R. R. Sgarro
Manager-Nuclear Regulatory Affairs

PPL Bell Bend, LLC
38 Bomboy Lane, Suite 2
Berwick, PA 18603
Tel. 570.802.8102 FAX 570.802.8119
rrsgarro@pplweb.com

December 6, 2010

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

BELL BEND NUCLEAR POWER PLANT
BBNPP PLOT PLAN CHANGE COLA
SUPPLEMENT, PART 3 (ER); SECTION 5.6
BNP-2010-316 Docket No. 52-039

References: 1) BNP-2010-175, T. L. Harpster (PPL Bell Bend, LLC) to U.S. NRC, "July 2010 BBNPP Schedule Update", dated July 16, 2010

2) BNP-2010-246, R. R. Sgarro (PPL Bell Bend, LLC) to U.S. NRC, "BBNPP Plot Plan Change Supplement Schedule Update," dated September 28, 2010

In Reference 1, PPL Bell Bend, LLC (PPL) provided the NRC with schedule information related to the intended revision of the Bell Bend Nuclear Power Plant (BBNPP) footprint within the existing project boundary which has been characterized as the Plot Plan Change (PPC). As the NRC staff is aware, the plant footprint relocation will result in changes to the Combined License Application (COLA) and potentially to new and previously responded to Requests for Additional Information (RAIs). PPL declassified this docketed schedule information from regulatory commitment status in Reference 2, with an agreement to update the staff via weekly teleconferences as the project moves forward.

PPL has committed to provide the NRC with COLA supplements, consisting of revised COLA Sections and associated RAI responses/revisions, as they are developed. These COLA supplements will only include the changes related to that particular section of the COLA and will not include all conforming COLA changes. Conforming changes for each supplement necessary for other COLA sections will be integrated into the respective COLA supplements and provided in accordance with the schedule, unless the supplement has already been submitted. In the latter case, the COLA will be updated through the normal internal change process. The revised COLA supplements will also include all other approved changes since the submittal of Revision 2. All COLA supplements and other approved changes will ultimately be incorporated into the next full COLA revision.

Enclosure 1 provides the revised BBNPP COLA Supplement, Part 3 (Environmental Report), Section 5.6, Revision 2b. The revised BBNPP COLA section supersedes previously submitted information in its entirety.

No open RAIs are associated with the enclosed COLA section. No previously submitted responses to RAIs are affected by the changes shown in the enclosed COLA section. No departures and/or exemptions to this BBNPP COLA section have been revised as a result of the PPC. No new or revised RAI responses are included in this transmittal.

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NRO

The only new regulatory commitment is to include the revised COLA section (Enclosure 1) in the next COLA revision.

If you have any questions, please contact the undersigned at 570.802.8102.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on December 6, 2010

Respectfully,

Rocco R. Sgarro

RRS/kw

Enclosure: Revised BBNPP COLA Part 3 (ER); Section 5.6, Revision 2b

cc: (w/o Enclosures)

Mr. Michael Canova
Project Manager
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Mr. William Dean
Regional Administrator
U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406-1415

Ms. Stacey Imboden
Senior Project Manager
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Dr. Donald Palmrose
Senior Project Manager
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Enclosure

Revised BBNPP COLA Part 3 (ER); Section 5.6, Revision 2b

5.6 TRANSMISSION SYSTEM IMPACTS

This section discusses transmission system operation and maintenance impacts on terrestrial and aquatic ecosystems and members of the public. The significance of these predicted impacts are evaluated and alternative practices to mitigate the impacts are proposed, as needed. The discussion is limited to the transmission facilities associated with BBNPP and modifications or upgrades to the existing transmission system required to connect the additional generation capacity from the unit. Impacts from the existing transmission system, constructed and operated for SSES Units 1 and 2, were addressed in the Environmental Report submitted with the original plant license application (PPL, 1972) and re-evaluated in the Environmental Report submitted with the license renewal application (PPL, 2006).

5.6.1 Terrestrial Ecosystems

This section considers the effects of transmission facility operation and maintenance on the terrestrial ecosystem. The review evaluates the significance of these predicted impacts on important terrestrial species and habitats, and evaluates alternative practices to mitigate the impacts, as needed.

5.6.1.1 Terrestrial Ecosystems

The terrestrial ecology of the BBNPP site was characterized in a series of field ~~studies. Vegetation of the BBNPP project area was recently surveyed.~~ studies completed from July 2007 to August 2008 and from April to June, 2010. Major plant community type (terrestrial habitat types) comprise old field, upland shrub habitat, upland deciduous forest, palustrine emergent wetlands, palustrine scrub/shrub wetlands and palustrine forested wetlands.

The terrestrial ecology of the BBNPP site was characterized in a series of field studies conducted between July 2007 and September ~~2008. This section reports on results available through July 24, 2008.~~ 2008 and an additional set of studies was completed in May and June, 2010. Field studies included a flora survey ~~(Summer 2008),~~ (July 2007 to August 2008 and April to June, 2010), a faunal ~~survey(October~~ survey (October 2007 through September ~~2008),~~ 2008 and Spring 2010), a rare butterfly survey (June and July, 2008), and an Indiana bat mist net survey (June and July, 2008), as well as wetland delineation efforts (July 2007 through August ~~2008).~~ 2008 and April to June, 2010).

5.6.1.2 Important Terrestrial Species and Habitats

As noted in Section 2.4.1, the following species and habitats of the project site have been designated as important according to Federal and Commonwealth of Pennsylvania criteria:

Species important because of rarity:

- Bald Eagle *(Haliaeetus leucocephalus)*: State Threatened
- Peregrine Falcon *(Falco peregrinus)*: State Threatened
- Osprey *(Pandion haliaetus)*: State Threatened
- Indiana Bat *(Myotis sodalis)*: Federal Endangered and State Endangered
- Eastern Small-footed Myotis *(Myotis leibii)*: State Threatened
- Northern Myotis *(Myotis septemtrionalis)*: State Candidate Rare
- Allegheny Woodrat *(Neotoma magister)*: State Threatened

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- Eastern Spadefoot *(Scaphiopus holbrookii)*: State Endangered
- Redbelly Turtle *(Pseudemys rubiventris)*: State Threatened
- Timber Rattlesnake *(Crotalus horridus)*: State Special Concern
- Eastern Hognose Snake *(Heterodon platyrhinos)*: State Species of Special Concern
- Northern Peary-eye *(Enodia anthedon)*: State Vulnerable
- Long Dash *(Polites mystic)*: State Vulnerable
- Mulberry Wing *(Poanes massasoit)*: State Vulnerable
- Baltimore Checkerspot *(Euphydryas phoeton)*: State Vulnerable
- Plants: No plant species designated as important according to Federal and/or Commonwealth of Pennsylvania criteria are present within a 0.5 mi (0.8 km) radius of the project area

Commercially or recreationally valuable species:

- White-tailed Deer *(Odocoileus virginianus)*
- Black Bear *(Ursus americana)*
- Wild Turkey *(Melagris gallopovo)*
- Black Cherry *(Prunus serotina)*

Species critical to the structure and function of local terrestrial ecosystems:

- Meadow vole *(Microtus pensylvanicum)*
- Deer Mouse *(Peromyscus manniculatus)*
- White-footed Mouse *(Peromyscus leucopus)*
- Red Maple *(Acer rubrum)*
- River Birch *(Betula nigra)*
- Spicebush *(Lindera benzoin)*
- Skunk Cabbage *(Symplocarpus foetidus)*
- Canada Goldenrod *(Solidago canadensis)*

Species that could serve as biological indicators of effects on local terrestrial ecosystems:

- Scarlet Tanager *(Piranga olivacea)*
- Vegetation cover in the project area consists of relatively common plants with widespread distributions. None of these species are considered to be particularly reliable for monitoring impacts to terrestrial habitats. An alternate approach would be

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to monitor sensitive habitats such as wetlands for adverse changes to hydrologic regimes, plant survival and species compositions. Study plots could be located in undeveloped wetland habitat ~~remaining~~ onsite and in nearby wetlands, particularly those located downstream from the project area.

Important habitats:

- Palustrine emergent wetlands - jurisdictional wetland
- Palustrine scrub/shrub wetlands - jurisdictional wetland
- Palustrine forested wetlands - jurisdictional wetland

5.6.1.3 Potential Adverse Effects of Operation and Maintenance Practices

No additional offsite transmission corridors or other offsite land use will be required to connect BBNPP to the existing electrical grid. Two new 500 kV switchyards, and two new 500 kV, 4,260 MVA circuits on individual towers, will be constructed on site. An expansion of the existing Susquehanna 500 kV switchyard will also be required. The new transmission lines will connect the new BBNPP switchyard to an expansion of the existing Susquehanna 500 kV Yard, and to the new 500 kV Susquehanna Yard 2. Additionally, the 230 kV transmission lines currently passing through the BBNPP site will be relocated to ~~run along~~ the ~~northern boundary~~ north of ~~the project area.~~Beach Grove Road.

The PPL EU will follow the standard industry practices for operation and maintenance of transmission line rights-of-way. Vegetation management will be practiced to avoid any power outages and injury to the public and company employees from overgrown or diseased trees. Trees are pruned or cut, and integrated vegetation management performed, according to the relevant PPL ~~EUprocedures.~~EU procedures.

Routine maintenance in and along the onsite transmission corridor requires periodic cutting of herbaceous and low woody growth, saplings, larger shrubs, and small trees. Herbicide applications are used only on an occasional basis, if at all. Access roads for construction and subsequent maintenance are stabilized wherever necessary with a course of stones to prevent formation of ruts and gullies in the exposed soil. These road surfaces will be allowed to grass over and cut only as necessary to maintain occasional vehicular access.

The clearing of forest habitat for the construction of onsite transmission lines could have a negative impact on the Indiana bat, the only Federally and State listed endangered species likely to occur at the BBNPP site. To avoid possible negative impacts on the Indiana bat, cutting of trees > 5 in (13 cm) diameter at breast height (dbh) during non-hibernating periods will be done in consultation with appropriate Federal and State Regulatory Agencies.

Operation and maintenance of the power line rights-of-way as a permanent old-field habitat is likely to benefit, over the long term, each of the commercially or recreationally important animals listed in Section 2.4.1, including white-tailed deer, black bear, and wild turkey. This should stimulate growth of low vegetation for deer grazing and browsing, summer berry (raspberry, blackberry) production for black bears, and important insect food for developing wild turkey poults. In addition, this maintained old-field habitat may provide improved food and cover conditions for important prey species, also listed in Section 2.4.1, such as the meadow vole, deer mouse, and white-footed mouse.

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Maintenance of the newly cleared segment of the onsite power line corridor might provide new opportunities for the brown-headed cowbird, a nest parasite, to penetrate the forest edge and impair the nesting success of host birds, including some forest-interior bird species like the scarlet tanager. Although considered a slight impact, this adverse impact would persist as long as the power line corridor is maintained in a primarily old-field stage of ecological succession adjoining sizeable forest tracts. There may also be continuously adverse impacts on scarlet tanager and other forest-interior bird species from competition with and predation by other forest-edge vertebrate species.

The power line corridor is subject to direct adverse impacts in the form of intermittent disruptions associated with control of corridor vegetation by maintenance through cutting or spraying activities. These impacts could include the mortality of small, relatively sedentary vertebrates and invertebrates.

With regard to the four important butterfly (insect) species listed in Table 2.4-1 that are known to utilize adjacent areas to the east of the BBNPP site (northern peary-eye, long dash, mulberry wing and Baltimore checkerspot), the following plants are preferred hosts: willows, poplars, milkweed, mountain laurel, bluegrasses, upright sedge, flower nectar, violets, and turtlehead. During the construction and maintenance of the power line corridors the Pennsylvania Department of Conservation and Natural Resources (PDCNR) recommends that particular attention be paid to these host plants to minimize negative impacts and possibly even enhance ~~habitat.~~habitat (PDCNR, 2008b).

Construction of new transmission line corridors through forested lands in the project area will adversely affect forest ecosystem critical woody species, particularly red maple and spicebush. These species predominate in both upland and wetland forests. However, both the forest communities and ecosystem critical species present onsite occur widely throughout northeastern Pennsylvania. Therefore, development of new transmission line facilities within the confines of the project boundaries will not result in cumulative impacts to forest communities or critical species at either a local or regional scale.

In contrast, forest clearing will favor the development of old field habitat and other early successional vegetation communities. Regular removal of woody vegetation through routine rights-of-way maintenance will preserve these areas as permanent openings that will benefit ecosystem critical species such as Canada Goldenrod, as well as other herbaceous plants.

The height of the transmission lines will meet the PPL EU and National Electric Safety Code NESC) requirements to prevent induced current due to electrostatic effects for any ecological species by assuming a large truck or farm machinery may travel underneath the transmission lines. Therefore, there are no adverse effects due to induced current.

Noise impacts associated with the transmission system lines are due to corona discharge (a crackling or hissing noise). Corona noise for a 500 kV line has been estimated to be 59.3 dBA during a worst case rain with heavy electrical loads (SCE, 2006). For reference, normal speech has a sound level of approximately 60 dB. Therefore, noise from the transmission lines will not have an adverse effect on the terrestrial ecology. (SCE, 2006)

5.6.1.4 Measures and Controls to Mitigate Potential Impacts

Project design attempts first to avoid impacts on wetlands, and on other important habitats as well as important species. Where impacts are unavoidable, they are minimized to the greatest possible extent. Unavoidable impacts are then mitigated as part of the overall project plan.

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The bare soil exposed on access roads will be rendered stable by covering it with a permeable cover of loose stone through which vegetation will be encouraged to grow to improve long-term post-construction stability. All other areas of disturbed soil will be similarly revegetated and maintained in such condition as a routine part of right-of-way management.

~~There are no rare or important plant species.~~

Biocides will be used sparingly if ever, in response to highly selective problems, and away from water.

Streams and wetlands in the rights-of-way that are connected with water bodies containing fish will be maintained in as well-shaded a state as practicable to minimize the warming effect of direct sunlight on surface water.

5.6.1.5 Wildlife Management Practices

There are no ongoing formal wildlife management practices on the project site.

5.6.1.6 Consultation with Agencies

Affected Federal, State, and Regional agencies will be contacted regarding the potential impacts to the terrestrial ecosystem resulting from transmission system operation and maintenance.

The U.S. Fish and Wildlife Service was consulted for information on known occurrences of Federally-listed threatened, endangered, or special status species and critical habitats (USFWS, 2008). For State-listed threatened, endangered, or special status species and critical habitats, the Pennsylvania Game Commission was consulted concerning mammals and birds (PGC, 2008); the Pennsylvania Fish and Boat Commission was consulted consulted concerning reptiles, amphibians, and other aquatic biota (PFBC, 2008), and the Pennsylvania Department of Conservation and Natural Resources was consulted concerning plants, natural communities, terrestrial invertebrates, and geologic features (PDCNR, ~~2008).~~ 2008a and PDCNR, 2008b). Wetlands regulatory officials with the U.S. Corps of Engineers and Pennsylvania Department of Environmental Protection were consulted regarding wetlands issues. Identification of the important species discussed above was based, in part, on information provided by that ~~consultation.~~ consultation (PDCNR, ~~2008) (PFBC, 2008) (PGC, 2008)~~ 2008b; PFBC, 2008; PGC, 2008; PPL, 1972). Additional correspondence was submitted to the Pennsylvania Department of Conservation and Natural Resources, The Pennsylvania Fish and Boat Commission, the Pennsylvania Game Commission, and the U.S. Fish and Wildlife Service on September 20, 2010 (PPL, ~~1972)~~2010a; PPL, 2010b; PPL 2010c; PPL 2010d).

5.6.1.7 References

PDCNR, ~~2008.~~2008a. Pennsylvania Department of Conservation and Natural Resources, Endangered and Threatened Species of Pennsylvania, Index, Website: http://www.dcnr.State.pa.us/wrcf/pubindex.aspx, Date accessed: April 2, 2008.

PDCNR, 2008b. Letter from Rebecca H. Bowen (Pennsylvania Department of Conservation and Natural Resources) to George Wrobel (CEG GNA Engineering), Re: Environmental Review of Bell Bend Nuclear Power Plant Site, Berwick, Luzerne County, Pennsylvania, Dated: March 24, 2008.

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PFBC, 2008. Pennsylvania Fish and Boat Commission, Letter from Christopher A. Urban to Rod Krich (Unistar Nuclear), Re: threatened and endangered reptiles and amphibians concerning the Bell Bend Nuclear Power Site, Berwick, Luzerne County, PA, April 14, 2008.

PGC, 2008. Pennsylvania Game Commission, Letter from James R. Leigey to Rod Krich (Unistar Nuclear), Re: PNDI Database Search, Berwick, PA NPP-1 Project, Salem Township, Luzerne County, PA, April 10, 2008.

PPL, 1972. Pennsylvania Power and Light Company. Susquehanna Steam Electric Station, Applicant's Environmental Report, Revised, July 1972.

PPL, 2006. PPL Susquehanna, LLC, Appendix E, Applicant's Environmental Report - Operating License Renewal Stage, Susquehanna Steam Electric Station, September 2006.

PPL, 2010a. Letter from Terry Harpster (PPL) to Chris Firestone (Pennsylvania Department of Conservation and Natural Resources), Bell Bend Nuclear Power Plant Large Project Species of Special Concern Screen Salem Township, Luzerne County, PA, September 20, 2010.

PPL, 2010b. Letter from Terry Harpster (PPL) to Christopher Urban (Pennsylvania Fish and Boat Commission), Bell Bend Nuclear Power Plant Large Project Species of Special Concern Screen Salem Township, Luzerne County, PA, September 20, 2010.

PPL, 2010c. Letter from Terry Harpster (PPL) to Tracey Mumma (Pennsylvania Game Commission), Bell Bend Nuclear Power Plant Large Project Species of Special Concern Screen Salem Township, Luzerne County, PA, September 20, 2010.

PPL, 2010d. Letter from Terry Harpster (PPL) to Pamela Shellenberger (U.S. Fish and Wildlife Service), Bell Bend Nuclear Power Plant Large Project Species of Special Concern Screen Salem Township, Luzerne County, PA, September 20, 2010.

SCE, 2006. Southern California Edison, Transmission Upgrades West of Devers Substation, Corona Noise Impacts, Website: http://docs.cpuc.ca.gov/published/FINAL_DECISION/ 64017-05.htm, Date accessed: May 6, 2008.

USFWS, 2008. U.S. Fish and Wildlife Service, Letter from David Densmore to Rod Krich (Unistar Nuclear), Re: USFWS Project #2008-518, Federally Listed Endangered and Threatened Species for the Bell Bend Nuclear Power Plant Site, Berwick, Luzerne County, PA, January 18, 2008.

5.6.2 Aquatic Ecosystems

This section considers the effects of transmission facility operation and maintenance on the aquatic ecosystems. The review evaluates the significance of these predicted impacts on important aquatic species and habitats, and evaluates alternative practices to mitigate the impacts, as needed.

5.6.2.1 Aquatic Ecosystems

As described in 2.4.2.1, surveys of benthic macroinvertebrates and fish in Walker Run and the onsite ponds were conducted during 2007 and 2008. In the spring of 2010, fish surveys were completed in the North Branch Canal and adjacent waters. For the offsite water body, Susquehanna River, a historic record of field studies was available for the fish assemblage, and records from 2004 to 2007 were included. The benthic macroinvertebrate community present in the Susquehanna River was assessed in 2007. ~~Information on the fish community believed~~

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~~to be present in the section of the North Branch Division of the Pennsylvania Canal System in the vicinity of the access road leading to the intake structures is available from fishery surveys of Lake Took-A-While.~~ Results of the surveys are summarized for each water body in Section 2.4.2.1 and Section 2.4.2.2.

PPL EU has not initiated detailed design of the new transmission facilities. Water bodies that are impacted by the project are identified in Section 2.3 and listed below:

- Unnamed tributary of and Walker Run,
- Johnson's Pond,
- Beaver Pond,
- West Building Pond,
- Unnamed Pond 1,
- Unnamed Pond 2,
- Farm Pond,
- North Branch Division of the Pennsylvania Canal System, ~~and~~
- Canal Outlet,
- Marshland, and
- Susquehanna River.

5.6.2.2 Important Aquatic Species and Habitats

As described in Section 2.4.2, extensive surveys of these water bodies were conducted. No rare or unique aquatic species were identified in onsite ~~water bodies~~ ponds or streams in the project vicinity. The aquatic species that are present onsite are ubiquitous, common, and easily located in nearby waters. Typical fish species included blacknose dace, white sucker, sunfish and creek chub. Recreationally important species included largemouth bass and bluegill in the onsite ponds and brown trout in Walker Run. However, access to these onsite water bodies is restricted, thus no angling opportunities exist or will be lost. The most important aquatic macroinvertebrate species in the ponds and stream were the juvenile stages of aquatic insects.

Fish community surveys in the North Branch Canal and adjacent waterbodies (Canal Outlet and Marshland) documented a warm-water fish community typical of other waterbodies in Pennsylvania. Common fish species included bluegill, green sunfish, golden shiner, and white sucker. Recreationally important species included sunfish (bluegill, pumpkinseed, and green sunfish), largemouth bass, chain pickerel, and yellow and brown bullhead. One unusual species occurrence in the Canal Outlet was the collection of a single brook stickleback *(Culaea inconstans)*. The species is currently considered a candidate species in Pennsylvania. No previous occurrences of the brook stickleback are known from waterbodies in the vicinity of BBNPP and this observation likely represents an introduction through human action. Furthermore, the Canal and adjacent waters are not the type of habitat preferred by this species. A more detailed discussion of brook stickleback is provided in Section 2.4.2.1.3.

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For the Susquehanna River, two species of mussels were identified as species of special concern: yellow lampmussel *(Lampsillis cariosa)* and green floater ~~(~~*(Lasmigona subviridis)* subviridis). Both were collected in the vicinity of the location for the BBNPP discharge and intake structures. No rare or unique fish species were identified from the Susquehanna River. The fish community was comprised of common species which are ubiquitous throughout Pennsylvania. Abundant fish included smallmouth bass, walleye, spotfin shiner, and spottail shiner. Several species of recreationally important fish were identified from the Susquehanna River including smallmouth bass, walleye, muskellunge, northern pike, and channel catfish.

~~No important species are known or anticipated to be present within the North Branch Canal. The community present in the canal most likely mimics that of Lake Took-a-While. The fish community in the lake is typical of other warm-water lentic water bodies in Pennsylvania.~~

Section 2.4.2 also provides a discussion on the physical, chemical, and biological factors known to influence distribution and abundance of aquatic life. No important aquatic habitats were identified in the project vicinity.

5.6.2.3 Potential Impacts from Operation and Maintenance

No additional offsite transmission corridors or other offsite land use will be required to connect BBNPP to the existing electrical grid. Two new 500 kV switchyards, and two new 500 kV, 4,260 MVA circuits on individual towers, will be constructed on site. An expansion of the existing Susquehanna 500 kV switchyard will also be required. The new transmission lines will connect the new BBNPP switchyard to an expansion of the existing Susquehanna 500 kV Yard, and to the new 500 kV Susquehanna Yard 2. Additionally, the 230 kV transmission lines currently passing through the BBNPP site will be relocated to run ~~along~~to the ~~northern boundary~~ north of ~~the project area.~~Beach Grove Road.

The new BBNPP transmission facilities will be constructed in areas that, at present, are vegetated, and have varying ~~topography,~~ topography. The proposed transmission lines will cross over onsite waterbodies and ~~some of which~~ areas that contain delineated wetlands.

Transmission system operations and maintenance have the potential to cause impacts to water bodies and aquatic ecology.

The PPL EU will follow the standard industry practices for operation and maintenance of transmission line rights-of-way. Vegetation management will be practiced to avoid any power outages and injury to the public and company employees from overgrown or diseased trees. Trees are pruned or cut, and integrated vegetation management performed, according to the relevant PPL EU procedures.

Routine maintenance in and along the onsite transmission corridor requires periodic cutting of herbaceous and low woody growth, saplings, larger shrubs, and small trees. Herbicide applications are used only on an occasional basis, if at all. Access roads for construction and subsequent maintenance are stabilized wherever necessary with a course of stones to prevent formation of ruts and gullies in the exposed soil. These road surfaces will be allowed to grass over and cut only as necessary to maintain occasional vehicular access.

Increased runoff from impervious surfaces from the switchyard could cause a modification to the hydrograph and increases in temperature, sediment and nutrients in receiving water bodies, and corresponding impacts to aquatic invertebrates, plants, and fish. Impacts from these affects would be mitigated by the provision of storm water retention facilities.

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PPL EU procedures for vegetation management control the use of herbicides to mitigate the potential to contaminate water bodies and aquatic species. As previously noted, application of these chemicals is anticipated to be very infrequent.

Since the transmission facilities are not located offsite no direct impacts to the Susquehanna River aquatic ecosystem is expected. Indirect impacts may result from increased sedimentation and heat loads to tributary streams, but would most likely be mitigated by storm water retention facilities.

Onsite aquatic ecosystems may be affected by operation and maintenance of transmission facilities. Impacts will likely include increased runoff from impervious surfaces into the water bodies. Increased runoff may change the hydrograph of Walker Run and increase the magnitude of flood events. Large flood events could result in stream-bed scour and increased transport of stream substrate. With the increased runoff from impervious surfaces it is possible that an increase in stream water temperature may occur in the summer. Defoliants and herbicides may also be transported to the onsite water bodies after rainfall events. Defoliants and herbicides could potentially impact the aquatic species present in Walker Run.

These potential impacts could be monitored by evaluating post-construction fish and macroinvertebrate communities in Walker Run downstream from the transmission facilities. The loss of certain fish species or change in relative abundance of sensitive taxa could indicate potential impacts. Changes in the benthic macroinvertebrate community species composition and abundance could also be evaluated. Benthic macroinvertebrates are routinely used to measure anthropogenic impacts to water bodies (EPA, 1999).

5.6.2.4 Measures and Controls to Mitigate Potential Impacts

The bare soil exposed on transmission facility access roads will be rendered stable by covering it with a permeable cover of loose stone through which vegetation will be encouraged to grow to improve long-term post-construction stability. All other areas of disturbed soil will be similarly revegetated and maintained in such condition as a routine part of rights-of-way management.

Biocides will be used sparingly if ever, in response to highly selective problems, and away from water, under the exclusive control of a licensed biocide applicator.

Streams and wetlands in the rights-of-way that are connected with water bodies containing fish will be maintained in as well-shaded a state as possible to minimize the warming effect of direct sunlight on surface water.

As described in Section 2.4.2, no important fish species were found ~~onsite~~on-site and thus none are present within the zone of influence of the transmission facilities. The only ecologically important species found on-site were benthic macroinvertebrates and no adverse impact to this group is anticipated from operation of transmission facilities. Two important mussel species and eight fish species were determined to be present in the Susquehanna River. However, no adverse impacts to these species are anticipated from operation of the transmission facilities.

5.6.2.5 Consultation with Agencies

Affected Federal, State, and Regional agencies have already been or will be contacted regarding the potential impacts to the aquatic ecosystem resulting from transmission system operation and maintenance.

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Affected Federal, Commonwealth and Regional agencies have been contacted regarding the potential impacts to the aquatic ecosystem resulting from transmission system operation and maintenance. The United States Fish and Wildlife Service was consulted for information on known occurrences of Federally listed threatened, endangered, or special status species and critical habitats (USFWS, 2008). The Pennsylvania Fish and Boat Commission was consulted for information on known occurrences of State-listed threatened, endangered, or special status aquatic species and critical habitats (PFBC, 2008). Identification of the important species discussed above was based on information provided by that consultation.

5.6.2.6 References

EPA, 1999. Environmental Protection Agency, Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition, EPA-841-B-99-002.

PFBC, 2008. Pennsylvania Fish and Boat Commission, Letter from Christopher A. Urban to George Wrobel (Unistar Nuclear), Re: Species Impact Review (SIR) - Rare, Candidate, Threatened, Endangered Species, Berwick, Luzerne County, PA NPP-1, April 14 2008.

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5.6.3 Impacts to Members of the Public

This section describes the transmission system impacts from the BBNPP to its connection with the transmission system. The description is limited to the transmission facilities associated with the new BBNPP and modifications or upgrades to the existing transmission system required to connect the additional generation capacity from BBNPP. Impacts from the existing transmission system, constructed and operated for SSES Units 1 and 2, were addressed in the Environmental Report submitted with the original plant license application (PPL, 1972) and re-evaluated in the Environmental Report submitted with the SSES Units 1 and 2 license renewal application (PPL, 2006).

5.6.3.1 Electrical Design Parameters

As described in Section 3.7, the BBNPP switchyard will be electrically interconnected to the 500 kV transmission system by constructing two 500 kV, 4,260 MVA independent lines on individual towers entirely within the boundaries of the project area. One circuit will connect the BBNPP switchyard to the existing Susquehanna 500 kV switchyard and a separate circuit will connect to the new 500 kV Susquehanna Yard 2. The transmission line circuits will be designed to meet the power delivery requirements. Each phase will use the same three-subconductor bundles comprised of three 1,590 circular mills, 45/7 aluminum conductor, steel reinforced (ACSR) conductors with 18 in (46 cm) separation. There will typically be two 1/2-inch extra-high strength (EHS) overhead ground wires (OHGW) on each transmission line. The new lines will be designed to preclude crossing of lines wherever possible.

The design of the new transmission circuits would consider the potential for induced current as a design criterion. The National Electric Safety Code (NESC) has a provision that describes how to establish minimum vertical clearances to the ground for electric lines having voltages exceeding 98 kV alternating current to ground (NESC, 2007). The clearance must limit the induced current due to electrostatic effects to 5 mA if the largest anticipated truck, vehicle, or equipment were short-circuited to ground. For this determination, the NESC specifies that the

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lines be evaluated assuming a final unloaded sag at 120°F (49°C). The calculation is a 2-step process in which the analyst first calculates the average field strength at 1 m (3.3 ft) above the ground beneath the minimum line clearance, and second calculates the steady-state current value. The design and construction of the BBNPP substation and transmission circuits would comply with this NESC provision. At a minimum, conductor clearances over the ground would equal or exceed 29 ft (9 m) phase-to-ground over surfaces that could support a large truck or farm machinery, while clearance over railroad lines would equal or exceed 37 ft (11 m) phase-to-ground. The two circuits will be constructed in such a manner to provide sufficient physical separation to minimize the risk of simultaneous failure. The two lines will be constructed in accordance with established National Electric Safety Code (NESC) standards, PJM procedures and State and Local regulations. Detailed design of the transmission interconnection will be done as part of the PJM Interconnection process per PJM's Open Access Transmission Tariff.

Environmental impacts are limited to the proposed plant and construction area on the BBNPP site. No new corridors, or crossings over main highways, primary roads, waterways, or railroad lines are required.

5.6.3.2 Structural Design Parameters

As described in Section 3.7, the number and location of the transmission towers between the existing Susquehanna 500 kV Yard, the new Susquehanna 500 kV Yard 2, and the BBNPP switchyard will conform with PPL EU and PJM design standards. The BBNPP switchyard would occupy an 850 ft (259 m) by 300 ft (91 m) tract of land approximately 900 ft (274 m) east of the BBNPP containment. The BBNPP switchyard would be electrically integrated with the existing Susquehanna 500 kV Yard, the new Susquehanna 500 kV Yard 2 by constructing two 500 kV, 4,260 MVA, lines on individual towers. The two circuits will be constructed in such a manner to provide sufficient physical separation to minimize the risk of simultaneous failure. The two lines will be constructed in accordance with established National Electric Safety Code (NESC) standards, PJM procedures and State and Local regulations. Detailed design of the transmission interconnection will be done as part of the PJM Interconnection process per PJM's Open Access Transmission Tariff. The existing 500 kV transmission towers are designed and constructed to National Electric Safety Code (NESC) and PJM Transmission and Substation Design Subcommittee Technical Requirements. The new towers added to support BBNPP will also conform to these criteria. The new towers will be steel tubular or lattice designs, and will provide minimum clearances in accordance with the aforementioned standards (Section 3.7). The two circuits connecting the existing Susquehanna 500 kV Yard, the new Susquehanna 500 kV Yard 2, and the BBNPP switchyard, will be carried on separate towers. All structures will be grounded with a combination of ground rods, foundation grounds and a ring counterpoise system.

5.6.3.3 Maintenance Practices

The transmission lines and towers for BBNPP are located entirely within the boundaries of the BBNPP project area. Environmental impacts would be limited to the proposed project plant and construction area. Thus, no new corridors and associated vegetation buffer zones would be required to minimize visual impacts along roadways.

The use of pesticides and herbicides for vegetation control is described in the PPL EU vegetation management procedures.

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5.6.3.4 Aircraft Visibility

The Federal Aviation Administration (FAA) normally requires that structures that exceed a height of 200 ft (61 m) above ground level be marked and/or lighted for "increased conspicuity to ensure safety to air navigation" (FAA, 2000). If any transmission structures exceed a height of 200 ft (61 m) above ground surface Federal Aviation Administration permits will be required.

Helicopters, however, may land periodically at the BBNPP site and the design of the transmission towers and lines will include lights and markers, where appropriate, to alert helicopter traffic to potential hazards created by the proposed structures. For example, lighting may be incorporated into tower design and painted spherical markers may be attached to overhead lines for increased conspicuity to ensure air safety (FAA, 2000).

Aesthetic impacts are also considered in the design of the new transmission structures. Buildings and equipment will be painted to blend with the existing facilities and will not significantly increase the visual impact of the BBNPP site. While the transmission towers will be of sufficient height to avoid safety impacts on the ground, the towers will not be excessively high such that aircraft safety is compromised or unnecessary visual impacts result from excessive tower height.

5.6.3.5 Electric Field Gradients

The maximum electric field gradients for the proposed transmission lines can be predicted through calculation. While there are no specific criteria for maximum electric field gradients, induced currents resulting from high electric fields created by overhead transmission lines are a concern and must be considered in the system design in accordance with the NESC.

As part of the design process, the transmission lines will be analyzed to determine electrical field strengths and to verify conformance with NESC requirements on line clearance to limit shock from induced currents. The minimum clearance to the ground, for lines having voltages exceeding 98 kV alternating current, must limit the potential induced current due to electrostatic effects to 5 milliamperes if the largest anticipated truck, vehicle, or other equipment were short-circuited to ground. For this determination, the NESC specifies that the lines be evaluated assuming a final unloaded sag at 120°F (49°C). The calculation is a 2-step process in which the average field strength at 1.0 m (3.3 ft) above the ground beneath the minimum line clearance is calculated, and then the steady-state current value is determined. The 500 kV lines to be constructed between the BBNPP switchyard, the existing Susquehanna 500 kV Yard, and the new Susquehanna 500 kV Yard 2, will be designed to meet the NESC.

5.6.3.6 Proposed Transmission Corridors

The transmission lines to support BBNPP will be constructed within the BBNPP site, thus no new offsite corridors or widening of existing offsite corridors is required to connect BBNPP to the existing electrical grid. The existing two 500 kV circuits from the SSES ~~site, the Susquehanna-Wescosville-Alburtis line to the Alburtis substation and the Sunbury-Susquehanna #2 line,~~ site are shown on the map in ~~Figure~~Figure 3.7-2 ~~3.7-1~~ (Section 3.7). The site topography and generalized route for the transmission lines on the BBNPP site are also shown in ~~Figure~~Figure 3.7-2 ~~3.7-1~~ (Section 3.7). The onsite transmission lines are anticipated to cross over a construction road and laydown areas associated with the project. Since these lines are not expected to be energized until the end of the project, exposure of the construction phase work force to field gradients would be minimal. Areas under the transmission lines will be cleared of any vegetation that might pose a safety threat. Any maintenance access roads are not anticipated to increase the public's exposure to electric field

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reestablishment of native grasses and shrub vegetation, rather than tall trees, in the corridor will also limit wildlife exposure for smaller animal species.

5.6.3.7 Impacts to Communication Systems

Generally, the cause of radio or television interference from transmission lines is from corona discharge from defective insulators or hardware. Complaints regarding electromagnetic interference with radio or television reception that occur are investigated for cause and, as necessary, defective components replaced to correct the problem. The existing BBNPP transmission lines are designed and constructed to minimize corona. The lines supporting BBNPP will also be designed and constructed to minimize corona. As such, it is expected that radio and television interference from these new lines will be minimal.

5.6.3.8 Grounding Procedures for Stationary Objects

The structures and equipment on the BBNPP site will be adequately grounded in the course of designing and constructing the BBNPP. There are no new offsite lines and associated rights-of-way required for BBNPP. No new offsite rights-of-way and associated grounding of stationary objects is required.

5.6.3.9 Electric Shock Potentials to Moving Vehicles

There is minimal potential for electric shock in moving vehicles such as buses or cars since the vehicles are insulated from ground by their rubber tires. As a result, occupants in cars and buses are generally safe from potential shock from overhead high voltage lines. In addition, since the vehicle is moving, there is little opportunity for the vehicle to become "capacitively charged" due to immersion in a transmission line's electrical field. In the unlikely event that a moving vehicle becomes charged, it is also unlikely that a grounded person outside the moving car or bus will touch the vehicle, thereby discharging a current through the person's body.

5.6.3.10 Noise Levels

Corona discharge is the electrical breakdown of air into charged particles caused by the electrical field at the surface of the conductors, and is increased by ambient weather conditions such as humidity, air density, wind, and precipitation and by irregularities on the energized surfaces. During wet conditions audible noise from the corona effect can exceed 50 dBA for a 500 kV line. Corona noise for a 500 kV line may range between 59 and 64 dBA during a worst case rain with heavy electrical loads (SCE, 2007). For reference, normal speech has a sound level of approximately 60 dBA and a bulldozer idles at approximately 85 dBA.

There were no state or county noise ordinances found for the BBNPP site area. Salem Township has a qualitative noise standard in Section 318 of the Zoning Ordinance. The Standard states "Noise which is determined to be objectionable because of volume, frequency or beat shall be muffled or otherwise controlled."

BBNPP transmission lines are designed and constructed with hardware and conductors that have features to eliminate corona discharge. Nevertheless, during wet weather, the potential for corona discharge increases, and nuisance noise could occur if insulators or other hardware have any defects. Corona induced noise along the existing transmission lines is very low or inaudible, except possibly directly below the line on a quiet, humid day. Such noise does not pose a risk to humans. Complaints on transmission line noise are monitored but reports of nuisance noise have not been received from members of the public.

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As shown in Figure 3.7-2~~Figure 3.7-1,~~, the BBNPP switchyard, the transmission lines connecting the BBNPP switchyard to the existing Susquehanna 500 kV Yard and the new Susquehanna 500 kV Yard 2, will be constructed entirely on the BBNPP site. Switchyards include transformer banks and circuit breakers that create "hum," normally around 60 dBA, and occasional instantaneous sounds in the range of 70 to 90 dBA during activation of circuit breakers (CA, 2006). The new BBNPP switchyard, the expansion to the existing Susquehanna 500 kV Yard, and the new Susquehanna 500 kV Yard 2, will introduce these new noise sources (transformers and circuit breakers) to its location.

A leaf off noise survey was conducted at the SSES with measurements taken at the nearest residential locations to the proposed BBNPP. There are switchyards and transmission lines associated with SSES. Absolutely no sounds from the plant were detectable during attended measurement for normal operation on February 29, 2008. Sound pressure levels were below 60 dB. SSES Unit 1 was shut down on March 3, 2008. Noise from the plant, presumed to be construction or maintenance sources, was readily audible during the March 14, 2008 attended measurement survey, but sound pressure levels remained below 60 dB (HAI, 2008). Therefore, in the absence of construction and maintenance activities, all measured ambient sound levels can be attributed to normal, current environmental sources, such as traffic noise, high wind and rain and are not related to the existing SSES plant.

The noise levels surrounding the substation would likely be close to 60 dBA near the substation fence, but would be significantly reduced near the site boundary, approximately ~~2,800~~1,800 ft ~~(850~~(549 m) to the south. According to NUREG-1437, noise impacts from currently operating nuclear power plants have been found to be small and generally not noticed by the public. Noise levels below 60 to 65 decibels are considered to be of small significance (NRC, 1996).

5.6.3.11 References

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