pennsylvania agency in their reviews. Therefore, the proposed EPU would have no significant impacts to Commonwealth-listed species.

*Socioeconomics*

Currently, approximately 900 permanent workers and 200 contract workers are employed at PBAPS. Exelon's EPU-related plant modifications would occur during the regularly scheduled refueling outages. During normal refueling outages, approximately 800 temporary workers are added to the normal workforce of 1,100 permanent and contract workers. The first phase of EPU modifications is planned to be implemented during the 2014 outage. During that outage, approximately 1,300 additional temporary workers will be added to the normal outage workforce, with the total workforce at PBAPS peaking at approximately 3,200 workers over the modification period. Once EPU-related plant modifications have been completed, the size of workforce at PBAPS would return to normal levels. The PBAPS workforce will remain similar to pre-EPU levels, as will the temporary workforce needed for future refueling outages. The size of the workforce will be unaffected by implementation of the proposed EPU.

The NRC expects most outage and EPU plant modification workers to relocate temporarily to communities in Lancaster or York County, resulting in short-term increases in the local population along with increased demands for public services and housing. As modification work would be temporary, most workers would likely stay in rental homes, apartments, mobile homes, and camper-trailers. The 2011 American Community Survey 1-year estimate for vacant housing units reported 11,509 units in Lancaster County and 12,192 units in York County that could potentially ease the demand for local rental housing. Therefore, while a short duration temporary increase in plant employment would occur, this increase would have little or no noticeable effect on the availability of housing in the region.

The additional number of workers, truck material, and equipment deliveries needed to support EPU-related plant modifications would likely cause short-term level of service impacts (restricted traffic flow and higher incident rates) on secondary roads in the immediate vicinity of

PBAPS. Increased traffic volumes would be necessary to support implementation of EPU-related modifications during the refueling outage. As EPU-related plant modifications would occur during a normal refueling outage, there could be noticeable short-term (during certain hours of the day), level-of-service traffic impacts beyond what is experienced during normal outages. During periods of high traffic volume (i.e., morning and afternoon shift changes), work schedules could be staggered and employees and/or local police officials could be used to direct traffic entering and leaving PBAPS to minimize level-of-service impacts.

PBAPS currently pays property taxes and payments in lieu of property taxes to York County, Peach Bottom Township, and the South Eastern School District. The amount of future property taxes and payments in lieu of property taxes paid by PBAPS could be affected by the increased value of PBAPS as a result of the EPU and increased power generation. Due to the short duration of EPU-related plant modification activities, there would be little or no noticeable effect on local tax revenues generated by temporary workers residing in Lancaster and York counties.

Therefore, based on the information presented above, no significant socioeconomic impacts are expected from EPU-related plant modifications and operations under EPU conditions in the vicinity of PBAPS.

#### *Environmental Justice Impacts*

An environmental justice impact analysis evaluates the potential for disproportionately high and adverse human health and environmental effects on minority and low-income populations that could result from activities associated with the proposed EPU at PBAPS. Such effects may include biological, cultural, economic, or social impacts. Minority and low-income populations are subsets of the general public residing in the vicinity of PBAPS, and all are exposed to the same health and environmental effects generated from activities at PBPAS.

The NRC considered the demographic composition of the area within a 50-mile radius of PBAPS to determine whether minority populations may be affected by the proposed action. The NRC examined the distribution of minority populations within 50 miles of PBAPS using the U.S. Census Bureau data for 2010.

According to the 2010 Census data, approximately 5 million people live within a 50-mile radius of PBPAS. Minority populations within 50 miles compose 35.6 percent (approximately 1.8 million persons) of the total population. The largest minority group was Black or African-American (approximately, 1.2 million persons or 23.1 percent), followed by Hispanic or Latino (of any race) (approximately 315,000 persons or 6.3 percent). According to 2011 American Community Survey 1-Year Estimates, minority populations within Lancaster County comprise 10.2 percent of the total population with the largest minority group being Hispanic or Latino (of any race) at 8.9 percent. Minority populations within York County comprise 12.2 percent of the total population with the largest minority group being Black or African-American at 6 percent.

According to 2011 American Community Survey 1-Year Estimates census data for Lancaster and York counties, approximately 10.9 percent of the population residing within Lancaster County and 11.0 percent of the population residing in York County were determined to be living below the 2011 federal poverty threshold. In addition, approximately 7.9 percent of families residing within Lancaster County and 8.2 percent of the families in York County were determined to be living below the Federal poverty threshold. The 2011 Federal poverty threshold was \$22,350 for a family of four and \$10,890 for an individual. The median household income for Lancaster County was approximately \$64,566 and for York County was approximately \$66,053. Lancaster County median household income is 28.5 percent higher than the median household income (approximately \$50,228) for Pennsylvania, while York County is 31 percent higher.

Potential impacts to minority and low-income populations would mostly consist of human health, environmental, and socioeconomic effects (e.g., noise, dust, traffic, employment, and housing impacts). Radiation doses from plant operations after the EPU are expected to continue to remain well below regulatory limits.

Noise and dust impacts would be temporary and limited to onsite activities. Minority and low-income populations residing along site access roads could experience increased commuter vehicle traffic during outage shift changes. Increased demand for inexpensive rental housing during the EPU-related plant modifications could disproportionately affect low-income populations; however, due to the availability of housing, impacts would be of short duration (approximately 30 to 40 days) and limited. Furthermore, according to the 2011 American Community Survey 1-year estimate, there were 11,509 vacant housing units in Lancaster County and 12,192 vacant housing units in York County available to help alleviate any short-term increased demand.

Based on this information and the analysis of human health and environmental impacts presented in this environmental assessment, the proposed EPU would not have disproportionately high and adverse human health and environmental effects on minority and low-income populations residing in the PBAPS vicinity.

#### *Historic and Cultural Resources Impacts*

There are no records of historic and cultural resources being found on PBAPS property. However, there is the potential to find historic and cultural resources at the PBAPS site as the majority of recorded archaeological sites in the region are found within the first terraces above the Susquehanna River. The likelihood of these resources being present at PBAPS has diminished as the terraces near PBAPS were flooded by the formation of Conowingo Pond.

Nevertheless, there are nine historic properties listed on the National Register of Historic Places within 6 miles of PBAPS.

As previously discussed, all EPU-related plant modifications would take place within existing buildings and facilities at PBAPS, including the replacement of two electrical transformers on the existing pads. Since no ground disturbance or construction-related activities would occur outside of previously disturbed areas and existing electrical transmission facilities, there would be no significant impact from EPU-related plant modifications on historic and archaeological resources, should they be found on or in the vicinity of PBAPS.

#### *Non-Radiological Cumulative Impacts*

The NRC staff considered potential cumulative impacts on the environment resulting from the incremental impact of the proposed EPU when added to other past, present, and reasonably foreseeable future actions in the vicinity of PBAPS. For the purposes of this analysis, past actions are related to the construction and licensing of PBAPS, present actions are related to current operations, and future actions are those that are reasonably foreseeable through the end of station operations including operations under the EPU.

There will not be significant cumulative impacts to the resource areas of air quality, groundwater, threatened and endangered species, or historic and cultural resources in the vicinity of PBAPS, because the contributory effect of ongoing actions within a region are regulated and monitored through a permitting process under State or Federal authority (e.g. NPDES and 401/404 permits under the Clean Water Act). In these cases, impacts are managed as long as these actions are in compliance with their respective permits and conditions of certification.

Surface water and aquatic resources were examined for potential cumulative impacts. The geographic boundary for potential cumulative impacts is the area of the post-EPU thermal

mixing zone in Conowingo Pond. If the proposed EPU is approved and is implemented, PBAPS is predicted to have a slightly larger and hotter mixing zone than pre-uprate conditions during full flow and capacity. The NRC staff anticipates that PBAPS will continue to operate post-EPU in full compliance with the requirements of the PADEP. The PADEP would evaluate PBAPS compliance with its individual wastewater facility permit.

Land use, and aesthetics impacts from the EPU are not expected to contribute to cumulative impacts as there will be no construction of new transmission facilities on site, transmission maintenance and vegetation practices will not change, and all plant modifications will be implemented within existing buildings

As discussed in the aquatic biology section, the abundance of aquatic organisms as a source of food for terrestrial organisms should not change. During the construction of the EPU, only minor temporary changes in air emissions from additional workers and construction equipment are expected. No changes to air emission from implementation of the EPU are expected. There will not be any increases to surface water or air that would increase the impact to terrestrial biota as a result of the EPU. Therefore, the NRC staff concludes that impacts to terrestrial biota are not expected to contribute to cumulative impacts to terrestrial resources as a result of the proposed action.

The greatest socioeconomic impacts from the proposed EPU and continued operation of PBAPS would occur during the 2014 outage. The increase in EPU-related construction workforces would have a temporary effect on socioeconomic conditions in local communities from the increased demand for temporary housing, public services (e.g., public schools), and increased traffic, but would not contribute to cumulative impacts. No significant cumulative impacts are expected as a result of the proposed EPU.

*Non-Radiological Impacts Summary*

As previously discussed, the proposed EPU would not result in any significant non-radiological impacts. Table 1 summarizes the non-radiological environmental impacts of the proposed EPU at PBAPS.

**Table 1 - Summary of Non-Radiological Environmental Impacts**

Land Use and Aesthetic	The proposed EPU is not expected to cause a significant impact on land use conditions and aesthetic resources
Non-Radioactive Waste	The proposed EPU is not expected to cause a significant impact from the generation of nonradioactive waste.
Air Quality	The proposed EPU is not expected to cause a significant impact on air quality.
Water Use	The proposed EPU is not expected to cause a significant impact on water use.
Water Quality	The proposed EPU is not expected to cause a significant impact on water quality.
Aquatic Resources	The proposed EPU is not expected to cause a significant impact on aquatic resources.
Terrestrial Resources	The proposed EPU is not expected to cause a significant impact on terrestrial resources.
Threatened and Endangered Species	The proposed EPU would have no effect on any species or habitats protected under the Endangered Species Act or on designated essential fish habitat protected under the Magnuson-Stevens Fishery Conservation and Management Act. Additionally, the proposed EPU would have no significant impacts on any Pennsylvania-listed species.
Socioeconomics	No significant socioeconomic impacts are expected as a result of the proposed EPU.
Environmental Justice	The proposed EPU is not expected to cause any disproportionately high and adverse human health and environmental effects on minority and low-income populations residing in the PBAPS vicinity.
Historic and Cultural Resources	The proposed EPU is not expected to cause any significant impact to historic and cultural resources.
Non-Radiological Cumulative	No significant non-radiological cumulative impacts are expected as a result of the proposed EPU.

## **Radiological Impacts**

### *Radioactive Gaseous, Liquid Effluents and Solid Waste*

Units 2 and 3 use waste treatment systems to collect, process, recycle, and dispose of gaseous, liquid, and solid wastes that contain radioactive material in a safe and controlled manner within NRC and Environmental Protection Agency (EPA) radiation safety standards. The licensee's evaluation of plant operation at the proposed EPU conditions shows that no physical changes would be needed to the radioactive gaseous, liquid, or solid waste systems.

### *Radioactive Gaseous Effluents*

The gaseous waste management system manages radioactive gases generated during the nuclear fission process. Radioactive gaseous wastes are composed of activation gases and radioactive noble gases from the reactor coolant system, gases from the charcoal treatment system, and gases collected during venting of plant piping. The licensee's evaluation determined that implementation of the proposed EPU would not significantly increase the volume of gases processed in the gaseous waste management system, since plant system functions are not changing and the volume of gases from the plant systems are not expected to change. The analysis also showed the proposed increase in power level would increase the total amount of radioactivity in the gaseous waste management system. However, the licensee's evaluation concluded that the increased radioactivity would not require any changes to the gaseous waste management system. The system would continue to safely control and process the waste in accordance with plant procedures to maintain radioactive gaseous releases within the dose limits of 10 CFR 20.1301 and the as low as is reasonably achievable (ALARA) dose objectives in Appendix I to 10 CFR Part 50 and EPA's 40 CFR Part 190.

### *Radioactive Liquid Effluents*

The liquid waste management system collects, processes, and prepares radioactive liquid waste for disposal. Radioactive liquid wastes include liquids from plant systems containing reactor coolant and liquids that became contaminated from contact with plant systems containing radioactive liquids. The licensee's evaluation shows that the proposed EPU would not significantly increase the inventory of liquid normally processed by the liquid waste management system. This is because the system functions are not changing and the volume inputs remain approximately the same. The licensee's evaluation showed the proposed EPU would increase the total amount of radioactivity in the liquid waste management system. However, since the composition of the radioactive material in the waste and the volume of radioactive material processed through the system are not expected to significantly change, the licensee's evaluation concluded that no changes are needed to the system's design or operation. The existing equipment and plant procedures will continue to control radioactive liquid releases to the environment within the NRC's dose limits in 10 CFR 20.1301 and ALARA dose standards in Appendix I to 10 CFR Part 50 and EPA's 40 CFR Part 190.

### *Public Radiation Doses at EPU Conditions*

The primary sources of offsite dose to members of the public from Units 2 and 3 are radioactive gaseous and liquid effluents. As discussed in the radioactive gaseous and liquid effluent sections above, operation at the proposed EPU conditions will not change the radioactive gaseous and liquid waste management systems' abilities to perform its intended functions to safely control and process the waste. There would be no change to the radiation monitoring system and procedures used to control the release of radioactive effluents in accordance with NRC radiation protection standards for the public in 10 CFR 20.1301 and Appendix I to 10 CFR Part 50 and EPA's 40 CFR Part 190.

The licensee evaluated the projected dose to members of the public from radioactive effluents at the proposed EPU by using actual dose data reported for the period from 2005 through 2008 and recalculated the dose based on the proposed EPU. The following bullets summarize the projected maximum dose to a member of the public located outside the PBAPS site boundary from radioactive gaseous and liquid effluents from the proposed EPU:

- The maximum whole body dose to an offsite member of the public from the combined radioactive liquid effluents from Units 2 and 3 is  $1.52 \times 10^{-2}$  millirem (mrem)/year, which is well below the 6 mrem/year dose criterion in Appendix I to 10 CFR Part 50 for two reactor units.
- The maximum organ dose to an offsite member of the public from the combined radioactive liquid effluents from Units 2 and 3 is  $1.98 \times 10^{-2}$  mrem/year, which is well below the 20 mrem/year dose criterion in Appendix I to 10 CFR Part 50 for two reactor units.
- The maximum air dose at the site boundary from gamma radiation from the combined gaseous effluents from Units 2 and 3 is  $7.27 \times 10^{-1}$  millirad (mrad)/year, which is well below the 20 mrad/year dose criterion in Appendix I to 10 CFR Part 50 for two reactor units.
- The maximum air dose at the site boundary from beta radiation in the combined gaseous effluents from Units 2 and 3 is  $1.42 \times 10^{-1}$  mrad/year, which is well below the 40 mrad/year dose criterion in Appendix I to 10 CFR Part 50 for two reactor units.
- The maximum organ (thyroid) dose to an offsite member of the public from radioactive iodine and radioactive material in particulate form from Units 2 and 3 is 5.12 mrem/year,

which is well below the 30 mrem/year dose criterion in Appendix I to 10 CFR Part 50 for two reactor units.

- Based on the projected annual EPU doses from radioactive gaseous and liquid effluents from Units 2 and 3 being well within the dose criteria in Appendix I to 10 CFR Part 50 and the projected negligible direct shine dose contribution from components within the facilities, including the independent spent fuel storage installation, the total dose will be well within the 40 CFR 190 annual whole body dose standard of 25 mrem/year.

Based on the above, the projected radiation doses to members of the public from the proposed EPU are expected to be within Federal regulatory limits and therefore, would not be significant.

#### *Occupational Radiation Doses at EPU Conditions*

The licensee's evaluation determined that the radioactivity levels in plant systems are expected to increase with the proposed EPU. Permanent shielding to reduce radiation levels is used throughout the two reactor units to protect workers. The licensee's evaluation of the current shielding design determined that it is adequate to continue to protect the workers from the projected increased radiation levels. In addition to the permanent shielding, the licensee's radiation protection program, through the use of training, protective clothing and equipment, temporary shielding, monitoring radiation levels, and direct oversight by radiation protection personnel at individual job sites, will ensure that radiation exposures to workers will be ALARA, as required by 10 CFR 20.1101. Based on the above information, the NRC staff concludes that the proposed EPU is not expected to significantly affect radiation levels within the plant and would not be a significant radiological impact to the workers.

### *Radioactive Solid Wastes*

Radioactive solid wastes include solids recovered from the reactor coolant systems, solids that come into contact with the radioactive liquids or gases, and solids used in the reactor coolant process system. The licensee evaluated the potential effects of the proposed EPU on the solid waste management system. The results of the evaluation indicate that the proposed EPU will increase the volume and activity of radioactive solid waste by approximately 14 percent. The largest volume of radioactive solid waste generated at Units 2 and 3 is low-level radioactive waste which includes used resins, filters, dry compressible waste, irradiated components, and waste oil and ash.

As stated by the licensee, the proposed EPU would not have a significant effect on the radioactive solid waste system. The proposed EPU would not generate a new type of waste or create a new waste stream. No changes are needed to the system to accommodate the projected additional volume and activity. The equipment used to process the solid waste is designed and operated to ensure that hazards to the workers and the environment are minimized. Waste processing areas are monitored for radiation as part of the radiation protection program to ensure that radiation exposure to workers is maintained within NRC dose limits in 10 CFR 20.1201.

Based on the above, the licensee is expected to continue to safely control and process radioactive solid waste from the proposed EPU in accordance with NRC requirements. Therefore, the impacts from solid waste would not be significant.

### *Spent Nuclear Fuel*

Spent fuel from Units 2 and 3 is stored in the plant's spent fuel pool and in dry casks in the independent spent fuel storage installation (ISFSI). Spent fuel generated after implementation of the proposed EPU will also be stored in the spent fuel pool and the ISFSI.

Units 2 and 3 are licensed to use uranium-dioxide fuel up to a maximum enrichment of 5 percent by weight uranium-235. The typical average enrichment is approximately 4.2 percent by weight of uranium-235. The average fuel assembly discharge burnup for the proposed EPU is expected to be approximately 51,000 megawatt days per metric ton uranium (MWd/MTU) with no fuel pins exceeding the maximum fuel rod burnup limit of 62,000 MWd/MTU. The licensee will maintain these fuel characteristics during the proposed EPU. There will be no change to the fuel design or the current 24-month refueling cycle. The fuel characteristics for enrichment and burnup presented above, will ensure that environmental impacts associated with the spent fuel will remain within the impact values contained in: (1) 10 CFR 51.51, Table S-3, "Table of Uranium Fuel Cycle Environmental Data"; (2) 10 CFR 51.52, Table S-4, "Environmental Impact of Transportation of Fuel and Waste to and from One Light-Water-Cooled Nuclear Power Reactor"; as supplemented by (3) NUREG-1437, Volume 1, Addendum 1, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report, Section 6.3 - Transportation, Table 9.1, Summary of findings on NEPA [National Environmental Policy Act] issues for license renewal of nuclear power plants" (ADAMS Accession No. ML040690720).

Therefore, there would be no significant impacts resulting from spent nuclear fuel.

#### *Design-Basis Accidents*

Design-basis accidents (DBAs) are evaluated by both the licensee and the NRC staff to ensure that Units 2 and 3 can withstand a spectrum of postulated accidents without undue hazard to the health and safety of the public.

Separate from the NRC staff's environmental assessment in this document, the NRC staff is evaluating the licensee's DBA analyses of the potential radiological consequences that may result from the proposed EPU. The results of the NRC staff's evaluation and conclusion will be documented in a Safety Evaluation (SE) that will be made publically available. If the

NRC staff concludes in the SE that the radiological consequences of DBAs at the proposed EPU power levels are within NRC requirements, then the proposed EPU will not have a significant impact with respect to the radiological consequences of DBAs.

*Radiological Cumulative Impacts*

The radiological dose limits for protection of the public and plant workers have been developed by the NRC and EPA to address the cumulative impact of acute and long-term exposure to radiation and radioactive material. These dose limits are codified in 10 CFR Part 20 and 40 CFR Part 190.

The cumulative radiation doses are required to be within the limits set forth in the regulations cited previously. The public dose limit of 25 mrem/year in 40 CFR Part 190 applies to all reactors that may be on a site and also includes any other nearby nuclear facilities. Currently, there are no other operating nuclear power reactors located near Units 2 and 3. As discussed in the public radiation dose section, the NRC staff reviewed the licensee's projected post-EPU radiation dose data and concluded that the projected dose to members of the public would be well within the limits of 10 CFR Part 20 and 40 CFR Part 190. The NRC staff expects continued compliance with NRC's and EPA's public dose limits during operation at the proposed EPU power level. Therefore, the NRC staff concludes that there would not be a significant cumulative radiological impact to members of the public from radioactive effluents from Units 2 and 3 at the proposed EPU operating conditions.

As previously discussed, the licensee has a radiation protection program that maintains worker doses within the dose limits in 10 CFR 20.1201. The NRC staff expects continued compliance with the agency's occupational dose limits during operation at the proposed EPU power level.

*Radiological Impacts Summary*

Based on the radiological evaluations discussed previously, with the exception of the impacts associated with DBAs which the NRC staff is evaluating separately from this EA, the proposed EPU would not result in any significant radiological impacts. If the NRC staff concludes in its SE that the DBAs associated with the proposed EPU meet NRC requirements, then the environmental impacts will not be significant. Table 2 summarizes the radiological environmental impacts of the proposed EPU at PBAPS.

**Table 2 - Summary of Radiological Environmental Impacts**

Radioactive Gaseous Effluents	Radioactive gaseous effluents are expected to be adequately handled by the existing radwaste system.
Radioactive Liquid Effluents	Radioactive liquid effluents are expected to be adequately handled by the existing radwaste system.
Public Radiation Doses at EPU Conditions	Radiation doses to members of the public from radioactive effluents are expected to remain below NRC (10 CFR 20.1301 and Appendix I) and EPA radiation protection standards (40 CFR Part 190).
Occupational Radiation Doses at EPU Conditions	Radiation doses to workers are expected to remain within NRC dose limits (10 CFR 20.1201).
Radioactive Solid Wastes	Radioactive solid waste is expected to be adequately handled by the existing radwaste system.
Spent Nuclear Fuel	The spent fuel characteristics will remain within the bounding criteria used in the impact analysis in 10 CFR Part 51, Table S-3.
Design-Basis Accidents	If the NRC staff concludes in the SE that the radiological consequences of DBAs at the proposed EPU power levels are within NRC requirements, then DBAs will not have a significant radiological consequence.
Radiological Cumulative Impacts	Radiation doses to the public and plant workers would remain below NRC (10 CFR Part 20) and EPA (40 CFR Part 190) radiation protection standards.

*Environmental Impacts of the Alternatives to the Proposed Action*

As an alternative to the proposed action, the NRC staff considered denial of the proposed EPU (i.e., the “no-action” alternative) for PBAPS, Units 2 and 3. Denial of the application would result in no change in the current environmental impacts. However, if the EPU were not approved, other agencies and electric power organizations might be required to pursue other means of providing electric generation capacity, such as fossil fuel or alternative fuel power generation, to offset future demand. Construction and operation of such a fossil-fueled or alternative-fueled plant may create impacts in air quality, land use, and waste management significantly greater than those identified for the proposed EPU.

*Alternative Use of Resources*

This action does not involve the use of any different resources (water, air, land, nuclear fuel) not previously considered in NUREG-1437, Supplement 10.

*Agencies and Persons Consulted*

In accordance with its stated policy, on September 6, 2013, the staff consulted with the Pennsylvania State official, Mr. Brad Fuller of the Pennsylvania Department of Environmental Protection, regarding the environmental impact of the proposed action. The State official had no comments.

**III. Finding of No Significant Impact.**

The NRC is proposing to amend Renewed Facility Operating License Nos. DPR-44 and DPR-56 for PBAPS, Units 2 and 3. The proposed amendments would authorize an increase in the maximum reactor power level from 3514 MWt to 3951 MWt.

The NRC has determined not to prepare an Environmental Impact Statement for the proposed action. The proposed action will not have a significant effect on the quality of the human environment because, amending the licenses with the higher maximum reactor power

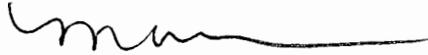
level, will not result in any significant radiological or non-radiological impacts. Accordingly, the NRC has determined that a Finding of No Significant Impact (FONSI) is appropriate. The NRC's Environmental Assessment (EA), included in Section II above, is incorporated by reference into this finding.

The NRC's FONSI and the related environmental documents listed below are available for public inspection and may be inspected online through the NRC's Agencywide Documents Access and Management System (ADAMS) at <http://www.nrc.gov/reading-rm/adams.html>. You may also inspect these documents at the NRC's Public Document Room as described previously.

The NRC's FONSI and the associated EA are available in ADAMS at Accession No. ML14042A397. Related environmental documents supporting the NRC's FONSI are as follows: (1) Attachment 8, "Supplemental Environmental Report," to Exelon's EPU amendment request dated September 28, 2012 (ADAMS Accession No. ML12286A011); (2) NUREG-1437, Volume 1, Addendum 1, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report, Section 6.3 - Transportation, Table 9.1, Summary of findings on NEPA issues for license renewal of nuclear power plants," dated August 1999 (ADAMS Accession No. ML040690720); (3) Supplement 10 to NUREG-1437, "Generic Environmental Impact Statement for the License Renewal of Nuclear Power Plants, Regarding Peach Bottom Atomic Power Station, Units 2 and 3," dated January 2003 (ADAMS Accession No. ML030270059); and (4) "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," NUREG-1437, Volume 1, Revision 1, dated June 2013 (ADAMS Accession No. ML13106A241).

Dated at Rockville, Maryland, this 24th day of March 2014.

For the Nuclear Regulatory Commission.

A handwritten signature in black ink, appearing to read 'Meena K. Khanna', with a long horizontal flourish extending to the right.

Meena K. Khanna, Chief,  
Plant Licensing Branch I-2,  
Division of Operating Reactor Licensing,  
Office of Nuclear Reactor Regulation.

March 24, 2014

Mr. Michael J. Pacilio  
President and Chief Nuclear Officer  
Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

**SUBJECT: PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3 - FINAL ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT RELATED TO THE PROPOSED EXTENDED POWER UPRATE (TAC NOS. ME9631 and ME9632)**

Dear Mr. Pacilio:

Enclosed is a copy of the Final Environmental Assessment and Finding of No Significant Impact related to your application for an amendment dated September 28, 2012, as supplemented by letters dated February 15, 2013, May 7, 2013, May 24, 2013, June 4, 2013, June 27, 2013, July 30, 2013, July 31, 2013, August 5, 2013, August 22, 2013, August 29, 2013, September 13, 2013, October 11, 2013, October 15, 2013, October 31, 2013, December 6, 2013, December 20, 2013, January 17, 2014, January 31, 2014 (two letters), February 20, 2014, February 28, 2014, March 10, 2014, and March 17, 2014, for Peach Bottom Atomic Power Station, Units 2 and 3. The proposed amendment would authorize an increase in the maximum power level from 3514 megawatts thermal (MWt) to 3951 MWt. The requested change, referred to as an extended power uprate, represents an increase of approximately 12.4 percent above the current licensed thermal power level.

The assessment is being forwarded to the Office of the Federal Register for publication.

Sincerely,

*/ra/*

Richard B. Ennis, Senior Project Manager  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-277 and 50-278

Enclosure:  
Environmental Assessment

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*\*via email*

**ADAMS Accession Nos.: Package: ML14042A382 Letter: ML14042A387 EA: ML14042A397**

OFFICE	NRR/DORL/LPL1-2/PM	NRR/DORL/LPL1-2/LA	NRR/DLR/RERB/BC
NAME	REnnis	ABaxter*	DWrona
DATE	3/21/14	3/10/14	3/6/14
OFFICE	OGC	NRR/DORL/LPL1-2/BC	NRR/DORL/LPL1-2/PM
NAME	DRoth	MKhanna	REnnis
DATE	3/20/14	3/24/14	3/24/14

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