



Appalachian National Scenic Trail Delaware Water Gap National Recreation Area Middle Delaware National Scenic and Recreational River

New Jersey and Pennsylvania



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and Special Use Permit Final Environmental Impact Statement
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Volume I

**UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE**
**SUSQUEHANNA TO ROSELAND 500-kV TRANSMISSION LINE RIGHT-OF-WAY
AND SPECIAL USE PERMIT FINAL ENVIRONMENTAL IMPACT STATEMENT**

**APPALACHIAN NATIONAL SCENIC TRAIL, DELAWARE WATER GAP NATIONAL RECREATION AREA, MIDDLE
DELAWARE NATIONAL SCENIC AND RECREATIONAL RIVER, PENNSYLVANIA AND NEW JERSEY**

Lead Agency: National Park Service, U.S. Department of the Interior

Cooperating Agency: U.S. Fish and Wildlife Service

This *Susquehanna to Roseland 500-kV Transmission Line Right-of-Way and Special Use Permit Final Environmental Impact Statement (EIS)* was prepared for the Delaware Water Gap National Recreation Area (DEWA), Appalachian National Scenic Trail (APPA), and Middle Delaware National Scenic and Recreational River (MDSR) in Pennsylvania and New Jersey. This EIS describes the proposal of PPL Electric Utilities Corporation and Public Service Electric and Gas Company (PSE&G), jointly known as the applicant, to construct a portion of the Susquehanna to Roseland 500-kV transmission line (S-R Line) and reconstruct an existing 230-kV line along their current right-of-way (ROW) through the parks, and details the six alternatives for the route of the transmission line, the resources that would be affected by the alternatives, and the environmental consequences of the alternatives.

Federal action by the National Park Service (NPS) is needed because the applicant has submitted an application and plan to construct its line across areas under NPS jurisdiction. The applicant requests NPS permission to expand the size of the current ROW, access the ROW through existing natural and cultural areas, construct new and taller power line towers, and remove and replace the existing 230-kV Bushkill-to-Kittatinny Line (B-K Line) with a new double-circuit 500-kV transmission line (the S-R Line). The purpose of the proposed action is to respond to the applicant's request to construct a double-circuit 500-kV power line across three units of the national park system considering the purposes and resources of the affected units as expressed in statute, regulation, and policy.

Under alternative 1 (no action), the permit to allow construction of the applicant's proposal would be denied and current conditions would be presumed to continue. Alternative 2 (applicant's proposed route) would cross approximately 4.3 miles of NPS lands along the existing B-K Line corridor and require the cleared ROW to be expanded to between 200 to 350 feet in width. Alternative 2b (applicant's alternate route) would follow the same route as alternative 2, but would be constructed within the applicant's existing deeded ROW without expansion. Alternative 3 would cross approximately 5.4 miles of NPS lands along a different existing transmission line corridor and would require a ROW ranging between 150 and 300 feet in width. Alternative 4 would cross approximately 1.5 miles of NPS lands along another existing transmission line corridor and would require a ROW ranging between 200 to 300 feet in width. This alternative would not cross the MDSR. Alternative 5 would follow the same route as alternative 4, but would not include a 0.6-mile stretch of NPS land found west of the Bushkill substation. Alternative 2 is the **NPS preferred alternative**, and alternative 1 is the **environmentally preferable alternative**. The EIS analyzes the impacts of the alternatives in detail for geologic resources (including topography and paleontology); floodplains; wetlands; vegetation; landscape connectivity, wildlife habitat, and wildlife; special-status species; rare and unique communities; archeological resources; historic structures; cultural landscapes; socioeconomics; infrastructure, access, and circulation; visitor use and experience; visual resources; soundscapes; wild and scenic rivers; park operations; and health and safety.

The draft EIS was released in November 2011 and was available for public and agency review and comment beginning with publication of the notice of availability in the Federal Register. Comments were accepted during the 60-day public comment period. After this public review, NPS identified the preferred alternative and revised this document in response to public comments. A 30-day no-action period will follow the notice of availability in the Federal Register for the release of the final version of this document. After this period, the alternative or actions constituting the approved plan will be documented in a record of decision that will be signed by the Regional Director of the Northeast Region of the NPS. For further information regarding this document, please visit <http://parkplanning.nps.gov/dewa>.

John J. Donahue, Superintendent
Delaware Water Gap National Recreation Area &
Middle Delaware National Scenic and Recreational River
HQ River Road, off Rt. 209, Bushkill, PA 18324
(570) 426-2418

Pamela Underhill, Superintendent
Appalachian National Scenic Trail
P.O. Box 50, Harpers Ferry, WV 25425
(304) 535-6278



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EXECUTIVE SUMMARY

This *Susquehanna to Roseland 500-kilovolt (kV) Transmission Line Right-of-Way and Special Use Permit Final Environmental Impact Statement* (EIS) analyzes the environmental consequences of constructing a transmission line through portions of the Delaware Water Gap National Recreation Area (DEWA), Appalachian National Scenic Trail (APPA), and the Middle Delaware River National Scenic and Recreation Area (MDSR), in Pennsylvania and New Jersey in order to inform the National Park Service's decision on whether to issue the permits required to do so. The EIS assesses the impacts that could result from the denial of the permits and the continuation of current conditions (the no-action alternative) or the implementation of any of the five action alternatives (2, 2b, 3, 4, and 5). This EIS has been prepared in accordance with the National Environmental Policy Act (NEPA), the Department of Interior regulations implementing NEPA, and the National Park Service (NPS) Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision Making. The NPS is integrating the NEPA compliance process with that for Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and using the NEPA documentation and coordination processes for Section 106 compliance pursuant to 36 CFR § 800.8(c). Integration of the requirements of Section 106 of the NHPA into the NEPA process and documentation are accomplished by meeting the criteria set forth in 36 CFR § 800.8(c)(1)-(4).

PURPOSE OF ACTION

The federal action under consideration in this EIS is deciding whether to issue the applicant the permits it needs to construct a double-circuit 500-kV transmission line across three units of the national park system. The purpose of the federal action is to respond to the applicant's proposal considering the purposes and resources of the affected units of the national park system, as expressed in statute, regulation, policy, and the NPS objectives in taking action.

NEED FOR ACTION

Federal action by the NPS is needed because the applicant has submitted an application and a plan to construct its line across areas under NPS jurisdiction. The applicant requests NPS permission to expand the size of the current right-of-way (ROW), to access the ROW through existing natural and cultural resource areas, to construct new and taller support towers, and to remove and replace the existing 230-kV Bushkill-to-Kittatinny Line (B-K Line) with a new double-circuit 500-kV transmission line (the Susquehanna-to-Roseland (S-R Line)). Under NEPA, before the NPS can issue a permit allowing a transmission line to cross a unit of the national park system it must consider and assess the impact on the human environment.

BACKGROUND AND PURPOSE OF DEWA, MDSR, AND APPA

DEWA, MDSR, and APPA are three separate units of the national park system. DEWA, MDSR, and APPA are central components of nature-based recreation for the New York City/Philadelphia metroplex.

DEWA is a 67,210-acre park along the shores of the Delaware River in New Jersey and Pennsylvania. DEWA offers a variety of outdoor recreational opportunities, including boating, fishing, swimming, biking, cross-country skiing, rock climbing, sightseeing, natural and cultural history, and the general solitude of a rural environment. Each year, DEWA receives more than 5.2 million recreational visitors (NPS 2012c). The park is the eighth most visited unit (depending on the year) in the national park system and visitation is growing at a steady rate. Much of this visitation is from the nearby, rapidly expanding, New York/northern New Jersey and Philadelphia suburban areas (NPS 2010c, NPS 2012c). The Delaware River is one of the primary recreational attractions in the park unit. The river is the last free-flowing river

on the eastern seaboard (NPS 2003a, 1). Some of the important purposes of DEWA are to meet outdoor recreational needs, as well as to preserve scenic, scientific, and historic resources that contribute to the public enjoyment of the lands and waters in the park, and to leave the resources unimpaired for future generations.

MDSR was established as a scenic and recreational river in 1978 under the Wild and Scenic Rivers Act. The Delaware River is one of the cleanest rivers in the nation making it a popular destination for swimming, fishing, boating, canoeing, kayaking, rafting, and tubing. It is estimated that more than 15 million persons in the United States, including New York City, Philadelphia, and surrounding urban areas, depend on the water of the Delaware River Basin for public water supply and industrial use (Sloto and Buxton 2006, 2). A portion of the Delaware River Water Trail, a national scenic trail from Hancock, New York to Trenton, New Jersey, runs through MDSR. The purpose of the MDSR is to protect and enhance those values which contribute to making the river a recreational and scenic river, and that provide public use and enjoyment of these values.

APPA is a 2,175-mile-long public footpath from Maine to Georgia conceived in 1921 and completed in 1937. APPA was designated as the nation's first national scenic trail by the National Trails System Act in 1968. It is arguably the most famous hiking path in the world. The trail was built and is still maintained by private citizen volunteers across 14 states. It is enjoyed by an estimated two to three million people each year and is within a day's drive of two-thirds of the U.S. population. APPA is managed cooperatively by the NPS, the Appalachian Trail Conservancy, volunteers from 31 local Appalachian Trail Clubs, the U.S. Department of Agriculture Forest Service, and a variety of other state and local land-managing agencies. APPA crosses over 75 federal and state forests and park lands (NPS 2010d). APPA was created with the purpose of providing maximum outdoor recreational potential as an extensive footpath, as well as to provide for the enjoyment of and conservation of the scenic, historic, natural, and cultural resources found in areas where the trail passes. It also stands as a monument to the historical movement of the visionaries and volunteers who conceived of and brought the Trail into existence.

OBJECTIVES

Physical resources

- Avoid adverse effects on geologic resources (geology, paleontology, and rare and unique geologic features), soil resources (soils and prime and unique farmlands), and water resources (surface waters and groundwater).

Natural resources

- Avoid adverse effects on natural resources (vegetation, landscape connectivity and wildlife habitat, special-status species, and rare and unique communities).
- Protect existing functions and values of wetlands and floodplains by avoiding adverse impacts or limiting impacts to an insignificant level.
- Maintain the ecological integrity of rare and unique communities and prevent degradation of the communities from occurring.
- Protect threatened and endangered species by avoiding impacts. Complete consultation with federal agencies as required under the Endangered Species Act of 1973, as amended (16 United States Code [USC] § 1531–1544), and coordinate with state agencies regarding state-listed species.

- Manage any construction and maintenance activities to avoid or reduce impacts on wildlife and plant species as much as possible.
- Manage any construction and maintenance activities to avoid or reduce the introduction and spread of invasive species.
- Avoid or minimize adverse effects on migratory birds in accordance with Migratory Bird Treaty Act and the 2010 *Memorandum of Understanding Between the U.S. Department of the Interior National Park Service and the U.S. Fish and Wildlife Service to Promote the Conservation of Migratory Birds*.
- Mitigate impacts on landscape connectivity.

Cultural resources

- Avoid, minimize, or mitigate adverse effects on identified archeological resources.
- Avoid, minimize, or mitigate adverse effects on identified historic structures.
- Avoid, minimize, or mitigate adverse effects on identified cultural landscapes.
- Protect the eligibility of cultural resources for National Register of Historic Places (National Register) nomination.

Socioeconomics

- Avoid impacts on surrounding land use; socioeconomics; and infrastructure, access, and circulation; or gateway communities.

Visitor use and experience

- Maintain visitor experience, including preservation of key qualities such as primitive, solitary, and pastoral experiences. If impacts are unavoidable, mitigate impacts as appropriate, including any lost use due to closures or diminished experience caused by construction.

Visual resources

- Avoid, minimize, or mitigate impacts to scenic viewsheds and landscapes.

Soundscapes

- Avoid, minimize, or mitigate impacts on soundscapes.

Wild and scenic rivers

- Avoid adverse effects on the esthetic, scenic, historic, archeological, and scientific features of MDSR.

Park operations

- Avoid adverse effects on the parks' fiscal and operating resources, including long-term management of resources and volunteer organizations.

Human health and safety

- Protect the safety of staff and visitors; measures taken to ensure human health and safety could include closures of roads, the river, trails, and airspace, as necessary.

SUSQUEHANNA TO ROSELAND TRANSMISSION LINE LOCATION AND BACKGROUND

In 2007, the regional transmission operator, PJM Interconnection (PJM), identified a 500-kV transmission line between the Susquehanna Substation in Pennsylvania and the Roseland Substation in New Jersey as the preferred and most effective solution for reliability violations forecasted as part of the Federal Energy Regulatory Commission-approved Regional Transmission Expansion Plan process. Responding to this assessment, the applicant proposed to construct a 500-kV transmission to connect the two substations on a route that included crossings of DEWA, APPA, and MDSR.

The applicant applied for permits to allow the construction, maintenance, and operation of the S-R Line across three units of the national park system, the expansion of the existing ROW, and the replacement of an existing 230-kV transmission line it owns. The existing 230-kV transmission line runs from the Bushkill substation to the Kittatinny substation, crossing DEWA, MDSR, and APPA, and is referred to in this document as the Bushkill-to-Kittatinny line or B-K Line. It also crosses a small panhandle of DEWA en route to and northwest of the Bushkill Station. This line and its ROW predate the establishment of all of the three Park units and has been described by the applicant as almost or actually obsolete. The B-K Line towers are approximately 80 feet in height and its deeded ROW varies from 100 to 380 feet in width through the parks. The applicant proposes to replace the B-K Line towers with new towers up to 195 feet tall, install an additional circuit (the S-R Line), and widen the ROW to accommodate these new facilities. The new replacement B-K Line would be capable of carrying 500-kV, though it would be initially energized at only 230-kV. The applicant's proposal and the action alternatives to it discussed herein include both the construction of the S-R Line and the replacement of the B-K Line as part of the project. References in this document to "the line" refer to both lines and the single set of towers they share.

The applicant's purpose for the proposed S-R Line is to strengthen the reliability of the grid at the direction of the regional transmission operator, PJM. PJM oversees the overall movement of wholesale electricity between many electric utilities in all or parts of 13 states and the District of Columbia. The PJM 2007 load forecast model identified 23 projected grid reliability criteria violations starting in 2012. PJM advised that an upgrade to this line would aid in resolving several violations and issues related to reliability and congestion. The need for the proposed S-R Line has been expressed several times by PJM in planning documents. PJM's Regional Transmission Expansion Plans from 2007 to 2010 have identified the proposed S-R Line as an important project on what was termed by PJM as a "backbone" line. The North American Electric Reliability Corporation also identified the proposed S-R Line as a "backbone," while the applicant has repeatedly noted the need for and importance of increased electrical transmission capacity between Berwick, Pennsylvania and Roseland, New Jersey. If constructed, the new S-R Line would make the current transmission line corridor an even more important link in the regional grid than it is now. The two new lines proposed would require a much higher level of access roads and activity to monitor and maintain.

The public has expressed concerns about the need for and impacts of the project. Individuals and public organizations have questioned the need for an expanded transmission line, given the static-to-recessional economic climate and advances in energy efficiency. In areas served by the proposed S-R Line, energy consumption has decreased in recent years, and forecasts of a continued downward trend in regional demand cause some to question whether there is a verifiable need for the proposed line. Three municipalities have questioned the need for the line, and have noted engineering concerns with long-

distance electrical power transmission and its potential to cause cascading power failures due to the increased current needed to maintain power flows across such lines.

The Pennsylvania Public Utility Commission and the New Jersey Board of Public Utilities have approved the S-R Line, although the approval included conditions and the New Jersey Board of Public Utilities decision is being challenged in court.

Whether there is a need for the proposed S-R Line project is not for the NPS to decide, nor is it a factor in the preparation of this EIS; that question is within the purview of the Pennsylvania Public Utility Commission and New Jersey Board of Public Utilities. The NPS prepared this EIS to determine whether to grant or deny the applicant's request for construction and ROW permits within NPS lands.

ALTERNATIVES CONSIDERED

This EIS considers six alternatives that would cross NPS lands and require an NPS permit. The NPS does not control the route of the proposed S-R Line in areas outside NPS lands. Although the applicant could choose any route outside of NPS jurisdiction, the NPS identified possible routes in each alternative that could connect the Susquehanna and Roseland substations only to determine suitable alternative locations where the line could cross park lands. The NPS identified routes solely to determine if construction on the routes is technically feasible. Route identification does not constitute any NPS attempt to determine the actual location of the proposed lines outside of NPS jurisdiction. The routes and requirements of the proposed alternatives are presented as follows.

DESCRIPTION OF THE ALTERNATIVES

Alternative 1: The No-action Alternative

Under the no-action alternative, the NPS would deny the applications for right-of-way and construction permits to expand the B-K Line to a new double-circuit line through NPS lands. The existing B-K Line traverses approximately 4.3 miles of DEWA. Within DEWA boundaries, the route crosses MDSR and APPA approximately perpendicularly. Within the study area, the alternative 1 alignment is approximately 5.6 miles long. The deeded width of the existing B-K Line ROW ranges from 100 to 380 feet in Pennsylvania and New Jersey; however, the ROW is currently cleared to a width between approximately 80 and 150 feet. There are 22 existing transmission towers located within DEWA boundaries for the existing B-K Line and there are no existing access roads to the ROW, except public roads such as Route 20, Community Drive, and others. This alternative would have no effect on the existing transmission line outside of NPS property and assumes that the existing line within the parks would remain in place without expansion or replacement. In essence, it assumes that current conditions on the ground will continue indefinitely into the future. However, the applicant could seek to expand or replace the existing utility lines within the existing easements through the parks. There are no proposals to do so at this time.

Alternative 2: Applicant's Proposed Route

The route proposed by the applicant would follow the route of the existing B-K Line, which traverses approximately 4.3 miles of DEWA. Within DEWA boundaries, the route crosses MDSR and APPA approximately perpendicularly. Within the study area, the alternative 2 alignment is approximately 5.6 miles long. The deeded width of the existing B-K Line ROW ranges from 100 to 380 feet in Pennsylvania and New Jersey; however, the ROW is currently cleared to a width between approximately 80 and 150 feet. This alternative would require clearing of vegetation for an additional 50 to 200 feet of ROW.

Alternative 2b: Applicant's Alternate Proposal

The alignment for the applicant's alternate proposal would follow the route of the existing B-K Line, which traverses approximately 4.3 miles of DEWA. Within DEWA boundaries, the route crosses MDSR and APPA approximately perpendicularly. Within the study area, the alternative 2 alignment is approximately 5.6 miles long. The deeded width of the existing B-K Line ROW ranges from 100 to 380 feet in Pennsylvania and New Jersey; however, the ROW is currently cleared to a width between approximately 80 and 150 feet. The difference between alternative 2 and alternative 2b is that the former would require widening the existing ROW, while the latter would be constructed within the existing ROW. The towers for alternative 2b would be the same height as those described for alternative 2, but alternative 2b would require two additional towers within NPS lands compared to alternative 2. These towers would be constructed within the 100-foot-wide portion of the alignment. Because the ROW under alternative 2b is narrow, the applicant's plans require these additional towers to protect against fire hazards presented by the risk of conductor blowout. The minimum horizontal clearance to the edge of the ROW under high wind conditions to prevent conductor blowout was determined to be greater than 100 feet, and the NPS has expressed concern about the safety of constructing within the existing ROW. The feasibility of this alternative is dependent on the applicant's ability to clear danger trees beyond the existing ROW. This ability is based upon the controversial assumption that they have a right to clear danger trees on NPS property outside any deeded ROW. In communications with NPS, the applicant has indicated they have the right to clear danger trees from NPS property without additional permission from NPS. NPS does not agree with this determination.

Alternative 3

The alternative 3 alignment would pass through DEWA along the ROW of existing transmission and distribution lines. The existing transmission and distribution lines would be removed before construction of the S-R Line. The existing transmission line ROW is 100 feet wide, and this alternative would require clearing the ROW of vegetation for an additional 50 to 200 feet. The structures of the transmission and distribution lines would be constructed so that these lines and the S-R Line would run parallel to one another within the expanded ROW. That is, two separate sets of structures would be constructed, one set for the proposed S-R Line and one set for the existing transmission and distribution lines along the alternative 3 alignment. Alternative 3 would cross a total of 5.4 miles within the DEWA boundary. The route would also cross about 1.7 miles of the northern end of Worthington State Forest, which is located adjacent to DEWA. Alternative 3 also runs along the eastern boundary of DEWA for approximately 1.8 miles. The alignment for this alternative also crosses MDSR within DEWA, and crosses APPA. Construction of this alternative would require the removal and relocation of the existing B-K Line crossing inside the parks.

Alternative 4

Alternative 4 would pass through the southernmost portion of DEWA along the path of an existing distribution line ROW and would also pass through a small section of the park along the alignment of the B-K Line. The existing ROW ranges from 100 to 200 feet wide, and this alternative would require clearing the ROW of vegetation for an additional 100 to 200 feet. The existing line along alternative 4 would be removed before construction of the S-R Line. The structures of the existing distribution line would be replaced so that it and the double-circuited S-R Line would run parallel to one another within the expanded ROW. The route would cross about 1.5 mile of NPS lands, including DEWA and APPA. This alternative would also cross the Lower Delaware River; however, the crossing of the Delaware River would occur outside the DEWA and MDSR boundaries and outside the study area. The alternative 4 alignment would also cross through portions of Cherry Valley National Wildlife Refuge (NWR).

Construction of this alternative would require the removal and relocation of the existing B-K Line crossing inside the parks.

Alternative 5

Alternative 5 would follow the same alignment as alternative 4 (described above) but would not cross the 0.6 mile portion of DEWA west of the Bushkill Substation associated with alternative 4. This is the only difference between 4 and 5 over which NPS exercises any discretion or control. Inside the study area, alternative 5 would be approximately 1.7 miles long, with approximately 0.9 mile within NPS lands.

NPS PREFERRED ALTERNATIVE

The Council on Environmental Quality (CEQ) regulations for implementing NEPA require that an agency identify its preferred alternative or alternatives in a final EIS [1502.14(e)]. The preferred alternative is the alternative “which the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors” (Question 4a of the Council on Environmental Quality’s “Forty Most Asked Questions Concerning CEQ’s National Environmental Policy Act Regulations” (1981)). **The NPS has identified alternative 2, the applicant’s proposed alternative, as the preferred alternative, with the incorporation of critical mitigation measures.**

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The environmentally preferable alternative is the alternative that would promote the requirements of the national environmental policy expressed in section 101(b) of NEPA. It is the alternative that causes the least damage to the biological and physical environment and that best protects, preserves, and enhances historic, cultural, and natural resources (CEQ 1981, Q6a). **Alternative 1, the no-action alternative, was selected as the environmentally preferable alternative by the NPS.** This decision was based on the available scientific data about the proposal and mitigation measures presented by the applicant and collected by NPS. An analysis of this data made it clear that alternative 1 best meets the requirements of the environmentally preferable alternative.

ENVIRONMENTAL CONSEQUENCES

The summary of environmental consequences considers the actions being proposed and the cumulative impacts to resources from occurrences inside and outside the park. The potential environmental consequences of the actions are addressed for geologic resources (including topography and paleontology); floodplains; wetlands; vegetation; landscape connectivity, wildlife, and wildlife habitat; special-status species; and rare and unique communities. Other topics considered in detail include archeological resources; historic structures; cultural landscapes; socioeconomics; infrastructure, access, and circulation; visitor use and experience; visual resources; soundscapes; wild and scenic rivers; park operations; and health and safety. A brief summary of the major environmental consequences for each alternative is presented below.

Alternative 1 would not have significant impacts on the environment. Any cumulative impacts to resources would remain adverse primarily from other actions taken outside the study area. While there are adverse impacts associated with the continued operation and maintenance of the 230-kV transmission line, the duration and intensity of these impacts are not such as to make them significant impacts in the context of the park. Alternative 1 would not accomplish the transmission grid stability objectives of the applicant.

Alternative 2 would cause significant adverse impacts to geologic resources; wetlands; vegetation; landscape connectivity, wildlife habitat, and wildlife; special-status species; rare and unique communities; archeological resources; historic structures; cultural landscapes; socioeconomics; infrastructure, access and circulation; visual resources; visitor use and experience; wild and scenic rivers; and park operations.

Alternative 2b would cause significant adverse impacts to geologic resources; wetlands; vegetation; landscape connectivity, wildlife habitat, and wildlife; special-status species; rare and unique communities; archeological resources; historic structures; cultural landscapes; socioeconomics; infrastructure, access and circulation; visual resources; visitor use and experience; wild and scenic rivers; park operations; and human health and safety

Alternative 3 would have significant adverse impacts on geologic resources; vegetation; landscape connectivity, wildlife habitat, and wildlife; special-status species; rare and unique communities; archeological resources; historic structures; cultural landscapes; socioeconomics; infrastructure, access, and circulation; visual resources; visitor use and experience; wild and scenic rivers; and park operations.

Alternative 4 would have significant adverse impacts on many resources, including geologic resources; wetlands; rare and unique communities; archeological resources; historic structures; cultural landscapes; socioeconomics; infrastructure, access and circulation; visual resources; and visitor use and experience.

Alternative 5 would have significant adverse impacts on many resources including geologic resources; wetlands; rare and unique communities; archeological resources; historic structures; cultural landscapes; socioeconomics; infrastructure, access and circulation; visual resources; and visitor use and experience.

IMPACTS OF THE ALTERNATIVES

Resource	Alternative 1: No-Action Alternative	Alternative 2: The Applicant's Proposed Route	Alternative 2b	Alternative 3	Alternative 4	Alternative 5
Geologic Resources	No impacts from vegetation maintenance activities on geology and topography; vegetation maintenance could increase access to and visibility of paleontological specimens, particularly at previously identified sites. No significant impacts.	Impacts from tower construction and grading on geology, topography, and paleontology; the installation of 7 tower foundations/crane pads in rare or unique features and in unstable geologic formations and 12 in areas with slopes greater than 10%, could impact geologic resources; drilling and excavation could disturb paleontological resources. Significant impacts.	Same as alternative 2.	Impacts on geology due to the drilling, and excavation activities; the installation of at least 25 tower foundations/crane pads in areas with slopes greater than 10% and 11 to 15 towers/crane pads in unstable areas and in rare or unique geologic features; construction and clearing would impact paleontology through direct damage, collection, or vandalism of paleontological sites. Significant impacts.	Impacts from tower construction and grading on geology, topography, and paleontology; the installation of 2 tower foundations/crane pads in areas with slopes greater than 10% and in unstable areas; no towers would be constructed within rare or unique geology inside the study area; construction and clearing would impact paleontology through direct damage, collection, or vandalism of paleontological sites. Significant impacts.	Impacts from tower construction and grading on geology, topography, and paleontology; the installation of 2 tower foundations/crane pads in areas with unstable geologic formations and 1 in an area with slopes greater than 10%; no towers would be constructed within rare or unique geology inside the study area; construction and clearing would impact paleontology through direct damage, collection, or vandalism of paleontological sites. Significant impacts.
Floodplains	Impacts from vegetation maintenance in the floodplain; vegetation clearing would impact some floodplain functions and values, but is not likely to affect overall natural floodplain values. No significant impacts.	A maximum of 14.3 acres of vegetation in the floodplain would be affected by vegetation management; access roads and crane pads would develop 0.14 acre of the floodplain . No significant impacts.	A maximum of 8.4 acres of vegetation in the floodplain would be affected by vegetation management; access roads and crane pads would develop 0.14 acre of the floodplain . No significant impacts.	A maximum of 7.9 acres of vegetation in the floodplain would be affected by vegetation management; access roads and crane pads would develop 0.22 acre of the floodplain . No significant impacts.	No vegetation in the floodplain would be cleared; access roads and crane pads would develop 0.16 acre of the floodplain . No significant impacts.	No vegetation in the floodplain would be cleared and no development in the floodplain would occur. No significant impacts.
Wetlands	Impact from vegetation maintenance, resulting in conversion of 8.64 acres of wetlands to scrub shrub or emergent wetlands; 5.46 acres of rare and unique wetlands, which are also Exceptional Value Wetlands, would be affected. No significant impacts.	Impacts from clearing wetlands, resulting in conversion of 20.28 acres of forested wetlands to scrub shrub and/or emergent wetlands; construction of access roads and crane pads in wetlands (1.02 acres), and from drilling activities; 15.22 acres of Exceptional Value Wetlands and/or rare and unique wetlands would be affected. Significant impacts.	Impacts from clearing wetlands, resulting in conversion of 10.28 acres of forested wetlands to scrub shrub and/or emergent wetlands; construction of access roads and crane pads in wetlands (1.01 acres), and from drilling activities; 6.35 acres of Exceptional Value Wetlands and/or rare and unique wetlands would be affected. Significant impacts.	Impacts from clearing wetlands, resulting in conversion of 1.93 acres of forested wetlands to scrub shrub and/or emergent wetlands; construction of access roads in wetlands (0.02 acres) and from drilling activities; no permanent impacts on Exceptional Value Wetlands and/or rare and unique wetlands. No significant impacts.	Impacts from clearing wetlands, resulting in conversion of 4.52 acres of forested wetlands to scrub shrub and/or emergent wetlands; construction of access roads in wetlands (0.09 acres) and from drilling activities; no permanent impacts on Exceptional Value Wetlands and/or rare and unique wetlands. Significant impacts.	Impacts from clearing wetlands, resulting in conversion of 4.31 acres of forested wetlands to scrub shrub and/or emergent wetlands; construction of access roads in wetlands (0.09 acres) and from drilling activities; no permanent impacts on Exceptional Value Wetlands and/or rare and unique wetlands. Significant impacts.
Vegetation	Impacts would result from vegetation maintenance activities and maintenance of scrub shrub habitat in the ROW; functionality of the plant communities would not be affected. No significant impacts.	Approximately 240 acres of vegetation would be cleared in the ROW, 129 acres of this which is mature forest; impacts would also result from spread of invasive species, vegetation maintenance activities, and vegetation clearing from other construction activities outside the ROW (25.4 acres); functionality of the plant communities would decline. Significant impacts.	Approximately 144 acres of vegetation would be cleared in the ROW , 42 acres of this which is mature forest; impacts would also result from spread of invasive species, vegetation maintenance activities, and vegetation clearing from other construction activities outside the ROW (26.7 acres); functionality of the plant communities would decline. Significant impacts.	Approximately 313 acres of vegetation would be cleared in the ROW , 204 acres of this which is mature forest; impacts would also result from spread of invasive species, vegetation maintenance activities, and vegetation clearing from other construction activities outside the ROW (100.6 acres); functionality of the plant communities would decline. Significant impacts.	Approximately 113 acres of vegetation would be cleared in the ROW , 70 acres of this which is mature forest; impacts would also result from spread of invasive species, vegetation maintenance activities, and vegetation clearing from other construction activities outside the ROW (55.9 acres); functionality of the plant communities would decline. No significant impacts.	Approximately 74 acres of vegetation would be cleared in the ROW , 44 acres of this which is mature forest; impacts would also result from spread of invasive species, vegetation maintenance activities, and vegetation clearing from other construction activities outside the ROW (55.3 acres); functionality of the plant communities would decline. No significant impacts.

Resource	Alternative 1: No-Action Alternative	Alternative 2: The Applicant's Proposed Route	Alternative 2b	Alternative 3	Alternative 4	Alternative 5
Landscape Connectivity, Wildlife Habitat, and Wildlife	Impacts would result from the continued maintenance of the ROW, loss of habitat from removal of danger trees outside the ROW, and disturbance and direct mortality of wildlife. No significant impacts.	Impacts would result from habitat loss, habitat alteration, the continued maintenance of the ROW, the isolation of habitat patches, increased edge habitat, the disturbance and direct mortality of wildlife, and the isolation of some species. Significant impacts.	Same as alternative 2.	Impacts would result from habitat loss, habitat alteration, the continued maintenance of the ROW, the isolation of habitat patches, increased edge habitat, the disturbance and direct mortality of wildlife, and the isolation of some species. Benefit from restoration of the B-K Line, resulting in larger patches of contiguous habitat. Significant impacts.	Impacts would result from habitat loss, habitat alteration, the continued maintenance of the ROW, the isolation of habitat patches, increased edge habitat, the disturbance and direct mortality of wildlife, and the isolation of some species. Benefit from restoration of the B-K Line, resulting in larger patches of contiguous habitat, and moving the infrastructure to the edge of DEWA. No significant impacts.	Impacts would result from habitat loss, habitat alteration, the continued maintenance of the ROW, the isolation of habitat patches, increased edge habitat, the disturbance and direct mortality of wildlife, and the isolation of some species. Benefit from restoration of the B-K Line, resulting in larger patches of contiguous habitat, and moving the infrastructure to the edge of DEWA. No significant impacts.
Special-status Species Overall*	No significant impacts.	Significant impacts.	Significant impacts.	Significant impacts.	No significant impacts.	No significant impacts.
Special-status Species: Aquatic Species	Impacts from temporary changes to water quality during maintenance activities.	Impacts from direct mortality, habitat loss, and some changes to habitat during construction and maintenance activities.	Same as alternative 2.	Impacts from changes to habitat during construction and maintenance activities.	No impact because no aquatic species are likely to exist in the ROW.	Same as alternative 4.
Special-status Species: Terrestrial Invertebrate Species	Vegetation maintenance activity would maintain and could expand suitable habitat (herbaceous).	Same as alternative 1.	Same as alternative 1.	N/A	N/A	N/A
Special-status Species: Birds	Impacts from maintenance activities could destroy nesting habitat and disturb breeding/nesting activities; conversely maintenance could create additional scrub shrub habitat in ROW; electrocution/collision potential.	Impacts from construction of line resulting in habitat loss, from presence of line resulting in collision or electrocution, and from disturbance during construction and maintenance activities; could create additional scrub shrub habitat in ROW; this alternative would not be consistent with the Bald Eagle Guidelines.	Same as alternative 2.	Same as alternative 2.	Impacts from construction of line resulting in habitat loss, from presence of line resulting in collision or electrocution, and from disturbance during construction and maintenance activities; could create additional scrub shrub habitat in ROW; this alternative would be consistent with the Bald Eagle Guidelines.	Same as alternative 4.
Special-status Species: Reptiles and Amphibians	Impacts from maintenance and human activities from disturbance of denning, basking, foraging, nesting, and breeding activities as well as introduction of invasive species.	Impacts from direct mortality, destruction of nests and/or overwintering areas; impacts on habitat used for foraging and basking; habitat loss / fragmentation / degradation during construction and maintenance activities. Potential for illegal collection of special-status reptiles due to easier access from maintained access roads.	Same as alternative 2.	Same as alternative 2.	Same as alternative 2.	Same as alternative 2.
Special-status Species: Mammals	Impacts from disturbance during maintenance activities and from tree removal in areas with potential habitat.	Impacts from noise and disturbance during construction; loss of potential habitat, including roosting sites or maternity colonies.	Same as alternative 2.	Same as alternative 2.	Same as alternative 2.	Same as alternative 2.
Special-status Species: Plants	Impacts from maintenance activities, including some wetland areas that support listed plants; disturbance as well as introduction of invasive species would occur.	Impacts from forest clearing, construction in wetland areas from access roads and crane pads, and drilling, as well as from vegetation maintenance.	Same as alternative 2.	Same as alternative 2.	Same as alternative 2.	Same as alternative 2.

Resource	Alternative 1: No-Action Alternative	Alternative 2: The Applicant's Proposed Route	Alternative 2b	Alternative 3	Alternative 4	Alternative 5
Rare and Unique Communities	Impacts from artificially maintaining scrub shrub habitat in the park artificially maintaining scrub shrub habitat in the parks; soils and wildlife would be affected. No significant impacts.	Impacts from vegetation clearing, line construction, deconstruction of the existing line, and potential spread of invasive species, as well as artificial maintenance of scrub shrub habitat; six communities would be affected (Arnott Fen, Delaware River Riparian Corridor, eastern hemlock forests, Hogback Ridge, Kittatinny Ridge, Van Campen). Significant impacts.	Same as alternative 2.	Impacts from vegetation clearing, line construction, deconstruction of the existing line, and potential spread of invasive species, as well as artificial maintenance of scrub shrub habitat; three communities would be affected (Delaware River Riparian Corridor, eastern hemlock forests, Kittatinny Ridge). Significant impacts.	Impacts from vegetation clearing, line construction, deconstruction of the existing line, and potential spread of invasive species, as well as artificial maintenance of scrub shrub habitat; for communities would be affected (eastern hemlock forests, Kittatinny Ridge, Minsi Lake / Bear Swamp, Totts Gap). Significant impacts.	Same as alternative 5 but would not impact eastern hemlock forests. Significant impacts.
Archeological Resources	Impacts on archeological sites due to physical impacts from the maintenance of vegetation along the existing ROW. No significant impacts.	Impacts from physical impacts of construction and disturbance of archeological resources; 2 known archeological sites could be directly affected by construction activities; impacts would depend on the nature and extent of physical disturbance to the archeological resources. Adverse effects on one site with prehistoric components Significant impacts.	Same as alternative 2.	Possible impacts from physical impacts of construction and disturbance of archeological resources; 1 potential archeological site exists along this alternative; impacts would depend on the nature and extent of physical disturbance to the potential archeological resources. Adverse effects on one site with historic components. Significant impacts.	Possible impacts from physical impacts of construction and disturbance of archeological resources; 1 potential archeological site exists along this alternative; impacts would depend on the nature and extent of physical disturbance to the potential archeological resources. Adverse effects on one site with prehistoric components. Significant impacts.	Same as alternative 4.
Historic Structures	Impacts from the visual impact of vegetation removal during maintenance activities. No significant impacts.	Impacts on historic structures from physical destruction and removal of vegetation and the visual impact of larger towers and lines, which would diminish the integrity of the setting, feeling, and association of numerous historic structures. Adverse effects on at least 17 identified historic structures , one through physical destruction and at least 16 through visual effects. Significant impacts.	Same as alternative 2.	Impacts on historic structures from removal of vegetation and the visual impact of larger towers and lines, which would diminish the integrity of the setting, feeling, and association of numerous historic structures; physical destruction of the B-K Line, an historic structure. Adverse effects on at least 7 identified historic structures through visual effects. Significant impacts.	Impacts on historic structure from removal of vegetation and the visual impact of larger towers and lines, which would diminish the integrity of the setting, feeling, and association of numerous historic structures; physical destruction of the B-K Line, an historic structure. Adverse effects on at least 4 identified historic structures through visual effects. Significant impacts.	Same as alternative 4.
Cultural Landscapes	Physical and visual impacts of the existing line and vegetation maintenance; would diminish the integrity of setting, feeling, and association of numerous cultural landscapes. No significant impacts.	Impacts on cultural landscapes from vegetation clearing and construction of new towers, altering character-defining features and resulting in measurable changes, thus diminishing the overall integrity of the resources, or producing noticeable changes or alterations to the character-defining features of the cultural landscapes. Adverse effects on 18 cultural landscapes through visual intrusions and physical impacts. Significant impacts.	Same as alternative 2.	Impacts on cultural landscapes from vegetation clearing and construction of new towers, altering character-defining features and resulting in measurable changes, thus diminishing the overall integrity of the resources. Adverse effects on 6 cultural landscapes through visual intrusions and physical impacts. Significant impacts.	Impacts on cultural landscapes from vegetation clearing and construction of new towers, altering character-defining features and resulting in measurable changes, thus diminishing the overall integrity of the resources. Adverse effects on 4 cultural landscapes through visual intrusions and physical impacts. Significant impacts.	Same as alternative 4.

Resource	Alternative 1: No-Action Alternative	Alternative 2: The Applicant's Proposed Route	Alternative 2b	Alternative 3	Alternative 4	Alternative 5
Socioeconomics	No impact on socioeconomics. No significant impacts.	Impacts to the local and regional economy due to changes in recreation, visitation, tourism, and agricultural revenue. Opportunity for job placement during the construction period. Significant impacts.	Same as alternative 2.	Same as alternative 2.	Same as alternative 2.	Same as alternative 2.
Infrastructure, Access, and Circulation	Temporary, brief road closures or detours during the maintenance periods. Hamilton Trail in New Jersey, the McDade Trail near Community Drive, and part of the Van Campen Glen Trail would be used for maintenance activities. No significant impacts.	Use of heavy construction equipment on historic River Road and 1.5 miles of Old Mine Road would result in impacts on infrastructure. Impacts on access and circulation would occur at specific locations during the construction period. Significant impacts.	Same as alternative 2.	Use of heavy construction equipment on approximately 4.5 miles of River Road and 6.5 miles of Old Mine Road would result in impacts to infrastructure. Impacts on access and circulation would occur at specific locations during the construction period. Benefit from removal of large infrastructure along the B-K Line under alternative 3. Significant impacts.	The use of heavy equipment on NPS Drive, Totts Gap Road, and Mountain Road would result in impacts to infrastructure. Impacts on access and circulation would occur during the construction period at specific locations. Benefit from removal of large infrastructure along the B-K Line under alternative 4. Significant impacts.	Same as alternative 4.
Visual Resources	The presence of the existing alignment would affect visual intactness from continued operation of the existing transmission line. No significant impacts.	Changes to visual resources from the deconstruction and construction activities would be most apparent along Millbrook Flatbrook Road and Old Mine Road in New Jersey. Affected sites in Pennsylvania potentially include Fernwood Resort, Pennsylvania Hwy 209 near Bushkill, McDade Trail, the cultural landscape related to the Schoonover house, and Community Drive. Affected sites in New Jersey potentially include Van Campen Glen, Hamilton, and Pioneer trails, Watergate Recreation Site, and Millbrook Village. The higher towers would also impact the viewshed at Walpack Bend, and the Appalachian Trail. Significant impacts.	Changes to visual resources from the deconstruction and construction activities would be similar to alternative 2. The impacts would be most apparent along McDade Trail near the Schoonover House and Community Drive, and MDSR. There would be two additional nearly 200-foot towers. Significant impacts.	Changes to visual resources from the deconstruction and construction activities would be most apparent along McDade Trail, Old Mine Road, MDSR, and APPA. Improved visual cohesiveness and unity resulting from the unobstructed natural forest cover within due to the removal of the existing B-K Line, but there would be greater visual impact along the alternative 3 ROW from two sets of structures. Line would also be visible from popular recreation sites, including Smithfield Beach and Hialeah Air Park. Significant impacts.	Changes to visual resources from the deconstruction and construction activities would be most apparent where the line would be in proximity to APPA, but would also occur at Mount Tammany summit and the Karamac Trail. Improved visual cohesiveness and unity resulting from the unobstructed natural forest cover within due to the removal of the existing B-K Line, but there would be greater visual impact along the alternative 4 ROW from two sets of structures. Significant impacts.	Changes to visual resources from the deconstruction and construction activities would be most apparent where the transmission line would cross APPA because it would also be intersected by an access road. Improved visual cohesiveness and unity resulting from the unobstructed natural forest cover within due to the removal of the existing B-K Line, but there would be greater visual impact along the alternative 5 ROW from two sets of structures. Significant impacts.
Soundscapes	Intermittent impacts on soundscapes due to maintenance activities associated with continued operation of the existing transmission line. No significant impacts.	Impacts would result from disturbance during decommissioning, construction, and maintenance activities. Some readily detectable impacts would be expected within 350 feet of the alignment centerline from the operation of the line. No significant impacts.	Same as alternative 2.	Impacts would result from disturbance during decommissioning, construction, and maintenance activities. Some readily detectable impacts would be expected within 300 feet of the alignment centerline during operation and maintenance. No significant impacts.	Same as alternative 2.	Same as alternative 2.

Resource	Alternative 1: No-Action Alternative	Alternative 2: The Applicant's Proposed Route	Alternative 2b	Alternative 3	Alternative 4	Alternative 5
Visitor Use and Experience	Impacts would result primarily from the continued visual impacts of the existing transmission line. Noise and visual intrusions would result in slight impacts during maintenance activities. No significant impacts.	Impacts to visitor use and experience with the most intense impacts at Watergate Recreation Site. Visitors would experience impacts where the transmission line crosses APPA. Impacts related to deconstruction and construction would be localized, particularly related to noise. Significant impacts.	Same as alternative 2.	The 90-degree bend of the line would affect views from several vantage points, affecting many visitors. New visual intrusions would be created at Raccoon Ridge along APPA, and would be seen from other vantage points along the trail. Impacts at APPA would occur for 2.5 miles. Construction-related impacts would occur from impacts on soundscapes based on location. Significant impacts.	Impacts would occur at the Red Dot (Tammany) Trail and Karamac Trail. Construction-related impacts would occur from impacts on soundscapes based on location. Significant impacts.	Same as alternative 4.
Wild and Scenic Rivers	No additional impact on the values on which the river was designated from any maintenance activities. No significant impacts.	Many of the values for which the river was designated would be perceptibly changed and would result in visual changes that would affect a relatively large area, a large number of users, and would exist for the period of analysis. Significant impacts.	Same as alternative 2.	Many of the values for which the river was designated would be perceptibly changed and would result in visual changes that would affect a relatively large area, a large number of users, and would exist for the period of analysis. Enhancement of MDSR values from the decommissioning and restoration of the B-K alignment. Significant impacts.	Enhancement of MDSR values from the decommissioning and restoration of the B-K Line. Significant impacts.	Same as alternative 4.
Park Operations	Some adverse impacts from continued operation and maintenance of the existing B-K Line. Park staff would monitor vegetation maintenance activities, but the maintenance would not be conducted on a regular basis; there would be no change in the number of park staff and no change to the parks' budgets because it is assumed that the applicant would be responsible for the costs associated with the NPS managing the permit. No significant impacts.	Adverse impacts from need for park staff for patrolling, monitoring, and enforcement; Impacts on park operations would result from construction-related activities and monitoring activities; 2 to 3 new employees would be hired; there would be no change to the parks' or divisions' budgets because the applicant would be responsible for the parks' costs associated with the NPS managing the permit. Significant impacts.	Same as alternative 2.	Same as alternative 2.	Adverse impacts, but moderated by shorter construction period, shorter crossing of NPS lands and fewer sensitive resources present. Impacts on park operations would result from construction-related activities and monitoring activities (including actions along APPA); 1 new employee would be hired; there would be no change to the parks' or divisions' budgets because the applicant would be responsible for the parks' costs associated with the NPS managing the permit. No significant impacts.	Same as alternative 4, but impacts may be even less as route does not include section of DEWA west of the Bushkill Substation. No significant impacts.
Health and Safety	Adverse impacts from continuing operation and maintenance of the existing B-K Line. No significant impacts.	Impacts on visitors/staff at DEWA, MDSR, and APPA from potential safety hazards associated with construction, equipment related hazards, and transportation of materials. Impacts to safety would be minimized and temporary. No significant impacts.	Impacts to visitors and staff from potential safety hazards associated with construction activities. Impacts to safety would be minimized and temporary. Additional impacts to health and safety due to fire risk and potential power outages from failure to meet NERC clearance standards. Significant impacts.	Impacts on visitors/staff at DEWA, MDSR, and APPA from potential safety hazards associated with construction, equipment related hazards, and transportation of materials. Impacts for park staff and visitors at APPA slightly less severe than alternative 2 due to a smaller area affected by construction. Impacts to safety would be minimized and temporary. No significant impacts.	Same as alternatives 2 and 3, but area affected is smaller. No significant impacts.	Same as alternative 4, but the area affected is slightly smaller. No significant impacts.

*Significance criteria only evaluated on a resource level, not species specific.

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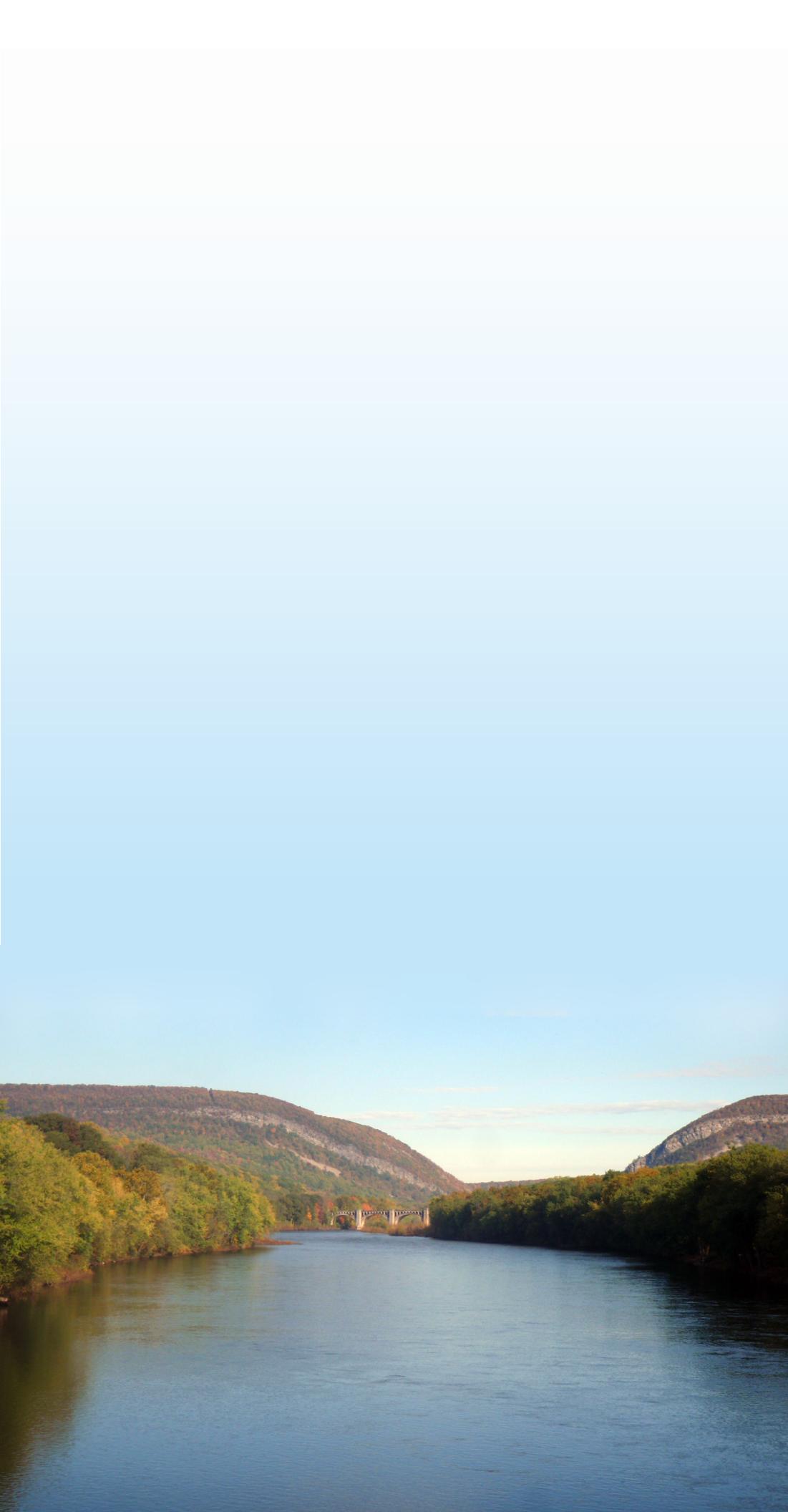
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ACRONYMS AND ABBREVIATIONS

ACCC	aluminum conductor composite core
ACHP	Advisory Council on Historic Preservation
ACSR	aluminum conductor steel reinforced
AMSL	above mean sea level
APE	area of potential effects
APLIC	Avian Power Line Interaction Committee
APPAs	Appalachian National Scenic Trail
BA	biological assessment
B-K Line	Bushkill-to-Kittatinny Line
BMP	Best Management Practice
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
dB	decibels
dBA	A-weighted decibel scale
DDT	dichlorodiphenyltrichloroethane
DEWA	Delaware Water Gap National Recreation Area
EIS	Environmental Impact Statement
EMF	electromagnetic field
FHWA	Federal Highway Administration
FR	Federal Register
GIS	Geographic Information System
GMP	general management plan
GPS	Global Positioning System
IBA	important bird area
IMA	important mammal area
KOP	key observation point
kHz	kilohertz
kV	kilovolt
MDSR	Middle Delaware National Scenic and Recreational River
National Register	National Register of Historic Places
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NESC	National Electric Safety Code
NHPA	National Historic Preservation Act of 1966
NJDEP	New Jersey Department of Environmental Protection
NJENSP	New Jersey Endangered and Nongame Species Program
NJNHP	New Jersey Natural Heritage Program
NJ HPO	New Jersey Historic Preservation Office or Officer
NOAA	National Oceanic and Atmospheric Administration

NPS	National Park Service
NRCS	U.S. Department of Agriculture Natural Resources Conservation Service
NWI	National Wetlands Inventory
NWR	National Wildlife Refuge
Organic Act	National Park Service Organic Act of 1916
ORV	off-road vehicle
PADCNR	Pennsylvania Department of Conservation and Natural Resources
PADEP	Pennsylvania Department of Environmental Protection
PADOT	Pennsylvania Department of Transportation
PFBC	Pennsylvania Fish and Boat Commission
PEPC	Planning, Environment, and Public Comment
PFO	Palustrine Forested Wetlands
PJM	PJM Interconnection
PL	Public Law
PNHP	Pennsylvania Natural Heritage Program
PPL	Pennsylvania Power and Light Electric Utilities Corporation
PSE&G	Public Service Electric and Gas Company
PSS	Palustrine Scrub Shrub Wetlands
PUBHx	Palustrine Non-vegetation Wetlands
ROW	right-of-way
RTO	Regional Transmission Operator
SHPO	State Historic Preservation Office
S-R Line	Transmission Line Upgrade and Expansion from Susquehanna, Pennsylvania, to Roseland, New Jersey
TNC	The Nature Conservancy
TSS	total suspended solids
USACE	U.S. Army Corps of Engineers
USC	United States Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VSL	visual split location
ZVI	zone of visual influence

A scenic landscape photograph showing a wide river flowing from the foreground into a valley. The banks of the river are lined with dense green trees, some showing signs of autumn color. In the distance, two large, rocky mountains rise against a clear blue sky. A small bridge with arches spans the river near the base of the mountains.

Chapter 1

Purpose of and Need for Action

CHAPTER 1: PURPOSE OF AND NEED FOR ACTION

INTRODUCTION

A consortium of utilities, consisting of PPL Electric Utilities Corporation and Public Service Electric and Gas Company (PSE&G), jointly known as the applicant, propose to construct a 500,000-volt (500-kilovolt [kV]) transmission line from the Susquehanna Substation (Berwick, Pennsylvania) to the Roseland Substation (Roseland, New Jersey) (the “Susquehanna-to-Roseland” or S-R Line), which would require crossing three units of the national park system: the Delaware Water Gap National Recreation Area (DEWA), the Middle Delaware National Scenic and Recreational River (MDSR), and the Appalachian National Scenic Trail (APPA), in Pennsylvania and New Jersey (figure 1). The applicant has requested permits to authorize construction activity and expand its right-of-way (ROW) in order to build the S-R Line across these three units. The federal action analyzed in this environmental impact statement (EIS) is deciding whether or not, and under what conditions, to issue the applicant the permits it has requested.

PURPOSE AND NEED

The purpose component of an EIS defines the goals and objectives that the National Park Service (NPS) intends to fulfill by taking action. The need component explains why taking action is necessary. (*Director’s Order 12: Conservation Planning, Environmental Impact Analysis, and Decision Making Handbook* (NPS 2001c)).

The purpose of and need for action by the NPS, consistent with the Department of the Interior National Environmental Policy Act (NEPA) regulations, 43 CFR § 46.420, is distinct from that of the applicant.

PURPOSE OF ACTION

The purpose of the federal action here is to respond to the applicant’s proposal considering the purposes and resources of the affected units of the national park system, as expressed in statute, regulation, policy, and the NPS objectives in taking action, detailed later in this chapter.

NEED FOR ACTION

The federal action by the NPS is needed because the applicant has submitted an application and plan to construct its line across areas under NPS jurisdiction. The applicant requests NPS permission to expand the size of the current ROW, to access the ROW through existing natural and cultural areas, to construct new and taller support towers, and to remove and replace the existing 230-kV Bushkill-to-Kittatinny Line (B-K Line) with a new double-circuit 500-kV transmission line.

COOPERATING AGENCY

In February 2011, the NPS formally invited the U.S. Fish and Wildlife Service (USFWS) to participate as a cooperating agency in the review for this EIS. The S-R Line could affect lands proposed to be a part of the Cherry Valley National Wildlife Refuge (NWR), which was established in October 2010 with the acquisition of the first 185 acres (USFWS 2010f, 1). Cherry Valley, Pennsylvania contains a variety of wetland and upland habitats, as well as a portion of a migration flyway used by migrating raptors, and supports federally and Pennsylvania state-listed species (USFWS 2008, xi). The request to add USFWS as a cooperating agency is based on USFWS expertise and local knowledge of the resources within

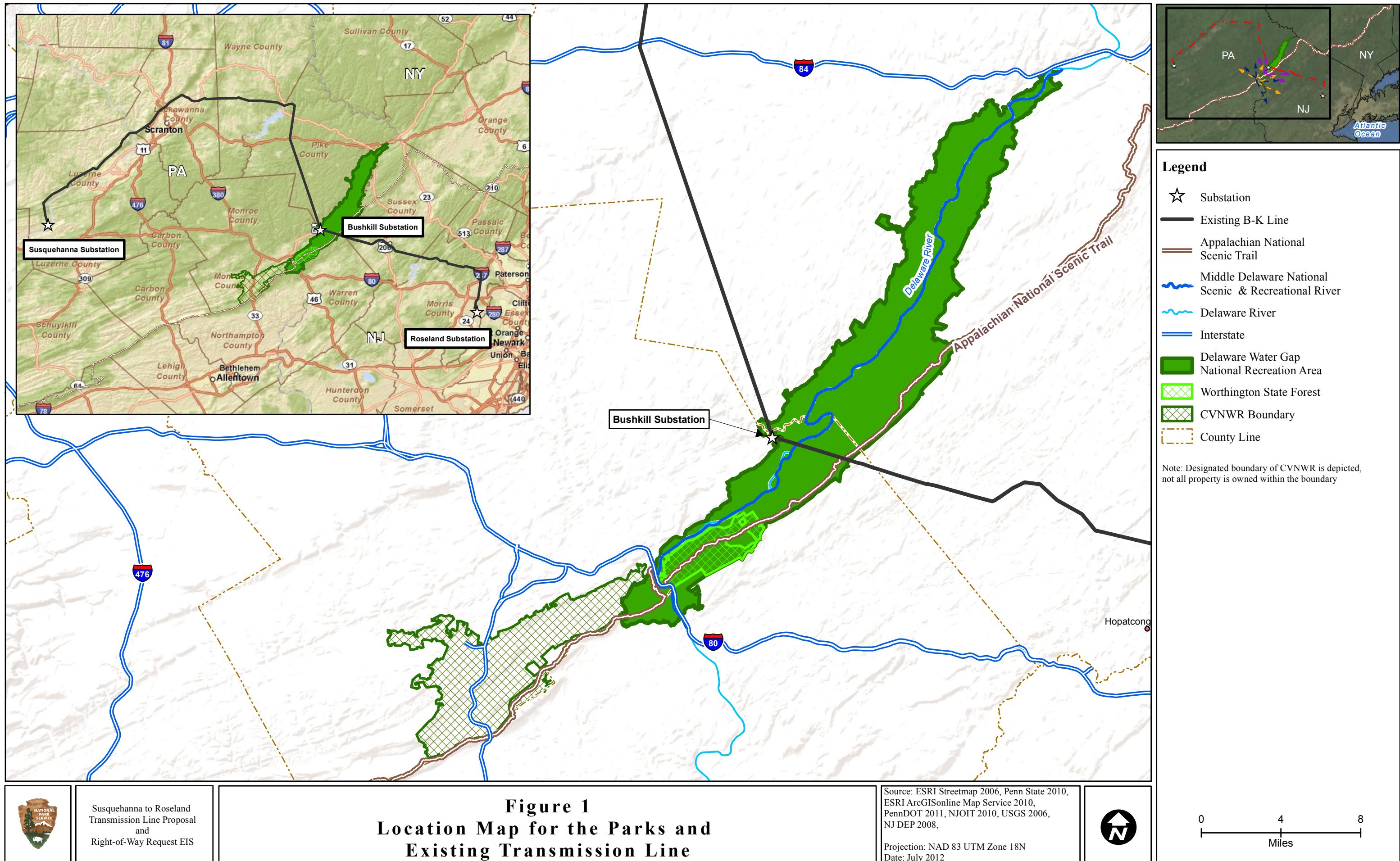
Cherry Valley NWR that could be affected by the proposed S-R Line. The USFWS has accepted that invitation. The U.S. Army Corps of Engineers (USACE) was also invited to be a cooperating agency but declined.

SUSQUEHANNA TO ROSELAND TRANSMISSION LINE LOCATION AND BACKGROUND

In 2007, the regional transmission operator, PJM Interconnection (PJM), identified a 500-kV transmission line between the Susquehanna Substation and the Roseland Substation as the preferred and most effective solution for reliability violations forecasted as part of the Federal Energy Regulatory Commission - approved Regional Transmission Expansion Plan process. Responding to this assessment, the applicant proposed to construct a double-circuit 500-kV transmission to connect the two substations on a route that included crossings of DEWA, APPA, and MDSR.

The applicant applied for permits to allow the construction, maintenance and operation of the S-R Line across three units of the national park system, the expansion of the existing ROW, and the replacement of an existing 230-kV transmission line it owns. The existing 230-kV transmission line runs from the Bushkill substation to the Kittatinny substation, crossing DEWA, MDSR, and APPA, and is referred to in this document as the B-K Line. It also crosses a small panhandle of DEWA en route to and northwest of the Bushkill Station. This line and its ROW predate the establishment of all of the three park units and has been described by the applicant as almost or actually obsolete. The B-K Line towers are approximately 80 feet in height and its deeded ROW varies from 100 to 380 feet in width through the parks. The applicant proposes to replace the B-K Line towers with new towers up to 195 feet tall, install an additional circuit, and widen the ROW to accommodate these new facilities. The new replacement B-K Line would be capable of carrying 500 kV, though it would be initially energized at only 230 kV. The applicant's proposal and the action alternatives to it discussed herein include both the construction of the S-R Line and the replacement of the B-K Line as part of the project. References in this document to "the line" refer to both lines and the set of towers they share.

The applicant's purpose for the proposed S-R Line is to strengthen the reliability of the grid at the direction of the regional transmission operator, PJM. PJM oversees the movement of wholesale electricity between many electric utilities in all or parts of 13 states and the District of Columbia. The PJM 2007 load forecast model identified 23 projected grid reliability criteria violations starting in 2012. PJM advised that an upgrade to this line would aid in resolving several violations and issues related to reliability and congestion. The need for the proposed S-R Line has been expressed several times by PJM in planning documents. PJM's Regional Transmission Expansion Plans from 2007 to 2010 have identified the proposed S-R Line as an important project on what was termed by PJM as a "backbone" line. The North American Electric Reliability Corporation (NERC) also identified the proposed S-R Line as a "backbone," while the applicant has repeatedly noted the need for and importance of increased electrical transmission capacity between Berwick, Pennsylvania and Roseland, New Jersey. If constructed, the new S-R Line would make the current transmission line corridor an even more important link in the regional grid than it is now. The two new lines proposed would require a much higher level of access roads and activity to monitor and maintain.



The public has expressed concerns about the need for and impacts of the project. Individuals and public organizations have questioned the need for an expanded transmission line, given the static-to-recessional economic climate and advances in energy efficiency. In areas served by the proposed S-R Line, energy consumption has decreased in recent years, and forecasts of a continued downward trend in regional demand cause some to question whether there is a verifiable need for the proposed line. Three municipalities have questioned the need for the line, and have noted engineering concerns with long-distance electrical power transmission and its potential to cause cascading power failures due to the increased current needed to maintain power flows across such lines.

The Pennsylvania Public Utility Commission and the New Jersey Board of Public Utilities have approved the S-R Line, although the approval included conditions and the New Jersey Board of Public Utilities decision is being challenged in court.

Whether there is a need for the proposed S-R Line project is not for the NPS to decide, nor is it a factor in the preparation of this EIS. The NPS prepared this EIS to determine whether to grant or deny the applicant's request for construction and ROW permits within NPS lands.

BACKGROUND OF THE PARKS

DEWA, MDSR, and APPA are three separate units of the national park system (figure 1). DEWA, MDSR, and APPA are central components of nature-based recreation for the New York City/Philadelphia metroplex.

DELAWARE WATER GAP NATIONAL RECREATION AREA

DEWA is a 67,210-acre park along the shores of the Delaware River in New Jersey and Pennsylvania. DEWA offers a variety of outdoor recreational opportunities, including boating, fishing, swimming, bicycling, cross-country skiing, rock climbing, sightseeing, natural and cultural history, and the general solitude of a rural environment. In addition, the recreation area offers more than 200 miles of hiking trails, including more than 27 miles of Appalachian Trail (NPS 2010a).

Delaware Water Gap National Recreation Area is a 67,210-acre park along the shores of the Delaware River in New Jersey and Pennsylvania.

DEWA was established in 1965. When conducting initial studies for inclusion of DEWA into the national park system, the NPS investigated relocating the B-K Line to make the area compatible with the uses of the proposed park, including the "preservation of the scenic, scientific, and historic features contributing to public enjoyment of such lands and waters" (Public Law (PL) 89-158; 89th Congress H.R.89.); however, the B-K Line through DEWA was not removed and remains in use today. Figure A-1 in appendix A is a map from 1962 that presents the proposed relocation of the B-K Line.

Each year, DEWA receives more than 5.2 million recreational visitors (NPS 2012c). The park is the eighth most visited unit (depending on the year) in the national park system and visitation is growing at a steady rate. Much of this visitation is from the nearby, rapidly expanding, New York/northern New Jersey and Philadelphia suburban areas (NPS 2010c, 2012c). Open spaces, combined with other regional protection and preservation initiatives, create a multistate greenway corridor. This corridor preserves essential habitat for the sustained health of plant and animal communities, including special-status species, in the region.

The park contains an environment of unique geologic and natural features as well as cultural landscapes and historic resources. The diverse ecosystems and landscape features provide unique scenery and experiences for visitors and crucial habitat for plants and animals. The park's outstanding geologic and

natural features form some of the best-known scenic landscapes in the northeastern United States and illustrate the characteristic landforms and biotic areas of the Appalachian Ridge and Valley Province and the Southern Appalachian Plateau Province. The most popular geologic feature is the Delaware Water Gap itself which is approximately 1,200 feet deep from the tops of the mountains to the surface of the Delaware River. The Gap is a mile wide from New Jersey's Mount Tammany to Pennsylvania's Mount Minsi. The park also contains a significant concentration of cultural resources spanning 12,000 years of human habitation. The valley has been inhabited for thousands of years, and dozens of historic structures dot the park's scenic roads. Historic rural villages from the eighteenth and nineteenth centuries remain intact on the New Jersey side, and landscapes of past settlements are scattered throughout the park (NPS 2010a). Additionally, the park encompasses significant Native American archeological sites.

MIDDLE DELAWARE NATIONAL SCENIC AND RECREATIONAL RIVER

The Delaware River is the longest undammed river in the Eastern United States. MDSR was established as a scenic and recreational river in 1978 under the Wild and Scenic Rivers Act. For 40 miles the MDSR passes between low, forested mountains with barely a house in sight. Then the river cuts through the mountain ridge to form the famed Delaware Water Gap. Exiting the park, the river runs 200 miles south to the Delaware Bay at Wilmington, Delaware, and then to the Atlantic Ocean. The Delaware River is one of the cleanest rivers in the nation due to years of work to protect and restore it (NPS 2010a; Delaware River Keeper n.d.), making it a popular destination for swimming, fishing, boating, canoeing, kayaking, rafting, and innertubing. It is estimated that more than 15 million people in the United States, including New York City, Philadelphia, and surrounding urban areas, depend on the water of the Delaware River Basin for public water supply and industrial use (Sloto and Buxton 2006, 2). A portion of the Delaware River Water Trail, a national scenic trail from Hancock, New York, to Trenton, New Jersey, runs through MDSR.

*Middle Delaware National
Scenic and Recreational River
was established as a scenic
and recreational river in 1978
under the Wild and Scenic
Rivers Act.*

APPALACHIAN NATIONAL SCENIC TRAIL

*The Appalachian National
Scenic Trail is a 2,175-mile-
long public footpath.*

APPA is a 2,175-mile-long public footpath. It traverses through the scenic, wooded, pastoral, wild, and culturally resonant lands across 14 of the eastern United States, from Katahdin in Maine to Springer Mountain in Georgia. Conceived in 1921 and completed in 1937, the trail was built and is still maintained by volunteers, giving rise to its nickname: “the people’s trail.” APPA was designated as the nation’s first national scenic trail by the National Trails System Act in 1968. It is arguably the most famous hiking path in world. It is enjoyed by an estimated 2–3 million people each year and within a day’s drive of two-thirds of the U.S. population. People of all ages and abilities come to APPA to enjoy short walks, day hikes, long-distance backpacking journeys, or the revered “thru-hike” on this iconic trail. APPA offers a variety of opportunities for viewing spectacular scenery, for adventure, for exercise, for nature study, for personal exploration, and for renewal (NPS 2010d).

APPA is managed cooperatively by the NPS, the Appalachian Trail Conservancy, volunteers from 31 local Appalachian Trail Clubs, the U.S. Department of Agriculture Forest Service (USFS), and dozens of other state and local land-management agencies. Within this partnership, thousands of volunteers do much of the work each year to keep the trail open for all to enjoy. Although APPA is considered a unit of the NPS, the Appalachian Trail traverses a complex patchwork of lands consisting of 75 federal and state parks and forests in addition to the extensive corridor of NPS-managed lands (NPS 2010d).

The Appalachian Trail Conservancy is the volunteer-based nonprofit organization dedicated to the protection and management of APPA and its associated lands, Appalachian Trail Conservancy serves as the primary source of information to visitors about the Appalachian Trail (NPS 2010d).

ENABLING LEGISLATION OF THE NATIONAL PARK SYSTEM UNITS

DEWA, MDSR, and APPA are three separate units of the national park system, each with distinct enabling legislation. Each of the parks' enabling legislation was created in accordance with the NPS Organic Act of 1916 (Organic Act): "to conserve the scenery and the natural and historical objects and the wildlife therein and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations." In enabling legislation, Congress and the president create and define a park unit's boundaries and management. The DEWA, MDSR, and APPA enabling laws follow.

DELAWARE WATER GAP NATIONAL RECREATION AREA

DEWA Enabling Legislation: PL 89-158; 89th Congress H.R. 89 (September 1, 1965): This legislation authorizes the establishment of DEWA from an area of the Tocks Island Dam and Reservoir, a project that was never implemented and was later deauthorized by Congress. The legislation authorized DEWA for outdoor recreational purposes, and included among the purposes of DEWA the preservation of the scenic, scientific, and historic resources of the area contributing to public enjoyment of the lands and waters. A full text of the entire legislation authorizing the establishment of DEWA is provided in appendix A.

MIDDLE DELAWARE NATIONAL SCENIC AND RECREATIONAL RIVER

MDSR Enabling Legislation: Wild and Scenic Rivers Act, PL 90-542 (16 U. S. Code [USC] §§ 1271–1287) (November 10, 1978): In 1978, the Delaware River within DEWA was designated as a scenic and recreational river under the Wild and Scenic Rivers Act. The provisions of the act stipulate that as a scenic and recreational river, the Middle Delaware

shall be administered in such manner as to protect and enhance the values which caused it to be included in [the wild and scenic rivers] system without ... limiting other uses that do not substantially interfere with public use and enjoyment of these values. In such administration primary emphasis shall be given to protect [the area's] esthetic, scenic, historic, archeological, and scientific features. (Wild and Scenic Rivers Act [16 USC 1271–1287])

APPALACHIAN NATIONAL SCENIC TRAIL

APPA Enabling Legislation: National Trails System Act, PL 90-543 (16 USC § 1241 et seq.), as amended through PL 103-145 (November 17, 1993). The National Trails System Act established APPA and directed the Secretary of the Interior, in cooperation with the Secretary of Agriculture, state and local governments, and private citizens, to protect and administer APPA. The act provided the Secretary of the Interior and the Secretary of Agriculture with the authority to relocate APPA; administer use of and access to APPA; regulate incompatible uses, including motorized uses, bicycles, and horses; and enter into agreements with state agencies and nongovernment organizations to protect, manage, maintain, and develop APPA. It also encouraged state agencies to pass similar legislation and take active steps to protect APPA and authorized federal land acquisition, as necessary, to establish a permanent route and protective corridor surrounding the footpath.

On March 21, 1978, President Carter signed the “Appalachian Trail Amendments” to the National Trails System Act. This law reauthorized the APPA Advisory Council, required a comprehensive management plan for APPA, and increased the amount of funding for land acquisition. Authority to acquire by eminent domain was increased to an average of 125 acres per mile, and the Secretary of the Interior and the Secretary of Agriculture were directed to substantially protect APPA within three years.

On March 28, 1983, President Reagan signed an Act of Congress (PL 98-11) to amend the National Trails System Act, thus strengthening support for volunteers and volunteer-based organizations, refining the process for designating side and connecting trails, providing the authority for administrative transfers of land, authorizing whole tract acquisition with the consent of the landowner, defining trail uses, and clarifying that donated easements qualify as conservation tax exemptions.

PURPOSE AND SIGNIFICANCE OF THE THREE PARKS

National park system units are established by Congress to fulfill specified purposes. A park unit’s purpose is the fundamental building block for its decisions to conserve resources and “to allow visitation in such a manner as to leave these resources unimpaired for future generations” (Organic Act). The Organic Act of August 25, 1916, states that “the Service thus established shall promote and regulate the use of Federal areas known as national parks, monuments and reservations … by such means and measures as to conform to the fundamental purpose of the said parks, monuments and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.”

The purpose and significance of the three parks are described below.

DELAWARE WATER GAP NATIONAL RECREATION AREA

Establishment: Congress established DEWA in 1965 to provide for “public outdoor recreation use and enjoyment of the proposed Tocks Island Reservoir and lands adjacent thereto and for the preservation of the scenic, scientific, and historic features contributing to public enjoyment of such lands and waters” (PL 89-158).

Purpose: The purposes of the national recreation area are as follows:

Park Resource Protection: Preserve the natural, cultural, and scenic resources contributing to public enjoyment of the national recreation area’s lands and waters.

River Resource Protection: Protect and enhance the values which caused the river to be included in the national wild and scenic river system.

Education: Foster preservation and educational activities that support natural and cultural resource protection.

Research and Conservation: Protect the national recreation area’s resources through research and appropriate resource conservation and restoration practices.

Recreation Use and Enjoyment: Provide for public outdoor recreation use and enjoyment, assuring that such use and enjoyment has minimal impacts on the national recreation area’s natural and cultural resources (NPS 1999).

Significance: DEWA provides a distinctive combination of natural resources, cultural resources, and recreational features that collectively offer outstanding opportunities for public use and enjoyment in an increasingly urbanized region. The following resources and features contribute to the national recreation area's significance:

- Outstanding geologic and natural features form some of the best-known scenic landscapes in the northeastern United States and illustrate the characteristic landforms and biotic areas of the Appalachian Ridge and Valley Province and the Southern Appalachian Plateau Province.
- Open spaces, combined with other regional protection and preservation initiatives, create a multistate greenway corridor that preserves essential habitat for the sustained health of plant and animal communities, including potentially threatened species, in the region.
- DEWA has the most significant, intact concentration and diversity of known archeological resources in the northeastern United States, as well as outstanding examples of American Indian and European settlements dating from the Early Woodland through Late Colonial historic periods. The early European settlement of the Middle Delaware Valley is manifested in the park through unique cultural landscapes (NPS n.d.a; Puniello 1991; Kraft 1986). Additionally, the park has historic structures representative of eighteenth-century frontier farms, nineteenth-century rural farms and villages, and twentieth-century energy-efficient design (NPS 1996).

The park is significant due to the exceptional quality of the Delaware River; it is the last free-flowing river in the eastern United States, and provides outstanding recreational and scenic opportunities. The quality and quantity of river water remain in good condition and provide a stable ecological environment because approximately 40 miles of river within the boundaries of the park have been designated as MDSR, and the river is buffered by a combination of protected lands (federal, state, local, and other conservation lands) including the Upper Delaware Scenic and Recreational River.

DEWA is one of the largest public open spaces remaining in the northeastern metropolitan corridor and the second largest acreage NPS unit in the Northeast Region of the NPS. The national recreation area provides a broad diversity of exceptional and unique nearby natural resource-based recreational opportunities. The park is the eighth most visited area in the national park system, with over 5 million recreational visits each year. Visitation is growing at a steady rate. Much of this visitation is from the nearby, rapidly expanding, New York/northern New Jersey and Philadelphia suburban areas (NPS 2010c).

MIDDLE DELAWARE NATIONAL SCENIC AND RECREATIONAL RIVER

In 1968, the Delaware River within DEWA was designated as a scenic and recreational river under the Wild and Scenic Rivers Act. The provisions of the act stipulate that as a scenic and recreational river, the Middle Delaware shall be administered in such manner as to protect and enhance the values that caused it to be included in the wild and scenic rivers system without limiting other uses that do not substantially interfere with public use and enjoyment of these values. According to the act, the primary emphasis in the administration of MDSR should be on protecting the area's aesthetic, scenic, historic, archeological, and scientific features.

APPALACHIAN NATIONAL SCENIC TRAIL

Establishment: APPA was established in 1968 with the passage of the National Trails System Act (PL 90-543, October 2, 1968, 16 USC §1244). It is a unit of the national park system as well as a component of the national trails system. It is administered by the Secretary of Interior through the NPS, in

consultation with the Secretary of Agriculture. The NPS coordinates management of APPA through the park office Harpers Ferry, WV.

Purpose: APPA was established to provide for maximum outdoor recreation potential as an extended trail and for the conservation and enjoyment of the nationally significant scenic, historic, natural, and cultural resources of the areas through which the Appalachian Trail passes (NPS 2005a).

Significance: APPA is a way, continuous from Maine to Georgia, for travel on foot through the wild, scenic, wooded, pastoral, and culturally significant lands of the Appalachian Mountains. It is a means of sojourning among these lands, such that visitors may experience them by their own unaided efforts. The body of the Trail is provided by the lands it traverses, and its soul is in the living stewardship of the volunteers and partners of the Appalachian Trail Cooperative Management System (NPS 2005a).

LAWS, REGULATIONS, AND POLICIES RELEVANT TO THIS EIS

Various laws, regulations, and policies of the NPS and the federal government are described in this section to show the constraints within which this EIS will need to operate and the goals and policies it must meet. The NPS, in preparing this EIS, must conform to the federal laws, regulations, and policies listed in this section.

Table 1 lists the authorities potentially applicable to the proposed S-R Line. This list is not intended to be exhaustive and if a law is not listed it does not relieve the NPS or the applicant from compliance with that directive. Descriptions of these and other relevant laws, regulations, and planning documents are presented in appendix B.

TABLE 1: FEDERAL LAWS, REGULATIONS, EXECUTIVE ORDERS, AND SECRETARIAL ORDERS POTENTIALLY APPLICABLE TO THE S-R LINE

Laws and Regulations	Reference
Federal Noxious Weed Act of 1975, as amended	7 USC §§ 2801–2814
NPS Organic Act of 1916 (Organic Act)	16 USC §§ 1, 2–4
General Authorities Act of 1970	16 USC § 1a1 et seq.
Park System Resource Protection Act	16 USC § 19jj
NPS authorities governing issuance of rights-of-way for power transmission lines	16 USC § 5 36 CFR §§ 14.70–78
Antiquities Act of 1906	16 USC § 431 et seq.
National Historic Preservation Act of 1966, as amended (NHPA), and regulations implementing the act	16 USC § 470 et seq.
Archaeological Resources Protection Act of 1979, as amended	16 USC § 470aa et seq.
Bald and Golden Eagle Protection Act of 1940, as amended	16 USC §§ 668–668c
Migratory Bird Treaty Act of 1918	16 USC §§ 703–711
Wild and Scenic Rivers Act	16 USC §§ 1271–1287
Endangered Species Act of 1973, as amended	16 USC § 1531 et seq.
National Parks Omnibus Management Act of 1998	16 USC §§ 5901–6011
Native American Graves Protection and Repatriation Act of 1990	25 USC §§ 3001–3013 et seq.
Occupational Safety and Health Act of 1970	29 USC § 651 et seq.
Clean Water Act	33 USC § 1251 et seq.
American Indian Religious Freedom Act of 1978	42 USC § 1996

Laws and Regulations	Reference
Safe Drinking Water Act of 1974	42 USC § 3000f et seq.
National Environmental Policy Act of 1969, as amended (NEPA)	42 USC § 4371 et seq.
Noise Control Act of 1972, as amended	42 USC § 4901 et seq.
Pollution Prevention Act of 1990	42 USC § 13101 et seq.
Energy Policy Act of 2005	42 USC § 13201 et seq.
Title 36, Code of Federal Regulations (CFR)	36 CFR Chapter I
NPS regulations governing issuance of rights-of-way for power transmission lines	36 CFR Part 5
Environmental Protection Agency's Determining Conformity of Federal Actions to State or Federal Implementation Plans	40 CFR Part 93
Council on Environmental Quality (CEQ) general regulations implementing NEPA	40 CFR §§ 1500–1508
National Environmental Policy Act, Protection and Enhancement of Environmental Quality	Executive Order 11512
National Historic Preservation	Executive Order 11593
Floodplain Management	Executive Order 11988
Protection of Wetlands	Executive Order 11990
Federal Compliance with Pollution Control Standards	Executive Order 12088
Environmental Justice	Executive Order 12898
Indian Sacred Sites	Executive Order 13007
Invasive Species	Executive Order 13112
Responsibilities of Federal Agencies to Protect Migratory Birds	Executive Order 13186
Responsibilities, and the Endangered Species Act, June 5, 1997	Secretarial Order 3206
Department of the Interior NEPA regulations	43 CFR Part 46
Transmission Vegetation Management Program	NERC Standard FAC-003-01

OBJECTIVES IN TAKING ACTION

The NPS's objectives for preparing this EIS were developed in accordance with Director's Order 12 (NPS 2011g). An objective is a statement of park-management goals that the NPS has identified as relevant in responding to the applicant's request. The alternatives must achieve the NPS's objectives to a large degree for the action to be considered appropriate and resolve the purpose of and need for action. Objectives must be grounded in the parks' enabling legislation, purpose, significance, and mission goals, and must be compatible with direction and guidance provided in the parks' general management plan (GMP), comprehensive management plans, strategic plans, and/or other management guidance, including NPS policies.

All action alternatives selected for detailed analysis must meet S-R Line objectives to a large degree and resolve the purpose of and need for action.

During the internal scoping meeting the interdisciplinary team, composed of resource specialists from the NPS and consultant staff, developed and refined goals and objectives for the following topics.

Physical resources

- Avoid adverse effects on geologic resources (geology, paleontology, and rare and unique geologic features), soil resources (soils and prime and unique farmlands), and water resources (surface waters and groundwater).

Natural resources

- Avoid adverse effects on natural resources (vegetation, landscape connectivity and wildlife habitat, special-status species, and rare and unique communities).
- Protect existing functions and values of wetlands and floodplains by avoiding adverse impacts or limiting impacts to an insignificant level.
- Maintain the ecological integrity of rare and unique communities and prevent degradation of the communities from occurring.
- Protect threatened and endangered species by avoiding impacts. Complete consultation with federal agencies as required under the Endangered Species Act of 1973, as amended (16 USC 1531–1544), and coordinate with state agencies regarding state-listed species.
- Manage any construction and maintenance activities to avoid or reduce impacts on wildlife and plant species as much as possible.
- Manage any construction and maintenance activities to avoid or reduce the introduction and spread of invasive species.
- Avoid or minimize adverse effects on migratory birds in accordance with Migratory Bird Treaty Act and the 2010 *Memorandum of Understanding Between the U.S. Department of the Interior National Park Service and the U.S. Fish and Wildlife Service to Promote the Conservation of Migratory Birds*.
- Mitigate impacts on landscape connectivity.

Cultural resources

- Avoid, minimize, or mitigate adverse effects on identified archeological resources.
- Avoid, minimize, or mitigate adverse effects on identified historic structures.
- Avoid, minimize, or mitigate adverse effects on identified cultural landscapes.
- Protect the eligibility of cultural resources for National Register of Historic Places (National Register) nomination.

Socioeconomics

- Avoid impacts on surrounding land use; socioeconomics; and infrastructure, access, and circulation; or gateway communities.

Visitor use and experience

- Maintain visitor experience, including preservation of key qualities such as primitive, solitary, and pastoral experiences. If impacts are unavoidable, mitigate impacts as appropriate, including any lost use due to closures or diminished experience caused by construction.

Visual resources

- Avoid, minimize, or mitigate impacts to scenic viewsheds and landscapes.

Soundscapes

- Avoid, minimize, or mitigate impacts on soundscapes.

Wild and scenic rivers

- Avoid adverse effects on the esthetic, scenic, historic, archeological, and scientific features of MDSR.

Park operations

- Avoid adverse effects on the parks' fiscal and operating resources, including long-term management of resources and volunteer organizations.

Human health and safety

- Protect the safety of staff and visitors; measures taken to ensure human health and safety could include closures of roads, the river, trails, and airspace, as necessary.

SCOPING PROCESS AND PUBLIC PARTICIPATION

Scoping is an early and open process to determine the breadth of environmental issues and alternatives to be addressed in any planning document prepared in accordance with NEPA. Scoping includes obtaining early input about the planning project from the public, park staff, interested agencies, or any agencies with jurisdiction by law or expertise. Scoping activities for this proposed S-R Line EIS are summarized below. Additional information on the public involvement process and ongoing agency coordination is presented in "Chapter 5: Consultation and Coordination."

NEPA public involvement: a notice of intent to prepare an EIS was published in the Federal Register on January 21, 2010, to announce the beginning of the S-R Line EIS process. The NPS also released a public scoping newsletter for the S-R Line to the public for review and comment in January 2010. The newsletter included a description of the proposed S-R Line, the purpose of and need for the project, background information, project objectives, and a list of issues and impact topics.

To determine the scope of issues to be analyzed in depth in this EIS, three public scoping meetings were held in Pennsylvania and New Jersey in February 2010. During the scoping comment period, approximately 6,500 comments were received from over 29 states and 4 countries (the United States, United Kingdom, France, and Serbia). Individuals living in the proposed area of the S-R Line submitted 6,343 letters. The NPS Planning, Environment, and Public Comment (PEPC) database was used for management of the comments. A summary of the comments can be found in the public scoping comment summary report dated April 2010, which is located on the NPS PEPC website <http://parkplanning.nps.gov/> (NPS 2010e).

During the scoping comment period, approximately 6,500 comments were received from over 29 states and 4 countries.

Additional public meetings were held in August 2010 and a public comment period was held from August to September 2010 to examine the range of preliminary alternatives and solicit input on alternative elements. During the comment period, approximately 1,700 separate pieces of correspondence were received and entered into the PEPC system. A public comment summary report was generated and made

available to the public in November 2010; this report can be found on the NPS PEPC website (NPS 2010f).

Following the release of the draft EIS, the public comment period extended from November 2011 to January 2012 and public meetings were held in January 2012. The NPS received more nearly 27,000 pieces of correspondence during the comment period, in addition to the 102 participants who spoke during the public meetings. A public comment analysis report was prepared and is included as appendix L; the report is also posted on the NPS PEPC website <http://parkplanning.nps.gov/DEWA>.

Chapter 5 of this EIS provides more details about the public scoping activities, including agency scoping and consultation that were an integral part of the EIS process.

ISSUES AND IMPACT TOPICS RETAINED FOR DETAILED ANALYSIS

To focus the environmental analysis, the issues identified during scoping were used to derive a number of impact topics. Impact topics are resources of concern that could be affected, either beneficially or adversely, by implementing any of the proposed alternatives. The issues and potential impacts associated with the applicant's proposed route and all the other action alternatives are discussed in the following sections. Details on the existing conditions for each resource topic are presented in "Chapter 3: Affected Environment," and the anticipated impacts are presented in "Chapter 4: Environmental Consequences."

NATURAL RESOURCES

Geologic Resources (Geology, Paleontology, and Rare and Unique Geologic Features)

Construction activities could impact geologic resources. The foundations for the new towers may extend below grade 40 feet or more, requiring extensive drilling¹, which could affect geological and paleontological resources. Construction activities could cause geohazards such as rockslides and limestone fracturing, which could alter wetland environments that provide rare and unique habitats for both plant and wildlife species.

Floodplains

Impacts on floodplains and their functionality could occur from the proposed Line. The construction of towers and access roads, displacement of floodwater by towers, and compaction of soil from crane pads could all affect floodplains and riparian buffers. An NPS floodplains statement of findings is required. The final statement of findings will be included in the record of decision, after the draft statement of findings has been distributed for public review and comment.

Wetlands

The proposed line could have impacts on wetlands and their functionality. Wetland delineations and assessments of functions and values for wetlands have been conducted. Access roads and towers, crane pads, and other construction activities could compact soils, involve vegetation removal, and alter surface hydrology, which could impact wetland functions and values. Vegetation maintenance could affect plant

¹ The draft EIS examined the effects of blasting and drilling, but after completing its analysis and hearing in public comment that the public and other agencies had concerns with blasting, and that the applicant considered it not necessary, NPS has determined not to allow blasting.

growth. An NPS wetlands statement of findings is required. The final statement of findings will be included in the record of decision, after the draft statement of findings has been distributed for public review and comment.

Vegetation

Impacts on vegetation in the ROW and along the routes of proposed access roads are expected. All action S-R Line alternatives would require significant trimming or clearing of some vegetation in their respective ROWs. The B-K Line ROW has not been maintained and would also require vegetation trimming. Access roads would require vegetation clearing. Areas needed for pulling and splicing of the wires may require some trimming and clearing, or use of these areas may result in trampling of vegetation. All action alternatives also have the potential to promote invasive species.

Landscape Connectivity, Wildlife Habitat, and Wildlife

The proposed transmission line expansion may contribute to habitat fragmentation by increasing the width of the ROW, clearing heavily forested areas in the ROW and along proposed access roads, and reducing large, contiguous blocks of habitat. Impacts on wildlife and their habitats in and adjacent to the ROW and proposed access roads may also occur. Construction noise may deter wildlife from using their normal home ranges. Road widening and clearing of trees along the roads would result in removal and alteration of wildlife habitat. The installation of taller towers with transmission lines above the current tree height could adversely affect migratory birds, and the Secretary of the Interior has been petitioned to designate a national raptor migration corridor in this area. Impacts such as illegal off-road vehicle (ORV) use, as unfortunately often occurs on other ROWs in the park, would compound habitat fragmentation.

Special-status Species (Aquatic and Terrestrial)

Federal and state-listed species and other species of conservation concern are located near and along the proposed alternative routes and could be affected by construction and maintenance of the S-R Line. The degradation of water quality and habitat alteration as a result of construction activities may affect special-status aquatic species.

Rare and Unique Communities

The proposed action alternatives for the Line could have impacts on many rare and unique ecological communities in DEWA. The hemlock forest community is a natural heritage site and a DEWA outstanding natural feature that supports rare species. Kittatinny talus slope, which is located just downslope of APPA, is in the Kittatinny Mountains, a New Jersey priority natural heritage site. Hogback Ridge is a unique ecosystem in DEWA. Van Campen Brook and its tributaries are important fish habitat (such as for wild native trout reproduction).

CULTURAL RESOURCES

The S-R Line action alternatives have the potential to affect cultural resources in DEWA and along MDSR. Pennsylvania and New Jersey have deemed the entire length of APPA eligible for nomination to the National Register, as have the other 12 states through which the trail passes. Currently, other sections of the trail are listed on the register. Scenic impacts on cultural landscapes are also possible.

Archeological Resources

Impacts on archeological resources are anticipated. The applicant has conducted surveys for archeological resources around existing and proposed tower structure, access road, and crane pad locations as well as “harvest impact areas” along their proposed route. River terraces along the Delaware River are prime locations for archeological sites, including sites containing prehistoric structural remains, and have the potential to be affected by the transmission line expansion.

Historic Structures

Surveys have identified historic structures in Pennsylvania and New Jersey and at DEWA. No physical impacts on historic structures are anticipated, but visual impacts would occur. The S-R Line would involve the regular placement of new towers and intervening electrical transmission lines within identified alternative alignments. Because these features are large in scale and readily visible from great distances, they would have visual impacts on historic structures within the valley.

Cultural Landscapes

According to NPS-28: *Cultural Resource Management Guideline*, a cultural landscape is a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions.

The parks themselves jointly form a man made cultural landscape that would be permanently altered by the action alternatives. Construction activities, the new transmission lines, and new access roads would all affect significant cultural landscape features and characteristics (natural systems and features, spatial organization, land use, cultural traditions, circulation, topography, vegetation, wild or domestic fauna, buildings and structures, cluster arrangements, small-scale features, constructed water features, views and vistas, and archeological sites). Impacts on cultural landscapes would be permanent. Any cultural landscapes that have been identified would be evaluated. Cultural landscapes studies would likely be necessary for several locations, including Van Campen Glen, APPA, Old Mine Road Historic District, Watergate Recreation Site, Delaware View, and Community Drive. Additional cultural landscapes that could be affected by alternatives would be identified through the viewshed analysis.

OTHER AGENCY LAND USE PLANS OR POLICIES

Federal, state, county, and municipality-based land use plans or policies related to the study area exist. The counties in the existing study area have comprehensive land use and zoning plans. Some of the municipalities (townships and boroughs) have zoning and land use plans, as well. Some of the proposed S-R Line activities may not be compatible with these agency land use plans.

SOCIOECONOMICS (SOCIOECONOMICS AND INFRASTRUCTURE, ACCESS, AND CIRCULATION)

The proposed action alternatives for the Line may change the way the parks, park resources, and park concessionaires’ resources are used, resulting in economic impacts. The expanded ROW and new transmission lines could result in economic impacts due to changes in visitation or use of park resources. Employment for the local community and businesses may rise during construction activities. Tourism may also be affected by the Line. Transporting construction equipment and towers would have impacts on

public roads including increased traffic, road deterioration from heavy trucks, and reduced access from surrounding communities. The Line has the potential to negatively affect real estate values near the proposed transmission lines.

VISITOR USE AND EXPERIENCE

The existing visitor experience, including key elements such as primitiveness and solitude, may be affected by the action alternatives for the Line. In all three parks, construction activities and the visibility of the new towers above the existing tree line would have an impact on visitor experience. Construction activities (including drilling, clearing, and heavy equipment noise) and large visible towers would affect visitor experience at APPA. Effects on visitor experience due to changes or reduced access to scenic resources are also anticipated. Scenic resource protection is specified in the enabling legislation of APPA, DEWA, and MDSR. Temporary and permanent closures of roads, river, trails, and campsites would be implemented for safety and transport needs. Action alternatives would result in an adverse impact on the visitor experience.

VISUAL RESOURCES

The proposed Line and associated access roads may alter some viewsheds, which could adversely affect the visitors' appreciation of the parks' viewsheds and scenic resources. Separate viewshed analyses have been conducted for scenic and visual impacts in the three parks. DEWA and the surrounding lands are part of the scenic viewshed for APPA. Construction is expected to affect the visual and aesthetic resources of the parks for decades.

SOUNDSCAPES

Construction and maintenance activities would cause noise impacts. An increase in transmission line voltage may cause increases in corona effect noise (audible electric line noise), especially during periods of high aerial conductivity (such as times of high humidity). Visitors could be subjected to non-natural sounds as a result of construction activities and operation of the proposed line for the life of the line, not just during construction. More roads and more maintenance would result from selection of any action alternative.

WILD AND SCENIC RIVERS

All alternatives would cross the Delaware River and several would cross the Delaware River where the river is designated as the MDSR, a wild and scenic river. The Wild and Scenic Rivers Act defines scenic river areas as those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads. The proposed Line may have impacts on natural viewsheds along the Delaware River. The construction of new towers and expansion of the ROW would disrupt the character of the shoreline.

PARK OPERATIONS

Construction and operation of the proposed S-R Line is likely to negatively affect park operations such as law enforcement and resource management. The S-R Line would require park staff to monitor and oversee more frequent maintenance activities associated with the newly cleared areas. More time would be required for park staff to handle additional long-term resource management responsibilities, utility coordination, law enforcement, and maintenance. Volunteers may also be redirected from their usual activities to monitor vegetation, create ORV barriers, or address trail erosion problems.

HUMAN HEALTH AND SAFETY

The local roads and park roads are narrow, typically only rated for loads less than 10 tons, restricted to noncommercial traffic, and subject to constant maintenance issues. Large, heavy equipment use would be a potential problem due to traffic control issues, deterioration caused by excess loads, and exceedances of bridge and culvert weight capacities. Transporting large construction equipment and new towers on park and public roads would cause a safety concern, and the river would be closed to public use as necessary during installation of the power lines for visitor safety. In addition, electromagnetic field (EMF) exposure related to transmission lines was identified by the public during the scoping process as a topic of concern.

SUSTAINABILITY AND LONG-TERM MANAGEMENT

Impacts on natural resources from the proposed Line would be ongoing, and potential mitigation measures would necessitate long-term management and monitoring actions by the parks. In addition, a variety of ramifications are generally associated with power lines, such as illegal ORV use and forest cover fragmentation. Another long-term management consideration is that the conversion of this transmission corridor from a noncritical status to a critical corridor would affect the way this area is accessed and maintained in the future. It is reasonably foreseeable that the logic being applied to justify adding more lines to the existing B-K Line ROW would continue as future needs expand, and further transmission line expansion proposals may be forthcoming. Continued addition of ROW and roads would diminish the value and services provided by the existing natural and cultural resources.

ISSUES AND IMPACT TOPICS ELIMINATED FROM FURTHER CONSIDERATION

The following resources were analyzed in detail while drafting this EIS. The analysis determined that each of the alternatives would have minimal impacts on these resources in the study area, and either the impacts are similar across the action alternatives or impacts on the resource are thoroughly analyzed and described under another resource topic. The following resources were dismissed from further analysis in this EIS.

AIR QUALITY

Section 118 of the 1963 Clean Air Act (42 USC 7401 et seq.) requires park units to meet all federal, state, and local air pollution standards. Further, the Clean Air Act provides that the federal land manager has an affirmative responsibility to protect air quality related values (including visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse pollution impacts. NPS *Management Policies 2006* also requires parks to perpetuate the best possible air quality in parks to (1) preserve natural resources and systems, (2) preserve cultural resources, and (3) sustain visitor enjoyment, human health, and scenic vistas (NPS 2006a, 53). The construction and operation of the S-R Line under all action alternatives would comply with the NPS mandates. DEWA is not a federal Class I area afforded additional protection for air quality related values such as visibility. DEWA is a Class II area, which allows for a less stringent level of air quality protection than Class I areas. Warren and Sussex Counties in New Jersey are designated as non-attainment for ozone. A general conformity analysis was performed for the preferred alternative. The general conformity analysis and the carbon sequestration analysis are included in appendix G.

Impacts on air quality would be the same across all action alternatives inside and outside the study area. The amount of criteria pollutants emitted as a result of the action alternatives would include trace amounts of particulate matter, nitrogen oxides, and carbon monoxide and impacts on air quality would be no

greater than minimal. On a regional level, the amount of criteria pollutants emitted would not be substantial and the impacts on air quality would be the same for all action alternatives. Therefore, NPS has determined that this is not a significant issue and dismisses it in accordance with CEQ guidance. See 40 CFR § 1500.4.

Climate Change and Greenhouse Gas Emissions

The Environmental Quality Division of the NPS has released draft interim guidance on considering climate change in NPS NEPA analysis, one of the key questions that should be addressed is “What is the contribution of the proposed project to climate change, as indicated by greenhouse gas emissions associated with the project?” (NPS 2009a, 1). On February 18, 2010, the CEQ released a draft guidance memorandum on the consideration of greenhouse gas emissions and climate change impacts as part of compliance with NEPA (Sudley 2010, 1).

DEWA is involved in the Climate Friendly Parks Program, which is a collaboration of the NPS and the U.S. Environmental Protection Agency (USEPA) aimed at addressing climate change. The purpose of the program is to measure greenhouse gas emissions, develop sustainable strategies to mitigate these emissions and adapt to climate change impacts, and educate the public about these efforts (NPS 2005b, 6). DEWA has also developed “climate friendly” objectives and targets for DEWA employees for climate change mitigation and air pollution reduction (NPS 2005b, 6).

Climate change has had, and will continue to have, a marked impact on natural systems (NPS 2006b, 10). However, the responses of ecosystems to global warming have only been postulated and likely will vary among systems (Shaver et al. 2000). It is expected that one result of future climate change in the eastern United States will be an increase in the number of ice storms, which can disturb forest systems (National Assessment Synthesis Team 2001). There may also be changes in the number and intensity of extreme events such as hurricanes and northeasters (Groisman, Knight, and Karl 2000), all of which stress the natural systems of the Eastern Rivers and Mountains Network (NPS 2006b, 11).

Construction and maintenance activities associated with the S-R Line alternatives would result in fossil fuel consumption. However, the parks are in fact a carbon sink but the issue of the contribution of the alternatives to climate change through greenhouse gas emissions was dismissed from further analysis.

Climate change may contribute to the adverse impacts on natural resources expected from the proposed S-R Line. However, these adverse impacts are not expected to increase the intensity of the impacts identified for the alternatives and impacts from climate change are also similar across all action alternatives. In addition, ecosystems are currently under pressure from a number of stressors in addition to climate change, including habitat loss and degradation, development, pollution, toxic chemicals, overfishing, invasive species, pests, disease outbreaks, habitat fragmentation, and wildfires (NACCI 2010, 44). Due to these reasons and the impossibility of predicting the severity of future climate change or its impacts with certainty, this topic was dismissed from further consideration.

SOIL RESOURCES (SOILS AND PRIME AND UNIQUE FARMLANDS)

Soils

NPS *Management Policies 2006* requires the NPS “to understand and preserve the soil resources of parks, and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil or its contamination of other resources. ... Management action will be taken by superintendents to prevent or at least minimize adverse, potentially irreversible impacts on soil” (NPS 2006a, 56).

The majority of soils in the study area formed as a result of glaciations that once covered the mountains of the park. Soils in DEWA are primarily composed of a poorly to excessively well-drained, fine to coarse, loamy mix formed in glacial material such as glacial till, colluvium, or outwash derived from sandstone, siltstone, shale, conglomerate, and/or quartzite (USDA Natural Resources Conservation Service [NRCS] 2010a). Most of the adverse impacts on soils are due to soil compaction; this is similar across all action alternatives. Soil compaction results in loss of soil productivity and this is addressed and analyzed under the wetlands resource topic. Some soil loss from construction activities of towers and access would occur. The footprint of these structures is relatively small and thus the action would not cause significant impact to soils. Therefore, the soil resources topic is not carried forward in this EIS.

Prime and Unique Farmlands

The Farmland Protection Policy Act (7 USC § 4201 et seq.) was passed to address the effects of federal programs on the conversion of farmland to nonagricultural uses. In support of this legislation, the Department of the Interior issued several memoranda to guide its agencies in addressing prime and unique farmlands in the NEPA process. Prime farmlands are those lands that have the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fertilizer, pesticides, and labor, and without intolerant soil erosion. Unique farmlands are those that are used for the production of specific high-value food and fiber crops.

The majority of prime and unique soil along the proposed alternative alignments is currently forested land and is not being actively farmed. Impacts on prime and unique farmlands would be no greater than minimal because it is likely that the agriculture land containing the prime soil would continue to be farmed. Other areas containing prime or unique farmlands are currently forested habitat. Therefore, the prime and unique farmlands topic is dismissed from further analysis.

WATER RESOURCES (SURFACE WATER AND WATER QUALITY, GROUNDWATER, AND AQUATIC RESOURCES)

The Clean Water Act requires the NPS to “comply with all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions respecting the control and abatement of water pollution” (33 USC § 1251 et seq., section 313). NPS *Management Policies 2006* states that the NPS will “take all necessary actions to maintain or restore the quality of surface waters and ground waters in the parks consistent with the Clean Water Act and all other applicable federal, state, and local laws and regulations” (NPS 2006a). The NPS has also established general goals for water quality, and in accordance with these goals, the NPS works cooperatively with states to protect and enhance the quality of water in national park system units.

Water quality protection is one of the most important responsibilities of the Delaware River Basin Commission; its water quality standards designate the MDSR and the portion of the river and tributaries contained in DEWA as outstanding basin waters.

Surface Water and Water Quality

Within the boundaries of DEWA and MDSR, the Delaware River flows 40 miles from near Matamoras, Pennsylvania, to Slateford Creek, Pennsylvania (Horwitz et al. 2008, 1). The portion of the Delaware River Basin in DEWA is composed of 48 major tributaries and encompasses a drainage area of 69,000 acres in parts of Pennsylvania and New Jersey. In addition to the Delaware River and tributaries, approximately 200 lakes and ponds are within the boundaries of DEWA. These ponds and lakes vary in size, ranging from surface dimensions of less than an acre to 35 acres (NPS 2010g). The surface water

quality in the mainstem of the Delaware River in DEWA is considered high quality (NPS 2010h, 1). Within DEWA, all streams but one originate outside the park boundary. Water quality in these streams is generally high; however, nearby human development has resulted in increased nutrient, sediment, and fecal coliform levels in some streams (NPS 2010h). Other surface water bodies in DEWA, including lakes and ponds, generally have good water quality, although depressed dissolved oxygen concentrations have been observed in later summer when large quantities of aquatic plants die and decay (NPS 2010h).

Because no construction would be completed in any waterbodies and no discharge permit is being requested, impacts to water quality would primarily occur from increased sediment loads being introduced into the stream from construction activities (short term) and from increased erosion due to vegetation loss and new access roads (long term). Analysis of these impacts was conducted using the USFS WEPP model to estimate increased total suspended solids (TSS) concentrations. The WEPP model does not account for the installation of best management practices (BMPs) such as silt fence and straw bales therefore it represents the worst case scenario of 100% failure of required erosion and sedimentation controls. The WEPP model indicated minimal short term and long term increases in TSS for some tributaries and undetectable increases in TSS in the Delaware River. The model did not detect differences between the action alternatives. The likelihood of 100% failure of erosion and sedimentation controls is remote so it is unlikely that impacts to surface water quality would be detectable. Therefore, the topic of surface water and water quality is not carried forward in this EIS.

Groundwater

An aquifer is a geologic formation that yields water. The principal sources of groundwater (water beneath surface of the ground) in the Delaware River Basin are unconsolidated sand and gravel aquifers and fractured, consolidated bedrock aquifers (Sloto and Buxton 2006, 2). Unconsolidated aquifer systems are found underlying both valley and upland areas of DEWA, MDSR, and APPA and are generally composed of glacial materials such as coarse-grained sand and gravel with mixtures of clay and silts (Sloto and Buxton 2006, 2).

Due to the presence of limestone there is an increased potential of groundwater contamination during drilling activities; this is similar across all action alternatives. Impacts to groundwater from drilling activities are addressed and analyzed under the wetlands resource topic. Therefore, the topic of groundwater is not carried forward in this EIS.

Aquatic Resources

Aquatic resources include fish and aquatic macroinvertebrates. Most of the adverse impacts on aquatic resources are due to a measurable change in the water quality due to stream crossings and runoff; the loss of vegetation, which would alter habitat and food availability; the opening of tree canopies, which could also lead to changes in water temperature that could affect stream health and biodiversity; and the potential for drilling in limestone, which could alter flow or water availability. These issues are addressed and analyzed under the wildlife and wetlands resource topics. Therefore, the topic of aquatic resources is not carried forward in this EIS.

Tribal Resources (Including Sacred Sites and Indian Trust Resources)

The relevant Tribal Historic Preservation Officers have been consulted regarding tribal resource impacts and no tribes have identified tribal resources within the project area. Tribes have expressed interest and concern regarding potential impacts to existing archeological resources and cultural landscapes. Since no tribal resources were identified during consultation, a separate analysis is not necessary. The Delaware Nation has stated that they prefer routing the transmission line around the park.

Most tribes have expressed an interest in continued consultation on the project, although only a subset have provided input in person, on the phone, or in writing. The NPS conducted an on-site consultation at DEWA with the Delaware Nation, the Delaware Tribe of Indians, the Stockbridge-Munsee Community, the Eastern Shawnee Tribe of Oklahoma, and the Absentee Shawnee Tribe in January 2012 prior to the announcement of the NPS's preferred alternative. At that consultation, tribal representatives expressed serious concerns about impacts to archeological sites and cultural landscapes. After the consultation, the Stockbridge-Munsee Community, the Delaware Tribe, and the Eastern Shawnee Tribe of Oklahoma provided written Council Resolutions or tribal comments requesting that the NPS choose the "No-action Alternative." The parks have conducted additional Tribal consultations on the agency's preferred alternative (alternative 2) and are incorporating Tribal comments into mitigation measures. Therefore, this resource topic is eliminated from further analysis.

MUSEUM COLLECTIONS

Natural and cultural studies related to this EIS would generate collections of discipline-based museum objects (biological, physical, geological, and archeological). The NPS is required to curate these collections in perpetuity. An extensive administrative record (hard copy and digital) would be catalogued and archived in the parks for any resources discovered and evaluated. Cataloging and curating archives can cost between \$1 and \$10 per object. Archeological objects can cost between \$2 and \$10 per object to catalog and curate. These scientific records would be archived permanently. The proposed project would require the expansion of the parks' archival and museum collection operations to permanently maintain all museum collections (objects and archives). Mitigation measures for any permitted action alternative will include funds to catalog and curate museum collections resulting from the project. Therefore, this impact topic is eliminated from further analysis.

ENERGY RESOURCES AND CONSERVATION POTENTIAL

This topic involves assessing NPS energy requirements and the potential for energy conservation associated with the various alternatives, but it is most relevant to facility construction projects. The construction of the S-R Line would not affect any NPS facilities. Because there would be monitoring of the mitigation required under this EIS, some increased energy may be needed; however, there would only be negligible impacts on energy resources, because NPS fuel consumption would not change to a large degree as a result of the construction or because of the maintenance of resources impacted by this action. The parks would continue to operate under the wise energy-use guidelines and requirements stated in the NPS *Management Policies 2006* (NPS 2006a); Executive Order 13123, "Greening the Government through Effective Energy Management"; Executive Order 13031, "Federal Alternative Fueled Vehicle Leadership"; Executive Order 13149, "Greening the Government through Federal Fleet and Transportation Efficiency;" and the 1993 NPS *Guiding Principles of Sustainable Design* (NPS 1993a). Therefore, this resource topic is eliminated from further analysis.

ENVIRONMENTAL JUSTICE

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires federal agencies to make achieving environmental justice part of their mission. Specifically, each agency must identify and address "disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

A compilation of statistics on population composition, median income, and poverty level has determined that no minority or low-income populations exist in the counties and townships in the study area (U.S. Census Bureau 2000a; 2000b). Therefore, no impacts would occur on minority or low-income

populations in the study area and any impacts on these groups outside the study area would not be disproportionate for any one group of people. Therefore, this topic is eliminated from further consideration. The lost use and other impacts would affect all citizens equally.

GATEWAY COMMUNITIES

According to the NPS *Management Policies 2006* (2006a, 158), a gateway community is a community close to a unit of the national park system whose residents and elected officials are often affected by the decisions made in the course of managing the park, and whose decisions may affect the resources of the park. Gateway communities usually offer food, lodging, and other services to park visitors. They also provide opportunities for employee housing and a convenient location to purchase goods and services essential to park administration (NPS 2006a, 158).

To a limited degree, all action alternatives could have a small, temporary beneficial impact on local economies during construction due to construction employment (it is expected that workers specifically skilled in transmission line construction would be brought in from outside the area). Although not all communities would be affected under each alternative, where adverse impacts are expected, they would be similar and would minimally affect the quality of the human environment. Because similar impacts are expected under each alternative, they would not meaningfully contribute to decision making and the selection of a preferred alternative. Because impacts on gateway communities are not expected to affect decision making for this EIS, this topic was dismissed from further analysis.

LAND USE

The proposed alternatives have the potential to affect how land within park boundaries is used. NPS *Management Policies 2006* states, “appropriate land protection methods must be applied to protect park resources and values from incompatible land use” (NPS 2006a, 29). Similarly, section 3.1 of Director’s Order 25: *Land Protection* says, “The National Park Service will use all available authorities to protect lands and resources within NPS units” (NPS 2001b).

Though the applicant's project may impact certain values that land use plans seek to preserve (such as vegetation), it would not greatly change existing land use itself, nor land use plans. Therefore, the impact topic of Land Use has been dismissed from further detailed analysis.

