

ARCHEOLOGICAL RESOURCES

METHODOLOGIES

Information on potential archeological resources was obtained in two ways, through background research and field survey. The former involved the study of existing reports, site files, and other relevant available data. Information was gathered from DEWA facilities, the Pennsylvania SHPO and New Jersey Historic Preservation Office (NJ HPO), and from reports and data supplied by the applicant. A Phase IB archeological field survey included surface reconnaissance and the excavation of shovel test units placed along measured transects across the project alternatives. Per guidelines established by DEWA for the project, a 7.5-meter shovel test interval was employed, with a single transect following the approximate centerline of the corridors for each alternative. Slopes in excess of 15% were not shovel tested but were surface inspected for artifacts and aboveground features (e.g., rock shelters and building foundations). This approach may be considered standard procedure for linear project areas.

Resource-specific context for assessing the significance of impacts in accordance with NEPA and the CEQ regulations includes the following:

- DEWA is identified in the congressional record for archeological significance.
- The archeological record in DEWA is unusually complete and contiguous because of the unique geography and the pre-Columbian settlers that it attracted, and because the area has been protected from disturbance.
- The unusually complete archeological record makes this area an important destination for archeological research.
- Archeological resources have been extensively lost elsewhere and are under continuing threat of loss due to development pressures.

STUDY AREA

The APE is determined as the geographic area in which an undertaking may directly or indirectly cause an alteration in the character or use of historic properties (36 CFR § 800.16[d]). The section 106 definition of an APE and the APE for archeological resources are both described in the “Archeological Resources” section of chapter 3.

CUMULATIVE IMPACTS COMMON TO ALL ALTERNATIVES

An assessment of cumulative impacts on cultural resources is required by both the CEQ and NHPA. Cumulative impacts on archeological resources would include the disturbance or destruction of potential archeological resources, which would lead to the further depletion of the archeological record and knowledge base in DEWA, MDSR, and APPA. Archeological sites are nonrenewable resources and are therefore finite in number. Past, present, and reasonably foreseeable activities that could have beneficial or adverse impacts on archeological resources in the parks and inside and outside the study area are discussed in following sections and summarized under each alternative as applicable.

Projects Inside the Study Area

Inside the study area, projects that could result in adverse cumulative impacts on archeological resources include the following road, development, and utility projects: I-80 weigh station (facility upgrade), sustainable comfort stations, New Jersey Swim Beach (Turtle Beach), McDade Trail realignment, the

Tennessee Gas Line Proposal (addition to an existing gas pipeline), and Northeast Supply Link Expansion – Palmerton Loop. These projects have involved or could involve ground disturbance, which could permanently alter or destroy archeological resources. Additionally, illegal activities such as the collection of artifacts and illegal ORV use could result in the loss of archeological resources. Other park activities could also result in adverse impacts on archeological resources: the issuance of special use permits related to visitor use, incidental business permits / commercial visitor services, agricultural leases, and parkwide invasive species control programs. The PADOT SR 2001 road project could have adverse impacts on archeological resources. Projects that have created or could create beneficial impacts on archeological resources include the rehabilitation of Childs Park, the regrading of six historic buildings, hazardous structure demolition/deconstruction, and the stabilization and repair of damaged structures. These projects could preserve and/or rehabilitate historical structures with associated archeological deposits or significant landscape features that support archeological sites inside the study area and protect architectural resources through BMPs. Because the presence, extent, and location of archeological resources are largely unknown, cumulative impacts inside the study area could be adverse.

Projects Outside the Study Area

Outside the study area, projects including utility projects and other development projects have the potential to adversely affect archeological resources. Projects that could have adverse impacts include local residential development adjacent to the parks, the Appalachian Trail relocation near the Columbia Gas Transmission Company pipeline crossing, the Dominion/Allegheny Power 500-kV transmission line project, the Northeast Supply Link Expansion – Palmerton Loop, the Federal Energy Regulatory Commission relicensing of Yards Creek Generating Station, Marcellus shale natural gas drilling, PFBC natural gas leasing and water access programs, and residential development. These projects have caused or could cause a substantial change in the significance of archeological resources outside the study area. Projects outside the study area are somewhat mitigated by a variety of conservation and open space plans that could lessen the impacts on archeological resources. Cumulative impacts on archeological resources outside the study area could be adverse because the presence and extent of archeological resources are largely unknown.

IMPACTS OF THE ALTERNATIVES ON ARCHEOLOGICAL RESOURCES

Due to the nature of archeological projects, the presence or absence of all archeological sites in any region cannot be known before initiating an archeological field investigation. Potential archeological sites can be identified through research, and can be confirmed through field investigation. Accordingly, the impacts on potential archeological resources cannot be fully known beforehand. If an adverse effect on an archeological resource is identified, all efforts would be made to avoid the adverse effect before proceeding with ground-disturbing activities.

Common to All Alternatives

Mitigation Measures: Mitigation measures would reduce impacts from construction, operation, and maintenance activities for all action alternatives and are described in chapter 2 and appendix F. In project areas where archeological resources are located, mitigation could include preserving the sites in place by avoiding the disturbance or destruction of potential resources. Site areas might be cordoned off and deliberately avoided by construction activities, thereby preserving the potential resource for future scientific study.

Outside the Study Area: Outside the study area, regardless of which alternative is selected, the transmission line could pass through Carbon, Lackawanna, Luzerne, Monroe, Northampton, Pike, and Wayne counties in Pennsylvania and Morris, Sussex, and Warren counties in New Jersey.

The clearing, construction, and vegetation maintenance activities outside the study area would be consistent with those described for inside the study area; however, the impacts outside the study area would be indirect. The direct impacts from the construction of the transmission line outside the study area generally cannot be determined, as described in the introduction of this chapter. Additionally, the specific resources that would be affected by the transmission line outside the study area cannot be identified until the route is chosen by the applicant. Upon this decision, additional surveys would be required to determine whether archeological resources would be affected along the selected route.

Outside the study area, systematic archeological surveys have not been undertaken. Accordingly, the nature and number of potential archeological resources are not known for these areas. However, the S-R Line could affect potential resources. Outside the study area, indirect adverse impacts on archeological resources could result from vegetation clearing and maintenance associated with the no-action alternative. Under all action alternatives, indirect impacts on potential archeological resources cannot be determined yet; however, impacts are expected to be adverse. Cumulative impacts on archeological resources outside the study area could be adverse, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the indirect adverse impacts on archeological resources as a result of activities outside the study area are combined with other past, present, and reasonably foreseeable projects outside the study area, an overall adverse cumulative impact could be expected.

Alternative 1: No Action

Under the no-action alternative, the existing ROW currently crosses known archeological sites. The ROW would not be widened under alternative 1; however, the continued operation of the existing transmission line would require periodic vegetation maintenance including pruning and removal of vegetation in the ROW. These ongoing activities could create impacts on archeological sites from soil disturbance, artifact displacement and movement, artifact breakage (e.g., ceramic vessels, glass), disturbance of cultural features such as firepits and foundation remnants, and the exposure of the newly denuded landscape to potential erosion. Although impacts on potential archeological resources would continue in the existing ROW, the undertaking would not result in additional impacts under the no-action alternative.

Cumulative Impacts

Past, present, and reasonably foreseeable projects inside the study area would have adverse cumulative impacts on archeological resources, as described previously in the “Cumulative Impacts Common to All Alternatives” section. However, Alternative 1 would not alter the level of impact.

Conclusion

Alternative 1, the no-action alternative, would result in the continued operation of the existing transmission line with regular vegetation maintenance. There would be adverse impacts on the archeological sites in alternative 1 due to physical impacts from the maintenance of vegetation along the existing ROW. When analyzed together with past, present, and future projects, the cumulative impacts under this alternative would be expected to be adverse.

The adverse impacts of alternative 1 would be confined to the limits of the present ROW and none of the adverse impacts would change existing conditions. After applying the Advisory Council criteria for adverse effects, the NPS determined that implementation of alternative 1 would result in a finding of no adverse effects to archeological resources, since the impacts would not result directly from the undertaking. Therefore, the actions under alternative 1 would be in keeping with the parks’ enabling legislations, *NPS Management Policies 2006*, and all other applicable federal and state laws. Although

there are adverse impacts associated with the continued operation and maintenance of the B-K Line, the intensity of the adverse impacts would not change as a result of the undertaking.

Alternative 2

Inside the study area, a Phase IB archeological survey conducted by The Louis Berger Group, Inc. on behalf of the applicant identified 2 archeological sites within the bounds of the alternative 2 corridor that could be directly affected by construction activities; 23 additional sites were identified but these would not be affected by construction (Berger 2010b). One affected site has components that date to the prehistoric period and the historic period. Phase II archeological investigations at this site resulted in a recommendation of National Register eligibility for the prehistoric component only. The second site dates to the prehistoric period; Phase II archeological investigations also resulted in a recommendation of National Register eligibility.

If transmission line construction and/or maintenance activities impinge on the site of an archeological resource and disturbance to the site landscape is unavoidable, then the effect would be considered adverse. The degree to which the effect is adverse would depend on the nature, extent, and location of the construction disturbance. The amount of soil disturbance (surface disturbance, actual earth-moving or excavation) is a key factor in the analysis.

Specific kinds of adverse effects that may be anticipated for alternative 2 would include the removal and clearing of vegetation along the proposed ROW. These activities on the site surface could create adverse effects on archeological resources, if present. In order to install the transmission towers, excavation would be needed to a depth of 15 to 30 feet. Drilling would be used to excavate the ground material to the required depth. If an archeological site were located in the area of excavation, adverse effects could include full physical removal or destruction.

Significant archeological resources would be avoided to the greatest extent possible. If archeological resources could not be avoided, an appropriate mitigation strategy would be developed in consultation with the appropriate SHPO and, as necessary, American Indian tribes. If during construction previously unknown archeological resources are discovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and, if the resources cannot be preserved in situ, an appropriate mitigation strategy developed. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (25 USC § 3001) of 1990 would be followed.

The construction of access roads would include the removal of vegetation, the placement of gravel, and grading. Impacts on archeological resources would occur due to the earthmoving activities at the site. The operation of the existing transmission line would require periodic vegetation maintenance including the pruning and removal of vegetation in the ROW. These ongoing activities could create adverse impacts on archeological sites. Types of impacts could include soil disturbance, artifact displacement and movement, artifact breakage (e.g., ceramic vessels, glass), disturbance to cultural features such as firepits and foundation remnants, and the exposure of the newly denuded landscape to erosion.

Adverse effects could occur at the site containing only prehistoric components, primarily in a portion of the site with few artifacts. It is yet to be determined what mitigation measures under Section 106 this would require. Engineering controls could be used to eliminate disturbance to the remainder of the site.

Section 106 Summary

Based on surveys conducted by the applicant, it was recommended that the prehistoric components of both sites were National Register eligible, and therefore, met the definition of a historic property. The application of the Advisory Council criteria of adverse effects (36 CFR § 800.5, “Assessment of Adverse Effects”) resulted in the finding that the site with both prehistoric and historic period components would not be disturbed. However, protection through engineering controls was recommended as a precaution against inadvertent ground-disturbing activities. Likewise, it was found that the site containing only prehistoric period components would be adversely affected. Nonetheless, it was recommended that engineering controls could mitigate ground-disturbing activities to the most significant portions of the site. See appendix M for a complete summary of the section 106 process for this final EIS.

Cumulative Impacts

Past, present, and reasonably foreseeable projects inside the study area would have adverse cumulative impacts on archeological resources, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the impacts on archeological resources as a result of alternative 2 are combined with the other projects inside the study area, an overall adverse cumulative impact would be expected. Alternative 2 would not alter the level of impact.

Conclusion

The implementation of alternative 2 could have adverse impacts on potential historic properties, and those recommended as historic properties. As discussed, adverse effects to archeological sites could be mitigated through avoidance and engineering controls, with the exception of a portion of the site containing only prehistoric components. Appropriate mitigation measures would be required to address the adverse effects under Section 106 to this site. The cumulative effects of activities under alternative 2, coupled with other past, present, and future projects noted, could constitute adverse cumulative effects.

After applying the Advisory Council criteria for adverse effects, the NPS made a preliminary determination that alternative 2 would have an adverse effect on archeological resources based on the potential for discovering significant archeological sites. However, the effect will not be known until pre-construction surveys are completed and the determination may change, depending on the nature of the archeological sites found. Because the nature and extent of archeological resources along any of the action alternatives is not known, for the purposes of analysis in this EIS, the unknown archeological resources along any of the action alternative alignments are assumed to be significant; therefore, the adverse impacts of any of the action alternatives would also be assumed to be significant.

Permitting the project would adversely affect multiple protected resources inside the parks, in some instances irreversibly. Allowing such adverse effects in order to facilitate private infrastructure expansion would be contrary to NPS practice and principle of protecting and improving these resources, and of removing incompatible infrastructure to do so. This could establish precedent that may invite similar proposals by other applicants in the future, and create an expectation of like treatment for those proposals; it may make it difficult to deny such proposals. DEWA and APPA both contain numerous other utility crossings, which makes the risk of such precedent particularly concerning for these parks. Furthermore, as units of the national park system, wherein all parks are entitled to equal protection, creating such a precedent could have ramifications for parks nationwide. The location of this particular crossing through the center of DEWA could make such a precedent even more potent. Installing the S-R Line on this alignment may invite future utilities proposing to follow the same route.

Alternative 2b

Inside the study area, the alternative 2b alignment would follow the same route as described for alternative 2; however, under alternative 2b, the ROW would only be cleared to the extent of the applicant's deeded property rights.

Inside the study area, a Phase IB archeological survey conducted by The Louis Berger Group, Inc., on behalf of the applicant identified 2 archeological sites within the bounds of the alternative 2 corridor that would be directly affected by construction activities; 23 additional sites were identified but these would not be affected by construction (Berger 2010b). One affected site has components that date to the prehistoric period and the historic period. Phase II archeological investigations at this site resulted in a recommendation of National Register eligibility for the prehistoric component only. The second site dates to the prehistoric period; Phase II archeological investigations also resulted in a recommendation of National Register eligibility.

Under alternative 2b, the potential for impacts from clearing, construction, operation, and vegetation maintenance activities, as well as the assessment of impact levels, would be the same as those described for alternative 2.

No adverse effect was assumed for the archeological site with both historic and prehistoric components since the site sits 12 feet (3.7 meters) from an access road; nonetheless, it was recommended that protection could be ensured through engineering controls (timber-matting). Adverse effects would occur at the site containing only prehistoric components; however, only in an area with scant resources. It was anticipated that the adverse effect would not change the National Register eligibility of the site. Engineering controls could be used to eliminate disturbance to the remainder of the site. Therefore, it was recommended that no additional archeological investigation is needed at either site.

Section 106 Summary

Based on surveys conducted by the applicant, it was recommended that the prehistoric components of both sites were National Register eligible, and therefore, met the definition of a historic property. The application of the Advisory Council criteria of adverse effects (36 CFR § 800.5, "Assessment of Adverse Effects") resulted in the finding that the site with both prehistoric and historic period components would not be disturbed. However, protection through engineering controls was recommended as a precaution against inadvertent ground-disturbing activities. Likewise, it was found that the site containing only prehistoric period components would be adversely affected. Nonetheless, it was recommended that engineering controls could mitigate ground-disturbing activities to the most significant portions of the site. See appendix M for a complete summary of the section 106 process for this final EIS.

Cumulative Impacts

Past, present, and reasonably foreseeable projects inside the study area would have adverse cumulative impacts on archeological resources, as described previously in the "Cumulative Impacts Common to All Alternatives" section. When the impacts on archeological resources as a result of alternative 2b are combined with the other projects inside the study area, an overall adverse cumulative impact would be expected. Alternative 2b would not alter the level of impact.

Conclusion

The implementation of alternative 2b could have adverse effects on potential historic properties and those recommended as being historic properties. As discussed, direct impacts to archeological sites could be

mitigated through avoidance and engineering controls, with the exception of a portion of the site containing only prehistoric remains. For the portion of this prehistoric site subject to disturbance, it was recommended that no additional work was needed because the site would retain National Register eligibility. The cumulative effects of activities under alternative 2b, coupled with other past, present, and future projects noted, could constitute adverse cumulative effects.

After applying the Advisory Council criteria for adverse effects, the NPS has a preliminary determination that alternative 2b would have an adverse effect on archeological resources based on the potential for discovering significant archeological sites. However, the effect will not be known until pre-construction surveys are completed and the determination may change, depending on the nature of the archeological sites found. As stated for alternative 2, the impacts on archeological resources from the action alternatives is assumed to be significant for the purposes of analysis in this EIS because the nature and extent of archeological resources along any of the action alternatives is not known. Alternative 2b has potential for significant impacts associated with the precedent set by permitting a proposed transmission line that would adversely affect multiple protected resources inside the parks. The results of this action would be contrary to NPS practice and principle of protecting and improving these resources and would potentially establish a precedent that may invite similar proposals by others and make it difficult for the NPS to deny such proposals.

Alternative 3

Due to access limitations, archeological surveys were not conducted within the boundaries of Worthington State Forest, which represents approximately 1.7 miles of the alternative 3 alignment within NPS boundaries.

Inside the study area, a Phase IB archeological survey conducted by John Milner Associates identified one archeological site within the bounds of the alternative 3 corridor (JMA 2011). The site dates to the historic period and appears to be a farmstead. The site contained a cellar hole measuring 23 feet by 14 feet (7 meters by 4.3 meters) and a related surface feature, located 75 feet (23 meters) north of River Road. A total of 273 artifacts were recovered, including a variety of whitewares and redwares, nails, and window glass; no brick was recovered. For all datable artifacts the mean date is 1896.

The site has not been evaluated for significance and possible eligibility for listing in the National Register (i.e., a Phase II evaluation). Thus, because it is yet unknown whether the site constitutes a historic property, an assessment of possible effects on this site must be made under the assumption that the site is indeed a significant archeological resource.

The potential for impacts from clearing, construction, operation, and vegetation maintenance activities, as well as the assessment of impact levels, under alternative 3 are the same as those described for alternative 2. Overall, the potential for adverse impacts from alternative 3 activities exists; however it is unknown whether the site identified during the Phase IB archeological survey is significant.

Section 106 Summary

The application of the Advisory Council criteria of adverse effects (36 CFR § 800.5, “Assessment of Adverse Effects”) has not been fully completed; however, it is apparent that adverse effects would occur on archaeological resources. At this time it has been determined that alternative 3 would have an adverse effect on one archaeological resource within the APE. The assessment of effect for archaeological resources is ongoing as final design of the transmission continues. See appendix M for a complete summary of the section 106 process for this final EIS.

Cumulative Impacts

Past, present, and reasonably foreseeable projects inside the study area would have adverse cumulative impacts on archeological resources, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the impacts on archeological resources as a result of alternative 3 are combined with the other projects inside the study area, an overall adverse cumulative impact would be expected. Alternative 3 would not alter the level of impact.

Conclusion

The implementation of alternative 3 could have adverse impacts on potential historic properties. As discussed, the nature and severity of the impact would depend on the nature and extent of physical disturbance to the archeological resources in the alternative alignment. The cumulative effects of alternative 3, coupled with other past, present, and future projects noted earlier, could constitute adverse cumulative impacts.

After applying the Advisory Council criteria for adverse effects, the NPS made a preliminary determination that alternative 3 would have an adverse effect on archeological resources based on the potential for discovering significant archeological sites. However, the effect will not be known until pre-construction surveys are completed and the determination may change, depending on the nature of the archeological sites found. Although the nature and extent of archeological resources along any of the action alternatives is largely known from surveys, there is still a risk that some archeological resources have not been identified. For the purposes of analysis in this EIS, the potential unknown archeological resources along any of the action alternative alignments are assumed to be significant; therefore, the adverse impacts of any of the action alternatives would also be assumed to be significant. Mitigation would be implemented to avoid and minimize adverse impacts to archeological resources; however, in the absence of site-specific information, it is reasonable to assume that not all adverse impacts can be completely avoided or minimized sufficiently to reduce the intensity below that which would be potentially significant. Therefore, at this time, all of the action alternatives are assumed to have the potential to result in significant adverse impacts on archeological resources. However, if site-specific surveys showed that adverse impacts could be effectively avoided and reduced through mitigation measures, it is also possible that one or more of the action alternatives would not result in significant impacts on archeological resources.

Alternative 3 would contribute to the cumulative adverse impacts on archeological resources in the region surrounding the parks and would increase their scarcity and sensitivity inside the parks, where they are afforded special protection. As stated for alternative 2, permitting this project would reverse the trend of preserving resources by removing non-conforming features and it may establish precedent for future actions. The construction of a transmission line with taller towers would adversely impact the historic structures within the parks, which is counter to their enabling legislation and mandates.

Alternative 4

Inside the study area, a Phase IB archeological survey conducted by John Milner Associates identified one archeological site within the bounds of the alternative 4 corridor (JMA 2011). The site dates to the prehistoric period but cannot be more precisely dated yet. The site has not been evaluated for significance and possible eligibility for listing in the National Register (i.e., a Phase II evaluation). Thus, it is yet unknown whether the site constitutes a historic property, and an assessment of possible effects on this site must be made under the assumption that the site is indeed a significant archeological resource.

The potential for impacts from clearing, construction, operation, and vegetation maintenance activities, as well as the assessment of impact levels, under alternative 4 are the same as those described for alternative 2. Overall, the potential for adverse impacts on archeological resources from alternative 4 activities exists; however, it is unknown whether the site identified during the Phase IB archeological survey is significant.

Section 106 Summary

The application of the Advisory Council criteria of adverse effects (36 CFR § 800.5, “Assessment of Adverse Effects”) has not been fully completed; however, it is apparent that adverse effects would occur on archaeological resources. At this time it has been determined that alternative 4 would have an adverse effect on one archaeological site within the APE. The assessment of effect for archaeological resources is ongoing as final design of the transmission continues. See appendix M for a complete summary of the section 106 process for this final EIS.

Cumulative Impacts

Past, present, and reasonably foreseeable projects inside the study area would have adverse cumulative impacts on archeological resources, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the impacts on archeological resources as a result of alternative 4 are combined with the other projects inside the study area, an overall adverse cumulative impact would be expected. Alternative 4 would not alter the level of impact.

Conclusion

The implementation of alternative 4 could have adverse impacts on a potential historic property. As discussed, the nature and severity of the impact would depend on the nature and extent of physical disturbance to the potential archeological resource in the alternative alignment. The cumulative effects of alternative 4, coupled with other past, present, and future projects noted earlier, could constitute adverse cumulative impacts.

After applying the Advisory Council criteria for adverse effects, the NPS has made a preliminary determination that alternative 4 would have an adverse effect on archeological resources based on the potential for discovering significant archeological sites. However, the effect will not be known until pre-construction surveys are completed and the determination may change, depending on the nature of the archeological sites found. Although the nature and extent of archeological resources along any of the action alternatives is largely known from surveys, there is still a risk that some archeological resources have not been identified. For the purposes of analysis in this EIS, the potential unknown archeological resources along any of the action alternative alignments are assumed to be significant; therefore, the adverse impacts of any of the action alternatives would also be assumed to be significant. Mitigation would be implemented to avoid and minimize adverse impacts to archeological resources; however, in the absence of site-specific information, it is reasonable to assume that not all adverse impacts can be completely avoided or minimized sufficiently to reduce the intensity below that which would be potentially significant. Therefore, at this time, all of the action alternatives are assumed to have the potential to result in significant adverse impacts on archeological resources. However, if site-specific surveys showed that adverse impacts could be effectively avoided and reduced through mitigation measures, it is also possible that one or more of the action alternatives would not result in significant impacts on archeological resources.

As with the other action alternatives, alternative 4 also has potential for significant adverse impacts associated with the precedent set by permitting a proposed transmission line that would adversely affect multiple protected resources inside the parks, contrary to NPS practice and principle of protecting and

improving these resources and potentially establishing a precedent that may invite similar proposals by others and make it difficult for the NPS to deny such proposals. As previously noted, DEWA and APPA both contain numerous other utility crossings, which makes the risk of such precedent particularly concerning for these parks and which could have ramifications for parks nationwide. The precedent potentially set by alternative 4 may include more consideration of moving infrastructure to the edges of NPS units; however, this does not offset the adverse impacts caused by the presence of such infrastructure. Alternative 4 would persist as a non-conforming feature in the parks landscape and would remain for the life of the line.

Alternative 5

Inside the study area, alternative 5 would follow the same route as alternative 4 through DEWA and APPA, except for a portion of the B-K Line from the Bushkill Substation to the western boundary of DEWA. The Phase IB archeological survey (Berger 2010b) did not identify archeological resources in this portion of the B-K Line ROW; therefore, the adverse impacts inside the study area for alternative 5 would be the same as those described for alternative 4.

Section 106 Summary

The application of the Advisory Council criteria of adverse effects (36 CFR § 800.5, “Assessment of Adverse Effects”) has not been fully completed; however, it is apparent that adverse effects would occur on archaeological resources. At this time it has been determined that alternative 5 would have an adverse effect on one archaeological resource within the APE. The assessment of effect for archaeological resources is ongoing as final design of the transmission continues. See appendix M for a complete summary of the section 106 process for this final EIS.

Cumulative Impacts

Past, present, and reasonably foreseeable projects inside the study area would have adverse cumulative impacts on archeological resources, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the impacts on archeological resources as a result of alternative 5 are combined with other projects inside the study area, an overall adverse cumulative impact would be expected. Alternative 5 would not alter the level of impact.

Conclusion

The implementation of alternative 5 could have adverse impacts on a potential historic property. As discussed, the nature and severity of the impact would depend on the nature and extent of physical disturbance to the potential archeological resources in the alternative alignment. The cumulative effects of alternative 5, coupled with other past, present, and future projects noted earlier, could constitute adverse cumulative impacts.

After applying the Advisory Council criteria for adverse effects, the NPS made a preliminary determination that alternative 5 would have an adverse effect on archeological resources based on the potential for discovering significant archeological sites. However, the effect will not be known until pre-construction surveys are completed and the determination may change, depending on the nature of the archeological sites found. Because the nature and extent of archeological resources along any of the action alternatives is not known, for the purposes of analysis in this EIS, the unknown archeological resources along any of the action alternative alignments are assumed to be significant; therefore, the adverse impacts of any of the action alternatives would also be assumed to be significant. Mitigation would be implemented to avoid and minimize adverse impacts to archeological resources; however, in the

absence of site-specific information, it is reasonable to assume that not all adverse impacts can be completely avoided or minimized sufficiently to reduce the intensity below that which would be potentially significant. Therefore, at this time, all of the action alternatives are assumed to have potential to result in significant adverse impacts on archeological resources. However, if site-specific surveys showed that adverse impacts could be effectively avoided and reduced through mitigation measures, it is also possible that one or more of the action alternatives would not result in significant impacts on archeological resources.

As stated for alternative 2, the impacts on archeological resources from the action alternatives is assumed to be significant for the purposes of analysis in this EIS because the nature and extent of archeological resources along any of the action alternatives is not known. Alternative 5 has potential for significant impacts associated with the precedent set by permitting a proposed transmission line that would adversely affect multiple protected resources inside the parks. The results of this action would be contrary to NPS practice and principle of protecting and improving these resources and would potentially establish a precedent that may invite similar proposals by others and make it difficult for the NPS to deny such proposals.

HISTORIC STRUCTURES

METHODOLOGIES

The methodologies for analyzing impacts to and treatment of historic structures considers the objectives of both NEPA and NHPA because the NPS has elected to integrate its compliance with Section 106 of the NHPA into the NEPA process and documentation pursuant to 36 CFR § 800.8(c). NEPA and NHPA are separate statutes with similar objectives regarding the treatment of historic structures. NEPA is very generalized, requiring federal agencies “to use all practicable means....to improve and coordinate federal plans....to preserve important historic [and] cultural aspects of our national heritage” and prepare “a detailed statement” on “the environmental impact of the proposed action” and “any adverse environmental effects which cannot be avoided” (Pub. L. 91-190, 42 USC §§ 4331-4332). These historic and cultural aspects are not defined in the statute, and there is no explicit guidance on how to achieve these objective. Section 106 of NHPA, on the other hand, is very specific about which structures are considered “historic” and thus subject to assessments for possible adverse effects. Therefore, the implementing regulations for NHPA (36 CFR Part 800) are normally employed to meet the compliance requirements of both NEPA and NHPA. Under NHPA, an *adverse effect* is recognized through a consideration of its ability to diminish or destroy the character-defining features of the historic structure, those features that convey the structure’s significance. The ability of a structure to convey significance is known as integrity. As defined by the NPS, there are seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association. Five of these aspects (location, design, materials, workmanship, and association) relate mainly to physical effects, such as alteration or demolition of historic structures. With the exception of demolition of the historic B-K Line, physical effects on historic structures are not anticipated under any of the proposed alternatives. Two of these aspects of integrity (setting and feeling) relate mainly to visual impacts or effects.

Setting is the physical environment of a historic structure, and *feeling* is a structure’s expression of the aesthetic or historic sense of a particular period of time (NPS 1991b: 44–49). For many historic structures in village or farmstead contexts, the idyllic rural setting commonly associated with these resource types is a character-defining feature. Feeling, while closely associated with setting, is more subjective still and is discerned entirely through field investigation. While the aesthetic sense of a particular period can be fairly easily recognized on site by a trained professional, the historic sense of a particular period requires some imagination, especially if the period of significance of the historic structure predates one’s life experience. While proximity and sight lines to proposed alignments necessarily factor into assessments of visual

effects, the more subjective aspects of integrity are the driving considerations: whether the proposed undertaking would diminish the integrity of setting and feeling of identified historic structures, thus diminishing or destroying their character-defining features.

Existing Data Review: Historic structures were identified in several ways depending on their locations. For the portions of the APE associated with alternatives 1, 2, and 2b, information was drawn from the results of the cultural landscape investigation (JMA 2011) and historic architecture eligibility and effects report (Berger 2012). For the portions of the APE associated with alternatives 3, 4, and 5 within the parks' boundaries, where extensive previous investigation had occurred, the DEWA inventory of historic structures was consulted. This inventory included a GIS layer containing points identifying the location of each identified resource, and a database containing standardized information about the identity, location, status, type, and age of each resource. Information was extracted from the GIS layer and database to create field maps and structure lists. For the portions of the APE associated with alternatives 3, 4, and 5 outside the parks' boundaries, where little or no previous investigation had occurred, a reconnaissance survey was conducted to determine the presence of structures that met the 50-year age consideration (pre-1961) and integrity requirements of the National Register (NPS 1991b). The Pennsylvania SHPO Cultural Resources Geographic Information System website and NJ HPO survey files were also reviewed to determine the presence and location of previously identified structures (Clark et al. 2011).

Field Investigation: Each identified historic structure was field checked to determine its presence or absence (standing or demolished), its state of integrity, and whether its landscape setting appeared to contribute to its historical and/or architectural significance. These notations were correlated with the findings of the cultural landscape study and historic architecture eligibility and effects report to identify structures that also contributed to one or more identified cultural landscapes. Structures were photographed using a Nikon D90 digital SLR (single lens reflex) camera with a NIKKOR 18–105 mm lens and a Nikon GP-1 Global Positioning System (GPS) adapter. The GPS adapter allowed for a determination of precise locations and the precise measurement of distances between structures and alignments. In addition, photographs were taken from the vicinity of each structure toward the relevant alignment. A lens setting of 32 mm (equivalent to 50 mm on a standard 35 mm camera) allowed for an approximation of normal human eyesight relative to scale.

Effect Assessment: Possible effects were assessed through thoughtful consideration of proximity and probable sight lines from the historic structures to the alternatives, and the importance of the integrity of setting and feeling relative to appropriate NHPA section 106 effect definitions.

Resource-specific context for assessing the significance of effects in accordance with NEPA and the CEQ regulations includes the following:

- Historic preservation is specifically identified in DEWA's enabling legislation.
- DEWA preserves the theme of the initial westward expansion of coastal colonies.
- DEWA contains some of earliest examples of historical structures in the region; many of these sites retain their original appearance and orientation in largely intact surroundings (e.g., Old Mine Road is the earliest commercial road in the county).
- Historic structures are major draw for visitation (approximately 44% visitors identified these as important).

STUDY AREA

The designated APE for historic structures is described in the "Historic Structures" section of chapter 3.

CUMULATIVE EFFECTS COMMON TO ALL ALTERNATIVES

An assessment of cumulative effects on cultural resources is required by both the CEQ and NHPA. Existing and anticipated future projects at DEWA, MDSR, and APPA were identified to determine the potential cumulative effects. Past, present, and reasonably foreseeable activities that have beneficial or adverse effects on historic structures in the parks and inside and outside the study area are listed here and discussed under each alternative as applicable.

Projects Inside the Study Area

Inside the study area, the following projects could cause adverse changes to character-defining features of historic structures: PADOT SR 2001 (road reconstruction), the rehabilitation of road bridges throughout the parks in New Jersey and Pennsylvania, the repair of Watergate Dam #10, and hazardous structure demolition and deconstruction. Other projects or activities with adverse effects include the PPL Electric Utilities Northeast Pocono reliability project, the PPL proposal for a 138/12-kV substation, existing utility towers within 5 miles, illegal ORV use, trespassing, vandalism, and arson. The proposed projects near APPA and other historic structures could have adverse effects on such structures. Projects that could have a beneficial effect on historic structures include Delaware River bridge projects, the repair of historic stone culverts on Mountain Road, the rehabilitation of Childs Park, and the regrading of six historic building sites.

Inside the study area several past, present, and reasonably foreseeable actions analyzed are specific to historic structures. The proposed projects that preserve and/or rehabilitate historic buildings, structures, or landscape features inside the study area could have beneficial effects on historic structures. For example, in the study area, the proposed stabilization and repair of B.B. Van Campen House, Broadhead Farm, and Miller House could have beneficial effects on these structures, provided the improvements are made in accordance with the Secretary of the Interior's Standards. Beneficial effects could also result from comprehensive planning and management documents through BMPs to protect historic structures.

The combined beneficial and adverse effects of the past, present, and reasonably foreseeable projects that could affect historic structures could result in an adverse cumulative effect on historic structures.

Projects Outside the Study Area

Outside the study area, utility projects and other development projects have the potential to cause adverse changes to character-defining features of historic structures, including PADOT SR 2001 (road reconstruction), the PPL Electric Utilities Northeast Pocono reliability project, the PPL proposal for a 138/12-kV substation; and existing utility towers within 5 miles. Several utility projects have the potential to cause adverse changes to character-defining features of historic structures; however, the effects are unknown: the Northeast Supply Link Expansion – Palmerton Loop, and the Dominion/Allegheny Power Transmission Line Project. Projects that could have a beneficial effect include Pike County agricultural security areas. In addition, projects outside the study area are somewhat mitigated by a variety of conservation and open space plans that could have beneficial effects on historic structures.

The effects on historic structures from these projects outside the study area would be the same as those described for projects inside the study area, although the route is unknown outside the study area. Therefore, projects outside the study area could result in adverse cumulative effects on historic structures, depending on the presence and extent of historic structures found along the route outside the study area.

EFFECTS OF THE ALTERNATIVES ON HISTORIC STRUCTURES

Section 106 effects are summarized by identified historic structure and alternative in tables 48 through 50 in the following sections. The identification numbers are taken from two sources, depending on how the information was collected. Historic structures located inside the park's boundary that were included in the DEWA historic structure inventory are listed by their assigned DEWA identification numbers. Historic structures located inside the park's boundary that were not included in the DEWA historic structure inventory or historic structures outside the park's boundary that were field surveyed are listed by arbitrarily assigned Pennsylvania or New Jersey numbers.

Common to All Alternatives

Mitigation Measures: Mitigation measures would reduce effects on historic structures from construction, operation, and maintenance activities for all action alternatives and are described in chapter 2 and appendix F.

Outside the Study Area: Outside the study area, regardless of which alternative is selected, the transmission line could pass through Carbon, Lackawanna, Luzerne, Monroe, Northampton, Pike, and Wayne counties in Pennsylvania and Morris, Sussex, and Warren counties in New Jersey.

Clearing, construction, and vegetation maintenance activities outside the study area would be consistent with those described for inside the study area; however, the effects outside the study area would be indirect. The direct effects from the construction of the transmission line outside the study area cannot be determined, as described in the introduction of this chapter. Additionally, the specific historic structures that would be affected by the transmission line outside the study area cannot be identified until the route is chosen by the applicant. Upon this decision, additional surveys would be required to determine whether historic structures would be affected along the selected route.

Outside the study area, the proposed transmission line could pass through the Pocono environmental heritage region, Delaware and Lehigh National Heritage Corridor, and Lackawanna Heritage Valley state and national heritage area. Because the location of the line outside the study area is not known, the presence and number of historic structures in visual proximity to any of the alternatives is undocumented.

Outside the study area, indirect adverse effects on historic structures would result from vegetation clearing and maintenance associated with the no-action alternative. Under all action alternatives, indirect adverse effects on historic structures would result from clearing, construction, and vegetation maintenance outside the study area. Cumulative effects outside the study area would result in adverse effects on historic structures, as described previously in the "Cumulative Effects Common to All Alternatives" section. When the adverse indirect effects on historic structures as a result of activities outside the study area are combined with other past, present, and reasonably foreseeable projects in the study area, an overall adverse cumulative effect would be expected. The S-R Line project would not alter the level of effect.

Alternative 1: No Action

Inside the study area, under the no-action alternative the widening of the existing transmission line ROW would not occur. Currently, historic structures, including APPA, are located near the existing line, and the existing line has a direct visual effect. Annual vegetation maintenance as described in the applicant's vegetation management plans would result in the removal or loss of existing vegetation and would negate any visual mitigation to existing historic structures. Therefore, adverse effects on historic structures would occur under alternative 1.

Cumulative Effects

Cumulative effects on historic structures from past, present, and reasonably foreseeable projects inside the study area would be adverse, as described previously in the “Cumulative Effects Common to All Alternatives” section. When the effects on historic structures as a result of alternative 1 are combined with the other projects inside the study area, an overall adverse cumulative effect would be expected. Alternative 1 would not alter the level of effect.

Conclusion

Alternative 1, the no-action alternative, would result in the continued operation and maintenance of the existing transmission line. There would be adverse effects on historic structures; the effects from alternative 1 are based on visual effects from the removal of vegetation during maintenance activities. The effects of past, present, and reasonably foreseeable projects, when combined with the effects on historic structures under alternative 1, would result in adverse cumulative effects on historic structures inside the study area.

The adverse effects of alternative 1 would be confined to the limits of the present ROW and none of the adverse effects would change existing conditions. After applying the Advisory Council criteria for adverse effects, the NPS determined that implementation of alternative 1 would result in a finding of no adverse effects to historic structures. Therefore, the actions under alternative 1 would be in keeping with the parks’ enabling legislations, NPS *Management Policies 2006*, and all other applicable federal and state laws. Although there are adverse effects associated with the continued operation and maintenance of the B-K Line, the intensity of the adverse effects in the context of historic structures in the parks would not be considered significant.

Common to All Action Alternatives

Removal of Existing Structures: All action alternatives (2, 2b, 3, 4, and 5) would involve the removal of all or a portion of the B-K Line, as described in chapter 2. During the removal and disposal of existing structures, visual effects on historic structures would occur from dust production, the removal of the crane pads and equipment at wire pulling sites, the disassembly and removal of lattice towers, the creation of access roads, and the transportation of construction equipment to and from the decommissioning sites. Similar effects would occur related to the construction of the new facilities. The removal of the existing structures would have an effect on the B-K Line, which is eligible for listing. Access roads and spur roads would require clearing and grading and would affect historic structures in the immediate vicinity of the roads. After the completion of the transmission lines, access roads with gravel surfacing would continue to be maintained. Such actions would have adverse effects on historic structures in DEWA and on APPA.

Vegetation Clearing: The ROWs would be cleared of vegetation for the construction of the new double 500-kV transmission line for alternatives 2 through 5. Alternatives 2, 3, 4, and 5 include clearing up to 350 feet; the ROW would be extended up to 175 feet from either side of the centerline of the existing ROW. Under alternative 2b, the applicant proposes to operate the S-R Line within the existing ROW. The NPS anticipates that the applicant would require additional area for construction; therefore, it is estimated that under alternative 2b, the applicant would expand the ROW to the extent of their deeded property rights, which ranges from 100 feet to 380 feet. For alternative 2b, the ROW would be cleared on either side of the centerline to an appropriate width based on the deeded property rights. Clearing would be complete for all action alternatives, with the exception of the 50-foot buffer near intermittent streams/wetlands and the 100-foot buffer near perennial waterways such as the Delaware River (PPL and PSE&G 2008, 7).

Section 106 Summary: NHPA section 106 regulations apply only to structures that meet the eligibility requirements of the National Register. Therefore, the assessment of NHPA section 106 effects applies only to those historic structures that are listed in the National Register or those that meet National Register criteria for listing. Tables 48 through 50 list all of the historic structures identified in DEWA. The section 106 effects are presented in these tables for the structures that are listed in the National Register or are considered eligible for listing.

Alternative 2

Alternative 2 would result in possible effects on 36 identified structures, all known to meet National Register eligibility requirements. With the exception of demolition of the historic B-K Line, none of the effects would be direct physical effects, but would be visual and would vary depending on how the viewshed of the historic structure is affected by clearing or construction of alternative 2. Visual effects would result from removal or loss of vegetation and from sight of the larger transmission towers and more numerous conductors within the viewshed of the historic structures. The presence of the large towers and lines would diminish the integrity of setting, feeling, and association of numerous historic structures. Under alternative 2, the overall assessment of effect for section 106 would be an adverse effect to historic structures.

Section 106 Summary

The application of the Advisory Council criteria of adverse effects (36 CFR § 800.5, “Assessment of Adverse Effects”) has not been fully completed; however, it is apparent that adverse effects would occur on historic structures. There were 36 identified historic structures within the APE. At this time it has been determined that alternative 2 would have an adverse effect on at least 17 historic structures within the APE. Alternative 2 would have no adverse effect on 19 historic structures (table 48). The assessment of effect for historic structures is ongoing as final design of the transmission line progresses and section 106 consultation continues. See appendix M for a complete summary of the section 106 process for this final EIS.

Cumulative Effects

Cumulative effects on historic structures from past, present, and reasonably foreseeable projects inside the study area would be adverse, as described previously in the “Cumulative Effects Common to All Alternatives” section. Within the study area, non-historic elements of two historic structures and four non-historic structures (the non-historic components of the Copper Mine Inn Complex, John Michael Farm, and the Cornelius Gunn House [outbuildings], and the non-historic structures Oakley Stoll House, Sadie Van Campen House, and John P. House Farmstead/Romaine Warner House) are planned for demolition or have already been removed under the hazardous structures removal program. When the effects on historic structures as a result of alternative 2 are combined with the other projects inside the study area, an overall adverse cumulative effect would be expected. Alternative 2 would not alter the level of effect.

Conclusion

Alternative 2 would have an adverse effect on 1 historic structure through physical destruction and at least 16 historic structures through visual effects. The visual effects would be somewhat mitigated by the beneficial effects associated with the planned improvements to several historic structures in the study area. When the effects from alternative 2 are considered with the effects of other past, present, and future projects inside the study area, the cumulative effects would be adverse.

Alternative 2 would have adverse effects on historic structures that would be significant. After applying the Advisory Council criteria for adverse effects, the NPS determined that implementation of alternative 2 would have an adverse effect on at least 17 historic structures. The adverse visual effect would result from the visual intrusion of the higher transmission line towers and lines and a larger ROW that cannot be effectively avoided or minimized and would diminish the integrity of the setting, feeling, and association. These effects would be further exacerbated by the function of the national parks specifically to protect such resources. In the context of the purpose and significance for which DEWA, APPA, and MDSR were established and NPS mandates to specifically preserve the natural, cultural, and scenic resources within them, the adverse effects of alternative 2 on historic structures would likely be considered significant.

Permitting the project would adversely affect multiple protected resources inside the parks, in some instances irreversibly. Allowing such adverse effects in order to facilitate private infrastructure expansion would be contrary to NPS practice and principle of protecting and improving these resources, and of removing incompatible infrastructure to do so. This could establish a precedent that may invite similar proposals by other applicants in the future, and create an expectation of like treatment for those proposals; it may make it difficult to deny such proposals. DEWA and APPA both contain numerous other utility crossings, which makes the risk of such precedent particularly concerning for these parks. Furthermore, as units of the national park system, wherein all parks are entitled to equal protection, creating such a precedent could have ramifications for parks nationwide. The location of this particular crossing through the center of DEWA could make such a precedent even more potent. Installing the S-R Line on this alignment may invite future utilities proposing to follow the same route.

Public attention surrounding this project is high. There is likely to be a high degree of controversy over any effects on park resources that are particularly popular with the public, such as scenery, visitor use and experience, rare and unique communities, cultural landscapes, and historic structures, for any of the alternatives. The inherent uncertain nature of predicting the true degree of some of these impacts would likely heighten this controversy. Additionally, construction at this particular location in DEWA is likely to accentuate the controversy due to the unique characteristics presented here and high visitor traffic to the area.

The applicant's project would impact portions of several resources inside the park that are also under pressure in the surrounding region. This project is one component of a larger regional plan by the Regional Transmission Operator (RTO) to enhance systems reliability. Other component projects of this plan have already and would continue to affect APPA, especially in the areas of scenic resources and visitor use and experience, as well as other national parks in their paths. The overall experience of the APPA visitor would be degraded because this project would contribute cumulatively to the adverse impacts caused by the infrastructure projects along the entirety of the trail. Additionally, multiple types of development outside of DEWA and APPA are quickly diminishing several of the resources analyzed at a broader scale. The reduction of these resources in the region surrounding the parks increases the scarcity and sensitivity of them inside the parks where they are afforded special protection. Alternative 2 would contribute to the cumulative adverse impact on these resources.

Alternative 2b

The alternative 2b alignment would require two additional transmission towers within NPS boundaries; however, the visual effects on historic structures would be considered the same. Therefore, the adverse effects for alternative 2b would be the same as those described for alternative 2 and would be caused by the visual effects of the new transmission line on the historic structures inside the study area.

Section 106 Summary

The application of the Advisory Council criteria of adverse effects (36 CFR § 800.5, “Assessment of Adverse Effects”) has not been fully completed; however, it is apparent that adverse effects would occur on historic structures. There were 36 identified historic structures within the APE. At this time it has been determined that alternative 2b would have an adverse effect on at least 17 historic structures within the APE. Alternative 2b would have no adverse effect on 19 historic structures (table 48). The assessment of effect for historic structures is ongoing as final design of the transmission line progresses and Section 106 consultation continues. See appendix M for a complete summary of the section 106 process for this final EIS.

Cumulative Effects

Cumulative effects on historic structures from past, present, and reasonably foreseeable projects inside the study area would be adverse, as described previously in the “Cumulative Effects Common to All Alternatives” section. Within the study area, non-historic elements of two historic structures and four non-historic structures (the non-historic components of the Copper Mine Inn Complex, John Michael Farm, and the Cornelius Gunn House [outbuildings], and the non-historic structures Oakley Stoll House, Sadie Van Campen House, and John P. House Farmstead/Romaine Warner House) are planned for demolition or have already been removed under the hazardous structures removal program. When the effects on historic structures as a result of alternative 2b are combined with the other projects inside the study area, an overall adverse cumulative effect would be expected. Alternative 2b would not alter the level of effect.

Conclusion

Alternative 2b would have adverse effects on at least 17 historic structures. The presence of the large towers and lines would diminish the integrity of setting, feeling, and association of numerous historic structures. The effects would be somewhat mitigated by the beneficial effects associated with the planned improvements to several historic structures in the study area. When considered with the adverse effects of other past, present, and future projects inside the study area, the overall cumulative effects from alternative 2b would be adverse.

Alternative 2b would contribute to the cumulative adverse impacts on historic structures in the region surrounding the parks and would increase their scarcity and sensitivity inside the parks where they are afforded special protection. As stated for alternative 2, permitting this project would reverse the trend of preserving resources by removing non-conforming features and it may establish precedent for future actions. The construction of a transmission line with taller towers would adversely impact the historic structures within the parks, which is counter to their enabling legislation and mandates. The adverse effects of alternative 2b would be the same as alternative 2; therefore, for the same reasons outlined for alternative 2, alternative 2b may potentially result in significant adverse effects on historic structures.

Public attention surrounding this project is high. There is likely to be a high degree of controversy over any effects on park resources that are particularly popular with the public, such as scenery, visitor use and experience, rare and unique communities, cultural landscapes, and historic structures, for any of the alternatives. The inherent uncertain nature of predicting the true degree of some of these impacts would likely heighten this controversy. Additionally, construction at this particular location in DEWA is likely to accentuate the controversy due to the unique characteristics presented here and high visitor traffic to the area.

TABLE 48: SUMMARY OF NHPA SECTION 106 EFFECTS ON HISTORIC STRUCTURES FOR ALTERNATIVES 2 AND 2B

ID	Name (Date)	Section 106 Effect
103	Newcomb House (Larch Hollow) (1850)	No adverse effect
139	*Copper Mine Inn (1840)	No adverse effect
162	Calno School (1880)	Adverse effect
171	Schoonover Mountain House/Farm (1860)	Adverse effect
178/181	John Turn Farm: Limekiln, Smokehouse, Weavehouse (1815)	No adverse effect
191	Horace Van Auken House (1880)	Adverse effect
196	*Miller House/Amos Van Campen Outbuildings (1860)	No adverse effect
197	*Abraham Van Campen House/Zipser House (1900)	No adverse effect
198	*B.B. Van Campen House (1840)	Adverse effect
206	James Van Campen Farm "Blasi" (c.1875)	Adverse effect
236	Costello House (Smith House) (c.1800)	No adverse effect
242	Peters House (1840)	No adverse effect
247	Bushkill Dutch Reform Church (1860)	No adverse effect
283	Captain Jacob Shoemaker House (1810)	Adverse effect
294	*Millbrook Schoolhouse (1840)	Adverse effect
296	*E. L. Garris House (1852)	Adverse effect
297	*Sylvester Hill House (1850)	Adverse effect
302/303	*Decker Ferry House (1795/1895)	Adverse effect
327	*Salamovka (Delaware View House) (1850)	Adverse effect
343	Rosenkrans House (1800)	No adverse effect
397	Nyce Farm-Van Gordon House (Eshback Farm) (1775-1795)	No adverse effect
464	Brodhead Farm "Wheat Plains" (Heller Farm) (1890)	No adverse effect
518-523	Shoemaker-Houck Farm (Silver Spray Farm) (1822)	No adverse effect
525	Jacob Roe House (1812)	No adverse effect
527	Walpack Center Historic District (1850)	No adverse effect
PA-63	Zion Lutheran Church (1851)	No adverse effect
PA-66/NJ-1	Appalachian Trail (Appalachian National Scenic Trail) (1926, 1933)	Adverse effect
PA-80	John Michael Farm (1875)	No adverse effect
PA-84/NJ-11	PA-NJ Interconnection (1928-1956)	Adverse effect
NJ-3	Old Mine Road Historic District	Adverse effect
NJ-4	Milbrook Village Historic District (1832-1875)	Adverse effect
NJ-18	Camp Ken-Etiwa-Pec (1938)	No adverse effect
NJ-19	Catfish Fire Tower (State of NJ property) (1922/1993)	Adverse effect
NJ-20	Chado Farm/Broadstone Farms (1900/1932)	No adverse effect
NJ-21	*George Trauger House (1860)	Adverse effect
NJ-22	Isaac Van Campen Inn (c.1750)	No adverse effect

*Starred properties contribute to the Old Mine Road Historic District

Alternative 3

Alternative 3 would result in possible effects to 61 identified structures, some known to meet National Register eligibility requirements and others as yet undetermined. With the exception of demolition of the historic B-K Line, none of the effects would be physical, but would be visual, as described for alternative 2. The presence of the large towers and lines would diminish the integrity of setting, feeling, and association of numerous historic structures. Under alternative 3, the overall assessment of effect for section 106 would be an adverse effect to historic structures.

Section 106 Summary

The application of the Advisory Council criteria of adverse effects (36 CFR § 800.5, “Assessment of Adverse Effects”) has not been fully completed; however, it is apparent that adverse effects would occur on historic structures. Of the 61 structures identified for study within the APE, 33 have been determined to be historic structures. At this time it has been determined that alternative 3 would have an adverse effect on at least 7 historic structures within the APE. Alternative 3 would have no adverse effect on 26 historic structures (table 49). The assessment of effect for historic structures is ongoing as final design of the transmission line progresses and Section 106 consultation continues. See appendix M for a complete summary of the section 106 process for this final EIS.

TABLE 49: SUMMARY OF NHPA SECTION 106 EFFECTS ON HISTORIC STRUCTURES FOR ALTERNATIVE 3

ID	Name (Date)	Section 106 Effect
37	Slateford Farm (1800, 1833)	No adverse effect
39	Munsch-Cyr Farm (1910)	No adverse effect
60	Old Delaware Water Gap Railroad Station	No adverse effect
103	Newcomb House (Larch Hollow) (1850)	Adverse effect
139	*Copper Mine Inn (1840)	Adverse effect
162	Calno School (1880)	Adverse effect
171	Schoonover Mountain House/Farm (1860)	No adverse effect
172	Gonzales Mill Site (1840)	Eligibility undetermined
178/181	John Turn Farm: Limekiln, Smokehouse, Weavehouse (1815)	No adverse effect
191	Horace Van Auken House (1880)	No adverse effect
194	Van Campen Cemetery (1850)	Eligibility undetermined
196	*Miller House/Amos Van Campen Outbuildings (1860)	No adverse effect
197	*Abraham Van Campen House/Zipser House (1900)	No adverse effect
198	*B.B. Van Campen House (1840)	No adverse effect
201	De Pue Cemetery (1819)	Eligibility undetermined
206	James Van Campen Farm “Blasi” (c.1875)	No adverse effect
236	Costello House (Smith House) (c.1800)	No adverse effect
242	Peters House (1840)	No adverse effect
244	John Turn Store and Tinsmith Shop (1840)	No adverse effect
247	Bushkill Dutch Reform Church (1860)	No adverse effect
258	Ralph G. Turn Jr. House (1920)	Eligibility undetermined
264	Dippre House (1920)	Eligibility undetermined

ID	Name (Date)	Section 106 Effect
282	Kinney-Hawkins House/Millbrook General Store (1860)	<i>Eligibility undetermined</i>
283	Captain Jacob Shoemaker House (1810)	<i>No adverse effect</i>
294	*Millbrook Schoolhouse (1840)	<i>No adverse effect</i>
296	*E. L. Garriss House (1852)	<i>No adverse effect</i>
297	*Sylvester Hill House (1850)	<i>No adverse effect</i>
327	*Salamovka (Delaware View House) (1850)	<i>No adverse effect</i>
340	Van Scouder-Knight Farm (early 1800s)	<i>Eligibility undetermined</i>
343	Rosenkrans House (1800)	<i>No adverse effect</i>
PA-1	Unnamed farmstead (1850)	<i>Eligibility undetermined</i>
PA-2	Unnamed farmstead (1910)	<i>Eligibility undetermined</i>
PA-3	Unnamed dwelling (1920)	<i>Eligibility undetermined</i>
PA-4	Henry Transue Farm (1870)	<i>Eligibility undetermined</i>
PA-5	Unnamed dwelling (1935)	<i>Eligibility undetermined</i>
PA-6	Spring Hills Farm (1830)	<i>Eligibility undetermined</i>
PA-7	Inwood (1800)	<i>Eligibility undetermined</i>
PA-8	Cortwright-Meegan Farm (1856)	<i>Eligibility undetermined</i>
PA-9	Egger Home (1880)	<i>Eligibility undetermined</i>
PA-10	Unnamed dwelling (1920)	<i>Eligibility undetermined</i>
PA-11	Unnamed dwelling (1930)	<i>Eligibility undetermined</i>
PA-63	Zion Lutheran Church (1851)	<i>No adverse effect</i>
PA-65	Delaware Water Gap Historic District (1841)	<i>No adverse effect</i>
PA-66/NJ-1	Appalachian Trail (Appalachian National Scenic Trail) (1926, 1933)	<i>Adverse effect</i>
PA-67	Delaware, Lackawanna and Western Railroad (1908)	<i>No adverse effect</i>
PA-69	Ernest and Theresa Fleischman House (1947)	<i>Eligibility undetermined</i>
PA-78	Emanuel and Juliette Wagenhouzen House (1923)	<i>Eligibility undetermined</i>
PA-80	John Michael Farm (1875)	<i>Adverse effect</i>
PA-84/NJ-11	PA-NJ Interconnection (1928-1956)	<i>Adverse effect</i>
NJ-2	Delaware Water Gap Slate Co. Historic District (1870-1904)	<i>No adverse effect</i>
NJ-3	Old Mine Road Historic District	<i>Adverse effect</i>
NJ-4	Millbrook Village Historic District (1832-1875)	<i>No adverse effect</i>
NJ-5	New York Susquehanna and Western RR Bridge	<i>Eligibility undetermined</i>
NJ-6	Delaware Water Gap Toll Bridge	<i>Eligibility undetermined</i>
NJ-9	Yards Creek Pumped Storage Electric Gen. Sta.	<i>Eligibility undetermined</i>
NJ-10	Yards Creek Hydro-Power Tunnel and Penstock	<i>Eligibility undetermined</i>
NJ-12	Sussex County Bridge #318	<i>Eligibility undetermined</i>
NJ-13	Sussex County Bridge #330 (Flatbrookville Bridge) (1884-1886)	<i>Eligibility undetermined</i>
NJ-16	Stanley and Louise Parr Property (1940)	<i>Eligibility undetermined</i>
NJ-17	Ribble-Boehme Barn (1880)	<i>Eligibility undetermined</i>
NJ-21	*George Trauger House (1860)	<i>No adverse effect</i>

*Starred properties contribute to the Old Mine Road Historic District

Cumulative Effects

Cumulative effects on historic structures from past, present, and reasonably foreseeable projects inside the study area would be adverse, as described previously in the “Cumulative Effects Common to All Alternatives” section. Within the study area 5 structures (non-historic components of the Copper Mine Inn Complex, Dippre House, non-historic components of the John Michael Farm, Sadie Van Campen House, and Smith House/Costello House) are planned for demolition under the hazardous structures removal program. When the effects on historic structures as a result of alternative 3 are combined with the other projects inside the study area, an overall adverse cumulative effect would be expected. Alternative 3 would not alter the level of effect (table 49).

Conclusion

Alternative 3 would have adverse effects on at least 7 historic structures. The visual effect would be somewhat mitigated by the beneficial effects associated with the planned improvements to several historic structures in the study area. When considered with the adverse effects of other past, present, and reasonably foreseeable projects inside the study area, the overall cumulative effects of alternative 3 would be adverse.

Alternative 3 would have the same types of adverse effects on historic structures as alternatives 2 or 2b and would affect the largest number of historic structures of any of the action alternatives. Like the other action alternatives, alternative 3 has potential for significant impacts associated with the precedent set by permitting a proposed transmission line that would adversely affect multiple protected resources inside the parks. The results of this action would be contrary to NPS practice and principle of protecting and improving these resources and would potentially establish a precedent that may invite similar proposals by others and make it difficult for the NPS to deny such proposals. After applying the Advisory Council criteria for adverse effects, the NPS has determined that implementation of alternative 3 would have an adverse effect on historic structures because, like alternatives 2 and 2b, alternative 3 would involve demolition of the historic B-K Line and diminish the integrity of setting, feeling, and association of numerous other historic structures. For the same reasons outlined for alternatives 2 and 2b, the adverse effects of alternative 3 on historic structures would likely be considered significant.

Public attention surrounding this project is high. There is likely to be a high degree of controversy over any effects on park resources that are particularly popular with the public, such as scenery, visitor use and experience, rare and unique communities, cultural landscapes, and historic structures, for any of the alternatives. The inherent uncertain nature of predicting the true degree of some of these impacts would likely heighten this controversy.

Alternative 4

Alternative 4 would result in possible effects to 24 historic structures, some known to meet National Register eligibility requirements and others as yet undetermined. With the exception of demolition of the historic B-K Line, none of the effects would be direct physical effects to the historic structures, but would be visual, as described for alternative 2. The presence of the large towers and lines would diminish the integrity of setting, feeling, and association of numerous historic structures. Under alternative 4, the overall assessment of effect for section 106 would be an adverse effect to historic structures.

Section 106 Summary

The application of the Advisory Council criteria of adverse effects (36 CFR § 800.5, “Assessment of Adverse Effects”) has not been fully completed; however, it is apparent that adverse effects would occur

on historic structures. Of the 24 structures identified for study within the APE, 9 have been determined to be historic structures. At this time it has been determined that alternative 4 would have an adverse effect on at least 4 historic structure within the APE. Alternative 4 would have no adverse effect on 5 historic structures (table 50). The assessment of effect for historic structures is ongoing as final design of the transmission line progresses and Section 106 consultation continues. See appendix M for a complete summary of the section 106 process for this final EIS.

Cumulative Effects

Cumulative effects on historic structures from past, present, and reasonably foreseeable projects inside the study area would be adverse, as described previously in the “Cumulative Effects Common to All Alternatives” section. When the effects on historic structures as a result of alternative 4 are combined with the other projects inside the study area, an overall adverse cumulative effect would be expected. Alternative 4 would not alter the level of effect.

Conclusion

Alternative 4 would have adverse effects on numerous historic structures through physical and visual effects. The presence of the large towers and lines would diminish the integrity of setting, feeling, and association of numerous historic structures. When considered with the adverse effects of other past, present, and future projects inside the study area, the overall cumulative effects from alternative 4 would be adverse.

Alternative 4 would affect the smallest number of historic structures of any of the action alternatives; however, the adverse effects may still be considered significant because alternative 4 would involve demolition of the historic B-K Line and be an intrusion that would diminish setting, feel, and association of one or more historic structures that cannot be effectively mitigated. Adverse impacts would be offset by the B-K Line removal, but the B-K Line removal is itself an impact on a historic structure, and the historic structures with a view of the B-K Line have had the view for 80 years – long enough to become part of the historic landscape, depending on the period of significance. With the exception of APPA, removal of the B-K Line would not benefit the historic structures affected by alternative 4. After applying the Advisory Council criteria for adverse effects, the NPS has concluded that implementation of alternative 4 would have an adverse effect on historic structures as a result of visual effects from the towers and ROW clearing and physical effects from demolition of the historic B-K Line and access roads.

Alternative 4 would contribute to the cumulative adverse impacts on historic structures in the region surrounding the parks and would increase their scarcity and sensitivity inside the parks, where they are afforded special protection. As stated for alternative 2, permitting this project would reverse the trend of preserving resources by removing non-conforming features and it may establish precedent for future actions. The construction of a transmission line with taller towers would adversely impact the historic structures within the parks, which is counter to their enabling legislation and mandates. Considered in the context of the laws and policies that govern protection and management of historic structures in national parks, the adverse effects of alternative 4 would likely be considered significant.

Public attention surrounding this project is high. There is likely to be a high degree of controversy over any effects on park resources that are particularly popular with the public, such as scenery, visitor use and experience, rare and unique communities, cultural landscapes, and historic structures, for any of the alternatives. The inherent uncertain nature of predicting the true degree of some of these impacts would likely heighten this controversy.

TABLE 50: SUMMARY OF NHPA SECTION 106 EFFECTS ON HISTORIC STRUCTURES FOR ALTERNATIVES 4 AND 5

ID	Name (Date)	Section 106 Effect
37	Slateford Farm (1800, 1833)	<i>Adverse effect</i>
39	Munsch-Cyr Farm (1910)	<i>Adverse effect</i>
60	Old Delaware Water Gap Railroad Station	<i>No adverse effect</i>
103	Newcomb House (Larch Hollow) (1850)	<i>No adverse effect</i>
PA-12	Unnamed dwelling (1900)	<i>Eligibility undetermined</i>
PA-13	Unnamed dwelling (1870)	<i>Eligibility undetermined</i>
PA-14	Unnamed dwelling (1890)	<i>Eligibility undetermined</i>
PA-15	Totts Gap Farm (1820, 1835, alt. ca. 1935, ca. 1945)	<i>Eligibility undetermined</i>
PA-16	Drake Farm (1800)	<i>Eligibility undetermined</i>
PA-17	Tranquility Farm (1850)	<i>Eligibility undetermined</i>
PA-65	Delaware Water Gap Historic District (1841)	<i>No adverse effect</i>
PA-66/NJ-1	Appalachian Trail (Appalachian National Scenic Trail) (1926, 1933)	<i>Adverse effect</i>
PA-67	Delaware, Lackawanna and Western Railroad (1908)	<i>No adverse effect</i>
PA-71	Unnamed farmstead (1800)	<i>Eligibility undetermined</i>
PA-84/NJ-11	PA-NJ Interconnection (1928-1956)	<i>No adverse effect</i>
NJ-2	Delaware Water Gap Slate Co. Historic District (1870-1904)	<i>Adverse effect</i>
NJ-5	New York Susquehanna and Western RR Bridge	<i>Eligibility undetermined</i>
NJ-6	Delaware Water Gap Toll Bridge	<i>Eligibility undetermined</i>
NJ-9	Yards Creek Pumped Storage Electric Generating Station	<i>Eligibility undetermined</i>
NJ-10	Yards Creek Hydro-Power Tunnel and Penstock	<i>Eligibility undetermined</i>
NJ-12	Sussex County Bridge #318	<i>Eligibility undetermined</i>
NJ-13	Sussex County Bridge #330	<i>Eligibility undetermined</i>
NJ-16	Stanley and Louise Parr Property (1940)	<i>Eligibility undetermined</i>
NJ-17	Ribble-Boehme Barn (1880)	<i>Eligibility undetermined</i>

Alternative 5

The alignments for alternatives 4 and 5 would follow the same route through DEWA and APPA, except for the portion of the B-K Line from the Bushkill Substation to the western boundary of DEWA. The effects for alternative 5 inside the study area would be the same as those described for alternative 4 and would result from physical and visual effects. Under alternative 5, the overall effect on historic structures would be adverse.

Section 106 Summary

The application of the Advisory Council criteria of adverse effects (36 CFR § 800.5, “Assessment of Adverse Effects”) has not been fully completed; however, it is apparent that adverse effects would occur on historic structures. Of the 24 structures identified for study within the APE, 9 have been determined to be historic structures. At this time it has been determined that alternative 5 would have an adverse effect on at least 4 historic structure within the APE. Alternative 5 would have no adverse effect on 5 historic

structures (table 50). The assessment of effect for historic structures is ongoing as final design of the transmission line progresses and Section 106 consultation continues. See appendix M for a complete summary of the section 106 process for this final EIS.

Cumulative Effects

Cumulative effects on historic structures from past, present, and reasonably foreseeable projects inside the study area would be adverse, as described previously in the “Cumulative Effects Common to All Alternatives” section. When the adverse effects on historic structures as a result of alternative 5 are combined with the other projects inside the study area, an overall adverse cumulative effect would be expected. Alternative 5 would contribute an appreciable adverse increment to the overall cumulative effect.

Conclusion

Alternative 5 would have adverse effects on numerous historic structures. The presence of the large towers and lines would diminish the integrity of setting, feeling, and association of numerous historic structures. When considered with the adverse effects of other past, present, and future transmission line projects inside the study area, the overall cumulative effects from alternative 5 would be adverse.

As with the other action alternatives, alternative 5 has potential for significant adverse impacts associated with the precedent set by permitting a proposed transmission line that would adversely affect multiple protected resources inside the parks, contrary to NPS practice and principle of protecting and improving these resources and potentially establishing a precedent that may invite similar proposals by others and make it difficult for the NPS to deny such proposals. As previously noted, DEWA and APPA contain numerous other utility crossings, which makes the risk of such precedent particularly concerning for these parks and which could have ramifications for parks nationwide. The infrastructure of alternative 5 would persist as a non-conforming feature in the parks’ landscape and would remain for the life of the line. The adverse effects of alternative 5 are the same as alternative 4; therefore, the adverse effects of alternative 4 would also likely be considered significant.

Public attention surrounding this project is high. There is likely to be a high degree of controversy over any effects on park resources that are particularly popular with the public, such as scenery, visitor use and experience, rare and unique communities, cultural landscapes, and historic structures, for any of the alternatives. The inherent uncertain nature of predicting the true degree of some of these impacts would likely heighten this controversy.

CULTURAL LANDSCAPES

METHODOLOGIES

Existing Data Review: Cultural landscape resources were identified in two ways, depending on their locations: for portions of the APE within the DEWA boundary, where previous investigation has occurred, the DEWA database of cultural landscape inventories, the DEWA inventory of historic resources, and the DEWA list of contributing structures were used; for portions of the APE outside the parks’ boundaries, where little or no previous investigation had occurred, a reconnaissance survey was conducted to determine the presence of yet unevaluated (or documented) properties that might be eligible for the National Register. The Pennsylvania SHPO Cultural Resources Geographic Information System website and NJ HPO survey files were also reviewed to determine the presence and location of previously identified resources both inside and outside the parks’ boundaries.

Field Investigation: Initial efforts included a field survey of the resources including landscapes identified by DEWA as vulnerable to impacts from the proposed alternatives. Field work also clarified the extent of the current documentation of cultural landscapes. Field work helped verify location, setting, structures, landscape features, direct views to the existing transmission line corridors, physical proximity to the transmission line corridors, site spatial organization, topography, vegetation, small-scale features, conditions, and extant features that survive from the period of significance. Field observation also extended to the larger cultural landscape of the river corridor and the river valley, which continues to mirror the setting, feeling, and association of the earliest periods of habitation into the twentieth century.

Impact/Effect Assessment: In order for a cultural landscape to be listed in the National Register, it must possess significance (the meaning or value ascribed to the landscape) and retain the integrity of those features necessary to convey its significance as well as meeting one or more of the National Register criteria (36 CFR Part 63). The character-defining features in the identified cultural landscapes included spatial organization and land patterns, topography, vegetation, circulation patterns, water features, structures/buildings, and site furnishings and objects. Individual features were not examined alone, but in relationship to the overall landscape. The arrangement and interrelationships of the cultural landscapes' organizational elements and character-defining features provided the key to the determination of the potential impacts and effects of the proposed action presented in the project alternatives.

The cultural landscape resources in the APE were listed and organized by resource type, historical documentation, location and context, and tract number. The location of the resources was mapped according to the APE for each alternative. GIS overlays of vegetation and topography and viewshed analysis were also used in discerning the extent and type of potential effects and impacts (see cultural landscape resource tables in appendix J).

Because the NPS has elected to integrate its compliance with Section 106 of the NHPA into the NEPA process and documentation pursuant to 36 CFR § 800.8(c), the method for assessing impacts/effects on cultural landscapes is designed to comply with requirements of both NEPA and section 106 of NHPA, and with implementing regulations 40 CFR Part 1500 and 36 CFR Part 800, respectively, while considering the differences between NEPA and NHPA language. Impacts and effects on identified cultural landscapes were anticipated to be visual and physical and for the period of analysis of 15 years. Resource-specific context for assessing the significance of the impacts in accordance with NEPA and the CEQ regulations includes the following:

- Encompassing a river valley and the surrounding mountains and gazed down upon by millions of visitors from APPA and hundreds of other trails, the Delaware River Valley is a living ecosystem and an iconic representation of the human environment. This single large cultural landscape is made up of many individual cultural landscapes such that the context of cultural landscapes is larger than simply the individual cultural landscapes analyzed.
- DEWA was established to preserve past land uses and as a whole represents a cultural landscape, encompassing the Delaware River Valley with all of its architecture, history, pre-history, and traditions inextricably interwoven with the magnificent natural resources around which that culture was built.
- APPA is considered a cultural landscape because of its importance to the environmental and outdoor recreation movements and the visionary and volunteer efforts to create the Appalachian Trail.
- DEWA is also important to the past environmental movements due to Tocks Island Dam controversy. Many citizens were seriously aggrieved by the loss of their family homesteads through eminent domain. In the end, however, they asked that the valley be preserved for future

generations. Even today, many of the people who sacrificed the most for the creation of the park for the greater good still ask that it be retained for those higher purposes and never allowed to be denigrated for inappropriate uses.

- A contemporary aspect is the changing relationship of the park to the community around it where the community is increasingly integrating the park into their local community.

STUDY AREA

The designated APE for cultural landscapes is described in the “Historic Structures” section chapter 3.

CUMULATIVE IMPACTS COMMON TO ALL ALTERNATIVES

An assessment of cumulative impacts on cultural resources is required by both the CEQ and NHPA. Existing and anticipated future projects at DEWA, MDSR, and APPA were identified to determine the potential cumulative impacts. Past, present, and reasonably foreseeable activities that could have beneficial or adverse impacts on cultural landscapes in the parks and inside and outside the study area are listed in the following sections and discussed under each alternative as applicable.

Projects Inside the Study Area

Inside the study area, projects that could result in adverse cumulative impacts on cultural landscapes through the alteration of character-defining features of cultural landscapes include the following utility and road projects: the I-80 weigh station, PADOT SR 2001, the rehabilitation of road bridges throughout the parks in New Jersey and Pennsylvania, the repair of failing Watergate Dam #10, the Tennessee Gas Line Proposal, the Columbia Gas Transmission Company pipeline, the PJM Interconnection Proposal, the PPL Electric Utilities Northeast Pocono reliability project, the PPL proposal for a 138/12-kV substation, and existing utility towers within 5 miles. Other development projects that could have adverse effects on cultural landscapes include the hazardous structure demolition/deconstruction of 230 structures; Kittatinny Point Visitor Center; New Jersey Swim Beach (Turtle Beach); McDade Trail realignment; and illegal ORV use, vandalism, trespassing, arson, and encroachment. Other projects that could have adverse impacts include the issuance of special use permits related to visitor use, incidental business permits / commercial visitor services, the DEWA prescribed-burn program, and the DEWA hazard fuel reduction program. Illegal woodcutting could have an adverse impact on cultural landscapes. Projects that could have beneficial impacts on the character-defining features of cultural landscapes include the following: the repair of historic stone culverts on Mountain Road, the stabilization and repair of damaged structures, and the rehabilitation of Childs Park. These projects could preserve and/or rehabilitate significant landscape features inside the study area and protect these landscapes. Inside the study area, cumulative impacts could be adverse.

Projects Outside the Study Area

Outside the study area, projects include other developments that have the potential to adversely affect cultural landscapes, including the Tennessee Gas Line Proposal, the Columbia Gas Transmission Company pipeline, the PJM Interconnection Proposal, the PPL Electric Utilities Northeast Pocono reliability project, the PPL proposal for a 138/12-kV substation, and existing utility towers within 5 miles. Other utility and development projects that may have an adverse impact include the Federal Energy Regulatory Commission relicensing of Yards Creek Generating Station, Marcellus shale natural gas drilling, Blue Mountain Ski Resort wind turbines, wind turbines in northeastern Pennsylvania, PFBC natural gas leasing and water access programs, Fernwood Casino, and residential development. The Alpine Rose Racetrack could have an adverse impact on cultural landscapes. Projects outside the study

area that could have beneficial impacts on cultural landscapes include the following: the high-speed passenger train from northeast Pennsylvania to New York City, the New Jersey to Pennsylvania Lackawanna Passenger Rail cutoff, agricultural leases, Pike County agricultural security areas, and county and township open space and conservation plans. The overall cumulative impacts on cultural landscapes from these projects outside the study area could be adverse.

IMPACTS OF THE ALTERNATIVES ON CULTURAL LANDSCAPES

Common to All Alternatives

Mitigation Measures: Mitigation measures would reduce impacts on cultural landscapes from construction, operation, and maintenance activities for all action alternatives and are described in chapter 2 and appendix F.

Outside the Study Area: Outside the study area, regardless of which alternative is selected, the transmission line could pass through Carbon, Lackawanna, Luzerne, Monroe, Northampton, Pike, and Wayne counties in Pennsylvania and Morris, Sussex, and Warren counties in New Jersey. The clearing, construction, and vegetation maintenance activities outside the study area would be consistent with those described for inside the study area; however, the impacts outside the study area would be indirect. The direct impacts from the construction of the transmission line outside the study area cannot be determined, as described in the introduction of this chapter. Additionally, the specific resources that would be affected by the transmission line outside the study area cannot be identified until the route is chosen by the applicant.

Outside the study area, the S-R Line would pass through a variety of landscapes — some of which could be cultural landscapes — that have inherent National Register eligibility but are as yet undocumented. Under the no-action alternative, the existing B-K Line ROW may have affected cultural landscapes in the surrounding area (specifically in the Pocono environmental heritage region, the Delaware and Lehigh National Heritage Corridor, and the Lackawanna Heritage Valley state and national heritage region) since its construction in the 1920s and may continue to do so. Any impacts related to the existence of the existing transmission line would be adverse.

Outside the study area, the ROW width would be increased to 350 feet as it would be in the study area, with similar impacts. The transmission line would cross a variety of different types of publicly accessible protected areas, heritage areas, and historic resources. A wider ROW, taller structures, and additional access roads would have more impacts on identified or not yet identified or documented cultural landscapes both in heritage areas and outside heritage areas. Impacts could range from no noticeable change to the visual environment to areas where the ROW could cross a historic road corridor, trail, or district and/or cultural landscapes associated with farmsteads and villages. Impacts would be greatest if the ROW traverses a great distance through a heritage area such as the Pocono environmental heritage region, the Delaware and Lehigh National Heritage Corridor, or the Lackawanna Heritage Valley state and national heritage region. Adverse impacts would result from construction and from ongoing maintenance activities.

The effects of other projects could add to the impacts of the S-R-Line on cultural landscapes. Cumulative impacts on cultural landscapes outside the study area could be adverse, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the indirect adverse impacts on cultural landscapes as a result of activities outside the study area are combined with other past, present, and reasonably foreseeable projects in the study area, an overall adverse cumulative impact could be expected.

Alternative 1: No Action

The no-action alternative would involve no new construction or appreciable changes to current conditions. The existing corridor, galvanized steel tower structures, and conductors would continue to be visible from cultural landscapes in DEWA and would continue to cross documented cultural landscapes in DEWA. The existing corridor and structures cross APPA and would remain part of the viewshed from APPA.

The existing transmission alignment intrudes on historic viewsheds of cultural landscapes located in close proximity to the existing power line corridor. Vegetation along the ROW and trees and shrubs related to the specific historic sites have increased in size and density since the alignment was installed in the 1920s, partially mitigating the transmission line's visual intrusion into historic views. The size and scale of the existing alignment also disrupts character-defining features such as spatial organization and vegetation/open space patterns along historic road corridors, trail corridors, and historic districts. This is evident where the alignment crosses APPA and the Old Mine Road Historic District. Again, existing vegetation mitigates some of the visual disruption at these crossings. The existing transmission line is not visible from a large number of cultural landscapes identified in the study area because the viewing distance is so great that impacts would not be discernible or because vegetation and/or topographic features block potential views from the cultural landscape. In addition, the continued operation of the existing transmission line would require periodic maintenance, including the clearing of vegetation in the ROW. Access roads in the ROW would also require periodic maintenance to provide access for repairs and maintenance of the system. The systematic removal of existing vegetation would impact viewsheds from cultural landscapes to the utility corridor and towers. The vegetation currently provides some visual mitigation for impacts on cultural landscapes. The overall impact on cultural resources under alternative 1 would be adverse, but confined to the limits of the present ROW and would not change existing conditions.

Cumulative Impacts

Cumulative impacts on cultural landscapes from past, present, and reasonably foreseeable projects inside the study area would be adverse, as described previously in the "Cumulative Impacts Common to All Alternatives" section. When the impacts on cultural landscapes as a result of alternative 1 are combined with the other projects inside the study area, an overall adverse cumulative impact would be expected. Alternative 1 would not alter the level of impact.

Conclusion

Alternative 1, the no-action alternative, would result in the continued presence, operation, and maintenance of the existing transmission line route. The presence of the large towers and lines would diminish the integrity of setting, feeling, and association of numerous cultural landscapes. There would also be visual effects from the removal of vegetation during maintenance activities. Overall, alternative 1 would result in adverse impacts to cultural landscapes. The effects of past, present, and reasonably foreseeable projects, when combined with the impacts on cultural landscapes under alternative 1, would result in overall adverse cumulative impacts on cultural landscapes inside the study area.

The adverse impacts of alternative 1 would be confined to the limits of the present ROW and none of the adverse impacts would change existing conditions. After applying the Advisory Council criteria for adverse effects, the NPS determined that implementation of alternative 1 would result in a finding of no adverse effects to cultural landscapes. Therefore, the actions under alternative 1 would be in keeping with the parks' enabling legislations, NPS *Management Policies 2006*, and all other applicable federal and state laws. While there are adverse impacts associated with the continued operation and maintenance of

the B-K Line, the intensity of the adverse impacts in the context of cultural landscapes in the parks would not be considered significant.

Common to All Action Alternatives

Removal of Existing Structures: All action alternatives (2, 2b, 3, 4, and 5) would involve the removal of all or a portion of the B-K Line, as described in chapter 2. During the removal and disposal of existing structures, adverse visual and physical impacts on cultural landscapes would occur from grading activities, dust production, the removal of the crane pads and equipment at wire pulling sites, the disassembly and removal of lattice towers, the creation of access roads, and the transportation of construction equipment to and from the decommissioning sites. Similar impacts would occur related to the construction of the new facilities. Access roads and spur roads would require clearing and grading and would affect cultural landscapes in the immediate vicinity of the roads. After the completion of the transmission lines, access roads with gravel surfacing would continue to be maintained. Such actions would have adverse impacts on cultural landscapes in DEWA and on APPA.

Vegetation Clearing: The ROWs would be cleared of vegetation for the construction of the new double 500-kV transmission line for alternatives 2 through 5. Alternatives 2, 3, 4, and 5 include clearing up to 350 feet; the ROW would be extended up to 175 feet from either side of the centerline of the existing ROW.

Under alternative 2b, the applicant proposes to operate the S-R Line within the existing ROW. The NPS anticipates that the applicant would require additional area for construction; therefore, it is estimated that under alternative 2b, the applicant would expand the ROW to the extent of their deeded property rights, which ranges from 100 feet to 380 feet. For alternative 2b, the ROW would be cleared on either side of the centerline to an appropriate width based on the deeded property rights. Clearing would be complete for all action alternatives, with the exception of the 50-foot buffer near intermittent streams/wetlands and the 100-foot buffer near perennial waterways such as the Delaware River (PPL and PSE&G 2008, 7).

Section 106 Summary

Section 106 Findings of Effect are common to each of the action alternatives. NHPA section 106 regulations apply only to properties that meet the eligibility requirements of the National Register. Therefore, the assessment of NHPA section 106 effects applies only to those cultural landscapes that are listed on the National Register or those that meet National Register criteria for listing. NHPA section 106 effects are summarized by alternative in table 51. There are detailed assessments of effects under section 106 of the NHPA for each action alternative.

TABLE 51: SUMMARY OF NHPA SECTION 106 EFFECTS ON CULTURAL LANDSCAPES

Effect on Cultural Landscapes	Alternative				
	2	2b	3	4	5
<i>No adverse effect</i>	25	25	31	4	4
<i>Adverse effect</i>	18	18	6	4	4
Total resources listed or eligible	43	43	37	8	8

Alternative 2

The expansion and construction of new towers and the permanent loss of vegetation under alternative 2 would result in increased visual intrusion on cultural landscapes, as well as physical impacts, where the

ROW corridor crosses the cultural landscapes inside the study area. Under alternative 2, the expanded ROW would be maintained at an operational width of 200 feet, increasing the acreage of maintained scrub shrub habitat to approximately 129 acres.

Within the APE established for alternative 2, there are 64 cultural landscapes identified for impact/effect assessment. Of these 64 cultural landscapes, there are 43 either in the National Register or that meet National Register criteria for listing (see table 51). Assessment of effect for these 43 cultural landscapes was based on the criteria for adverse effect in 36 CFR Part 800, Protection of Historic Properties. It states that adverse effect is found when an undertaking may alter directly or indirectly any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects for alternative 2 would occur due to physical destruction or damage to property where the proposed power line alignment would cross the landscape parcels, trails, districts, or roads. The construction of the corridor and towers would introduce large visual elements that diminish viewshed integrity of cultural landscapes in close proximity and disrupt viewsheds from cultural landscapes located at greater distances from the power line corridor. Table J-1 in appendix J presents the cultural landscapes identified for assessment, as well as the National Register documentation and a summary of impacts (NEPA) and effects (NHPA) for alternative 2.

Section 106 Summary

The application of the Advisory Council criteria of adverse effects (36 CFR § 800.5, "Assessment of Adverse Effects") has not been fully completed; however, it is apparent that adverse effects would occur on cultural landscapes. At this time it has been determined that alternative 2 would have an adverse effect on 18 cultural landscapes within the APE. Alternative 2 would have no adverse effect on 25 cultural landscapes. The assessment of effect for cultural landscapes is ongoing as final design of the transmission line continues. See appendix M for a complete summary of the section 106 process for this final EIS.

Impact Assessment

There were 22 cultural landscapes in alternative 2 documented as ineligible or undetermined. Under NEPA guidelines, impacts to the majority of these landscapes would be negligible to minimal due to the distance from the cultural landscape to the utility line corridor, preventing any viewshed disruptions or visual intrusions. Three landscapes out of the 22 with ineligible or undetermined status would be significantly impacted due to the alignment of the corridor across the parcel or road.

There would be no substantial impacts for the landscapes found to have no adverse effects. For these cultural landscapes, distance, topography, and vegetation would preclude any visual intrusions.

The cultural landscapes determined to have adverse effects would be substantially impacted by the proposed corridor alignment and tower construction for alternative 2. These cultural landscapes are in close physical proximity to the powerline corridor, or the alignment would cross the landscape parcel, district, or trail. The alignment would cross the Appalachian Trail and the Old Mine Road Historic District and would be visible from many of the cultural landscapes. Alternative 2 would have substantial adverse impacts to cultural landscapes.

Cumulative Impacts

Cumulative impacts on cultural landscapes from past, present, and reasonably foreseeable projects inside the study area would be adverse, as described previously in the "Cumulative Impacts Common to All Alternatives" section. When the impacts on cultural landscapes as a result of alternative 2 are combined

with the other projects inside the study area, an overall adverse cumulative impact would be expected. Alternative 2 would not alter the level of impact.

Conclusion

Inside the study area, the implementation of alternative 2 would result in adverse impacts on cultural landscapes. The effects of past, present, and reasonably foreseeable projects, when combined with the impacts on cultural landscapes under alternative 2, would result in overall adverse cumulative impacts on cultural landscapes inside the study area.

Alternative 2 would alter character-defining features of cultural landscapes along the alignment with visual intrusion of taller towers and an expanded ROW, diminishing the overall integrity of some and substantially changing the character-defining features of others, including historic viewsheds, spatial organization, and cultural vegetation. There would be permanent adverse effects to the cultural landscapes because the study area of the transmission line is maintained as an existing non-conforming feature. These impacts would last for the life of the line.

Permitting the project would adversely affect multiple protected resources inside the parks, in some instances irreversibly. Allowing such adverse effects in order to facilitate private infrastructure expansion would be contrary to NPS practice and principle of protecting and improving these resources, and of removing incompatible infrastructure to do so. This could establish a precedent that may invite similar proposals by other applicants in the future, and create an expectation of like treatment for those proposals; it may make it difficult to deny such proposals. DEWA and APPA both contain numerous other utility crossings, which makes the risk of such precedent particularly concerning for these parks. Furthermore, as units of the national park system, wherein all parks are entitled to equal protection, creating such a precedent could have ramifications for parks nationwide. The location of this particular crossing through the center of DEWA could make such a precedent even more potent. Installing the S-R Line on this alignment may invite future utilities proposing to follow the same route.

Public attention surrounding this project is high. There is likely to be a high degree of controversy over any effects on park resources that are particularly popular with the public, such as scenery, visitor use and experience, rare and unique communities, cultural landscapes, and historic structures, for any of the alternatives. The inherent uncertain nature of predicting the true degree of some of these impacts would likely heighten this controversy. Additionally, construction at this particular location in DEWA is likely to accentuate the controversy due to the unique characteristics presented here and high visitor traffic to the area.

The applicant's project would impact portions of several resources inside the park that are also under pressure in the surrounding region. This project is one component of a larger regional plan by the RTO to enhance systems reliability. Other component projects of this plan have already affected, and would continue to affect APPA, especially in the areas of scenic resources and visitor use and experience, as well as other national parks in their paths. The overall experience of the APPA visitor would be degraded because this project would contribute cumulatively to the adverse impacts caused by the infrastructure projects along the entirety of the trail. Additionally, multiple types of development outside of DEWA and APPA are quickly diminishing several of the resources analyzed at a broader scale. The reduction of these resources in the region surrounding the parks increases the scarcity and sensitivity of them inside the parks where they are afforded special protection. Alternative 2 would contribute to the cumulative adverse impact on these resources.

After applying the Advisory Council criteria for adverse effects, the NPS determined that implementation of alternative 2 would have an adverse effect on cultural landscapes. The adverse effect would result from

the visual intrusion of the larger transmission line that cannot be effectively mitigated and would diminish the integrity of the setting, feeling, and association. These impacts would be further exacerbated by the scarcity of such resources in the highly developed east and the function of the national parks specifically to protect such resources. In the context of the purpose and significance for which DEWA, APPA, and MDSR were established and NPS mandates to specifically preserve the natural, cultural, and scenic resources within them, the adverse impacts of alternative 2 on cultural landscapes would likely be considered significant.

Alternative 2b

The APE for alternative 2b is the same as alternative 2 and both have the same alignment as described for alternative 2. The assessment of effects for alternative 2b would be the same as alternative 2. They both contain the same resources and have the same numbers of cultural landscapes with adverse effects and no adverse effects. Table J-2 in appendix J presents the cultural landscapes identified for assessment, as well as the National Register documentation and a summary of impacts (NEPA) and effects (NHPA) for alternative 2b.

Section 106 Summary

The application of the Advisory Council criteria of adverse effects (36 CFR § 800.5, “Assessment of Adverse Effects”) has not been fully completed; however, it is apparent that adverse effects would occur on cultural landscapes. At this time it has been determined that alternative 2b would have an adverse effect on 18 cultural landscapes within the APE. Alternative 2b would have no adverse effect on 25 cultural landscapes. The assessment of effect for cultural landscapes is ongoing as final design of the transmission line continues. See appendix M for a complete summary of the section 106 process for this final EIS.

Impact Assessment

Alternative 2b would follow the same alignment as described for alternative 2. However, due to the differences in the alternatives (two additional towers), the impacts on cultural landscapes differ for alternative 2b.

Under NEPA guidelines, three landscapes along alternative 2b could be substantially impacted due to the alignment of the corridor across the parcel or road. The remainder of these landscapes would have negligible or minimal impacts due to distance from the landscape to the corridor, preventing any viewshed or visual disruptions. Most are too far away from the corridor to be impacted.

There would be no significant impacts for the landscapes found to have no adverse effects. In a few cases, the cultural landscapes would be visually impacted to a greater extent than in alternative 2 due to the additional towers in 2b. These would be moderate impacts but not substantial.

Of the cultural landscapes that would have adverse effects, all would be substantially impacted by the proposed corridor alignment and tower construction for alternative 2b. These cultural landscapes are in close physical proximity to the powerline corridor, or the alignment would cross the landscape parcel, district, or trail. The alignment would cross the Appalachian Trail and the Old Mine Road Historic District and would be visible from many of the cultural landscapes. Alternative 2b would have substantial adverse impacts to cultural landscapes.

Cumulative Impacts

Cumulative impacts on cultural landscapes from past, present, and reasonably foreseeable projects inside the study area would be adverse, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the impacts on cultural landscapes as a result of alternative 2b are combined with the other projects inside the study area, an overall adverse cumulative impact would be expected. Alternative 2b would not alter the level of impact.

Conclusion

Inside the study area, implementation of alternative 2b would result in adverse impacts on cultural resources. When considered with the effects of other past, present, and reasonably foreseeable projects inside the study area, the overall cumulative impacts from alternative 2b would be adverse.

For the same reasons outlined for alternative 2, alternative 2b would likely have significant adverse impacts on cultural landscapes. Public attention surrounding this project is high. There is likely to be a high degree of controversy over any effects on park resources that are particularly popular with the public, such as scenery, visitor use and experience, rare and unique communities, cultural landscapes, and historic structures, for any of the alternatives. The inherent uncertain nature of predicting the true degree of some of these impacts would likely heighten this controversy. Additionally, construction at this particular location in DEWA is likely to accentuate the controversy due to the unique characteristics presented here and high visitor traffic to the area.

Alternative 2b would contribute to the cumulative adverse impacts of intrusions into cultural landscapes and the reduction of these resources in the region surrounding the parks and increases the scarcity and sensitivity of them inside the parks where they are afforded special protection. As stated for alternative 2, permitting this project would reverse the trend of preserving resources by removing non-conforming features and it may establish precedence for future actions. The construction of a transmission line with taller towers would adversely impact the cultural landscapes within the parks, which is counter to their enabling legislation and mandates. Although impacts to cultural landscapes would be less under alternative 2b than under alternative 2, the integrity of the cultural landscapes would be jeopardized. Therefore, in the context of the purpose and significance of the national parks and NPS policies for protection and management of cultural landscapes, these adverse impacts would be considered significant.

Alternative 3

Within the APE established for alternative 3, there are 57 cultural landscapes identified for impact/effect assessment. Of these 57 cultural landscapes, 37 are either on the National Register or meet National Register criteria for listing (see table 51). Assessment of effect for these 37 cultural landscapes was based on the criteria for adverse effect in 36 CFR Part 800, “Protection of Historic Properties.” It states that adverse effect is found when an undertaking may alter directly or indirectly any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association. Adverse effects for alternative 2 would occur due to physical destruction or damage to property where the proposed power line alignment crosses the landscape parcels, trails, districts, or roads. The construction of the corridor and towers would introduce large visual elements that diminish viewshed integrity of cultural landscapes in close proximity and disrupt viewsheds from cultural landscapes located at greater distances from the power line corridor. See table J3 in appendix J for a summary of assessment of effects for alternative 3. Table J-3 in appendix J presents the cultural landscapes identified for assessment for alternative 3, as well as the National Register documentation and a summary of impacts (NEPA) and effects (NHPA).

Section 106 Summary

The application of the Advisory Council criteria of adverse effects (36 CFR § 800.5, “Assessment of Adverse Effects”) has not been fully completed; however, it is apparent that adverse effects would occur on cultural landscapes. At this time it has been determined that alternative 3 would have an adverse effect on 6 cultural landscapes within the APE. Alternative 3 would have no adverse effect on 31 cultural landscapes. The assessment of effect for cultural landscapes is ongoing as final design of the transmission line continues. See appendix M for a complete summary of the section 106 process for this final EIS.

Impact Assessment

There were 20 cultural landscapes in alternative 3 documented as ineligible or undetermined. Under NEPA guidelines, impacts to the majority of these landscapes would be negligible to minimal due to the distance from the cultural landscape to the utility line corridor, preventing any viewshed disruptions or visual intrusions. One landscape out of the 20 with ineligible or undetermined status would be significantly impacted due to the alignment of the corridor across the road.

There would be no substantial impacts for the landscapes found to have no adverse effects. For these cultural landscapes, distance, topography, and vegetation would preclude any visual intrusions.

The cultural landscapes determined to have adverse effects would be substantially impacted by the proposed corridor alignment and tower construction for alternative 3. These cultural landscapes are in close physical proximity to the powerline corridor, or the alignment would cross the landscape parcel, district, or trail. The alignment would cross the Appalachian Trail and would be visible from many of the cultural landscapes. Alternative 3 would have substantial adverse impacts to cultural landscapes.

Cumulative Impacts

Cumulative impacts on cultural landscapes from past, present, and reasonably foreseeable projects inside the study area would be adverse, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the impacts on cultural landscapes as a result of alternative 3 are combined with the other projects inside the study area, an overall adverse cumulative impact would be expected. Alternative 3 would not alter the level of impact.

Conclusion

Inside the study area, the implementation of alternative 3 would result in adverse impacts on cultural landscapes. When the impacts on cultural landscapes as a result of alternative 3 are combined with other projects inside the study area, an overall adverse cumulative impact would be expected.

After applying the Advisory Council criteria for adverse effects, the NPS determined that implementation of alternative 3 would have an adverse effect on cultural landscapes. The adverse effect on cultural landscapes would result from alteration of character-defining features, such as disassociation of road and trail corridors from their vernacular surroundings that would diminish the overall integrity of the cultural landscape.

Like the other action alternatives, alternative 3 has potential for significant impacts associated with the precedent set by permitting a proposed transmission line that would adversely affect multiple protected resources inside the parks. The results of this action would be contrary to NPS practice and principle of protecting and improving these resources and would potentially establish a precedent that may invite similar proposals by others and make it difficult for the NPS to deny such proposals. Public attention

surrounding this project is high. There is likely to be a high degree of controversy over any effects on park resources that are particularly popular with the public, such as scenery, visitor use and experience, rare and unique communities, cultural landscapes, and historic structures, for any of the alternatives. The inherent uncertain nature of predicting the true degree of some of these impacts would likely heighten this controversy.

For the same reasons outlined for alternatives 2 and 2b, the adverse impacts of alternative 3 on cultural landscapes would also likely be considered significant.

Alternative 4

Within the APE established for alternatives 4 and 5 there are 17 cultural landscapes identified for assessment. Of these 17 cultural landscapes, 8 are either on the National Register or meet National Register criteria for listing (see table 51). Assessment of effect for these 8 cultural landscapes was based on the criteria for adverse effect in 36 CFR Part 800, “Protection of Historic Properties.” It states that adverse effect is found when an undertaking may alter directly or indirectly any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association. Adverse effects for alternative 4 would occur due to physical destruction or damage to property where the proposed power line alignment would cross the landscape parcels, trails, districts, or roads. The construction of the corridor and towers would introduce large visual elements that diminish viewshed integrity of cultural landscapes in close proximity and would disrupt viewsheds from cultural landscapes located at greater distances from the power line corridor. See table J4 in appendix J for a summary of assessment of effects for alternative 4. Table J-4 in appendix J presents the cultural landscapes identified for assessment for alternative 4, as well as the National Register documentation and a summary of impacts (NEPA) and effects (NHPA).

Section 106 Summary

The application of the Advisory Council criteria of adverse effects (36 CFR § 800.5, “Assessment of Adverse Effects”) has not been fully completed; however, it is apparent that adverse effects would occur on cultural landscapes. At this time it has been determined that alternative 4 would have an adverse effect on 4 cultural landscapes within the APE. Alternative 4 would have no adverse effect on 4 cultural landscapes. The assessment of effect for cultural landscapes is ongoing as final design of the transmission line continues. See appendix M for a complete summary of the section 106 process for this final EIS.

Impact Assessment

There were nine cultural landscapes in alternative 4 documented as ineligible or undetermined. Under NEPA guidelines, impacts to the majority of these landscapes would be negligible to minimal due to the distance from the cultural landscape to the utility line corridor, preventing any viewshed disruptions or visual intrusions. Two landscapes out of the nine with ineligible or undetermined status would be moderately impacted due to proximity of the alignment to the cultural landscape.

There would be no substantial impacts for the landscapes found to have no adverse effects. For these cultural landscapes, distance, topography, and vegetation would preclude any visual intrusions.

The cultural landscapes determined to have adverse effects would be substantially impacted by the proposed corridor alignment and tower construction for alternative 4. These cultural landscapes are in close physical proximity to the powerline corridor, or the alignment would cross the resource. The

alignment would cross the Appalachian Trail and would be visible from many of the cultural landscapes. Alternative 4 would have substantial adverse impacts to cultural landscapes.

Cumulative Impacts

Cumulative impacts on cultural landscapes from past, present, and reasonably foreseeable projects inside the study area would be adverse, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the impacts on cultural landscapes as a result of alternative 4 are combined with the other projects inside the study area, an overall adverse cumulative impact would be expected. Alternative 4 would not alter the level of impact.

Conclusion

Inside the study area, the implementation of alternative 4 would result in adverse impacts on cultural landscapes. When the impacts on cultural landscapes as a result of alternative 4 are combined with other projects inside the study area, an overall adverse cumulative impact would be expected.

For the same reasons outlined for alternatives 2, 2b, and 3, alternative 4 would likely have significant adverse impacts on cultural landscapes. Although fewer cultural landscapes would be substantially altered than under alternatives 2, 2b, and 3, alternative 4 would still be a non-conforming feature within DEWA and APPA cultural landscapes.

Alternative 4 would contribute to the cumulative adverse impacts of intrusions into cultural landscapes and the reduction of these resources in the region surrounding the parks would increase their scarcity and sensitivity inside the parks where they are afforded special protection. The applicant’s project is one component of a larger regional plan by the RTO to enhance systems reliability. Other component projects of this plan have already and would continue to affect APPA, as well as other national parks in their paths. The construction of a transmission line with taller towers would adversely impact the cultural landscapes within the parks, which is counter to their enabling legislation and mandates. As with the other action alternatives, alternative 4 may establish precedent for future actions because it reverses the trend of improving visitor experience and scenic values by removing non-conforming features. Thus, the NPS believes that alternative 4 would result in significant adverse impacts to cultural landscapes.

Public attention surrounding this project is high. There is likely to be a high degree of controversy over any effects on park resources that are particularly popular with the public, such as scenery, visitor use and experience, rare and unique communities, cultural landscapes, and historic structures, for any of the alternatives. The inherent uncertain nature of predicting the true degree of some of these impacts would likely heighten this controversy.

After applying the Advisory Council criteria for adverse effects, the NPS has concluded that implementation of alternative 4 would have an adverse effect on cultural landscapes as a result of visual impacts from the towers and ROW clearing and physical impacts from access roads.

Alternative 5

Alternative 5 would follow the same alignment as alternative 4 with the exception of the portion of the B-K Line from the Bushkill Substation to the western boundary of DEWA. Assessment of effects for alternative 5 would be same as for alternative 4. Table J-4 in appendix J presents the cultural landscapes identified for assessment for alternative 5, as well as the National Register documentation and a summary of impacts (NEPA) and effects (NHPA).

Section 106 Summary

The application of the Advisory Council criteria of adverse effects (36 CFR § 800.5, “Assessment of Adverse Effects”) has not been fully completed; however, it is apparent that adverse effects would occur on cultural landscapes. At this time it has been determined that alternative 5 would have an adverse effect on 4 cultural landscapes within the APE. Alternative 5 would have no adverse effect on 4 cultural landscapes. The assessment of effect for cultural landscapes is ongoing as final design of the transmission line continues. See appendix M for a complete summary of the section 106 process for this final EIS.

Impact Assessment

Impact assessment for alternative 5 would be the same as alternative 4.

Cumulative Impacts

Cumulative impacts on cultural landscapes from past, present, and reasonably foreseeable projects inside the study area would be adverse, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the impacts on cultural landscapes as a result of alternative 5 are combined with other projects inside the study area, an overall adverse cumulative impact would be expected. Alternative 5 would not alter the level of impact.

Conclusion

Inside the study area, the implementation of alternative 5 would result in adverse impacts on cultural landscapes. When the adverse impacts on cultural landscapes as a result of alternative 5 are combined with other projects inside the study area, an overall adverse cumulative impact would be expected.

As with the other action alternatives, alternative 5 has potential for significant adverse impacts associated with the precedent set by permitting a proposed transmission line that would adversely affect multiple protected resources inside the parks, contrary to NPS practice and principle of protecting and improving these resources and potentially establishing a precedent that may invite similar proposals by others and make it difficult for the NPS to deny such proposals.

Public attention surrounding this project is high. There is likely to be a high degree of controversy over any effects on park resources that are particularly popular with the public, such as scenery, visitor use and experience, rare and unique communities, cultural landscapes, and historic structures, for any of the alternatives. The inherent uncertain nature of predicting the true degree of some of these impacts would likely heighten this controversy. As previously noted, DEWA and APPA contain numerous other utility crossings, which makes the risk of such precedent particularly concerning for these parks and which could have ramifications for parks nationwide. Alternative 5 would persist as a non-conforming feature in the parks landscape and would remain for the life of the line. For the same reasons outlined for alternative 4, the adverse impacts of alternative 5 would likely be considered significant.

SOCIOECONOMICS

This section evaluates the potential impacts of each alternative on the social and economic elements of the communities near the study area. Values of the social environment mainly include quality of life, while economic values include economic benefits or losses to local communities. Impacts were determined by considering the effect of the existing conditions and the proposed construction and operation of the transmission lines on the overall socioeconomic conditions in the area.

METHODOLOGIES

Impacts were evaluated using the process described in the “General Methodology for Measuring Impacts by Resource” section at the introduction of chapter 4. Impacts were determined by considering the effect of the existing conditions and the proposed construction and operation of the transmission lines on the communities and populations that could be affected by the proposed actions. Impacts related to changes in visitor use as a result of the proposed alternatives were considered in relation to the local economy. Impacts on businesses that provide services to visitors, such as canoe liveries, lodging and food facilities, and others were evaluated qualitatively. No statistical or other quantitative analysis was completed during the course of this socioeconomic impact analysis. Because no measurable difference is expected among the action alternatives, impacts are analyzed collectively under “Common to All Action Alternatives,” rather than individually.

Perceptions based on aesthetics and/or safety concerns related to high-voltage transmission lines can affect where people live and work, which can shift populations and affect socioeconomics. Literature assessing the impacts of high-voltage transmission lines on property values was used to estimate how these perceptions could affect development patterns. This literature generally concludes that high-voltage transmission lines do have an effect on property value (Hamilton and Schwann 1995). For example, the obstruction of favored views or the presence of structures in a natural environment may decrease selling price (Furby et al. 1988). Properties adjacent to or within approximately 500 to 650 feet of the transmission line experience the most impact (Hamilton and Schwann 1995; Des Rosiers 2002). Neither the height of the transmission structures nor the voltage of the lines was found to have a significant impact on property values (Hamilton and Schwann 1995).

Conversely, in some studies a small beneficial impact was found associated with a transmission line ROW that provides access to recreational use, is attractively landscaped, or provides added privacy to adjacent properties. However, the literature notes that the value of this “greenspace” “should not be overrated” (Hamilton and Schwann 1995). Being adjacent to an easement can increase value from 7% to 22% only where proximity advantages (enlarged visual field, increased intimacy) exceed drawbacks. Nonadjacent but visually exposed properties can experience higher property values due to improved visual clearance (Des Rosiers 2002).

Transmission lines can affect farm operations and increase costs for farm operators, depending on the transmission line design and type of farming. Transmission lines can affect field operations, irrigation, aerial spraying, windbreaks, and future land development. According to the Public Service Commission of Wisconsin (2010), tower placement in farm fields can

- create problems for turning field machinery and maintaining efficient fieldwork patterns
- create opportunities for weed encroachment
- compact soils and damage drain tiles
- result in safety hazards due to pole and guy-wire placement
- hinder or prevent aerial activities by planes or helicopters
- interfere with moving irrigation equipment
- hinder future consolidation of farm fields or subdividing land for residential development

Some studies of agricultural land indicate that per acre values near transmission lines can be 16% to 29% lower than properties without easements. The negative effects of proximity were largest with smaller properties (Furby et al. 1988).

Resource-specific context for assessing impacts to socioeconomics includes

- the values of the local social environment; primarily quality of life
- economy of the local communities surrounding the parks and local economic values, including economic benefits and losses to the local communities

STUDY AREA

Because socioeconomics primarily pertains to effects outside NPS boundaries, the study area for socioeconomics includes landowners owning in-holdings in DEWA and the counties and townships that are immediately adjacent to the proposed alternatives. Pennsylvania counties in the area of effect include Pike, Monroe, and Northampton. New Jersey counties include Sussex and Warren. Figure 47 shows counties and townships intersected by each alternative.

CUMULATIVE IMPACTS COMMON TO ALL ALTERNATIVES

Appendix H provides a list of past, present, and reasonably foreseeable activities that would have beneficial or adverse impacts on socioeconomics inside and outside the study area. These projects are summarized below, with anticipated impacts identified in the following subsections. The impacts associated with these projects were analyzed in conjunction with the impacts expected for the no-action and action alternatives.

Projects Inside the Study Area

Inside the study area, cumulative projects that would have adverse and beneficial impacts on socioeconomics include the following road projects: Smooth Ride Initiatives, Old Mine Road South rehabilitation, Delaware River bridge projects, US Route 209 – Raymondskill Creek Bridge rehabilitation, the PADOT SR 2001 road project, and the Marshalls Creek traffic relief project. These projects would result in a beneficial impact on local socioeconomics through improved access to the parks and adjacent businesses after the projects are completed. Overall, cumulative projects inside the study area would result in a beneficial impact on socioeconomics.

Projects Outside the Study Area

Outside the study area, cumulative projects that could affect socioeconomics include proposed residential and commercial developments in New Jersey and Pennsylvania, Susquehanna Nuclear Reactor upgrades, the high-speed passenger train from northeast Pennsylvania to New York City, the New Jersey to Pennsylvania Lackawanna Passenger Rail Cutoff, Marcellus shale natural gas drilling, and the proposed Fernwood Casino. These projects would have beneficial impacts from the increased benefit to the regional economy and tourism and increased workforce demand, as well as improved commuting options, increased property values, and additional tax revenue for local governments, who could expand community services. Cumulative projects outside the study area would result in beneficial socioeconomic impacts.

IMPACTS OF THE ALTERNATIVES ON SOCIOECONOMICS

Common to All Alternatives

Outside the Study Area: The direct impacts from construction and maintenance of the line outside the study area cannot be determined, as described in the introduction of this chapter. In addition, specific

impacts outside the study area cannot be identified until the route is chosen by the applicant. However, it is anticipated that the proposed transmission line would pass through populated areas outside the study area where residential and business displacements may occur to accommodate ROW widening. It is assumed that sales tax-generating businesses displaced by ROW widening could be relocated locally and their displacement would not represent a permanent loss in sales tax revenue for state and local jurisdictions. Outside the study area and in urban areas, it is assumed that the applicant would use the existing road system and no new access roads would be required, resulting in no socioeconomic impacts.

Businesses that cater to visitors would experience adverse economic impacts from potential changes in visitation. Impacts caused by changes in visitor spending on counties in the study area cannot be accurately determined, although Monroe and Pike counties rely the most heavily on tourism revenue. Potential impacts on property values would be highly variable and based on distance from the transmission line. No impacts on population growth or migration would occur due to the construction of the S-R Line. Impacts on agricultural revenue and operations would also occur. Construction-related employment and local revenue generation would have a positive socioeconomic impact, while negative effects may occur during construction due to increased noise, dust, light, and glare; displacement of residences and businesses; and decreased recreation, business, and agricultural revenues. Cumulative impacts outside the study area would result in beneficial impacts on socioeconomics as described previously in the “Cumulative Impacts” section. When the impacts on socioeconomic resources as a result of activities outside the study area are combined with other past, present, and reasonably foreseeable projects in the study area, an overall beneficial cumulative impact would be expected.

Alternative 1: No Action

Under the no-action alternative, there would be no changes to tourism revenue. Property value increases or decreases have likely already occurred because the transmission line has been in place for many decades. Neighborhoods have developed around and in response to the existing transmission line. There would be no changes to agricultural land as a result of implementing alternative 1. As a result, alternative 1 would result in no impacts on the local and regional workforce, local businesses, residents, farmers, or property values inside the study area.

Cumulative Impacts

Cumulative projects inside the study area would result in an overall beneficial impact on socioeconomics, as described previously in the “Cumulative Impacts Common to All Alternatives” section. The no-action alternative would have no impacts on socioeconomic conditions. Therefore, there would be no cumulative impacts associated with alternative 1.

Conclusion

Alternative 1 would have no socioeconomic impacts compared to existing conditions and therefore no cumulative impacts. Because alternative 1 would have no socioeconomic impacts, there would be no potential for significant impacts.

Common to All Action Alternatives

Mitigation Measures: Mitigation measures would be implemented to reduce impacts on socioeconomics and are taken into consideration in the impact analysis. Mitigation measures are described in appendix F.

The impact analysis for socioeconomics addresses all alternatives under “Common to All Action Alternatives” to reduce repetition. There are few socioeconomic differences between the alternatives, so the analysis discusses them together and highlights their differences where appropriate.

As noted in chapter 3, visitor spending steadily declined from 2006 to 2009, with a substantial increase of 37% in 2010 over 2009 despite relatively steady visitation. Therefore, the adverse economic impact resulting from potential changes to visitation under the action alternatives cannot be accurately estimated. Some visitors may not be deterred by the new transmission line crossing the river; some may prefer to recreate elsewhere. Although overall visitation to DEWA is expected to increase, future levels of participation in guided river trips and other recreation services are unknown. Adverse economic impacts on river recreation providers, as well as other companies that serve visitors (e.g., food and lodging establishments), could be greater for alternatives 2, 2b, and 3, which would cross the Delaware River within DEWA, as compared to alternatives 4 and 5, which would cross the river south of DEWA and the Delaware Water Gap, a popular takeout location (e.g., many river trips end at the Kittatinny Point Visitor Center). Increased adverse impacts from alternatives 2 and 2b would also occur as a result of fewer campsites at Hamilton River campsites. This would reduce the number of campsites at a very popular river camping location, forcing visitors to camp elsewhere, possibly affecting the number of visitors and trips liveries could provide.

Stringing transmission line wires across the Delaware River would take approximately one day during the eight month construction period. The river would be closed to recreation service providers during that one day period, which may affect multiday river trips as well. However, if visitors using privately owned boats were unaware of the closure, they might leave and recreate elsewhere, or return home. Local service providers, such as food and lodging establishments, would experience impacts based on the loss of business during the closure.

One local outfitter provides guided tours of APPA. Adverse impacts on views from the trail could diminish visitors’ experience. However, the majority of visitors would continue to participate in this activity with the service provider. Under alternative 3, the transmission line would parallel APPA for 2.5 miles, creating an adverse visual effect. If the local outfitter used this section, impacts would occur if visitors chose to avoid the area. Impacts on this particular supplier would be measurable, but impacts on overall economic activity and employment in the study area would be slight.

As noted in chapter 3, Pike County’s leading industry is tourism, and the county has a goal to retain tourism as a major component of economic development. Similarly, Monroe County has the third largest tourist economy in Pennsylvania and supports the third largest labor force in tourist-related expenditures. Tourism in Pennsylvania’s Northampton County does not play a measurable role in the county’s economy. Therefore, in Pennsylvania, Pike County would be the most affected by changes to visitation under alternatives 2 through 4, and Monroe County would also be affected under all action alternatives. Because it is difficult to identify precise reasons why visitor spending has been declining since 2006, the magnitude of the economic impact on these counties from implementation of the action alternatives cannot be accurately determined.

Although recreation and tourism are considered the backbone of Sussex County, New Jersey, only 7% to 11% of the county’s revenue is generated by tourism, and 60% of the county’s workforce travels outside the county for employment. Wages associated with tourism have prevented the tourism sector from becoming the foundation of Sussex County’s economy. Warren County, New Jersey, employs the smallest percentage of people in the sales and service industry in the study area and the county sees little potential of generating family wage jobs and increasing the tax base through tourism expenditures. The action alternatives would not likely have a measurable effect on the affected counties in New Jersey given the small role tourism plays in their overall economy.

Potential indirect impacts on residential property values would be highly variable and are not readily predictable. Residential property values may decrease for those residences directly adjacent to the ROW that do not experience proximity advantages, such as enlarged visual field and increased intimacy. No residences currently exist adjacent to the alternative alignments in DEWA. A few homes are located along the alternative 4 and 5 alignments in and adjacent to Cherry Valley NWR. Some residences might experience property value increases if proximity advantages apply. Impacts would vary based on current market value. However, property value increases or decreases may have already occurred because a transmission line is already in place. Because the literature notes that neither the height of the structures nor the voltage of the lines have been found to have a substantial impact on property values, measurable changes to property values due to height and voltage changes are not expected. Impacts related to the expansion of the ROW would be more likely. However, increased tower height may mean that some properties that currently have no view of the existing towers may have views of the new taller towers.

Inside the study area, the alternative alignments would follow an existing utility corridor and transmission line or transportation corridor and traverse forested areas that contain few existing residential and commercial structures. Inside the study area no businesses would require removal and/or relocation. However, a small number of residential displacements may occur for alternatives 2 and 2b in Lehman, Hardwick, and Stillwater townships. Some additional residential displacements may occur for alternatives 3 and 4 in Smithfield, Middle Smithfield, and Blairstown townships. The alternative 5 alignment would parallel or traverse more highly urbanized areas in Monroe County, Pennsylvania, and Morris County, New Jersey, where the potential for displacements and impacts on adjacent communities would be the greatest. Alternatives 4 and 5 would require a ROW from one private inholding in DEWA near Totts Gap Road, but would not result in a commercial or residential displacement. It is assumed that construction staging areas and the locations of new access roads would be selected to avoid existing residences and structures, and that no displacements or relocations would be required.

The initial displacement of residences and businesses would affect a small sector of the local and regional population resulting in adverse impacts. These impacts are expected to occur during ROW land acquisition leading up to the eight-month construction period. The applicant would provide financial compensation to private property owners when acquiring an easement resulting from the widened ROW, under the authority granted by the states' public utility commissions. The usual measure required is payment of fair market value, as determined by agreement between the parties or an independent appraisal, for the property acquired. Upon issuance of the negotiated financial compensation, it is anticipated that property owners would purchase replacement property and relocate their homes and businesses within two years of completion of the project. Throughout the remaining period of analysis, slight impacts on residences, businesses, sales tax revenue, and neighborhood cohesion would occur.

The presence of a high-voltage transmission line could affect where people live based on visual and noise impacts or their perceptions and beliefs about potential health impacts (see the "Health and Human Safety" section). As a result, people may move away from or avoid housing and communities near a transmission line, resulting in potential socioeconomic impacts on the immediate area. The alternative alignments would be located along an existing utility corridor and transmission line or transportation corridor around which communities have developed. Little to no population migration would occur as a result of upgrading to a high-voltage transmission line.

The proposed alternatives would not encourage population growth inside or outside the study area; instead, the alternatives would be a response to growth already occurring and projected to occur in the region. The resident population in communities surrounding DEWA is expected to continue to increase by as much as 50% by 2020. The implementation of the action alternatives is not expected to affect this growth. No impacts on population growth or employment trends would occur under any of the action alternatives throughout the period of analysis.

All action alternatives parallel or traverse agricultural lands inside and outside the study area, including leased agricultural lands in DEWA. Although the ROW would be widened through these lands, the agricultural use of these lands would not necessarily be precluded. If towers are placed in farm fields, the action alternatives could increase costs for farm operators and decrease property values compared to adjacent properties without transmission line ROWs (see “Methodologies” in this section). Counties in the study area have already experienced the loss of agricultural land in recent years, in part related to the rising costs of farm operations, and have goals to protect farmland. Increased costs and decreased property values could further affect agricultural operations in a small sector of the local and regional economy throughout the period of analysis. The alternative 2, 2b, and 3 alignments could result in tower placement in leased agricultural land in DEWA, resulting in decreased revenue for the park. The intensity of the potential adverse impact on agricultural revenue and operations would vary depending on the quantity of farmland affected by each of the action alternatives.

Construction activities common to all action alternatives could cause major increases in noise levels, generate fugitive dust and odors, and generate glare, temporarily affecting residents, businesses, and business patrons and employees inside and outside the study area. Construction work is scheduled to occur throughout most of the daytime hours (12 hours a day), six days a week, for up to eight months. As documented in the “Soundscapes” section of this EIS, noise levels during construction could increase by more than 13 dBA in areas 3,200 feet from the alignment and 5 dBA for areas 6,400 feet from the alignment. Actual noise levels and quantities of dust and glare would depend on the type, amount, and location of construction activities. Construction work would be localized primarily at tower locations, wire pull sites, and staging areas and would progressively move along the alignment. Therefore, no residences or businesses would experience increased levels of noise, dust, light, and glare for the full eight-month construction period. Construction activities outside DEWA would also conform to local noise ordinances, which may restrict the type and duration of construction noise. Existing businesses immediately adjacent to the alternative alignments inside the study area are identified in table 52. Potential construction-related adverse impacts may include decreased business patronage, especially for businesses with outdoor venues, and changes in the timing and frequency of outdoor social activities.

TABLE 52: BUSINESSES ADJACENT TO THE ACTION ALTERNATIVES WITHIN THE STUDY AREA

Alternative	Business Name	Location
Alternatives 2, 2b	Fernwood Hotel, Golf Course and Resort; Petrizzo's Restaurant	Middle Smithfield Township
Alternative 3	Fernwood Hotel, Golf Course and Resort; Petrizzo's Restaurant; Great Bear Golf and Country Club	Middle Smithfield Township
Alternative 4	Fernwood Hotel, Golf Course and Resort; Petrizzo's Restaurant; Great Bear Golf and Country Club; KOA Campground; Cherry Valley Golf Course; retail and commercial developments surrounding the intersection of SR 209 and Municipal Drive	Middle Smithfield and Stroud townships
Alternative 5	Cherry Valley Golf Course; large commercial developments along I-80	Stroud, Hamilton, Stroudsburg, and East Stroudsburg townships

Local companies and residents may be employed during the decommissioning of the B-K Line and the construction of the new transmission line, resulting in slight temporary economic benefits. Construction employment that would occur over the eight-month period would include skilled or semiskilled positions, such as line workers, welders, heavy equipment operators, surveyors, engineers, utility equipment workers, truck drivers, warehouse workers, and laborers. As indicated in chapter 2, the workforce necessary for construction is expected to range from approximately 20 to 120 personnel, with an estimated average daily workforce of 50 personnel. A small number of new workers may also be required

to monitor the newly constructed transmission line ROW for any illegal use and also for resource management throughout the period of analysis. A small proportion of these construction-related and maintenance personnel could be hired locally, resulting in slight beneficial employment impacts. However, it is anticipated that skilled positions would not be filled locally.

The relatively small additions to the construction workforce are not expected to result in a permanent increase in population, employment, or spending in the region. However, the eight-month construction period would temporarily increase overall economic activity, resulting in secondary beneficial economic impacts on local and regional economies. The funds spent directly on the project locally would have multiplier effects throughout the regional economy. Indirect jobs may be created by construction activity, such as material suppliers to construction workers and off-site construction-related workers such as administrative, clerical, and managerial workers. Many construction materials, including the transmission towers and conductors, would likely be purchased outside the study area. Other materials, such as concrete, gravel, and culverts, could be purchased locally. Some local revenues would also be generated through lodging or campground rental fees and through the purchase of meals, etc., for construction workers. Local purchases would result in small increases in local tax revenues, but these generally would not be measurable. Economic impacts would be beneficial.

The removal of existing towers and construction of new towers would likely require construction equipment to traverse agricultural land. This could temporarily restrict crop production or potentially damage crops if activities occurred during the growing season. The restriction of crop production or damage to crops could potentially decrease revenues for agricultural landowners whose crops would be affected. Construction-related adverse impacts on agricultural lands would occur if crop production was decreased or crops were damaged.

All action alternatives would cross DEWA and/or state game lands in Pennsylvania and New Jersey that accommodate hunting and other recreational activities that stimulate the local and regional economy. Construction activity would require restricted public access in some of these areas. These restrictions would be temporary and localized to the immediate construction area; hunting and other recreational activities could continue in unrestricted areas of the park and state game lands. Therefore, temporary changes in visitation patterns for hunting and other forms of recreation, and the resulting effects on tourism revenue for local service providers, are unknown. Prospective visitors could choose to cancel hunting or other recreational trips altogether or could simply choose to hunt or recreate in an alternative location in the park or in state game lands. Normal hunting and recreational activities are expected to resume after construction is completed. The potential impact on the local and regional economy would therefore be limited to the eight-month construction period, and cannot be determined. It is recommended that construction activities be scheduled to avoid peak hunting and recreational seasons in DEWA and other state game lands, if possible.

Cumulative Impacts

Cumulative projects inside the study area would result in an overall beneficial impact on socioeconomics, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the impacts associated with the action alternatives are combined with other past, present, and reasonably foreseeable projects in the study area, an overall beneficial cumulative socioeconomic impact would be expected. None of the action alternatives would alter the level of impact.

Conclusion

Overall, adverse impacts to the local and regional economy from impacts to recreation would occur, with slight indirect effects on residential property values. Adverse impacts are expected on residential property

and business owners from possible displacement. Adverse impacts on agricultural revenue and operations would occur related to farm operations. Adverse impacts would occur to service providers during construction closures. Beneficial impacts would also occur during construction from possible local employment, and the eight-month construction period would temporarily increase overall economic activity in the area. Construction-related adverse impacts on agricultural lands would occur if crop production was decreased or crops were damaged. Beneficial and adverse effects would occur primarily during the construction phase of the project, although some effects, such as those to real estate, may persist for the life of the line.

All of the action alternatives involve uncertainties regarding socioeconomic impacts. Adjacent homeowners have voiced concerns that real estate values would drop when the S-R Line is constructed across their properties but it is uncertain whether real estate values would drop. Some local businesses that would be used to support construction (materials, lodging, etc.) may benefit, whereas businesses that depend upon the tourism industry may lose business due to road and park closures. There is additional uncertainty as to whether the construction project would result in the creation of new local jobs or if these jobs would go to other skilled laborers from outside the region. There is uncertainty as to how visitors would respond to the introduction of a double circuit 500-kV line with towers twice the height of those currently existing in the area. The methods used to calculate impacts to scenic resources are limited and can only approximate the actual impacts; the scope and magnitude would remain unknown until construction is complete. It is not possible to estimate the loss to the local economies as a result of visitors that may go elsewhere because of construction closures, or visitors that choose not to return to the park units after the power line was constructed, or residents that choose to leave the area as a result of concerns about the proximity of the power line to their homes. Any loss of revenue to the local economies would be an adverse contribution to an overall decline in visitor spending, the reasons for which are also not precisely known. However, regardless of these uncertainties, it is unlikely that the adverse impacts of any of the action alternatives on socioeconomics would reach a level of significance because any changes in visitation or visitor spending would be highly localized; in some cases, would be of limited duration, only occurring when areas were closed for construction and would resume afterward; and would not likely result in all affected visitors choosing not to return to the park units (i.e., of all visitors adversely affected by the presence of the power line, some may choose to leave and not return but others are likely to relocate their activities to other areas of the park units where the power line would not affect their visitation). Similarly, the number of residents affected by the action alternatives is very small and while some may perceive their quality of life to be diminished by the proximity of the power line, it is unlikely that all affected residents would choose to move out of the area. In the context of the local economies in proximity to the action alternatives, any loss of revenue as a result of these changes would likely be small; thus, the adverse impacts of any of the action alternatives are not considered to be significant.

INFRASTRUCTURE, ACCESS, AND CIRCULATION

The section evaluates the alternatives as they relate to impacts on circulation and access on existing and proposed transportation infrastructure, as well as the impact on the condition of this infrastructure.

METHODOLOGIES

The analysis of impacts on infrastructure, access, and circulation was based on a qualitative assessment of how the different phases (construction, operations and maintenance) of the proposed alternatives would affect existing transportation infrastructure and the ability of visitors and the local community to access or travel (circulate) to their desired destinations. Potential impacts on roads in general were evaluated inside and outside the study area. Planned or programmed road improvements were assessed to determine how such improvements would affect, or be affected by, the proposed alternatives.

Resource-specific context for infrastructure, access, and circulation includes the following:

- DEWA is a linear park with primarily parallel roads; not all roads in DEWA are owned by the NPS.
- Commercial uses of DEWA roads are restricted except for US 209 (which requires a permit); most park roads are very basic and unsuitable for use by heavy equipment because they do not have the necessary foundations, do not have the required turning or overhead clearances, and traverse difficult terrain.
- Typically, no new roads are allowed in national parks that do not benefit park purposes.
- Some DEWA roads are also historic resources (e.g., Old Mine Road and River Road).

STUDY AREA

The study area for infrastructure, access, and circulation includes the areas within the parks, with focus on routes that provide direct access to the vicinity of existing and potential transmission line ROW and proposed utility access roads. Traffic control zones for construction are laid out in sections: advance warning, transition, activity, and termination. These zones would vary in length based on the speed limits, road widths, the type of construction, and other factors. As noted in “Chapter 3: Affected Environment,” various federal highways, state routes, local county roads, and NPS-owned roads make up the transportation network surrounding DEWA, MDSR, and APPA. There are approximately 86 miles of paved roads and 83 miles of unpaved roads in the 67,210-acre national recreation area, and DEWA has over 50 entry points, with a high proportion of travel through the park made by commuters and local residents (NPS and FHWA 2009, 6, 13). Primary roads in DEWA are owned and managed by the NPS; however, there are some private/public inholdings in the states of Pennsylvania and New Jersey with their own roads used to access their properties (NPS and FHWA 2009). Major roads from New Jersey and Pennsylvania traverse the DEWA boundary as shown in figures 49 through 52 (in chapter 3). The MDSR is accessible from multiple points within the park, and APPA is accessible from points in the park and throughout its length. Visitors boating (canoeing, kayaking) MDSR can access the river from boat launches within DEWA off Old Mine Road and River Road. Visitors hiking the APPA can access it from various trails within DEWA and Worthington State Forest in New Jersey. APPA can also be accessed from I-80 at the south end of DEWA, Camp Road at the Mohican Outdoor Center, and Millbrook-Blairstown Road.

CUMULATIVE IMPACTS COMMON TO ALL ALTERNATIVES

For this EIS, actions inside and outside the parks can affect infrastructure, access, and circulation, primarily during deconstruction and construction activities because infrastructure, particularly roads, must support the additional use by large construction vehicles and a construction workforce. Such use can affect how people access and circulate through the parks, as well as surrounding areas. Completed, current, and future activities that would have beneficial or adverse impacts on infrastructure, access, and circulation in the parks, inside and outside the study area, are summarized here, with anticipated impacts identified. Cumulative impacts that would persist beyond the construction period are the focus of the assessment. Generally, the planned NPS, state, and local transportation improvement projects introduced below would benefit infrastructure, access, and circulation in and to the parks because they are maintenance, road, trail, or multimodal improvement projects that improve traveler safety. However, there may be some adverse effects if the transportation improvements induce population growth resulting in traffic congestion, which can affect access and circulation. Appendix H provides a list of cumulative projects.

Under the discussion of each alternative, the impacts associated with these projects were analyzed in conjunction with the impacts expected for the alternatives.

Projects Inside the Study Area

Projects inside the study area related to road and bridge repair would have beneficial impacts on infrastructure, access, and circulation. Several projects would affect circulation and access inside the study area by improving and restoring infrastructure, reducing traffic and congestion, and providing multiple methods of travel in the parks. The following projects would create beneficial impacts on infrastructure, access, and circulation: the US Route 209 commercial use expiration in 2015, Delaware River Bridge projects, the Alternative Transportation Program; Marshalls Creek traffic relief project; Smooth Ride Initiatives 2006–2007 (pavement resurfacing projects); the PADOT SR 2001 road project; Old Mine Road South rehabilitation; and River Road rehabilitation. These projects would have beneficial impacts from improvements to traffic circulation and heavy vehicle use, road resurfacing, and improved signs, shoulders, and road geometry, as well as the addition of turn lanes, guardrails, and reflectors. However, while the road and bridge repair projects may be immediately beneficial, these projects are not considered beneficial to the parks. These projects are contrary to the parks' goals of maintaining character, scenery, and cultural landscapes. Additionally, these projects could facilitate an increase in population in the area of effect, resulting in additional demands on infrastructure, and could also adversely affect access and circulation.

The construction of Turtle Beach in 2010 resulted in damage to Old Mine Road in New Jersey due to the weight of the trucks and construction equipment used for construction. Park roads not designed to withstand heavy loads might be similarly damaged in the future for projects that require the transport of heavy construction equipment.

Cumulative impacts on infrastructure, access, and circulation inside the study area would be immediately beneficial due to the implementation of maintenance and safety projects for park roads. However, these past, present and reasonably foreseeable future projects represent an adverse impact.

Projects Outside the Study Area

Outside the study area, residential and commercial development would have adverse cumulative impacts on infrastructure, access, and circulation. These projects would have adverse impacts through increased traffic congestion, and increased urbanization, which would require new infrastructure and put stress on the existing system. There would be beneficial impacts from airport improvements and the high-speed passenger train from northeast Pennsylvania to New York City. These projects would provide improvements in the infrastructure of the area. Cumulative impacts on infrastructure, access, and circulation outside the study area would be adverse.

IMPACTS OF THE ALTERNATIVES ON INFRASTRUCTURE, ACCESS, AND CIRCULATION

Common to All Alternatives

Outside the Study Area: Outside the study area, regardless of which alternative is selected, the transmission line could pass through Carbon, Lackawanna, Luzerne, Monroe, Northampton, Pike, and Wayne counties in Pennsylvania and Morris, Sussex, and Warren counties in New Jersey.

Under the no-action alternative, existing conditions would persist outside the study area. There would be no impacts from construction. Slight impacts would occur to access and circulation during maintenance periods. Outside the study area, there would be impacts from project construction under any of the action

alternatives. The specific locations of the access roads outside the study area would be identified during design and are currently not known; however, multiple major and local roads would be crossed. In addition, access roads may be needed along the length of the transmission line. During the transmission wire installation, roads (including some major highways) would be closed, partially closed, or detoured. During these periods, road detours would result in changes to circulation and access to desired destinations resulting in adverse impacts.

Outside the study area, indirect impacts on infrastructure, access, and circulation from vegetation clearing, construction of the transmission line, operation and maintenance of the transmission line, and vegetation maintenance would be adverse and would occur to varying degrees, depending on the location. These impacts would persist for the full period of analysis. Outside the study area, access roads would cross local and regional transportation facilities, to be determined. Cumulative impacts on infrastructure, access, and circulation outside the study area would be expected to be adverse, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the adverse impacts expected on infrastructure, access, and circulation are combined with other past, present, and reasonably foreseeable projects outside the study area, an overall cumulative adverse impact would be expected.

Alternative 1: No Action

Under the no-action alternative, widening the existing transmission line ROW would not occur. The operation of the existing transmission line would continue to require periodic maintenance, including the clearing of vegetation in the ROW. There would be no impacts on local roads or park access or circulation associated with the alternative 1 alignment related to the operation of the line. During the infrequent periods of maintenance activity for the transmission line, there could be maintenance equipment moving along the roads used to access the ROW. Because maintenance would occur only periodically, there would be a slight, perceptible effect on the ability of the public to access desired destinations or on daily traffic volumes; however, there would be no change from existing conditions. Selected trails are used for existing maintenance activities and would continue to be used under alternative 1. These trails are the Hamilton Trail in New Jersey, the McDade Trail near Community Drive, and part of the Van Campen Glen Trail. Where transmission lines cross roads and trails, there could be temporary, brief road closures or detours during the maintenance periods. Depending on the length of closure or detour and the type of road (e.g., county road), the impact could vary from no perceptible change to a noticeable change that does not limit the ability of the public to readily access their destination. Therefore, impacts on access and circulation would continue to occur during maintenance. As stated in chapter 2, no new construction activity would take place; activities would only include operation and maintenance of the existing line. Therefore, alternative 1 would result in no change from existing conditions.

Cumulative Impacts

Cumulative impacts on infrastructure, access, and circulation inside the study area would be adverse as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the impacts expected on infrastructure, access, and circulation as a result of alternative 1 are combined with other past, present, and reasonably foreseeable projects in the study area, the cumulative impacts would be adverse.

Conclusion

Alternative 1, the no-action alternative, would continue the operation and maintenance of the existing transmission line. Inside the study area, there would be adverse impacts during maintenance. Cumulative impacts would be adverse.

Alternative 1 would not result in any change in existing conditions. The current adverse impacts, such as brief road closures or presence of equipment on local roads or trails, are minimal and have little or no potential to rise to a level of significant impacts because these occurrences are infrequent, of short duration, and represent a temporary interference with visitor and public use of local roads and trails.

Common to All Action Alternatives

Mitigation Measures: Mitigation measures would be implemented to reduce impacts on infrastructure, access, and circulation and are taken into consideration in the impact analysis for each of the build alternatives. Mitigation measures are described in appendix F.

Project Construction: Under all action alternatives, the proposed transmission facilities would require one new double 500-kV line across the parks. This would require the construction of new towers and foundations to accommodate the line. Spur roads, access roads, pulling and splicing sites, wire pull locations, and staging areas would be required for all action alternatives. (Access roads would also be needed for on-going maintenance, discussed below.) Helicopters and trucks would likely be used to transport construction equipment and supplies. These activities would temporarily disrupt road and potentially trail and river activity within the parks' boundaries. The closest rail intermodal facility is located near the intersection of I-81 and I-380, well outside the study area; therefore, the equipment would need to be trucked to the study area. This analysis assumes that equipment would likely be brought into the area from access points along I-80, and construction staging would occur outside the parks or within the existing cleared ROW. From the construction staging area to the site on the transmission line, construction traffic and equipment would travel on existing roads or new transmission line access roads. Roads not designed to withstand heavy loads (e.g., Old Mine Road, River Road, others) could be damaged via the transport of construction vehicles and heavy equipment, with impacts to park infrastructure

New access roads for construction and maintenance of the transmission line would be composed of compacted dirt or gravel. Access roads are considered permanent, because they would be used for maintenance activities once construction is complete. The access roads for decommissioning the existing transmission line are discussed below. In addition to permanent access roads, there may be spur roads to pulling and splicing sites. Pulling and splicing sites would be established inside and outside the study area and would require additional access roads connecting to the associated tower. When possible, these areas would be established where the ground is already disturbed. Tower and pulling and splicing sites would be located to avoid wetlands and sensitive areas where possible, and the spur roads would be restored after construction. During future project planning, design engineers would work closely with park staff to avoid sensitive areas within park boundaries as much as possible. Mitigation measures described in appendix F would be applied, but they would not be sufficient to change the level of impact to NPS roads.

Because all staging areas would be located outside the parks or on existing cleared ROW, there would be no anticipated impacts on parking availability in DEWA.

Overall, construction could last up to eight months, based on a six-day-a-week, 12-hour-a-day schedule. The construction labor force would range from 20 to 120 persons, with an average workforce of 50. The construction crews would use public roads and proposed access roads (described as applicable by alternative, below) to reach the construction sites. The average anticipated workforce of 50 personnel would be detectable when compared to the current traffic volumes on park roads. Volumes are up to 660 to 12,000 per day during the month of August, depending on park location, but lower during the months planned for construction.

In addition to the traffic associated with employees commuting to their work site, there would be traffic associated with the movement of construction equipment. From the staging areas outside the parks there would be daily construction traffic going back and forth to the access road for a specific construction site along the ROW. Estimated construction trips would be seven (one-way) per hour and approximately 140 vehicle miles traveled per day. During the overall project construction, construction would focus on specific transmission line segments and then move to another segment. Therefore, the need to access each site would be localized and of a shorter duration than the duration of construction of the entire project. The movement of heavy equipment and the transport of materials on large trucks could result in traffic delays because this equipment moves slowly or may be oversized, disrupting normal traffic flow. In addition, trucks would be required to stop at the park contact station to show their commercial use authorization, which would impact congestion on park roads such as River Road or Old Mine Road, where no commercial traffic is allowed except permitted canoe liveries. These traffic delays and the potential for less ease of access to desired destinations would be noticeable to the public. These impacts would be similar inside and outside the study area.

The proposed transmission lines would cross existing roads and during transmission wire installation, roads would be closed. Individual road closures would not likely last more than three days, and the roads could be open for access during non-construction work hours. During closure periods there would be road detours resulting in apparent changes to circulation and access to desired destinations.

During periods of maintenance there could be temporary closures of short sections of trails. The proposed transmission line could cross existing trails, including APPA. During transmission wire installation, trails would be closed or detoured. The analysis assumes that similar to roads, trail closures would not last more than three days. Closures to river traffic are anticipated for one day during construction for the removal of the existing B-K Line and one day for the installation of the new line.

Construction for all action alternatives would result in adverse impacts on infrastructure, access and circulation in the study area.

Removal of Existing Structures: Under all action alternatives (2, 2b, 3, 4, and 5), all or a portion of the existing B-K Line within the park boundaries would be removed to the extent feasible as described in chapter 2. The removal of the transmission line would disrupt circulation and access. The use of construction equipment and the potential disruption of traffic and other transportation services would result from the decommissioning the existing transmission line. Individual roads or trails would potentially be closed for a day or more during the removal of the line.

In the study area, the access roads used to decommission the existing transmission line would cross or intersect the following facilities, listed from east to west (with the purpose of the facility in parentheses):

New Jersey:

- APPA (hiking trail)
- Millbrook Road / NPS 602 (main east–west road)
- Old Mine Road (main north–south road, scenic route, southern section closed in winter)
- Pioneer, Hamilton Ridge, and Van Campen Glen trails (hiking trails; Hamilton Ridge Trail provides access to existing utility road)

Pennsylvania:

- Freeman Tract Road (unpaved township road, crossed by B-K Line)

- NPS River Road / Township 515 / (primary entry road to parks, north–south road, scenic route, eligible historic resource, provides access to existing utility road)
- Community Drive (local road)
- US Route 209, located outside park boundaries but inside and outside study area (primary road to parks)
- Creek Road (local road)

The roads listed above, particularly River Road and Old Mine Road, would be affected by the weight of the equipment used to approach and decommission the existing line. Sections of these historic roads are in poor condition, and the weight of heavy vehicles would further damage them. Depending on the weight of the vehicles and the condition of the road section, impacts to infrastructure would range from detectable to readily apparent. There would also be impacts to roadside vegetation and the canopy if it needs to be cut to allow sufficient clearance for construction vehicles and equipment. Local phone, electric, and cable lines could also require relocation.

During the decommissioning of the existing B-K Line, traffic delays from the movement of heavy equipment and transport of materials on large trucks would affect the roads listed above, disrupting normal traffic flow because this equipment moves slowly or may be oversized. These temporary traffic delays and the potential for reduced ease of access to desired destinations would be noticeable to the public for short periods; therefore, adverse impacts on access and circulation would result.

As described in the “Project Construction” section below, there could be temporary closures or detours where the existing line crosses a road (e.g., Old Mine Road) or trail (e.g., APPA) as the existing line is removed. At these specific locations, the impacts would be apparent for access and circulation.

Overall, the removal of the transmission line would result in localized adverse impacts on infrastructure, access and circulation that would last several days to a few weeks, depending on location. Damages to existing roadway infrastructure and the tree canopy could occur. Areas disturbed by road-related construction would be reclaimed after construction is complete (see appendix F). However, this reclamation would not be sufficient to change the level of impact.

Maintenance: After construction is complete, the facility would require periodic inspections via helicopter and truck, and regularly scheduled maintenance every six months to ensure system reliability and performance. The access roads established for construction would be maintained at a width of 12 feet.

During the short periods of maintenance activities for the transmission line or access roads, maintenance equipment could move along public roads (either inside or outside the study area). Because the roads within the parks generally have low traffic volumes, there would be some effect on the ability of the public to access desired destinations or on daily traffic volumes.

Where transmission lines cross roads (either inside or outside the study area), there could be temporary closures or detours of the roads during the maintenance periods. Depending on the length of time of the closure or detour and the type of road (e.g., interstate, highway, and rural road), the impact could vary from no perceptible change to a noticeable change that does not limit the public’s ability to readily access their destination.

Maintenance activities would result in adverse impacts on access and circulation and potential impacts to roadway infrastructure from the use of heavy equipment.

Alternative 2

Under alternative 2, the project construction impacts related to infrastructure, access, and circulation in the study area would last an estimated eight months. The roads affected during project construction would be the same as those listed under the “Removal of Existing B-K Line” section above. Potential damages to infrastructure could increase due to the intensified use of the road by construction trucks and equipment for installation of the S-R Line, which may require heavier construction equipment than that used to decommission the existing line.

Use of heavy construction equipment on historic River Road and Old Mine Road, sections of which are in poor condition, could result in adverse impacts that persist beyond the construction period. These roads would be used to reach the transmission line ROW access roads. Equipment such as concrete trucks and cranes can weigh many tons. Although the equipment would be used for short periods, impacts on River Road and Old Mine Road would occur due to their current condition and their intended use, as described in chapter 3. Impacts could occur to other roads (e.g., Community Drive) used by construction equipment, as well. These impacts would affect the roadway condition and would persist after construction. The alternative 2 alignment would cross River Road near the northern terminus where the road is newest and close to DEWA Headquarters. Impacts would likely be apparent. Approximately 1.5 miles of Old Mine Road would be affected by construction vehicles if the alternative 2 alignment is accessed from the north. Depending on the condition of Old Mine Road in this section, impacts on this historic road would be apparent to obvious. The NPS *Park Road Standards* manual notes that “Park roads cannot accommodate all types of vehicles ... the Service is not obligated to construct roads or to manage traffic so that all forms of modern transportation technology can be accommodated within the park” (NPS 1984, 8). The NPS *Park Road Standards* manual also describes how park roads are designed based on the types of vehicles allowed to use the facility by park management. The physical dimensions and operating characteristics of the vehicles that would be used on the roads are used to develop design criteria (NPS 1984, 13). Although the parks did not design the original roads, they maintain them as park connector roads, which are not intended to bear heavy loads. Mitigation measures described in appendix F would be applied, but they would not be sufficient to change the level of impact to NPS roads.

Alternative 2 would require 5.4 miles of access roads, 2.0 miles of which would be outside the ROW (1.6 miles in Pennsylvania and 0.4 mile in New Jersey). The new access roads could lead to more unauthorized use of the project corridor. The mitigation measures in appendix F would help offset this potential impact. Potential impacts related to vegetation, soils, and wildlife are addressed under “Vegetation,” “Geologic Resources,” and “Landscape Connectivity, Wildlife Habitat, and Wildlife.”

Cumulative Impacts

Cumulative impacts on infrastructure, access, and circulation inside the study area would be adverse, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the impacts expected on infrastructure, access, and circulation as a result of alternative 2 are combined with other past, present, and reasonably foreseeable projects in the study area, the cumulative impacts would be adverse.

Conclusion

Inside the study area, impacts on access and circulation would occur at specific locations during the construction period. Use of heavy construction equipment on historic River Road and Old Mine Road would result in adverse impacts on infrastructure, depending on current conditions of existing road sections. These effects would persist until the damage to the roads is repaired. Cumulative impacts would be primarily adverse.

The adverse impacts of alternative 2 on visitor access, circulation, and overall traffic movement would be considerable, especially during the period of construction, but are not likely to be significant. Construction activities would result in temporary closures of trails, roads, and the MDSR to ensure visitor safety. Road and site closures would interrupt visitor access and experience in the park and compound safety management challenges during the busy seasons but this would occur for a finite period and can be managed through advance notice to visitors and the traveling public. The movement of heavy construction equipment through the park would also have adverse impacts on DEWA and Worthington State Forest roads because these roads are not constructed to handle heavy equipment; some of these roads are also historic resources. The roads would be repaired and rehabilitated once construction was completed, although some damage may not be corrected. Like all of the other action alternatives, not all of the property crossed by alternative 2 within the study area is owned or managed by the NPS; meaning not all access to the parks is under NPS control. This alternative crosses federal lands, trails, private properties, and local roads. Permanent closures of river campsites in the vicinity of alternative 2 would impact the amount of camping facilities available, putting pressure on other campsites along the MDSR in DEWA. Specifically, closure of Hamilton Campsites would affect camping opportunities along the entirety of the Delaware River within DEWA and MDSR, as the campsites are evenly spaced to accommodate multi-day trips. Park operations would be adversely impacted because of the increased need for staffing to monitor and patrol areas during construction for visitor safety and to mitigate impacts on resources. In addition, the expansion of the ROW and creation of access roads would make access for illegal uses such as ORVs increasing the need for law enforcement patrols and resource protection in these areas. Construction activities, the presence of heavy equipment, and alterations to typical traffic flow would create greatly increased risks to visitor and staff safety as well as the traveling public. However, such impacts would be temporary. Proper management, advanced planning, and park staff expertise dealing with these types of disruptions would minimize these risks.

Alternative 2 has potential for significant adverse impacts as a result of permitting a proposed transmission line that would adversely affect multiple protected resources inside the parks, in some instances irreversibly. Allowing such adverse effects in order to facilitate private infrastructure expansion would be contrary to NPS practice and principle of protecting and improving these resources, and of removing incompatible infrastructure to do so. This could establish a precedent that may invite similar proposals by other applicants in the future, and create an expectation of like treatment for those proposals (i.e., it may make it difficult to deny such proposals). DEWA and APPA both contain numerous other utility crossings, which makes the risk of such precedent particularly concerning for these parks. Furthermore, as units of the national park system, wherein all parks are entitled to equal protection, creating such a precedent could have ramifications for parks nationwide. The location of this particular crossing within the center of DEWA could make such a precedent even more potent. Installing the S-R Line on this alignment may invite future utilities proposing to follow the same route.

Alternative 2b

The alternative 2b alignment would follow the same route as alternative 2. There would be no measurable change to infrastructure, access, and circulation compared to alternative 2. Therefore, adverse impacts inside the study area would occur as described under alternative 2.

Cumulative Impacts

Cumulative impacts would be the same as alternative 2: adverse.

Conclusion

There would be no measurable difference between the direct and indirect adverse impacts of alternatives 2 and 2b relative to infrastructure, access, and circulation. Cumulative impacts would be primarily adverse.

Similar to alternatives 2, 4, and 5, the adverse impacts of alternative 2b on visitor access, circulation, and overall traffic movement from construction and operation of the proposed transmission line would be large. Alternative 2b would result in temporary closures of roads, trails, and the MDSR during construction activities, and permanent closures of river campsites. Closure of Hamilton Campsites would affect camping opportunities along the entirety of the Delaware River within DEWA and MDSR, as the campsites are evenly spaced to accommodate multi-day trips. DEWA and Worthington State Forest roads would be adversely impacted because these roads were not constructed to handle heavy equipment. These effects would interrupt visitor access and experience in the park and would compound safety management challenges during the busy seasons. An increased need for monitoring and patrolling construction areas and access roads would adversely affect park operations. The potential risk to public safety as a result of construction activities would be minimized through proper management, advanced planning, and park staff expertise dealing with these types of disruptions.

Like the other action alternatives, alternative 2b also has potential for significant impacts associated with the precedent set by permitting a proposed transmission line that would adversely affect multiple protected resources inside the parks. The results of this action would be contrary to NPS practice and principle of protecting and improving these resources and would potentially establish a precedent that may invite similar proposals by others and make it difficult for the NPS to deny such proposals. However, alternative 2b has an additional aspect that raises the potential for significant risk to public safety. Alternative 2b would be constructed within the existing ROW, which is only 100 feet wide in certain places and bordered by 60- to 80-foot high trees on both sides. There is disagreement between the applicant and the NPS as to whether the proposed line could be safely and properly constructed and operated within the existing ROW. NERC guidelines call for clearances between live wires and trees on the edge of the corridor that are greater than what the current ROW would offer. The information obtained by the NPS from independent research indicates that operation of the line in areas where clearances are less than required by NERC standards creates a considerable fire hazard; that is, the increased hazard of live wires contacting trees and sparking a forest fire. Additionally, such an event would likely cause an outage of the line that would lead to loss of power to users downstream, which could create uncalculated health and safety issues. The applicant disputes this claim and the matter remains unresolved. Thus, the NPS believes this risk is a significant impact under alternative 2b.

Alternative 3

Inside the study area, the alternative 3 alignment would traverse DEWA, MDSR, APPA, and Worthington State Forest for approximately 5.4 miles. The alignment would use an existing transmission line ROW that would be expanded from its current 100-foot width by an additional 50 to 100 feet. In total, the alternative 3 alignment would traverse 157 miles and would require the development of new access roads and spur roads. Inside the study area, approximately 1.6 miles of access roads would be required outside the ROW. Additional access roads would be needed for the approximately 5-mile segments running parallel to the north–south boundaries of DEWA on the New Jersey and Pennsylvania sides of the park. These access roads should remain outside the study area. All access roads would be permanently maintained.

The duration of project construction impacts related to infrastructure, access, and circulation in the study area would generally be less than eight months for this alternative. In the study area, the following roads (listed from east to west) would be intersected or crossed by utility access roads:

New Jersey:

- Yards Creek Road (provides access to Yards Creek Hydroelectric Station)
- APPA (hiking trail)
- Old Mine Road (main north–south road, scenic route, listed historic resource, southern section closed in winter)

Pennsylvania:

- McDade Trail (hiking, mountain biking, and cross-country skiing trail)
- River Road (primary road to parks, north–south roadway, scenic route, eligible historic resource, provides access to existing utility road)
- Mosiers Knob Road (local road)
- Creek Road (local road)

During construction, there could be impacts on the roads listed above due to traffic delays from the movement of heavy equipment and the transport of materials on large trucks, disrupting normal traffic flow because this equipment moves slowly or may be oversized. Temporary traffic delays and the potential for reduced ease of access to desired destinations would be noticeable to the public for short periods and would result in adverse impacts on access and circulation. As described under the “Project Construction” section, there could also be temporary road closures or detours where the existing line crosses the road as the existing line is removed. Impacts would be localized and apparent for access and circulation.

As discussed in the “Project Construction” section, the construction for all action alternatives would result in impacts on access and circulation in the study area. Impacts on infrastructure from heavy construction equipment would also occur, as described for the alternative 2 alignment. These impacts would persist beyond the construction period, until the roads are repaired. Additionally, under alternative 3, longer sections of River Road and Old Mine Road would be traveled by construction equipment to reach the transmission line ROW. Approximately 5 miles of both roads would need to be traveled if accessed from I-80 to the south. Approximately 4.5 miles of River Road and 6.5 miles of Old Mine Road would be traveled if accessed from the north. As described in chapter 3, River Road is in poor condition and therefore susceptible to damage from heavy loads. The southern section of Old Mine Road in Worthington State Forest includes a narrow one-lane section that would also be susceptible to damage from wide, heavy loads. This segment may have to be avoided entirely if the construction equipment is too wide to pass safely. If so, the route to the construction site would likely use Millbrook Road (NPS 602) for access to Old Mine Road from the north. Damages to the roads used for transporting construction vehicles and equipment would likely occur, with the severity depending on the condition of the specific road sections. Mitigation measures described in appendix F would be applied, but they would not be sufficient to change the level of impact to NPS roads.

Alternative 3 would require 3.5 miles of access roads, 0.9 mile of which would be outside the ROW. The additional new utility access roads could lead to more unauthorized use of the project corridor. The mitigation measures in appendix F would help offset this potential impact. Potential impacts related to

vegetation, soils, and wildlife are addressed under “Vegetation,” “Geologic Resources,” and “Landscape Connectivity, Wildlife Habitat, and Wildlife.”

Cumulative Impacts

Cumulative impacts on infrastructure, access, and circulation inside the study area would be adverse, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the impacts expected on infrastructure, access, and circulation as a result of alternative 3 are combined with other past, present, and reasonably foreseeable projects in the study area, the cumulative impacts would be adverse.

Conclusion

Inside the study area, adverse impacts on access and circulation would occur at specific locations during the construction period. The use of heavy construction equipment on park roads, including historic River Road and Old Mine Road, could result in adverse impacts on infrastructure, depending on the current condition of the existing road sections. These effects would persist until the damage to the roads is repaired. Cumulative impacts would be primarily adverse.

Compared to the other action alternatives, the adverse impacts of alternative 3 on infrastructure, access, and circulation could be significant because longer sections of River Road and Old Mine Road would be traveled by construction equipment to reach the transmission line ROW, resulting in potentially longer traffic delays during construction and much more damage to the roads. Mitigation measures would offset some but not all of the damage. Some roads, such as the Yards Creek road and Mosiers Knob road, are primarily used for local access and not normally roads traveled by heavy equipment, increasing the adverse impacts on local traffic and visitors that use these areas. However, like the other action alternatives, any increased safety risk to visitors and park staff from construction activities, the presence of heavy equipment, and alterations to typical traffic flow would be minimized by proper management, advanced planning, and park staff expertise dealing with these types of disruptions. Risks to public safety are expected to be temporary and minimal.

As with the other action alternatives, permitting the project would adversely affect multiple protected resources inside the parks, in some instances irreversibly. Alternative 3 has potential for significant impacts associated with the precedent set by permitting a proposed transmission line that would adversely affect multiple protected resources inside the parks, contrary to NPS practice and principle of protecting and improving these resources and potentially establishing a precedent that may invite similar proposals by others and make it difficult for the NPS to deny such proposals. As previously noted, DEWA and APPA contain numerous other utility crossings, which makes the risk of such precedent particularly concerning for these parks and which could have ramifications for parks nationwide. Furthermore, as units of the national park system, wherein all parks are entitled to equal protection, creating such a precedent could have ramifications for parks nationwide. The location of alternative 3 roughly in the center of DEWA could make such a precedent even more potent. Installing the S-R Line on this alignment may invite future utilities proposing to follow the same route. The removal of the B-K Line under alternative 3 would have beneficial impacts to the recreational sites, roads, and trails within DEWA, the MDSR, and APPA where that line crosses these areas by the removal of the towers and rehabilitation of the vegetation in the long-term. The restoration would restore the natural habitat to the heart of DEWA and MDSR and reduce the number of crossings of APPA. It would also help to offset some of the adverse impact because there would be one less utility crossing of the park units; however, overall, the beneficial impacts of the removal of the existing line do not outweigh the significant negative impacts of visual intrusion of the expanded line paralleling the MDSR and APPA.

Alternative 4

Inside the study area, the alignment for alternatives 4 would follow approximately 1.7 miles parallel to an existing 100-foot-wide ROW for electric utilities in the southernmost portion of DEWA. The ROW would need to be expanded by an additional 100 to 200 feet, with vegetation cleared for construction and operation of the line. This segment would cross NPS Drive and Mountain and Totts Gap roads. It would cross the APPA in the southern part of DEWA. In addition to crossing these areas of DEWA and APPA, Alternative 4 would follow the alignment of the B-K Line for 0.6 mile from the western boundary of DEWA to the Bushkill Station (near Park Headquarters), totaling 2.3 miles within the park. Outside DEWA and APPA, the alternative 4 alignment would angle northeast to follow the existing B-K Line to the Roseland Substation in New Jersey, and would rejoin the alternative 3 alignment on the Pennsylvania side of the river, traveling north, west, and south to Susquehanna Substation. The alignment would require expanding the ROW to cross the Lower Delaware River outside DEWA.

Construction of alternative 4 would be anticipated to last eight months; therefore, the project construction impacts related to infrastructure, access, and circulation for these alternatives would generally last eight months.

Inside the study area, utility access roads would intersect or cross the following facilities (all in Pennsylvania):

- NPS Drive (local road)
- Totts Gap Road (local road)
- APPA (trail)
- Mountain Road (local road)
- Creek Road (local road, alternative 4 only)

During construction, there could be adverse impacts on the roads listed above due to traffic delays from the movement of heavy equipment and the transport of materials on large trucks, disrupting normal traffic flow because this equipment moves slowly or may be oversized. Temporary traffic delays and the potential for reduced ease of access to desired destinations would be noticeable to the public for short periods and would result in impacts on access and circulation. As discussed in the “Project Construction” section, the construction for all action alternatives would result in adverse impacts on access and circulation in the study area. Beyond the construction period, there could be infrastructure impacts on NPS Drive, Totts Gap Road, and Mountain Road from the use of heavy equipment. Depending on the condition of the roads, adverse impacts would vary. Mitigation measures described in appendix F would be applied, but they would not be sufficient to change the level of impact to NPS roads.

Alternative 4 would require 1.6 miles of new access roads, 0.5 mile of which would be outside the ROW. The new access roads could lead to more unauthorized use of the project corridor. The mitigation measures in appendix F would help offset this potential impact. Potential impacts related to vegetation, soils, and wildlife are addressed under “Vegetation,” “Geologic Resources,” and “Landscape Connectivity, Wildlife Habitat, and Wildlife.”

Cumulative Impacts

Cumulative impacts on infrastructure, access, and circulation inside the study area would be adverse, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the impacts expected on infrastructure, access, and circulation as a result of alternative 4 are combined with other

past, present, and reasonably foreseeable projects in the study area, the cumulative impacts would be adverse.

Conclusion

Inside the study area, adverse impacts on access and circulation would occur during the construction period at specific locations, affecting visitor use and experience from closures of roads, trails, and sites. Additional infrastructure adverse impacts could result from the use of heavy equipment on NPS Drive, Totts Gap Road, and Mountain Road. These effects would persist until the damage to the roads is repaired. Cumulative impacts would be primarily adverse.

As with alternatives 2, 2b, and 5, the adverse impacts of alternative 4 on visitor access, circulation, and overall traffic movement would be considerable, especially during the period of construction, but are not likely to be significant. The movement of heavy construction equipment through the park would have adverse impacts on park roads because these roads are not constructed to handle heavy equipment. Construction activities would result in temporary closures of trails and roads to ensure visitor safety. These temporary closures would have an adverse impact on visitor experience, making traversing the park difficult, but this would occur for a finite period and can be managed through advance notice to visitors and the traveling public. Damage to park and local roads would also likely be considerable, especially at Totts Gap Road and Mountain Road. The roads would be repaired and rehabilitated once construction was completed, although some damage may not be corrected. Like the other action alternatives, not all of the property crossed by alternative 4 within the study area is owned or managed by the NPS; meaning not all access to the parks is under NPS control. This alternative crosses federal lands, trails, private properties, and local roads. Park operations would also be adversely impacted because of the increased need for staff to monitor and patrol areas during construction for visitor safety and to mitigate impacts on resources. In addition, the expansion of the ROW and creation of access roads would make access for illegal uses such as ORVs increasing the need for law enforcement patrols and resource protection in these areas. Alternative 4 crosses the Delaware River outside of the designated MDSR. The Appalachian Trail would be crossed and would need to be re-routed during construction activities.

Construction activities, the presence of heavy equipment, and alterations to typical traffic flow would create greatly increased risks to visitor and staff safety as well as the traveling public. However, such impacts would be temporary. Proper management, advanced planning, and park staff expertise dealing with these types of disruptions would minimize these risks.

The removal of the existing B-K Line as a part of mitigation for construction of alternative 4 has some potentially significant beneficial impacts that may balance the adverse effects of construction, operation, and maintenance of alternative 4: large infrastructure would be moved to the margins of DEWA; an existing transmission line ROW and associated infrastructure would be removed from the center of DEWA; and the river crossing of the MDSR would be completely removed, enhancing the scenic and recreational qualities. Natural habitat would be restored (53 acres total), creating larger patches of contiguous habitat and reducing fragmentation in the core of the park. Additionally, an incompatible feature crossing the landscape would be moved to the southern extent of the DEWA boundary, reducing the total number of cultural and historic structures adversely affected by a double circuit 500-kV the transmission line.

As with the other action alternatives, alternative 4 also has potential for significant adverse impacts associated with the precedent set by permitting a proposed transmission line that would adversely affect multiple protected resources inside the parks, contrary to NPS practice and principle of protecting and improving these resources and potentially establishing a precedent that may invite similar proposals by others and make it difficult for the NPS to deny such proposals. As previously noted, DEWA and APPA

both contain numerous other utility crossings, which makes the risk of such precedent particularly concerning for these parks and which could have ramifications for parks nationwide. The precedent potentially set by alternative 4 may include more consideration of moving infrastructure to the edges of NPS units; however, this does not offset the adverse impacts caused by the presence of such infrastructure. Alternative 4 would persist as a non-conforming feature in the parks landscape and would remain for the life of the line. Although the B-K Line would be removed and restored, the opportunity is lost to remove another incompatible use that intrudes upon the scenic quality and natural character of the parks.

Alternative 5

Inside the study area, the alignment for alternative 5 would follow the same route through DEWA and APPA as alternative 4, with the exception of the portion of the B-K Line from the Bushkill Substation to the western boundary of DEWA. Alternative 5 would require 0.9 mile of new access roads, 0.16 mile of which would be outside the ROW. Outside the study area, the alternative 5 alignment would generally follow I-80 to the Roseland and Susquehanna substations. The adverse impacts on infrastructure, access, and circulation would be the same as described for alternative 4.

Cumulative Impacts

Cumulative impacts on infrastructure, access, and circulation inside the study area would be adverse, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the impacts expected on infrastructure, access, and circulation as a result of alternative 5 are combined with other past, present, and reasonably foreseeable projects in the study area, the cumulative impacts would be adverse.

Conclusion

Inside the study area, adverse impacts on access and circulation would occur during the construction period at specific locations. Additional adverse impacts on infrastructure could result from the use of heavy equipment on NPS Drive, Totts Gap Road, and Mountain Road. These effects would persist until road damage is repaired. Cumulative impacts would be primarily adverse.

As with alternatives 2, 2b, and 4, the adverse impacts of alternative 5 on visitor access, circulation, and overall traffic movement would be considerable, especially during the period of construction, but are not likely to be significant.

The movement of heavy construction equipment through the park would have adverse impacts on park roads because these roads are not constructed to handle heavy equipment. Construction activities would result in temporary closures of trails and roads to ensure visitor safety. These temporary closures would have an adverse impact on visitor experience, making traversing the park difficult and denying access to popular visitor use sites, but this would occur for a finite period and can be managed through advance notice to visitors and the traveling public. Damage to park and local roads would also likely be considerable, especially Totts Gap Road and Mountain Road. The roads would be repaired and rehabilitated once construction was completed, although some damage may not be corrected. Like the other action alternatives, not all of the property crossed by alternative 5 within the study area is owned or managed by the NPS; meaning not all access to the parks is under NPS control. This alternative crosses federal lands, trails, private properties, and local roads. Park operations would be adversely impacted because of the increased need for staffing to monitor and patrol areas during construction for visitor safety and to mitigate impacts on resources. In addition the expansion of the ROW and creation of access roads would make access for illegal uses such as ORVs increasing the need for law enforcement patrols and

resource protection in these areas. Alternative 5 would cross the Delaware River outside of the designated MDSR. The Appalachian Trail would still be crossed and would need to be re-routed during construction activities.

Construction activities, the presence of heavy equipment, and alterations to typical traffic flow would create greatly increased risks to visitor and staff safety as well as the traveling public. However, such impacts would be temporary. Proper management, advanced planning, and park staff expertise dealing with these types of disruptions would minimize these risks.

The removal of the existing B-K Line as a part of mitigation for construction of alternative 5 has some potentially significant beneficial impacts: large infrastructure would be moved to the margins of DEWA; an existing transmission line ROW and associated infrastructure would be removed from the center of DEWA; and the river crossing of the MDSR would be completely removed, enhancing the scenic and recreational qualities. Natural habitat would be restored (53 acres total), creating larger patches of contiguous habitat and reducing fragmentation in the core of the park. Additionally an incompatible feature crossing the landscape would be moved to the southern extent of the DEWA boundary (DEWA lands west of the Bushkill Substation would not be crossed by new nearly 200-foot towers and additional conductors), reducing the total number of cultural and historic structures adversely affected by a double circuit 500-kV transmission line.

As with the other action alternatives, alternative 5 also has potential for significant adverse impacts associated with the precedent set by permitting a proposed transmission line that would adversely affect multiple protected resources inside the parks, contrary to NPS practice and principle of protecting and improving these resources and potentially establishing a precedent that may invite similar proposals by others and make it difficult for the NPS to deny such proposals. As previously noted, DEWA and APPA contain numerous other utility crossings, which makes the risk of such precedent particularly concerning for these parks and which could have ramifications for parks nationwide. The precedent potentially set by alternative 5 may include more consideration of moving infrastructure to the edges of NPS units; however, this does not offset the adverse impacts caused by the presence of such infrastructure. Alternative 5 would persist as a non-conforming feature in the parks landscape and would remain for the life of the line. Although the B-K Line would be removed and restored, the opportunity is lost to remove another incompatible use that intrudes upon the scenic quality and natural character of the parks.

VISUAL RESOURCES

This section evaluates impacts on visual resources and scenic views associated with DEWA (including MDSR) and APPA. Impacts were determined by assessing the visual quality of existing views at a variety of locations in DEWA and along APPA, and then comparing that assessment with visual simulations representing the proposed changes (see appendix K).

METHODOLOGIES

The analysis of impacts for scenic views and visual resources assesses the potential impact associated with constructing, operating, and maintaining the proposed transmission lines along the alternate alignments being evaluated in this EIS. The analysis also assesses the potential impact associated with decommissioning the existing transmission line.

Visual quality is by nature subjective. The Federal Highway Administration (FHWA) developed an analytical method for assessing visual quality effects by reducing subjectivity and allowing for a more objective assessment of visual effects. This method is described in detail in the manual *Visual Impact Assessment for Highway Projects* (FHWA n.d.).

Visual quality is the character of the landscape that generally gives visual value to the setting. Because visual quality is inherently subjective, objective descriptions are used to quantify the visual assessment. Three critical characteristics of landscape visual quality are considered and appraised, including vividness, intactness, and unity. Each of these characteristics is independent and intended to evaluate one aspect of visual quality. Definitions of these terms are (FHWA 1988, 48):

Vividness: The combination of landform, water, vegetation, and human development that form a memorable composition and distinctive visual scene. Contrast and visual interest tend to contribute to strong vividness. The numeric rating for vividness is derived by appraising each of these four components and dividing their sum by four. The numeric breakdown is as follows:

- 7–Very high
- 6–High
- 5–Moderately high
- 4–Average
- 3–Moderately low
- 2–Low
- 1–Very low

Intactness: The visual integrity of the natural and built environment and its freedom from visually encroaching elements. The numeric rating is derived by appraising these two components and then dividing their sum by two. The numeric breakdown is then the same as for vividness.

Unity: The degree to which the visible components of the landscape combine to form a coherent, harmonious visual pattern. Human development can contribute to visual unity by adhering to principles of context sensitive design. The numeric breakdown is the same as for vividness.

Evaluations based on these three criteria have proven to be good predictors of the visual quality using the following sample equation:

$$\text{Visual Quality} = \frac{\text{Vividness} + \text{Intactness} + \text{Unity}}{3}$$

The total visual quality was then defined based on the following breakdown:

- 5.7–7.0: Very high
- 4.7–5.6: High
- 3.7–4.6: Moderately high
- 2.7–3.6: Average
- 1.9–2.6: Moderately low
- 1.1–1.8: Low
- 0.0–1.0: Very low

Following the discussion for each alternative, a table provides the visual quality numeric scoring for each key observation point (KOP) analyzed for the given alternative. The numeric scoring shown in the tables and provided in this analysis was calculated (and in some cases rounded) to two significant digits.

Other terms and definitions used in performing the visual quality assessment include the following:

Viewer Position: The position from which the viewer observes the subject. The viewer is superior when above the subject and inferior when below the subject. The normal position is when the viewer is level with the subject.

In addition, exposure, sensitivity, frequency, viewer numbers, and duration are each terms FHWA uses to identify and consider how viewers interact with and respond to views being evaluated. These terms and impacts to viewers and their experience are discussed in the “Visitor Use and Experience” section.

Enabling and management documentation defines the mission of the NPS as including the preservation of scenic places, among other special qualities of places (i.e., historic, cultural, biological, etc.). Therefore, the integrity of national park system units is reliant on freedom from incompatible visual encroachments or elements in scenic views that conflict with the critical characteristics of high visual quality. The intrinsically scenic character of protected parks calls for the parks themselves to be considered a visual resource, separate from evaluation, and consideration of the sensitivity or possible reaction or quantity of potential resource viewers. However, the potential effects of the proposed actions on viewers (e.g., park visitors) are discussed in the “Visitor Use and Experience” section of this chapter.

In summary, this analysis generally followed these steps:

1. Determine the alternative elements and their extent using the alternatives description prepared for the EIS at the time field work was conducted in the fall of 2010. This involves understanding the transmission corridor alignment alternatives, tower scale and dimensions, layout, and the zone of cleared vegetation along the length of the corridor (350 feet for alternatives 2, 3, 4 and 5, and 100 feet for alternative 2b).
2. Establish the project visual analysis study area: for this analysis, the study area corresponds to the area between the VSLs, as described in chapter 2.
3. Determine the viewshed of the study area. A viewshed can be thought of as the ‘seen area’ from a given point in the landscape.
4. Determine KOPs, which provide a broad range of representative views from which to view the alternatives (described in more detail below).
5. Conduct field work to establish visual quality at KOPs in their present condition, evaluated using the visual quality rating process described above. The present visual character of the study area was also established during field work (refer to chapter 3).
6. Prepare visual simulations to represent the changes that would be expected under the proposed alternatives as seen from the KOPs (refer to appendix K for images of the existing conditions and simulated conditions).
7. Establish visual quality of the effects of the proposed action as described above using the simulations. Visual quality considers the entire view from a KOP, which may include positive or negative features that are not always able to be captured in the representative photograph used to

create the simulations. To account for this, the simulations were taken into the field and compared with the present view where feasible.

8. Determine visual impacts on KOPs based on the overall change in visual quality ratings. Also, a qualitative discussion of the overall effects of the proposed alternatives is provided in each conclusion.

Key Observation Points and Field Work

Key observation point is a term commonly used in visual resource analysis to describe an identified location and position of a viewer, for the purpose of evaluating potential action impacts from a wide variety of viewing contexts. For this analysis, KOPs are shown on figures 54 and 55. KOPs can be either sensitive points within the viewshed, typical points representative of a common landscape character or view type, or random points (FHWA 1988, 33). Typically, KOPs document the landscape from a stationary view and a level position. Locations of KOPs were determined through field work and consultation with NPS staff familiar with park resources.

In general, the KOPs selected include established scenic vistas; social and recreational attractions such as day-use areas, visitors centers, and campgrounds; cultural landscape resources such as historic sites; and points along roads and trails with special scenic qualities. In addition, points where an alignment would cross a resource feature (trail, river) were included. The locations of all preliminary KOPs identified for this analysis are shown on figures 54 and 55 (in chapter 3).

KOPs are a standard assessment tool used for visual quality impact; however, they are intended to identify representative views within the study area, and therefore they have certain inherent limitations. KOP photographs capture the viewscape as a snapshot in time at a specific location and looking at a defined direction. Level of visibility of the proposed actions could vary depending upon the season (leaf-on or leaf-off in a deciduous forest, for example), and atmospheric and weather conditions can extend or limit views into the distance. KOP analyses are not intended to consider every point in the landscape; they are however, intended to provide an adequate sample from which conclusions regarding potential impacts or benefits to a scenic resource can be determined. Changes to visual resources caused by the alternatives would be seen from locations other than those evaluated by the given KOPs. Also, the impact on a view is affected by the direction the viewer is facing. Consideration for these limitations and variables is included relevant to each KOP.

Field work to establish the study area and document existing view conditions at preliminary KOPs was conducted over two sessions during September and October 2010. Working in teams of at least two, each preliminary KOP was visited to establish visibility of relevant existing transmission or utility features, and representative views and the surrounding landscape were photographed. Each KOP was assessed using the FHWA Visual Quality Rating Scale described above, using a field data sheet to record visual quality ratings for unity, intactness and vividness. A third field work session was conducted in December 2010 after visual simulations representing proposed conditions had been prepared. When feasible, the simulations were brought into the field for comparison with the existing ‘on the ground’ view conditions. A detailed discussion on the creation of visual simulations is provided below.

Creation of Visual Simulations

Each KOP was visited to establish existing visual quality and to collect photographs. An approximately 27-millimeter focal length was selected to represent the field of view perceived by the human eye for all the simulations to best capture each view, including the appropriate context. A single photograph was then selected for each KOP, which was intended to depict a “typical view” of the alignment in the context

of the setting. Digital SLR [single lens reflex] cameras were used to create photographs for the simulations, as they provide the highest quality image and sharp detail close up and at a distance. Photographs were taken using Canon 50D (17- to 40-millimeter lens), Canon 5D Mark II (17- to 40-millimeter lens), and Canon T2i (18- to 55-millimeter lens) cameras.

Digital study area data were gathered and compiled to create a 3D model of each alignment using the primary modeling package (AutoCAD 2008). Elevation data acquired from U.S. Geological Survey Seamless Data Warehouse was used to define the elevation of the proposed tower structures, as well as the KOPs. In addition, GIS-based reference data (existing roads, selected park features, and the proposed alignments) were combined to create a reference file to confirm viewpoints were in the correct spatial relationship to the proposed 3D model. Finally, GPS points acquired during fieldwork provided accuracy in locating the position of the viewer in relation to the 3D model and existing features. Proposed towers were placed according to the design documents provided by the applicant for alternative 2, and approximately 1,200 feet apart for the remaining alternatives where the tower locations have not been determined, with some adjustment as appropriate for topography changes and angle points. The repositioned existing distribution transmission lines were shown within the ROW using the best available information based on industry standards relative to pole type and offset clearances. However, the exact design and placement of these lines is not known at this time.

Next, a 3D model of the proposed alignment, including towers, conductors, insulators, and wires, was modeled per details provided by the applicant. After the model was built in AutoCAD and reference points for the photographs were placed, the model was exported to a rendering software package, Vue 5 Infinite, which allows the application of photorealistic textures and realistic lighting. A virtual camera was placed within this software to correspond to the location of each KOP photograph. Textures were applied to depict proposed elements (i.e., Corten steel transmission towers), and lighting in the existing photograph was duplicated in the software package so shadows, time of day, and weather conditions were matched. The computer rendered the view from each virtual camera at each KOP, matching the angle of view at 27 millimeters to match the existing photograph. The rendering was saved as an image file for the next step.

The images were then prepared for inclusion in the EIS. Using photographic modification software, the photographs were altered to remove existing features, such as steel lattice towers and vegetation that would be removed according to the proposed alternative. The simulations show the proposed conditions at approximately 15 years after implementation, representative of the typical future condition. The 350-foot proposed ROW was used to define the vegetation removal limits from the photographs, and aerial photography combined with reference object dimensions, such as the existing and proposed towers, were used to determine the clearing effects in each photograph. In the case of more challenging areas, such as the alternative 3 crossing of Old Mine Road, a surface model of the existing terrain was created and a 350-foot-wide clearing was modeled to depict the changes as accurately as possible.

In areas where existing vegetation being removed would reveal something currently hidden from view, fieldwork photographs were used to represent the new viewshed. In cases where no reference photographs were available due to geographic features or dense forest, a typical texture of the same forest, land cover, or terrain type was used to replace the removed vegetation. After removing existing features, the rendering of the proposed improvements was overlaid and then appropriately blended into the existing photograph, with adjustments to account for distant haze and shadows from existing vegetation.

Context

Resource-specific context for assessing impacts to visual resources includes

- the Organic Act and the enabling legislation for all three park units specifically identifies scenery as a key resource
- the parks contain views that are unusual in this region in extent, vividness, intactness, and unity (i.e., unbroken views across miles)
- there is intrinsic value in beautiful scenery or views (like a commodity)

STUDY AREA AND VIEWSHED

The geographic study area for visual resources is divided as inside and outside the study area. The NPS cannot prescribe changes on lands outside its ownership, which are those outside the study area. However, due to the nature of scenic views, particularly distant views such as those in the landscape being analyzed for the EIS, visual changes outside defined ownership boundaries still have the potential to directly impact views as seen from adjacent protected areas, including those owned and managed by the NPS. Therefore, the conclusion statements under each alternative discussion refers to locations inside the study area and outside the study area, but the level of impacts on the visual resources were determined regardless of this consideration.

In addition, a second study area, unique to visual resources analyses and not addressed under other resource topics, was defined and considered. As stated previously, visibility is not always limited to defined boundaries, so impacts on visual resources must be considered beyond the localized vicinity of the proposed actions. To account for this, an additional preliminary ‘line of sight’ analysis was performed early in the process. This analysis used unique study areas for each alternative. Line of sight analyses are often used in visual resource analysis and can help identify patterns of visibility in the landscape of a proposed action, in this case, transmission towers. For this analysis, a zone of visual influence (ZVI) study area was initially defined at 20 miles from the DEWA boundary and the APPA centerline. This conservative distance was considered for two primary reasons. First, many park resources are located at geographic highpoint locations within park boundaries, offering broad vistas of the landscapes outside NPS ownership. Second, the large scale of the proposed actions increases the potential to see the transmission lines from a distance.

Each alternative was analyzed according to a unique corresponding ZVI study area. The area defined as 20 miles offset from DEWA and the centerline of APPA were then overlain onto an area defined as 20 miles offset from each alternative alignment, and the intersection of the two areas became the ZVI study area for the given alternative. This approach was effective for identifying geographic areas most likely to be impacted by the proposed actions.

Once the ZVI study area was defined for each alternative, a GIS line-of-sight analysis was conducted within in the ZVI study area for existing and proposed conditions for each alternative alignment. This process allowed for the identification of places in the landscape where existing transmission poles could be visible for each proposed alignment. The landscape terrain was represented by a 10 meter by 10 meter digital elevation model. Existing transmission poles were analyzed using the best available data, including pole height and location. Because proposed tower locations are not yet known, for the purposes of this analysis, preliminary tower locations were applied for each alternative along the same portion of the line as the existing poles, with spacing of six towers per mile where potential tower locations are unknown. The viewshed was then determined for each alternative by a GIS-based series of yes/no analyses whereby any grid square was highlighted if any part of any tower was visible. The results of these bare earth

visibility analyses were tabulated and are included at the end of each alternative discussion. The tabulations show areas (in acres) from which existing wood poles and proposed monopole towers could be seen under bare earth conditions from within DEWA, from the MDSR and from the APPA corridor, defined at 1,000 feet wide.

Although the ZVI analyses were useful for preliminary study, they consider the landscape under ‘bare earth’ terrain conditions (without regard for vegetation cover). Detailed vegetation cover data was not available for this level of analysis. Based on field observation, the undeveloped landscape in the study area is generally densely forested and views are commonly limited to the foreground or middle ground by surrounding vegetation. While the visual simulations taken at the KOPs have certain limitations because they are a snapshot in time (see Key Observation Points and Field Work), the bare earth ZVI analyses also has their limitations because they do not consider screening from existing vegetation. However, changes to vegetation from management actions and natural events such as blowdowns and wildfires could potentially open vistas and bring the towers and ROW clearing within view.

The final locations chosen to determine the effects of the proposed alternatives (i.e., the KOPs) were determined with the assistance of NPS staff familiar with park resources and field work.

References to the study area in the remaining portion of this visual resources analysis refer to study area established by the VSLs.

CUMULATIVE IMPACTS

Actions inside and outside the parks can affect scenic quality of views seen from in the parks. Replacement or restoration of park facilities would likely benefit overall visual quality, whereas activities outside the study area, such as expansion of natural gas pipelines or construction of cell towers, could degrade visual resources both inside and outside the study area. Past, present, and reasonably foreseeable future activities that would have beneficial or adverse impacts on visual resources in the parks, inside and outside the study area, are summarized here. Cumulative impacts on visual resources were then determined by combining the impacts from the projects listed below. These projects were taken from a list of potential cumulative projects developed for the S-R Line that can be found in appendix H. Overall cumulative impacts were considered for each alternative and are described below.

Projects Inside the Study Area

Inside of the study area, cumulative projects that would result in adverse impacts on visual resources include the following utility projects: Metropolitan Edison Utility Tree Removal and Trimming, and Metropolitan Edison Enhanced Vegetation Management Program (which will expose more of the transmission line and impact the viewscape); Federal Energy Regulatory Commission Relicensing of Yards Creek Generating Station; Jersey Central Power & Light vegetation maintenance; Marcellus Shale Natural Gas Drilling, Northeastern Pennsylvania and Southern New York; and Columbia Gas Transmission Company (new gas pipeline).

Many activities undertaken within DEWA to upgrade roads would beneficially affect visual resources, including: Smooth Ride Initiatives 2006/2007: Road Surface Rehabilitation throughout DEWA; US Route 209 Roadway Surface and Health and Safety Improvements; Old Mine Road South Rehabilitation; DEWA 14(7) Rehab Remainder of US Route 209; Alternative Transportation Program; US Route 209 Commercial Use Expiration 2015. Other infrastructure improvements within DEWA would beneficially affect visual resources, including Hazardous Structure Demolition/Deconstruction; Stabilize and Repair Damaged Structures; Kittatinny Point Visitor Center Storm Recovery; Kittatinny Point Boat Launch Replacement; River Campsite Restoration of Flood-Damaged Sites; Re-route 150 Feet of Coppermine

Trail; and Agricultural Leases (which would preserve agricultural lands). Although the beneficial impacts of these actions could positively affect visual resources, the beneficial impacts would not outweigh the adverse impacts from the above-mentioned projects. Cumulative impacts inside the study area would result in adverse impacts on visual resources.

Projects Outside the Study Area

Outside of the study area, cumulative projects that would result in adverse impacts on visual resources include the following utility and energy projects: Tennessee Gas Line Proposal; PJM Interconnection Proposal; PPL Proposal for Transmission Line Substation; Blue Mountain Ski Resort Community Scale Wind Turbine, Palmerton, Carbon County, Pennsylvania; and wind turbines in Northeastern Pennsylvania.

Outside of the study area, some NPS activities would beneficially affect visual resources in other parts of the park, including Regrade Six Historic Building Sites, Phase II (Parkwide); Pocono Environmental Education Center Cabin Replacement; Rehabilitate Childs Park; removing dead and dying trees; and upgrading cultural and recreational facilities. The designation of agricultural security areas would also be a beneficial impact, because agricultural security areas would help preserve traditional land uses and views. Such agricultural security areas include Pike County Agricultural Security Areas; New Jersey Highlands Water Protection and Planning Act (Highlands Council); Pocono Forest and Waters Conservation Landscape Initiative (PA Department of Conservation and Natural Resources); New Jersey State Forests, Parks, & Wildlife Management Areas—NJ DEP Natural Lands Management Program; PA Forest Stewardship Program; NJ Forest Stewardship Program; Sussex County Farmland Preservation; Warren County Farmland Preservation; Monroe County Agricultural Land Preservation Program; Northampton County Farmland Preservation Agricultural Security Areas; County Open Space Plans; Common Waters Partnership (Common Water Fund); TNC New Jersey Chapter; TNC Pennsylvania Chapter Northeast Region; and Wallkill NWR; Cherry Valley NWR. Although these projects could positively affect visual resources, the beneficial impacts would not outweigh the adverse impacts from the above-mentioned projects. Cumulative impacts outside the study area would result in adverse impacts on visual resources.

Projects Specifically Affecting APPA

For APPA, the geographic range for cumulative impacts on visual resources is the entire trail, Maine to Georgia, and includes transportation and infrastructure crossings (roads, bridges, ROWs) that degrade the visual resources of APPA. Scenic quality of the trail is already adversely impacted by other actions.

The development and utility projects listed above, particularly the Marcellus shale and Columbia and Tennessee pipelines, would also adversely affect APPA. The resource management and restoration plans and activities would offer beneficial effects. Additional adverse impacts occur from activities already implemented or planned along the entire length of the trail, including Dominion/Allegheny Power 500-kV Transmission Line Project, 317 antennas 29 greater than 200 feet tall (e.g., cable television, communication towers) within five miles (113 in Pennsylvania, 9 in New Jersey); 63 pipelines (28 in Pennsylvania, 1 in New Jersey); 94 electrical power lines (33 in Pennsylvania, 4 in New Jersey). In addition, approximately 1,500 transportation infrastructure facilities, including local roads, park roads, highways and interstates, and railroads are within, or proposed for development within, the vicinity of APPA (228 in Pennsylvania, 85 in New Jersey).

Of these projects, most are complete and currently affect the visual resources of APPA. The following projects are planned for the future: four transmission line upgrades in Virginia, West Virginia, and New Hampshire, three natural gas line upgrades in Pennsylvania and New Jersey, the Berks County Public

Safety Communications Project (3 tall communication towers on Kittatinny Ridge), and the Highland Wind farm in Maine. Additionally, the continued and expanded exploration of shale gas in the Allegheny Plateau is expected to continue and accelerate the need more transmission projects. Likewise, the increasing interest in development of ridge-top wind resources will generate more projects of that type. The expansion of the cellular network resulting in additional towers is also expected to continue.

IMPACTS OF THE ALTERNATIVES ON VISUAL RESOURCES

Common to All Alternatives

Outside the Study Area: Outside the study area, regardless of which alternative is selected, the transmission line could pass through Carbon, Lackawanna, Luzerne, Monroe, Northampton, Pike, and Wayne and counties in Pennsylvania and Morris, Sussex, and Warren counties in New Jersey. The clearing, construction, and vegetation maintenance activities outside the study area would be consistent with those described for inside the study area. The direct impacts from construction and maintenance of the line outside the study area cannot be determined, as described in the introduction of this chapter. In addition, specific impacts outside the study area cannot be identified until the route is chosen by the applicant.

As indicated in chapter 3, the transmission line would cross a variety of different types of publically accessible protected areas. Under the action alternatives, a wider cleared ROW, taller monopole towers, larger more numerous conductors, and additional access roads could impact visual resources in these areas. The action alternatives would result in noticeable change in scenery. However, adverse impacts would result only from areas where the changes in overall visual quality as a result of the action alternatives were in conflict with stated management plans, policies, or guidelines established for visual resources within these areas. The intensity of impacts would depend on the location and duration of the activity, season, and weather conditions.

Outside the study area, views from APPA would be affected upon approach to the transmission line. Depending on the route outside the study area, the transmission line could cause visual impacts, especially if the line causes disruptions to the middleground, creating a noticeable contrast to the trail scenery and affecting the unity and intactness of the views near the crossing.

Additionally, outside the study area, alternatives 4 and 5 would cross a small section of Cherry Valley NWR in Pennsylvania. As noted in chapter 3, the refuge would permit public access for day use. The stated “premier task” of the refuge is “conserving wildlife” (USFWS 2010c). Cherry Valley NWR is not explicitly managed for visual quality. However, the disruption of forest cover caused by the wider ROW and the presence of large transmission infrastructure could adversely affect scenery relative to a protected natural landscape. Outside the study area, alternatives 4 and 5 would cross the Delaware River. Changes to views, such as views from pedestrian bridges, could result from the increase in tower height and larger more numerous conductors seen crossing the river. These impacts would affect visual resources because they would represent a new visual intrusion where none currently exists. However, the level of impact would depend on whether such views or areas are managed or protected with regard to visual quality.

Outside the study area, impacts on visual resources would be caused by vegetation clearing, construction of the transmission line, operation and maintenance of the transmission line, and vegetation maintenance with the severity depending on the area the line was passing through and any stated management policies, plans, or guidelines for the protection of scenic views or visual quality. Cumulative impacts outside the study area would result in adverse impacts on visual resources as described previously in the “Cumulative Impacts” section. When the impacts on visual resources as a result of activities outside the study area are

combined with other past, present, and reasonably foreseeable projects in the study area, an overall adverse cumulative impact would be expected.

Alternative 1: No Action

Under the no-action alternative, the existing corridor, galvanized steel tower structures, and conductors would remain visible from recreation sites, scenic trails, and scenic drives in DEWA. The existing corridor and structures would also remain visible where the alignment crosses APPA. The existing transmission line ROW would not be widened. Overall visual quality scores for alternative 1 (the present alignment) under existing conditions are provided in table 53.

Affected KOPs with visibility of the existing alignment include the following:

- APPA (where the alignment crosses)
- Old Mine Road
- Fernwood Resort at Hwy 209
- Hamilton Ridge Trail; Pioneer Trail
- McDade Trail near the Schoonover House
- Millbrook Village (vicinity)
- Watergate Recreation Site
- Van Campen Glen Trail
- MDSR (east of Bushkill)
- Hamilton River campsites

In general, the existing transmission alignment prevents the potential for high visual quality where the alignment is visible. The existing alignment hinders visual unity due to the large transmission structures conflicting with the natural, undeveloped aesthetic seen throughout DEWA and along APPA in the study area. Particularly, the existing alignment disrupts the dominance, scale, and diversity of the visual patterns present in the naturally occurring landscape. The abrupt interruption of vegetation created by the cleared ROW also disrupts the visual harmony associated with nationally protected scenic resources, particularly in the regional context of northeast Pennsylvania/western New Jersey, where the undeveloped landscape is predominantly vegetated by mixed deciduous forest.

The presence of the existing alignment also adversely affects visual intactness. Visible towers and conductors represent incompatible intrusions that encroach upon the natural setting. The cleared ROW creates a visually reductive swath that can interrupt continuous forest cover and cause it to appear fragmented. The presence of the alignment tends to diminish overall intactness of the scenic natural area due to the appearance of the transmission line infrastructure. Depending on viewpoint location, the cleared ROW creates unobstructed viewshed corridors along which the lattice towers and conductors can be seen into the distance, typically until visibility is bounded by a topographic feature, commonly a ridgeline. Visual encroachments from the existing alignment are therefore accentuated when viewed from with the ROW looking parallel with it; such as where roads and trails intersect the alignment.

Visual vividness, or memorability, is also affected by the presence of the existing route, because protected scenic resources are often valued, and thus remembered, for their freedom from otherwise ubiquitous and typically unsightly infrastructure elements.

Operation of the existing transmission line would require periodic maintenance, including clearing and mowing of vegetation in the ROW. Definitive vegetation management carried out by the applicant within the existing ROW is not known, so the impacts can only be estimated. All maintenance activities, particularly recent vegetation removal and the presence of large equipment, have the potential to adversely impact protected scenery.

For these reasons, continued operation of the existing alignment, alternative 1, would result in adverse impacts on the visual resources of DEWA, MDSR, and APPA. Conversely, at APPA, the existing ROW clearing provides an opportunity to view east and west, which would not be possible without the continued maintenance of the corridor.

Cumulative Impacts

Cumulative impacts inside the study area from past, present, and reasonably foreseeable projects would result in adverse impacts on visual resources as described previously in the “Cumulative Impacts” section. When the impacts on visual resources as a result of alternative 1 are combined with other projects in the study area, an overall cumulative adverse impact would be expected.

The past, present, and reasonably foreseeable projects identified along the length of APPA would produce adverse cumulative impacts on the trail as explained in the “Cumulative Impacts” section. When the impacts on visual resources as a result of alternative 1 are combined with other projects that affect APPA, an overall adverse cumulative impact would be expected.

Conclusion

Alternative 1, the no-action alternative, would result in the continued presence, operation, and maintenance of the existing transmission line route. Vegetation clearing would result in adverse impacts during maintenance activities and for a time after maintenance activities. When combined with the impacts on visual resources under alternative 1, the effects of past, present, and reasonably foreseeable future projects would result in adverse cumulative impacts on visual resources inside the study area, and adverse cumulative impacts specifically on APPA.

Considering the intensity of the impacts of alternative 1 in the context of the purposes for which these parks were established and are managed, the adverse impacts of alternative 1 on visual resources are not considered to be significant. The existing line diminishes the high visual quality of an otherwise intact natural scenic area; however, the existing line was present when the parks and MDSR were established and thus, was part of the existing conditions. The existing line is partially screened from some locations because of the relative height of the towers versus the surrounding forest canopy. The actions under alternative 1 would be in keeping with the parks’ enabling legislations, *NPS Management Policies 2006*, and all other applicable federal and state laws. 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 combined context, duration, and intensity of these impacts do not result in significant impacts.

Common to All Action Alternatives

Mitigation Measures: Mitigation measures would be implemented to reduce impacts on visual resources and are taken into consideration in the impact analysis. Mitigation measures are described in appendix F.

Alternatives 3, 4, and 5 include the removal of all or a portion of the B-K Line as described in chapter 2. For these alternatives, the existing B-K Line corridor would be allowed to revegetate, ultimately returning

to forested habitat; under alternatives 2 and 2b the proposed transmission line would be constructed along the existing B-K Line alignment.

During removal and disposal of existing structures, there would be adverse visual impacts from grading activities, dust production, removal of the crane pads and equipment at wire pull sites, disassembly and removal of lattice towers, creation of access roads, and transportation of construction equipment to and from the decommissioning sites. There would be similar impacts related to construction of the new line including grading activities to create level pads for tower sites, construction of foundations, and construction of steel towers, including wire installation. New pulling and splicing sites, as well as new construction staging locations, would further adversely impact scenery and views near the construction activities. Short duration construction detours and/or road closures may increase road signage and create traffic congestion, which would adversely impact general scenic quality in DEWA. In general, construction-related impacts would be most acute where the activity is visible in the foreground to middleground, between 0.25 and 2 miles away. Impacts on visual quality and scenic views during the operation of the proposed action alternatives would vary by alternative, as discussed in subsequent paragraphs.

Because some ROW expansion is necessary only for construction safety and maneuverability, a portion of the corridor along the ROW would be allowed to revegetate after construction is complete. Only the width of the ROW necessary to maintain access roads and the transmission line would continue to be maintained, up to 350 feet. However, for the purposes of this analysis, all visual simulations assume clearing of the entire 350-foot standard ROW width. Revegetation would improve visual quality of DEWA and APPA by potentially increasing the extent of vegetation screening between the proposed action and the viewer, slightly lessening the long-term effects of the ROW expansion.

Maintenance vehicles and field crews would be periodically visible locally from KOPs associated with the alternatives. Effects of recent vegetation clearing (i.e., visible pruning scars, recently removed tree branches and stumps) would adversely impact visual quality where the proposed corridor is visible in the foreground, such as at locations where the alternative passes over a scenic trail or MDSR. It is anticipated that the proposed ROW would be maintained approximately every year or as deemed necessary by the applicant.

For all the action alternatives, certain dynamic components of the visual environment would interact with the proposed actions creating some level of variability in the resulting impact. Examples of these components include ephemeral qualities, such as weather conditions (e.g., low cloud cover or haze) and seasonal variations, such as the deciduous forest condition (leaf-on/leaf-off) and how that affects visibility from a given point. Solar aspect, also a seasonal consideration, would play a role in how the proposed ROW expansions appear when viewed from a moderate distance, because the greatest potential for visibility of the corridor occurs from the visual contrast caused by the shadow effect of the adjacent vegetation. Finally, the position of the viewer and the angle at which one views the alignment would affect the level of impact on visual quality. Each of these components is discussed if or when they influence the level of impact under the proposed alternatives.

It is expected that diverter devices would be placed on static wires and transmission conductors to prevent bird strike along specific segments of the alignment. The potential locations of the bird diverters in the context of the KOP locations and view direction are presented in figures 74, 75, and 76. See figures 54 and 55 for locations of all selected KOPs. The diverters would be required where the alignment would intersect with typical migratory bird routes: crossing MDSR and where the alignment passes over Kittatinny Ridge and the Hogback. Bird diverting devices are also discussed in the "Landscape Connectivity, Wildlife Habitat, and Wildlife" section of this chapter. Generally speaking, the devices would increase visibility of the lines by making the conductors more noticeable and would increase visual

clutter, especially when seen in the foreground. It is not currently known what type of device would be installed; however, the devices would be in accordance with APLIC standards and be considered the best available technology. The spacing of the devices on the conductors would be based on the type installed; but spacing could vary from 30 to 200 feet apart. Spiral wire diverters were originally analyzed along the alignment where diverters would be required. For the sake of completeness, marker ball devices were also considered and simulated at two KOPs at alternative 3: McDade Trail near MDSR and the crossing at APPA. The spiral wires and marker ball type diverters were each simulated for McDade Trail where alternative 3 crosses MDSR, and at APPA where alternative 3 crosses over the trail. Figures 3-4a and 3-4b and 3-13a and 3-13b in appendix K depict possible diverter types that could be installed, and the corresponding visual impacts of each. Based on these simulations, the marker balls would result in greater visual impact than the spiral wire because they result in greater visual clutter and would be visible from further away.

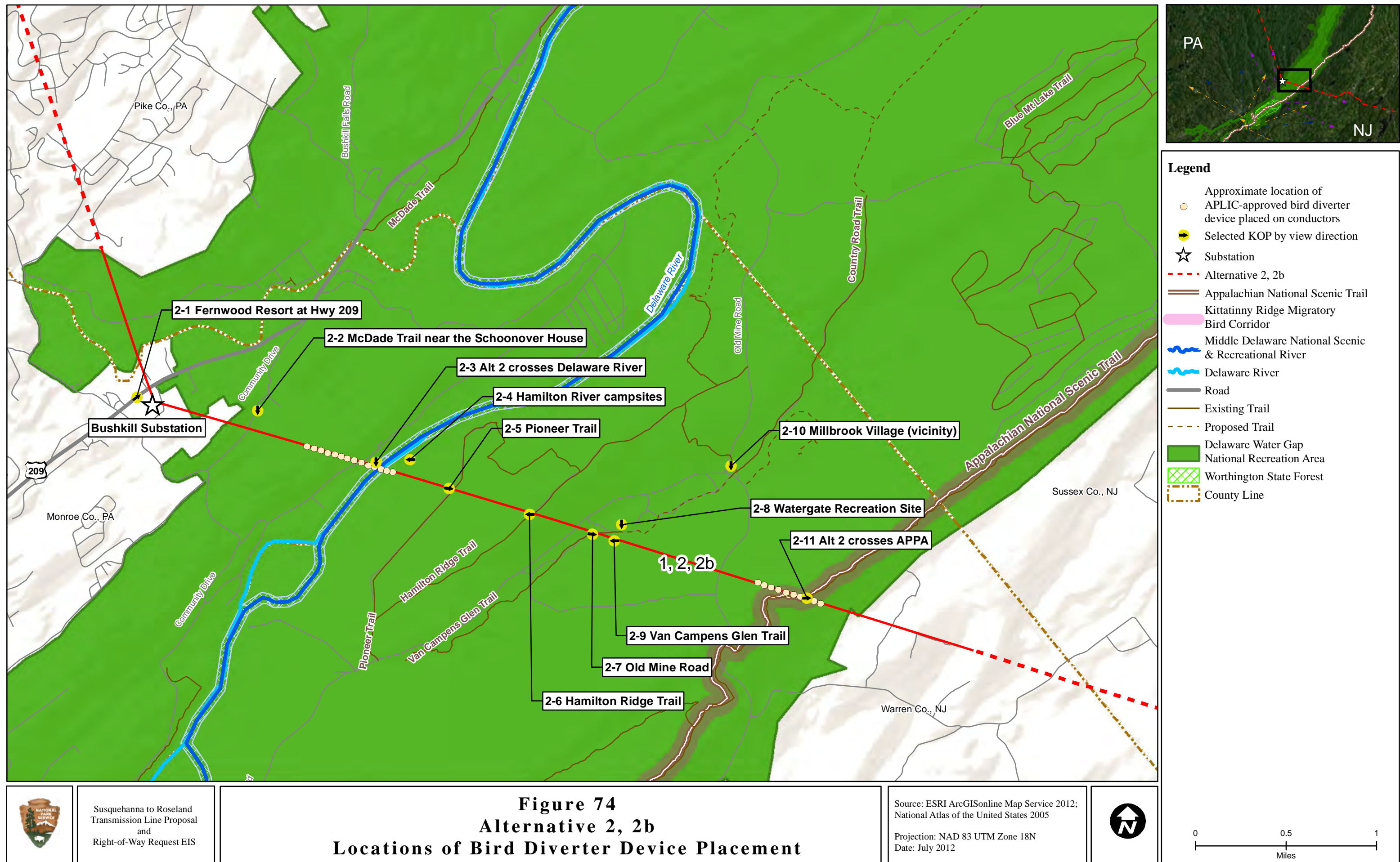
The following analysis and evaluation for each alternative were based on the changes in visual quality at each selected KOP with visibility of a given alternative. Qualitative discussion of the impacts (considering changes to unity, intactness, and vividness) are provided, followed by the change in the visual quality numeric rating, based on FHWA methodology to provide objective analysis. General changes to visual resource resulting from the alternative are also described following each alternative description.

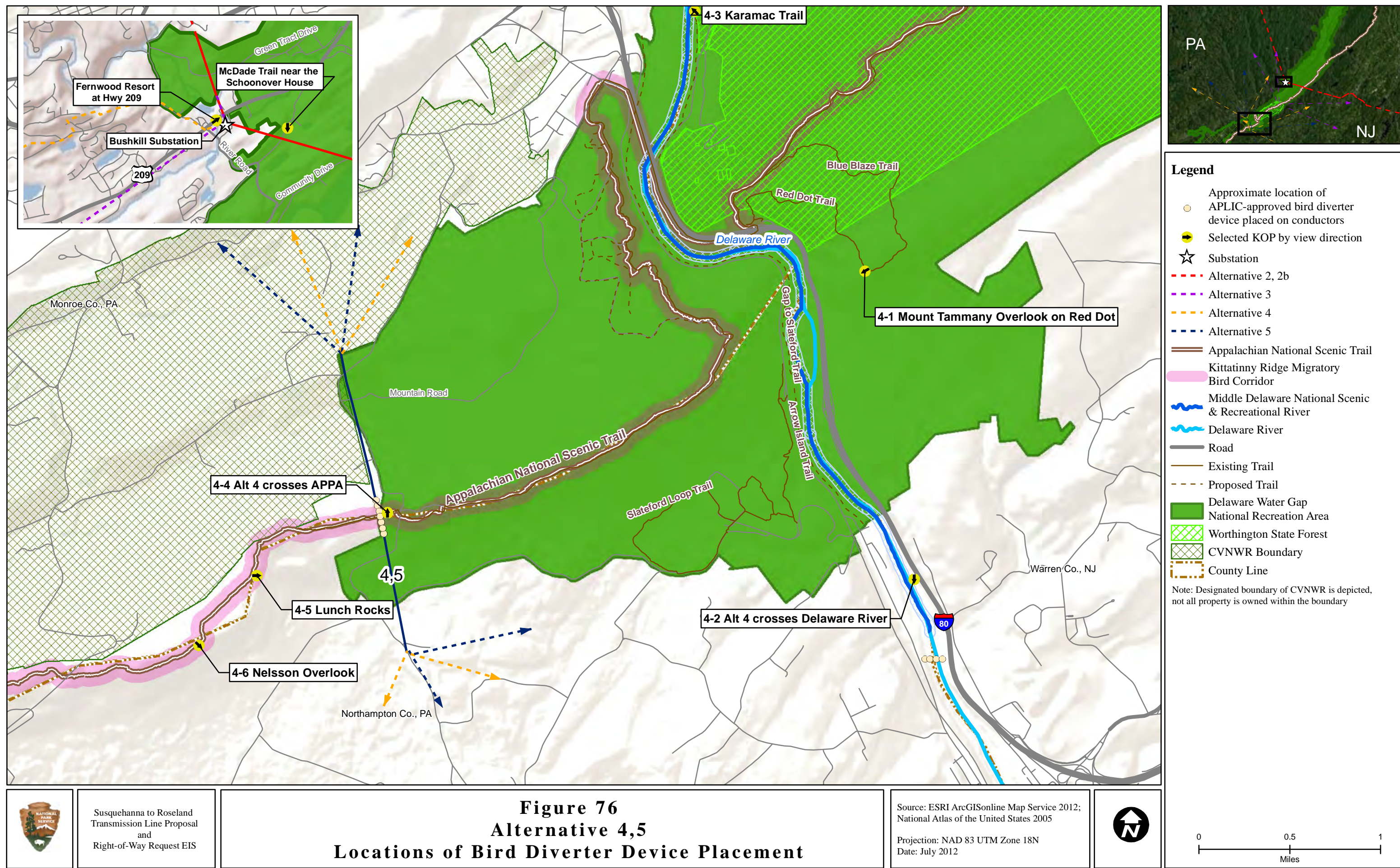
Alternative 2

Alternative 2 would result in widening the existing transmission line ROW through DEWA, MDSR, and APPA for approximately 5.6 miles. The existing structures and lines would be removed and replaced with new monopole towers and lines as described in chapter 2, resulting in a permanent loss of vegetation along the existing ROW. Proposed access roads for maintenance would be the same for alternatives 2 and 2b.

During the course of this analysis, including fieldwork and visual simulation production, certain preliminary KOPs were found to provide no visibility of the proposed actions, because the viewing distance was so great the impact would not be discernible, or vegetation or landform features blocked potential views. These KOPs were subsequently eliminated from further study. For alternative 2, these KOPs include the following:

- APPA at the future relocation section
- Culver fire tower
- Blue Mountain viewpoint
- Rattlesnake Mountain viewpoint
- Sunrise Mountain pavilion
- DEWA Cliff Trail overlooks
- Salamovka House
- Rivers Bend group campground
- Camp Mohican Lodge facility
- Pennsylvania Hwy 209 at Little Egypt Road





Susquehanna to Roseland
Transmission Line Proposal
and
Right-of-Way Request EIS

Figure 76
Alternative 4,5
Locations of Bird Diverter Device Placement

Source: ESRI ArcGISonline Map Service 2012;
National Atlas of the United States 2005

Projection: NAD 83 UTM Zone 18N
Date: July 2012



Visual simulations were prepared to depict the changes for KOPs impacted by alternative 2 and are included in appendix K (figures 2-1 through 2-11). Affected KOPs with potential visibility of the proposed actions under alternative 2 include the following:

- Fernwood Resort at Hwy 209
- McDade Trail near the Schoonover House
- MDSR (east of Bushkill)
- Hamilton River campsites
- Pioneer Trail
- Hamilton Ridge Trail
- Old Mine Road
- Watergate Recreation Site
- Van Campen Glen Trail
- Millbrook Village (vicinity)
- APPA (at the point where the existing alignment passes over)

Table 53 summarizes changes in the overall visual quality for the affected KOPs for alternative 2, based on the FHWA scale of 0 to 7.

TABLE 53: ALTERNATIVE 2: SUMMARY OF CHANGES TO VISUAL QUALITY RATINGS* AT IDENTIFIED KOPS

KOP Name	Visual Quality Score Under Existing Conditions	Visual Quality Score Under Simulated Proposed Conditions	Total reduction in Visual Quality, unless noted otherwise
Fernwood Resort	2.54	2.21	(0.33)
McDade Trail near Schoonover House and Community Dr.	5.04	3.42	(1.62)
MDSR at alternative 2	5.00	3.83	(1.17)
Hamilton River campsites	5.13	4.46	(0.67)
Pioneer Trail	3.04	2.50	(0.54)
Hamilton Ridge Trail	3.00	2.79	(0.21)
Old Mine Rd., at alternative 2	3.04	2.96	(0.08)
Watergate Recreation Site	4.67	3.38	(1.29)
Van Campen Glen Trail	3.08	2.33	(0.75)
Millbrook Village	4.42	3.92	(0.50)
APPA at alternative 2 crossing	2.71	2.92	Increase of 0.21 from specific KOP viewpoint (overall impacts to APPA in the vicinity of the crossing would be adverse)

*The ratings are based on the FHWA scale from 1 to 7.

Fernwood Resort, Pennsylvania Hwy 209

Proposed conditions are represented in appendix K, figure 2-1, “Proposed.” While Fernwood Resort is located outside the DEWA boundary, its proximity to the park along Pennsylvania Hwy 209 results in its serving as a visual point of access; therefore it has been included for the sake of completeness. As figure 2-1 in appendix K shows, the new towers would be much more visible compared with baseline conditions. Vegetation removal would be visible near the proposed tower and in the background as the alignment crests the slope. Visual unity would be reduced from low to very low to low; due to the scale of the proposed tower giving it stronger dominance in this view. However, in the context of the surrounding development, the change would be less pronounced. Intactness would be reduced due to the increased encroachment resulting from the introduced conductors and tower silhouetted against the sky, but would remain moderately low to average. Vividness for the existing commercial development is currently very low to low, and the proposed action would have adverse effects on this aspect of visual quality. The overall visual quality at Fernwood Resort would remain moderately low (however, the visual quality rating would be reduced from 2.54 to 2.21 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 0.33. Adverse impacts would occur on the visual resources of Fernwood Resort due to the alternative 2 alignment.

McDade Trail near Community Drive, Schoonover House

Proposed conditions are shown in appendix K, figure 2-2, “Proposed.” Vegetation would be removed to accommodate the proposed alignment, and the taller tower would noticeably extend above the tree tops. Due to the perpendicular angle of the view from McDade Trail at this point, the widened ROW would be somewhat subtle. Visual unity would be reduced from moderately high to high to moderately low to average due to the scale of the tower drawing focus away from the human-made structure (i.e., the barn) that previously was the focus. The visible tower and conductors appear out of proportion with the other visible elements, creating visual conflict. Intactness would also be reduced from moderately high to high to moderately low to average, as the tower and new conductors encroach upon the view and would be silhouetted against the sky. Vividness would be somewhat reduced from moderately low/average to moderately low, mainly due to the intruding human-made development impacting the ability of the scene to be remembered for its natural or historic and cultural uniqueness. The presence of access roads within the ROW would also contribute to adverse visual impacts compared to baseline conditions. The overall visual quality at McDade Trail at the Schoonover House would be reduced from high to average (shifting from 5.04 to 3.42 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 1.62. Adverse impacts would occur on the visual resources of McDade Trail, Community Drive, and the Schoonover House near the alternative 2 alignment.

MDSR

Proposed conditions are shown in appendix K, figure 2-3, “Proposed.” Along MDSR, the taller towers and larger conductors would become more noticeably visible compared with baseline conditions, in which the steel lattice structure is mostly screened from view until seen from directly beneath the alignment. Proposed conditions show the tower extending beyond the tree height, disrupting the scale and balance of the scene. Due to the angle of this view, the proposed vegetation removal would be only somewhat more visible moving toward the line, and then very apparent when viewed within the proposed ROW. For visibility to migratory birds, deflector devices in accordance with APLIC standards and considered best available technology would be installed on the conductors where they cross the river and ascending the Hogback Ridge. While the distance from which the diverters would be discernible would depend on type installed, when seen their presence would increase visual clutter and the ability of the conductors to be noticed.

Affects to visual unity would include a reduction to the existing harmony shown in the baseline condition, caused by the introduced tower and conductors conflicting with the natural view. Therefore, unity would be reduced from moderately high to moderately low. Intactness would be reduced from moderately high / high to average / moderately high due to the new encroaching features and vegetation removal increasing the apparent level of development and contributing to visual intrusions. Vividness would be somewhat reduced numerically but would remain average to moderately high due to the intrusion of incompatible human-made elements detracting from the otherwise memorable combination of natural elements: water, vegetation, and landform. The overall visual quality at MDSR would be reduced from high to moderately high (shifting from 5.00 to 3.83 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 1.17. Adverse impacts would occur on the visual resources of MDSR due to the alternative 2 crossing.

Hamilton River Campsites

Proposed conditions are represented in appendix K, figure 2-4, “Proposed.” Taller towers and vegetation removal would be apparent compared with baseline conditions, although the line of sight across the river would remain somewhat screened by trees. Hamilton River includes eleven relatively primitive campsites, and a central, representative site was selected for this analysis. The expanded ROW on the New Jersey bank (the nearer bank in the figure) would also be clearly visible from the campsite, as vegetation removal would likely extend to the northern edge of the campsite. It is possible that a new tower on the New Jersey bank would be visible from the campsite. A new or improved existing (i.e., cleared and graveled) maintenance access road is also proposed near the campsite. For visibility to migratory birds, deflector devices in accordance with APLIC standards and considered best available technology would be installed on the conductors where they cross the river and ascending the Hogback Ridge. While the distance from which the diverters would be discernible would depend on the type installed, when seen their presence would increase visual clutter and the ability of the conductors to be noticed.

Overall, visual unity would be reduced from moderately high / high to average / moderately high, as the proposed actions would conflict with the sense of visual remoteness, free from other visual cues of development. The noticeably cleared ROW across the river would also contribute to disrupted visual harmony. Intactness would be reduced from moderately high / high to moderately high due to the widened ROW vegetation removal and the new encroachment of the tower the conductors. Encroachment would be emphasized to the extent bird diverter devices were visible, particularly during winter ‘leaf-off’ conditions when opportunity to view the alignment would be greatest. Vividness would be reduced from average / moderately high to moderately low / average due to the intrusion of human-made infrastructural elements into the otherwise undeveloped setting, thus limiting the ability of the view to be remembered as highly natural. The overall visual quality at Hamilton River campsites would be reduced from high to moderately high (shifting from 5.13 to 4.46 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 0.67. Adverse impacts would occur on the visual resources of Hamilton River campsites due to the alternative 2 alignment.

Pioneer Trail

Proposed conditions are shown in appendix K, figure 2-5, “Proposed.” Taller poles, larger conductors, and substantial vegetation removal would occur where the trail passes under the alignment. The new, larger towers would have a longer span capacity, resulting in potentially fewer total towers, depending upon terrain, thus contributing to visual unity. As seen in the figure, the nearest tower would be on the distant horizon, rather than in the immediate foreground as in the baseline condition. However, overall unity would still be somewhat reduced compared with baseline conditions, mainly due to the expanded ROW vegetation clearing disrupting the naturally occurring landscape (thus decreased from low / moderately low to low). Intactness would also be reduced from average / moderately low to average, as

the proposed alignment would increase the apparent level of development and increase visual encroachments resulting from the tower fully silhouetted at the top of the ridgeline and the conductors obstructing the sky view. Vividness at Pioneer Trail would be reduced numerically, but would remain low to moderately low, primarily due to the substantial vegetation loss in the proposed ROW creating a manmade intrusion in the context of the scenic wooded landscape trail. No visual benefit would be provided by the cleared vegetation in terms of new views, as visibility would be limited to the near middleground by topography, and the surrounding landscape forms are not highly memorable. The overall visual quality at Pioneer Trail would be reduced from average to moderately low (shifting from 3.04 to 2.50 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 0.54. Adverse impacts would occur on the visual resources of Pioneer Trail due to the alternative 2 alignment.

Hamilton Ridge Trail

Proposed conditions are shown in appendix K, figure 2-6, “Proposed.” This KOP is located near Pioneer Trail, as described in the “Visual Resources” section of chapter 3. Impacts on the visual environment would be similar to those at Pioneer Trail; the widening of the cleared ROW being the most apparent change compared with existing conditions. However, the proposed tower design would produce a slight improvement in visual unity. The towers would be visually simpler compared with the steel lattice structures, and in the context of this view, would appear more visually concurrent surrounded by the vegetation due to the color, line, and form of the tower and the woody foreground vegetation. In addition, the position of the viewer- somewhat superior relative to the landscape as it falls away along the corridor- contributes to the proposed tower appearing less visually dominant compared with baseline conditions. Therefore, visual unity would be enhanced from low / moderately low to moderately low. Intactness would be reduced, from average to moderately low, due to the widened cleared ROW resulting in a visual manmade intrusion in the context of the scenic wooded trail. Vividness would not be substantially affected, as the clearing would create an opportunity to view the surrounding landscape. However, the vegetation removal would reduce the vegetation component of the vividness of the scene, and vividness would remain low to moderately low. The overall visual quality at Hamilton Ridge Trail would be reduced from moderately low / low to moderately low (shifting from 3.00 to 2.79 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 0.21. Adverse impacts would occur on the visual resources of Hamilton Ridge Trail due to the alternative 2 alignment.

Old Mine Road

Proposed conditions are shown in appendix K, figure 2-7, “Proposed.” Primary impacts would result from the visual fragmentation of the vegetation caused by widening the cleared ROW. Unity would be only slightly altered compared with baseline conditions, enhanced from low / moderately low to moderately low as the proposed monopole towers would be somewhat less visually obtrusive. Intactness would be reduced from average to moderately low to average due to the visual subtraction of forest cover and the encroachment of the conductors. Vividness would be reduced numerically, primarily due to the vegetation removal along the proposed ROW interrupting the otherwise forested scenic drive. Vividness would remain low to moderately low. The overall visual quality at alternative 2 crossing Old Mine Road would remain average (shifting slightly from 3.04 to 2.96 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 0.08. Adverse impacts would occur on the visual resources of Old Mine Road due to the alternative 2 alignment.

Watergate Recreation Site

Proposed conditions are shown in appendix K, figure 2-8, “Proposed.” As the figure indicates, the alignment abuts the edge of the picnic area at Watergate Recreation Site, so the proposed ROW expansion would likely encroach onto the existing open lawn area, which would expose much of lawn to wide views of the alternative 2 alignment. The taller towers would noticeably extend above the tree tops, disrupting the scale of the surrounding visual elements and adding visual clutter. Unity would be reduced from moderately high to moderately low due to the obvious presence of a major transmission line being out of visual harmony with the pastoral recreation area. Intactness would be reduced from average / moderately high to moderately low / average due to the encroachment of the proposed ROW corridor and the increased visibility of taller towers and more conductors. Vividness would be somewhat reduced from average / moderately high to moderately low / average due to the encroaching transmission structures limiting the ability of the area to be remembered as scenic and natural. The overall visual quality at alternative 2 crossing Watergate Recreation Site would be reduced from moderately high / high to average (shifting from 4.67 to 3.38 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 1.29. Adverse impacts would occur on the visual resources of Watergate Recreation Site due to the alternative 2 alignment.

Mitigation at Watergate Recreation Site could help reduce the level of impact expected. A conceptual representation of this mitigation is shown in appendix K, figure 2-8, “Mitigation.” Conceptual landscaping as represented in the figure shows how vegetation planted outside but along the utility ROW would likely look in approximately 15 years, consistent with the timeframe of this EIS. Beyond that, it is assumed that the vegetation would eventually grow to screen the elements of the alternative from many views in the Watergate Recreation Site picnic area, particularly views from the open picnic lawn thus reducing the overall visual quality impacts of the transmission line at this KOP. However, even after mitigating landscaping (i.e., trees) reaches mature size, it would not necessarily screen all visibility of the proposed towers from all points in Watergate Recreation Site, especially given seasonal changes in canopy cover and the varying topography of the area. Specifically, it is possible that the proposed towers would remain visible from the upper parking lot of the recreation area.

Van Campen Glen Trail

Proposed conditions are shown in appendix K, figure 2-9, “Proposed.” Impacts would be similar to those of Pioneer and Hamilton Ridge Trail KOPs. Taller towers would be visible from the trail and would extend higher than the tree tops. The widened clearing of the ROW would interrupt the surrounding forested landscape, creating a visual intrusion. Visual unity would be reduced at this view from low / moderately low to low as the proximity to the nearest tower emphasizes its scale, which does not harmonize with the visual order of the view. The expanded ROW would more strongly dominate the scene, also reducing visual harmony. However, if the towers were placed and thus seen from a greater distance, it is possible they could provide a slight increase in visual harmony compared with baseline conditions (i.e., steel lattice structures). Intactness would be reduced from average to moderately low due to the visual subtraction of the expanded ROW and from the towers silhouetted against the sky. Vividness would be slightly reduced compared with baseline conditions; from low / moderately low to low, as the widened ROW clearing would create a visual intrusion in the context of a scenic wooded trail. The overall visual quality at alternative 2 crossing Van Campen Glen Trail would be reduced from average to moderately low (shifting from 3.08 to 2.33 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 0.75. Adverse impacts would occur on the visual resources of Van Campen Glen Trail due to the alternative 2 alignment.

Millbrook Village, Vicinity

Proposed conditions are shown in appendix K, figure 2-10, “Proposed.” No visual impacts are expected under alternative 2 from in the village due to localized tree cover and structures limiting views predominantly to the foreground. However, the existing transmission alignment would be visible approaching the village from Old Mine Road, traveling south. Compared with baseline conditions, alternative 2 would be more noticeable as it passes at an angle across the background slope. Depending on atmospheric and light conditions, the conductors may be highly visible or blend into the vegetation, except where they are visible above the landform and thus become silhouetted. A contrasting shadow line along the proposed ROW would be visible during sunny days, particularly in the afternoon, causing the alignment to be more noticeable. Unity at this view would be slightly reduced from moderately high / average to moderately high due to the alignment conflicting with the texture, pattern, and line of the scene. Intactness would be reduced somewhat from average / moderately high to moderately low / average, as the conductors would add visual clutter and would be visible across the entire background of the view. Vividness would be reduced numerically, but would remain moderately low to average due to the presence of modern human-made infrastructure visible in proximity to an area intended to exhibit historic and cultural landscape values. The overall visual quality near Millbrook Village would remain moderately high (shifting from 4.42 to 3.92 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 0.50. Adverse impacts would occur on the visual resources near Millbrook Village due to the alternative 2 alignment.

APPA at Alternative 2 Crossing

Proposed conditions are shown in appendix K, figure 2-11, “Proposed.” Visual changes would include new steel towers, more and larger conductors, and an expanded ROW clearing, which would be visible when hiking toward the corridor and from the trail looking into the distance to the east. Bird diverter devices meeting APLIC standards would be required at this location, placed along the proposed alignment approximately 500-feet to either side of the APPA centerline.

From this specific KOP viewpoint, the form and color of the monopole tower harmonize slightly better in the context of the surrounding landscape compared with the existing steel lattice structure, marginally improving visual unity. However, this improvement would be offset by the disharmony created by the widened cleared ROW swath receding into the distance, emphasized by the angle of view looking parallel to the alignment. Overall unity would, therefore, be only slightly enhanced from low to low / moderately low. Intactness would receive some benefit from the proposed tower design reducing visual clutter in the foreground and opening the opportunity to view out. However, the taller monopole towers and larger conductor would remain encroachments, particularly because this location would require installation of bird diverters on the conductors. Also, the visual subtraction created by the widened ROW clearing in the middleground would negate some of the benefit. For these reasons, intactness would not be altered at this view. Vividness would be slightly benefited as the reduction in visual clutter would create an opportunity to view farther into the scenic landscape, and would be enhanced from low / moderately low / moderately low. Overall visual quality where alternative 2 crosses APPA would remain average. The visual quality score from this viewpoint would be marginally enhanced compared with existing conditions, shifting slightly from 2.71 to 2.92 on the FHWA scale of 1 to 7. This represents a slight increase in overall visual quality of 0.21 at this particular viewpoint, so visual quality could improve depending upon on the viewer’s position. However, overall, the expanded ROW clearing, taller monopole towers, and larger more numerous conductors (including diverter devices) would very likely degrade visual quality of views approaching the ROW and from other points within it relative to APPA. For these reasons, adverse impacts would occur on the overall visual resources of APPA at the alternative 2 crossing. It is also possible that the widened ROW could be seen from points along APPA where the ROW traverses outside the study area.

Zone of Visual Influence (ZVI) Bare-Earth Terrain Modeling

As described in the “Methodologies” section, table 54 provides areas (in acres) from which the existing lattice towers and proposed transmission towers could potentially be seen under bare earth conditions, for alternatives 2 and 2b, for lands within DEWA and along the APPA alignment (defined at 1000 feet wide). Similar tables indicating the ‘zone of visual influence’ are provided for each alternative. Figures representing this bare-earth analysis are provided for existing and proposed alignment conditions for all the alternatives in appendix K and in the Visual Resources Summary Report. Figures 77 and 78 present a comparison of the existing pole visibility across the alternatives and proposed pole visibility, respectively. See figures 79 and 80, respectively, for existing pole visibility and proposed pole visibility specific to alternatives 2 and 2b.

TABLE 54: ALTERNATIVE 2/2B VISIBILITY USING ZVI BARE-EARTH TERRAIN MODELING (ESTIMATED IN ACRES)

Pole / Tower height	Number of poles/towers within DEWA:	Potential Visibility from within DEWA	Potential Visibility from MDSR	Potential Visibility from APPA
Existing 85' lattice towers along the alternative 2 alignment	23	31,606	902	2,305
Proposed 195 foot monopole (6 towers per mile)	21 (alternative 2) 19 (alternative 2b)	35,307	1,506	5.903

Overall Alternative 2 Impacts

Activities related to deconstruction and construction near KOP sites would adversely affect visual resources and scenic views, as described in the “Common to All Action Alternatives” section. Under alternative 2, these impacts 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. Adverse impacts would depend on the extent to which deconstruction and construction activities could be seen, as well as the location of temporary spur roads. Adverse impacts would occur, with the most impacts related intense deconstruction and construction activities. Impacts related to operation and maintenance of the transmission line would be the same as for alternative 1: adverse.

Cumulative Impacts

Cumulative impacts inside the study area would result in adverse impacts on visual resources as described previously in the “Cumulative Impacts” section. When the impacts on visual resources as a result of alternative 2 are combined with other past, present, and reasonably foreseeable projects in the study area, an overall cumulative adverse impact would be expected.

The past, present, and reasonably foreseeable projects identified along the length of APPA would produce adverse cumulative impacts on the trail as explained in the “Cumulative Impacts” section. When the impacts on visual resources as a result of alternative 2 are combined with other projects that affect APPA, an overall adverse cumulative impact would be expected.

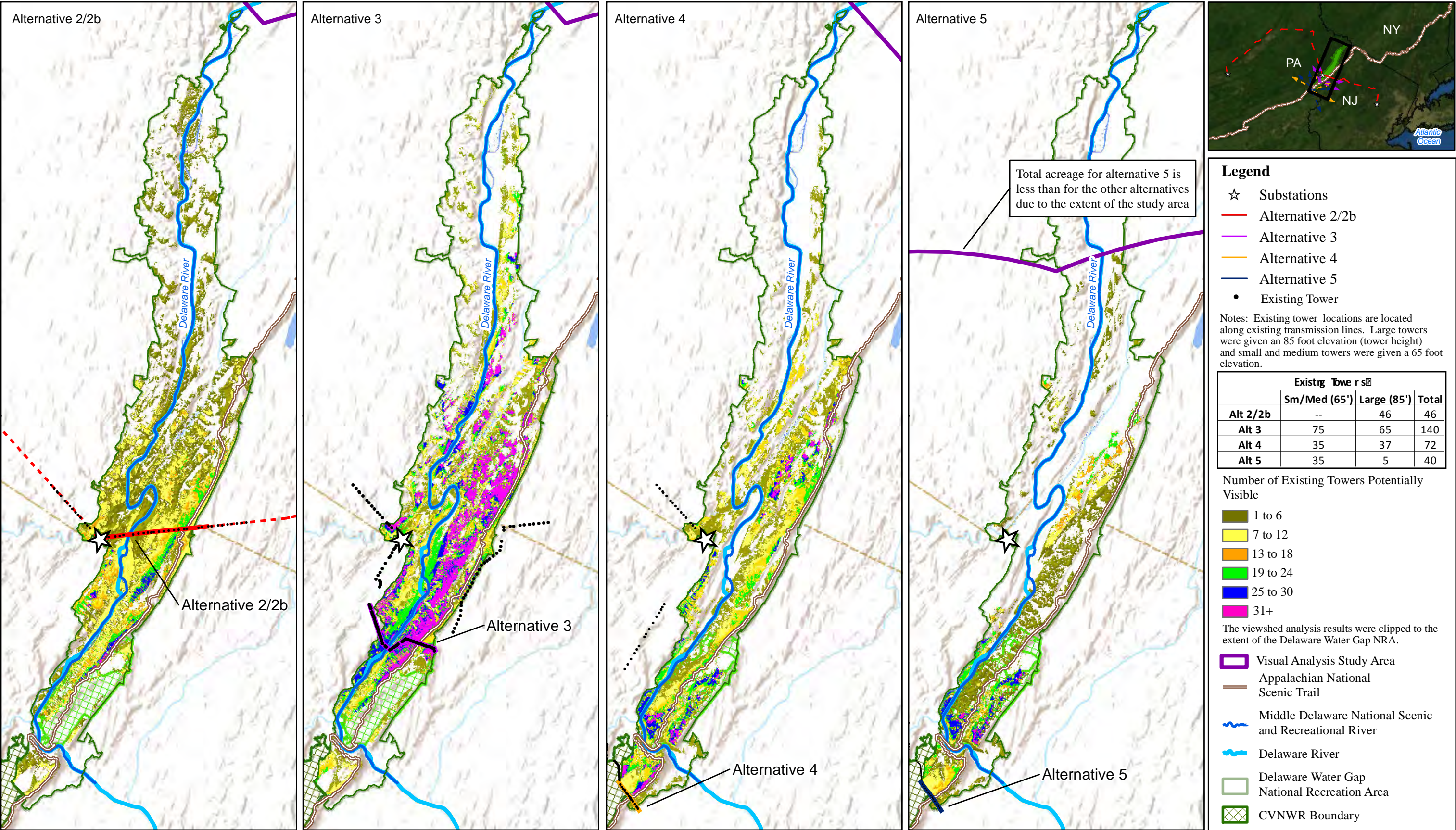
Conclusion

Inside the study area, alternative 2 would result in adverse impacts on visual quality and scenic views, in particular at the McDade Trail. In general, visual contrast resulting from shadow lines within the ROW corridor swath would be more apparent and visually dominant during spring and summer ‘leaf-on’ conditions; conversely, the taller towers and larger conductors would be more visible during winter ‘leaf-off’ conditions. The straight line formed by the B-K Line alignment provides opportunities to view the corridor at specific locations, such as beneath it while driving Old Mine Road. In such cases, the corridor would be highly visible and would encroach briefly as the viewer approaches or is within the ROW. The adverse impacts would potentially be highest at the Watergate Recreation Site depending on the proximity of the viewer to the transmission line. Impacts related to deconstruction and construction would be localized. Ongoing maintenance activities would be of limited duration and in specific locations, resulting in localized adverse impacts. When combined with the impacts on visual resources under alternative 2, the effects of past, present, and reasonably foreseeable future projects would result in adverse cumulative impacts on visual resources inside the study area, and adverse cumulative impacts specifically on APPA.

The applicant’s project would impact the portions of several resources inside the park that are also under pressure in the surrounding region. Multiple types of development outside of DEWA and APPA are quickly diminishing several of the resources analyzed on a broader scale, including scenic viewsheds. Alternative 2 would cross in the center part of DEWA, including the MDSR. In general, this area is one of the most undeveloped areas of the park, containing large swaths of contiguous mature forest with few manmade intrusions. Alternative 2 would cross close to a unique river feature, the Walpack Bend, which is a premier visitor attraction in DEWA. Installation of new taller towers would introduce a noticeable visual intrusion that would diminish scenic quality. This, in turn, would have adverse impacts on the MDSR through degradation of the scenic values for which the river was designated. The visual change would affect a relatively large area and a large number of users, and would exist for the period of analysis.

The crossing’s location in DEWA makes it visible from distant high points like APPA. For APPA, alternative 2 would traverse what is now a very natural and relatively unspoiled viewshed provided by these undeveloped lands below it. The applicant’s project is one component of a larger regional plan by the RTO.

The presence of large and obtrusive infrastructure in a relatively undeveloped zone would be a distraction and would detract from the experience visitors seek at the parks. It would degrade the regionally unique and unusual wilderness-like viewshed for APPA that DEWA and MDSR provide. A crossing at this location poses high risk for drastic scenic degradation. Alternative 2 contributes to the cumulative adverse impact on visual resources; in addition, the loss of visual resources in the region surrounding the parks would increase their scarcity and sensitivity inside the parks, where they are afforded special protection. Construction in this location would have some marginal beneficial impacts because replacement of the existing lattice structures with steel monopoles would reduce visual clutter at close distances.



Susquehanna to Roseland
Transmission Line Proposal
and
Right-of-Way Request EIS

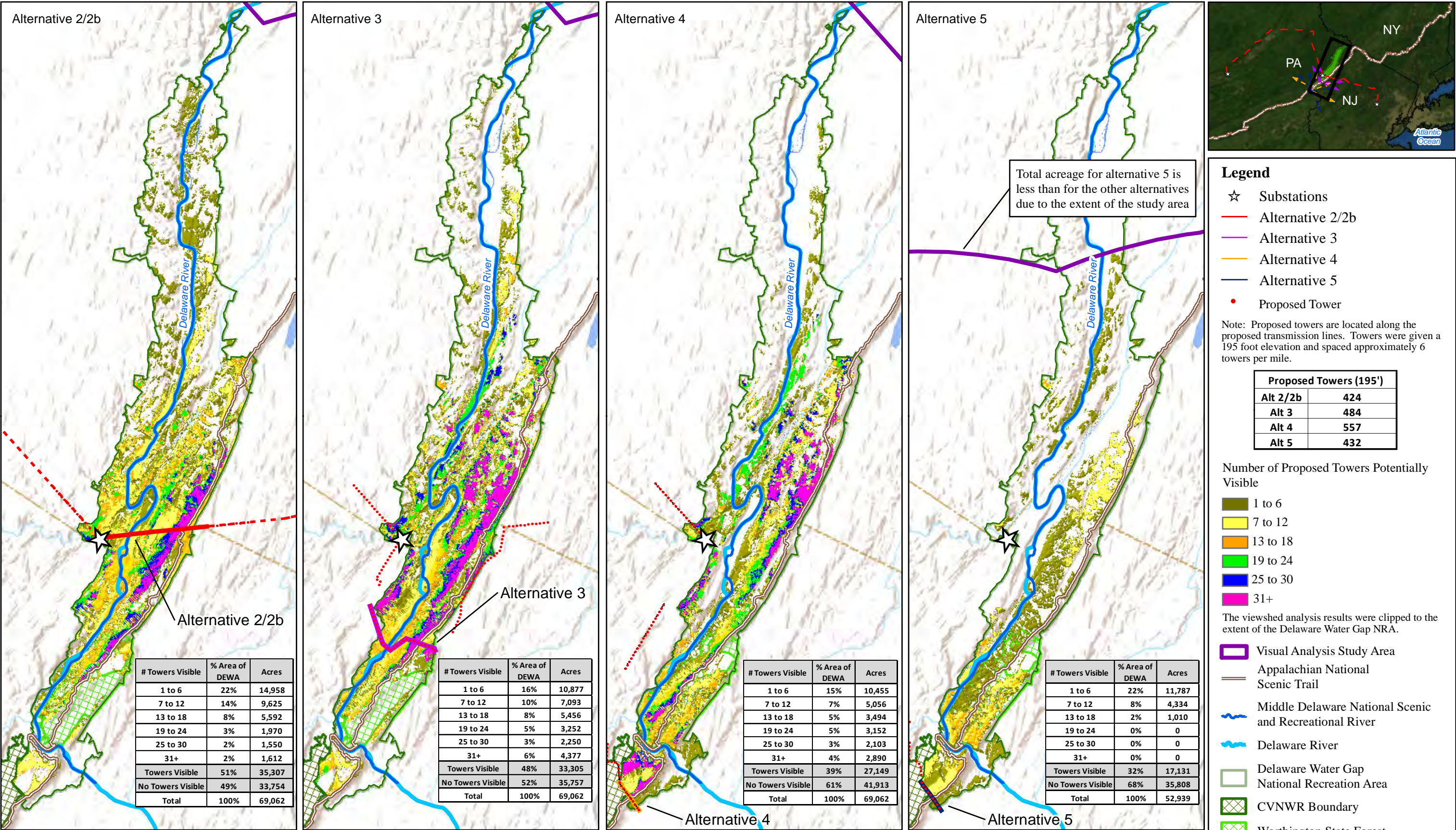
Figure 77
Existing Tower Visibility: Bare Terrain Analysis

Source: NPS 2010, EA Engineering 2010,
DEWA 2008, ESRI 2002, ESRI 2006, ESRI
2010, NJOIT - OGIS 2008, PASDA 2010

Projection: NAD 83 UTM Zone 18N
Date: July 2012



0 3 6
Miles



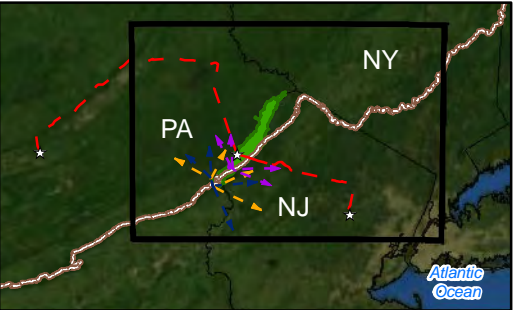
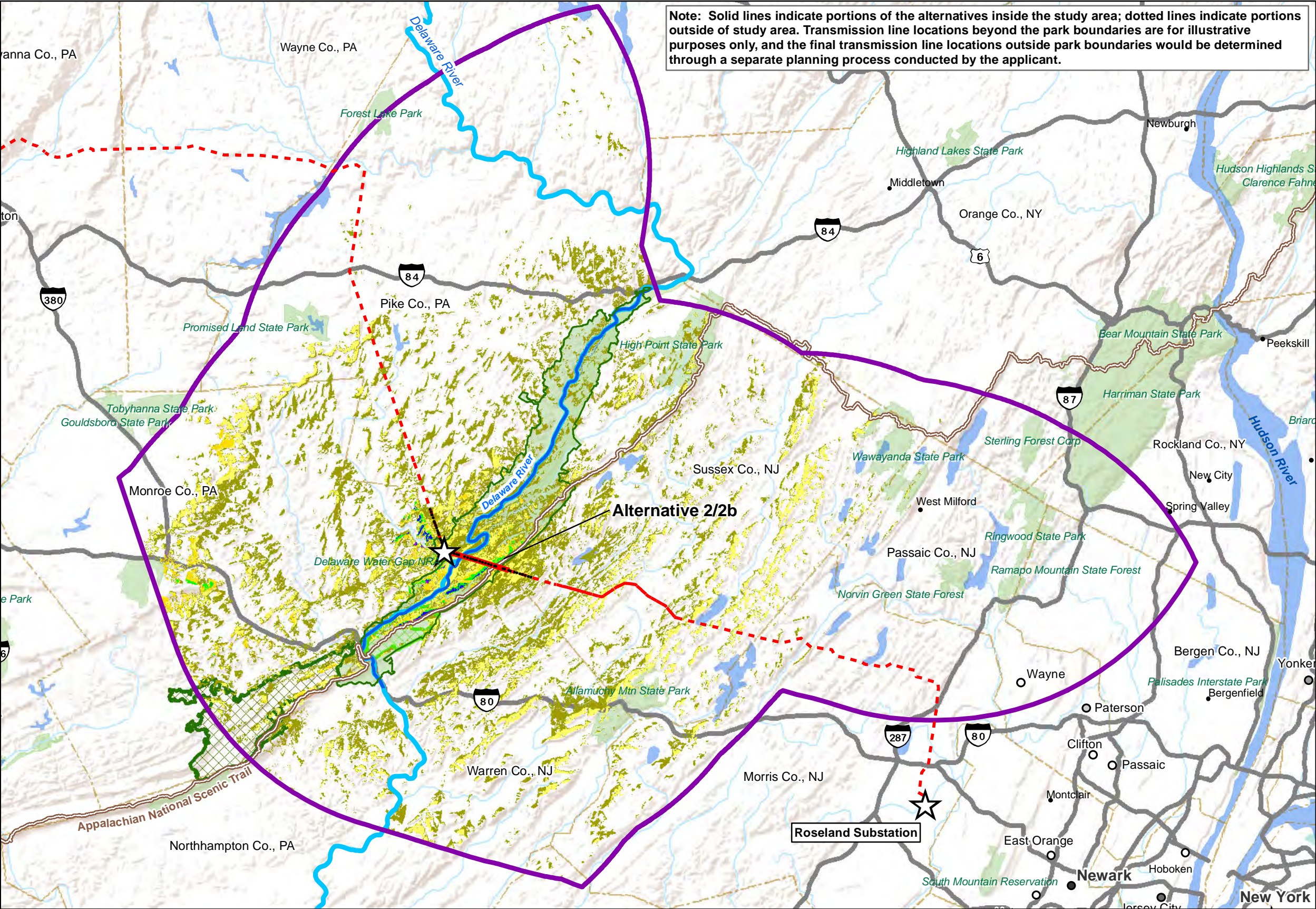
Susquehanna to Roseland
Transmission Line Proposal
and
Right-of-Way Request EIS

Figure 78
Proposed Tower Visibility: Bare Terrain Analysis

Source: NPS 2010, EA Engineering 2010,
DEWA 2008, ESRI 2002, ESRI 2006, ESRI
2010, NJOIT - OGIS 2008, PASDA 2010

Projection: NAD 83 UTM Zone 18N
Date: July 2012





Legend

- ☆ Substation
 - Alternative 2/2b
 - Number of Existing Towers Potentially Visible
 - 1 to 6
 - 7 to 12
 - 13 to 18
 - 19 to 24
 - 25 to 30
 - 31+
 - Existing Tower
 - Visual Analysis Study Area
 - Appalachian National Scenic Trail
 - Middle Delaware National Scenic and Recreational River
 - Delaware River
 - Delaware Water Gap National Recreation Area
 - CVNWR Boundary
 - Worthington State Forest
 - State Park
 - County Line
 - Interstate Hwy
- Notes: Existing tower locations are located along existing transmission lines. Large towers were given an 85 foot elevation (tower height) and small or medium towers were given a 65 foot elevation.
- The study area is defined as the union of the areas that are 20 miles from the DEWA boundary and 20 miles from the APPA alignment, intersected with the area that is 20 miles from the alternative alignment.



Susquehanna to Roseland
Transmission Line Proposal
and
Right-of-Way Request EIS

Figure 79
Existing Tower Visibility: Bare Terrain Analysis
Alternative 2/2b

Source: NPS 2010, EA Engineering 2010,
DEWA 2008, ESRI 2002, ESRI 2006, ESRI
2010, NJOIT - OGIS 2008, PASDA 2010

Projection: NAD 83 UTM Zone 18N
Date: July 2012

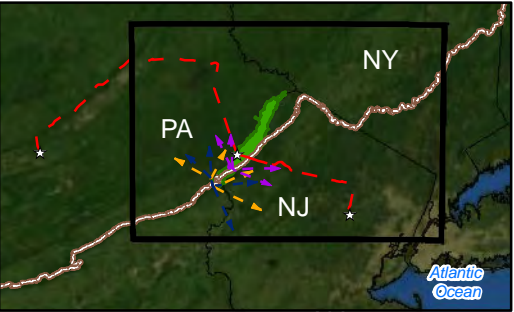
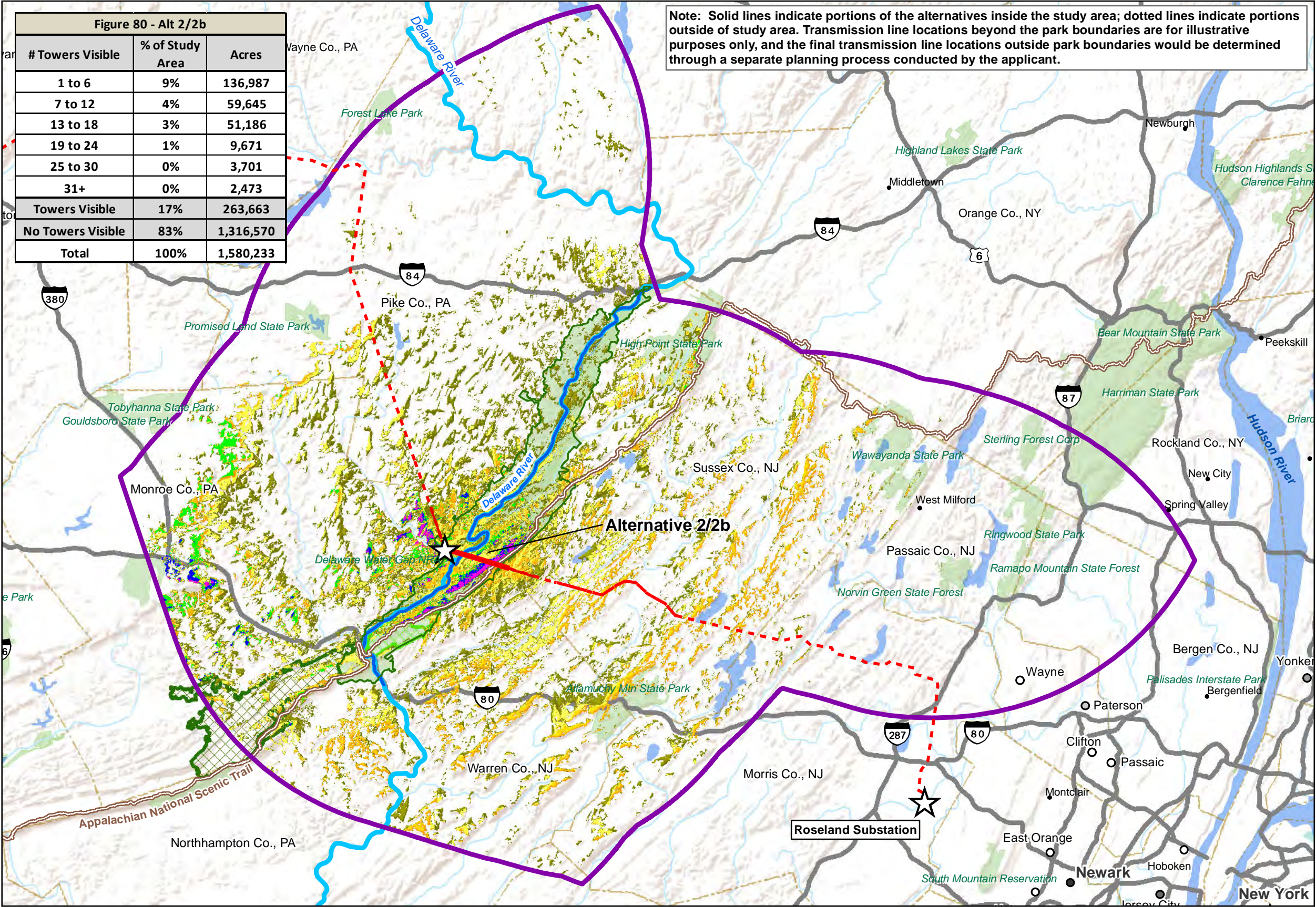


0 5 10
Miles

Figure 80 - Alt 2/2b

# Towers Visible	% of Study Area	Acres
1 to 6	9%	136,987
7 to 12	4%	59,645
13 to 18	3%	51,186
19 to 24	1%	9,671
25 to 30	0%	3,701
31+	0%	2,473
Towers Visible	17%	263,663
No Towers Visible	83%	1,316,570
Total	100%	1,580,233

Note: Solid lines indicate portions of the alternatives inside the study area; dotted lines indicate portions outside of study area. Transmission line locations beyond the park boundaries are for illustrative purposes only, and the final transmission line locations outside park boundaries would be determined through a separate planning process conducted by the applicant.



Legend

☆ Substation

Alternative 2/2b

Number of Proposed Towers Potentially Visible

1 to 6

7 to 12

13 to 18

19 to 24

25 to 30

31+

Proposed Tower

Note: Proposed towers are located along the proposed transmission lines. Towers were given a 195 foot elevation and spaced approximately 6 towers per mile.

The study area is defined as the union of the areas that are 20 miles from the DEWA boundary and 20 miles from the APPA alignment, intersected with the area that is 20 miles from the alternative alignment.

Visual Analysis Study Area

Appalachian National Scenic Trail

Middle Delaware National Scenic and Recreational River

Delaware River

Delaware Water Gap National Recreation Area

CVNWR Boundary

Worthington State Forest

State Park

County Line

Interstate Hwy

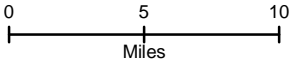


Susquehanna to Roseland
Transmission Line Proposal
and
Right-of-Way Request EIS

Figure 80
Proposed Tower Visibility: Bare Terrain Analysis
Alternative 2/2b

Source: NPS 2010, EA Engineering 2010,
DEWA 2008, ESRI 2002, ESRI 2006, ESRI
2010, NJOIT - OGIS 2008, PASDA 2010

Projection: NAD 83 UTM Zone 18N
Date: July 2012



Installation of new, more visibly apparent towers would introduce a non-conforming characteristic into the environment of these resources degrading their relevant integrities. Impacts to scenic resources would be significant. The taller towers and wider ROW would create a dramatic visual disturbance where very little disturbance currently exists. These impacts would be widely distributed across both APPA and DEWA at any location where the line is visible. Overall, the significance of the impact of alternative 2 is a result of two considerations: the particularly resource-rich area through which the alternative crosses, and the potential to inflict harm to those resources because of the magnitude and duration of the adverse impacts. Although it is true that not all impacts can be predicted with great certainty, in the context of the purpose and significance for which DEWA, APPA, and MDSR were established and NPS mandates to specifically preserve the natural, cultural, and scenic resources within them, additional precautions are warranted when considering risks to these resources, many of which are of national importance. Visual resources are under threat by other actions and outside pressure, which in the context of the function of the parks as an “oasis” or refuge within the highly developed east coast, elevates the need to preserve and protect these scarce, sensitive resources. Similarly, certain resources are non-renewable, which makes any impacts to them all the more serious because they cannot be replaced if lost. And some resources are under threat by other actions and outside pressure, which in the context of the function of the parks as an “oasis” or refuge within the highly developed east coast, elevates the need to preserve and protect these scarce, sensitive resources.

Public attention surrounding this project is high. There is likely to be a high degree of controversy over any effects on park resources that are particularly popular with the public, such as scenery, visitor use and experience, rare and unique communities, cultural landscapes, and historic structures, for any of the alternatives. The inherent uncertain nature of predicting the true degree of some of these impacts would likely heighten this controversy. Additionally, construction at this particular location in DEWA is likely to accentuate the controversy due to the unique characteristics presented here and high visitor traffic to the area.

Permitting the project would adversely affect multiple protected resources inside the parks, in some instances irreversibly. Allowing such impacts is contrary to typical NPS practice of improving scenic conditions by removing non-conforming features and may establish precedent for future actions. This could establish precedent that may invite similar proposals by other applicants in the future, and create an expectation of like treatment for those proposals; it may make it difficult to deny such proposals. DEWA and APPA both contain numerous other utility crossings, which makes the risk of such precedent particularly concerning for these parks. Furthermore, as units of the national park system, wherein all parks are entitled to equal protection, creating such a precedent could have ramifications for parks nationwide. The location of this particular crossing through the center of DEWA could make such a precedent even more potent. Installing the S-R Line on this alignment may invite future utilities proposing to follow the same route. Thus, the NPS believes that alternative 2 would result in significant adverse impacts to visual resources.

Alternative 2b

The alternative 2b alignment would follow the same route as alternative 2, described previously. However, under alternative 2b the proposed alignment would be constructed within the existing ROW limits currently in place within DEWA boundaries, which varies from 100 to 350-feet wide. The KOPs with potential visibility of the proposed actions under alternative 2b are the same as those for alternative 2. In general, alternative 2b would result in similar visual effects as alternative 2 given the coincident alignments. However, installing the proposed towers within the existing cleared ROW would have less noticeable visual effects compared with alternative 2 where vegetation widening is proposed.

Table 55 summarizes the change in overall visual quality ratings at the affected KOPs for alternative 2b, based on the FHWA scale of 1 to 7.

TABLE 55: ALTERNATIVE 2B: SUMMARY OF CHANGES TO VISUAL QUALITY RATINGS* AT IDENTIFIED KOPS

KOP Name	Visual Quality Score Under Existing Conditions	Visual Quality Score Under Simulated Proposed Conditions	Total reduction in Visual Quality, unless noted otherwise
Fernwood Resort	2.54	2.29	(0.25)
McDade Trail near Schoonover House and Community Dr.	5.04	3.75	(1.29)
MDSR at alternative 2b	5.00	3.83	(1.17)
Hamilton River campsites	5.13	4.75	(0.38)
Pioneer Trail	3.04	2.50	(0.54)
Hamilton Ridge Trail	3.00	2.79	(0.21)
Old Mine Rd., at alternative 2	3.04	2.79	(0.25)
Watergate Recreation Site	4.67	4.58	(0.09)
Van Campen Glen Trail	3.08	2.58	(0.50)
Millbrook Village	4.42	4.17	(0.25)
APPA at alternative 2 crossing	2.71	2.92	Increase of 0.21 at specific KOP location (impacts are anticipated to APPA as a result of alternative 2b)

*The ratings are based on the FHWA scale from 1 to 7.

Visual simulations were prepared to depict the changes for KOPs impacted by alternative 2b (appendix K, figures 2b-1 through 2b-11). Because the changes to the transmission corridor would be similar to alternative 2, it was not necessary to include detailed analysis for each KOP. However, numeric scoring of the proposed conditions based on the simulations was required to determine the intensity of impact. The results of that scoring are shown in the visual analysis matrix for alternative 2b included in appendix K. For those segments of the alignment where the existing ROW width is 100-feet or 150-feet, slightly less visual disruption and fragmentation would occur under alternative 2b compared with the expanded clearing proposed under alternative 2, especially when the ROW is viewed along its length. This difference is most notable relative to the overall intactness of a view and the vegetation component of the vividness of a view.

Overall Alternative 2b Impacts

Impacts from the height of the proposed towers, particularly when silhouetted against the sky, along with the larger and more apparent conductors, would be similar to alternative 2. This would result in adverse impacts at several KOPs under alternative 2b, with the most intense impacts at McDade Trail near the Schoonover House and Community Drive, and MDSR. Overall, alternative 2b would have adverse impacts on visual resources.

Cumulative Impacts

Cumulative impacts inside the study area would result in adverse impacts on visual resources as described previously in the “Cumulative Impacts” section. When the impacts on visual resources as a result of alternative 2b are combined with other past, present, and reasonably foreseeable projects in the study area, an overall cumulative adverse impact would be expected.

The past, present, and reasonably foreseeable projects identified along the length of APPA would produce adverse cumulative impacts on the trail as explained in the “Cumulative Impacts” section. When the impacts on visual resources as a result of alternative 2b are combined with other projects that affect APPA, an overall adverse cumulative impact would be expected.

Conclusion

Inside the study area, alternative 2b would result in adverse impacts on visual quality and scenic views. In general, similar to alternative 2, visual contrast resulting from shadow lines within the ROW corridor swath would be more apparent and visually dominant during spring and summer “leaf-on” conditions; conversely, the taller towers and larger conductors would be more visible during winter “leaf-off” conditions. The straight line formed by the B-K Line alignment provides opportunities to view the corridor at specific locations; however, for those segments of the alignment where the existing ROW width is 100 feet or 150 feet, slightly less visual disruption and fragmentation would occur under alternative 2b compared with the expanded clearing proposed under alternative 2. Installing the proposed towers within the existing cleared ROW would have less noticeable visual effects compared with alternative 2 where vegetation widening is proposed. Despite some marginally improved views from very specific view locations as a result of the removal of the lattice tower, shown at the KOP, impacts on APPA from alternative 2b would remain adverse. When combined with the impacts on visual resources under alternative 2b, the effects of past, present, and reasonably foreseeable future projects would result in adverse cumulative impacts on visual resources inside the study area, and adverse cumulative impacts specifically on APPA.

Though the route would be identical to alternative 2, alternative 2b would include two towers in addition to those required for alternative 2. These two towers would be located in the vicinity of Bushkill Substation. Through the course of this analysis, the additional towers were found to be screened from view from the selected KOPs—including Fernwood Resort—by vegetation and landforms. Adverse impacts could still occur, however, from other locations within DEWA where the towers could be visible.

As stated for alternative 2, many resources outside of the park units are under pressure from development; visual resources are being impacted by this development. Alternative 2b would cross through the middle of DEWA and MDSR, where many unique vegetation communities exist. The construction of the S-R Line through this portion of the parks would diminish scenic quality. For APPA, alternative 2b would traverse what is now a very natural and relatively unspoiled viewshed provided by these undeveloped lands below it. The visual change would affect a relatively large area and a large number of users, and would exist for the period of analysis.

Overall, the significance of the impact of alternative 2b is a result of two considerations: the particularly resource-rich area through which the alternative crosses, and the potential to inflict harm to those resources because of the magnitude and duration of the adverse impacts.

Public attention surrounding this project is high. There is likely to be a high degree of controversy over any effects on park resources that are particularly popular with the public, such as scenery, visitor use and experience, rare and unique communities, cultural landscapes, and historic structures, for any of the alternatives. The inherent uncertain nature of predicting the true degree of some of these impacts would likely heighten this controversy. Additionally, construction at this particular location in DEWA is likely to accentuate the controversy due to the unique characteristics presented here and high visitor traffic to the area.

Allowing impacts to scenic resources is contrary to typical NPS practice of improving scenic conditions by removing non-conforming features and may establish precedent for future actions. Thus, the NPS believes that alternative 2b would result in significant adverse impacts to visual resources.

Common to Alternatives 3, 4, and 5

Removal of the B-K Line: Under alternatives 3, 4, and 5, the B-K Line would be decommissioned and removed, allowing that corridor to be revegetated according to its natural condition, as described in chapter 2. Benefits of this action to the visual resources of DEWA and APPA would include improved visual cohesiveness and unity resulting from the unobstructed natural forest cover within. The absence of the B-K Line has the potential to improve overall vividness for views in DEWA, as the landscape would provide unencumbered views of natural forest and a greater aesthetic of remoteness consistent with a nationally protected scenic resource.

KOPs that would be directly benefited with regard to visual quality due to decommissioning, removal and revegetation of the existing alignment include the following:

- APPA at the crossing of the existing alignment (however, the benefits of the existing distant view opportunity created by the cleared vegetation there would be lost)
- McDade Trail near Schoonover House along Community Drive
- MDSR at the crossing of the existing corridor
- Hamilton River campsites
- Pioneer and Hamilton Ridge trails
- Old Mine Road
- Watergate Recreation Site
- Van Campen Glen Trail
- Millbrook Village

Impacts resulting from the decommissioning, removal and revegetation would be consistent with those discussed earlier for construction activities. The presence of dismantling equipment and periodic traffic congestion related to the activity would cause adverse impacts on the visual resources of DEWA and APPA, especially at the listed KOPs. Decommissioning and revegetating the existing B-K Line would improve the larger visual environment to these KOPs in DEWA and along APPA.

The following alternatives propose to follow various existing rights of way in the study area and vicinity, as described in chapter 2. Where an alternative would follow an existing transmission line for a portion of its route, the proposed 500-kV conductors and towers would be collocated within ROW with the existing line. The visual impact would be exacerbated by the inconsistent appearance and scale of the different lines: the proposed alignment consisting of tall monopole towers while the existing alignments include various styles of shorter wooden poles. For the purposes of this analysis, the visual simulations of the proposed conditions show repositioned existing distribution transmission lines based on the best available information in accordance with applicable safety and clearance standards. The final design and placement of these lines is not known at this time.

Alternative 3

The existing alignment the alternative 3 corridor would follow includes several angle points, where the route would change direction, resulting in the proposed corridor being visible from many different locations in DEWA and along APPA. Unlike alternative 2, the existing distribution line wooden poles along the route the alternative 3 alignment follows would be reconstructed within the proposed ROW, alongside the new line. Visual simulations show this proposed condition.

During the course of this analysis, including fieldwork and visual simulation production, certain preliminary KOPs were found to provide no visibility of the proposed actions, because the viewing distance was so great the impact would not be discernible, or vegetation or landform features blocked potential views. These KOPs were subsequently eliminated from further study. For alternative 3, these KOPs include the following:

- Camp Mohican Lodge facility
- Sunfish Pond

Visual simulations were prepared to depict the changes for KOPs impacted by alternative 3 and are included in appendix K (figures 3-1 through 3-18). Affected KOPs with potential visibility of the proposed actions under alternative 3 include the following:

- Hidden Lake Dam
- Smithfield Beach
- River Road (near the existing transmission alignment)
- McDade Trail at the crossing of the existing alignment
- Old Mine Road at the crossing of the existing alignment
- Walter's Tract river campsites
- Hialeah Picnic Area (as seen from the exit road)
- Hialeah air park
- MDSR at the crossing of the existing alignment
- Shawnee Resort Beach
- Turtle Beach
- APPA from the future relocation section
- APPA at the crossing of the existing alignment

- APPA at Raccoon Ridge
- APPA at the view overlooking Lower Yards Creek Reservoir
- Two views along APPA at the ridge near Rattlesnake Swamp
- Catfish fire tower

Hidden Lake Dam

Proposed conditions are shown in appendix K, figure 3-1, “Proposed.” Visual changes would be limited to a few towers being visible, but not apparent, in the distance. The changes would not be substantially visible enough to alter visual unity or vividness, which would remain high for unity and average to moderately high for vividness. However, the marginal encroachment of the towers extending above the canopy line would slightly reduce intactness from high to very high / moderately high to high. This impact would be limited to favorable weather conditions not hindered by low clouds or haze. The overall visual quality at Hidden Lake Dam would remain high (shifting slightly from 5.58 to 5.42 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 0.16. Adverse impacts would occur on the visual resources of Hidden Lake Dam due to the alternative 3 alignment.

Smithfield Beach

Proposed conditions are shown in appendix K, figure 3-2, “Proposed.” The proposed 500-kV ROW and towers would be much more noticeable and visually intrusive compared with baseline conditions. While only the tower at the top of the ridge would be seen silhouetted against the sky, the other towers and conductors would still be distinguished above the vegetation. The widened ROW would create a shadow line that contrasts with the color and texture of the forested slope. This effect would be even stronger under sunny conditions. The replacement 115-kV transmission poles and wires could also be seen, though the poles would not be visible above the canopy. At this view, unity would be reduced substantially, from moderately high / high to moderately low / average, as the proposed changes would conflict considerably with the form, emphasis, pattern, and texture of the landscape, drawing focus away from the river and onto the distracting ROW corridor. Intactness would also be reduced, from moderately high / high to average / moderately high, due to the vegetation removal along the ROW creating a visual intrusion across much of the forest backdrop. Vividness would be reduced from moderately high / high to average / moderately high, due to the intrusion of human-made transmission features limiting the ability of the view to be remembered as natural and scenic. The overall visual quality at Smithfield Beach would be reduced from high to moderately high (shifting from 5.38 to 4.00 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 1.38. Adverse impacts would occur on the visual resources of Smithfield Beach due to the alternative 3 alignment.

Table 56 summarizes the change in overall visual quality ratings at the affected KOPs for alternative 3, based on the FHWA scale of 1 to 7.

TABLE 56: ALTERNATIVE 3: SUMMARY OF CHANGES TO VISUAL QUALITY RATINGS* AT IDENTIFIED KOPS

KOP Name	Visual Quality Score Under Existing Conditions	Visual Quality Score Under Simulated Proposed Conditions	Total Reduction in Visual Quality
Hidden Lake Dam	5.58	5.42	(0.16)
Smithfield Beach	5.38	4.00	(1.38)
River Rd at alternative 3	4.54	3.96	(0.58)
McDade Trail at alternative 3- A (spiral wire)	4.92	3.46	(1.46)
McDade Trail at alternative 3- B (marker balls)	4.92	3.38	(1.54)
Old Mine Rd., at alternative 3	4.08	2.92	(1.16)
Walter's Tract River campsites	5.50	3.38	(2.12)
Hialeah Picnic Area	4.67	3.92	(0.75)
Hialeah Air Park	4.25	3.38	(0.87)
MDSR at alternative 3	5.50	3.29	(2.21)
Shawnee Resort Beach	4.54	4.46	(0.08)
Turtle Beach	4.88	4.79	(0.09)
APPA: Future relocation section	6.58	5.96	(0.62)
APPA: alternative 3 crossing- A (spiral wire)	4.17	2.83	(1.34)
APPA: alternative 3 crossing- B (marker balls)	4.17	2.67	(1.42)
APPA: Raccoon Ridge	5.96	4.83	(1.13)
APPA: View overlooking Yards Creek Reservoir	5.54	4.00	(1.54)
APPA: Vista from Rattlesnake Swamp Ridge no. 1	5.25	3.75	(1.50)
APPA: Vista from Rattlesnake Swamp Ridge no. 2	5.50	3.58	(1.92)
Catfish fire tower	5.25	4.75	(0.50)

* Visual quality ratings based on FHWA scale from 1 to 7.

River Road

Proposed conditions are shown in appendix K, figure 3-3, "Proposed." The widened ROW would be more noticeable compared with baseline conditions, and several proposed towers would be seen. The parallel angle of view toward the alignment would emphasize this impact. However, the middleground riparian vegetation and distance to the change would reduce the impacts somewhat. The replacement 115-kV transmission poles and wires could also be seen on the slope of Kittatinny Ridge, though the poles would not be visible above the canopy. Unity would be slightly reduced from moderately high / average to moderately high, as the larger ROW would disrupt the color, form, and texture of the forested slope, and distract from the rural scene. Intactness would be reduced from moderately high to average due to the increased visibility of the transmission elements, which would add visual clutter, and the visually subtractive result of the vegetation removal. Vividness would remain moderately low to average, as the change would interrupt the pastoral aesthetic of the view. The overall visual quality at River Road near

the alternative 3 alignment would remain moderately high (shifting slightly from 4.54 to 3.96 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 0.58. Adverse impacts would occur on the visual resources of River Road near the alternative 3 alignment.

McDade Trail, at Alternative 3

Proposed conditions are shown in appendix K, figure 3-4, “Proposed.” This view is from directly beneath the alignment. The widened ROW would appear expansive on the near and far banks of MDSR. Bird diverter devices meeting APLIC standards would be required on the conductors at this location crossing the river. Figures 3-4a and 3-4b in appendix K depict possible diverter types that could be installed, and the corresponding visual impacts of each. Based on these, the diverters would increase visibility of the conductors when seen in the foreground and would increase visual clutter, because the conductors and diverters would be seen silhouetted against the sky. Between the two diverter types, the marker balls would be much more apparently visible than the spiral wires, result in comparatively more visual clutter, and would be seen from farther away. For these reasons, marker ball diverters would result in greater visual impacts compared with spiral wires.

The angle point towers would be more noticeable across the river, and the angle point itself would create visual distraction and relief from viewing the alignment swath straight up the ridge face. Unity would be substantially impacted, changing from moderately high to moderately low due to the proposed corridor interrupting the visual order of the scene, including the scale, balance, texture, and emphasis. The proposed towers and ROW would appear out of scale with the surrounding landscape elements, rising above the tree tops and dominating the view. Intactness would be reduced from moderately high / high to moderately low / average, as the expanded cleared corridor would create a visually subtractive intrusion in the context of the wooded, scenic trail. This impact would be limited slightly by the angle point across the river, where visibility of the clearing would become screened by the perpendicular angle of view and existing vegetation. The larger towers and more visible conductors would increase encroachment on the view. Migratory bird diverters would also be clearly visible on the conductors over the river, as the figures show. The use of bird diverters is discussed in the “Landscape Connectivity, Wildlife Habitat, and Wildlife” section of this chapter. Vividness would be slightly reduced numerically, but would remain average to moderately high, sustained somewhat by the expanded view to the river, including new visibility of a small island, which would enhance the landform component of vividness. However, the vegetation component of vividness would be reduced due to the larger ROW clearing.

For the purpose of comparison, simulations for two possible bird diverter devices were prepared for this KOP and are considered representative of the additional change to the visual environment different styles could result in. If spiral wires were selected, the overall visual quality for McDade Trail at alternative 3 would change from high to average (shifting slightly from 4.92 to 3.46 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 1.46. Considering the simulation depicting the marker ball style, overall visual quality would be further reduced, to a score of 3.38. Regardless of the style of diverter selected, adverse impacts would occur on the visual resources of McDade Trail at alternative 3.

Old Mine Road at Alternative 3

Proposed conditions are shown in appendix K, figure 3-5, “Proposed.” As the figure demonstrates, there would be substantial changes where alternative 3 passes over Old Mine Road. Vegetation removal for the cleared ROW would create an opening wide enough to provide views to MDSR and open the view to more sky, interrupting the predominantly canopy-enclosed viewscape along the road. The angle point double-tower structure would be plainly visible from the road traveling north, as would the corridor passing up the slope, because the view would parallel that portion of the alignment. APLIC-approved bird

diverter devices would be required to be placed on the conductors as the alignment crosses MDSR, these would be visible to viewers passing under on Old Mine Road as well, given that the road is so near the river. The repositioned 115-kV poles would be visible but would be somewhat visually absorbed by background vegetation. In general, views traveling south would be less impacted. Visual unity would be reduced from moderately low / average to low, as the visible towers, conductors and angle point, coupled with the existing appurtenances (i.e., highway-style guard rail, smaller transmission line) combine to create a somewhat jumbled, disharmonious view. Intactness would be reduced, changing from moderately high / high to moderately low / average, due to the removal of vegetation and encroachment of the conductors and proposed towers. Conversely, vividness would be marginally enhanced numerically due to the newly created opportunity to view the river, which is relatively unusual along this portion of Old Mine Road, as the river is commonly screened by riparian vegetation (appendix K, figure 3-5, “Existing”). Vividness would remain moderately low to average. The overall visual quality for Old Mine Road at alternative 3 would change from moderately high to average (shifting from 4.08 to 2.92 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 1.16. Adverse impacts would occur on the visual resources of Old Mine Road at the alternative 3 crossing.

Walter’s Tract River Campsites

Proposed conditions are shown in appendix K, figure 3-6, “Proposed.” Although the alignment would be only barely visible from in the campsite, this view was selected to capture the effects of the changes as viewed from the riverbank access trail. Primary changes would include the introduction of several proposed towers, and two visible angle points resulting in views of overlapping conductors. The repositioned existing distribution line would also be visible in the ROW, though its wood poles would not protrude above the canopy. APLIC-approved bird diverter devices would be required were the alignment crosses MDSR, and depending upon the style of diverter selected, these could be visible from the KOP location. To the extent the diverters were visible, the primary effect would be to increase visual clutter and encroaching elements. Visual unity would be decreased substantially, changing from high to low due to the complex alignment adding disorder to the scene. Intactness would be reduced from high to average, because the multiple angle points would increase the extent of the encroachment and introduce visual clutter to the otherwise unencumbered natural setting. The visible removal of vegetation in the proposed ROW would also reduce intactness. Vividness would be reduced numerically, due to the intrusion of human-made structures into the natural view and the removal of vegetation detracting from the memorability of the river setting. Vividness would remain average to moderately high. The impact on vividness would be restrained somewhat by the landscape extending outside the figure, such as views directly across the river and downstream, which would not be impacted and would thus be more memorable. The overall visual quality for Walter’s Tract river campsites at alternative 3 would be reduced from high to average (shifting from 5.50 to 3.38 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 2.12. Adverse impacts would occur on the visual resources of Walter’s Tract river campsite due to the alternative 3 alignment.

Hialeah Picnic Area, Exit Road

Proposed conditions are shown in appendix K, figure 3-7, “Proposed.” No impact is expected to within the picnic area, as views toward the alternative 3 alignment would be blocked by vegetation. This view is from the existing facility exit road, where the proposed alignment would be briefly visible when exiting the picnic area. Changes to the visual resources would include a noticeably visible proposed tower on top of the ridge in the distance, and visible conductors at each side; these features would be silhouetted against the sky. The widened ROW clearing would also be perceptible. These impacts would be tempered somewhat by the distance from the alignment. The repositioned existing distribution line wood poles would be seen, but from this distance would be absorbed by the vegetation. Unity would be slightly reduced from moderately high to average to moderately high due to the distraction caused by

disharmonious elements introduced into an otherwise natural scene. Intactness would also be reduced, changing from moderately high to high to average to moderately high due to the introduced encroachments of the tower and conductors, particularly as they would appear silhouetted against the sky. Vividness would be only marginally affected due to the encroaching human-made structures and slightly visible disruption of vegetation. Vividness would be reduced from moderately low to average to moderately low. The overall visual quality for Hialeah Picnic Area would be reduced from high to moderately high (shifting from 4.67 to 3.92 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 0.75. Adverse impacts would occur on the visual resources of Hialeah Picnic Area as viewed from the exit road due to the alternative 3 alignment.

Hialeah Air Park

Proposed conditions are shown in appendix K, figure 3-8, “Proposed.” Compared to baseline conditions, the proposed ROW expansion would be noticeably visible from Hialeah Air Park as it climbs the far slope. The increased width of the corridor, combined with the view angle, would create a contrasting shadow line in the ROW, which would dominate the view and disrupt the color, line, balance, and texture of the view. A few towers, and to a lesser degree, the conductors, would be discernible. The wood poles of the repositioned distribution line would be visible in the ROW, though they would easily be absorbed into the vegetation. Unity would be reduced, changing from average to moderately low due to the encroaching ROW and transmission features conflicting with the existing visual elements. Intactness would be reduced, from moderately high/high to average, due to the scale of the proposed corridor increasing the amount of perceived development and encroaching upon the primarily pastoral recreational setting. Vividness would be reduced numerically somewhat, but would remain moderately low to average due to the introduction of human-made structures and the visual fragmentation of the otherwise contiguous forested slope, which limits the ability of the scene to be remembered as unencumbered and pastoral. The overall visual quality for Hialeah Air Park would be reduced from moderately high to average (shifting from 4.25 to 3.38 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 0.87. Adverse impacts would occur on the visual resources of Hialeah Air Park due to the alternative 3 alignment.

MDSR, at Alternative 3

Proposed conditions are shown in appendix K, figure 3-9, “Proposed.” In the context of the surrounding landscape, this view would be considerably more expansive than could be captured in a single frame. Therefore, the visual quality scores were determined onsite during field reconnaissance and account for views beyond the frame of the figure.

The proposed angle point towers’ scale, coupled with the surrounding cleared vegetation, would result in the towers and conductors becoming dominant in the view. Bird diverter devices meeting APLIC standards would be required along this segment as the alignment crosses the river. The devices would very likely be visible to water recreationalists passing beneath the line. To the extent the devices were visible and from what distance they could be seen, the diverters would increase encroachments into the scene and would cause reduced visual intactness.

Similar to other KOPs, the reconstructed existing distribution line would be visible but not dominant. However, at MDSR, the alignment angle point would emphasize the visual clutter of the collocated transmission lines resulting in many encroachments. Visual unity would be substantially reduced, changing from moderately high / high to moderately low / average, due to the shift in the emphasis and balance of the scene. The introduced transmission elements would create disharmony and conflict with the existing natural features of water, landform, and vegetation. Intactness would be substantially reduced as well, changing from moderately high / high to low / moderately low, due to the encroachments from

vegetation removal along the proposed ROW, the angle point of the alignment creating a cluttered appearance, and the multiple conductors being clearly visible across the viewshed. Bird diverters would increase these impacts. Vividness would be reduced, changing from moderately high / high to average / moderately high, due to the increased scale of the human-made objects in the context of the scenic natural landscape. The overall visual quality for MDSR would be reduced from high to average (shifting from 5.50 to 3.29 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 2.21. Adverse impacts would occur on the visual resources of MDSR at the crossing of alternative 3.

Shawnee Resort Beach

Proposed conditions are shown in appendix K, figure 3-10, “Proposed.” Similar to Fernwood Resort discussed under alternative 2, Shawnee Resort Beach is located outside DEWA boundaries. However, visible changes that could affect the immediate shoreline and the river are relevant to MDSR in addition to Shawnee Resort Beach. The changes to the view would introduce visibility of a single proposed tower marginally detectable in the far distance, protruding above the tree tops. Opportunity to detect the tower would be highly dependent upon atmospheric conditions. Haze or fog would make the tower indistinguishable, but in clear conditions, it may be slightly more visible than under the simulated conditions. However, visual unity would be unaffected and would remain average. Vividness would also be unaffected and would remain average to moderately high. Intactness would be marginally impacted numerically due to the added encroachment of the tower. The overall visual quality for Shawnee Resort Beach would remain moderately high (the rating would change from 4.54 to 4.46 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 0.08. Adverse impacts would occur on the visual resources of Shawnee Resort Beach due to the alternative 3 alignment, depending on atmospheric conditions.

Turtle Beach

Proposed conditions are shown in appendix K, figure 3-11, “Proposed.” The alternative 3 alignment would be slightly closer to the viewer at Turtle Beach compared to Shawnee Resort Beach, but the effects on the visual resources would be similar. A tower at the top of the ridge on the opposite bank (Pennsylvania) would be visible under favorable climatic conditions; fog or haze would make the tower indistinguishable. A slight shadow line would result along the widened ROW corridor. Unity would be unaffected and would remain moderately high. Vividness would also be unaffected and would remain average to moderately high. Impacts on intactness would be similar to those at Shawnee Resort Beach; intactness would be reduced numerically but would remain average to moderately high. The addition of the tower atop the ridge would slightly encroach upon the view, particularly because most of the tower would be silhouetted against the sky. The overall visual quality for Turtle Beach would remain high (shifting from 4.88 to 4.79 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 0.09. Adverse impacts would occur on the visual resources of Turtle Beach due to the alternative 3 alignment, depending on atmospheric conditions.

APPA at Future Relocation Section

Proposed conditions are shown in appendix K, figure 3-12, “Proposed.” This KOP is currently located a few hundred feet from APPA, and is in DEWA. However, this analysis evaluates effects on the future APPA relocation site. Changes to the existing view at the relocation site include the introduction of a transmission tower and conductors that were previously absent, but would be seen in the distance on the ridge. Visual unity would be slightly reduced from very high to moderately high to high due to this encroachment disrupting the visual balance of the scene and detracting somewhat from the existing highly harmonious view. Intactness would also be reduced from high to moderately high to high due to the newly encroaching element. Vividness would remain high to very high, as the distance to the

encroachment would offset effects on the memorability of the existing scene. The overall visual quality for APPA at the future relocation section would remain very high (shifting somewhat from 6.58 to 5.96 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 0.62. Adverse impacts would occur on the visual resources of APPA at the trail future relocation section due to the alternative 3 alignment.

The following KOPs are located along APPA and within the boundaries of DEWA as well as Worthington State Forest.

APPA at Alternative 3 Crossing

Proposed conditions are shown in appendix K, figure 3-13, “Proposed.” Changes to the view would include new transmission towers, larger conductors, and expansion of the cleared ROW, which would be visible into the middleground as it passes over a forested ridge. Vegetation removal resulting from the expanded ROW clearing would increase the frame of this view, providing a greater opportunity to view the surrounding scenery to the east and west. The increased scale of the steel monopole in the immediate foreground would cause it to become more dominant in the view, compared with baseline conditions. The additional conductors would also distract from and clutter the landscape scene, further emphasized by the inclusion of APLIC-approved bird diverting devices on the conductors, which would be required where the alignment passes over Kittatinny Ridge. Figures 3-13a and 3-13b in appendix K depict possible diverter types that could be installed, spiral wire and marker balls, and the corresponding visual impacts of each. Based on the simulations, the diverters would increase visibility of the conductors when seen in the foreground and would increase visual clutter, because the conductors and diverters would be seen silhouetted against the sky. Between the two diverter types, the marker balls would be more apparently visible than the spiral wires, result in comparatively more visual clutter, and would be seen from farther away.

Visual unity would be reduced from average to low, due to the increased visibility of the transmission structures conflicting with the natural setting and interrupting the color, texture and emphasis of the view. Intactness would be reduced from average to low / moderately low due to the increased visual encroachment of the tower, the larger and more numerous conductors, accumulated visual clutter of the collocated lines, and the visually subtractive quality of the widened ROW. The increase in the scale of the alignment would increase the apparent level of development in the viewshed, also causing a reduction in visual intactness in the context of a protected scenic resource. Vividness would be slightly reduced, due to the vegetation fragmentation and human-made encroachments, but this would be offset somewhat by the increased cleared ROW providing a wider view opportunity of the surrounding landscape, which is scenic and memorable.

As for McDade Trail, two simulations were prepared for this KOP which depict two possible bird diverter styles, spiral wires and marker balls. With spiral wires, the overall visual quality for APPA at alternative 3 would be reduced from moderately high to average (shifting from 4.17 to 2.83 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 1.34. If the marker ball-type bird diverters were selected to be installed on the conductors at this location, the overall visual quality score would be further reduced, to 2.67.

Regardless of the style of bird diverter selected, adverse impacts would occur on the visual resources of APPA at the alternative 3 crossing.

APPA at Raccoon Ridge

Proposed conditions are shown in appendix K, figure 3-14, “Proposed.” Changes to the view would include the introduction of a steel transmission tower behind the existing trees and multiple visible conductors. The widened alignment would also be noticeable in the middleground (across MDSR in Pennsylvania) as it climbs a forested ridge. Visibility of the new transmission line components would decrease visual unity from very high / average to moderately high, compared with baseline conditions, which do not include views of the utility line in the foreground. Added encroachments of the tower and conductors and the ROW visible in the middleground would reduce intactness from very high to average / moderately high. Bird diverter devices would be required on the conductors at this location also, further reducing intactness to the extent they could be seen. Spiral wires were determined to not be visible from this distance. The proposed alignment would affect the memorability of the contiguous vegetation of the scene and its lack of human-made development, reducing vividness numerically, although it would remain moderately high to high. The overall visual quality for the APPA view at Raccoon Ridge would be reduced from very high to moderately high (shifting from 5.96 to 4.83 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 1.13. Adverse impacts would occur on the visual resources of APPA at Raccoon Ridge due to the alternative 3 alignment.

APPA at View Overlooking Lower Yards Creek Reservoir

Proposed conditions are shown in appendix K, figure 3-15, “Proposed.” Changes to the view would include a more noticeable transmission alignment, vegetation removal, larger towers, and numerous visible conductors. The wood poles of the repositioned existing distribution would be seen from the superior viewing angle, but would be easily absorbed by the background vegetation. Visual unity would be reduced from high to average, due to the widened ROW clearing disrupting the texture, pattern, and emphasis of the view and detracting from its existing harmony. The wider proposed corridor, towers and conductors would encroach upon the view, reducing intactness from moderately high / high to moderately low / average. Impacts on the vegetation pattern and increased visible transmission development would affect the memorability of the view, reducing vividness from moderately high to high to average to moderately high. The overall visual quality for the APPA vista overlooking Lower Yards Creek Reservoir would be reduced from high to moderately high (shifting from 5.54 to 4.00 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 1.54. adverse impacts would occur on the visual resources of APPA at the view overlooking Lower Yards Creek Reservoir due to the alternative 3 alignment.

Outside the study area, the following KOPs (which are located in DEWA but outside Worthington State Forest) would be affected by the alternative 3 alignment. Additional adverse impacts en route to the substations would be the same as for alternative 2.

APPA at Vista from Ridge near Rattlesnake Swamp, No. 1

Proposed conditions are shown in appendix K, figure 3-16, “Proposed.” In the vicinity of Rattlesnake Swamp, APPA follows the edge of a rocky ledge for about 2.5 miles, providing continuous scenic views to the east, including opportunities to view the alternative 3 alignment in the valley below. For this reason, two view locations along APPA were selected to evaluate the proposed actions.

Changes in this view would include taller, more noticeable towers and increased visibility of numerous conductors. The repositioned distribution line would also be seen where it passes near the viewer before becoming screened by vegetation. In the foreground, the existing alignment passes over a series of small open fields of rural residential development; therefore, no impacts on vegetation resulting from the proposed ROW expansion would occur. However, the expanded clearing would be noticeable and

intrusive in the distance, particularly as the view parallels that portion of the alignment. Visual unity would be substantially reduced from high to moderately low, due to the scale of the proposed alignment conflicting with that of the existing landscape elements and detracting from the harmony of the pastoral scene. The visible angle points of the alignment in the distance would create fragmentation and detract from a cohesive, harmonious visual pattern. Intactness would be reduced from moderately high to high to average to moderately high, due to the encroachment of the noticeable conductors and taller towers, particularly as the alignment would be visible across the viewshed. The higher position of APPA, and thus the viewer relative to the proposed changes, would restrain impacts on intactness to some degree, as the transmission elements would not be seen silhouetted against the sky. The increased scale of the proposed alignment would contribute to a greater perceived level of development, which would affect the ability of the view to be remembered for its consistent rural pattern. Vividness would change from average to moderately high to average. The overall visual quality for the first APPA vista at the ridge near Rattlesnake Swamp would be reduced from high to moderately high (shifting from 5.25 to 3.75 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 1.50. Adverse impacts would occur on the visual resources of APPA at the first vista near Rattlesnake Swamp due to the alternative 3 alignment.

APPA at Vista from Ridge near Rattlesnake Swamp, No. 2

Proposed conditions are shown in appendix K, figure 3-17, “Proposed.” Changes in this view would include noticeable expansion of the cleared ROW visible across the viewshed, taller towers rising above the tree canopy, and numerous conductors. The repositioned existing distribution line would contribute to the overall visual clutter, because the view is superior and looks parallel up the alignment into the distance. Vegetation removal along the proposed ROW would result in a strongly contrasting shadow line, emphasizing the alignment. This effect would be somewhat moderated under overcast weather conditions when lighting would be much more diffused. The dominance of the alignment would conflict with the color, texture, scale, and emphasis of the view, substantially reducing unity from moderately high to high to moderately low. Intactness would also be substantially reduced from high to moderately low / average due to the fragmentation of vegetation and additional visually encroaching transmission elements. Vividness would be reduced from moderately high to average to moderately high due to the increased level of human-made development and the impacts on vegetation cover limiting the ability of the view to be remembered as highly natural. The overall visual quality for the second APPA vista at the ridge near Rattlesnake Swamp would be reduced from high to average (shifting from 5.50 to 3.58 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 1.92. In the short term, the existing towers would also remain visible, further impacting visual quality. Adverse impacts would occur on the visual resources of APPA at the second view near Rattlesnake Swamp due to the alternative 3 alignment.

APPA at Catfish Fire Tower

Proposed conditions are shown in appendix K, figure 3-18, “Proposed.” As discussed in the “Visual Resources” section of chapter 3, views from inside the fire tower at this KOP could not be considered for this analysis because the tower cannot be lawfully entered. However, the trail near the base of the tower offers views to the south. Changes to this view along APPA would include somewhat visible conductors and the tapered top of a single tower. None of the proposed transmission line elements would be highly noticeable from APPA, as they would be below the natural line of sight and would be somewhat screened by branches in leaf-off condition, as simulated. (The changes may be less apparent when the vegetation is leafed out in spring and summer.) Under simulated conditions, visual unity would be marginally affected, and would change from high to moderately high to high. Intactness would be reduced slightly from moderately high to high to moderately high, due to the encroachment of the proposed conductors, given the slightly contrasting effect of their horizontal orientation relative to vegetation. Vividness would be

marginally affected by the introduced human-made development and would change from average to moderately low to average. The overall visual quality for APPA at Catfish fire tower would remain high (shifting from 5.25 to 4.75 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 0.50. The existing towers would not be visible from this location. Adverse impacts would occur on the visual resources of APPA at Catfish fire tower due to the alternative 3 alignment.

Zone of Visual Influence Bare-Earth Terrain Modeling: As described in the “Methodologies” in this section, table 57 provides areas (in acres) from which the existing wood poles and proposed transmission towers could potentially be seen under bare earth conditions, specific to alternative 3, for lands within DEWA and along the APPA alignment (defined at 1,000 feet wide). See figures 81 and 82, respectively, for existing pole visibility and proposed tower visibility specific to alternative 3.

TABLE 57: ALTERNATIVE 3 VISIBILITY USING ZVI BARE-EARTH TERRAIN MODELING (ESTIMATED IN ACRES)

Pole / Tower Height	Number of poles/ towers within DEWA	Potential Visibility from within DEWA	Potential Visibility from MDSR	Potential Visibility from APPA
Existing 65- to 85-foot poles along the alternative 3 alignment	46	31,645	1,026	3,565
Proposed 195-foot monopole (6 towers per mile)	32	33,305	1,509	6,166

Overall Alternative 3 Impacts

Activities related to deconstruction and construction in proximity to KOP locations would adversely affect visual resources as described in the “Common to All Action Alternatives” section. Impacts would depend on proximity and the extent to which deconstruction and construction activities could be seen, as well as the location of temporary spur roads. Under alternative 3, these impacts would be most apparent where the alignment would cross a resource like the McDade Trail, Old Mine Road, MDSR, and APPA. Views along the McDade Trail, MDSR, and APPA would remain unchanged until reaching the alignment, where the views would be affected during construction. KOPs close to the existing route such as Walter’s Tract river campsites would also be impacted for short periods due to construction activities. Adverse impacts would occur on the remaining KOPs considered for alternative 3. Impacts related to operation and maintenance of the transmission line would be the same as alternative 2 and would involve periodic vehicular access for vegetation and equipment maintenance. Such impacts would be localized and of short duration. Overall, alternative 3 would result in adverse impacts on visual resources inside the study area.

Cumulative Impacts

Cumulative impacts inside the study area would result in adverse impacts on visual resources as described previously in the “Cumulative Impacts” section. When the impacts on visual resources as a result of alternative 3 are combined with other past, present, and reasonably foreseeable projects in the study area, an overall cumulative adverse impact would be expected.

The past, present, and reasonably foreseeable projects identified along the length of APPA would produce adverse cumulative impacts on the trail as explained in the “Cumulative Impacts” section. When the impacts on visual resources as a result of alternative 3 are combined with other projects that affect APPA, an overall adverse cumulative impact would be expected.

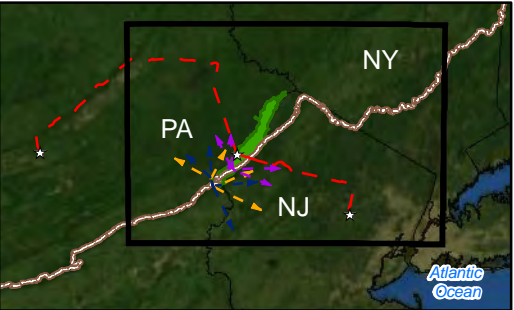
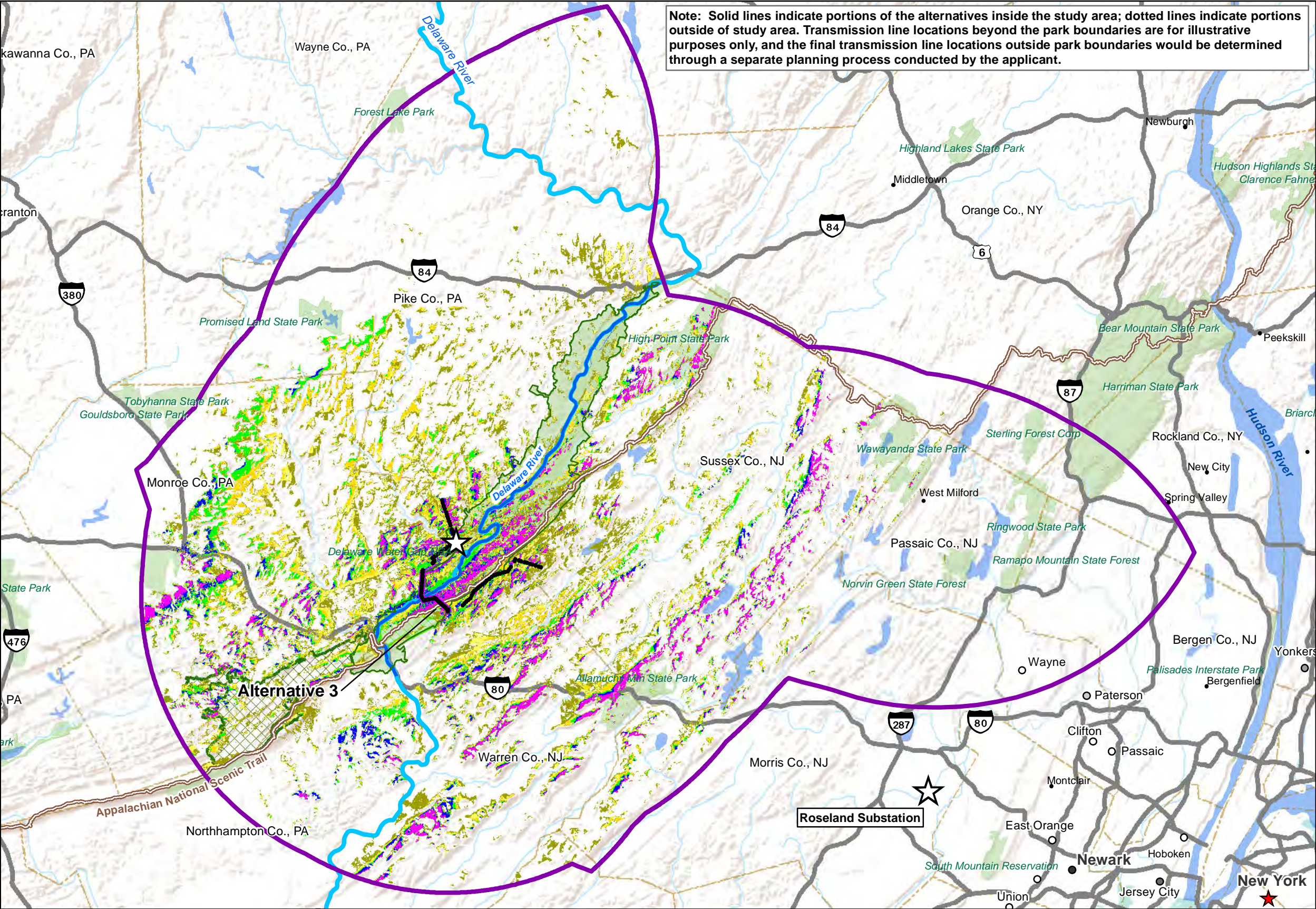
Conclusion

Inside the study area, alternative 3 would result in adverse impacts of varying intensity depending upon the KOP. In general, the complexity of the alignment (i.e., numerous angle points) would affect views from several locations, thereby impacting visual quality at several KOPs and potentially from areas away from the corridor but looking toward the corridor. Similar to alternative 2, the ROW corridor would be most visually apparent in the landscape during spring and summer 'leaf-on' conditions when shadow lines increase the visual contrast created by the cleared ROW. During winter 'leaf-off,' the proposed towers could become more apparent, but the corridor would be visually de-emphasized. Unlike alternative 2, the existing distribution transmission line would be reconstructed and co-located within the expanded ROW, adding to the visible clutter within the corridor as seen from specific KOPs. The alternative 3 alignment would also create visual intrusions where none currently exist at Raccoon Ridge along APPA, and would be seen from other view locations along the trail. When combined with the impacts on visual resources under alternative 3, the effects of past, present, and reasonably foreseeable future projects would result in adverse cumulative impacts on visual resources inside the study area, and adverse cumulative impacts specifically on APPA.

When considered in the context of the purposes for which DEWA and APPA were established and the scenic qualities of the MDSR for which it was designated as part of the national wild and scenic river system along with the high expectations of visitors as to the type of experience they should have in these places, the adverse impacts of increased visibility and intrusion of the transmission line along alternative 3 are significant. Alternative 3 would cross and then parallel the Kittatinny Ridge which APPA traverses. The transmission line corridor and structures would be clearly visible under alternative 3 and the presence of two sets of structures would increase the adverse impact on aesthetics and scenery, lasting the life of the project. Because of the route up the Kittatinny Ridge, the visibility of the tall towers would be greatly increased along the MDSR, and would also be visible from the McDade Trail and popular recreational sites like Smithfield Beach and Hialeah Air Park, and the scenic drives and cultural landscapes of Old Mine Road in New Jersey and River Road in Pennsylvania. The visual impacts from alternative 3 would be experienced by a large number of visitors due to the concentration of recreational facilities within sight of the transmission line corridor. Removal of the existing B-K Line would have beneficial impacts by restoring the natural habitat at the heart of DEWA and MDSR and reducing the number of crossings of APPA; however, overall the beneficial impacts of the removal of the existing line do not outweigh the negative impacts of visual intrusion of the expanded line paralleling the MDSR and APPA. Alternative 3 also contributes to the cumulative adverse impacts of intrusions into scenic viewsheds. The reduction of these resources in the region surrounding the parks would increase their scarcity and sensitivity inside the parks, where they are afforded special protection.

Public attention surrounding this project is high. There is likely to be a high degree of controversy over any effects on park resources that are particularly popular with the public, such as scenery, visitor use and experience, rare and unique communities, cultural landscapes, and historic structures, for any of the alternatives. The inherent uncertain nature of predicting the true degree of some of these impacts would likely heighten this controversy.

Allowing impacts to visual resources is contrary to typical NPS practice of improving scenic conditions by removing non-conforming features and may establish precedent for future actions. As stated for alternative 2, permitting this project reverses the trend of improving visitor experience and scenic values by removing non-conforming features. The construction of an additional line with taller towers would adversely impact the scenic nature of APPA, DEWA, and MDSR, which is counter to their enabling legislation and mandates to protect scenery. Thus, the NPS believes that alternative 3 would result in significant adverse impacts to visual resources.



Legend

- ☆ Substation
- Alternative 3

Number of Existing Towers Potentially Visible

- 1 to 6
- 7 to 12
- 13 to 18
- 19 to 24
- 25 to 30
- 31+

• Existing Tower

Notes: Existing tower locations are located along existing transmission lines. Large towers were given an 85 foot elevation (tower height) and small or medium towers were given a 65 foot elevation.

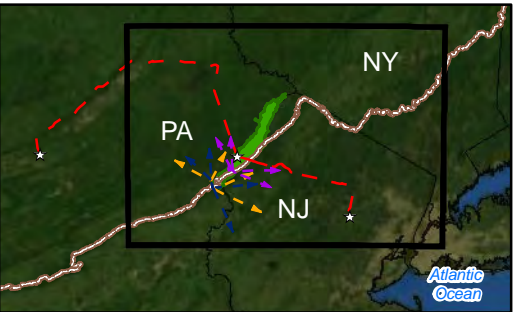
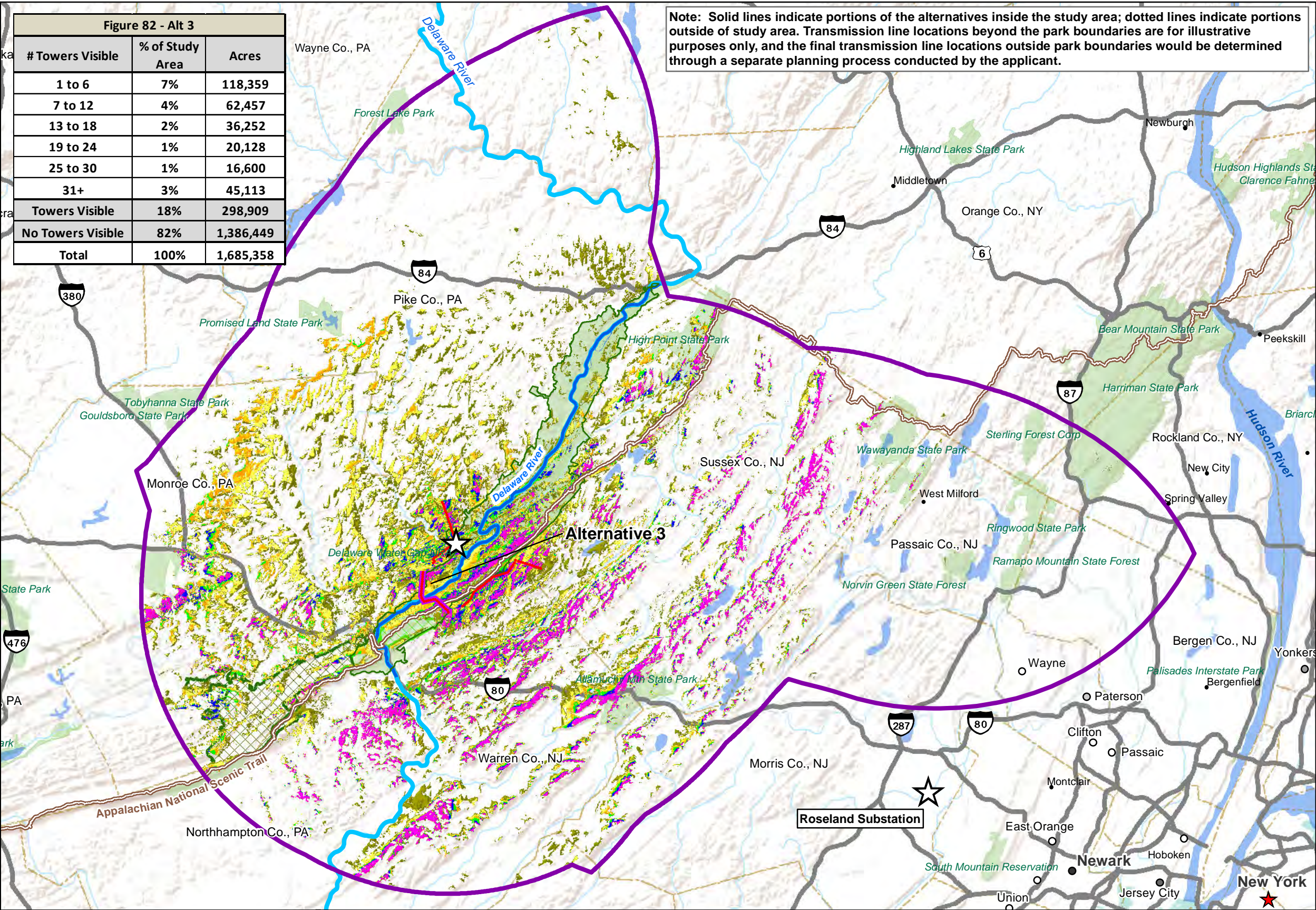
The study area is defined as the union of the areas that are 20 miles from the DEWA boundary and 20 miles from the APPA alignment, intersected with the area that is 20 miles from the alternative alignment.

- Visual Analysis Study Area
- Appalachian National Scenic Trail
- Middle Delaware National Scenic and Recreational River
- Delaware River
- Delaware Water Gap National Recreation Area
- CVNWR Boundary
- Worthington State Forest
- State Park
- County Line
- Interstate Hwy

Figure 82 - Alt 3

# Towers Visible	% of Study Area	Acres
1 to 6	7%	118,359
7 to 12	4%	62,457
13 to 18	2%	36,252
19 to 24	1%	20,128
25 to 30	1%	16,600
31+	3%	45,113
Towers Visible	18%	298,909
No Towers Visible	82%	1,386,449
Total	100%	1,685,358

Note: Solid lines indicate portions of the alternatives inside the study area; dotted lines indicate portions outside of study area. Transmission line locations beyond the park boundaries are for illustrative purposes only, and the final transmission line locations outside park boundaries would be determined through a separate planning process conducted by the applicant.



Legend

- ☆ Substation
- Alternative 3
- Number of Proposed Towers Potentially Visible
 - 1 to 6
 - 7 to 12
 - 13 to 18
 - 19 to 24
 - 25 to 30
 - 31+
- Proposed Tower
- Note: Proposed towers are located along the proposed transmission lines. Towers were given a 195 foot elevation and spaced approximately 6 towers per mile.
- The study area is defined as the union of the areas that are 20 miles from the DEWA boundary and 20 miles from the APPA alignment, intersected with the area that is 20 miles from the alternative alignment.
- Visual Analysis Study Area
- Appalachian National Scenic Trail
- Middle Delaware National Scenic and Recreational River
- Delaware River
- Delaware Water Gap National Recreation Area
- CVNWR Boundary
- Worthington State Forest
- State Park
- County Line
- Interstate Hwy

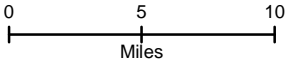


Susquehanna to Roseland
Transmission Line Proposal
and
Right-of-Way Request EIS

Figure 82
Proposed Tower Visibility: Bare Terrain Analysis
Alternative 3

Source: NPS 2010, EA Engineering 2010,
DEWA 2008, ESRI 2002, ESRI 2006, ESRI
2010, NJOIT - OGIS 2008, PASDA 2010

Projection: NAD 83 UTM Zone 18N
Date: July 2012



Alternative 4

Like alternative 3, the existing distribution line would be replaced and repositioned within the ROW to accommodate the proposed double 500-kV line. Visual simulations show both the repositioned existing transmission line and the proposed new alignment.

During the course of this analysis, including fieldwork and visual simulation production, certain preliminary KOPs were found to provide no visibility of the proposed actions because the viewing distance was so great the impact would not be discernible, or vegetation or landform features blocked potential views. These KOPs were subsequently eliminated from further study. For alternative 4, preliminary KOPs eliminated during analysis include the following:

- Arrow Island Overlook
- Lookout Rocks (near Mount Minsi)
- Council Rock.

Visual simulations were prepared to depict the changes for KOPs impacted by alternative 4 and are included in appendix K (figures 4-1 through 4-6). Affected KOPs with potential visibility of the proposed actions under alternative 4 include the following:

- Mount Tammany Summit
- Delaware River as viewed from the river, north of the existing rail bridge
- Karamac Trail along MDSR
- APPA at the crossing of the existing alignment
- APPA at Lunch Rocks
- Nelson Overlook
- Fernwood Resort at Hwy 209.

Table 58 summarizes the change in overall visual quality ratings at the affected KOPs, based on the FHWA scale of 1 to 7.

TABLE 58: ALTERNATIVES 4 AND 5: SUMMARY OF CHANGES TO VISUAL QUALITY RATINGS AT IDENTIFIED KOPs

KOP Name	Visual Quality Rating Under Existing Conditions	Visual Quality Rating Under Simulated Proposed Conditions	Total Reduction in Visual Quality
Mt. Tammany Summit (alternative 4 only)	5.71	4.46	(1.25)
Delaware River at alternative 4/5 crossing	6.25	4.67	(1.58)
View from Karamac Trail (alternative 4 only)	5.21	4.79	(0.42)
APPA: at alternative 4/5 crossing	3.00	2.00	(1.00)
APPA: Lunch Rocks	5.04	3.04	(2.00)
APPA: Nelson Overlook	5.21	3.88	(1.33)

Mount Tammany Summit

Proposed conditions are shown in appendix K, figure 4-1, “Proposed.” Changes to the view due to the alignments for alternative 4 would include a noticeable corridor in the middleground, emphasized by a pronounced shadow line under simulated conditions (the visibility of which would vary depending on atmospheric conditions). The proposed corridor would disrupt the existing texture and line of the view. Proposed towers would be somewhat discernible from this distance, about 2 miles, but only during favorable weather conditions. No proposed conductors would be detectable from this distance. Unity would be reduced from high to average, due to the conflicting line created by the proposed alignment and the disruption of the contiguous forest pattern in the view. Intactness would be reduced from moderately high to average, due to the encroachment created by the proposed alignment, which would disrupt the otherwise intact forested landscape. (This effect would be moderated during winter “leaf-off” conditions, when the shadow line and visual contrast would not occur.) Impacts resulting from the increased visibility of intrusive human-made elements and vegetation removal would impact the ability of the view to be remembered as unencumbered and natural. However, the distance to the proposed actions and size of the corridor when viewed from this distance would offset the impacts slightly. Also, the level of impact would vary based on season and weather conditions. Therefore, vividness would be reduced in numeric score, but remain moderately high. The overall visual quality at Mount Tammany summit would be reduced from very high to moderately high (shifting from 5.71 to 4.46 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 1.25. Adverse impacts would occur on the visual resources at the Mount Tammany summit due to the alignment for alternative 4.

MDSR at Alternative 4 Crossing

Proposed conditions are shown in appendix K, figure 4-2, “Proposed.” Changes to the view would include the introduction of tall transmission towers on both sides of the Delaware River, with multiple angle point towers seen to the east (in New Jersey) where the alignment would change direction. Several conductors would be visible across the viewshed. Because the alignment would cross the river, bird diverter devices meeting APLIC standards would be required on the conductors or static lines, which could be visible, depending on the type of diverter applied. The perpendicular angle of the view toward the alignment and existing vegetation screening would combine to make impacts on vegetation unnoticeable from this view. Visual unity would be reduced from very high to average to moderately high from the transmission line features detracting from the existing historic rail bridge and conflicting with the scale, line, and focus and detracting from the harmony of the existing scene. Intactness would be reduced from high to average to moderately high, due to the encroachment of the towers and conductors, especially when silhouetted against the sky. Vividness would be reduced from moderately high to high to moderately high, due to the encroaching transmission development detracting from the memorability of the unique view focused on a scenic historic object. The overall visual quality at Delaware River at the crossing of alternative 4 would be reduced from very high to high (shifting from 6.25 to 4.67 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 1.58. Adverse impacts would occur on the visual resources of the Delaware River at the alignments for alternative 4 due to the alternatives.

Karamac Trail

Proposed conditions are shown in appendix K, figure 4-3, “Proposed.” Changes to the view would include introduced visibility of a portion of a single transmission tower and several conductors in the distant middleground, rising above existing vegetation. The presence of the transmission structure would somewhat detract from the cohesive, harmonious riverside scene. Unity would be reduced from moderately high to average to moderately high. The tower and conductors would cause a slight encroachment, so overall intactness would be reduced from moderately high to average to moderately

high. Vividness would be slightly affected by the introduction of encroaching transmission elements, but would remain moderately high. The overall visual quality at Karamac Trail would remain high (shifting from 5.21 to 4.79 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 0.42. Adverse impacts would occur on the visual resources of Karamac Trail along MDSR due to the alternative 4 alignment.

APPA at Alternative 4 Crossing

Proposed conditions are shown in appendix K, figure 4-4, “Proposed.” Changes to the view would include obvious widening of the alignment, and introduction of several tall towers along the repositioned distribution line as the route continues into the middleground before changing direction. Existing unity at this view is already low (refer to the “Visual Resources” section of chapter 3), and the proposed expanded ROW and numerous visible towers would disrupt the existing scale and emphasis, therefore, reducing unity from low to very low. Intactness would be reduced from average / moderately high to low / moderately low due to the widened ROW creating a visual subtraction in the context of the forested landscape. The encroachment of the towers and increased number of conductors would also affect intactness. Bird diverters would be required at this location as well, further reducing visual intactness to the extent they were visible and apparent as hikers passed beneath the lines. Vividness would be reduced from low / moderately low to very low / low, as the expanded ROW would open up a greater opportunity to view the background landscape, although this would be outweighed by the visually obtrusive proposed corridor development and the impacts on vegetation. The overall visual quality for APPA at the crossing of alternative 4 would be reduced from average to moderately low (shifting from 3.00 to 2.00 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 1.00. Adverse impacts would occur on the visual resources of APPA at the alternative 4 crossing due to the alternatives.

APPA at Lunch Rocks

Proposed conditions are shown in appendix K, figure 4-5, “Proposed.” Changes to the view would include obvious visibility of the proposed ROW, which would enter the scene from the left and continue down the slope, before changing direction away from the viewer. Visibility of the proposed corridor would be emphasized by a contrasting shadow line. It is likely that from this distance the alignment would appear less severe in overcast weather conditions or during winter ‘leaf-off’ when the corridor would create less visual contrast. Portions of several tall towers would be seen above the existing tree canopy, and numerous conductors would be detectable. Visual unity would be substantially reduced from high to moderately low, due to the conflict and disharmony created by the alignment in the context of the existing contiguously forested landscape. Intactness would be similarly reduced from moderately high to high to average, resulting from the visual intrusion created by the proposed cleared ROW, emphasized by the contrasting shadow line and visual subtraction of vegetation. The impacts from the introduced human-made transmission development and, to a larger degree, the loss of the existing continuously intact forest cover would substantially reduce the ability of the view to be remembered for its natural and remote aesthetic. Therefore, vividness would be reduced from moderately low to average, to low to moderately low. The overall visual quality for APPA at Lunch Rocks would be reduced from high to average (shifting from 5.04 to 3.04 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 2.00. Adverse impacts would occur on the visual resources of APPA at Lunch Rocks due to the alignments for alternative 4.

APPA at Nelson Overlook

Proposed conditions are shown in appendix K, figure 4-6, “Proposed.” Visible changes would include the introduction of the proposed cleared ROW carving a “U” shape into the existing forest canopy in the middleground. New transmission towers and conductors would be detectable under favorable weather

conditions. Unity would be reduced from moderately high to high to moderately low to average due to the widened corridor disrupting the existing form, texture, balance, and pattern of the view, particularly given the multiple directional changes of the proposed alignment. Intactness would be reduced from moderately high to high to moderately low to average, due to the encroachment created by the proposed corridor. The distance of the proposed towers would not add appreciably to encroachments. Vividness would remain average to moderately high, but would be impacted by the intrusion of the human-made transmission line on the visual pattern; and changes to vegetation from the expanded ROW, each of which would impact the memorability of the pastoral aesthetic view. The overall visual quality for APPA at Nelson Overlook would be reduced from high to moderately high (shifting from 5.21 to 3.88 on the FHWA scale of 1 to 7). This represents a decrease in overall visual quality of 1.33. Adverse impacts would occur on the visual resources of APPA at Nelson Overlook due to the alternative 4 alignment.

Fernwood Resort, Pennsylvania Hwy 209

The first 0.6-mile segment of the alternative 4 alignment includes the portion of the alternative 2 alignment from Bushkill Substation to the western boundary of DEWA. Therefore, the Fernwood Resort KOP was analyzed for alternative 2 and the proposed conditions are represented in appendix K, figure 2-1, “Proposed.” The adverse impacts under alternative 4 would be the same as those described for alternative 2.

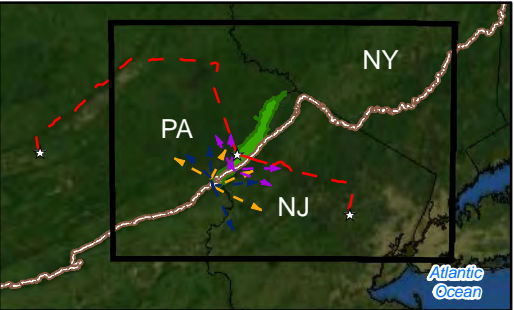
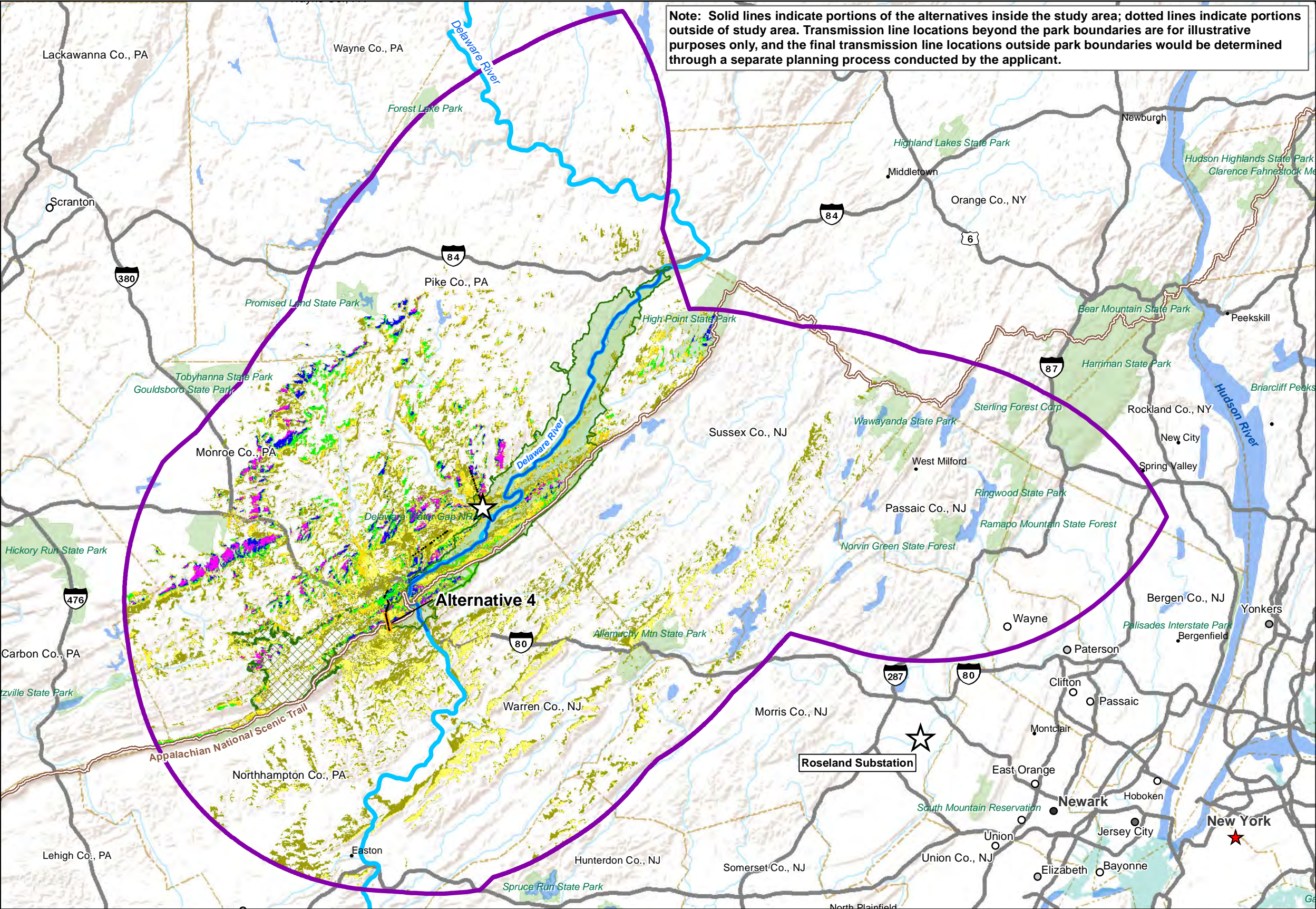
Zone of Visual Influence Bare-Earth Terrain Modeling: As described in the “Methodologies” section, table 59 provide areas (in acres) from which the existing wood poles and proposed transmission towers could be seen under bare earth conditions, specific to alternative 4, for lands within DEWA and along the APPA alignment (defined at 1000 feet wide). See figures 83 and 84, respectively, for existing pole visibility and proposed pole visibility for alternative 4 and figures 85 and 86 for alternative 5.

TABLE 59: ALTERNATIVE 4 VISIBILITY USING ZVI BARE-EARTH TERRAIN MODELING (ESTIMATED IN ACRES)

Pole / Tower Height	Number of poles/ towers within DEWA	Potential Visibility from within DEWA	Potential Visibility from MDSR	Potential Visibility from APPA
Existing 65- to 85-foot poles along the alternative 4 alignment	14	22,591	530	3,444
Proposed 195-foot monopole (towers as sampled)	9	27,149	1,995	6,721

Overall Alternative 4 Impacts

Activity during deconstruction and construction would adversely affect visual quality as described in the “Common to All Action Alternatives” section. Impacts would depend on the extent to which deconstruction and construction activities could be seen, as well as the location of temporary spur roads. Under alternative 4, construction impacts would be most apparent where the line would be in proximity to APPA. At this location, the access road would veer east outside the ROW and would cross APPA about 600 feet from the transmission line. This would represent two crossings of the trail related to alternative 4. The widened ROW clearing, reconstructed and collocated distribution line and taller poles as a result of alternative 4 would create impacts. Adverse impacts related to operations and maintenance of the transmission line would occur inside the study area. Overall, alternative 4 would result in adverse impacts to visual resources.



Legend

- ☆ Substation
- Alternative 4

Number of Existing Towers Potentially Visible

- 1 to 6
- 7 to 12
- 13 to 18
- 19 to 24
- 25 to 30
- 31+

• Existing Tower

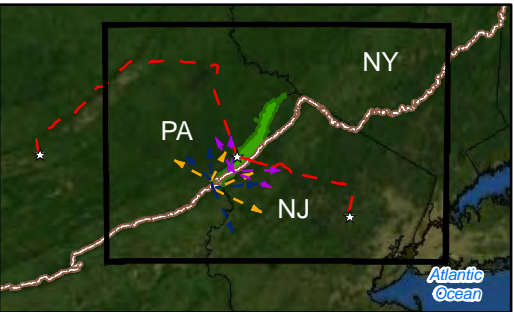
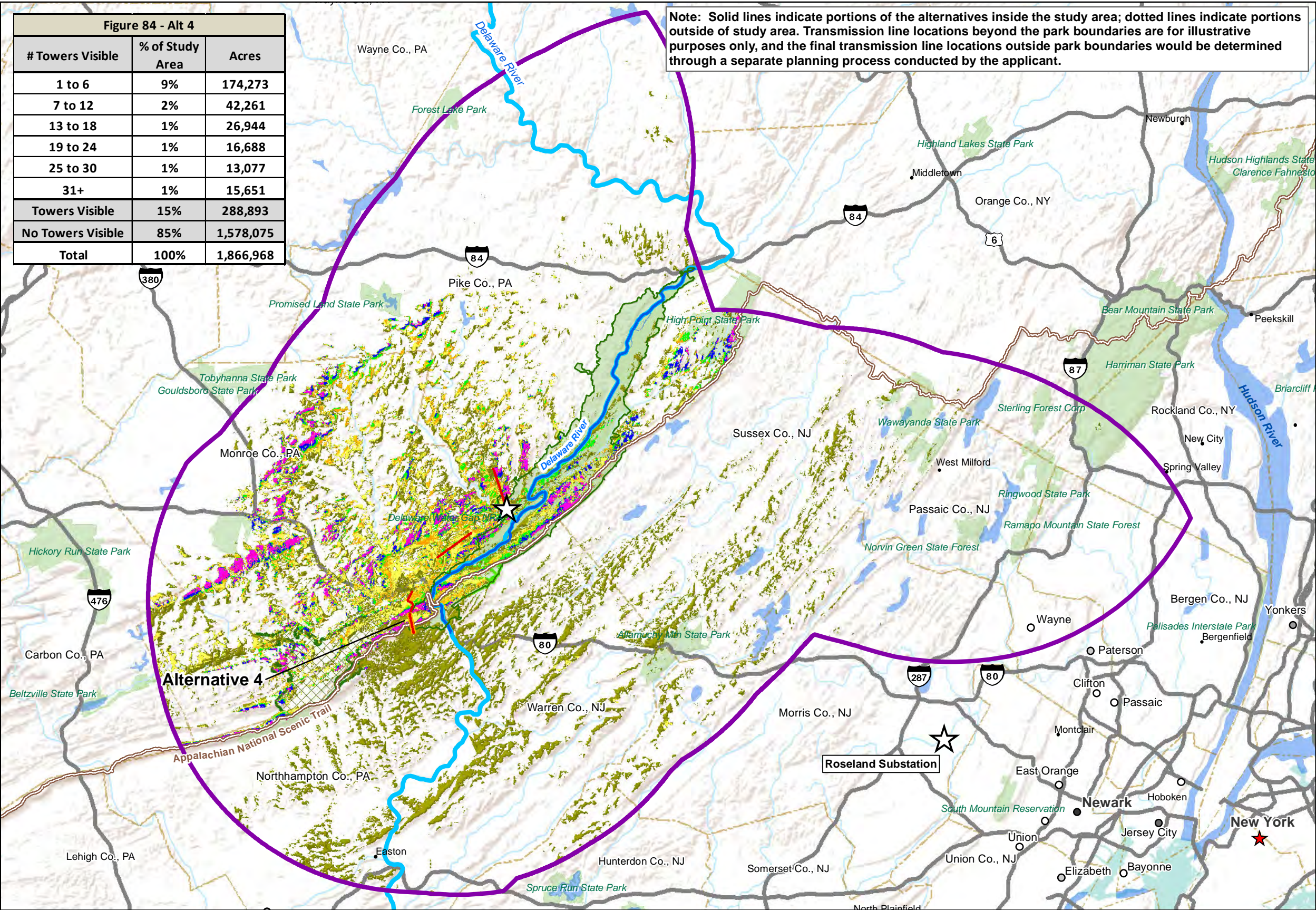
Notes: Existing tower locations are located along existing transmission lines. Large towers were given an 85 foot elevation (tower height) and small or medium towers were given a 65 foot elevation.

The study area is defined as the union of the areas that are 20 miles from the DEWA boundary and 20 miles from the APPA alignment, intersected with the area that is 20 miles from the alternative alignment.

- Visual Analysis Study Area
- Appalachian National Scenic Trail
- Middle Delaware National Scenic and Recreational River
- Delaware River
- Delaware Water Gap National Recreation Area
- CVNWR Boundary
- Worthington State Forest
- State Park
- County Line
- Interstate Hwy

Figure 84 - Alt 4		
# Towers Visible	% of Study Area	Acres
1 to 6	9%	174,273
7 to 12	2%	42,261
13 to 18	1%	26,944
19 to 24	1%	16,688
25 to 30	1%	13,077
31+	1%	15,651
Towers Visible	15%	288,893
No Towers Visible	85%	1,578,075
Total	100%	1,866,968

Note: Solid lines indicate portions of the alternatives inside the study area; dotted lines indicate portions outside of study area. Transmission line locations beyond the park boundaries are for illustrative purposes only, and the final transmission line locations outside park boundaries would be determined through a separate planning process conducted by the applicant.



Legend

- ☆ Substation
- Alternative 4
- Number of Proposed Towers Potentially Visible
 - 1 to 6
 - 7 to 12
 - 13 to 18
 - 19 to 24
 - 25 to 30
 - 31+
- Proposed Tower
- Note: Proposed towers are located along the proposed transmission lines. Towers were given a 195 foot elevation and spaced approximately 6 towers per mile.
- The study area is defined as the union of the areas that are 20 miles from the DEWA boundary and 20 miles from the APPA alignment, intersected with the area that is 20 miles from the alternative alignment.
- Visual Analysis Study Area
- Appalachian National Scenic Trail
- Middle Delaware National Scenic and Recreational River
- Delaware River
- Delaware Water Gap National Recreation Area
- CVNWR Boundary
- Worthington State Forest
- State Park
- County Line
- Interstate Hwy

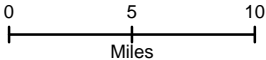


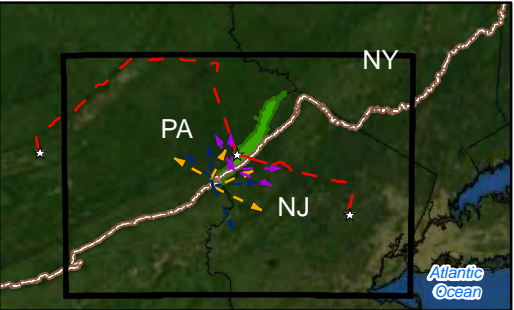
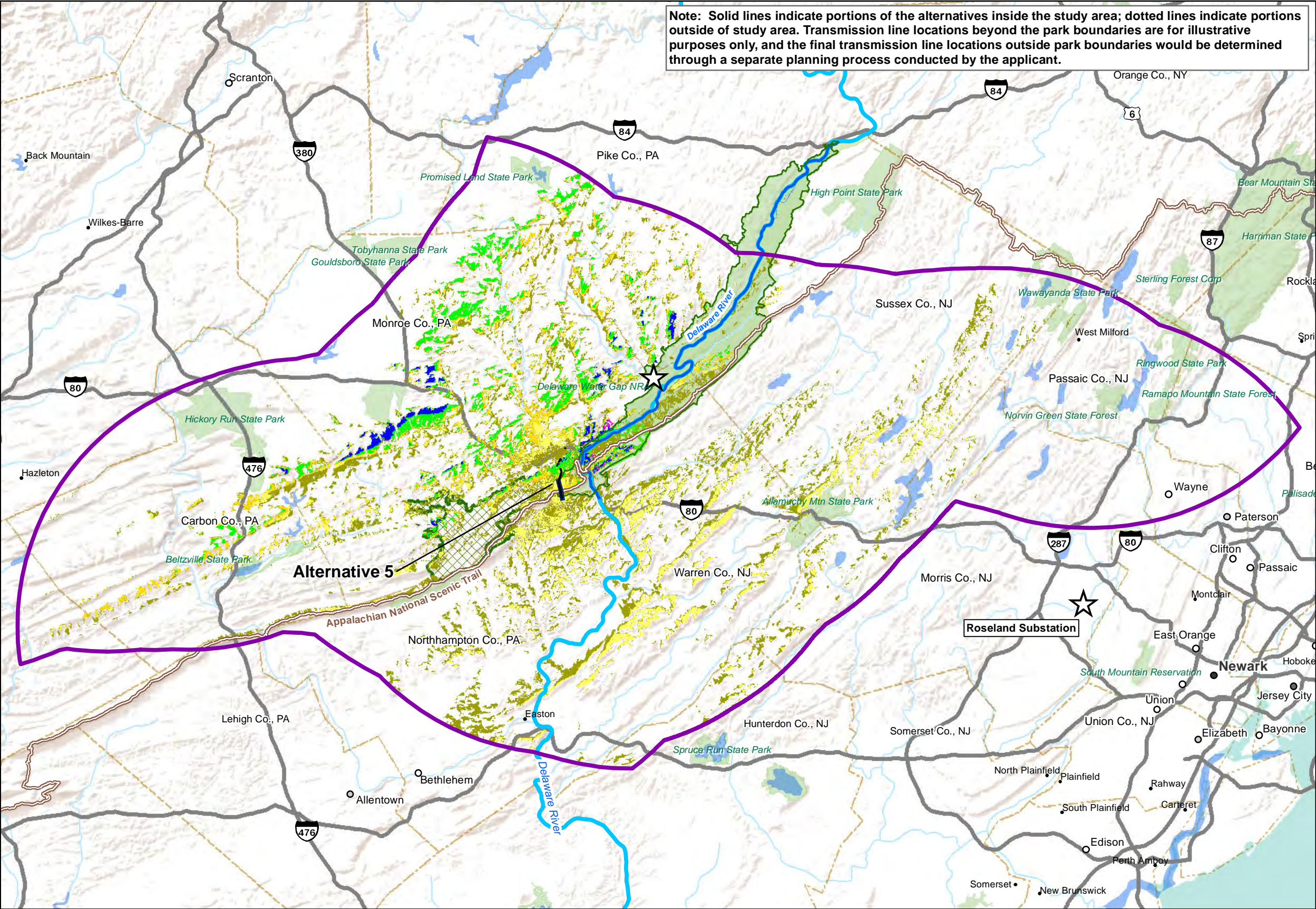
Susquehanna to Roseland
Transmission Line Proposal
and
Right-of-Way Request EIS

Figure 84
Proposed Tower Visibility: Bare Terrain Analysis
Alternative 4

Source: NPS 2010, EA Engineering 2010,
DEWA 2008, ESRI 2002, ESRI 2006, ESRI
2010, NJOIT - OGIS 2008, PASDA 2010

Projection: NAD 83 UTM Zone 18N
Date: July 2012





Legend

- ☆ Substation
- Alternative 5

Number of Existing Towers Potentially Visible

- 1 to 6
- 7 to 12
- 13 to 18
- 19 to 24
- 25 to 30
- 31+

• Existing Tower

Notes: Existing tower locations are located along existing transmission lines. Large towers were given an 85 foot elevation (tower height) and small or medium towers were given a 65 foot elevation.

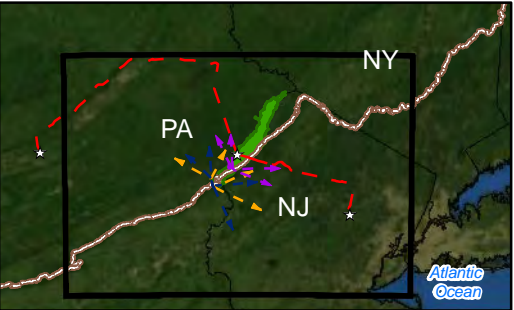
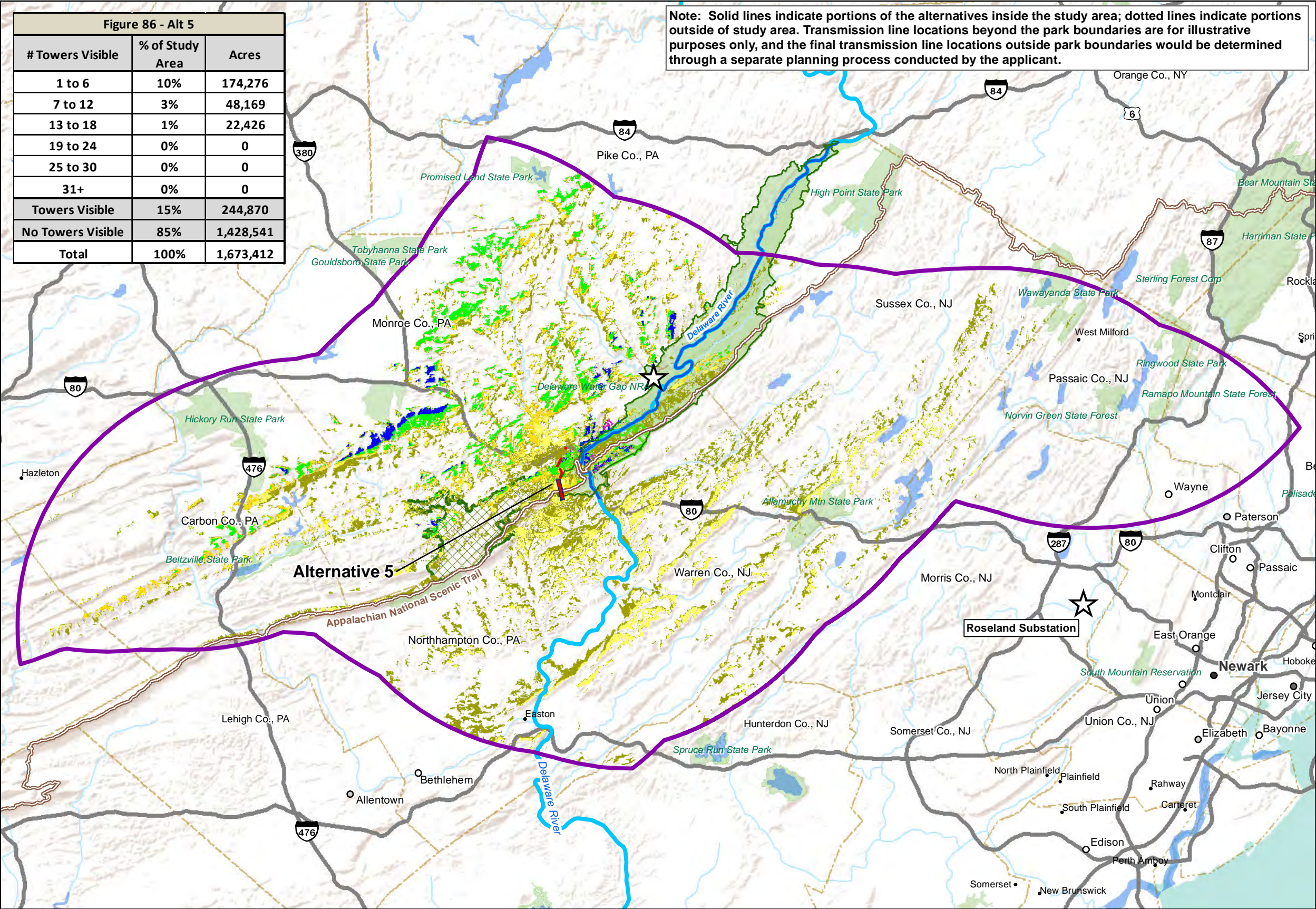
The study area is defined as the union of the areas that are 20 miles from the DEWA boundary and 20 miles from the APPA alignment, intersected with the area that is 20 miles from the alternative alignment.

- Visual Analysis Study Area
- Appalachian National Scenic Trail
- Middle Delaware National Scenic and Recreational River
- Delaware River
- Delaware Water Gap National Recreation Area
- CVNWR Boundary
- Worthington State Forest
- State Park
- County Line
- Interstate Hwy

Figure 86 - Alt 5

# Towers Visible	% of Study Area	Acres
1 to 6	10%	174,276
7 to 12	3%	48,169
13 to 18	1%	22,426
19 to 24	0%	0
25 to 30	0%	0
31+	0%	0
Towers Visible	15%	244,870
No Towers Visible	85%	1,428,541
Total	100%	1,673,412

Note: Solid lines indicate portions of the alternatives inside the study area; dotted lines indicate portions outside of study area. Transmission line locations beyond the park boundaries are for illustrative purposes only, and the final transmission line locations outside park boundaries would be determined through a separate planning process conducted by the applicant.



Legend

- ☆ Substation
- Alternative 5
- Number of Proposed Towers Potentially Visible
 - 1 to 6
 - 7 to 12
 - 13 to 18
 - 19 to 24
 - 25 to 30
 - 31+
- Proposed Tower
- Note: Proposed towers are located along the proposed transmission lines. Towers were given a 195 foot elevation and spaced approximately 6 towers per mile.
- The study area is defined as the union of the areas that are 20 miles from the DEWA boundary and 20 miles from the APPA alignment, intersected with the area that is 20 miles from the alternative alignment.
- Visual Analysis Study Area
- Appalachian National Scenic Trail
- Middle Delaware National Scenic and Recreational River
- Delaware River
- Delaware Water Gap National Recreation Area
- CVNWR Boundary
- Worthington State Forest
- State Park
- County Line
- Interstate Hwy

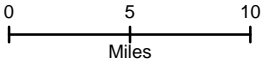


Susquehanna to Roseland
Transmission Line Proposal
and
Right-of-Way Request EIS

Figure 86
Proposed Tower Visibility: Bare Terrain Analysis
Alternative 5

Source: NPS 2010, EA Engineering 2010,
DEWA 2008, ESRI 2002, ESRI 2006, ESRI
2010, NJOIT - OGIS 2008, PASDA 2010

Projection: NAD 83 UTM Zone 18N
Date: July 2012



Cumulative Impacts

Cumulative impacts inside the study area would result in adverse impacts on visual resources as described previously in the “Cumulative Impacts” section. When the impacts on visual resources as a result of alternative 4 are combined with other past, present, and reasonably foreseeable projects in the study area, an overall cumulative adverse impact would be expected.

The past, present, and reasonably foreseeable projects identified along the length of APPA would produce adverse cumulative impacts on the trail as explained in the “Cumulative Impacts” section. When the impacts on visual resources as a result of alternative 4 are combined with other projects that affect APPA, an overall adverse cumulative impact would be expected.

Conclusion

Under alternative 4, adverse impacts on visual resources at the affected KOPs would occur. Impacts on DEWA would occur at Mount Tammany summit, the Karamac Trail in Worthington State Forest, and affect APPA where the alignment crosses over. Construction-related and maintenance adverse impacts would occur. When combined with the impacts on visual resources under alternative 4, the effects of past, present, and reasonably foreseeable future projects would result in adverse cumulative impacts on visual resources inside the study area, and adverse cumulative impacts specifically on APPA.

When considered in the context of the purposes for which DEWA and APPA were established, the adverse impacts of increased visibility and intrusion of the transmission line along alternative 4 would be significant. The transmission line corridor and structures would be clearly visible under alternative 4 and the presence of two sets of structures would increase the adverse impact on aesthetics and scenery. The abrupt opening of the cleared ROW and the intrusion of transmission line towers would likely be intense and would diminish the sense of naturalness to visitors of the parks. Topography and vegetation cover would not screen the visual intrusion on the scenic landscape from almost 200-foot tall towers. These impacts are adverse, would last the life of the project, and cannot be further mitigated. Several significant benefits would occur from removing the B-K Line as part of mitigation for the construction of alternative 4. These benefits may balance the adverse effects of construction, operation, and maintenance of alternative 4.

Alternative 4 also contributes to the cumulative adverse impacts of intrusions into scenic viewsheds and the reduction of these resources in the region surrounding the parks would increase their scarcity and sensitivity inside the parks, where they are afforded special protection. The applicant’s project is one component of a larger regional plan by the RTO to enhance systems reliability. Other component projects of this plan have already affected, and would continue to affect APPA, especially in the areas of scenic resources, as well as other National Parks in their paths. The scenic resources of the APPA visitor would be degraded because this project would contribute cumulatively to the adverse impacts cause by the infrastructure projects along the entirety of the trail.

Public attention surrounding this project is high. There is likely to be a high degree of controversy over any effects on park resources that are particularly popular with the public, such as scenery, visitor use and experience, rare and unique communities, cultural landscapes, and historic structures, for any of the alternatives. The inherent uncertain nature of predicting the true degree of some of these impacts would likely heighten this controversy.

The scenic resources of DEWA and APPA are held in public trust. The Organic Act and the parks’ enabling legislation mandate that these resources are protected in perpetuity. Visitors come to the parks to experience the scenic resources. As with the other action alternatives, alternative 4 may establish

precedent for future actions because it reverses the trend of improving visitor experience and scenic values by removing non-conforming features. Thus, the NPS believes that alternative 4 would result in significant adverse impacts to visual resources.

Alternative 5

Alternative 5 would follow the same alignment as alternative 4 with the exception of the portion of the B-K Line from the Bushkill Substation to the eastern boundary of DEWA. Affected KOPs with potential visibility of alternative 5 include the following:

- Delaware River as viewed from the river, north of the existing rail bridge
- APPA at the crossing of the proposed alignment

The impacts on visual resources from the proposed transmission line along the alternative 5 alignment would be the same as those discussed for alternative 4 inside the study area.

Zone of Visual Influence Bare-Earth Terrain Modeling: As described under the “Methodologies” section, table 60 provide areas (in acres) from which the existing wood poles and proposed transmission towers could be seen under bare earth conditions, specific to alternative 5, for lands within DEWA and along the APPA alignment (defined at 1,000 feet wide).

TABLE 60: ALTERNATIVE 5 VISIBILITY USING ZVI BARE-EARTH TERRAIN MODELING (ESTIMATED IN ACRES)

Pole / Tower Height	Number of poles/ towers within DEWA	Potential Visibility from within DEWA	Potential Visibility from MDSR	Potential Visibility from APPA
Existing 65- to 85-foot poles along the alternative 5 alignment	11	13,849	432	2,183
Proposed 195 foot monopole (towers as sampled)	5	17,131	1,325	5,991

Overall Alternative 5 Impacts

Activity during deconstruction and construction would adversely affect visual quality as described in the “Common to All Action Alternatives” section. Under alternative 5, impacts would be greatest where the transmission line would cross APPA because it would also be intersected by an access road. Impacts related to operations and maintenance of the transmission line would be the same as for alternative 4. Overall, alternative 5 would result in impacts on visual resources.

Cumulative Impacts

Cumulative impacts inside the study area would result in adverse impacts on visual resources as described previously in the “Cumulative Impacts” section. When the impacts on visual resources as a result of alternative 5 are combined with other past, present, and reasonably foreseeable projects in the study area, an overall cumulative adverse impact would be expected.

The past, present, and reasonably foreseeable projects identified along the length of APPA would produce adverse cumulative impacts on the trail as explained in the “Cumulative Impacts” section. When the

impacts on visual resources as a result of alternative 5 are combined with other projects that affect APPA, an overall adverse cumulative impact would be expected.

Conclusion

The impacts on visual resources at the KOPs under alternative 5 would be the same as described for alternative 4 where the alignments coincide. Adverse impacts under alternative 5 in the study area would affect APPA. The transmission line corridor and structures would be clearly visible under alternative 5 and the presence of two sets of structures would increase the adverse impact on aesthetics and scenery, lasting the life of the project. Construction-related and maintenance impacts would be localized and of short duration. When combined with the impacts on visual resources under alternative 5, the effects of past, present, and reasonably foreseeable future projects would result in adverse cumulative impacts on visual resources inside the study area, and adverse cumulative impacts specifically on APPA.

For the same reasons described for alternative 4 above, the adverse impacts of alternative 5 also have potential to be significant. As stated for alternative 4, permanent adverse impacts would occur to the parks' scenic resources from the visual intrusion of new, nearly 200-foot towers and substantial vegetation clearing of the ROW. Topography and vegetation cover do not screen the visual intrusion on the scenic landscape from almost 200-foot tall towers. These impacts are permanent for the life of the line and cannot be mitigated. The applicant's project is one component of a larger regional plan by the RTO to enhance systems reliability. Other component projects of this plan have already affected, and would continue to affect APPA, especially in the areas of scenic resources, as well as other National Parks in their paths. The scenic resources of the APPA visitor would be degraded because this project would contribute cumulatively to the adverse impacts caused by the infrastructure projects along the entirety of the trail.

Public attention surrounding this project is high. There is likely to be a high degree of controversy over any effects on park resources that are particularly popular with the public, such as scenery, visitor use and experience, rare and unique communities, cultural landscapes, and historic structures, for any of the alternatives. The inherent uncertain nature of predicting the true degree of some of these impacts would likely heighten this controversy.

Allowing impacts to visual resources is contrary to typical NPS practice of improving scenic conditions by removing non-conforming features and may establish precedent for future actions. As with the other action alternatives, alternative 5 may establish precedent for future actions because it would reverse the trend of improving visitor experience and scenic values by removing non-conforming features. Thus, the NPS believes that alternative 5 would result in significant adverse impacts to visual resources.

SOUNDSCAPES

This section evaluates the impacts of noise associated with the proposed alternatives on park soundscapes. The effects of these impacts on people and wildlife are evaluated in the "Visitor Use and Experience," "Landscape Connectivity, Wildlife Habitat, and Wildlife," and "Special-status Species" sections.

METHODOLOGIES

The analysis of impacts for soundscapes assesses the potential impacts associated with constructing, operating, and maintaining the proposed transmission lines along the alternate alignments being evaluated as part of this EIS. The analysis also includes the potential impact associated with decommissioning the existing transmission line as part of the action alternatives.

The methodology used to assess soundscape impacts in this document is consistent with NPS *Management Policies 2006* (NPS 2006a) and Director's Order 47: *Soundscape Preservation and Noise Management* (NPS 2000a). The NPS Natural Sounds and Night Skies Division is currently working to establish standards and protocols for acoustic studies in national parks. This work includes establishing acoustic zones in each park unit based on vegetation, land cover, topography, elevation, and climate. Acoustic zones are areas in which these attributes are similar; therefore, they may have similar natural sound sources, sound levels, and propagation and attenuation properties. At this time, acoustic zones have not been established for the parks in the study area. The soundscapes research and analysis conducted for this EIS did not establish acoustic zones in DEWA, but did establish a baseline condition for the purposes of assessing the impacts of the proposed action.

Resource Systems Group, Inc. conducted background sound level monitoring between October 7 and November 14, 2010, to establish a baseline condition for soundscapes near the proposed alternatives. The data gathered included ambient sound levels (natural and existing), sources of sound, and frequency of human-generated sources of sound. This baseline was compared to predicted sound levels and the propagation of sound modeled for the proposed alternatives to identify potential impacts on the soundscape. The level of impact was assessed based on the type of sound introduced (including the frequency, magnitude, and duration), the degree of change from existing conditions, and the management objectives for the location.

Construction Activities: The analysis estimates that 6,400 feet (1.2 miles) from construction activities is the distance at which construction sound would decrease to the existing background sound levels. The sound from construction equipment can vary from intermittent to fairly continuous. Assuming that a truck (90 dBA), scraper-grader (87 dBA), moveable crane (82 dBA), tractor (85 dBA), and two power saws (78 dBA) are operating in the same area, peak construction period sound would generally be about 93 dBA at 50 feet from the construction site (USEPA 1971). Assuming a sound level decrease of approximately 7.5 dBA for every doubling of distance from the sound source across a soft surface such as vegetation (Caltrans 1998, 27), peak construction sound would be approximately 40 dBA at a distance of 6,400 feet (1.2 miles) from the source. This is close enough to the background sound levels in the study area that it would be barely perceptible or not perceptible at all (see the discussion of sound level monitoring in chapter 3).

Operations: The APEs for soundscapes over the life of the project was determined using sound propagation modeling. As detailed in appendix A of *Soundscapes Summary Report* (DEA 2010c), the predicted transmission line sound levels of the proposed alternatives were calculated using an empirical formula developed by the Bonneville Power Administration based on measurements of existing power lines. The following design assumptions for the proposed alternatives were used for the calculation:

- radius of conductor = 0.019 meters
- radius of bundle = 0.264 meters
- conductors per bundle = 3
- distance between conductors in a bundle = 0.457 meters
- conductor height above ground = 8.2 meters
- voltage = 500 kV
- configuration of phases = vertical

Terrain models developed for each alternative were used to estimate the propagation of transmission line sound moving away from the alternatives. The Cadna A acoustical modeling software used for this

analysis takes into account the source sound power levels, surface reflection and absorption, atmospheric absorption, geometric divergence, meteorological conditions, walls, barriers, berms, and terrain. The resulting sound level isolines (noise contours) surrounding the proposed alternatives show that the sound from the proposed transmission lines would decrease to the existing background sound levels within 350 feet from the centerline of the alternatives. This distance would be much less for some alternatives, as discussed in the “Impacts of the Alternatives on Soundscapes” section. This analysis was performed in the fall of 2010 using the alternative alignments that were current at that time. Since then, some refinements to the alternative alignments have been made. Consequently, the results presented in this section may slightly overestimate the area in specific management zones that would be affected by noise associated with the operation of the proposed alternatives.

Maintenance Activities: Maintenance operations are conducted at various times of the year for selective clearing or for repairing damaged transmission lines, resulting in periodic, temporary sources of sound. Routine inspection and maintenance of the transmission lines is accomplished by vehicular access from access roads. Pickup trucks and chainsaws are examples of equipment that may be used in maintenance activities. The area potentially affected by these activities would be similar to the area that would be affected by construction noise. However, the impacts of maintenance differ in that their duration would be much more brief and the impacts would recur periodically.

Context: Resource-specific context for assessing impacts on soundscapes includes:

- the undeveloped nature of the parks protects the natural soundscapes and buffers against non-natural, human-caused sounds, creating oases from civilization and urbanization
- natural sounds and escape from every-day noise is an important component of the visitor experience and is anticipated by visitors
- other sources of sound, as mentioned in chapter 3, include animals, wind, and water rushing (natural sounds); aircraft, vehicular traffic, people, and gunshots during hunting season (human-produced sound).

STUDY AREA

The geographic study area for soundscapes, similar to other resources, is divided as inside the study area and outside the study area. Inside the study area, areas where noise associated with the proposed action could be heard above the existing background sound levels were assessed for direct effects on the soundscape. The maximum distance out from the centerline where operations noise would be audible is 350 feet. For construction sound, potential direct effects on the soundscape were evaluated within 6,400 feet of construction activities. Outside the study area, the potential indirect effects of the proposed action were generally evaluated based on the types of noise-sensitive receptors that could be near the alignments.

CUMULATIVE IMPACTS COMMON TO ALL ALTERNATIVES

Actions inside and outside the parks can affect the ability of visitors to experience the natural sounds that compose the natural soundscape of the parks. Inappropriate human-generated sound (noise) can adversely affect park resources or values, including, but not limited to, natural soundscapes, cultural resources, wildlife, and visitor use and experience. For this EIS, human-generated sounds that were recorded above the natural ambient sound levels in the parks were considered along with the past, present, and reasonably foreseeable activities that would have beneficial or adverse impacts on soundscapes in the parks and inside and outside the study area. Overall, inappropriate sounds associated with past, present, and reasonably foreseeable actions inside and outside the parks would have an adverse impact on the natural soundscape, as described here.

Sound level monitoring was conducted for this EIS at six different sites representing a variety of settings, including remote ridgetop areas, accessible areas adjacent to the Delaware River, visitor use areas, and wetland areas. Human-generated sound was audible at all these sites, which suggests that much of the natural soundscape is currently affected by human-generated sound to some degree. Sources of human-generated sound recorded during the monitoring period include visitors/hikers, vehicular traffic, gunshots, construction equipment, sirens, car doors, dogs, aircraft overflights, and ORVs.

Human-generated sound in DEWA is audible 10% to 60% of the daytime hours, depending on the monitoring location. The existing ambient sound levels were within 3 dBA of the natural ambient sound levels at all of the monitoring sites. This 3 dBA difference would be barely perceptible to the human ear.

Projects Inside the Study Area

A variety of completed, current, and future activities inside the parks may have effects on soundscapes due to sound associated with road rehabilitation, vegetation clearing/burning, and utilities installation, upgrades, and maintenance. These projects would not result in lasting changes to the soundscape. No projects inside the study area would have cumulative impacts on soundscapes.

Projects Outside the Study Area

Outside the study area, current and reasonably foreseeable projects that would result in adverse cumulative impacts on soundscapes include the following development projects: airport improvements, the high speed passenger train from northeastern Pennsylvania to New York City, and the Alpine Rose Auto Racetrack. Airport and passenger rail improvements outside the study area might affect soundscapes if the improvements led to an increase in noise from increased flights and passenger rail trips, resulting in an adverse impact. However, the magnitude of this possible increase is unknown. Beneficial impacts would occur due to the expiration of commercial use on US Route 209 in 2015, because a reduction in noise levels in that area would occur due to the prohibition of commercial truck traffic. However, an overall population increase expected in the study area would lead to more passenger traffic on this road. The beneficial impacts of the expiration of commercial use on US Route 209 are not expected to offset the adverse impacts expected from a possible increase in noise from increased flights, passenger rail trips, and additional passenger motor vehicle traffic. Therefore, overall cumulative impacts outside the study area would be adverse, but the intensity of these impacts is unknown.

IMPACTS OF THE ALTERNATIVES ON SOUNDSCAPES

Common to All Alternatives

Outside the Study Area: Outside the study area, regardless of which alternative is selected, the transmission line could pass through Carbon, Lackawanna, Luzerne, Monroe, Northampton, Pike, and Wayne counties in Pennsylvania and Morris, Sussex, and Warren counties in New Jersey. A wide variety of land uses would be traversed. Where more undeveloped rural lands exist, such as along Rattlesnake Ridge, existing ambient sound levels may be similar to those measured in DEWA. The residential and urban areas on the west side of the parks are likely to have higher ambient sound levels. In these areas, the noise associated with the transmission lines would not likely be audible.

Outside the study area under the no-action alternative, existing ambient sound levels would remain unchanged. Impacts on soundscapes would be similar to those described for inside the study area. Human-generated noise associated with maintenance activities would have intermittent adverse impacts on the soundscape. The impacts associated with the action alternatives would be similar to those in the study area. There would be impacts from the decommissioning of the existing line and from construction

and maintenance activities. There would be adverse soundscape impacts within 350 feet of the alignment centerline from the noise associated with the continued operation of the existing transmission line. The cumulative impacts from past, present, and reasonably foreseeable projects on the natural soundscape outside the study area are unknown. When the indirect impacts on soundscapes as a result of activities outside the study area are combined with other past, present, and reasonably foreseeable projects outside the study area, the overall cumulative impact would be expected to be adverse.

Alternative 1: No Action

Baseline sound level monitoring shows that the sound associated with the existing transmission line is not audible over the existing background sound levels. There would be no increase in the existing ambient sound levels, which would continue to range from 34 to 48 dBA in the daytime. The soundscape would continue to include a mix of natural and human-generated sounds. There would be no construction activities along the transmission line alignment inside the study area.

The operation of the existing transmission line would require periodic vegetation maintenance every year at a minimum, including the clearing of vegetation in the ROW. Temporary disturbance to the soundscape from these activities would continue. Access roads in the ROW would also require periodic maintenance to provide access for system repairs and maintenance. Sound from equipment such as pickup trucks and chainsaws would continue to be audible periodically. The sound levels associated with these activities may be audible within approximately 6,400 feet of the sound source, which would affect approximately 11.8% of the natural zone in DEWA. Areas as much as 3,200 feet from the alignment may experience temporary sound level increases of more than 13 dBA, which would be consistently audible. Sound levels would increase less than 5 dBA at approximately 6,400 feet from the alignment, which would be barely detectable. Human-generated noise associated with maintenance activities would continue to have intermittent adverse impacts on the soundscape.

Cumulative Impacts

No projects inside the study area would have cumulative impacts on soundscapes, as described previously in the “Cumulative Impacts Common to All Alternatives” section. However, human-generated noise associated with maintenance activities during operation of the existing transmission line would have impacts on the soundscape. Therefore, cumulative soundscape impacts from alternative 1 would be adverse.

Conclusion

Alternative 1, the no-action alternative, would result in the continued operation and maintenance of the existing B-K Line route. Intermittent adverse impacts on soundscapes would continue inside the study area due to maintenance activities associated with continued operation of the existing transmission line. There would be no cumulative impact on the soundscape associated with alternative 1.

Considering the intensity of the impacts of alternative 1 in the context of the purposes for which these parks were established and are managed, the adverse impacts of alternative 1 on soundscapes are not considered to be significant. The existing line does not interfere with the natural sounds of the area in which the line is located. Although there are adverse impacts associated with periodic maintenance of the existing line, the disturbance to the natural soundscapes from vehicles and machinery would be temporary and intermittent; these impacts do not result in significant impacts.

Common to All Action Alternatives

Mitigation Measures: Mitigation measures would be implemented to reduce construction-related impacts on soundscapes and are taken into consideration in the impact analysis. Mitigation measures are described in appendix F.

Removal of Existing Structures: All action alternatives (2, 2b, 3, 4, and 5) include the removal of all or a portion of the B-K Line as described in chapter 2.

Construction Activities: Under all action alternatives, temporary disturbance to the soundscape would be expected from noise associated with construction activities, including the decommissioning of the existing B-K Line. Of the 56,606 acres of natural zone areas in DEWA, 11.8% would be affected by this action. As discussed in chapter 3, the sound associated with construction activities could be audible within approximately 6,400 feet of the sound source. Areas as much as 3,200 feet from the alignment could experience sound level increases of more than 13 dBA, which would be consistently audible. Sound levels would increase less than 5 dBA at approximately 6,400 feet from the alignment. Sound-control devices and muffled exhaust would be installed on all construction equipment and vehicles, respectively, which would help reduce noise during construction.

As shown in table 61, between 11.8% and 26.3% of the surrounding natural zone in DEWA would be temporarily affected assuming ground-based construction activity. Alternatives 3, 4, and 5 would also affect between 11% and 24.2% of the surrounding special use zone designated as nonfederal public land. If helicopters are used at times during construction, sound levels would be higher and a larger area would be affected as compared with ground-based construction activity. Construction disturbance would occur throughout most of the daytime hours (12 hours per day), six days a week for as long as eight months.

TABLE 61: SOUNDSCAPE IMPACTS FROM CONSTRUCTION ACTIVITIES

	Construction Activity	Maximum Natural Zone Affected (%)	Maximum Special Use Zone Affected (%)
Alternatives 2, 2b	Decommissioning and construction of transmission line	11.8	N/A
Alternative 3	Decommissioning and construction of transmission line	26.3	24.2
Alternatives 4, 5	Decommissioning and construction of transmission line	18.9	11

Adverse soundscape impacts would result from activities associated with decommissioning the existing transmission line and the construction of new transmission lines for all action alternatives, with the most severe impacts occurring under alternative 3. These impacts would last for as long as eight months. However, the construction would be confined to the locations of the transmission line features and the construction noise would not occur over the entire length of the alignment for the full eight months. Impacts would be minimized by sound control devices placed on construction equipment.

Operation of Transmission Lines: Existing ambient sound levels were measured at 36 to 37 dBA along the alternative alignments, as identified in table 62. The exception is near the Watergate Recreation Site, where the existing ambient sound level along the alternative 2 and 2b alignment was measured at 48 dBA. Although no monitoring was conducted adjacent to the Delaware River for alternatives 3, 4, and 5, it is anticipated that the sound level where the alignments cross the river would be similar to the river crossing location along alternative 2 and 2b, which was measured at 48 dBA.

TABLE 62: SOUNDSCAPE IMPACTS FROM THE OPERATION OF TRANSMISSION LINES

Alternative	Existing Ambient Sound Levels (dBA)	Maximum Natural Zone Affected (%)	Maximum Special Use Zone Affected (%)	Noise Levels at C/L (dBA)	Distance from C/L Where Noise Levels Reach 40 dBA (Feet)	Distance from C/L Where Noise Levels Reach 35 dBA (Feet)
Alternatives 2, 2b	36–37 ^a	0.47	N/A	44	150	350
Alternative 3	36	0.07	1.28	44	150	300
Alternatives 4, 5	37	0.13	N/A	44	130	350

C/L = centerline; N/A = not applicable.

a. Except near the Watagate Recreation Site, where the existing ambient sound level was measured/estimated at 48 dBA.

Inside the study area, the operation of the proposed transmission line for all action alternatives would affect less than 0.5% of the surrounding natural zone in DEWA, as identified in table 62. This is considered a small area of disturbance. The operation of the proposed transmission line along the alternative 3 alignment would also affect a maximum of 1.28% of the surrounding special use zone designated as nonfederal public land. This is considered a small area of disturbance.

The noise from the proposed transmission line could reach 44 dBA directly at the centerline of the alignments during unfavorable weather conditions (see table 62). For alternatives 2, 2b, 3, 4, and 5, this represents a 7 to 8 dBA increase from existing ambient sound levels, which would be readily detectible to the human ear. Within 130 to 150 feet of the alignment centerlines, transmission line noise would reduce to 40 dBA (see table 62). This represents a 3 to 4 dBA increase from ambient sound levels for alternatives 2, 2b, 3, 4, and 5, which is barely perceptible to the human ear. These conditions would occur approximately 14% of the time. Approximately 86% of the time (during fair weather conditions), the noise from the proposed transmission line would not be audible over the existing background sound levels. Within 300 to 350 feet of the alignment centerlines, transmission line noise would reduce to 35 dBA (see table 62), which would not be audible because it would be below the existing background sound levels for all action alternatives. These conditions would occur approximately 14% of the time. Under all action alternatives, the direct effects of the proposed transmission line operation would result in adverse impacts to soundscapes.

Maintenance of Transmission Lines: Under all action alternatives, temporary disturbance to the soundscape would be expected from noise associated with periodic maintenance activities, including the clearing of vegetation in the ROW. Access roads in the ROW would also require periodic maintenance to provide access for repairs and maintenance. Noise from equipment such as pickup trucks and chainsaws would be audible periodically. Noise levels associated with these activities would be similar to those described above for construction activities. This disturbance would be expected every year or as deemed necessary by the applicant.

Alternative 2

The adjacent townships of Middle Smithfield in Pennsylvania and Hardwick in New Jersey do not have sound ordinances applicable to the proposed action. Therefore, no conflicts with local ordinances are anticipated.

As stated in the “Common to All Action Alternatives” section above, there would be adverse soundscape impacts from decommissioning of the existing line and from construction and maintenance activities under alternative 2. With the implementation of mitigation measures to reduce construction noise as

described in appendix F, construction-related impacts would be minimized. Some readily detectable noise associated with the continued operation of the new double 500-kV transmission line would be expected within 350 feet of the alignment centerline (see table 62).

Cumulative Impacts

No projects inside the study area would have cumulative impacts on soundscapes, as described previously in the “Cumulative Impacts Common to All Alternatives” section. However, human-generated noise associated with decommissioning of the existing line and construction and maintenance of the new 500-kV line under alternative 2 would have adverse impacts on the soundscape. Therefore, cumulative impacts from alternative 2 would be adverse.

Conclusion

Inside the study area, adverse soundscape impacts would result from disturbance during decommissioning, construction, and maintenance activities. Some readily detectable adverse impacts on the soundscape would be expected within 350 feet of the alignment centerline (see table 62) from the operation of the line. Cumulative impacts are expected due to the adverse effects to the soundscape associated with construction and operation of alternative 2.

As described in the “Elements Common to All Action Alternatives” section above, adverse impacts to soundscapes from alternative 2 and the other action alternatives would result from activities associated with decommissioning the existing transmission line and the construction of new transmission lines. These impacts would last for as long as eight months. However, the construction would be confined to the locations of the transmission line features and the construction noise would not occur over the entire length of the alignment for the full eight months. There would be no conflict with local sound ordinances. Sound control devices placed on construction equipment would be used to help minimize adverse impacts. Once construction is completed, operation of the new transmission line would result in very little change in ambient noise levels from existing conditions. There may be persistent adverse impacts on trail users who walk directly under the line due to increased noise for a distance of up to 350 feet crossing the centerline in unfavorable weather conditions. This adverse impact would be of short duration, lasting only as long as it took to cross that distance.

Permitting the project would adversely affect multiple protected resources inside the parks, in some instances irreversibly. Allowing such adverse effects in order to facilitate private infrastructure expansion would be contrary to NPS practice and principle of protecting and improving these resources, and of removing incompatible infrastructure to do so. This could establish a precedent that may invite similar proposals by other applicants in the future, and create an expectation of like treatment for those proposals; it may make it difficult to deny such proposals. DEWA and APPA both contain numerous other utility crossings, which makes the risk of such precedent particularly concerning for these parks. Furthermore, as units of the national park system, wherein all parks are entitled to equal protection, creating such a precedent could have ramifications for parks nationwide. The location of this particular crossing through the center of DEWA could make such a precedent even more potent. Installing the S-R Line on this alignment may invite future utilities proposing to follow the same route. For these reasons, alternative 2 would not likely result in significant impacts.

Alternative 2b

The alternative 2b alignment follows the same route as the alternative 2 alignment, along the existing B-K Line. The alternative 2b towers would be the same height as the alternative two towers, although two additional towers would be required for alternative 2b. The addition of two towers for alternative 2b

would not measurably change the expected impacts. Thus, the adverse impact of alternative 2b would be the same as alternative 2.

Cumulative Impacts

The cumulative impacts under alternative 2b would be the same as those described for alternative 2, adverse, when combined with the other past, present, and reasonably foreseeable projects inside the study area.

Conclusion

Alternative 2b would result in adverse impacts on soundscapes inside the study area from the operation of the line. Cumulative impacts are expected due to the adverse effects to the soundscape associated with construction and operation of alternative 2b.

Similar to alternative 2, adverse impacts to soundscapes from alternative 2 and the other action alternatives would result from activities associated with decommissioning the existing transmission line and the construction of new transmission lines. These impacts would last for as long as eight months. However, the construction would be confined to the locations of the transmission line features and the construction noise would not occur over the entire length of the alignment for the full eight months. There would be no conflict with local sound ordinances. Sound control devices placed on construction equipment would be used to help minimize adverse impacts. Once construction is completed, operation of the new transmission line would result in very little change in ambient noise levels from existing conditions. There may be persistent adverse impacts on trail users who walk directly under the line due to increased noise for a distance of up to 350 feet crossing the centerline in unfavorable weather conditions. This adverse impact would be of short duration, lasting only as long as it took to cross that distance. The adverse impacts on soundscapes under alternative 2b are not considered to be significant.

Like the other action alternatives, alternative 2b has potential for significant impacts associated with the precedent set by permitting a proposed transmission line that would adversely affect multiple protected resources inside the parks. The results of this action would be contrary to NPS practice and principle of protecting and improving these resources and would potentially establish a precedent that may invite similar proposals by others and make it difficult for the NPS to deny such proposals.

Alternative 3

The adjacent townships of Smithfield in Pennsylvania and Blairstown in New Jersey do not have sound ordinances applicable to the proposed action. Therefore, no conflicts with local ordinances are anticipated.

As stated in the “Common to All Action Alternatives” section above, there would be adverse soundscape impacts from the decommissioning of the existing line and from construction and maintenance activities. Because sound associated with operation of the existing B-K Line is not audible over existing background sound levels as described under alternative 1, removal of the line would not provide benefits to the soundscape. With the implementation of mitigation measures to reduce construction noise as described in appendix F, construction-related impacts would be minimized. Some readily detectable adverse impacts would be expected within 300 feet of the alignment centerline (see table 62) from the noise associated with the continued operation of the new double 500-kV transmission line.

Cumulative Impacts

No projects inside the study area would have cumulative impacts on soundscapes, as described previously in the “Cumulative Impacts Common to All Alternatives” section. However, human-generated noise associated with decommissioning of the existing line and construction and maintenance of the new 500-kV line under alternative 3 would have readily detectable impacts on the soundscape. Therefore, cumulative impacts from alternative 3 would be adverse.

Conclusion

Inside the study area, adverse soundscape impacts would result from disturbance during decommissioning, construction, and maintenance activities. Some readily detectable impacts on the soundscape would be expected within 300 feet of the alignment centerline during operation and maintenance (see table 62). Adverse cumulative impacts are expected due to the soundscape impacts associated with construction and operation of alternative 3.

The adverse impacts on soundscapes under alternative 3 are somewhat worse than the other action alternatives because construction noise could affect a potentially larger area due to the length of the line within the parks; however, these adverse impacts are not considered to be significant for the same reasons described above.

Like the other action alternatives, alternative 3 has potential for significant impacts associated with the precedent set by permitting a proposed transmission line that would adversely affect multiple protected resources inside the parks. The results of this action would be contrary to NPS practice and principle of protecting and improving these resources and would potentially establish a precedent that may invite similar proposals by others and make it difficult for the NPS to deny such proposals.

Alternative 4

Construction activities between the hours of 6:00 p.m. and 8:00 a.m. would violate the Stroud Township noise ordinance if construction-related sound exceeds the limits. The Upper Mount Bethel Township also has an ordinance that may be applicable to the proposed action, but specific information was not available from the jurisdiction.

As stated in the “Common to All Action Alternatives” section above, there would be adverse soundscape impacts from the decommissioning of the existing line and from construction and maintenance activities. Because sound associated with operation of the existing B-K Line is not audible over existing background sound levels as described under alternative 1, removal of the line would not provide benefits to the soundscape. With the implementation of mitigation measures to reduce construction noise as described in appendix F, construction-related impacts would be minimized. There would be some readily detectable adverse impacts from the noise associated with the continued operation of the new double 500-kV transmission line within 350 feet of the alignment centerline (see table 62).

Cumulative Impacts

No projects inside the study area would have cumulative impacts on soundscapes, as described previously in the “Cumulative Impacts Common to All Alternatives” section. However, human-generated noise associated with decommissioning of the existing line and construction and maintenance of the new 500-kV line under alternative 4 would have readily detectable impacts on the soundscape. Therefore, cumulative impacts from alternative 4 would be adverse.

Conclusion

Inside the study area, adverse soundscape impacts would result from temporary disturbance during decommissioning, construction, and maintenance activities. Some readily detectable adverse impacts on the soundscape would be expected within 350 feet of the alignment centerline (see table 62) during operation and maintenance; however, no measureable change to the natural soundscape would be expected as a result of operation of the line under alternative 4. Adverse cumulative impacts are expected due to the soundscape impacts associated with construction and operation of alternative 4.

As described for alternative 2 above, the adverse impacts on soundscapes under alternative 4 are not considered to be significant. Construction activities would have to be coordinated with local ordinances to avoid conflicts.

Like the other action alternatives, alternative 4 has potential for significant impacts associated with the precedent set by permitting a proposed transmission line that would adversely affect multiple protected resources inside the parks. The results of this action would be contrary to NPS practice and principle of protecting and improving these resources and would potentially establish a precedent that may invite similar proposals by others and make it difficult for the NPS to deny such proposals.

Alternative 5

Inside the study area, the alignment for alternative 5 would follow the same route through DEWA and APPA as alternative 4, with the exception of the portion of the B-K Line from the Bushkill Substation to the western boundary of DEWA. The adverse impacts of alternative 5 on soundscapes would be the same as those described for alternative 4.

Cumulative Impacts

The cumulative impacts under alternative 5 would be the same as those described for alternative 4, adverse, when combined with the other past, present, and reasonably foreseeable projects inside the study area.

Conclusion

Similar to the other action alternatives, there would be adverse effects due to noise generated from the construction of alternative 5; however, no measurable change to the soundscapes of the parks would be expected as a result of operation of the line. Cumulative impacts are expected due to the adverse effects to the soundscape associated with construction and operation of alternative 5.

As described for alternative 2 above, the adverse impacts on soundscapes under alternative 5 are not considered to be significant. Construction activities would have to be coordinated with local ordinances to avoid conflicts.

Like the other action alternatives, alternative 5 also has potential for significant impacts associated with the precedent set by permitting a proposed transmission line that would adversely affect multiple protected resources inside the parks. The results of this action would be contrary to NPS practice and principle of protecting and improving these resources and would potentially establish a precedent that may invite similar proposals by others and make it difficult for the NPS to deny such proposals.

VISITOR USE AND EXPERIENCE

This section evaluates impacts on visitor use and experience. Impacts were determined by considering the effect of the existing conditions and the proposed construction and operation of the transmission lines on the overall use of recreational opportunities provided by the parks and the resulting experience visitors have while visiting the parks.

METHODOLOGIES

Visitors use a variety of park resources based on personal goals and interests, and the feeling they experience during their visit is the result of multiple actions and encounters. This analysis considers how the proposed alternatives would affect how people use park lands, as well as how the alternatives would alter visitors' experiences. Although several factors contribute to the quality of experience, the proposed actions would affect visitor use and experience primarily through visual and noise disruptions. Therefore, this analysis incorporates the findings from the "Soundscapes" and "Visual Resources" sections of this chapter to help determine how impacts on those park resources would affect visitor use and experience.

Aesthetic value is an important consideration in the management of recreation settings, especially where most people expect a natural-appearing landscape with limited evidence of "unnatural" disturbance of landscape features (USFS 1995, F-1). Scenic qualities can affect park visitors, residents of the local area or nearby communities, and a broader constituency who may either occasionally visit the parks or simply have an interest in their scenic qualities (USFS 1995, 3-3).

Landscapes are viewed to varying degrees from different locations, and subsequently differ in their importance (USFS 1995, 4-8). Visual impacts on visitor experience would depend on viewer exposure (which includes physical location, number of viewers, and view duration) and viewer sensitivity (which includes activity and awareness, personal values, and the cultural significance of a scene) (FHWA n.d., 97). Sometimes, only small numbers of people view certain landscapes (viewer exposure), but they may have high concern for scenic quality and high expectations of outstanding scenic beauty (viewer sensitivity). When associated with other related experience opportunities, such as introspection or spiritual quests, these landscapes have even higher scenic importance and value. Other natural resource values, such as wilderness, wildlife, or old-growth vegetation (cultural significance), may raise the importance of scenic quality and landscape settings (USFS 1995, 4-4). The particular activity in which people are engaged may encourage them to look at the landscape, such as nature photography, or distract them from doing so, such as driving during bad weather. A response by the viewer to a change can also be affected by expectations or awareness of the change, such as individual preconceptions about the landscape or an unexpected landscape transition (FHWA n.d., 69). In addition, the longer a view would be seen, the higher the impact. For example, motorists driving under a cleared canopy opening would be exposed to the change for a very short period, experiencing only a fleeting glimpse or a peripheral view of the effect. Hikers resting at an overlook along APPA would be exposed to a change for several minutes or longer. In assessing impacts on visitor use and experience, the analysis considers the duration of viewer exposure and viewer sensitivity based on location and activity, as described earlier. The types of activities in which visitors would likely engage at certain locations were used to estimate the duration of the activity as well as potential viewer sensitivity.

Visual impact research identifies the following factors that influence how people are affected by visual change (USFS 1995, 4-4, 4-7), which were incorporated into the analysis based on the location of visitors at specific sites in relation to the proposed actions:

- Landscapes seen close up are more visually sensitive than those seen in muted detail from greater distances.
- When people view landscapes at middleground distances, they often view them more coherently and in better context with their surroundings than they do foreground landscapes.
- When people view middleground landscapes that are evenly textured, human activities that dominate natural form, line, or texture create noticeable contrast.
- Scenic values increase as the terrain provides longer views, particularly where clean air allows for viewing crisp detail.
- Seasonal differences may affect viewer sensitivity; “leaf-on” and “leaf-off” conditions in deciduous forests will modify landscape visibility.
- Areas with important scenic features, such as national parks, attract a higher percentage of people with high concern for scenic quality.

As described in the “Affected Environment” chapter, most DEWA recreation sites exist in park development zones, which include intensive visitor use areas (NPS 1987, 16–21). These areas are surrounded by lands zoned as natural, with a resource management subzone that includes natural and human-made features that have contributed to the scenic diversity of the area. Impacts within or extending into the natural zone, where all lands and resources are to be maintained to enhance scenic diversity and other values, would result in higher impact intensities than those confined to the development zone. Therefore, this analysis considers the zone in which visitor activities take place to further determine the level of impact.

Inappropriate sound can also adversely affect park visitor experiences. Visitors usually have high expectations regarding a national park experience. The impacts of inappropriate sound on visitor experience are especially evident where visitor expectations include solitude, serenity, tranquility, contemplation (as in wilderness), or a completely natural or historic environment. Because exposure to significant and constant levels of noise in urban and/or suburban settings is part of daily life for many people, a degraded natural soundscape would not provide visitors with a contrasting environment, which national parks are generally assumed to provide, and would represent a direct impact on visitor experience. To the extent that noise might displace animals from viewing areas, for example, it could indirectly impact visitor experience by precluding visitors from enjoying the sights and sounds of wildlife. Locations where visitors would expect characteristics of solitude, as described earlier, were considered in this analysis as having higher impacts than locations focused on more group-centered recreation.

Resource-specific context for assessing impacts to visitor experience includes

- Visitors to national parks have high expectations for a high quality experience
- APPA is world renowned for hikers and can be a once-in-a-lifetime trip
- There are few large national parks in the east and DEWA, APPA, and the MDSR are uniquely accessible to millions of people (within a day’s drive)
- DEWA, APPA, and MDSR are an “oasis” offering an opportunity for solitude and escape from urbanized life that is rare in this part of the east coast

- The visitor base is exceptionally diverse, consisting of local, regional, national and international visitors, including both first-time and repeat users, with the duration of stays ranging from day-use to multi-day trips
- The parks offer a wide diversity of experiences available to visitors: hunting, paddling, hiking, camping, sightseeing, historic buildings and settings, agricultural practices and remnants of settlement of the valley and past ways of life

STUDY AREA

The study area for visitor use and experience is the same as described for the “Visual Resources” section in chapter 3.

CUMULATIVE IMPACTS COMMON TO ALL ALTERNATIVES

For this EIS, actions inside and outside the parks can affect visitor use and experience by offering additional or improved opportunities for recreational pursuits and experiences, such as replacing a boat launch. Conversely, opportunities could be degraded or eliminated by activities such as expanding or relocating a gas pipeline or adding cell phone towers near a recreation site. Completed, current, and future activities that could have beneficial or adverse impacts on visitor use and experience in the parks, inside and outside the study area, are summarized below, with anticipated impacts identified. A full list of cumulative projects can be found in appendix H. Under the discussion of each alternative, the impacts associated with these projects were analyzed in conjunction with the impacts expected for the alternatives.

Projects Inside the Study Area

Inside the study area, projects that would result in adverse impacts on visitor use and experience include the following utility projects: the PADOT SR 2001 road project, the repair of failing Watergate Dam #10, the US Route 209 Raymondskill Creek Bridge rehabilitation, the Delaware River Joint Toll Bridge Commission Delaware River bridge projects, the Tennessee Gas Line Proposal, the Columbia Gas Transmission Company pipeline increase, the DEWA prescribed-burn program, the DEWA hazard fuel reduction program, and existing utility towers within 5 miles. These projects would adversely affect visitor experience by lessening the natural feel of the parks and would affect visitor use through construction or other impacts that would inhibit easy access to recreation for visitors to the parks. Illegal activities, such as arson, vandalism, and trespassing, would also have adverse impacts on visitor use and experience. Licenses and permits for special use and incidental business/commercial visitor permits may affect visitor use and experience, and could be adverse for other visitors near the permitted activities.

Several cumulative development and utility projects inside the study area would have beneficial impacts on visitor use and experience, including the following: Smooth Ride Initiatives, US Route 209 road improvements, Sustainable Comfort Stations, the Pocono Environmental Education Center, New Jersey Swim Beach (Turtle Beach), hazardous structure demolition/deconstruction, the Kittatinny Point Visitor Center storm recovery, the Kittatinny Point Boat Launch replacement, the river campsite restoration of flood-damaged sites, the APPA relocation near the Columbia Gas pipeline crossing, and the Metropolitan Edison removal of unused power poles and transformers. These projects would improve facilities and resources available to visitors in the parks. Licenses and permits for special use and incidental business/commercial visitor permits may affect visitor use and experience, and the impacts would be beneficial for the permit recipients.

Although some projects would provide beneficial impacts that would positively affect visitor use and experience, the beneficial impacts would not outweigh the adverse impacts from the above-mentioned projects. Cumulative impacts on visitor use and experience inside the study area would be adverse.

Projects Outside the Study Area

Outside the study area, projects that would result in adverse impacts on visitor use and experience include the following utility and development projects: the PPL proposal for a 138/12-kV substation, the Tennessee Gas Line proposal, the Columbia Gas Transmission Company pipeline increase, Marcellus shale natural gas drilling, the Blue Mountain Ski Resort community-scale wind turbine, airport improvements, the Alpine Rose Racetrack, and wind turbines in northeastern Pennsylvania. These projects would result in adverse impacts from construction, the restriction of access, and the destruction of the natural feel of the parks and of the resources used by visitors. County and township open space and conservation plans would have beneficial impacts on visitor use and experience.

Although some projects would provide beneficial impacts that would positively affect visitor use and experience, the beneficial impacts would not outweigh the adverse impacts from the above-mentioned projects. Cumulative impacts on visitor use and experience outside the study area would be adverse.

Projects Specifically Affecting APPA

For APPA, the geographic range for cumulative impacts is Maine to Georgia, and includes any interruption in wilderness experience (roads, bridges, ROWs). The trail is already experiencing substantial impacts from other actions. Although some visitors use APPA for day hiking, the impacts for long-distance hikers is also considered for the entire length of APPA. For regional hikers, only projects within 20 miles of the S-R Line project are considered. Projects closer to the S-R Line are weighted heavier in the analysis. Projects along APPA are concentrated between northern Virginia and New Hampshire.

The development and utility projects listed above, particularly the Marcellus shale drilling and Columbia and Tennessee pipelines, would also adversely affect APPA. The resource management and restoration plans and activities would offer beneficial effects. Additional adverse impacts would result from activities planned along the entire length of the trail, including 317 antennas greater than 200 feet tall (e.g., cable television, communication towers) located within five miles of APPA (the vast majority, 113, are in Pennsylvania; Virginia has the next highest at 59; New Jersey has 9); 63 pipelines (the vast majority, 28, are in Pennsylvania; Massachusetts has the next highest at 14; New Jersey has 1); and 94 electrical power lines (the vast majority, 34, are in Virginia; Pennsylvania has the next highest at 17; New Jersey has 4). In addition, approximately 1,500 transportation infrastructure facilities, including local roads, park roads, highways and interstates, and railroads, are in (or proposed for development in) the vicinity of APPA. The majority, 316, are in Virginia, with Pennsylvania the next highest at 228. New Jersey has 85 proposed activities.

IMPACTS OF THE ALTERNATIVES ON VISITOR USE AND EXPERIENCE

Common to All Alternatives

Outside the study area: Regardless of which alternative is selected, the transmission line could pass through Carbon, Lackawanna, Luzerne, Monroe, Northampton, Pike, and Wayne counties in Pennsylvania and Morris, Sussex, and Warren counties in New Jersey. The clearing, construction, and vegetation maintenance activities outside the study area would be consistent with those described in the analysis of each alternative. Because the NPS cannot dictate where the line would actually go, the direct

impacts from the construction and maintenance of the transmission line outside the study area cannot be determined. Additionally, the specific resources that would be affected by the transmission line outside the study area cannot be identified until the route is chosen by the applicants.

Outside the study area, people would continue to recreate in those areas described in chapter 3. Where the transmission line corridor had been established prior to creation of the recreation area, repeat visitors would have developed a tolerance for the presence of the facility. New visitors to sites near the transmission line corridor may be more affected by the unexpected presence of the line in a recreational setting. Impacts would also vary based on the type of recreation area visited and on the activities supported. As indicated in chapter 3, the transmission line would cross a variety of different types of recreation areas, offering various recreational uses and resulting experiences. Under the action alternatives, a wider ROW, taller structures, and additional access roads would likely have more impact on people seeking solitude and naturalness than to those engaged in off-roading on drivable trails. Adverse impacts to visitors recreating outside the study area would result from construction and ongoing maintenance activities. The intensity would depend on the location and duration of the activity, season and time of week, and visitor sensitivity.

Outside the study area, views from APPA would be affected during the approach to the transmission line, as described under “Common to All Action Alternatives.” Depending on the route outside the study area, the transmission line could cause visual impacts, especially if the line causes disruptions to the middleground, creating a noticeable contrast and affecting how visually coherent the landscape would appear to visitors

Indirect adverse impacts to recreationists outside the study area from vegetation clearing, the construction of the transmission line, the operation and maintenance of the transmission line, and vegetation maintenance would occur.

Alternative 1: No Action

Under the no-action alternative, the existing transmission line ROW would not be widened. Visitors would experience no new sound impacts, because sound associated with the existing transmission line is currently not audible over the existing background sound levels, and there would be no increase in existing ambient sound levels. Visitors to DEWA and APPA segments in the study area have been exposed to views of the existing transmission line since the line was established. Although repeat visitors, particularly those who return to favorite recreation sites, may accept the presence of the transmission corridor and lines, new visitors may be adversely affected by their existence. It is also possible that repeat visitors currently avoid locations where the lines are most obvious, such as the Watergate Recreation Site. New visitors to sites like the Watergate Recreation Site may experience an unfavorable impression of DEWA due to the close proximity and visual intrusion of the existing structures. However, visitation to DEWA has steadily risen, demonstrating a 5% increase from 1999 to 2009 (NPS 2010ae). In addition, 96% of DEWA river users are satisfied overall with park facilities, services, and recreational opportunities (University of Idaho 2009).

Hikers using APPA may expect a different type of experience from those recreating at DEWA, specifically an experience that is focused more on being close to nature and enjoying the views along the trail (Manning et al. 2000). As described in the “Visual Resources” section in chapter 3, hikers would experience adverse effects from the abrupt vegetation opening created by the alternative 1 alignment’s cleared ROW for about 400 to 500 feet, as well as the close presence of two large galvanized steel lattice tower structures, before reentering the woods. The presence of the towers would diminish the sense of naturalness experienced by walking the trail through settings primarily undisturbed by large, human-made structures. However, the clearing would also provide views to the east and west, which some hikers may

experience as a benefit. Despite the presence of such structures and clearings, the number of long-distance hikers has nearly doubled from the 1990s (3,283) through the 2000s (6,302) (ATC 2009), indicating increasing interest in hiking the trail. Although an increased number of hikers on APPA, particularly long-distance hikers, would be affected, there would be no changes from existing conditions.

The operation of the existing transmission line would require periodic maintenance, including the clearing of vegetation in the ROW. Access roads in the ROW would also require periodic maintenance to provide access for repairs and maintenance to the system. All maintenance activities have the potential to adversely affect visitor use and experience near the actions due to noise and visual intrusions. These impacts would be more intense for hikers expecting solitude and a sense of naturalness. Most visitors would likely be unaware of the maintenance activities. There would be no noticeable change to visitor use and experience from operation of the existing transmission line.

Cumulative Impacts

Cumulative impacts on visitor use and experience inside the study area would be adverse, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the adverse impacts on visitor use and experience as a result of alternative 1 are combined with other past, present, and reasonably foreseeable projects in the study area, an overall adverse cumulative impact would be expected.

Conclusion

Alternative 1, the no-action alternative, would result in the continued operation and maintenance of the existing transmission line. Impacts in the study area 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. The continued operation of the existing transmission line would result in minimal impacts. Overall adverse cumulative impacts on visitor use and experience would be expected inside the study area.

The scenic character within the area traversed by the existing line is composed of mostly undeveloped, contiguous tracts of forest. Buffered from human development and encroachment, this stretch of the Appalachian Trail, perched atop the Kittatinny Ridge, is known for the solitary and wilderness-like experience it offers. Likewise, the Walpack Bend, just upstream of the transmission line crossing, is the most natural and least developed section of the MDSR. This area has the least evidence of human occupancy and influence making it a popular river destination because it offers an experience of solitude and exceptional scenic quality. Alternative 1 would result in some adverse impacts on visitor experience but would not change these unique characteristics of the area. The existing line was present when the parks and MDSR were established and thus, was part of the existing conditions. Also, the existing transmission line and ROW is virtually invisible from most places and at most times of the year because it is screened by topography or it is surrounded by forest 30 to 40 feet taller than the 85 foot towers. The no-action alternative would not establish any precedent for future actions with significant effects. To the extent it represented a decision in principle about future actions, it would favor the continuation of the status quo, which is not precedent setting in the context of the NPS system, whose primary goal is preservation for future generations. The actions under alternative 1 would be in keeping with the parks’ enabling legislations, *NPS Management Policies 2006*, and all other applicable federal and state laws. Any cumulative impacts to resources would remain adverse primarily from other actions taken outside the study area. Considering the intensity of the impacts of alternative 1 in the context of the purposes for which these parks were established and visitor expectations of the national park experience, the impacts of alternative 1 on visitor experience are not considered to be significant.

Common to All Action Alternatives

Mitigation Measures: Mitigation measures would be implemented to reduce impacts on visitor use and experience and are taken into consideration in the impact analysis. Mitigation measures are described in appendix F.

Removal of Existing Structures: All action alternatives (2, 2b, 3, 4, and 5) include the removal of all or a portion of the B-K Line described in chapter 2. During the removal and disposal of existing structures, visitors would experience adverse noise and visual impacts from the creation of access roads, the transportation of construction equipment to and from the decommissioning sites, the removal of the crane pads and equipment at wire pulling locations, the removal and disassembly of lattice towers, and grading activities. Possible helicopter use would result in additional noise and visual impacts. As the decommissioned route returns to natural conditions, vegetation would fill the corridor, which would gradually disappear over time. Although some visitors may prefer the views the transmission line ROW opening would provide, returning the corridor to natural conditions would enhance the natural environment that most visitors enjoy. The elimination of the visual impact of the existing transmission line would result in a primarily beneficial impact on visitor experience.

Project Construction and Components: Adverse impacts would result from the construction of the new facilities, including grading activities to create level pads for tower sites, the construction of foundations, and the construction of steel towers, including wire installation. New pulling and splicing sites, as well as new construction staging locations, would further affect visitors due to noise and visual disruptions. Some existing roads, new access roads, and spur roads would require clearing and grading. Upon completion of the transmission lines, all roads except the spur roads would be permanently maintained. During construction, visitors may also experience temporary road closures or reroutes, which could cause delays or the inability to access and use preferred recreation sites. To help minimize these effects, construction activities would be coordinated with NPS and other managers of affected recreation areas to avoid peak visitor use periods and notify visitors of construction. Prior to construction, a media strategy/notification plan would be developed to notify local residents and visitors of closures (see appendix F).

Because some of the ROW expansion is necessary for construction safety and maneuverability, after construction is completed a portion of the corridor along the ROW would be allowed to revegetate. Only the width of the ROW necessary to maintain access roads and the transmission line would continue to be maintained. Such revegetation would take many years and would indirectly benefit visitor use and experience by potentially creating a visual screen in some locations and restoring a sense of naturalness, including restored wildlife habitat. Similarly, mitigation measures to minimize impacts on natural resources as described in chapter 2 would benefit park visitors' experience of those resources.

Under all action alternatives, devices placed on transmission line conductors (wires) to deter birds would increase the visibility of the lines by making the conductors more prominent. This could increase the level of adverse impacts where visitors would be visually exposed to these devices. The impact would vary based on the location, activity, and viewer sensitivity. For example, drivers passing underneath the lines may not notice the devices. Visitors relaxing at an overlook along APPA would be more affected, increasing the overall level of impact.

The addition or improvement of access roads and spur roads called for under all action alternatives could result in ORV and dirt bike use, which is illegal in the parks. Such use would result in increased noise, which would adversely affect visitor experience. This engine noise would be incompatible with the natural, park-like setting. In addition, visitors could see damage to vegetation and scars from these vehicles, and would potentially see the roads being used in this manner. The presence of these vehicles and their resulting damage would also decrease the possibility of wildlife sightings. These impacts would

increase the level of impacts on visitor experience of the parks, and may influence visitors' use of the parks, because they may avoid such areas. To help minimize these effects, an off-highway vehicle / all-terrain vehicle (OHV/ATV) deterrent plan would be developed prior to construction activities, and temporary access roads would be permanently closed and revegetated to discourage such use (see appendix F).

As noted in chapter 3, many river users would pass below the transmission line under all action alternatives. Kittatinny Point, at the southern end of DEWA and downstream of the proposed transmission lines, is a popular river trip endpoint (Blotkamp et al. 2010, 48). The presence of the taller towers, thicker lines, and bird diverters (depending on the type used) would be seen not only as boaters pass below the wires, but during the approach from farther upstream. Under alternatives 3, 4, and 5, two sets of transmission lines would be visible. Sixty-four percent of DEWA visitors surveyed in 2010 indicated that power line expansion through DEWA and MDSR would detract from their park experience. For these reasons, changes proposed under the action alternatives would adversely affect the visitor experience of many boaters.

Similarly, visitors hiking long sections of trails, including APPA from both inside and outside DEWA boundaries, would be exposed to intermittent views of the transmission line during their approach to it. The towers would be taller, the ROW wider (with the exception of alternative 2b), and, in the case of alternatives 3, 4, and 5, two sets of transmission lines would be seen. The transmission lines would be more noticeable than existing conditions, so they would be seen from greater distances during the approach and would have a greater impact due to their larger presence. Therefore, the adverse impact on the "linear" experience of hiking a trail, especially APPA, would vary in intensity depending on visitor sensitivity and environmental conditions (e.g., leaf-on or leaf-off).

As noted in chapter 3, hunting is allowed throughout DEWA and is not concentrated in any particular area in relation to the proposed alternatives. Because hunters enjoy the natural aesthetics of their surroundings, they would experience similar impacts to other visitors. The canopy openings created by the transmission line would benefit some wildlife species but harm others. For example, some small game species may prefer canopy openings, depending on habitat (e.g., riparian areas), whereas deer prefer edge habitat but not direct openings. However, cleared openings are generally not suitable for hunting deer, because hunters would be visible to game. In addition, waterfowl hunters may not want to fire overhead toward the transmission lines and would therefore avoid these areas. As a result, widening the ROW would decrease the area's suitability for hunting. The most extensive impacts would result from deconstruction and construction activities. Natural quiet is important for hunters, particularly bow hunters. Noise from deconstruction and construction activities would frighten game from the area and degrade the naturalness of the hunting experience. Noise impacts would be greater under alternatives 3 and 4, which include the deconstruction of the existing B-K Line, the deconstruction of the existing transmission line along the alternative 3 or 4 corridor, and the construction not only of the S-R Line, but of the parallel replacement lines along the alternative 3 or 4 corridor. During these activities, hunters could choose to hunt in other parts of DEWA, possibly leading to crowding, which has been identified by 43% of all hunters as "unsatisfactory" in the park (Penn State 1989, 75). Once the existing B-K Line was revegetated under alternatives 3 and 4, beneficial impacts would result from increased habitat, improved habitat connectivity, and restored naturalness.

The NPS is mandated to preserve natural, historic, and scenic resources in perpetuity for the benefit and enjoyment of the public. Adverse impacts resulting from the action alternatives that would endure for the period of analysis would diminish the parks' ability to meet this mandate.

Under all action alternatives, adverse impacts on visitor experience may affect visitors to the extent that they do not return. This may be particularly true if access to a specific destination is closed during

deconstruction/construction activities. There is no way of knowing the degree to which this could occur, making the impact unquantifiable.

Alternative 2

As noted in chapter 3, the Delaware River is one focal point of DEWA, and 26% of visitors engage in some type of canoeing, kayaking, or tubing on the river as part of their visit. Nearly 170,000 visitors canoe the river annually. In addition, 16% of visitors engage in fishing. The alternative 2 alignment would follow the existing transmission line, which crosses the river. Visual simulations indicate a substantial change to views for river users, resulting from higher structures and additional, thicker conductors. Because paddling, floating, and fishing the river is popular, many visitors would be affected. Boaters would pass below the transmission line quickly, but the line would be seen in the distance for some time during the approach, detracting from the naturalness of the setting (see “Common to All Action Alternatives” above). This would be particularly true for paddlers, whose approach is slower than motorboats. Corona noise, which is not heard from the existing line, would be heard during bad weather days as described in chapter 3 of the “Soundscapes” section. Motorboating is allowed on the river, but speeds are limited to 10 mph, helping to keep noise minimal and retain a sense of naturalness. Anglers fishing from the shore may avoid the transmission line crossing, but several other shoreline fishing options exist. For these reasons, overall visitor satisfaction would begin to decline, because visitors would be aware of the change and the duration of the impact would be prolonged. However, visitors may still recreate in this manner along the river, but may choose to recreate in different areas.

Construction vehicles would use River Road to access work sites. River Road could also be used if detours were needed during construction, increasing congestion. Bushkill, a small town just outside NPS boundaries that provides access to DEWA, is also the location of the Bushkill Substation, where alternatives 2, 2b, 3, and 4 would connect before changing direction. Visual simulations show a considerable visual change at Bushkill under alternative 2. The towers would be much more visible due to a substantial height increase and three rows of conductors. Although Bushkill is a commercial area, the sight of the large structures may diminish visitors’ initial impressions of DEWA before turning onto River Road or continuing along US Route 209 into the park. Many visitors would be affected by the visual change, which would be continuous and may change some critical characteristics of the desired visitor experience. During bad weather events, corona noise would increase while approaching and traveling under the line, as described earlier. Motorists would not likely notice the noise, but pedestrians would. Although adverse impacts on visitor experience would occur, visitor use of this area is not likely to change because the location is a main entrance to DEWA.

Expanding the ROW and building new and/or clearing existing access roads would adversely affect scenic motoring and cycling on Old Mine Road near mile marker 11, where the existing transmission line currently creates an abrupt opening in the vegetation canopy. This opening would be larger under alternative 2 due to the expanded ROW. The historical integrity of this section of the road would be additionally diminished, which would further affect the experience for visitors focused on historical landscapes. Impacts on cyclists, who would pass through the opening more slowly than motorists, would be greater. During unfavorable weather conditions, cyclists would also experience a 7 to 8 dBA increase in noise levels to 44 dBA as a result of corona noise as they pass directly under the centerline, which motorists would not likely hear. Within 150 feet of the centerline, this noise would decrease to 40 dBA, which is barely perceptible to the human ear (see the “Soundscapes” section for more information). During unfavorable weather conditions, adverse noise impacts on cyclists, who would represent few DEWA visitors, would be slight and detectable but intermittent. The impact on visitor use and experience would be limited. Overall visitor satisfaction would remain constant, and visitors would continue to recreate in this manner. Motorists would either be unaware of the impacts or would experience them as slight but detectable. The experience would be fleeting, lasting only a few seconds.

Visitors hiking or mountain biking the McDade Trail would experience a wider canopy opening where alternative 2 would cross the trail. Currently the canopy opening is difficult to distinguish standing on the trail below. Removing the existing B-K Line and constructing the new one would create an abrupt canopy opening where one barely exists. The existing B-K Line is visible when approaching it from the south, but the structures only slightly clear the treetops. Visual simulations show a substantial change resulting from taller structures, which would be much more visible and would raise the conductors above the treetops, where they would also be clearly visible. Upon approaching the corridor, visitors would experience a 3 to 4 dBA increase in corona noise — a barely perceptible impact — within 150 feet of the centerline during unfavorable weather conditions compared to existing ambient sound levels. Corona noise would increase another 4 dBA (a 7 to 8 dBA total increase compared to existing ambient sound levels) as they pass directly under the centerline. These adverse impacts would be greater on hikers, who would pass more slowly under the transmission line than cyclists. Because the structures would be visible on the approach to the crossing, the duration of the visual impact would be more prolonged than if only visible at the crossing. However, the linear nature of the trail means that visitors may experience impacts on views as they approach the transmission line from a distance, as described under “Common to All Action Alternatives.” The presence of access roads would also increase noise and visual impacts compared to existing conditions. However, because these effects would occur primarily during unfavorable weather conditions and the numbers of hikers and cyclists would decrease at those times, the effect on visitor use and experience would be limited and visitors would likely continue using this trail.

Visitors who use Community Drive in the area near McDade Trail would also be affected where the transmission line would cross the road. The towers would be taller and the line would be more visible, particularly where the corridor would be cleared and widened.

The S-R Line corridor would not be visible or audible from Bushkill Access. Visitors would experience noise from the nearby road and from boat launching activities, particularly motorboats. Visitors who come to the area during winter to watch bald eagles would not be affected by any visual intrusion, even during the leaf-off season. No impacts are expected on visitors using this recreation site.

Widening the ROW and adding new or clearing existing access roads would affect Watergate Recreation Site, where the existing B-K Line abuts the southern boundary of the area and can be clearly seen from many vantage points in the site. Trees that currently partially screen views of the corridor and structures would be removed. The corridor would be more visible along hills to the east and west. If the existing large lattice towers were replaced with single tubular structures, visual quality may improve, because the existing towers currently occupy sizable amounts of space. However, the new towers would be substantially taller and would rise above the treetops, which would be more obvious from various vantage points at this site. Noise from the transmission line would be audible by an increase of 3 to 4 dBA within 150 feet of the lines during unfavorable weather conditions. The trail to the Upper Glen parking lot starts below the existing transmission line. Due to the obvious presence of the transmission line at the trailhead, some visitors may choose not to hike this trail, particularly those who believe there are health risks associated with exposure to transmission lines (see the “Human Health and Safety” section for a discussion of this issue). Visitors who hike this trail from Watergate Recreation Site to the Upper Glen would experience a 7 to 8 dBA noise increase directly under the transmission centerline during unfavorable weather conditions. Visitors hiking this trail from the Upper Glen parking lot to the south would experience an abrupt canopy opening after walking past the natural setting created by a creek and wooded area. Visual impacts would also be permanent for visitors to the Upper Glen trail, potentially changing some critical characteristics of the desired visitor experience. Visitors would be aware of the change, which may affect their decisions to recreate there.

The S-R Line would not be visible or audible from the trail that is used to access the Van Campen Glen Picnic Site. However, due to its proximity to the Watergate Recreation Site, Van Campen Glen may

experience additional use, and potentially crowding, if visitors relocate to a nearby area less affected by the presence of the transmission line. In addition, visitors hiking from Van Campen Glen to the Watergate Recreation Site would be adversely affected by the wider, abrupt canopy opening after following the heavily wooded trail. The intensity of these impacts would vary depending on the time of year and week (e.g., peak vs. nonpeak visitation, leaf-on vs. leaf-off). Van Campen Glen would be adversely affected by construction in the area and visitors may avoid Van Campen Glen during that time. Adverse impacts would vary during construction depending on the season, the day of the week, the location, the extent of construction closure, and the sensitivity of visitors.

Visitors hiking the Hamilton and Pioneer trails currently experience an abrupt opening in the canopy where the B-K Line crosses the trail. The opening currently creates a bright, sunny break in an otherwise shaded and tree-lined walk, and the cleared corridors can be seen east and west. The corridors would be even more visible if the ROW is widened. Widening the ROW and adding new or clearing existing access roads would increase the effect of this irregularity. Large lattice towers are currently close to both trails. Replacing these towers with single tubular structures may improve visual quality, because the existing towers currently occupy sizable amounts of space. The new towers would be substantially taller, which would make those in the middleground and background more obvious. As noted in “Methodologies” in this section, human activities in middleground landscapes can create a more noticeable contrast. During unfavorable weather conditions, corona noise would increase by 3 to 4 dBA to 40 dBA within 150 feet of the lines, increasing again to 44 dBA directly under the transmission centerline. Compared to existing conditions, impacts would be detectable but would not appreciably change the experience for visitors. Visitors would likely continue to use these trails although adverse impacts would occur.

The wider ROW and new access road would affect the Hamilton River campsites by intruding into the wooded camping area. The wider ROW and road would also more clearly indicate the presence of the transmission line compared to existing conditions and would detract from the natural camping experience for overnight boaters who use this site. This would be particularly true during unfavorable weather conditions, when noise from the line would be detectable 150 feet from the centerline, although 40 dBA is barely perceptible to the human ear. This would also be true when the access roads are in use by the applicants. Views across the river from the campsite would change as a result of the wider ROW and taller structures. The intrusion of the line into the campsite may influence boaters to bypass this campsite in favor of one in a more natural setting. In addition, several Hamilton River campsites would have to be permanently closed because of expansion of the transmission line. This would reduce the number of available campsites along the river and impact a very popular camping location. Visitors would have to use other locations. The change would be persistent at this location, and visitors would be aware of the change.

Visitors using the Rivers Bend campground would be affected where the alternative 2 alignment would be visible. A view from an overlook through the trees at the southern end of the campground that provides views of the Walpack Bend region and downstream would also include the ROW. Visitors who do not visit this overlook would not be affected.

The existing B-K Line is minimally visible from Millbrook Village, although it can be seen from the parking lot and the entrance to the village near the Wagon Wheel shop. Visual simulations show that the higher towers would raise the conductors, making them visible to the south against the sky and background vegetation. No noise would be heard from the conductors, which would be more than 0.5 mile away. Visitors would hear noise from nearby roads and other people, particularly during NPS-sponsored historical events. Visiting historic sites is a popular visitor activity at DEWA, and the presence of the conductors would detract from the historical setting of the village. The level of adverse impacts would depend on visitor sensitivity level. The presence of a modern structure in a historical setting would

noticeably alter visitor enjoyment, and thus their experience, of the area. However, the change to visitor experience at this location would not likely affect the use of this area.

Where the alternative 2 alignment would cross APPA, hikers would experience adverse effects from taller towers, more conductors, a wider ROW, and new or cleared existing access roads. The expanded ROW would clear an additional 50 to 200 feet beyond existing conditions. As shown in the visual simulation in the “Visual Resources” section in chapter 3, replacing the large lattice towers with single tubular structures would improve visual quality at this location to a slight degree, because the existing towers currently occupy sizable amounts of space. The absence of the large lattice towers would also improve views by removing foreground visual clutter at this location. However, the simulation provides a snapshot in time from one specific viewpoint. As noted in “Methodologies” in this section, people are more visually sensitive to landscapes seen close up. The increased height of the new towers would adversely affect visitors as they approach the transmission line during their hike, as described under “Common to All Action Alternatives.” The wider ROW, taller towers, and more noticeable conductors would result in an adverse effect on hikers approaching the transmission line. Overall, there would be a slight benefit to visitor experience at the specific simulation viewpoint due to increased visibility, but these impacts would be offset by the adverse impacts in other locations along the trail approaching the alternative 2 alignment. During unfavorable weather conditions, noise from the conductors under alternative 2 would be barely audible within 150 feet of the lines, increasing again to 44 dBA directly under the transmission centerline. Visitor use of the trail would not change.

Human activity during deconstruction and construction near recreation sites would adversely affect visitors’ experience and possibly affect the use of certain areas, as described in the “Common to All Action Alternatives” section. Under alternative 2, construction impacts would be most apparent along NPS 602 (Millbrook-Blairstown Road) and Old Mine Road in New Jersey. Affected sites potentially include Van Campen Glen, Upper Glen, Hamilton and Pioneer trails, the Watergate Recreation Site, and Millbrook Village. Deconstruction and construction activities would be coordinated with NPS events at Millbrook Village to avoid access issues to the extent practical. Impacts would also depend on the extent to which deconstruction and construction activities could be seen or heard, as well as the location of spur roads. As described in the “Soundscapes” section, sound levels could increase by more than 13 dBA in areas as far as 3,200 feet from the activity, resulting in an adverse impact during most of the daytime hours when deconstruction and construction activities would take place. Such an impact, particularly during peak season for visitors, would adversely affect visitor experience, and may cause visitors to use different recreational sites. However, many visitors are attracted to specific recreational locations in DEWA and regularly return to those locations rather than visiting other park areas. Such visitors may choose to avoid the park altogether during deconstruction and construction activities if their favorite site is affected, noticeably altering visitor use and experience. Mitigation measures to avoid peak visitor use periods and notify visitors of construction activities and closures would help minimize these impacts.

Impacts related to the maintenance of the transmission line would be similar to alternative 1. However, access roads would be cleared, compacted, and possibly widened under alternative 2, resulting in a slight change from existing conditions.

Cumulative Impacts

Cumulative impacts on visitor use and experience inside the study area would be adverse, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the adverse impacts on visitor use and experience as a result of alternative 2 are combined with other past, present, and reasonably foreseeable projects in the study area, an overall adverse cumulative impact would be expected. Alternative 2 would contribute an appreciable adverse increment to the overall cumulative impact.

Conclusion

In the study area, alternative 2 would result in impacts to visitor use and experience, with the most intense impacts at Watergate Recreation Site. Visitors would experience overall adverse impacts where the transmission line crosses APPA, although some benefits would be expected from the removal of visual clutter. Impacts related to deconstruction and construction would be localized, particularly related to noise; however, visitors would experience negative effects from construction noise. Ongoing maintenance activities would be of limited duration and in specific locations. Cumulative impacts inside the study area would be adverse. The reduction of resources in the region surrounding the parks would increase their scarcity and sensitivity inside the parks, where they are afforded special protections.

Alternative 2 would cross in the center part of DEWA, including the MDSR. In general, this area is one of the most undeveloped areas of the park, containing large swaths of contiguous mature forest, few manmade intrusions, unique geological formations, a globally significant rare plant community, and abundant opportunities for solitude. This part of the park is a particularly sensitive area because it contains high concentrations of many important and unique natural features. These characteristics attract visitors and it consequently plays host to a large proportion of DEWA users. It also crosses close to a unique river feature, the Walpack Bend, which is a premier visitor attraction in DEWA. The location of the crossing in DEWA makes it visible from distant high points like APPA. For APPA, the alternative would transit through what is now a very natural and relatively unspoiled viewshed provided by these undeveloped lands below it.

Alternative 2 would result in considerable, and in some cases, severe adverse impacts on visitor experience. Installation of new taller towers would introduce a noticeable visual intrusion that would diminish scenic quality. The presence of large and obtrusive infrastructure in a relatively undeveloped zone would be a distraction and detract from the experience visitors seek when coming to the parks. The visual change would affect a relatively large area, a large number of users, and would exist for the life of the project. It would degrade the regionally unique and unusual wilderness-like viewshed for APPA that DEWA and MDSR provide. This, in turn, would have adverse impacts on the MDSR through degradation of the scenic values for which the river was designated. Construction activities would result in temporary closures of trails, roads, and the MDSR, and permanent closures of river campsites, which would interrupt and limit visitor's access and experience in the park and compound safety management challenged during the busy season. Impacts related to construction activities would be of short duration but one-time visitors who were impacted by river closures or construction noise may have their experience of the MDSR forever diminished.

The Organic Act and the parks' enabling legislations mandate that these resources are protected in perpetuity. DEWA and APPA were created for their unique scenic characteristics and offerings which are specifically identified in the legislation that created the parks. The parks offer solitary experiences, isolated from human encroachment. Impacts are more acute because the parks provide uninterrupted naturalness in a developed region. Public attention surrounding this project is high. There is likely to be a high degree of controversy over any effects on park resources that are particularly popular with the public, such as scenery, visitor use and experience, rare and unique communities, cultural landscapes, and historic structures, for any of the alternatives. The inherent uncertain nature of predicting the true degree of some of these impacts would likely heighten this controversy. Additionally, construction at this particular location in DEWA is likely to accentuate the controversy due to the unique characteristics presented here and high visitor traffic to the area.

Permitting the project would adversely affect multiple protected resources inside the parks, in some instances irreversibly. This could establish precedent that may invite similar proposals by other applicants in the future, and create an expectation of like treatment for those proposals; it may make it difficult to

deny such proposals. DEWA and APPA both contain numerous other utility crossings, which makes the risk of such precedent particularly concerning for these parks. Furthermore, as units of the national park system, wherein all parks are entitled to equal protection, creating such a precedent could have ramifications for parks nationwide. The location of this particular crossing through the center of DEWA could make such a precedent even more potent. Installing the S-R Line on this alignment may invite future utilities proposing to follow the same route. The applicant's project is one component of a larger regional plan by the RTO to enhance system reliability. Other component projects of this plan have already affected, and would continue to affect APPA, especially in the areas of scenic resources and visitor use and experience, as well as other national parks in their paths.

Overall, the significance of the impact of alternative 2 is a result of two considerations: the particularly resource-rich area through which the alternative crosses and the potential to inflict harm to those resources because of the magnitude and duration of the adverse impacts. Although it is true that not all impacts can be predicted with great certainty, in the context of the purpose and significance for which DEWA, APPA, and MDSR were established and NPS mandates to specifically preserve the natural, cultural, and scenic resources within them, additional precautions are warranted when considering risks to these resources, many of which are of national importance. Similarly, certain resources are non-renewable, which makes any impacts to them all the more serious because they cannot be replaced if lost. And some resources are under threat by other actions and outside pressure, which in the context of the function of the parks as an "oasis" or refuge within the highly developed east coast, elevates the need to preserve and protect these scarce, sensitive resources. For these reasons, the environmental consequences of alternative 2 would be significant.

Considering the intensity of the impacts discussed above in the context of the purposes for which the three national park units were established and the high expectations of visitors as to the type of experience they should have in these places, the NPS believes that alternative 2 would result in significant adverse impacts on visitor use and experience because of the intrusion of the taller towers into the natural environment and loss of other resources which would appreciably diminish key aspects of the parks that visitors come to enjoy.

Alternative 2b

The alternative 2b alignment would follow the same route as alternative 2, and all towers would be the same height, although two additional towers would be required. The width of the ROW would not change from existing conditions. Although no visual impacts would result from a wider ROW, adverse impacts on visitor use and experience would be similar to those described for alternative 2 due to increased tower height and thicker conductors. Adverse impacts related to noise would also be similar to alternative 2, as described in the "Soundscapes" section.

Adverse impacts on DEWA would be similar to alternative 2. Impacts on APPA would also be similar to alternative 2 due to the taller towers and more noticeable conductors, even though the ROW width would be narrower in some sections, specifically at McDade Trail and Community Drive in Pennsylvania, more than 2 miles from APPA. Ongoing maintenance activities would be of limited duration and in specific locations. Adverse impacts would result from construction and ongoing maintenance activities.

Cumulative Impacts

Cumulative impacts on visitor use and experience inside the study area would be adverse, as described previously in the "Cumulative Impacts Common to All Alternatives" section. When the adverse impacts on visitor use and experience as a result of alternative 2b are combined with other past, present, and reasonably foreseeable projects in the study area, an overall adverse cumulative impact would be

expected. Alternative 2b would contribute an appreciable adverse increment to the overall cumulative impact.

Conclusion

Inside the study area, alternative 2b would result in similar impacts to alternative 2. Impacts on APPA would also be similar to those under alternative 2 even though the ROW width would be narrower in some sections, specifically at McDade Trail and Community Drive in Pennsylvania, more than 2 miles from APPA. Adverse impacts to visitor use and experience would result from construction and ongoing maintenance activities. Overall cumulative impacts inside the study area would be adverse.

Alternative 2b would cross DEWA in one of the most undeveloped areas of the park, which contains high concentrations of many important and unique natural features. The features of this area draw visitors and play host to a large proportion of DEWA users. Alternative 2b would also cross close to a unique river feature, the Walpack Bend, which is a premier visitor attraction in DEWA. The location of the crossing in DEWA would make it visible from distant high points like APPA. For APPA, the alternative would transit through what is now a very natural and relatively unspoiled viewshed provided by these undeveloped lands below it.

Alternative 2b would result in considerable, and in some cases, severe adverse impacts on visitor experience. During construction, visitors would experience negative effects from construction noise, temporary closures of trails, roads, and the MDSR, and permanent closures of river campsites, which would interrupt and limit visitor access and experience in the park and compound safety management challenges during the busy season. Impacts related to construction activities would be of short duration but one-time visitors who were impacted by river closures or construction noise may have their experience of the MDSR forever diminished. The new taller towers would be a distraction and would detract from the experience visitors seek at the parks. The visual change would affect a relatively large area, a large number of users, and would exist for the life of the project. It would degrade the regionally unique and unusual wilderness-like viewshed for APPA that DEWA and MDSR provide. However, the adverse impacts of alternative 2b may be somewhat less severe than alternative 2 because the ROW width would be narrower in at McDade Trail and Community Drive in Pennsylvania. Maintaining a narrower ROW width may help to mask some of the intrusiveness of the taller towers from some vantage points but does not substantially reduce the severity of the adverse impacts to visitor use and experience.

The impacts of any of the action alternatives have potential to be significant because of the high public attention surrounding this project. The natural, cultural, scenic, and recreational resources of DEWA and APPA are held in public trust and visitors come to the parks to experience these resources. Allowing impacts to these resources is contrary to typical NPS practice of improving scenic conditions by removing non-conforming features and may establish precedent for future actions. The applicant's project is one component of a larger regional plan by the RTO to enhance system reliability. Other component projects of this plan have already affected, and would continue to affect APPA, especially in the areas of scenic resources and visitor use and experience, as well as other national parks in their paths.

Overall, the significance of the impact of alternative 2b is a result of two considerations: the particularly resource-rich area through which the alternative crosses and the potential to inflict harm to those resources because of the magnitude and duration of the adverse impacts. Although it is true that not all impacts can be predicted with great certainty, in the context of the purpose and significance for which DEWA, APPA, and MDSR were established and NPS mandates to specifically preserve the natural, cultural, and scenic resources within them, additional precautions are warranted when considering risks to these resources, many of which are of national importance. Similarly, certain resources are non-renewable, which makes any impacts to them all the more serious because they cannot be replaced if lost. And some resources are under

threat by other actions and outside pressure, which in the context of the function of the parks as an “oasis” or refuge within the highly developed east coast, elevates the need to preserve and protect these scarce, sensitive resources. For these reasons, the environmental consequences of alternative 2b would be significant.

Considering the intensity of the impacts discussed above in the context of the purposes for which the three national park units were established and the high expectations of visitors as to the type of experience they should have in these places, the NPS believes that alternative 2b would result in significant adverse impacts on visitor use and experience because of the intrusion of the taller towers into the natural environment and loss of other resources which would appreciably diminish key aspects of the parks that visitors come to enjoy. Public attention surrounding this project is high. There is likely to be a high degree of controversy over any effects on park resources that are particularly popular with the public, such as scenery, visitor use and experience, rare and unique communities, cultural landscapes, and historic structures, for any of the alternatives. The inherent uncertain nature of predicting the true degree of some of these impacts would likely heighten this controversy. Additionally, construction at this particular location in DEWA is likely to accentuate the controversy due to the unique characteristics presented here and high visitor traffic to the area.

Alternative 3

Visual simulations indicate a substantial change to views for river users where alternative 3 would cross the Delaware River resulting from taller structures and additional, thicker conductors, as well as the second set of structures. Because paddling, floating, and fishing the river is so popular, many visitors would be affected (see “Common to All Action Alternatives,” above). Views of the riverbank on the New Jersey side would change dramatically due to the 90-degree bend to the northeast that would be included at that location. That bend and the continuation of the existing transmission line beyond it currently cannot be seen, but the corridor and structures (for the S-R Line and the replaced transmission/distribution line) would be clearly visible under alternative 3. As with alternative 2, the line would also be seen in the distance by boaters for some time during the approach, detracting from the naturalness of the setting. Corona noise would be heard during bad weather days as described earlier. This noise is not currently heard from the existing line. For these reasons, overall visitor satisfaction may begin to decline because visitors would be aware of the change, and the duration of the impact would be persistent. However, people would continue to recreate in this manner. Anglers fishing from shore may avoid the transmission line crossing, but other opportunities exist throughout the parks. Overall, adverse impacts to visitor use and experience would occur.

The existing transmission line that the alternative 3 alignment would follow cannot currently be seen from Turtle Beach. Visual simulations of the proposed line show a barely perceptible change in the distance. Visitors would be unaware of the change. Similarly, the alternative 3 alignment would not be visible from Poxono Access or Ricks Rocks. No impacts are expected at these locations.

The alternative 3 alignment would cross River Road just north of Hialeah Picnic Site. Visual simulations show the impact of a wider ROW and taller structures along the hillside to the west. Motorists driving on River Road may not notice the change to the hillside as much as passengers would, because motorists typically focus on the road while driving. Minimal changes are expected where the lines would cross the road.

The existing ROW traverses Worthington State Forest in DEWA and, like alternative 2, would be widened an additional 50 to 100 feet. Alternative 3 would cross Old Mine Road in Worthington State Forest with similar impacts on motorists and cyclists as described for alternative 2. Visual simulations show substantial changes due to widening the ROW and erecting taller structures. Upon crossing the road,

the alignment would take an almost 90-degree bend to the northeast, which currently is not visible to motorists and cyclists approaching from the south. The wider ROW under alternative 3 would make this bend visible, exposing the wider corridor and taller structures that would continue up a hill beyond it, changing the visitor experience. This increased exposure due to the wider ROW would also make the towers on the hillside, which currently cannot be seen, visible. Noise impacts during unfavorable weather conditions would be similar to those experienced under alternative 2. As described for alternative 2, cyclists would be more affected by the visual and auditory impact than motorists. The duration of the impact would be fleeting for motorists, and more prolonged, but still intermittent, for cyclists. However, visitors would continue to recreate in this manner.

Soon after visitors begin hiking or mountain biking north of the McDade trailhead from the Hialeah Picnic Site, the existing transmission line that the alternative 3 alignment would follow becomes barely visible on the hillside to the west. Visual simulations of the Hialeah Picnic exit road, which is close to McDade Trail in this area, show a substantial change resulting from the wider ROW and taller structures, which would be clearly visible across an open crop field as the line crosses the hillside. These impacts represent a new visual intrusion visible from the trail. Because the structures would be visible until visitors reach a wooded area, the duration of the visual impact would be more prolonged than if only visible at the crossing. Similarly, the linear nature of the trail means that visitors may experience adverse impacts on views as they approach the transmission line from a distance, as described under “Common to All Action Alternatives.”

Currently, farther along McDade Trail, the existing canopy clearing is obvious, creating a bright, sunny opening in a heavily wooded area. The opening provides views of the river, which cannot otherwise be seen after starting from the trailhead at Hialeah Picnic Site. A wider ROW would enlarge this clearing and provide more expansive views. Visual simulations show that the view across the river would change considerably because the 90-degree bend that the route would take just east of Old Mine Road would become clearly visible. Visitors looking across the river from this opening would see structures for both the S-R Line and the replaced transmission/distribution line.

Noise impacts at this location would be similar to those experienced under alternative 2. These impacts would occur in unfavorable weather conditions and would be greater on hikers, who would pass more slowly under the transmission line, than cyclists. The presence of access roads would also increase noise and visual impacts compared to existing conditions, thereby adversely affecting visitor experience, although visitors would continue to recreate in this manner, they may choose to use other sections of the McDade Trail to avoid the adverse impacts from the transmission line and access roads.

In addition to the impacts from paddling or floating the river described below, river users camping at campsite #106, which is adjacent to McDade Trail and the river (although open only to river users), would likely experience adverse impacts from alternative 3 at the campsite. These impacts would be similar to those shown in visual simulations for campsites at the Walters Tract river campsites. Again, the 90-degree bend in the transmission line on the east side of the river would create a more pronounced impact because the corridor and structures would be more visible compared to existing conditions. However, the impact would only be visible to the north from the edge of the river. Upon reaching the campsite, the transmission line would be behind (upstream of) boaters. In the campsite, vegetation surrounding the site would block views of the line, which would also be too distant to be audible. The visual impact would be intermittent from this site, and would not appreciably limit the visitor experience. Visitors would continue to use this campsite. Impacts at the Hialeah Island campsites would be similar because alternative 3 would be upstream from the campsites, primarily visible from the edge of the river.

Although McDade Trail originates at the Hialeah Picnic Site, the existing transmission line that the alternative 3 alignment would follow cannot be seen due to distance and substantial vegetation that blocks

views. Therefore, no impacts are expected on visitors using this picnic area. As visitors leave the picnic area, the transmission line would be visible to the north, as described earlier for McDade Trail. Drivers would not likely see the new transmission line, as it would be out of their line of sight. But passengers looking to the north would see it for a short time. Therefore, only some visitors would be affected, and the effect would be slight but adverse.

Similar impacts would be expected at Hialeah Air Park just north of Smithfield Beach. Although the alternative 3 alignment would be farther south, visual simulations show a dramatic change at the air park. The experience of some visitors flying model planes or watching the activity would be adversely affected. The visual change would be persistent, although the transmission lines would not be audible from this location. Visitors would continue to recreate in this manner. Impact intensity would vary depending on visitor sensitivity to and awareness of the visual change.

The alignment for alternative 3 would be visible from vantage points along APPA. Where the alternative would cross the trail, two sets of structures would be visible. The corridor would be more visible in the distance compared to existing conditions due to the wider ROW and taller structures of the S-R Line, as well as the presence of two parallel lines. Impacts would vary based on viewer sensitivity. Visitors would likely be adversely affected by the visual change in the distance, and scenic values increase with longer views. Changes in visitor experience would be detectable but would not appreciably limit the experience.

At the future APPA relocation site in DEWA, the existing transmission line in the alternative 3 alignment cannot currently be seen. Visual simulations show that a taller tower and conductors would be clearly visible in the distance, creating a new visual intrusion where one had not previously existed, thereby changing the desired visitor experience. However, visitor use of the trail would continue.

Raccoon Ridge is a vantage point along APPA just north of the transmission line crossing. The towers and conductors would be clearly visible where none exist under current conditions. The change would represent a large, human-made intrusion into a predominantly natural viewscape, noticeably altering the experience for most, if not all, APPA hikers.

Farther north, the alternative 3 alignment would closely parallel APPA for approximately 2.5 miles on the east side of DEWA. APPA follows a high ridgeline in this area, and the existing transmission line that the alternative 3 alignment would follow is below the ridge but visible from the trail. This transmission line would be placed parallel the new S-R Line, remaining visible in conjunction with the S-R Line under alternative 3. Many locations along the trail provide wide openings from which the existing transmission line can be seen for several miles to the north and south. Visual simulations show a dramatic and substantial change resulting from the wider ROW, taller structures, and dual sets of structures. The taller towers would raise the conductors considerably higher, making them far more visible compared to existing conditions. Trail hikers would be exposed to this change for the duration of their journey through the area. The change would noticeably alter the visitor experience, and hikers, particularly long-distance hikers, would be highly aware of and sensitive to the change. Overall visitor satisfaction along this area of the trail would likely markedly decline. However, visitor use of the trail would not change. The result would be an adverse impact on visitor experience.

Human activity during deconstruction and construction in proximity to recreation areas would adversely affect the visitor experience and possibly affect the use of certain areas, as described in the “Common to All Action Alternatives” section. Impacts would also depend on the extent to which deconstruction and construction activities could be seen or heard, as well as the location of spur roads. Deconstruction and construction impacts would be of longer duration under alternative 3 because the B-K Line would be removed, the existing structures along the alternative 3 alignment would be removed prior to construction of the S-R Line, and the existing line would be replaced. Therefore, alternative 3 would require two

deconstruction activities (the B-K Line and the existing alternative 3 line) and two separate construction activities (the S-R Line and the replacement of the existing alternative 3 line). These activities would affect large sections of the study area, and would be most apparent where the line would cross McDade Trail. As described for alternative 2, sound levels could increase by more than 13 dBA in areas as far as 3,200 feet from construction activity. Visitors using McDade Trail may not become aware of the adverse impact until they reach the crossing. It is therefore unlikely that visitors would avoid hiking or mountain biking the trail. Impacts on the visitor experience of these trail users would result where the transmission line would cross McDade Trail. During construction the affected portions of the McDade Trail would be closed to visitors. Mitigation measures to avoid peak visitor use periods and notify visitors of construction activities and closures would help minimize these impacts.

Impacts related to the maintenance of the transmission line would be similar to those under alternative 2, although more access roads would be created under alternative 3. In addition, two lines would need to be maintained under alternative 3. The presence and use of new permanent access roads may adversely affect visitors, but the effect would be slight, localized, and intermittent. Visitor use and experience would not measurably change.

Cumulative Impacts

Inside the study area, the adverse impacts resulting from alternative 3 were evaluated in the context of other projects in the region mentioned in the “Cumulative Impacts Common to All Alternatives” section. Similar to alternative 2, the primarily beneficial impacts expected in the study area would not be sufficient to offset the impacts expected in DEWA from other actions, such as possible increased crowding. These impacts would be combined with the mostly visual impacts resulting from a wider ROW, taller structures, and dual sets of structures under alternative 3, which would be adverse in DEWA. The resulting adverse cumulative impacts in DEWA would be adverse.

Cumulative impacts on visitor use and experience inside the study area from other past, present, and reasonably foreseeable projects would be adverse, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the adverse impacts on visitor use and experience as a result of alternative 3 are combined with the other projects in the study area, an overall adverse cumulative impact would be expected. Alternative 3 would contribute an appreciable adverse increment to the overall cumulative impact.

Conclusion

Inside the study area, the 90-degree bend the line would take at Old Mine Road would affect views from several vantage points, affecting many visitors. The alternative 3 alignment would also create new visual intrusions at Raccoon Ridge along APPA, and would be seen from other vantage points along the trail. Most of the adverse impacts on APPA would occur where the alternative 3 alignment would parallel the trail for approximately 2.5 miles. Two sets of structures would be constructed in the expanded ROW, increasing the visual impact. Construction-related adverse impacts would occur from impacts on soundscapes based on location. Multiple deconstruction/construction activities would occur. Maintenance impacts would be the same as alternative 2. Overall cumulative impacts inside the study area would be adverse.

Alternative 3 is likely to have more severe adverse impacts than the other action alternatives because the configuration of the line increases the number of vantage points affected and creates new visual intrusions in areas that do not currently have such intrusions. Alternative 3 would cross public lands administered by state and federal entities, providing a diversified visitor experience and many recreational opportunities. DEWA, MDSR, APPA, and Worthington State Forest are refuges from the densely populated East Coast

as the centerpieces for some of the largest continuous protected lands on the East Coast within a day's drive for millions of people. The unique topography and geology of Kittatinny Ridge, Delaware River Riparian Corridor, and the mature undisturbed Eastern Hemlock forests are the cornerstones of the geography in this region, providing a unique scenic setting through which alternative 3 would cross. The cultural landscape and National Register eligible APPA was designated to provide a wilderness-like experience and an opportunity for escape and solitude. Likewise the MDSR, designated under the Wild and Scenic Rivers Act, and the Delaware River Water Trail offer a parallel experience of solitude along the Delaware River.

The construction of an additional line with taller towers would adversely impact the scenic nature of APPA, DEWA, and MDSR which is counter to their enabling legislation and mandates to protect scenery. The route that alternative 3 follows bisects and parallels both the MDSR and the Kittatinny Ridge, which APPA traverses, with a significant change in visibility as a result of the ROW expansion, taller towers, and additional lines compared to the existing condition. Because of the route up the Kittatinny Ridge, the visibility of the tall towers would be greatly increased along the MDSR, and would be visible from the McDade Trail and popular recreational sites like Smithfield Beach and Hialeah Air Park, and the scenic drives and cultural landscapes of Old Mine Road in New Jersey and River Road in Pennsylvania. The visual impacts from alternative 3 would be experienced by a large number of visitors due to the concentration of recreational facilities within sight of the transmission line corridor.

Construction impacts such as noise and temporary closures of trails, roads, and the MDSR would be of relatively short duration. However, these temporary closures would affect a large number of visitors, making traversing the park difficult and denying access to a heavily used area of the MDSR and popular visitor use sites, such as Smithfield Beach. The adverse impacts of alternative 3 on visitor use and experience could be offset by the beneficial impacts of removing the existing B-K Line and restoring the natural habitat at the heart of DEWA and MDSR and reducing the number of crossing of APPA. The restoration would also have beneficial impacts to the recreational sites, roads, and trails within DEWA, the MDSR, and APPA. However, overall the beneficial impacts of the removal of the existing line do not outweigh the severe negative impacts of visual intrusion of the expanded line paralleling the MDSR and APPA.

It is unknown how the addition of another transmission line would impact visitor use patterns in DEWA, APPA, and MDSR. Visitors would likely continue to use these parks however they may choose to recreate in other areas away from the transmission lines. This could negatively impact the visitation to the parks as a whole or put increased pressure and resource impacts on other areas of the parks.

The impacts of any of the action alternatives have potential to be significant because of the high public attention surrounding this project. The natural, cultural, scenic, and recreational resources of DEWA and APPA are held in public trust and visitors come to the parks to experience these resources. Allowing impacts to these resources is contrary to typical NPS practice of improving scenic conditions by removing non-conforming features and may establish precedent for future actions. The applicant's project is one component of a larger regional plan by the RTO to enhance system reliability. Other component projects of this plan have already affected, and would continue to affect APPA, especially in the areas of scenic resources and visitor use and experience, as well as other national parks in their paths.

Public attention surrounding this project is high. There is likely to be a high degree of controversy over any effects on park resources that are particularly popular with the public, such as scenery, visitor use and experience, rare and unique communities, cultural landscapes, and historic structures, for any of the alternatives. The inherent uncertain nature of predicting the true degree of some of these impacts would likely heighten this controversy.

In considering the intensity of the impacts in the context of the purposes for which the three park units were established and the high expectations of visitors as to the type of experience they should have in these places, alternative 3 would likely result in significant adverse impacts on visitor use and experience. The severity of these impacts is likely to be greater than the other action alternatives because alternative 3 would result in a greater number of intrusions, including new intrusions, and would likely affect a larger number of visitors because of the concentration of popular visitor attractions.

Alternative 4

Because alternative 4 would originate at the Bushkill Substation, impacts on the Bushkill area would be as described for alternative 2.

Resort Point Overlook, Point of Gap Overlook, and Arrow Island Overlook along the Delaware River in the southern end of DEWA would not be affected by the alternative 4 alignment, which would not be visible from these locations. Similarly, neither would the Kittatinny Point Visitor Center. Across the highway, Red Dot (Tammany) Trail climbs 1,250 feet in 1.5 miles, providing views of Mount Minsi and the Delaware Water Gap. Although Mount Minsi would block views of much of the alignment, visual simulations show that the alignment would be clearly visible east of the mountain. Under existing conditions, the current transmission line is barely visible, if at all. Red Dot (Tammany) Trail is a demanding hike; the sweeping views are the reward for a difficult effort. Visitor experience would be diminished by the intrusion of the alternative 4 corridor in the viewshed, and the change would be persistent. Visitors who often hike this trail would notice the change, although overall visitor satisfaction would remain constant and visitors would continue to hike this trail. Therefore, adverse impacts on visitor experience would occur.

Visitors hiking APPA north of the river would not be exposed to views of the alternative 4 alignment. Visitors hiking the trail south of the river would not be affected by alternative 4 until reaching the transmission line crossing. The wider ROW would be a considerable and noticeable change, particularly in views to the northwest. Taller structures would be substantially higher than the existing wood towers, which would be removed and replaced. The change would be clearly detectable, but would not appreciably alter the visitor experience. The use of the trail would not change. Adverse impacts on visitor experience would occur.

Farther south along APPA, Lunch Rocks and Nelson Overlook provide views from high vantage points. At both locations, the existing transmission line that the alternative 4 alignment would follow is barely perceptible. The view from Lunch Rocks would change substantially as the wider ROW would create a far more visible corridor, and the taller towers would be clearly seen from the ridgetop in the middleground. Disruptions to the middleground may create a noticeable contrast and would affect how visually coherent the landscape would appear to visitors. The impact would affect the majority of the viewing area. At Nelson Overlook, the view would be affected primarily by the larger corridor, although it would not fill the entire viewframe. In both cases, the change would represent a new visual intrusion into the viewscape and would create adverse impacts to visitor experience.

The southern section of Karamac Trail is in DEWA adjacent to Worthington State Forest and begins at the traffic light on Old Mine Road. Visitors use the trail to access the river and spend time on the rocks. The existing transmission line that the alternative 4 alignment would follow is on the west side of the Delaware River and cannot currently be seen from the Karamac trailhead. However, it is visible at the terminus of the trail at the river, where hikers spend more time. Under alternative 4, one tower and conductors would be visible across the river. The remainder of the line would be obscured by vegetation. Visitors would either be unaware of the impact, or the impact would be slight and detectable. Few to

some visitors would be affected, but the change would not appreciably limit critical characteristics of the visitor experience. Visitors would continue to use this trail.

Human activity during deconstruction and construction near recreation sites would adversely affect visitor experience and possibly affect the use of certain areas, as described in the “Common to All Action Alternatives” section. Impacts would depend on the extent to which deconstruction and construction activities could be seen or heard, as well as the location of spur roads. Under alternative 4, construction impacts would be most apparent where the line would be close to APPA. The access road would veer east outside the ROW and would cross APPA about 600 feet from the transmission line. This would represent two crossings of the trail under alternative 4. As described for alternative 2, sound levels could increase during construction by more than 13 dBA in areas as far as 3,200 feet from the activity. In addition, more visitors would be adversely affected because there would be two rounds of deconstruction activities and two rounds of construction activities, which may not be conducted simultaneously and would affect visitors in different locations. Visitors hiking APPA may not become aware of the impact until they reach the crossing and access road. Because the access road would be several hundred feet from the transmission line, impacts related to construction and maintenance would be greater. Noise impacts on these trail users would occur where the alternative would cross APPA. Despite these impacts on visitor experience, visitors would continue to use this trail. Mitigation measures to avoid peak visitor use periods and notify visitors of construction activities and closures would help minimize these impacts.

Adverse impacts related to maintenance of the transmission line would be the same as for alternatives 2 and 3.

Cumulative Impacts

Cumulative impacts on visitor use and experience inside the study area would be adverse, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the adverse impacts on visitor use and experience as a result of alternative 4 are combined with other past, present, and reasonably foreseeable projects in the study area, an overall adverse cumulative impact would be expected. Alternative 4 would contribute an appreciable adverse increment to the minimum overall cumulative impact.

Conclusion

Adverse impacts would occur at the Red Dot (Tammany) Trail and Karamac Trail. However, most of the adverse impacts under alternative 4 in the study area would affect APPA. Two sets of structures would be built in the ROW, increasing the visual impacts. Construction-related impacts and maintenance impacts would be the same as alternative 3. Overall cumulative impacts inside the study area would be adverse.

The adverse impacts of alternative 4 on visitor experience would be less severe than the other action alternatives because there would be fewer areas affected by the intrusion of the power line; however, the impacts of alternative 4 are still likely to be significant. Visitor experience would be diminished by construction noise and activities, including closures of trails and roads, although these would be temporary and of varying intensity depending on distance. Visitor experience would be permanently diminished by the intrusion of the alternative 4 corridor in these viewsheds, especially APPA. The abrupt opening of the cleared ROW and the intrusion of transmission line towers would likely be intense and would diminish the sense of naturalness in areas where visitors specifically go to escape such intrusions, such as the Appalachian Trail and the difficult hike to the Red Dot Trail. Topography and vegetation cover would not screen the visual intrusion on the scenic landscape. The overall experience of the APPA visitor would be degraded because this project would contribute cumulatively to the adverse impacts

caused by infrastructure projects along the entirety of the trail. In both cases, the change would represent a new visual intrusion into the viewscape and would create adverse impacts to visitor experience.

Several important benefits would occur from removing the B-K Line as a part of mitigation for construction of alternative 4. Alternative 4 would move large infrastructure to the margins of DEWA, would remove an existing transmission line ROW and associated infrastructure from the center of DEWA, and would completely remove the river crossing of the MDSR, enhancing the scenic and recreational qualities. The benefits to APPA could outweigh the adverse impacts to DEWA.

Public attention surrounding this project is high. There is likely to be a high degree of controversy over any effects on park resources that are particularly popular with the public, such as scenery, visitor use and experience, rare and unique communities, cultural landscapes, and historic structures, for any of the alternatives. The inherent uncertain nature of predicting the true degree of some of these impacts would likely heighten this controversy. Additionally, the applicant's project is one component of a larger regional plan by the RTO to enhance system reliability. Other component projects of this plan have already affected, and would continue to affect APPA, especially in the areas of scenic resources and visitor use and experience, as well as other national parks in their paths.

Considering the intensity of the impacts discussed above in the context of the purposes for which the three national park units were established and the high expectations of visitors as to the type of experience they should have in these places, the NPS believes that alternative 4 would likely result in significant impacts on visitor use and experience because the proposed transmission line collectively detracts from the overall visitor experience of APPA and results in new intrusions into a natural environment that would appreciably diminish key aspects of the parks that visitors come to experience. Alternative 4 offers the potentially significant benefits of completely removing a utility line crossing of the MDSR plus removing and restoring the existing ROW through an especially sensitive area of DEWA, which could outweigh the negative impacts of this alternative.

Alternative 5

Adverse impacts on visitor use and experience would be the same in the study area as described for alternative 4.

Cumulative Impacts

Cumulative impacts under alternative 5 would be the same as those under alternative 4. Alternative 5 would contribute an appreciable adverse increment to the minimum overall cumulative impact.

Conclusion

Adverse impacts would occur at the Red Dot (Tammany) Trail and Karamac Trail. However, as with alternative 4, most of the adverse impacts under alternative 5 in the study area would affect APPA. Two sets of structures would be built in the ROW, increasing the visual impacts. Construction-related impacts and maintenance impacts would be the same as alternative 3. Overall, cumulative impacts inside the study area would be adverse.

The adverse impacts of alternative 5 on visitor experience would be less severe than the other action alternatives because there would be fewer areas affected by the intrusion of the power line; however, the impacts of alternative 5 are still likely to be significant. Visitor experience would be diminished during construction by noise and temporary closures of trails and roads. Visitor experience would be permanently diminished by the intrusion of the alternative 5 corridor in these viewsheds and the expanded

ROW width. These changes would diminish the sense of naturalness in areas where visitors specifically go to escape such intrusions, such as the Appalachian Trail and the difficult hike to the Red Dot Trail. Topography and vegetation cover would not screen the visual intrusion on the scenic landscape. The overall experience of the APPA visitor would be degraded; this project would contribute cumulatively to the adverse impacts caused by infrastructure projects along the entirety of the trail.

Several important benefits would occur from removing the B-K Line as a part of mitigation for construction of alternative 5. Alternative 5 would move large infrastructure to the margins of DEWA, would remove an existing transmission line ROW and associated infrastructure from the center of DEWA, and would completely remove the river crossing of the MDSR, enhancing the scenic and recreational qualities. The benefits to APPA could outweigh the adverse impacts to DEWA.

Public attention surrounding this project is high. There is likely to be a high degree of controversy over any effects on park resources that are particularly popular with the public, such as scenery, visitor use and experience, rare and unique communities, cultural landscapes, and historic structures, for any of the alternatives. The inherent uncertain nature of predicting the true degree of some of these impacts would likely heighten this controversy. Additionally, the applicant's project is one component of a larger regional plan by the RTO to enhance system reliability. Other component projects of this plan have already affected, and would continue to affect APPA, especially in the areas of scenic resources and visitor use and experience, as well as other national parks in their paths.

Considering the intensity of the impacts discussed above in the context of the purposes for which the three national park units were established and the high expectations of visitors as to the type of experience they should have in these places, the NPS believes that alternative 5 would likely result in significant impacts on visitor use and experience because the proposed transmission line collectively detracts from the overall visitor experience of APPA and results in new intrusions into a natural environment that would appreciably diminish key aspects of the parks that visitors come to experience. Alternative 5 offers the potentially significant benefits of completely removing a utility line crossing of the MDSR plus removing and restoring the existing ROW through an especially sensitive area of DEWA, which could outweigh the negative impacts of this alternative.

WILD AND SCENIC RIVERS

The Wild and Scenic Rivers Act of 1968 calls for the protection of specific U.S. rivers that “possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values” (16 USC § 1271). This policy is to preserve selected rivers “in their freeflowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes” (16 USC § 1271). These rivers are to be protected “for the benefit and enjoyment of present and future generations” (16 USC § 1271). The MDSR and the land adjacent to it have been identified as a component of the national wild and scenic rivers system to be administered by the Department of the Interior, specifically the NPS (16 USC § 1274; 16 USC § 1281). Wild and scenic rivers administered by the NPS are part of the national park system, and are subject to all laws, regulations, and policies applicable to that system (NPS n.d.b). The DEWA GMP states that, although the national recreation area and the scenic and recreational river have separate origins, they are considered an integrated whole for the purposes of park planning. As a scenic and recreational river, MDSR must be managed in accordance with the Wild and Scenic Rivers Act.

Section 10(a) directs managers to “protect and enhance” the values for which these rivers are designated (16 USC § 1281(a)). The “protect and enhance” language of Section 10(a) is interpreted in the Secretaries’ Guidelines as “a non-degradation and enhancement policy for all designated river areas, regardless of classification.” See Secretaries’ Guidelines, Section III, “Management.” The Interagency

Guidelines interpret Section 10(a) as a “non degradation and enhancement policy for all designated river areas, regardless of classification.”

The Wild and Scenic Rivers Council advises that Section 10c of the Wild and Scenic Rivers Act requires the NPS to use their general statutory authorities to protect wild and scenic river values, meaning that it 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] aesthetic, scenic, historic, archeological, and natural features (16 USC § 1281(a)).

METHODOLOGIES

The analysis of impacts on MDSR was based on a qualitative assessment of how the proposed alternatives would affect those values for which the river was designated, specifically those identified by the Wild and Scenic Rivers Act as having primary emphasis: aesthetic, scenic, historic, archeological, and natural features, including water quality. These resources are further defined in chapter 3 as water resources, scenery, recreation, wildlife, and vegetation. In addition, this analysis considers the protection and enhancement of MDSR for the benefit and enjoyment of the public, as called for under the act. Therefore, this analysis refers to those sections of this chapter that address these resources and values.

Resource-specific context for assessing impacts on the MDSR includes the following:

- The Wild and Scenic Rivers Act protects rivers that possess “outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values” and preserves their free-flowing condition for the benefit and enjoyment of present and future generations, echoing the Organic Act.
- Wild and scenic rivers administered by the NPS, such as the MDSR, are part of the national park system, and are subject to all laws, regulations, and policies applicable to that system. The DEWA GMP states that, although the national recreation area and the scenic and recreational river have separate origins, they are considered an integrated whole for the purposes of park planning.
- MDSR must be managed in accordance with the Wild and Scenic Rivers Act; Section 10(a) of the Act states that each component of the system “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] aesthetic, scenic, historic, archeological, and natural features.”
- Section 10c of the Wild and Scenic Rivers Act requires the NPS to use their general statutory authorities to protect wild and scenic river values which includes not only the river itself, but adjacent lands.

STUDY AREA

The study area for this topic includes the entire 40-mile designated segment of the MDSR, all of which flows within DEWA. The analysis under Section 10c of the Wild and Scenic Rivers Act includes lands adjacent to the river because the scenic values that fall under Section 10c review are associated with lands outside the immediate corridor of the river.

CUMULATIVE IMPACTS

Past, present, and reasonably foreseeable future actions within the park could affect the values for which the river was designated. The addition of roads, clearing of vegetation, or enhancement of environmental resources could have an effect on the river's values and the public's experience of the river. Projects outside the park would be less likely to affect the scenic or recreational values of the river, unless the effects are extensive; for example, a dam upstream of DEWA would likely compromise the qualities of the river that made it eligible for classification under the Wild and Scenic Rivers Act. Completed, current, and future activities that would have beneficial or adverse impacts on MDSR inside and outside the study area are summarized below. A full list of projects considered for the cumulative impacts analysis can be found in appendix H. Under each alternative, projects within and outside the study area that may contribute to cumulative effects on MDSR in addition to the actions described under the proposed alternative, are described and analyzed.

Projects Inside the Study Area

The primary emphasis for the protection of MDSR includes the area's aesthetic, scenic, historic, archeological, and natural features. See the "Visual Resources," "Cultural Resources," and "Visitor Use and Experience" cumulative impacts sections for actions that could affect those specific values of the recreational river, as well as enjoyment of those values. Activities that would affect the qualities that the Wild and Scenic Rivers Act emphasizes for protection, as well as the ability of visitors to enjoy those qualities (addressed under separate impact topics), include the following:

Projects that would have an adverse effect on aesthetic and scenic qualities include the Columbia Gas pipeline crossing, the Columbia Gas Transmission Corporation pipeline expansion, the Tennessee Gas Line proposal, and communications tower development. The following projects would affect aesthetic and scenic characteristics inside the study area by improving aesthetics through restoration and preservation and diminishing aesthetics in the short term through construction and staging activities: the Kittatinny Point Visitor Center storm recovery, the Delaware River bridge projects, and the improvement of the Delaware Water Gap Toll Bridge. Several projects would cause a change in the significance of archeological resources inside the study area through restoration of architectural resources, other structures, and recreational sites. These projects include the stabilization and repair of damaged structures, the New Jersey Swim Beach (Turtle Beach), the river campsite restoration of flood-damaged sites, and the McDade Trail realignment. The beneficial impacts on park facilities from actions within DEWA undertaken by the NPS would have more relevance under this topic than under "Visitor Use and Experience," particularly those actions adjacent to the river, such as restoration of river campsites. These actions include the New Jersey Swim Beach (Turtle Beach) and the river campsite restoration of flood-damaged sites.

Projects Outside the Study Area

Outside of the study area, the Marcellus Shale natural gas drilling and residential and commercial development in contributing watersheds could result in adverse impacts on the river through degradation of water quality. Beneficial impact on the river from conservation of resources would result from county and township open space and conservation plans and Pike County agricultural security leases.

IMPACTS OF THE ALTERNATIVES ON THE MIDDLE DELAWARE SCENIC RIVER

Alternative 1: No Action

Under the no-action alternative, the existing B-K Line ROW would not be widened. The features and attributes of MDSR would not change compared to existing conditions. According to the applicant's project website, the existing transmission line was built in the 1920s (PSE&G 2010b), prior to the designation of MDSR and DEWA. Therefore, alternative 1 would not further affect the values for which the river was designated.

The operation of the existing transmission line would require periodic maintenance, including clearing vegetation within the existing ROW. Access roads within the existing ROW would also require periodic maintenance to provide access for repairs and maintenance. These activities would not be visible from the river corridor and BMPs would minimize impacts such as erosion and sedimentation from vegetation management and access road maintenance. The existing line crossing of the MDSR would continue to conflict with the natural scene in that section of river but to no greater extent than what existed at the time that the MDSR was designated. The public would continue to enjoy the river as it has since the river's designation.

Cumulative Impacts

Because no impacts would occur on MDSR under alternative 1, there would be no cumulative impacts on MDSR under alternative 1.

Conclusion

Alternative 1, the no-action alternative, would result in the continued operation and maintenance of the existing transmission line. No additional impacts on MDSR are expected. Therefore, there would be no cumulative impacts on MDSR under alternative 1.

Because alternative 1 would not change existing conditions with regard to the MDSR, alternative 1 would have no potential for significant impacts on the MDSR.

Common to All Action Alternatives

For all action alternatives, the existing B-K Line within the park boundaries would be removed to the extent feasible as described in chapter 2, and the existing corridor would be allowed to revegetate, ultimately returning to forested habitat over the long term. Under any of the action alternatives some ROW expansion is necessary for construction safety and maneuverability, after which, a portion of the corridor along the ROW would be allowed to revegetate. Only the width of the ROW necessary to maintain access roads and the transmission line would be maintained. Such revegetation would indirectly reduce adverse impacts to the aesthetic and scenic qualities of MDSR by potentially creating a visual screen that would restore a sense of naturalness, albeit limited to some degree in some locations.

Alternative 2

Alternative 2 would result in widening the existing B-K Line ROW through DEWA and MDSR for approximately 4.3 miles. The existing structures and lines would be removed and replaced with new towers and lines as described in chapter 2, resulting in a permanent loss of vegetation along the existing ROW. An additional 50 to 200 feet beyond the width of the existing ROW would be required to construct, operate, and maintain the new transmission line. Adverse impacts would occur primarily on

scenic qualities. Adverse impacts on historic structures and on archeological and natural resources would occur as described under these respective topics. Therefore, many of the values for which the river was designated would be perceptibly changed. As indicated in the “Visitor Use and Experience” section, visual simulations demonstrate a substantial change to views for river users as a result of taller structures and additional, thicker conductors. The presence of the taller towers, thicker and more numerous lines, and bird diverters would be seen not only as boaters pass below the wires, but as they approach from both upstream and downstream directions. Bird diverters would increase the visibility of the transmission lines. Boaters would see this, in addition to the conductors crossing the river, in the distance approaching from either direction, detracting from the scenic quality of the setting and thereby interfering with enjoyment of the river’s features and recreation benefits. Visitors using river campsites within sight of the lines would be impacted for the duration of their stay at the campsite. The visual intrusion of the lines would detract from the scenic quality of the otherwise natural setting. Because paddling, floating, and fishing the river is so popular, many visitors would be affected, which would diminish public enjoyment of the river’s features and outdoor recreation benefits from what visitors experience today. The adverse impact to the visual qualities of the river would extend beyond the river itself and would be experienced by visitors who view the river from locations beyond the immediate crossing, representing a change that would affect a relatively large area and large number of visitors. For these reasons, adverse impacts to wild and scenic rivers would occur.

The preparation of existing access roads and construction staging areas would result in the additional loss and disturbance of natural areas along the existing ROW. The closest access road is approximately 1,000 feet from MDSR in Pennsylvania and approximately 500 feet from MDSR in New Jersey. It is possible that an additional 1.9 miles of access roads outside the ROW, as well as temporary spur roads, may be required, although none are anticipated to be visible from MDSR. The alternative 2 alignment would cross MDSR generally perpendicularly at only one location before continuing to the Susquehanna and Roseland substations. The corridor for alternative 2 would not follow the river nor would it be in proximity to the river along these routes. Therefore, there would be no impacts outside the study area other than those discussed in the “Cumulative Impacts Common to All Alternatives” section.

Cumulative Impacts

Within the study area, the impacts resulting from alternative 2 were evaluated in combination with other projects mentioned in the “Cumulative Impacts” section above. Additional clearing of corridors for new or expanded pipelines and the proliferation of communication towers could further degrade the scenic qualities of the MDSR. The possibility of future water quality degradation from Marcellus Shale natural gas development and other land use changes exists and would further impact the values of the MDSR. Beneficial impacts would occur as a result of land protection, restoration, and enhancement projects within and outside the parks; however, it is unlikely that these beneficial impacts would substantially reduce the adverse impacts from other development projects that would continue, particularly those affecting water quality.

Conclusion

The impacts on MDSR from alternative 2 would result in visual changes that would adversely affect a relatively large area, a large number of users, and would exist for the life of the project. Impacts related to construction activities would be of short duration when compared to the life of the project but one time visitors who were impacted by river closures or construction noise may have their experience of the MDSR forever diminished. The reduction of resources in the region surrounding the parks would increase their scarcity and sensitivity inside the parks, where they are afforded special protections. Alternative 2 would contribute to the cumulative adverse impact.

Alternative 2 would result in significant long-term degradation of the scenic values for which the river was designated, which would be contrary to the directives in section 10(a) of the Wild and Scenic Rivers Act to “protect and enhance” those values which caused the river to be included in the system. Alternative 2 would cross in the center part of DEWA, including the MDSR. In general, this area is one of the most undeveloped areas of the park, containing large swaths of contiguous mature forest, few man-made intrusions, unique geological formations, a globally significant rare plant community, and abundant opportunities for solitude. The presence of large and obtrusive infrastructure in a relatively undeveloped zone would be a distraction that would detract from the experience visitors seek when coming to the parks. It would degrade the regionally unique and unusual wilderness-like viewshed the MDSR provides. Large structures also introduce non-conforming elements to the parks’ cultural landscapes and historic sites affected by this alignment and detract from the characteristics that qualify them for protection. This, in turn, would have adverse impacts on the MDSR through the degradation of the scenic values for which the river was designated. The visual change would affect a relatively large area and a large number of users. A crossing at this location poses high risk for irreparable damage to significant ecological communities and drastic scenic degradation.

Permitting the project would adversely affect multiple protected resources inside the parks, in some instances irreversibly. Allowing such adverse effects in order to facilitate private infrastructure expansion would be contrary to NPS practice and principle of protecting and improving these resources, and of removing incompatible infrastructure to do so. This could establish precedent that may invite similar proposals by other applicants in the future, and create an expectation of like treatment for those proposals; it may make it difficult to deny such proposals. DEWA and APPA both contain numerous other utility crossings, which makes the risk of such precedent particularly concerning for these parks. Furthermore, as units of the national park system, wherein all parks are entitled to equal protection, creating such a precedent could have ramifications for parks nationwide. The location of this particular crossing through the center of DEWA could make such a precedent even more potent. Installing the S-R Line on this alignment may invite future utilities proposing to follow the same route.

Overall, the significance of the impact of alternative 2 is a result of two considerations: the particularly resource-rich area through which the alternative crosses and the potential to inflict harm to those resources because of the magnitude and duration of the adverse impacts. Although it is true that not all impacts can be predicted with great certainty, in the context of the purpose and significance for which DEWA, APPA, and MDSR were established and NPS mandates to specifically preserve the natural, cultural, and scenic resources within them, additional precautions are warranted when considering risks to these resources, many of which are of national importance. Similarly, certain resources are non-renewable, which makes any impacts to them all the more serious because they cannot be replaced if lost. And some resources are under threat by other actions and outside pressure, which in the context of the function of the parks as an “oasis” or refuge within the highly developed east coast, elevates the need to preserve and protect these scarce, sensitive resources. Considered in the context of the values for which the MDSR was designated and is managed, the NPS believes that alternative 2 would likely have significant impacts on the MDSR.

Alternative 2b

The alternative 2b alignment would follow the same route as alternative 2. All towers would be the same height as under alternative 2, but two additional towers would be required. As in alternative 2, taller towers would create more adverse visual and noise impacts compared to existing conditions (see the “Visual Resources” and “Soundscapes” sections for discussions related to those topics). Adverse impacts on historic, archeological, and natural features would occur as described for alternative 2. Therefore, many of the values for which the river was designated would be perceptibly changed as a result of taller

structures and additional, thicker conductors compared to existing conditions; creating an overall adverse impact.

Cumulative Impacts

Cumulative impacts for alternative 2b would be the same as expected under alternative 2.

Conclusion

The impacts on MDSR from alternative 2b would result in visual changes that would adversely affect a relatively large area, a large number of users, and would exist for the life of the project, similar to alternative 2. Impacts related to construction activities would be of short duration when compared to the life of the project but one time visitors who were impacted by river closures or construction noise may have their experience of the MDSR forever diminished. The reduction of resources in the region surrounding the parks would increase their scarcity and sensitivity inside the parks, where they are afforded special protections. Alternative 2b contributes to the cumulative adverse impact.

Alternative 2b would result in significant long-term degradation of the scenic values for which the river was designated, which would be contrary to the directives in section 10(a) of the Wild and Scenic Rivers Act to “protect and enhance” those values which caused the river to be included in the system. Alternative 2b would cross in an area of contiguous mature forest, few manmade intrusions, unique geological formations, a globally significant rare plant community, and abundant opportunities for solitude. The presence of large and obtrusive infrastructure in a relatively undeveloped zone would be a distraction that would detract from the experience visitors seek when coming to the parks, and would degrade the regionally unique and unusual wilderness-like viewshed the MDSR provides. Alternative 2b would have adverse impacts on the MDSR through the degradation of the scenic values for which the river was designated. The visual change would affect relatively large area and a large number of users. A crossing at this location poses high risk for irreparable damage to significant ecological communities and drastic scenic degradation.

The natural, cultural, scenic, and recreational resources of DEWA and APPA are held in public trust and visitors come to the parks to experience these resources. Allowing impacts to these resources is contrary to typical NPS practice of improving scenic conditions by removing non-conforming features and may establish precedent for future actions. The applicant’s project is one component of a larger regional plan by the RTO to enhance system reliability. Other component projects of this plan have already affected, and would continue to affect APPA, especially in the areas of scenic resources and visitor use and experience, as well as other national parks in their paths.

Overall, the significance of the impact of alternative 2b is a result of two considerations: the particularly resource-rich area through which the alternative crosses and the potential to inflict harm to those resources because of the magnitude and duration of the adverse impacts. Although it is true that not all impacts can be predicted with great certainty, in the context of the purpose and significance for which DEWA, APPA, and MDSR were established and NPS mandates to specifically preserve the natural, cultural, and scenic resources within them, additional precautions are warranted when considering risks to these resources, many of which are of national importance. Similarly, certain resources are non-renewable, which makes any impacts to them all the more serious because they cannot be replaced if lost. And some resources are under threat by other actions and outside pressure, which in the context of the function of the parks as an “oasis” or refuge within the highly developed east coast, elevates the need to preserve and protect these scarce, sensitive resources. Considered in the context of the values for which the MDSR was designated and is managed, the NPS believes that alternative 2b would likely have significant impacts on the MDSR.

Alternative 3

Inside the study area the alternative 3 alignment would cross MDSR using an existing transmission line ROW that would be expanded from its current 100-foot width by an additional 50 to 100 feet. Similar to alternative 2, adverse impacts would occur primarily on scenic qualities. Adverse impacts on historic structures and archeological and natural resources would occur as described under these respective topics. Therefore, many of the values for which the river was designated would be perceptibly changed. The S-R Line and the replaced transmission/distribution lines would cross the river perpendicularly, but on the New Jersey side of DEWA both sets of parallel transmission lines would turn sharply northeast, paralleling the river for approximately 1 mile. The presence of two sets of structures close to MDSR would increase the adverse impact on aesthetics and scenery. As noted in the “Visitor Use and Experience” section, views of the riverbank and the Kittatinny Ridge on the New Jersey side would change dramatically due to this 90-degree bend. The transmission line corridor and structures would be clearly visible under alternative 3. Bird diverters would increase the visibility of the transmission lines. Boaters would see this, in addition to the conductors crossing the river, in the distance approaching from either direction, detracting from the scenic quality of the setting and thereby interfering with enjoyment of the river’s features and recreation benefits. Visitors using river campsites within sight of the lines would be impacted for the duration of their stay at the campsite. Visitors to the popular river access sites and swimming beaches along that section of river would also have the scenic quality of the setting degraded. The change would extend beyond the river itself and would impact visitors who view the river from locations beyond the immediate crossing, representing a change that would affect a relatively large area. The adverse visual impacts from alternative 3 would be experienced by a greater number of visitors than other alternatives due to the concentration of recreational facilities within sight of the transmission line corridor.

Alternative 3 would require the development of new access roads and temporary spur roads; however, views from the river would likely be protected by existing trees, and access roads would not be placed closer than 200 feet to the river. All roads except for temporary spur roads would be permanently maintained.

As with alternative 2, there would be no impacts to MDSR from outside the study area other than those discussed in the “Cumulative Impacts Common to All Alternatives” section.

Cumulative Impacts

Cumulative impacts would be similar to alternative 2. Slight differences would result from the additional aesthetic and scenic impacts expected under alternative 3 due to the 90-degree bend the two sets of transmission lines would make on the east side of the river, exposing more of the corridor and structures to view.

Conclusion

Adverse impacts on MDSR scenic resources from alternative 3 would occur, and the visual change would affect a relatively large area and affect a large number of visitors. The decommissioning and restoration of the B-K Line alignment would enhance the values of the MDSR along that section of river but those benefits would be negated by the impacts to scenic values along Alternative 3.

Alternative 3 would result in significant long-term degradation of the scenic values for which the river was designated which is contrary to the directives in section 10(a) of the Wild and Scenic Rivers Act to “protect and enhance” the values that caused the river to be included in the system. The MDSR, designated under the Wild and Scenic Rivers Act, and the Delaware River Water Trail offer a parallel

experience of solitude along the Delaware River. The largely intact Delaware River riparian corridor within DEWA, rare in the highly developed east, contributes to a functioning floodplain that helps protect the qualities of the river that contribute to its designation as the MDSR. This large, undisturbed area of high-quality riparian habitat provides crucial habitat to migratory birds, as noted above, as well as other important breeding and foraging habitat for a variety of wildlife. The eastern hemlock forests are a unique ecosystem, found in specific locations along the slopes adjacent to the Delaware River, that support plant and animal communities not found anywhere else because of the specific combination of shading, temperature, and soil characteristics created by the dense hemlock growth.

The construction of an additional line with taller towers would adversely impact the scenic nature of MDSR, which is counter to their enabling legislation and mandates to protect scenery. The route of alternative 3 up the Kittatinny Ridge would greatly increase the visibility of the tall towers. It is unknown how the addition of another transmission line would impact the visitor use patterns. Visitors would likely continue to use the river, however, they may choose to recreate in other areas away from the transmission lines. This could negatively impact the visitation to the parks as a whole or put increased pressure and resource impacts on other areas of the parks.

The natural, cultural, scenic, and recreational resources of DEWA and APPA are held in public trust and visitors come to the parks to experience these resources. Allowing impacts to these resources is contrary to typical NPS practice of improving scenic conditions by removing non-conforming features and may establish precedent for future actions. The applicant's project is one component of a larger regional plan by the RTO to enhance system reliability. Other component projects of this plan have already affected, and would continue to affect APPA, especially in the areas of scenic resources and visitor use and experience, as well as other national parks in their paths.

The removal of the B-K Line would have beneficial impacts to Wild and Scenic Rivers by restoring the natural habitat to the heart of DEWA and MDSR and reducing the number of crossing of APPA. Overall, the beneficial impacts of the removal of the existing line do not outweigh the significant negative impacts of visual intrusion of the expanded line paralleling the MDSR and APPA.

In the context of the values for which the MDSR was designated and is managed, alternative 3 would likely result in significant adverse impacts on the MDSR, similar to the impacts that would likely result from alternatives 2 and 2b. Unlike alternatives 2 and 2b, alternative 3 offers some significant benefits from the removal and restoration of the especially sensitive and scenic area where the B-K Line currently exists. However, these benefits do not offset the negative impacts that would occur as a result of the alternative 3 route.

Alternative 4

The transmission lines for both alternatives would cross the Delaware River just outside DEWA, and thus outside the boundary of MDSR. The river has no special designation where it would be crossed by the alignments for alternative 4. A beneficial impact would result from decommissioning and restoring the B-K Line, which does cross MDSR. However, the transmission lines for alternative 4 may be visible by some people from the southernmost end of MDSR, which could adversely affect the aesthetic and scenic qualities of MDSR. This adverse impact would be localized and would occur along a stretch of river where the scenic values are already compromised by existing transportation corridors.

Approximately 1.73 miles of new access and spur roads would be required under these alternatives, including 0.67 mile outside DEWA and APPA boundaries. However, these roads would not be located near the river. No impacts are expected on MDSR as a result of construction of these access roads.

For the remainder of the proposed route outside the study area, the alternative 4 alignment would follow different routes. As with alternatives 2, 2b, and 3, there would be no impacts outside the study area other than those discussed in the “Cumulative Impacts Common to All Alternatives” section.

Cumulative Impacts

Within the study area the beneficial and possibly negative impacts related to aesthetic and scenic values under alternatives 4 and 5 were evaluated in the context of the effects of other projects in the region as mentioned in the “Cumulative Impacts” section above. When combined with the impacts expected under alternatives 4 and 5, cumulative impacts would likely remain adverse due to activities in the surrounding area that impact visual qualities. Alternatives 4 and 5 do not contribute to the adverse cumulative impact in any substantial way.

Conclusion

The alignment for alternative 4 would not cross MDSR. Several significant benefits would occur from removing the B-K Line as a part of mitigation for the construction of alternative 4. These benefits may balance the adverse effects of construction operation, and maintenance of alternative 4. For example, alternative 4 would move large infrastructure to the margins, would remove an existing transmission line ROW and associated infrastructure from the center of DEWA, and would completely remove the river crossing of MDSR, improving its scenic and recreational qualities. Wetlands, floodplains, and forest would be restored (53 acres total), creating larger patches on contiguous habitat and reducing fragmentation in the core of the park. Additionally, an incompatible feature crossing the landscape would be moved to the southern extent of the DEWA boundary, reducing the total number of cultural and historic structures adversely affected by the double-circuit 500-kV transmission line. It is possible that under alternative 4, the transmission line may be seen from the MDSR boundary by some people but adverse impacts would be minimal in comparison to transportation corridors that exist next to that segment of river.

The natural, cultural, scenic, and recreational resources of DEWA and APPA are held in public trust and visitors come to the parks to experience these resources. Allowing impacts to these resources is contrary to typical NPS practice of improving scenic conditions by removing non-conforming features and may establish precedent for future actions. The applicant’s project is one component of a larger regional plan by the RTO to enhance system reliability. Other component projects of this plan have already affected, and would continue to affect APPA, especially in the areas of scenic resources and visitor use and experience, as well as other national parks in their paths.

Compared to the other action alternatives, the impacts of alternative 4 are primarily beneficial. Under alternative 4, the river crossing of the MDSR would be completely removed and this especially scenic and sensitive area of the MDSR would be restored to natural conditions. In the context of the values for which the MDSR was designated and is managed, these beneficial impacts are potentially significant.

Alternative 5

Adverse impacts on wild and scenic rivers would be the same in the study area as described for alternative 4.

Cumulative Impacts

Cumulative impacts under alternative 5 would be the same as those under alternative 4. Alternative 5 would not contribute to the adverse cumulative impact in any substantial way.

Conclusion

The alignment for alternative 5 would not cross the MDSR. Several significant benefits would occur from removing the B-K Line as a part of mitigation for the construction of alternative 5. These benefits may balance the adverse effects of construction operation, and maintenance of alternative 5. For example, alternative 5 would move large infrastructure to the margins, would remove an existing transmission line ROW and associated infrastructure from the center of DEWA, and would completely remove the river crossing of MDSR, improving its scenic and recreational qualities. Wetlands, floodplains, and forest would be restored (53 acres total), creating larger patches on contiguous habitat and reducing fragmentation in the core of the park. Additionally, an incompatible feature crossing the landscape would be moved to the southern extent of the DEWA boundary, reducing the total number of cultural and historic structures adversely affected by the double-circuit 500-kV transmission line. It is possible that under alternative 5, the transmission line may be seen from the MDSR boundary by some people but adverse impacts would be minimal in comparison to transportation corridors that exist next to that segment of river.

The natural, cultural, scenic, and recreational resources of DEWA and APPA are held in public trust and visitors come to the parks to experience these resources. Allowing impacts to these resources is contrary to typical NPS practice of improving scenic conditions by removing non-conforming features and may establish precedent for future actions. The applicant's project is one component of a larger regional plan by the RTO to enhance system reliability. Other component projects of this plan have already affected, and would continue to affect APPA, especially in the areas of scenic resources and visitor use and experience, as well as other national parks in their paths.

Compared to the other action alternatives, the impacts of alternative 5 would be primarily beneficial. Under alternative 5, the river crossing of the MDSR would be completely removed and this especially scenic and sensitive area of the MDSR would be restored to natural conditions. In the context of the values for which the MDSR was designated and is managed, these beneficial impacts would be potentially significant.

PARK OPERATIONS

This section discusses the impacts of the proposed S-R Line alternatives, including the no-action alternative, on management and operations of the parks. The operations and management of the parks include the following departments: the Division of Visitor Management and Resource Protection, the Maintenance Division, the Resource Management and Science Division, and the Interpretation Education and Partnership Division.

METHODOLOGIES

Impacts on park operations are assessed with regard to staffing and annual operating budget. Elements of the alternatives could change the parks' existing staff requirements and budgetary expenditures.

The evaluation of impacts on park operations focuses on the number of staff members available to perform management practices, the ability of park staff to protect and preserve resources given current funding and staffing levels, and the projected need for additional staff time and materials in relationship to accomplishing additional tasks under each of the alternatives.

The impact analysis is based on the current description of park operations presented in "Chapter 3: Affected Environment" of this document. The required level of effort is discussed in terms of "full-time equivalents," or FTEs, which represent the hours worked by staff. One full-time equivalent equals 2,080

hours, the equivalent of one person working full-time year-round, or two part-time staff each working six months of the year.

Indirect impacts outside the study area are not addressed for park operations.

Topic-specific context for assessing impacts to park operations includes the following:

- Parks must operate within the constraints of the unit-specific budget and number of staff positions that have been allocated by congress and the NPS Director's office.
- DEWA and APPA are large parks with extensive operational activities that must be covered with available staff and budget.
- The diversity of resources and facilities contained within the parks and their linear nature increases the complexity of operations because of the variety of resources and visitor experiences that must be managed over a wide area.

STUDY AREA

The study area for park operations includes all areas of the parks that may be affected by the proposed alternatives.

CUMULATIVE IMPACTS COMMON TO ALL ALTERNATIVES

Park operations include several facets of work in the parks, such as maintenance of facilities, interpretation, and resource protection. Numerous projects throughout the parks also affect park operations due to management, staffing, and budgeting requirements and the need to coordinate with entities that may be managing those efforts. It is likely that additional past, present, and reasonably foreseeable projects in the parks would have cumulative impacts on park operations because of the diversity of projects and responsibilities of the parks. Actions inside and outside of the parks can affect park operations, but actions outside the study area would not have an impact on park operations, and therefore are not included. Past, present, and reasonably foreseeable projects inside the study area (inside the parks) that would have beneficial or adverse impacts on park operations are listed below and discussed under each alternative as applicable. These projects were taken from the entire list of cumulative projects for the S-R Line that can be found in appendix H. Cumulative impacts were then determined by combining the impacts of the alternative being considered with the impacts from the projects listed below. An overall cumulative impact analysis was determined for each alternative and is presented at the end of the impact analysis discussion for each alternative.

Projects Inside the Study Area

Inside the study area, cumulative projects or activities that would result in adverse impacts on park operations include the following: the Metropolitan Edison vegetation management and tree removal; the Columbia Gas Transmission Company pipeline increase; illegal activities, including arson, vandalism, hunting, and trespassing (requiring law enforcement response); and the licensing and permitting of special events and incidental business / commercial visitor permits. These activities would result in adverse impacts on park operations due to the increases in park staff, staff time, and budget that may be required. Beneficial impacts would result from the Smooth Ride Initiatives project, the expiration of the commercial use of US Route 209 in 2015, and the demolition/deconstruction of hazardous structures. These projects would result, or have resulted, in a reduced need for law enforcement. While some of these projects may have reduced the need for law enforcement to focus on specific issues, they have not reduced the need for law enforcement to address numerous other significant issues faced by law

enforcement every day in the park. Overall, cumulative impacts on park operations inside the study area would be adverse.

IMPACTS OF THE ALTERNATIVES ON PARK OPERATIONS

Alternative 1: No Action

Under the no-action alternative, the operations and maintenance of the parks would continue to include the following programs/divisions: the Division of Visitor Management and Resource Protection (includes law enforcement), the Resource Management and Science Division, and the Maintenance Division.

Although the maintenance of vegetation is performed by the applicant, natural resource staff in the Resource Management and Science Division would monitor and oversee maintenance activities in the existing ROW. Existing staff would be used for these monitoring tasks.

The maintenance of vegetation on an annual basis could result in an increase in ORV traffic in the cleared ROW. Law enforcement staff would increase patrols in the maintenance area to curb illegal ORV use and to protect visitors. Existing law enforcement staff would be responsible for these patrols because new staff members would not be hired.

During the vegetation maintenance of the existing ROW, the interpretation, education, and partnerships staff in the visitor centers would be responsible for communicating the news of any temporarily closed trails, roads, or areas to park visitors. Closures may also be communicated through the parks' websites.

If trails, roads, or other park areas are closed temporarily for the vegetation maintenance of the existing ROW, personnel in the Maintenance Division would be responsible for posting closure notices and barricading or fencing off these closed areas. There is a potential that maintenance staff may assist in monitoring the maintenance activities performed by the applicant. It would be the responsibility of law enforcement to enforce this closure, which could impact the ability of law enforcement staff to focus on other responsibilities, including the primary duties of protecting the park visitors and resources.

Overall, park staff would be responsible for monitoring the vegetation maintenance activities, but the maintenance would not be conducted on a regular basis. In addition, 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. Annual vegetation maintenance activities would not have a noticeable or measurable impact on park operations.

Cumulative Impacts

Cumulative impacts on park operations inside the study area from past, present, and reasonably foreseeable projects would be adverse, as described previously in the "Cumulative Impacts Common to All Alternatives" section. When the impacts on park operations as a result of alternative 1 are combined with other projects in the study area, an overall adverse cumulative impact would be expected. Alternative 1 would not alter the level of impact.

Conclusion

Overall, there would be adverse impacts on park operations associated with the no-action alternative. The parks' staff would have few responsibilities associated with the transmission line; therefore, no additional staff would be hired. During maintenance activities, some staff members would be on site to monitor the activities of the applicant. Staff would also be responsible for communicating the news of any temporary

closures to the parks' visitors at the visitor centers, through the parks' websites, or by posting closure signs and fencing in affected areas. There would be impacts because maintenance activities would only occur on an annual basis. In addition, the parks' role in the vegetation maintenance would not affect the parks' or divisions' budgets because it is assumed that the applicant would be responsible for the costs associated with the NPS managing the permit. When the impacts on park operations as a result of alternative 1 are combined with other past, present, and reasonably foreseeable projects in the study area, an overall adverse cumulative impact would be expected.

If the NPS takes no action, the only change would be the result of the applicant's new vegetation management standards, leading to more clearing of vegetation within the ROW than is the case now or has been the case historically. Under current ROW vegetation management activities the applicant is cutting danger trees. The applicant defines danger trees as those that, in falling, would either strike the conductor or pass within the minimum conductor clearance, which is 10 feet for 500-kV transmission lines (PPL 2010a, 6). The applicant contends that they can cut danger trees on federal land outside their deeded right. Disagreement over this issue between the NPS and PPL resulted in a court settlement in August 2010. This controversy is not, strictly speaking, a public one over the effects of the applicant's actions, but is an area of disagreement that would remain unresolved under alternative 1.

The no-action alternative would not establish any precedent for future actions with significant effects. To the extent it represented a decision in principle about future actions, it would favor the continuation of the status quo, which is not precedent setting in the context of the NPS system, whose primary goal is preservation for future generations.

Alternative 1 would result in some adverse impacts on park operations associated with the continued operation and maintenance of the existing B-K Line; however, considering the intensity of the adverse impacts in the context of park operations, the impacts would not likely be significant.

Common to All Action Alternatives

Removal and Disposal of Existing Structures: The removal of the existing B-K Line would be expected to result in adverse impacts on park operations. Impacts would occur because some staff members would be involved with monitoring the removal activities and would be distracted from normal daily tasks and responsibilities. During the removal of the transmission line, Division of Visitor Management and Resource Protection staff would be responsible for communicating with park visitors about any trail, road, or park area closures related to the removal activities. Law enforcement would likely patrol these closed or affected areas and roads on a more regular basis. Maintenance Division staff would be responsible for posting signs or fencing off areas where park visitors would be restricted. Maintenance staff would also be needed on site to monitor the removal of the transmission line by the applicant. Resource Management and Science Division staff would be on site to monitor the removal of the transmission lines to ensure that no special-status plants or wildlife, sensitive habitats, or cultural resources are affected. In addition, to prevent these impacts, staff would assess or survey the area before removal activities begin. If the priorities of law enforcement staff are shifted to focus on the removal of the transmission lines, it would impact the division's responsibilities to protect park resources and visitors in other areas, particularly if the majority of the law enforcement staff were redirected to focus on this task. It may be necessary to hire one additional staff member for monitoring during the 10-week removal period. If a staff member is not hired, priorities among current staff members would change. Overall, impacts would occur because staffing would increase or staff priorities would change.

Alternative 2

Due to the length of the transmission line through the parks and the extensive access roads associated with alternative 2, it is anticipated that two to three new DEWA staff members would be hired under alternative 2 to assist in park responsibilities associated with construction and postconstruction monitoring. Under alternative 2, DEWA staff would be responsible for monitoring actions along APPA.

Prior to construction activities, Resource Management and Science Division staff would need to assess/survey the proposed ROW and access roads to ensure that no special-status species, sensitive habitats, or cultural resources are located in the construction area. If any potential resources of particular concern are found in the project area, resource specialists would oversee construction activities. If cultural resources are located, the artifacts would be removed and logged into the parks' museum collections. The increase in museum collections would add to park staff operations because this division is currently understaffed. Resource specialists would also ensure that mitigation measures are being implemented during construction.

During the construction of the transmission line, park staff, likely from the Maintenance Division or a park representative, would be needed to monitor construction activities during the eight-month construction period. Maintenance staff would also be responsible for posting signs or fencing at road and trail closures and ensuring safe conditions for park staff and visitors. Park maintenance staff would also increase inspections of the roads frequently used by the construction vehicles to monitor for eroded areas or damage to the road surface that may cause safety issues for the public. Visitor Management and Resource Protection Division staff would be responsible for communicating the news of trail closures and road closures to the public, answering the public's questions and concerns, and coordinating with the applicant and construction staff. Law enforcement would increase patrols in closed areas to ensure that no illegal activities are occurring and that visitors are abiding by temporary closures. If any incidents occur related to the construction activities, such as vehicle accidents, law enforcement would be required to report to the scene. Increasing patrols and responding to incidents within the construction would impact the responsibilities of law enforcement staff to perform their normal duties and would greatly impact operations. This operation would take at least half of the normally scheduled patrol staff and assign them to oversee this maintenance operation which would result in an overall reduction in the efficiency of the patrol function within the park.

The two to three new staff members proposed to be hired would assist with some tasks related to construction activities. However, priorities for current employees would shift or change during the eight-month construction period because some staff members would have responsibilities associated with construction. There would be no change to the parks' budgets because the applicant would be responsible for the costs associated with the NPS managing the permit.

Upon completion of the transmission line, park staff would monitor soil erosion along access roads; vegetation restoration, including the possible spread of invasive species; water quality in water bodies receiving eroded sediments; and illegal activities occurring along the access roads and ROW for up to five years. Staff would also monitor raptors for up to two years to ensure that mitigation measures intended to avoid impacts on raptors are being implemented and are effective. Additionally, the maintenance of vegetation by the applicant would occur annually at minimum for the period of analysis. Park staff or park representatives would be on site to monitor or oversee maintenance activities. It may be necessary for resource specialists to assess/survey the area prior to maintenance activities. Visitor Management and Resource Protection staff would communicate the news of any closures in the parks to visitors. Maintenance staff would be responsible for posting signs or fencing for temporarily closed areas. There is a potential that illegal activities, such as the use of ORVs, would increase after the completion of the transmission line; therefore, law enforcement would increase patrols of the new access roads and ROW

after construction and maintenance activities are complete. In order to perform these additional tasks, two to three new staff members would be hired for DEWA/MDSR. The new staff would perform these tasks along the affected areas of APPA.

Overall, adverse impacts on park operations would be expected. Impacts on park operations from construction-related activities would only last the duration of the construction period. Following construction, standard monitoring would last up to five years and the monitoring of maintenance activities would be required annually for the period of analysis. Adverse impacts would occur because an additional two to three staff members would be hired and the workloads and priorities of existing staff members would be altered for the duration of the construction activities. Tasks and roles among park divisions may be shifted to fill voids and park staff may rely more heavily on volunteers. Although the overall impacts on park operations would occur, 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.

Cumulative Impacts

Cumulative impacts on park operations inside the study area from past, present, and reasonably foreseeable projects would be adverse, as described previously in the "Cumulative Impacts Common to All Alternatives" section. When the impacts on park operations as a result of alternative 2 are combined with other projects in the study area, an overall adverse cumulative impact would be expected. Alternative 2 would not alter the level of impact.

Conclusion

Inside the study area, adverse impacts on park operations would occur during the construction of the new transmission line and access roads. There would also be adverse impacts during postconstruction monitoring because two to three additional staff members would be hired and the workloads and priorities of current staff members would be altered. Tasks and roles among park divisions would be shifted to fill any voids and park staff may rely more heavily on volunteers. Additional tasks would include the monitoring of construction activities including closures, assessment for resources of particular concern in the study area, increased patrols by law enforcement, the monitoring of roads used by construction vehicles in the parks, the installation of closure signs throughout the parks, vegetation restoration, water quality monitoring, raptor monitoring, the monitoring of maintenance activities, ensuring the protection of resources from illegal access, ORV use, and spread of invasive species and monitoring the use of mitigation during construction and operation and maintenance phases of the line. All of these tasks would compound safety management already challenged during the busy seasons. When the impacts on park operations as a result of alternative 2 are combined with other past, present, and reasonably foreseeable projects in the study area, an overall adverse cumulative impact would be expected.

The adverse impacts of alternative 2 on park operations are likely to be severe. Even with additional staff, some of the duties of monitoring, patrols, and enforcement actions would fall on park staff and would be in addition to their normal duties, reducing the amount of time that staff can devote to other important park research, projects, and routine activities. Further, the need to ensure that the adverse impacts of construction and maintenance of the power line are minimized because of the high quality and sensitivity of the affected resources means that those duties may take precedence over other park projects and activities, resulting in important park work that may be delayed or not completed. Considering the intensity of these adverse impacts in the context of park operations, alternative 2 is likely to result in significant adverse impacts on park operations as a result of the additional workload that could interfere with normal park operations and result in park projects and activities being delayed or not completed.

Alternative 2b

Although the existing ROW under alternative 2b would not be widened, impacts on park operations would be the same as under alternative 2 because 5.3 miles of access roads would be constructed and monitoring efforts would still be substantial. It is anticipated that two to three new DEWA staff members would be hired under alternative 2b to assist in park responsibilities associated with construction and postconstruction monitoring.

During construction, park staff would be responsible for assessing or surveying construction areas prior to construction, monitoring construction activities, communicating information to park visitors, patrolling roads, and increasing enforcement in construction areas. During this period, adverse impacts on park operations would result.

Park staff would be responsible for postconstruction monitoring activities related to park resources, vegetation restoration, soil erosion, and maintenance activities. Law enforcement activities would include monitoring access roads for illegal activities, such as ORV use. Adverse impacts would be expected because an additional two to three staff members would be hired and existing staff workloads and priorities would change for the duration of construction activities. Tasks and roles among park divisions may be shifted to fill voids and park staff may rely more heavily on volunteers. Although there would be overall impacts on park operations, 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.

Cumulative Impacts

Cumulative impacts on park operations inside the study area from past, present, and reasonably foreseeable projects would be adverse, as described previously in the "Cumulative Impacts Common to All Alternatives" section. When the impacts on park operations as a result of alternative 2b are combined with other projects in the study area, an overall adverse cumulative impact would be expected. Alternative 2b would not alter the level of impact.

Conclusion

Under alternative 2b, adverse impacts on park operations during and after construction would result, because an additional two to three staff members would be hired and existing staff workloads and priorities would change for the duration of the construction activities. Tasks and roles among park divisions may be shifted to fill voids and park staff may rely more heavily on volunteers. Although the impacts on park operations would occur, 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. When the impacts on park operations as a result of alternative 2b are combined with other past, present, and reasonably foreseeable projects in the study area, an overall adverse cumulative impact would be expected.

Construction activities, the presence of heavy equipment, and alterations to typical traffic flow create greatly increased risks to visitor and staff safety. However, such impacts would be temporary. Proper management, advanced planning, and park staff expertise dealing with these types of disruptions would minimize these risks; properly managed risks to public safety are expected to be minimal. Operation of the line in areas where clearances are less than required by NERC standards would create a considerable fire hazard. Alternative 2b would be constructed within the existing ROW, which is only 100 feet wide in certain places and bordered by 60–80 foot high trees on both sides. NERC guidelines call for clearances between live wires and trees on the edge of the corridor that are greater than what the current ROW would offer. This would create the increased hazard of live wires contacting trees and sparking a forest fire.

Additionally, such an event would likely cause an outage of the line that would lead to loss of power to users downstream, which could create uncalculated health and safety issues.

The adverse impacts of alternative 2b would be the same as alternative 2; therefore, as described for alternative 2, alternative 2b would also likely result in significant adverse impacts on park operations as a result of the additional workload imposed on park staff that could interfere with normal park operations and result in park projects and activities being delayed or not completed.

Alternative 3

Similar to alternative 2, due to the length of transmission line through the parks and due to the construction of access roads, it is anticipated that two to three new DEWA staff members would be hired under alternative 3 to assist in park responsibilities associated with construction and postconstruction monitoring. Under alternative 3, DEWA staff would be responsible for monitoring actions along APPA.

During construction, adverse impacts on park operations would be the same as described above under alternative 2. Park staff would be responsible for assessing or surveying construction areas prior to construction, monitoring construction activities, communicating information to park visitors, patrolling roads, and increasing enforcement in construction areas.

After construction, adverse impacts would also be the same as alternative 2. Park staff would be responsible for postconstruction monitoring activities related to park resources, vegetation restoration, soil erosion, and maintenance activities. Law enforcement activities would include monitoring access roads for illegal activities, such as ORV use. Impacts would result because an additional two to three staff members would be hired and the workloads and priorities of existing staff members would change for the duration of the construction activities. If current law enforcement staff was away and less able to perform their normal patrol functions because of new responsibilities associated with monitoring the project, it could impact park operations, as rangers would be less able to focus on visitor safety and resource management. Tasks and roles among park divisions may be shifted to fill any voids, and other areas of work performed by park staff may rely more heavily on volunteers, though volunteers would not be involved in law enforcement duties. Although the overall impacts on park operations would occur, 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.

Cumulative Impacts

Cumulative impacts on park operations inside the study area from past, present, and reasonably foreseeable projects would be adverse, as described previously in the "Cumulative Impacts Common to All Alternatives" section. When impacts on park operations as a result of alternative 3 are combined with other projects in the study area, an overall adverse cumulative impact would be expected. Alternative 3 would not alter the level of impact.

Conclusion

Alternative 3 would have adverse impacts on park operations during the construction period. Postconstruction monitoring would create adverse impacts, because an additional two to three staff members would be hired and the workloads and priorities of existing staff members would change for the duration of the construction activities. Tasks and roles among park divisions may be shifted to fill any voids and park staff may rely more heavily on volunteers. Although the impacts on park operations would occur, 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. When the impacts on park

operations as a result of alternative 3 are combined with other past, present, and reasonably foreseeable projects in the study area, an overall adverse cumulative impact would be expected.

For the same reasons described for alternative 2, the adverse impacts of alternative 3 would also likely result in significant adverse impacts on park operations as a result of the additional workload imposed on park staff that could interfere with normal park operations and result in park projects and activities being delayed or not completed.

Alternative 4

It is anticipated that one new DEWA employee would be hired to assist in park responsibilities associated with construction and postconstruction monitoring under alternative 4. DEWA staff would be responsible for monitoring actions along APPA.

During the construction of the transmission line, the responsibilities of park staff would be the same as those described under alternative 2. However, adverse impacts on park operations would be less because the construction area inside the parks would be reduced. Park staff would be responsible for postconstruction monitoring activities related to park resources, vegetation restoration, soil erosion, and maintenance activities. Law enforcement activities would include monitoring access roads for illegal activities, such as ORV use. Adverse impacts on park operations after construction would occur because current levels of staffing would be increased by one employee and priorities may need to be changed among current staff. Although there would be overall adverse impacts on park operations under alternative 4, 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.

Cumulative Impacts

Cumulative impacts on park operations inside the study area from past, present, and reasonably foreseeable projects would be adverse, as described previously in the "Cumulative Impacts Common to All Alternatives" section. When the impacts on park operations as a result of alternative 4 are combined with other projects in the study area, an overall adverse cumulative impact would be expected. Alternative 4 would not alter the level of impact.

Conclusion

Adverse impacts on park operations during the construction activities would still occur, although the transmission line would only traverse the parks for 1.5 miles. Shifts in staff workloads and staff would occur over a relatively short period. Additional staff responsibilities would include assessing the proposed site for special-status species, sensitive habitats, and cultural resources; monitoring construction activities; increasing law enforcement patrols; communicating with park visitors; installing closure signs; and assessing roads. Park staff would be responsible for postconstruction monitoring activities related to park resources, vegetation restoration, soil erosion, and maintenance activities. Law enforcement activities would include monitoring access roads for illegal activities, such as ORV use. Impacts on park operations would occur during this period. Overall there would be adverse impacts because current levels of staffing would be increased by one employee and current staff priorities may need to be changed. When the impacts on park operations as a result of alternative 4 are combined with other past, present, and reasonably foreseeable projects in the study area, an overall adverse cumulative impact would be expected.

The adverse impacts of alternative 4 on park operations would likely be severe but the severity of the impacts would be moderated because of the shorter time period that staff would need to engage in pre-

and post-construction activities related to the power line due to the shorter crossing of NPS lands and fewer sensitive resources present along the alternative 4 route. Considering the intensity of these impacts in the context of park operations, the adverse impacts of alternative 4 on park operations may not rise to the level of significant impacts.

Alternative 5

Under alternative 5, park staff would be responsible for monitoring 0.9 mile of the transmission line within park boundaries. Although the affected area under alternative 5 is slightly less (approximately 0.5 mile) than alternative 4, overall impacts would be the same.

Cumulative Impacts

Cumulative impacts on park operations inside the study area from past, present, and reasonably foreseeable projects would be adverse, as described previously in the “Cumulative Impacts Common to All Alternatives” section. When the impacts on park operations as a result of alternative 5 are combined with other projects in the study area, an overall adverse cumulative impact would be expected. Alternative 5 would not alter the level of impact.

Conclusion

Adverse impacts on park operations during the construction activities would occur. There would be adverse impacts on park operations after construction, because current levels of staffing would be increased by one employee and current staff priorities may need to be changed. Additional staff responsibilities would include assessing the proposed site for special-status species, sensitive habitats, and cultural resources; monitoring construction activities; increasing law enforcement patrols; communicating with park visitors; posting signs; assessing roads; and postconstruction monitoring. When the impacts on park operations as a result of alternative 5 are combined with other past, present, and reasonably foreseeable projects in the study area, an overall adverse cumulative impact would be expected.

Alternative 5 would have essentially the same adverse impacts as alternative 4; thus, as explained for alternative 4 above, the adverse impacts of alternative 5 on park operations may not rise to the level of significant impacts.

HUMAN HEALTH AND SAFETY

This section presents an evaluation of the alternatives as they relate to health and safety impacts on the parks’ visitors and staff, as well as impacts on the health and safety of the general public located outside the parks’ boundaries.

METHODOLOGIES

The analysis of impacts on health and safety considered visitors as well as the staff of the parks. The analysis primarily considered impacts during the construction and operation of the S-R Line, necessary access roads, and other associated activities as proposed under each alternative. Transporting construction equipment and towers on narrow local roads and park roads would affect public roads, including traffic and surrounding communities. Construction equipment would occupy more than one lane, large-radius turns would be a concern, and road closures would be likely to be extensive during construction. In addition, the use of the river would be stopped as necessary during the construction of the S-R Line for visitor safety.

Topic-specific context for assessing impacts to human health and safety includes the following:

- By their nature, national parks are public lands that provide public services to visitors.
- DEWA and APPA, like all national parks, are “working” parks that are mandated to provide a safe workplace for employees as well as the public.
- DEWA contains numerous in-holdings (privately owned and public-owned lands within the legislated boundary of the park) and local roads that are not owned by the NPS, which means that there is considerable movement between NPS lands and non-NPS lands and access to the park is not entirely under park control.

STUDY AREA

The study area for health and safety includes the S-R Line alternative corridors and any area outside the corridors where necessary pulling and splicing sites, staging areas, and access roads are proposed. Indirect impacts outside the study area would also be addressed, which includes the counties the specific alternative alignments would traverse.

CUMULATIVE IMPACTS COMMON TO ALL ALTERNATIVES

Health and safety is a high priority in the parks. Common problems with health and safety are related to injuries sustained in recreational activities and automobile accidents. Many projects in the parks are undertaken to improve health and safety conditions for visitors, staff, and volunteers. Actions inside and outside the parks could affect health and safety in the parks. Past, present, and reasonably foreseeable activities that would have beneficial or adverse impacts on health and safety inside the study area as well as outside the study area are listed below and discussed under each alternative as applicable. These projects were taken from a list of potential cumulative projects developed for the S-R Line that can be found in appendix H. Cumulative impacts were then determined by combining the impacts of the alternative being considered with the impacts from the projects listed below. This cumulative impact analysis was done for each alternative and is presented at the end of the impact analysis discussion for each alternative.

Projects Inside the Study Area

Inside the study area, cumulative projects that would result in beneficial impacts on health and safety for park visitors and staff include the following: New Jersey Swim Beach (Turtle Beach), the Kittatinny Point Boat Launch replacement, the storm recovery efforts at Kittatinny Point Visitor Center, the river campsite restoration of flood-damaged sites, the McDade Trail realignment, the Smooth Ride Initiatives 2006–2007, the US Route 209 road surface and health and safety improvements, the US Route 209 rehabilitation, the Pocono Environmental Education Center cabin replacement, the rehabilitation of Childs Park, the rehabilitation of Old Mine Road South, the repair of Watergate service road, the I-80 weigh station project, the rehabilitation of road bridges throughout the parks, the Delaware River bridge projects, the demolition and deconstruction of hazardous structures, and the stabilization and repair of damaged structures throughout the parks. The improvement projects throughout the parks would benefit the health and safety of visitors and staff over the long term. Benefits would result from reducing fire hazards and improving or restoring park structures, trails, and roads. Improvements throughout the parks would allow safe recreational opportunities for visitors. Adverse impacts may result during construction periods.

Cumulative adverse impacts on the health and safety of park visitors and staff would be likely during the construction of multiple utility projects in the parks. Utility projects inside the study area that might affect

health and safety include the following: the Metropolitan Edison vegetation management and tree removal, the Metropolitan Edison removal of unused power poles and transformers, the Columbia Gas Transmission Company pipeline increase, and the Tennessee gas line proposal. Construction equipment and associated activities would create safety hazards for staff and visitors. Visitors to the parks who participate in illegal activities may affect the health and safety of visitors and staff in the parks. Illegal activities include arson, vandalism, hunting, use of ORVs, and trespassing. Overall, adverse cumulative impacts on human health and safety would result from projects inside the study area.

Projects Outside the Study Area

Outside the study area, cumulative projects that would result in adverse impacts on the health and safety of park staff and visitors include the following road and utility projects: the Columbia Gas Transmission Company pipeline increase and Marcellus shale natural gas drilling. Construction activities and equipment would create safety hazards along roads and in communities. Additional adverse impacts from natural gas drilling would create potential impacts on human health from contamination of groundwater. Beneficial impacts on the health and safety of park staff and visitors outside the study area would result from the transportation improvements and replacements in Pennsylvania and New Jersey. Cumulative impacts on health and safety outside the study area would be adverse.

IMPACTS OF THE ALTERNATIVES ON HUMAN HEALTH AND SAFETY

Common to All Alternatives

Outside the Study Area: Outside the study area, regardless of which action alternative is selected, the transmission line could pass through Carbon, Lackawanna, Luzerne, Monroe, Northampton, Pike, and Wayne counties in Pennsylvania and Morris, Sussex, and Warren counties in New Jersey.

The construction of the transmission line outside the study area would be consistent with those activities described for inside the study area. Because the NPS cannot dictate where the line would actually go, the impacts from the construction of the transmission line outside the study area cannot be determined. However, it is likely that impacts would be similar to those described for inside the study area.

Potential safety hazards would include being in the vicinity of construction equipment and the potential for misuse or accidents. There is always the potential for individuals, including children, to access the area, especially if located in residential neighborhoods. An additional safety hazard would include the potential for the public to come into contact with hazardous materials that may leak from the construction equipment during operation or while parked.

Potential safety hazards outside the study area would exist during the transport of construction materials and equipment to and from the construction area. Large trucks hauling wide loads would transport materials along the local roads and highways. Many of the vehicles would use more than one lane and would make wide turns, creating potential safety hazards to other drivers and pedestrians. If construction vehicles travel along neighborhood/local roads, the safety of the public would be jeopardized.

During construction and operation, impacts on health and safety would occur from being in the vicinity of the construction equipment, potential contact with hazardous materials, the transport of construction materials and equipment to and from the construction area, and annual vegetation maintenance. Overall, there would be adverse impacts on health and safety outside the study area.

Cumulative impacts outside the study area would result in potential adverse impacts on human health and safety as described previously in the “Cumulative Impacts Common to All Alternatives” section. When

the impacts on human health and safety outside the study area are combined with other past, present, and reasonably foreseeable projects outside the study area, an overall cumulative adverse impact would be expected.

Alternative 1: No Action

Within the study area, human health and safety concerns would continue under current conditions. There would be no changes to the public roads throughout the parks under the no-action alternative; however, motor vehicle accidents would continue to be a concern for park staff and visitors. Additional safety concerns in the future could result from the existing 80-year old transmission line potentially deteriorating over time as it continues to age.

During maintenance activities, park staff (e.g., natural resource specialists) would be on site to monitor maintenance activities. To minimize impacts on park visitors, staff would discourage visitors from recreating in areas where maintenance is occurring. Impacts on park staff and visitors would be expected to be minimal during maintenance activities because the effects would be at low levels of detection and no appreciable or measurable effect on human health or safety would occur.

Overall, adverse impacts on human health and safety under the no-action alternative would occur inside the study area.

Cumulative Impacts

Cumulative impacts on human health and safety inside the study area from past, present, and reasonably foreseeable projects would be adverse, as previously described in the “Cumulative Impacts Common to All Alternatives” section. When the impacts on human health and safety as a result of alternative 1 are combined with other projects in the study area, an overall adverse cumulative impact would be expected. Alternative 1 would not alter the level of impact.

Conclusion

Inside the study area, adverse impacts on human health and safety would occur for park staff, visitors, and the general public. Under the no-action alternative, there would be no changes to the current transmission line and no construction or changes to roads. There would be no new traffic patterns associated with the transmission line, so no change to the number of accidents occurring would be expected. The existing transmission line has the potential to deteriorate over time due to its age. Maintenance activities by the applicant would occur on an annual basis and park staff would be on site to monitor these activities. Adverse impacts on visitors and the public would be minimized by discouraging the use of the areas being maintained. Overall, there would be adverse impacts on human health and safety under the no-action alternative. When the impacts on human health and safety as a result of alternative 1 are combined with other past, present, and reasonably foreseeable projects in the study area, an overall adverse cumulative impact would be expected; any cumulative impacts to resources would remain adverse primarily from other actions taken outside the study area.

The no-action alternative would not establish any precedent for future actions with significant effects. To the extent it represented a decision in principle about future actions, it would favor the continuation of the status quo, which is not precedent setting in the context of the NPS system, whose primary goal is preservation for future generations. In conclusion, the actions under alternative 1 would be in keeping with the parks’ enabling legislations, *NPS Management Policies 2006*, and all other applicable federal and state laws.

Alternative 1 would have adverse impacts on human health and safety as a result of continuing operation and maintenance of the existing B-K Line but would not result in any changes to the existing adverse impacts. Considering the intensity of these impacts in the context of human health and safety, alternative 1 would not likely result in any significant adverse impacts on human health and safety.

Common to All Action Alternatives

Removal and Disposal of Existing Structures: Park staff would be on site to monitor the removal of the transmission line. A certified safety manager would be employed by the applicant during this period to ensure the safety of all park staff members, visitors, and the general public (PPL and PSE&G 2008, 15). The use of heavy construction equipment would create the risk of injuries for park staff and visitors near the removal areas or along haul routes. Access to areas associated with the removal of the existing lines would be prohibited to park visitors and the general public to reduce the risk of injuries occurring. A safety representative would also be stationed at removal areas near APPA to ensure the safety of hikers along APPA (PPL and PSE&G 2008, 14).

Accidents or injuries to park staff or visitors could occur as a result of the presence of large, heavy construction equipment. Impacts associated with the construction equipment would include the potential for contact with hazardous materials, such as the accidental release of gasoline, diesel fuel, oil, hydraulic fluid, and lubricants from vehicles or other equipment used in the removal process. In addition, improperly maintained equipment could leak fluids during operation or while parked. Impacts on human health and safety could occur from direct contact with these substances or from surface water and groundwater contamination due to runoff.

Construction equipment and materials needed for removal of the line would be stored at a staging area off park property. Additional impacts on human health and safety could occur during the transport of materials and equipment from the staging area to the transmission line removal area. The local roads and park roads are narrow, are typically only rated for loads less than 10 tons, are restricted to noncommercial traffic, and are subject to constant maintenance issues. The transport of large, heavy equipment would create safety hazards. Traffic control or closure would be necessary on some park roads during the removal of the transmission line and the roads could also physically deteriorate from the excess loads. Potential impacts on park visitors and the general public walking, bicycling, or driving along the roads could occur because construction equipment would occupy more than one lane and would have a wide turning radius. Impacts on the parks' staff would also occur because park staff members would travel the road in order to access the removal areas.

During the removal of the B-K Line, there would be adverse impacts on staff, visitors, and the general public. However, in the long term, beneficial impacts on health and safety would result because the possible risks or injuries associated with the deterioration of the existing 80-year old transmission line would no longer exist. After the removal of the transmission line, no impact on health and safety would be expected.

Removal of Vegetation: The removal of vegetation would create impacts on park staff, visitors, and the general public. Park staff would likely be on site to monitor vegetation removal. Potential impacts could include falling or tripping over downed vegetation, accidents related to large trees falling, and being in close proximity to construction equipment. Similar impacts on the general public and park visitors would occur if visitors do not respect park closures. During the removal of vegetation there would be adverse impacts on visitors, staff, and the general public.

Maintenance of Vegetation: Adverse impacts on the health and safety of park staff and visitors could occur during vegetation maintenance activities. Impacts would occur, but maintenance activities would

only occur once per year and impacts would be at such low levels of detection that no appreciable or measurable effect on human health or safety would occur. The potential for visitors to trip or fall over removed vegetation would also exist; however, to minimize these risks, visitors would be discouraged from recreating in the areas where maintenance is occurring. Park staff and/or the applicant would monitor maintenance areas to prevent the public from gaining access.

Helicopter Use: The use of a helicopter may be necessary for stringing the wires of the transmission line, as described in chapter 2. The use of a helicopter to construct the transmission line would create impacts on human health and safety. If park staff, visitors, or the general public are in the vicinity of incidents such as collisions with wires, conductors, and towers; engine or tail rotor failure at low altitudes; loss of tail rotor effectiveness; or potential bird strikes, injuries could occur. Other potential risks to health and safety from helicopter use would be related to mechanical failure, operational incidents, or collision. Impacts would result because mitigation measures would be implemented to reduce the risk of the above occurring; these mitigation measures are discussed in appendix F. Additional impacts related to the use of helicopters could occur when people on land are distracted by viewing the helicopters in the air. Incidents could include vehicle accidents, construction equipment incidents, or individuals tripping or falling. The high winds and noise generated by the helicopters flying at low levels could also create potential impacts on park staff, visitors, and the general public close to the construction areas.

Alternative 2

A certified safety manager would be employed through all construction phases to ensure the safety of visitors and the general public (PPL and PSE&G 2008, 15). Park staff would be on site to monitor construction activities. Impacts would result from park staff, visitors, and the public being in the vicinity of potential safety hazards associated with the use of construction equipment and the transport of construction materials to and from the construction area. Impacts would be expected to last the duration of the construction period, approximately eight months.

During the installation of the transmission line and access roads, the use of large pieces of construction equipment would be required, which would create safety hazards for park visitors, the general public, and specifically park staff. Park staff would be on site during the construction activities for monitoring purposes and would be surrounded by the operating equipment. Although park visitors would be discouraged from entering construction areas, the potential for incidents to occur may still exist if visitors do not respect park closures.

Additional adverse impacts on park staff, visitors to DEWA and MDSR, and the general public would result from the transport of construction materials and equipment to and from the construction area. As described above, the local roads and park roads that would be traveled are narrow, typically are only rated for loads less than 10 tons, are restricted to noncommercial traffic, and are subject to constant maintenance issues. Large, heavy equipment use would be a potential problem due to traffic control and physical deterioration from the excess loads. Transporting the large construction equipment as well as the new towers on park roads and public roads would be a safety concern. Construction equipment would occupy more than one lane, and the large-radius turns would also be a concern. Extensive road closures and traffic control may be necessary to minimize the risk of accidents occurring during the construction period. An additional safety concern for park staff and visitors to DEWA and MDSR would be boating traffic on the river during construction. During the stringing of the conductor across the Delaware River, there is a potential for accidents to occur. A safety watchman would be on the river during stringing operations to stop any boat traffic if an incident does occur or if conditions otherwise warrant (PPL and PSE&G 2008, 6).

Adverse impacts on park staff and visitors to APPA would be the same as those discussed for DEWA and MDSR; however, impacts would only affect one APPA crossing under alternative 2. Park staff would be on site to monitor the construction activities; however, the staff time needed for monitoring would be relatively limited because only one trail crossing is needed. Roads associated with APPA access would be less traveled by the large construction equipment and road closures and traffic control would only be needed for a short time. A safety representative would be stationed at the trail during any and all construction to maintain public safety (PPL and PSE&G 2008, 14).

Overall, inside the study area, adverse impacts on DEWA and MDSR staff and visitors and the general public would result from being in the vicinity of construction equipment, from the safety hazards of construction vehicles on roads, and from the hanging of wires across the Delaware River. Adverse impacts on APPA staff and visitors would result because the affected area would be small and the construction period in the APPA area would be relatively short. Therefore, there would be overall adverse impacts on human health and safety for all three parks under alternative 2.

Cumulative Impacts

Cumulative impacts on human health and safety inside the study area from past, present, and reasonably foreseeable projects would be adverse, as previously discussed in the “Cumulative Impacts Common to All Alternatives” section. When the impacts on human health and safety as a result of alternative 2 are combined with other projects in the study area, an overall adverse cumulative impact would be expected. Alternative 2 would not alter the level of impact.

Conclusion

Inside the study area, there would be adverse impacts on human health and safety for the general public and visitors and staff at DEWA and MDSR. Potential safety hazards would include incidents from being in the vicinity of the operation of construction equipment and the transport of construction materials and equipment to and from the construction area. Adverse impacts would occur on park staff because staff would be on site monitoring the construction activities and would also be involved in the road closures and road maintenance. Park visitors could be involved in incidents involving the large construction vehicles traveling on park roads. Adverse impacts on park staff and visitors at APPA would occur. When the impacts on human health and safety as a result of alternative 2 are combined with other past, present, and reasonably foreseeable projects in the study area, an overall adverse cumulative impact would be expected.

Alternative 2 would have create greatly increased risks to visitor and staff safety due to construction activities, the presence of heavy equipment, and alterations to typical traffic flow would. However, such impacts would be temporary. Proper management, advanced planning, and park staff expertise dealing with these types of disruptions would minimize these risks; properly managed risks to public safety are expected to be minimal. Thus, alternative 2 would not likely result in significant impacts to human health and safety.

Alternative 2b

Adverse impacts on human health and safety as a result of the construction of the proposed line would be similar to those under alternative 2. Adverse impacts would arise from safety hazards associated with use of construction equipment and the transport of construction materials to and from the construction area.

According to the NESC, transmission lines must be designed to provide adequate vertical clearance and to allow for adequate horizontal clearance at the edge of the ROW during high wind conditions. The safety

clearance required around the conductors is determined by normal operating voltages, conductor temperatures, short-term abnormal voltages, windblown swinging conductors, and contamination of the insulators. Conductor displacement as a result of high winds is termed “conductor blowout.” The applicant determined that a ROW width of 99 feet is needed for the double 500-kV line (calculations are shown in appendix D). However, the NPS found that the applicant’s calculations referred to voltages only up to 230 kV and failed to represent the required V-string clearance (21.5 feet from the structure’s centerline). The NPS also noted that the required clearance for each side of the ROW should be 20 feet, not 17 feet as the applicant proposed (appendix D). Ultimately, the NPS found that constructing the proposed project according to the proposed plan for the 100-foot ROW would violate NESC safety guidelines. The minimum horizontal clearance to the edge of the ROW under high wind conditions in terms of conductor blowout was determined to be greater than 100 feet. Safety hazards could occur from the operation of the double 500-kV transmission line within the existing 100-foot ROW. If trees are not removed beyond the 100-foot ROW, the double 500-kV transmission line could create fire hazards, especially if a conductor blows out. These fire risks and safety code insufficiencies would create impacts on the health and safety of park staff, visitors, and the general public.

Overall there would be adverse impacts on human health and safety for all three parks under alternative 2b.

Cumulative Impacts

Cumulative impacts on human health and safety inside the study area from past, present, and reasonably foreseeable projects would be adverse, as previously discussed in the “Cumulative Impacts Common to All Alternatives” section. When the impacts on human health and safety as a result of alternative 2b are combined with other projects in the study area, an overall adverse cumulative impact would be expected. Alternative 2b would not alter the level of impact.

Conclusion

Inside the study area, adverse impacts on public health and safety for DEWA and MDSR staff, visitors, and the general public could result during the construction of the transmission line and access roads. Impacts on park staff and visitors at APPA would result due to the smaller area affected by construction. Additionally, adverse impacts on park staff and visitors could result during the operation of the transmission line due to safety hazards and potential fire hazards because of the insufficient horizontal clearance in the ROW. When the impacts on human health and safety as a result of alternative 2b are combined with other past, present, and reasonably foreseeable projects in the study area, an overall adverse cumulative impact would be expected.

Alternative 2b would create increased risks to visitor and staff safety due to construction activities, the presence of heavy equipment, and alterations to typical traffic flow create greatly increased risks to visitor and staff safety. However, such impacts would be temporary and would be greatly minimized through proper management, advanced planning, and park staff expertise dealing with these types of disruptions. These adverse impacts of alternative 2b on human health and safety would not likely be significant.

However, alternative 2b has additional risks to human health and safety because operation of the line in areas where clearances are less than required by NERC standards creates a considerable fire hazard. Alternative 2b would be constructed within the existing ROW, which is only 100 feet wide in places and bordered by 60 to 80-foot high trees on both sides. NERC guidelines call for clearances between live wires and trees on the edge of the corridor that are greater than the current ROW would offer. This creates the increased hazard of live wires contacting trees and sparking a forest fire. The degree of danger posed to human safety by operating the line with clearances that are below NERC standards is uncertain.

Additionally, such an event would likely cause an outage of the line that would lead to loss of power to users downstream, which could create uncalculated health and safety issues. Because of these risks, alternative 2b would have the potential to result in significant adverse impacts on human health and safety.

Common to Action Alternatives 3, 4, and 5

Under alternatives 3 through 5, the removal of the existing B-K Line would eliminate the generation of EMFs at the line's current location. Although there remains a lack of consensus in the scientific community with regard to the public health impacts associated with the EMF levels generated by transmission lines, there would be no impact on human health and safety from EMFs under these alternatives because there would no longer be transmission lines generating EMFs at this location. It is worth noting that the area where the B-K Line would be removed is largely non-residential.

Alternative 3

Adverse impacts on human health and safety would be similar to those under alternative 2, because the potential safety risks would be the same.

Overall, inside the study area adverse impacts on DEWA and MDSR staff and visitors and the general public would occur. Impacts on APPA staff and visitors would result but the affected area would be small and the construction period would be relatively short. Therefore, overall adverse impacts on human health and safety under alternative 3 would occur.

Cumulative Impacts

Cumulative impacts on human health and safety inside the study area from past, present, and reasonably foreseeable projects would be adverse, as discussed previously in the "Cumulative Impacts Common to All Alternatives" section. When the impacts on human health and safety as a result of alternative 3 are combined with other projects in the study area, an overall adverse cumulative impact would be expected. Alternative 3 would not alter the level of impact.

Conclusion

Inside the study area, adverse impacts on public health and safety for DEWA and MDSR staff, visitors, and the general public would occur during the construction of the transmission line and access roads. The adverse impacts of alternative 3 may be slightly less severe for park staff and visitors at APPA than alternative 2 because of the smaller area affected by construction. When the impacts on human health and safety as a result of alternative 3 are combined with other past, present, and reasonably foreseeable projects in the study area, an overall adverse cumulative impact would be expected.

Adverse impacts of alternative 3 on human health and safety would be similar to those under alternatives 2, 4, and 5 because the potential safety risks would be the same. Considering the intensity of the adverse impacts in the context of human health and safety, alternative 3 would not likely result in significant impacts to human health and safety because the risks would be minimized through proper management, advanced planning, and park staff expertise dealing with these types of disruptions.

Alternative 4

Under alternative 4, the transmission line would traverse fewer miles of land in the parks compared to alternatives 2 and 3; however, adverse impacts would be similar because the same safety hazards to park

staff, visitors, and general public would exist. Because alternative 4 does not cross MDSR, there would be no safety concerns for boaters in the MDSR as a result of this alternative.

Overall, inside the study area adverse impacts on the health and safety of DEWA staff and visitors and the general public would result from being in the vicinity of construction equipment and from the safety hazards caused by construction vehicles on park roads. Adverse impacts on APPA staff and visitors would occur but the affected area would be small. Potential incidents in APPA would be the same as those in DEWA; however, the construction period would be relatively short. Therefore, overall adverse impacts on human health and safety for all three parks would occur under alternative 4.

Cumulative Impacts

Cumulative impacts on human health and safety inside the study area from past, present, and reasonably foreseeable projects would be adverse, as previously discussed in the “Cumulative Impacts Common to All Alternatives” section. When the impacts on human health and safety as a result of alternative 4 are combined with other projects in the study area, an overall adverse cumulative impact would be expected. Alternative 4 would not alter the level of impact.

Conclusion

Inside the study area, adverse impacts on health and safety of DEWA staff and visitors and the general public would result. During the construction of the transmission line and access roads, park staff would be on site monitoring the construction activities. There would be adverse impacts on park staff and visitors at APPA in the small area affected. When the overall impacts on human health and safety as a result of alternative 4 are combined with other past, present, and reasonably foreseeable projects in the study area, an overall adverse cumulative impact would be expected.

Adverse impacts of alternative 4 on human health and safety would be similar to those under alternatives 2, 3, and 5 because the potential safety risks would be the same. The adverse impacts of alternative 4 may be slightly less severe than alternatives 2 and 3 because of the smaller area affected by construction. Considering the intensity of the adverse impacts in the context of human health and safety, alternative 4 would not likely result in significant impacts to human health and safety because the risks would be minimized through proper management, advanced planning, and park staff expertise dealing with these types of disruptions.

Alternative 5

Alternative 5 would follow the same route through DEWA and APPA as alternative 4 except it would not include the 0.6-mile portion that connects to the Bushkill Substation and travels to the western boundary of DEWA (along the existing B-K Line). Therefore, adverse impacts for alternative 5 would be the same as those described above for alternative 4.

Cumulative Impacts

Cumulative impacts on human health and safety inside the study area from past, present, and reasonably foreseeable projects would be adverse, as previously discussed in the “Cumulative Impacts Common to All Alternatives” section. When the impacts on human health and safety as a result of alternative 5 are combined with other projects in the study area, an overall adverse cumulative impact would be expected. Alternative 5 would not alter the level of impact.

Conclusion

Inside the study area, adverse impacts on the health and safety of DEWA staff and visitors and the general public would occur. During the construction of the transmission line and access roads, park staff would be on site monitoring construction activities. There would be adverse impacts on park staff and visitors at APPA in the small area affected. When the overall impacts on human health and safety as a result of alternative 5 are combined with other past, present, and reasonably foreseeable projects in the study area, an overall adverse cumulative impact would be expected.

Adverse impacts of alternative 5 on human health and safety would be similar to those under alternatives 2, 3, and 4 because the potential safety risks would be the same. The adverse impacts of alternative 5 may be slightly less severe than alternatives 2, 3, and 4 because of the smaller area affected by construction. Considering the intensity of the adverse impacts in the context of human health and safety, alternative 5 would not likely result in significant impacts to human health and safety because the risks would be minimized through proper management, advanced planning, and park staff expertise dealing with these types of disruptions.

SUSTAINABILITY AND LONG-TERM MANAGEMENT

In accordance with NEPA, and as further explained in NPS Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision Making* (NPS 2011g), consideration of long-term impacts and the effects of foreclosing future options should be central to any NEPA document. According to Director's Order 12, and as defined by the World Commission on Environment and Development, "sustainable development is that which meets the needs of the present without compromising the ability of future generations to meet their needs." For each alternative considered in a NEPA document, considerations of sustainability must demonstrate the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity. This is described below for each alternative.

The NPS must consider whether the effects of the alternatives involve tradeoffs between the long-term productivity and sustainability of park resources and the immediate short-term use of those resources. It must also consider whether the effects of the alternatives are sustainable over the long term without causing adverse environmental effects for future generations (NEPA section 102[c][iv]).

Short-term and long-term alterations to and permanent loss of natural vegetation communities have occurred, are occurring, and will occur as a result of natural and unnatural changes inside the study area, including successional changes in vegetation, controlled and uncontrolled fires, invasive species colonization and management, disease and treatment or management of diseased vegetation or organisms, construction or demolition of park facilities, and park operations, including but not limited to law enforcement, interpretation, and conservation programs.

The existing ROW has been in place for more than 80 years and predates the parks. It is an established component of the parks, albeit an unnaturally maintained one that is not consistent with ordinary NPS management. The natural resources in the existing ROW are productive and sustainable; however, the form of that productivity and sustainability is inherently managed and maintained artificially and is not equivalent to the productivity of the mature forest that once existed in the ROW. Alternative 1, the no-action alternative, and the action alternatives (2, 2b, 3, 4, and 5) presented and analyzed in this EIS would create impacts that could further alter the short-term and long-term productivity of the natural resources inside the study area as discussed below.

THE RELATIONSHIP BETWEEN SHORT-TERM USE AND LONG-TERM PRODUCTIVITY OF THE ENVIRONMENT

Short-term uses of resources in the study area include the disturbance of soils, vegetation communities, and wildlife during construction and regular vegetation maintenance activities. The ecological productivity of the study area would be temporarily reduced but would continue over the long term, although in potentially different ways as a result of long-term alterations. Disturbed soils would be restored and revegetated; wildlife species that have fled disturbance and activity would return to former habitats or take up residence in new areas; vegetation would be reestablished; and feeding and foraging by wildlife would resume. Wildlife species that move between habitats would alter movement and foraging behavior temporarily as a result of limited mobility, or would avoid the area. Although vegetation maintenance would only be performed annually and would be localized along the ROW, vegetation maintenance would continue for the period of analysis and would therefore cause adverse impacts on natural resources. The periodic maintenance would not be frequent enough that wildlife in the vicinity would become habituated to the disturbance.

As noted, a transmission line is not consistent with ordinary NPS management to protect natural, scenic, and recreational resources; the incompatible use of NPS land would have an adverse impact on the natural, scenic, cultural, and recreational resources in the study area as well as on visitor experience.

Alternative 1: No Action

Activities under alternative 1, the no-action alternative, would continue to alter and use park resources for the transmission of electricity. Because the ROW would remain in place and continue to provide electricity under alternative 1, the continued presence of the ROW would require regular maintenance and an early successional plant community would result over the long term. Regular maintenance of vegetation in the ROW is a departure from the maintenance that has occurred in the past. Annual maintenance over the long term would maintain a more visually obvious ROW that would also increase the disconnectedness of adjacent habitats that was created more than 80 years ago. Other effects resulting from the presence of the ROW would include short-term, periodic, and localized disturbance; the disruption of daily and seasonal behaviors; and the direct mortality of individuals of some species. Although the long-term viability of park natural resources would continue, the ecological productivity of the habitats and wildlife in the ROW would be altered. Visual resources and visitor use and experience would continue to be affected over the long term by the presence of the ROW and transmission line components in the viewshed and landscape inside the study area. Although the transmission line would not be as visible as a larger, higher, new line, the regular maintenance of the ROW would ensure its visibility in the landscape and would be experienced by visitors to the parks from a variety of locations.

The NPS has been working with state and local agencies as well as nongovernmental conservation organizations in Pennsylvania and New Jersey to identify lands that connect state and federal lands and to prioritize areas that would establish connectivity on a regional scale. Wildlife species in the parks are directly affected by the natural abundance, biodiversity, and ecological integrity of their habitat. The presence of the ROW in the study area and regular maintenance under alternative 1 would not support the NPS role in establishing regional landscape connectivity.

Common to All Action Alternatives

The activities associated with the construction and maintenance of the ROW for any action alternative would result in a number of impacts that would alter long-term uses of park resources despite mitigation measures and BMPs that would offset the level of the impacts. The drilling of geologic resources; the possible alteration of hydrology from impacts on geology; the clearing of forest communities; permanent

alterations of visual aesthetics and changes to visitor experience from the presence of a newer, larger transmission line and permanent access roads; and the annual vegetation maintenance of a wider ROW as early successional stage vegetation are all long-term impacts that would affect resources and the uses of those resources by wildlife, visitors, and park personnel as well as influencing park operations in the long term. Some benefit would be provided by the decommissioning and restoration of the B-K Line in conjunction with the development of another ROW for the transmission line under alternatives 3 through 5; however, the long-term restoration process would not be expected to succeed into mature forest within the period of analysis of this EIS (15 years).

Alternative 2

Alternative 2 would maintain and expand the same use of park resources for the transmission of electricity as alternative 1. The expansion of the ROW and the construction of new towers would cause adverse impacts on natural resources during construction in addition to the adverse impacts associated with the loss of habitat and annual maintenance activities. The presence of the ROW in the study area and regular maintenance would not support the NPS role in establishing regional landscape connectivity.

Ecological productivity would continue under alternative 2; however, the widening of the ROW would alter the ecological productivity of the affected areas in the ROW as a result of the clearing and maintenance-related changes in vegetation communities and the wildlife using the new, maintained, early successional habitat. Disturbance, avoidance/abandonment, and mortality of wildlife would occur during specific periods of activity. Along the ROW in the study area, 52% of the ROW contains rare and unique communities that could be affected by construction and maintenance activities even though they would be avoided to the extent practicable.

Cultural resources would be affected by construction and the long-term presence of the transmission line, affecting archeological resources, cultural landscapes, and historic structures. Visitor use and experience and visual resources would be affected by the construction activities and the presence of a larger, higher transmission line in the long term. The towers would be twice the height of current towers and the ROW would be expanded and regularly maintained, making the towers, the line, and the ROW much more visible and intruding on visitor experience in the parks.

Alternative 2b

Alternative 2b would maintain the same use of park resources for the transmission of electricity as alternative 1, the no-action alternative. Because the applicants would not expand the ROW, the need for the removal of danger trees would be greater, resulting in long-term changes in the forested area along the ROW; however, the ecological productivity of the adjacent habitats along the existing ROW would be maintained because the habitat would not be cleared or altered. The construction of new towers would cause adverse impacts on natural resources during construction in addition to the adverse impacts associated with the loss of habitat and annual maintenance activities. Rare and unique communities are present as stated for the previous alternative (52%), and the productivity of these areas would be expected to be altered where they could not be avoided. The productivity of the ecological components in the ROW would continue but would be altered by a shift in vegetation community and wildlife use over the long term as a result of regular and thorough maintenance.

Cultural resources would be affected by the construction and the long-term presence of the transmission line, affecting archeological resources, cultural landscapes, and historic structures. Visitor use and experience and visual resources would be affected by the construction and the long-term presence of the transmission line. The towers would be double the height of current towers, making the towers and line much more visible and intruding on visitor experience in the parks.

The presence of the ROW in the study area and the regular maintenance over the long term under alternative 2b would not support the NPS role in establishing regional landscape connectivity.

Alternative 3

Alternative 3 would expand the use of park resources for the transmission of electricity, widening an existing ROW inside the study area. The expansion of the ROW and construction of new towers would cause adverse impacts on natural resources, including rare and unique communities, during construction in addition to the adverse impacts associated with the loss of habitat and annual maintenance activities. For the alternative 3 ROW, 47% of the area is designated as rare and unique communities that could also be affected by construction and maintenance impacts.

Cultural resources would be affected by the construction and the long-term presence of the transmission line, affecting archeological resources, cultural landscapes, and historic structures. Visitor use and experience and visual resources would be affected by the construction and the long-term presence of the transmission line.

As noted, a transmission line is not compatible with NPS protection of natural, scenic, and recreational resources; the incompatible use of NPS land would have a long-term adverse effect on the natural, scenic, cultural, and recreational resources inside the study area as well as on visitor experience. The presence of the ROW in the study area and the regular maintenance under alternative 3 would not support the NPS role in establishing regional landscape connectivity. Removal of the B-K Line under alternative 3 would offset the impact from the proposed transmission line by removing one non-compatible feature from an area of the parks that is relatively undeveloped. The towers would be double the height of current towers and the conductors would be doubled, making the towers and lines much more visible and intruding on visitor experience in the parks.

Alternative 4

Alternative 4 would not use park resources for the transmission of electricity to the extent expected for alternatives 1, 2, 2b, and 3. Despite the smaller footprint of the transmission line in alternative 4, the productivity of park resources would be altered from existing levels. The construction of new towers would cause adverse impacts on natural resources during construction and long-term impacts associated with the loss of habitat and annual maintenance activities. Rare and unique communities compose about 42% of the area and the productivity of these areas would be expected to be altered similarly where they could not be avoided. Productivity in forested areas would be reduced and altered (increasing the maintained early successional habitat). Visitor use and experience and visual resources would be affected by the construction and long-term presence of the larger, taller transmission line. Removal of the B-K Line under alternative 4 would offset the impact from the proposed transmission line by removing one non-compatible feature from an area of the parks that is relatively undeveloped. Alternative 4 would also move the infrastructure to the edge of DEWA where the park is already impacted by encroaching development.

Alternative 5

Alternative 5 would result in the least amount of park resources (0.9 miles) used for the transmission of electricity; however, the proposed route contains the highest percentage of rare and unique communities. The expansion of the ROW and the construction of new towers would cause short-term impacts on natural resources, including rare and unique communities, during construction and long-term impacts associated with the loss of habitat and annual maintenance activities. Visitor use and experience and visual resources would be affected by the construction and the long-term presence of the transmission line. However,

removal of the B-K Line under alternative 5 would offset the impact from the proposed transmission line by removing one non-compatible feature from an area of the parks that is relatively undeveloped. Alternative 5 would also move the infrastructure to the edge of DEWA where the park is already impacted by encroaching development.

IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

The NPS must consider whether the effects of the alternatives are irreversible or irretrievable commitments of resources. Irreversible impacts are those effects that cannot be changed over the long term or are permanent. Irretrievable commitments are those resources that, once gone, cannot be replaced. Irreversible commitments would result from the construction of new and permanent access roads and the operation of an upgraded transmission line that would require labor and would consume fossil fuels, would use raw materials such as steel, and would require roadway construction materials such as concrete and aggregate. The NPS must also consider whether the impacts on park resources would mean that once gone, the resource could not be replaced; in other words, the resource could not be restored, replaced, or otherwise retrieved (NEPA section 102[c][v]). The loss of geologic resources, special-status species (individuals), wetlands (through changes to hydrology, soils, vegetation), or wildlife habitat at the park would be considered an irretrievable resource commitment. Mitigation would be required for the loss of some resources, but would not fully offset impacts. Drilling and/or excavation could have an irretrievable impact on topography and paleontological resources associated with geologic formations if resources are lost or destroyed. Changes to rare and unique communities could be considered an irreversible resource commitment if drilling or other activities permanently alters the resource such that it can no longer support special-status species or function as a rare and unique community. In addition to natural resources, impacts to historic resources such as archeological sites, historic structures, and cultural landscapes could be considered an irretrievable resource commitment if drilling or excavation permanently alters or destroys resource, or the resource is completely lost. Impacts to these resources would be mitigated through various cultural landscape management requirements, but the impact would be irretrievable unless the known resources are completely recovered prior to construction activities. The use of land for permanent access roads and the ROW for the transmission line would be an irreversible commitment of resources during the period that the land is used for transportation infrastructure or energy requirements. However, the land could be converted to another use at a future date, just as the proposed project would remove and restore some roads and the existing ROW (depending upon the alternative) in the study area.

Alternative 1: No Action

Alternative 1 would continue ongoing impacts on natural resources, especially vegetation; landscape connectivity, wetlands, wildlife habitat, and wildlife as well as rare and unique communities. Some of these impacts could be reversed if the transmission line were to be removed and the natural resources restored. Under alternative 1, tree removal in forested wetlands would result in the conversion of wetland habitat type from a forested wetland to an emergent or scrub shrub wetland. Because northern forested wetlands may take 50 years to reach maturity (Kusler 2006, iii) and because trees in the ROW under alternative 1 would continue to be maintained/removed, wetland areas within the ROW would not recover during the period of analysis to become fully functioning forested wetlands. Mitigation would be required for the loss of wetlands, but would not fully offset impacts. Changes to rare and unique communities (that may also include wetlands) could be considered long-term and/or an irreversible resource commitment if maintenance activities permanently alters the resource such that it can no longer support special-status species or function as a rare and unique community. Although vegetation removal and maintenance efforts would continue, no new development, construction, excavation, or drilling would occur under alternative 1.

Alternatives 2 and 2b

Alternatives 2 and 2b would result in the irreversible and irretrievable commitment of geologic resources. The construction of the towers involves drilling bedrock and approximately seven of the towers would be sited in geologic resources that are rare or unique. These impacts would be permanent and irreversible and could not be mitigated. Drilling and excavation could also have an irreversible and irretrievable impact on topography and paleontological resources associated with geologic formations if resources are lost or destroyed. Unless mitigation involves documenting and recovering these resources prior to construction activities, an irreversible and irretrievable commitment of these resources would occur under alternatives 2 and 2b.

Additionally, the drilling of bedrock has the potential to cause impacts on groundwater and surface water resources, ultimately affecting hydrology in rare and unique communities as well as *Exceptional Value Wetlands* such as Arnott Fen. However this drilling is unlikely to affect groundwater (see discussion in “Geologic Resources”) and is not discussed further. These impacts could be permanent and could not be mitigated if hydrology changes such that wetland functions are no longer self-sustaining. Changes to rare and unique communities (that may also include wetlands) could also be considered long-term and/or an irreversible resource commitment if maintenance activities permanently alters the resource such that it can no longer support special-status species or function as a rare and unique community. Special-status plant species could be lost directly during vegetation removal/maintenance activities and/or indirectly due to the spread of invasive plant species from removal/maintenance activities. Special-status wildlife species could be lost through direct mortality with construction equipment or indirectly through loss of habitat or human disturbances. If there is a “take” of special-status species under alternatives 2 and 2b (likely individuals and not entire populations), this would be considered an irreversible commitment of resources.

Under alternatives 2 and 2b, tree removal in forested wetlands would result in the conversion of wetland habitat type from a forested wetland to an emergent or scrub shrub wetland. Because northern forested wetlands may take 50 years to reach maturity (Kusler 2006, iii) and because trees in the ROW under alternatives 2 and 2b would be removed and then maintained, wetland areas within the ROW would not recover during the period of analysis to become fully functioning forested wetlands. Mitigation would be required for the loss of wetlands, but would not fully offset impacts. Other long-term impacts such as those to vegetation; landscape connectivity, wildlife habitat, and wildlife; and visual resources would occur and would be irreversible during the period of analysis. These impacts, however, could only be mitigated or reversed after the period of analysis if the line were to be removed and the area of the ROW were restored in the future.

Under alternatives 2 and 2b, impacts to historic resources such as archeological sites, historic structures, and cultural landscapes could be considered an irreversible resource commitment if drilling or excavation permanently alters or destroys resource, or the resource is completely lost. Visual impacts would also occur due to the presence of the transmission line. Some impacts to these resources could be mitigated through various cultural landscape management requirements, but the impact would be irreversible unless the known resources are completely recovered prior to construction activities.

Alternatives 3 through 5

Similar to alternatives 2 and 2b, alternatives 3 through 5 would result in the irreversible and irretrievable commitment of geologic resources from the drilling and excavation activities required for the construction of the towers. The impacts would be permanent and irreversible and could not be mitigated. Along the alternative 3 alignment, approximately 11 to 15 of the towers would be sited in geologic resources that are rare or unique; construction and clearing would also impact paleontology and topography. Unless

mitigation involves documenting and recovering these paleontological resources prior to construction activities, an irreversible and irretrievable commitment of these resources would occur under alternatives 3, 4, and 5.

There are no rare or unique geologic resources along the corridors for alternatives 4 and 5, but adverse impacts to paleontology and topography resources could result in an irreversible and irretrievable commitment of these resources. Wetlands in rare or unique communities or *Exceptional Value Wetlands* would not be affected under alternatives 3, 4, or 5. Special-status plant or wildlife species could be lost directly and/or indirectly as described above for alternatives 2 and 2b. If there is a “take” of special-status species under alternatives 2 and 2b (likely individuals and not entire populations), this would be considered an irreversible commitment of resources.

Under alternatives 3, 4, and 5, tree removal in forested wetlands would result in the conversion of wetland habitat type from a forested wetland to an emergent or scrub shrub wetland and these wetland areas within the would not recover during the period of analysis to become fully functioning forested wetlands. Mitigation would be required for the loss of wetlands, but would not fully offset impacts. Other long-term impacts such as those to vegetation; landscape connectivity, wildlife habitat, and wildlife; and visual resources would occur and would be irreversible during the period of analysis. These impacts, however, could only be mitigated or reversed after the period of analysis if the line were to be removed and the area of the ROW were restored in the future.

Under alternative 3, impacts to historic resources such as known archeological sites, historic structures, and cultural landscapes could be considered an irreversible resource commitment if drilling or excavation permanently alters or destroys resource, or the resource is completely lost. Alternatives 4 and 5 do not contain known archeological resources, but historic structures, and cultural landscapes would be affected and could be considered an irreversible resource commitment. Visual impacts would also occur due to the presence of the transmission line under alternatives 3, 4, and 5. Some impacts to these resources could be mitigated through various cultural landscape management requirements, but the impact would be irreversible unless the known resources are completely recovered prior to construction activities.

UNAVOIDABLE IMPACTS

Unavoidable impacts constitute a substantial change to existing environmental conditions that cannot be completely offset by the implementation of mitigation measures. Unavoidable impacts on geology and visual resources could arise from the action alternatives 2, 2b, 3, 4, and 5 as described in chapter 2.

The excavation and drilling activities required for the construction of the new towers would permanently affect geologic resources. Because drilling is unlikely to affect groundwater (see discussion in “Geologic Resources”) it would not affect hydrology of the wetland areas or rare and unique communities in the vicinity and is not discussed further. The spread of invasive plant species from construction, excavation, and removal/maintenance activities would be an unavoidable impact to special-status plant and wildlife species as well as to native vegetation and wildlife species through competition of resources and habitat. It is expected that invasive plant species would spread along the ROW, along access roads and off the ROW, as well as into adjacent plant communities.

It is assumed that unavoidable impacts would also occur to unknown archeological and paleontological resources that have not yet been documented. There would also be unavoidable impacts to vegetation, park operations, and infrastructure (roadways).

Visual resources would be significantly affected by the presence of larger, taller transmission lines under all action alternatives, which would constitute an unavoidable impact and would adversely affect aesthetics and the experiences of visitors to the parks.

Cultural landscapes would be altered permanently and would constitute an unavoidable impact.

Landscape scale connectivity would be impacted permanently for both existing and potential protection in perpetuity and would constitute an unavoidable impact.

No other unavoidable impacts on resources were identified.

