COVER SHEET

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR AMENDMENT TO LICENSE

HOLTWOOD HYDROELECTRIC PROJECT
Docket No. P-1881-050

Section 5
Staff's Conclusions
Pages 137 through 154

FEIS

5.0 STAFF'S CONCLUSIONS

5.1 COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Sections 4(e) and 10(a) of the FPA require the Commission to give equal consideration to all uses of the waterway on which a project is located. When we review a hydropower project, we consider the water quality, fish and wildlife, recreation, cultural, and other non-developmental values of the involved waterway equally with its electric energy and other developmental values. In deciding whether, and under what conditions a hydropower project should be licensed, the Commission must determine that the project will be best adapted to a comprehensive plan for improving or developing the waterway. This section contains the basis for, and a summary of, our recommendations for conditions to be included in any amendment to the license for the Holtwood Project.

Based on our independent review and evaluation of the environmental and economic effects of the proposed action, the proposed action with additional staff-modifications and recommended measures, and no action, we recommend the proposed action with additional staff-recommended measures, as the preferred alternative. We recommend this alternative because (1) issuing an amendment to the project license would allow PPL to continue operating the project as a beneficial and dependable source of electric energy; (2) the project, with an increased installed capacity of 195.5 MW, would eliminate the need for an equivalent amount of fossil-fuel-produced energy and capacity, which helps conserve these nonrenewable resources; and (3) the recommended environmental measures would protect water quality, enhance fish and wildlife resources, and improve public use of project recreation facilities and resources.

Measures Proposed by Holtwood

We recommend including the following environmental measures proposed by PPL in any amended license issued by the Commission for the Holtwood Project:[35]

- Erosion and sedimentation control plans.
- A DO monitoring plan for the Holtwood tailrace, included in the plan and schedule for providing minimum streamflows in the tailrace, that would maintain and protect existing and designated uses and implement water quality standards (described below), and file the plan with the Commission for approval prior to the commencement of operation of the amended project.

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[35] Final plans and design drawing must be filed with the Commission for approval, must be prepared in consultation with the Corps, Pennsylvania DEP, Pennsylvania FBC, and FWS, and must include agency comments on the plan or design drawings. We do not repeat these provisions in the bulleted list of recommended measures.

- A plan detailing how the licensee would maintain uninterrupted fish migration and operation of the fish passage facilities during construction of the amended project.
- Final design drawings for any structural improvements to the project fish passage facilities, and the parts of the annual FOP that would include any changes in the operations of the fish passage facilities.
- A monitoring plan for upstream shad passage that includes Tier I and Tier II studies and associated effectiveness targets, consistent with the requirements of Interior's fishway prescription and WQC.
- A plan for discrete survival studies to determine survival of downstream migrating juvenile and adult shad that includes survival targets consistent with the requirements of Interior's fishway prescription and WQC.
- A plan and schedule for a siting study for permanent upstream eel fishway(s), consistent with the requirements of Interior's fishway prescription and WQC, including criteria for triggering the study. The final plan must also include mechanisms for development of future permanent eel fishways (including schedule) after the completion of siting studies, and for monitoring the effectiveness of the permanent fishways.
- A plan and schedule for a discrete survival study to determine the effectiveness of downstream eel passage at the project, consistent with the requirements of Interior's fishway prescription and WQC, including criteria for triggering the study, and fish survival targets that would indicate adequate effectiveness. The final plan must also include mechanisms for development of future operational or structural measures to improve downstream eel passage, and for monitoring the effectiveness of any measures implemented.
- Operation of the project fish lifts from April 1 through June 30, for a period of 5 years, after the initiation of amended project operation, for the upstream passage of resident species. Resident fish passage would be monitored during these operations, and at the end of resident fish passage operations, the licensee would consult with the agencies to determine if any operational modifications should be made for resident fish passage. Any plan to modify operations for resident fish passage would be filed with the Commission for approval.
- A final MSFOP for all operations and maintenance related to providing minimum streamflows, including daily and seasonal operations, the location and volume of each minimum flow release from the project, powerhouse unit sequencing and flow split between the two powerhouses and between the tailrace and Piney Channel, procedures for measuring and reporting minimum flows, procedures for determining net inflow to Lake Aldred and flows to the tailrace, Piney Channel, and the bypassed reach, as well as emergency procedures.

- Operation of the amended project to release a minimum streamflow (including leakage) equal to, on a daily volumetric basis, 98.7 percent of the minimum flow required by the Commission to be released at the downstream Conowingo Project, with a minimum continuous flow of 800 cfs from the project. If inflow to Lake Aldred is less than the required minimum streamflow, the amended project shall release a minimum flow equal to the inflow. PPL may request a waiver of this minimum flow requirement if necessary for the construction of the new powerhouse or fish passage facilities.
- Continue to use the existing configuration of flashboards to pass water through the existing 10-inch pipe on the dam to maintain the current rate of flow into the bypassed reach.
- When river flows are between 31,000 cfs and 61,500 cfs, supply flows to the bypassed reach of approximately 1,000 cfs once per day for 1 hour sufficient to wet the roots of the white doll's daisy plant population during the dry summer months of its growing season.
- A plan and schedule for providing minimum streamflows in the bypassed reach that would maintain and protect existing and designated uses and implement water quality standards. The plan must include procedures for monitoring water quality in the bypassed reach and for making modifications to the streamflows, consistent with the WQC.
- A plan and schedule for providing minimum streamflows in Piney Channel and in the tailrace that would maintain and protect existing and designated uses and implement water quality standards. The plan must include procedures for monitoring water quality in Piney Channel and the tailrace and for making modifications to the streamflows, consistent with the WQC.
- A final plan and schedule for excavations within Piney Channel, the tailrace, and bypassed reach, prior to commencement of construction.
- A long-term monitoring program of wetlands and state threatened and endangered plants in the river bed downstream of the dam, to examine the effects of reductions in spill frequency on in-river resources and to determine if any adjustments to planned flow release rates are warranted to ensure the continued protection of the river area.
- Construction of a wetland replacement project along Landis Run in Manheim Township, Lancaster County, to mitigate for wetlands affected by the project construction.
- Field delineate and identify all existing wetlands within the areas of ground-distributing activities, using orange construction fencing, prior to the start of construction activities through the completion of ground-disturbing activities and after site stabilization.

- Implement a minimum 5-year monitoring schedule at the wetland, stream and forested riparian planting mitigation sites.
- A final bald eagle protection plan, to ensure the continued protection of eagles that nest and forage within the immediate project area, that should be filed prior to the commencement of construction.
- A historic properties management plan to protect historic and archeological resources during project construction and throughout the term of the amended license, filed with the Commission prior to the commencement of ground-disturbing activities.

Modified and Additional Measures Recommended By Staff

- A plan detailing in-water and in-the-dry blasting activities approved by the Commission prior to the initiation of construction activities involving blasting.
- Operation of the project fish lifts for upstream passage of resident species from September 1 to October 15 for 5 years following commencement of amended project operations, to be followed by an evaluation of fall fish lift operations for resident species.
- Inclusion in the plan for uninterrupted fish migration during construction specific measures to mitigate for adverse effects from construction on upstream fish passage efficiency for shad.
- A land and shoreline management plan to establish long-term management objectives for project lands and to ensure the continued preservation of project lands, shoreline buffers, historic and archeological resources, and the protection of sensitive species, such as the bald eagle, that includes: (1) an assessment of the lands to be included within a shoreline buffer (including rationale for extending the shoreline buffer beyond that which currently exists at the project) and lands to be included within the project boundary for the protection of project resources, such as protection of fish and wildlife habitat, providing public access for recreation, and protecting sensitive, unique, or scenic areas; (2) a description of those lands covered by the plan, including any proposed revisions to the project boundary and revisions to exhibit G, if necessary; (3) a description of measures to be implemented for the management and use of project lands; (4) measures for the coordination of the plan with other resource management plans and programs for the project, such as the historic properties management plan, long-term monitoring program of wetlands and state threatened and endangered plants, and the bald eagle protection plan; (5) measures to revise and update the plan; and (6) a schedule for implementation of the plan and associated management measures.
- A recreational use monitoring plan that includes (1) estimates of annual project-related recreation use visitation; (2) assessments of the effects of proposed project construction on recreation opportunities and access at the project during the

construction period, the effects of project operations, i.e., reservoir elevations and provision of flows downstream of the project dam, on recreation access and opportunities at the project, the adequacy of the existing project's recreation facilities, and the need for additional recreation facilities at the project site; and (3) a description of any recreation plans proposed by PPL to accommodate or control visitation in the project area.

The following discussion describes the basis for staff-recommended measures, as well as for not recommending measures recommended by other entities.

Final Excavation Plans

PPL filed plans for excavations in the Susquehanna River in the vicinity of the Holtwood Project, as part of the information provided to Pennsylvania DEP on June 13, 2008, as part of the WQC process. Although it is likely that the final excavation plans may not differ substantially from these latest filed plans, details must be provided so that final assessment of potential impacts on water quality, fisheries, and wildlife can be made, and appropriate mitigation measures required as part of the compliance activities for the proposed amendment. Specific plans for in-water or in-the-dry excavations/blasting must be submitted and approved prior to the initiation of construction activities that involve blasting. The costs for preparing these final plans can not be estimated, because this planning would be part of PPL's and its selected contractor's final design and planning for the project. The plan should be prepared in consultation with Pennsylvania DEP, Pennsylvania FBC, and FWS, and filed with the Commission well prior to construction, so that staff has the opportunity to make adjustments to this planned excavation, if required, in order to protect water quality and aquatic habitat.

Construction Period Measures

Project construction would involve major excavations and heavy construction activities in the Susquehanna River in the vicinity of the Holtwood Project. PPL has estimated that 1.9 million cy of rock and other material would be excavated for the project. A construction project of this magnitude within and adjacent to the Susquehanna River would have the potential for adversely affecting water quality and fishery resources. The primary concerns related to this construction are effects on water quality due to release of sediment and fines, particularly for in-water construction, the effects of excavation/blasting on the migration of anadromous and catadromous species through the area, and effects on the operation of the fish passage facilities. PPL indicates that it is preparing erosion and sedimentation control plans in consultation with Pennsylvania DEP and other agencies, and that it will be required to obtain National Pollutant Discharge Elimination System and section 404 permits for construction. The plans and the other permits may well prevent major adverse effects on water quality that could affect fisheries habitat, but Commission staff should have the opportunity to review the erosion and sedimentation control plans to ensure that appropriate measures are being

implemented. There would be minimal additional cost for PPL to file the erosion and sedimentation control plans with the Commission prior to commencing construction.

PPL provided preliminary plans on how fish migration and fish passage operations would be maintained during the period of construction. These would include limiting major construction activities near the primary migratory routes to the project or in close proximity to fish passage facilities during the migration season, but the final details that would be developed by PPL's contractor would need to be provided, to ensure that migration and fish passage operations are not interrupted. Interruption of fish migration past the project would have major effects on the overall anadromous fish population in the basin, if fish are unable to reach upstream spawning grounds or do not successfully emigrate from the basin during the fall months. We expect that the cost to prepare and file these plans would be minor, because they would be part of PPL's overall final design and planning for the project.

As a result of additional consultations with the FWS during the section 10(j) process, we also now recommend that PPL prepare a plan to mitigate for any adverse construction effects that would reduce the efficiency of the Holtwood fish lifts during the 3-year construction period. PPL should prepare this plan for Commission approval, after consultations among the agencies, PPL, and the Conowingo licensee immediately after the conclusion of the spring fish passage operations. We expect that during those consultations, if construction effects are identified, PPL and the agencies would determine the shortfall of adult shad that would need to be mitigated, using the staff-proposed methodology described in section 3.3.3.2 of this EIS, and then determine the best method for mitigation, either additional fry production or trucking of shad from Conowingo. The final mitigation plan, with agency comments on the plan, would need to be filed with the Commission for approval by September 1 (about 2.5 months after conclusion of the spring fish passage season), in order to allow sufficient time for Commission approval and for PPL to prepare for and implement the plan in the following spring. There would be some additional cost for PPL to consult with the agencies and prepare the mitigation plan, although these consultations could occur at the same time as other consultations that may be required during the construction period. Substantial additional costs could occur if PPL was to implement additional fry stocking or adult shad trucking from Conowingo, but these costs would only occur if an adverse construction effect on fish passage were documented and trigger implementation of these measures. If adverse effects do not occur, these measures would not be implemented. These measures, if implemented, would protect shad passage during the construction period and ensure that upstream shad production is not reduced as a result of construction.

Fish Passage Improvements and Monitoring

The amended project would include major improvements to the upstream fish passage facilities at the project. These improvements should rectify several of the deficiencies in the facilities seen since they first went into operation in 1997, and have

resulted in low passage efficiencies. PPL and Pennsylvania DEP have agreed to the improvements through the COA, and Interior's preliminary fishway prescription essentially requires the same improvements as provided in the COA. Associated with the improvements, both the COA and preliminary fishway prescription include provisions for evaluation of the efficiency of the improved facilities, along with a mechanism for making additional operational or structural changes to the facilities in the future, if target efficiencies are not met. Provisions are also included for evaluation of downstream fish passage, development of American eel passage facilities, and evaluation of these facilities, with a mechanism for making changes in the facilities if target efficiencies are not met. We conclude that all of these provisions would substantially improve the efficiency of fish passage at the project, but at the same time the Commission should be included in the process for making these improvements, particularly if the improvements involve making changes to project structures (the fish passage facilities) or operations, which must be approved by the Commission. Thus, we recommend that final design plans, study plans for evaluation studies, and plans for any future modifications be filed with the Commission for approval. We can not estimate the total cost of all potential fish passage improvements and studies that may be implemented, because we do not know what those future improvements or studies may be. Even though the estimated costs of initial fish passage improvements proposed as part of the license amendment are substantial, the benefit to migrating fisheries would be well worth the cost of improving the currently inefficient fish passage system.

Fish Lift Operation for Resident Species

PPL, through the COA, proposes to operate the fish facilities at Holtwood from April 1 through June 30 for the upstream passage of resident species. Pennsylvania FBC, in its section 10(j) comments, recommends that the Holtwood fish facilities also be operated during the fall period (September 1 to October 15) for upstream resident fish passage for a 5-year period, and then evaluate with the agencies whether to make changes to or continue resident fish passage. Current spring fish lift operations for anadromous species pass substantial numbers of resident species, including the primary game species in the lower Susquehanna River, the walleye and smallmouth bass. Typically, spring fish lift operations occur from mid to late-April until early-June, so expanding this operation as proposed would add an additional 4 to 6 weeks of operation. This could result in additional substantial upstream passage of resident species. It is not known, however, the extent of resident fish passage that may occur during the fall operations recommended by Pennsylvania FBC. Undoubtedly some movement would occur, and these operations would allow evaluation of that movement. PPL, however, expressed concerns about operating in the fall, related to potential damage to lift components that could occur during that operation, with an insufficient period available before the following spring's operation to make necessary repairs.

In the draft EIS, we concluded that only 1 year of fall operations should be attempted because of the potential for fall fish lift breakdowns to affect spring operations.

The agencies, however, in their comments on the draft EIS, provide information that indicates the potential for fall damage to the fish lifts as a result of fall storms/hurricanes is remote, and that only 1 year of testing, as we recommended, could be influenced by unusual (either high or low) flow conditions or by strong or weak year classes that may affect the numbers of fish available for passage. We agree that the potential for storm damage in the fall is low, and that 1 year of fall operations as we initially recommended may not provide an adequate sampling of the fall period to determine whether fall operations would benefit resident species or the re-colonization of mussels in the lower Susquehanna River. Thus, we now conclude that fall operations should occur on an experimental basis for a 5-year period, similar to the spring operations for resident species, followed by an evaluation of the results by the licensee and agencies, to determine if additional fall operations are warranted. Any plan to continue fall operations would then need to be filed with the Commission for approval. Springtime operations for anadromous species should remain the priority for fish lift operations at the project, and experimental fall operations should not jeopardize spring operations. PPL would experience additional costs by operating the fish lifts during the fall, although the costs would likely be lower than during the spring months when the peak of the anadromous fish and gizzard shad runs occur. These fall operations, however, would allow determination of whether important resident fish movement occurs in the fall.

Project Minimum Flow Releases

The proposed amendment would result in the re-distribution of flows at Holtwood, with higher flows being passed down the tailrace channel (from the existing 31,500 cfs to the proposed 62,100 cfs), with a reduction in the spillage over the project dam. The licensee is also proposing a minimum conservation flow release of 200 cfs into the Piney Channel, a release of the Unit 1 generation flows of about 1,200 to 3,150 cfs to the Piney Channel instead of to the tailrace, a continuous release to the bypassed reach approximately equal to the existing leakage from the dam, and a drought release of 44 acre-feet per day from storage if approved by SRBC. There would also be habitat modification (channel excavations) associated with some of the releases, and the total minimum streamflow from the project (including leakage) would be equal to, on a daily volumetric basis, 98.7 percent of the minimum flow required by the Commission to be released at the downstream Conowingo Project, or inflow to Lake Aldred, whichever is less. There would also be a continuous minimum flow from the project of 800 cfs, as per the recent agreement with the licensee of the downstream Conowingo Project. Because the current project has no minimum flow requirements (except for leakage) the proposed and recommended minimum flows would have positive effects on downstream water quality and aquatic habitat.

PPL, however, has not provided details on how some of these releases would be made. For example, it is not clear what the schedule for Unit 1 releases into Piney Channel would be, and how leakage flows would be maintained in the bypassed reach. The licensee provided a draft MSFOP in its June 13, 2008 response to Pennsylvania DEP,

which included many details of how minimum flow releases would be provided. However, this plan was in draft form and did not include agency comments on the plan. There also appears to be recent additions to the proposed minimum flows (for example the continuous minimum flow of 800 cfs). Therefore, we recommend that a final MSFOP be filed with the Commission for approval, which would include PPL's specific plans for minimum flow releases into the tailrace, Piney Channel, and bypassed reach, plans for monitoring minimum flows, and for making future modifications to those flows. We would not expect that preparation of a final plan would add to the project costs as PPL would need to provide a final plan to Pennsylvania DEP.

Tailrace DO Monitoring Plan

Amendment of the project would result in a major re-distribution of flows from the bypassed reach into the tailrace, and installation of new generating units and a new powerhouse adjacent to the existing powerhouse. The licensee provided data that show the existing generating units provide some aeration during water passage through the units of from 0.2 to 0.8 mg/L. The new units, which would be of modern, more efficient design, would not likely provide any aeration through the units. Assuming that these units, would be preferentially operated during the low-flow summer months, their operation could result in reduced DO levels in the tailrace compared to existing conditions. Current DO levels in the tailrace generally meet state standards, but PPL has already proposed to conduct water quality monitoring in the tailrace, in response to Pennsylvania DEP concerns about potential DO reductions when the new units become operational. We agree that a DO monitoring program should be conducted in the tailrace once the amended project begins operation, to ensure that DO levels continue to meet state standards. If state standards are not maintained, the licensee would be required to implement measures to improve DO in the project tailrace releases. We estimate that a DO monitoring plan would add about $5,000 to the cost of the minimum streamflow implementation plan to maintain and protect existing and designated uses and implement water quality standards. This would be a reasonable cost for ensuring that state DO standards are continued to be met in the project tailrace.

Wetlands Mitigation Plans

Construction of the proposed project would permanently eliminate 1.24 acres (54,000 square feet) of wetlands. PPL proposes to replace the lost wetlands at a suitable location to be determined in consultation with the Corps and Pennsylvania DEP. In its comments on the draft EIS, PPL indicates that it has agreed to construct a wetlands mitigation project along Landis Run in Manheim Township and that details would be provided to the Commission after they are finalized in consultation with Pennsylvania DEP. We agree that PPL would need to replace wetlands that would be eliminated by construction of the new facilities. FWS also recommends that PPL prepare and implement prior to project construction a revised detailed compensatory mitigation plan to offset any unavoidable effects on fish and wildlife habitat, including river and wetland

habitat due to project construction and operation approved by FWS, Pennsylvania DEP, Corps, and Pennsylvania FBC. We conclude that the project-wide plans proposed by FWS are not needed and would be duplicative of proposed plans that address the effects of the proposed amendment. We discuss our recommendations relative to FWS's recommended compensatory mitigation plan in section 5.2, *Recommendations of Fish and Wildlife Agencies.*

Protection of Special-status Plants

Construction of the new facilities would affect American holly and white doll's daisy special-status plants. Pennsylvania DCNR requested and PPL has agreed to provide irrigation flows of approximately 1,000 cfs for 1 hour on days when river flows are between 31,000 and 61,500 cfs. PPL proposes and Pennsylvania DNR recommends a long-term monitoring program of wetlands and state threatened and endangered plants in the river bed downstream of the dam to examine the effects of reductions in spill frequency on in-river resources and determine if any adjustments to planned flow release rates are warranted to ensure the continued protection of the river area and special status plants. Although we do not expect operations to affect special-status plant populations, individual plants would be disturbed by some of the construction activities. Therefore, we recommend that the final monitoring plan be filed with the Commission for approval. The cost of the proposed irrigation flows and monitoring plan are included in PPL's overall cost estimate for the construction and operation of the project as amended.

Whitewater Boating

The proposed amendment would reduce flows over the Holtwood dam and affect existing opportunities for whitewater boating in the bypassed reach downstream of the project. The whitewater agreement specifies flows that would provide 264 hours of whitewater boating, similar to existing conditions, and calls for the construction of two new features that would replace features where use would be diminished by the reduced flows over the dam. The whitewater agreement provides for future maintenance of the new features as well as an evaluation of the potential effect of the features and boating flows in Piney Channel and the tailrace on the migratory fish program. Although the estimated cost of providing whitewater flows and features is considerable, continuing to provide comparable whitewater experiences is valuable to the well-established local boating organizations.

Recreational Enhancements and Monitoring

The proposed amendment would restrict public access to existing recreational facilities during the 3-year construction period and could reduce boating access to Lake Aldred during drought operations. PPL proposes a suite of recreational enhancements to existing recreational facilities, including extending public boat ramps on Lake Aldred as well as several new facilities to provide additional boating and fishing access downstream of the project. The proposed enhancements would allow boating access to Lake Aldred

during the infrequent periods when operations under drought conditions cause reservoir levels to go below the levels accessible by the existing public boat ramps. The new and expanded facilities would help to meet future demand for recreation on the project waters. The costs for these facilities are included in PPL's overall construction estimate and would be justified by the public benefit of increased recreational opportunities at the project. However, we note that recreational use has declined over the past 5 years and recommend, in addition to the proposed facilities, that PPL develop and implement a recreational use monitoring plan. We expect the estimated annual cost for recreational use monitoring would be relatively minor over the term of any amended license.

Historic Property Management Plan

The proposed amendment would involve excavation near areas that contain archeological sites and would alter the physical characteristics of the Holtwood dam and powerhouse complex. PPL proposes to prepare a historic property management plan in consultation with the SHPO. Implementation of a historic property management plan would ensure that construction activities would avoid archaeologically sensitive areas and that the designs for new powerhouse and dam features would avoid altering the characteristics that qualify the dam and powerhouse for listing in the National Register. Therefore, we recommend that PPL file the final historic property management plan with the Commission for approval. The estimated cost of such a plan is included in PPL's overall cost of construction and operation of the amended project.

5.2 RECOMMENDATIONS OF FISH AND WILDLIFE AGENCIES

Under the provisions of section 10(j) of the FPA, each hydroelectric license issued by the Commission shall include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, or enhancement of fish and wildlife resources affected by the project.

Section 10(j) of the FPA states that, whenever the Commission believes that any fish and wildlife agency recommendation is inconsistent with the purposes and the requirements of the FPA or other applicable law, the Commission and the agency shall attempt to resolve any such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency. In response to our Ready for Environmental Analysis notice, the following fish and wildlife agencies submitted recommendations for the project: Interior (letter filed April 16, 2008) and Pennsylvania FBC (letter filed May 2, 2008).

Table 26 lists the federal and state recommendations filed subject to section 10(j), and whether the recommendations are adopted under the staff alternative. Environmental recommendations that we consider outside the scope of section 10(j) have been considered under section 10(a) of the FPA and are addressed in the specific resource sections of this document and the previous section.

Table 26. Analysis of fish and wildlife agency 10(j) recommendations for the Holtwood Project. (Source: Staff)

Recommendation	Agency	Within the scope of section 10(j)	Annualized cost	Adopted?
1. For a period of 5 years beginning when the new hydroelectric units become operational, operate the fish passage system from April 1 through June 30 to allow passage of resident fish.	Pennsylvania FBC	Yes	**a**	Yes
2. For a period of 5 years beginning when the new hydroelectric units become operational, operate the fish passage system from September 1 to October 15, to allow passage of resident fish.	Pennsylvania FBC	Yes	$13,080	Yes, followed by evaluation of that passage.
3. During the first 5 years, beginning when the new units become operational, count and identify resident fish and provide daily and annual monitoring reports by December 31 to the resource agencies.	Pennsylvania FBC	No, not a specific measure to protect fish and wildlife resources.	$8,050	Yes
4. At the end of the first 5 years of operation of the new units, discuss whether modifications to the fish passage system operation for resident fish are necessary and/or whether to continue to operate the fish passage system as it was operated during the initial 5-year period.	Pennsylvania FBC	Yes	$630	Yes

Recommendation	Agency	Within the scope of section 10(j)	Annualized cost	Adopted?
5. Continue to participate in the Holtwood Fish Passage Technical Advisory Committee as required under the 1993 Settlement Agreement including an annual fish passage report.	Interior	No, not a specific measure for the protection of fish and wildlife.	**a**	Yes
6. Develop and implement a plan to minimize unavoidable impacts to river and wetlands from project construction and operation.	Interior	Yes	**a**	Yes
7. Develop and implement an eagle management and monitoring plan.	Interior	Yes	**a**	Yes
8. Prepare and implement prior to project construction a revised detailed compensatory mitigation plan to offset any unavoidable effects on fish and wildlife habitat, including river and wetland habitat, due to project construction and operation approved by FWS, Pennsylvania DEP, Corps, and Pennsylvania FBC.	Interior	Yes, following clarification by FWS during the 10(j) process that this measure was only related to maintaining shad passage during construction.	**b**	Yes
9. Develop and implement a post-construction monitoring plan for compensatory mitigation projects approved by FWS, Pennsylvania DEP, Corps, and Pennsylvania FBC.	Interior	Yes, following clarification by FWS during the 10(j) process that this measure was only related to maintaining shad passage during construction.	**b**	Yes

Recommendation	Agency	Within the scope of section 10(j)	Annualized cost	Adopted?
10. Develop a shoreline management plan for licensee-owned lands abutting project waters within 330 feet of the high water elevation that encompasses the preferred buffer zone width for the protection of avian and terrestrial species of concern.	Interior	Yes	**a**	Yes, in part.

[a] These costs are included in PPL's overall cost of environmental measures.

[b] These costs cannot be estimated at this time, but would be dependent on the magnitude of any losses that may occur.

The Commission staff made a preliminary determination that part of two recommendations by Interior and part of one recommendation by Pennsylvania FBC may be inconsistent with the purpose and requirements of the FPA or other applicable laws.

Evaluation of Resident Fish Passage

Pennsylvania FBC recommends an evaluation of the 5 years of resident fish passage during the spring and fall periods at the end of the 5-year period, and whether modifications to the fish passage system are necessary for resident fish, and absent modifications, to continue to operate the fish passage system as it was operated during the initial 5-year period. We agree that there should be an evaluation of the 5 years of springtime resident fish passage, and now agree with 5 years of experimental fall operations to determine if fall operations would serve any biological benefit, followed by an evaluation of whether resident fish passage should continue during the fall period. If operations indicate little passage during the fall period, fall passage may not be required. We estimate that the cost of operating the fish lifts during the fall period would be $13,080 per year, and if minimal passage is occurring, there would be little biological basis for continuing this operation. The Pennsylvania FBC recommendation does not allow for the potential termination of fall operations, so while we agree with 5 years of fall fish lift operation, we also believe that this operation should only continue if there is a biological basis for doing so.

Development of Compensatory Mitigation Plans

Interior recommends development of a plan to minimize unavoidable impacts to the river and wetlands from project construction and operation, and a revised detailed compensatory mitigation plan to offset any unavoidable impacts on fish and wildlife habitat, including river and wetland habitat, due to project construction and operation.

We did not recommend these plans in the draft EIS because we believe that they would be duplicative of other plans that we recommend for development associated with construction and operation of the amended project. However, as a result of additional consultations with the FWS during the section 10(j) process, FWS clarified that this recommendation for a compensatory mitigation plan was related primarily to assuring that upstream passage of American shad during the construction of the Holtwood Project expansion would be no less efficient than during the previous 11 years of operation of the Holtwood fish lifts. We agree that the efficiency of shad passage during project construction should be maintained at this minimum level, and generally agree with FWS's concept for mitigating any adverse effects on passage that may occur. Thus, we now recommend that PPL prepare a plan to mitigate for any adverse construction effects that would reduce the efficiency of the Holtwood fish lifts during the 3-year construction period. PPL should prepare this plan for Commission approval, after consultations among the agencies, PPL, and the Conowingo licensee immediately after the conclusion of the spring fish passage operations. The plan would be filed with the Commission for approval by September 1 for any construction year that the target fish passage efficiency is not met. Mitigation would occur in the following spring and could involve either additional shad fry hatchery production or trucking of additional adult shad from the Conowingo Project.

Shoreline Management Plan

PPL proposes to develop a land and shoreline management plan for project lands. Interior recommends that PPL develop a shoreline management plan specifically for licensee-owned lands abutting project waters within 330 feet of the high water elevation (a distance that encompasses the preferred buffer zone width for species of concern, avian and terrestrial, at the project). However, within the existing project boundary, in all but about 5 percent of the shoreline, there is at least a 200-foot forested buffer around the river. Although we generally agree with FWS about the provisions that should be included in a shoreline management plan, we disagree that all project lands within 330 feet of the high water elevation need to be included in the plan. We conclude that the shoreline buffer would not need to extend the 330-feet along the entire project reservoir and reach immediately downstream of the project to provide adequate protection of project resources. These areas may be less or greater than a 330-foot buffer zone, depending on project resources and access. Therefore, assessment of the lands needed for inclusion within the project boundary for project purposes and protection of resources affected by the project as part of the development of the plan would help to establish the locations where such a shoreline buffer would require adjustment of the existing project boundary. In addition, this assessment would identify locations where the existing project boundary may not encompass new project-related recreation access facilities that are developed as part of the proposed action, such as the new tailrace access area and access road. For these reasons, we determined that the part of the FWS recommendation dealing with the 330-foot buffer to be included in the shoreline management plan may be

inconsistent with the public interest standard of section 4(e) and the comprehensive planning standard of section 10(a) of the FPA.

5.3 CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2) of the FPA, 16 U.S.C., § 803(a)(2)A), requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. We reviewed 5 state and 8 federal plans that are applicable to the Holtwood Project, located in Pennsylvania. No inconsistencies were found.

- National Marine Fisheries Service. 2000. Fishery Management Report No. 36 of the Atlantic States Marine Fisheries Commission: Interstate Fishery Management Plan for American eel (*Anguilla rostrata*). Prepared by the American Eel Plan Development Team. April 2000. 78 pages.
- National Marine Fisheries Service. 2000. Technical addendum 1 to amendment 1 of the interstate fishery management plan for shad and river herring. February 9, 2000. 6 pages.
- National Marine Fisheries Service. 1999. Fishery Management Report No. 35 of the Atlantic States Marine Fisheries Commission: Shad and river herring [includes alewife (*Alosa pseudoharengus*), Blueback herring (*Alosa aestivalis*), Alabama shad (*Alosa alabamae*), American shad (*Alosa sapidissima*), and Hickory shad (*Alosa mediocris*)]—Amendment 1 to the Interstate Fishery Management Plan for shad and river herring. April 1999. 77 pages.
- Pennsylvania Department of Environmental Resources. 1990. The Pennsylvania scenic rivers program scenic rivers inventory. Harrisburg, Pennsylvania. April 1990.
- Pennsylvania Department of Environmental Resources. 1988. Pennsylvania 1988 water quality assessment. Harrisburg, Pennsylvania. April 1988. Three volumes.
- Pennsylvania Department of Environmental Resources. 1986. Pennsylvania's recreation plan, 1986-1990. Harrisburg, Pennsylvania. 224 pp. and appendices.
- Pennsylvania Department of Environmental Resources. 1983. Pennsylvania state water plan. Harrisburg, Pennsylvania. January 1983. 20 volumes.
- Susquehanna River Basin Commission. 1987. Comprehensive plan for management and development of the water resources of the Susquehanna River Basin. Harrisburg, Pennsylvania. June 1987. 153 pp. and appendices.
- U.S. Fish and Wildlife Service. 1992. Chesapeake Bay American eel fishery management plan. Annapolis, Maryland. December 18, 1992.
- U.S. Fish and Wildlife Service. 1989. Chesapeake Bay Alosid (shad and river herring) management plan. Annapolis, Maryland. July 1989.

- U.S. Fish and Wildlife Service. 1986. Canadian Wildlife Service. North American waterfowl management plan. Department of the Interior. Environment Canada. May 1986.
- U.S. Fish and Wildlife Service. 1983. Northern states bald eagle recovery plan. Denver, Colorado. pp76. and appendices.
- U.S. Fish and Wildlife Service. No date. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Washington, D.C. 11 pp.

We also reviewed a draft comprehensive plan by SRBC that would replace the 1987 comprehensive plan for the Susquehanna River.

- Susquehanna River Basin Commission. 2008. Comprehensive Plan for the Water Resources of the Susquehanna River Basin. Draft plan issued for comment in May 2008. 112 pp. plus appendices.

The Susquehanna River Basin Compact was enacted in December 1970 as Public Law 91-575 and joined the federal government and the states of New York, Pennsylvania, and Maryland as equal partners for a period of 100 years to manage the Susquehanna basin's water resources through proper planning, development and regulation. The Compact created SRBC as the single administrative agency to develop, effectuate, coordinate and adopt plans, policies, and programs related to water resources of the basin. SRBC was authorized to adopt a comprehensive plan for the immediate and long-term development and use of the water resources of the basin. The comprehensive plan provides a framework for SRBC to manage and develop the basin's water resources and serves as a guide for all SRBC programs and activities.

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