

**COVER SHEET**

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR  
AMENDMENT TO LICENSE  
HOLTWOOD HYDROELECTRIC PROJECT  
Docket No. P-1881-050

Cover Letter (and other information before the Table of Contents)

FEIS



**Federal Energy  
Regulatory  
Commission**

**Office of  
Energy  
Projects**

**November 2008**

**FERC/EIS-0224F**

**Final Environmental Impact Statement for License Amendment**



**Holtwood Hydroelectric Project  
FERC Project No. 1881-050, Pennsylvania**

**Federal Energy Regulatory Commission  
888 First Street N.E.  
Washington, DC 20426**



FERC/EIS-0224F

**FINAL ENVIRONMENTAL IMPACT STATEMENT  
FOR AMENDMENT TO LICENSE**

Holtwood Hydroelectric Project—FERC Project No. 1881-050  
Pennsylvania

Federal Energy Regulatory Commission  
Office of Energy Projects  
Division of Hydropower Administration and Compliance  
888 First Street, NE  
Washington, DC 20426

November 2008



FEDERAL ENERGY REGULATORY COMMISSION  
WASHINGTON, DC 20426

OFFICE OF ENERGY PROJECTS

To the Agency or Individual Addressed:

**Reference: Final Environmental Impact Statement**

Attached is the final environmental impact statement (EIS) for the Holtwood Hydroelectric Project (FERC Project No. 1881-050), located on the Susquehanna River in Lancaster and York counties, Pennsylvania.

This EIS documents the views of governmental agencies, non-governmental organizations, affected Indian tribes, the public, the license applicant, and the Federal Energy Regulatory Commission (Commission) staff. It contains staff evaluations of the applicant's proposal and the alternatives for an application for a license amendment for the Holtwood Hydroelectric Project.

Before the Commission makes a decision on the amendment application, it will take into account all concerns relevant to the public interest. The EIS will be part of the record from which the Commission will make its decision. The EIS was sent to the U.S. Environmental Protection Agency and made available to the public on or about October 31, 2008. Copies of the EIS are available for review in the Commission's Public Reference Branch, Room 2A, located at 888 First Street, N.E., Washington DC 20426. The EIS also may be viewed on the Internet at [www.ferc.gov/ferris.htm](http://www.ferc.gov/ferris.htm). Please call 202-502-8222 or TTY 202-208-1659 for assistance.

Attachment: Final Environmental Impact Statement

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**COVER SHEET**

- a. Title: Amending the license to increase the installed capacity of the Holtwood Hydroelectric Project, FERC Project No. 1881-050
- b. Subject: Final Environmental Impact Statement
- c. Lead Agency: Federal Energy Regulatory Commission
- d. Abstract: On December 20, 2007, PPL Holtwood, LLC (PPL or licensee) filed an application for an amendment to its license for the Holtwood Hydroelectric Project located on the Susquehanna River in Lancaster and York counties, Pennsylvania. PPL proposes to redevelop the Holtwood Hydroelectric Project by constructing a new powerhouse, installing new generation, and reconfiguring the project to improve upstream fish passage, particularly for American shad. PPL also requests that the license term be extended by 16 years to August 31, 2030.
- PPL proposes to amend the project consistent with the Consent Order and Agreement (COA) between PPL and the Pennsylvania Department of Environmental Protection, dated November 21, 2007. The COA would require PPL to implement various fish passage improvements at the project as well as minimum flow provisions and recreational enhancements. PPL would also implement a settlement agreement with representatives of whitewater boating organizations, dated June 13, 2008.
- The staff's recommendation is to amend the project license as proposed, with certain modifications, and additional measures recommended by the agencies.
- e. Contact: **Commission Staff Contact**
- Blake Condo  
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Washington, DC 20426  
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- f. Transmittal: This final environmental impact statement prepared by the Commission's staff on the hydroelectric application to amend the license filed by PPL for the existing Holtwood Hydroelectric Project (FERC Project No. 1881-050) is being made available to the public on or about October 31, 2008, as required by the National Environmental Policy Act.<sup>1</sup>

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<sup>1</sup> National Environmental Policy Act of 1969, as amended (Pub. L. 91-190, 42 U.S.C. § 4321 *et seq.*, January 1, 1970).

## FOREWORD

The Federal Energy Regulatory Commission (Commission), pursuant to the Federal Power Act (FPA)<sup>2</sup> and the U.S. Department of Energy Organization Act<sup>3</sup> is authorized to issue licenses for up to 50 years for the construction and operation of non-federal hydroelectric development subject to its jurisdiction, on the necessary conditions:

That the project...shall be such as in the judgment of the Commission will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce, for the improvement and utilization of water-power development, for the adequate protection, mitigation, and enhancement of fish and wildlife (including related spawning grounds and habitat), and for other beneficial public uses, including irrigation, flood control, water supply, and recreational and other purposes referred to in section 4(e)...<sup>4</sup>

The Commission may require such other conditions not inconsistent with the FPA as may be found necessary to provide for the various public interests to be served by the project.<sup>5</sup> Compliance with such conditions during the licensing period is required. The Commission's Rules of Practice and Procedure allow any person objecting to a licensee's compliance or noncompliance with such conditions to file a complaint noting the basis for such objection for the Commission's consideration.<sup>6</sup>

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<sup>2</sup> 16 U.S.C. §791(a)-825r, as amended.

<sup>3</sup> Public Law 95-91, 91 Stat. 556 (1977).

<sup>4</sup> 16 U.S.C. §803(a).

<sup>5</sup> 16 U.S.C. §803(g).

<sup>6</sup> 18 C.F.R. §385.206 (1987).

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**COVER SHEET**

**FINAL ENVIRONMENTAL IMPACT STATEMENT FOR  
AMENDMENT TO LICENSE**

**HOLTWOOD HYDROELECTRIC PROJECT**

**Docket No. P-1881-050**

Table of Contents  
Pages ix through xviii

FEIS

**TABLE OF CONTENTS**

LIST OF FIGURES ..... xiii

LIST OF TABLES..... xv

ACRONYMS AND ABBREVIATIONS..... xvii

EXECUTIVE SUMMARY ..... xix

1.0 INTRODUCTION ..... 1

    1.1 APPLICATION..... 1

    1.2 PURPOSE OF ACTION AND NEED FOR POWER..... 1

        1.2.1 Purpose of Action ..... 1

        1.2.2 Need for Power ..... 3

    1.3 STATUTORY AND REGULATORY REQUIREMENTS ..... 4

        1.3.1 Federal Power Act ..... 5

            1.3.1.1 Section 18 Fishway Prescription ..... 5

            1.3.1.2 Section 10(j) Conditions ..... 5

        1.3.2 Clean Water Act ..... 5

        1.3.3 Section 404 Permit ..... 6

        1.3.4 Essential Fish Habitat ..... 7

        1.3.5 Endangered Species Act ..... 7

        1.3.6 Coastal Zone Management Act ..... 7

        1.3.7 National Historic Preservation Act..... 7

    1.4 PUBLIC REVIEW AND CONSULTATION..... 8

        1.4.1 Scoping ..... 8

        1.4.2 Comments on the License Application and Interventions ..... 10

        1.4.3 Comments on the Draft Environmental Impact Statement ..... 11

2.0 PROPOSED ACTION AND ALTERNATIVES..... 13

    2.1 NO-ACTION ALTERNATIVE ..... 13

        2.1.1 Existing Project Facilities..... 13

        2.1.2 Existing Project Operation ..... 14

    2.2 APPLICANT’S PROPOSAL ..... 16

        2.2.1 Proposed Project Facilities and Construction Activities ..... 16

        2.2.2 Proposed Operational Modifications..... 19

        2.2.3 Proposed Environmental Measures ..... 20

        2.2.4 Construction Schedule..... 21

        2.2.5 Project Safety..... 21

        2.2.6 Modifications to Applicant’s Proposal—Mandatory Conditions.. 22

            2.2.6.1 Section 18 Prescription ..... 22

            2.2.6.2 Water Quality Certification Conditions..... 27

    2.3 STAFF ALTERNATIVE ..... 28

- 2.4 OTHER ALTERNATIVES..... 28
- 2.5 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS ..... 28
  - 2.5.1 Installation of a New Powerhouse on the Western (York County) Side of the River..... 28
  - 2.5.2 Installation of a Barrier Dam for Migratory Fish Guidance..... 28
- 3.0 ENVIRONMENTAL ANALYSIS..... 29
  - 3.1 GENERAL SETTING..... 29
  - 3.2 SCOPE OF CUMULATIVE EFFECTS ANALYSIS ..... 30
    - 3.2.1 Geographic Scope..... 30
    - 3.2.2 Temporal Scope..... 31
  - 3.3 PROPOSED ACTION AND ACTION ALTERNATIVES ..... 31
    - 3.3.1 Engineering Review ..... 31
    - 3.3.2 Geology and Soils..... 38
      - 3.3.2.1 Affected Environment..... 38
      - 3.3.2.2 Environmental Effects ..... 39
      - 3.3.2.3 Unavoidable Adverse Effects ..... 41
    - 3.3.3 Aquatic Resources ..... 42
      - 3.3.3.1 Affected Environment..... 42
      - 3.3.3.2 Environmental Effects ..... 53
      - 3.3.3.3 Cumulative Effects ..... 83
      - 3.3.3.4 Unavoidable Adverse Effects ..... 86
    - 3.3.4 Terrestrial Resources ..... 86
      - 3.3.4.1 Affected Environment..... 86
      - 3.3.4.2 Environmental Effects ..... 91
      - 3.3.4.3 Cumulative Effects ..... 98
      - 3.3.4.4 Unavoidable Adverse Effects ..... 98
    - 3.3.5 Recreational Resources ..... 98
      - 3.3.5.1 Affected Environment..... 98
      - 3.3.5.2 Environmental Effects ..... 108
      - 3.3.5.3 Unavoidable Adverse Effects ..... 118
    - 3.3.6 Land Use and Aesthetic Resources ..... 118
      - 3.3.6.1 Affected Environment..... 118
      - 3.3.6.2 Environmental Effects ..... 120
      - 3.3.6.3 Unavoidable Adverse Effects ..... 123
    - 3.3.7 Cultural Resources..... 123
      - 3.3.7.1 Affected Environment..... 123
      - 3.3.7.2 Environmental Effects ..... 129
      - 3.3.7.3 Unavoidable Adverse Effects ..... 131
- 4.0 DEVELOPMENTAL ANALYSIS ..... 133
  - 4.1 ECONOMICS OF THE NO-ACTION ALTERNATIVE ..... 134

4.2 ECONOMICS OF THE PROPOSED ALTERNATIVE ..... 134

4.3 ECONOMICS OF THE STAFF-RECOMMENDED ALTERNATIVE.. 134

4.4 COMPARISON OF ALTERNATIVES..... 134

5.0 STAFF’S CONCLUSIONS ..... 137

5.1 COMPREHENSIVE DEVELOPMENT AND RECOMMENDED  
ALTERNATIVE ..... 137

5.2 RECOMMENDATIONS OF FISH AND WILDLIFE AGENCIES..... 147

5.3 CONSISTENCY WITH COMPREHENSIVE PLANS..... 152

6.0 LITERATURE CITED..... 155

7.0 LIST OF PREPARERS ..... 159

8.0 LIST OF RECIPIENTS..... 161

APPENDIX A—CONSENT ORDER AND AGREEMENT MEASURES

APPENDIX B—COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT  
STATEMENT FOR THE HOLTWOOD HYDROELECTRIC  
PROJECT NO. 1881-050

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## LIST OF FIGURES

Figure 1.	Location of the Holtwood Project and other facilities on the lower Susquehanna River.....	2
Figure 2.	General view of existing and proposed facilities at the Holtwood Project.	17
Figure 3.	Detailed view of proposed and existing facilities at the Holtwood Project	32
Figure 4.	Abandoned Holtwood rock ramp spillway fishway (top) and tailrace fishway (bottom), constructed circa 1910.....	48
Figure 5.	Upstream fish passage facilities at the Holtwood Project, showing the proposed Unit 1 draft tube extension.....	50
Figure 6.	Proposed post-recreation season drought operations rule curve for the 44 acre-feet compensation flows.....	54
Figure 7.	3-D modeling of the upper tailrace area of the Holtwood Project under full generation.....	60
Figure 8.	2-D modeling of the lower tailrace area of the Holtwood Project under full generation.....	60
Figure 9.	Calculated tailwater rating curves for existing and proposed conditions ...	61
Figure 10.	2-D modeling results for velocity in the Piney Channel and bypassed reach with a proposed release of 3,150 cfs from Unit 1.....	61
Figure 11.	Critical operational elevations in the Conowingo reservoir.....	63
Figure 12.	Location of public recreation areas at the Holtwood Project.....	99

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## LIST OF TABLES

Table 1.	Major statutory and regulatory requirements for the Holtwood Project .....	4
Table 2.	Description of Interior’s preliminary fishway prescription for the Holtwood Project.....	22
Table 3.	Estimated decibel (dBA) levels at various distances from sound emission sources with levels above, equal to, and below the EPA criterion for noise safety .....	37
Table 4.	Mean monthly flows (cfs) from 1931–2005 at the Holtwood Project .....	42
Table 5.	Percent of time flow exceeded the project hydraulic capacity under current conditions at the Holtwood Project .....	44
Table 6.	Maximum discharge and usable storage at nearby hydroelectric facilities.	45
Table 7.	Summary of American shad passage on the Susquehanna River, 1997–2008 .....	51
Table 8.	Comparison of American shad passage at the Conowingo and Holtwood projects, 1997–2008 .....	51
Table 9.	Conowingo Project licensed minimum flows, and minimum flows (cfs) that would be released from the Holtwood Project to meet the 98.7 percent requirement.....	55
Table 10.	Lake Aldred water surface elevation (feet) with proposed daily volumetric minimum flow releases, conservation releases, and with drought operations with the QFERC trigger .....	56
Table 11.	Inflow (cfs) to Lake Aldred based on data from USGS gage no. 01576000 Susquehanna River at Marietta, Pennsylvania .....	57
Table 12.	Average monthly and annual spillage over Holtwood dam under current and proposed project operations.....	58
Table 13.	Flow velocities and depths in Piney Channel from Unit 1 releases.....	62
Table 14.	Recreation season modeled end-of-day Conowingo reservoir levels .....	64
Table 15.	Flows ranked, lowest to highest, with corresponding fish passage efficiency .....	71
Table 16.	Special-status plant species with the potential to occur in the Holtwood Project area .....	88
Table 17.	Special-status wildlife species with the potential to occur in the Holtwood Project area .....	90
Table 18.	Estimated recreation use at the Holtwood Environmental Preserve by recreation site (2001–2006).....	104
Table 19.	Estimated boatable flow range at primary whitewater features .....	106
Table 20.	Estimate of average number of boating days under existing conditions...	107
Table 21.	Summary of Lake Aldred minimum elevations under proposed conditions .....	110
Table 22.	Estimated boatable flow range at primary whitewater features under the proposed operations.....	115

Table 23. Summary of changes to annual whitewater boating days by whitewater boating feature ..... 116

Table 24. Assumptions for the economic analysis of the Holtwood Project ..... 133

Table 25. Summary of developmental costs, benefits, and annual net power benefits for the Holtwood Project alternatives..... 135

Table 26. Analysis of fish and wildlife agency 10(j) recommendations for the Holtwood Project..... 148

## ACRONYMS AND ABBREVIATIONS

APE	area of potential effects
cfs	cubic feet per second
COA	Consent Order and Agreement of November 21, 2007
Commission	Federal Energy Regulatory Commission
Corps	U.S. Army Corps of Engineers
cy	cubic yards
dBA	decibel on the A-weighted scale
DC	direct current
DO	dissolved oxygen
EIS	environmental impact statement
El.	elevation
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
ESA	Endangered Species Act
°F	degrees Fahrenheit
FERC	Federal Energy Regulatory Commission
FOP	fishway operating plan
FPA	Federal Power Act
fps	feet per second
FWS	U.S. Fish and Wildlife Service
Interior	U.S. Department of the Interior
kV	kilovolt
licensee	PPL Holtwood, LLC
mg/L	milligram per liter
MSFOP	Minimum Stream Flow Operating Procedures
MW	megawatt
MWh	megawatt-hour
NAAQS	National Ambient Air Quality Standards
National Register	National Register of Historic Places
NAVD	North American Vertical Datum
PEM	palustrine emergent wetland
Pennsylvania DCNR	Pennsylvania Department of Conservation and Natural Resources
Pennsylvania DEP	Pennsylvania Department of Environmental Protection
Pennsylvania FBC	Pennsylvania Fish and Boat Commission
PFO	palustrine forested
PIT	passive integrated transponder tag
PJM	Pennsylvania-New Jersey-Maryland
PPL	PPL Holtwood, LLC

Reliability <i>First</i>	Reliability <i>First</i> Corporation
RM	river mile
SHPO	Pennsylvania State Historic Preservation Officer
SRBC	Susquehanna River Basin Commission
USGS	U.S. Geological Survey
whitewater agreement	Settlement agreement among PPL and Recreational Stakeholders of June 13, 2008
WQC	water quality certification

**COVER SHEET**

**FINAL ENVIRONMENTAL IMPACT STATEMENT FOR  
AMENDMENT TO LICENSE**

**HOLTWOOD HYDROELECTRIC PROJECT**

**Docket No. P-1881-050**

Executive Summary  
Pages xix through xxii

FEIS

## EXECUTIVE SUMMARY

PPL Holtwood, LLC (PPL or licensee) proposes to increase the installed capacity, increase the hydraulic capacity, and improve upstream fish passage at the Holtwood Hydroelectric Project (FERC Project No. 1881-050) (Holtwood Project or project), located on the lower Susquehanna River in Lancaster and York counties, Pennsylvania. The project primarily is used to meet the peak power demands within the Pennsylvania-New Jersey-Maryland Interconnection, with limitations on peaking generation set by natural inflows of the Susquehanna River, operations of the upstream Safe Harbor Hydroelectric Project, and available storage, as governed by seasonal recreational demands. The project does not occupy any federal lands.

### Proposed Action

The Holtwood Project currently consists of a 3,075-foot-long and 55-foot-high dam that impounds 8 miles of the Susquehanna River and a powerhouse with 10 turbines having a combined installed capacity of 107.2 megawatts (MW). The existing project is described in more detail in section 2.1.1.

PPL proposes to construct a new powerhouse, install new turbines, construct a new skimmer wall and larger forebay, and reconfigure the project facilities to enhance upstream fish passage through modification of existing facilities and excavations in the tailrace channel. The licensed installed capacity at the project would increase from 107.2 MW to a proposed 195.5 MW. To improve migratory fish passage at the project, PPL would (1) modify the existing fish lift; (2) reroute the discharge of Unit 1 in the existing powerhouse; and (3) excavate in the project tailrace and Piney Channel. PPL also proposes to provide minimum flows, perform studies and evaluations of the effectiveness of the fish passage improvements and flow releases, improve existing and construct new recreational facilities, and protect special status plants and wildlife and cultural resources during construction. The proposed action and environmental measures are described in more detail in section 2.2. Because of the substantial costs associated with the proposed modifications, PPL requests a 16-year extension of the current license term through August 31, 2030.

### Alternatives Considered

This final environmental impact statement (EIS) analyzes the effects of the proposed reconfiguration of the project and recommends conditions for a license amendment for the project. In addition to PPL's proposal, we consider two alternatives: (1) PPL's proposal with staff modifications, and (2) no action—continued operation of the project with no changes.

Under PPL's proposal with staff modifications, the project would be reconfigured as proposed by PPL, but would include defining the extent of in-water blasting prior to the initiation of construction activities that involve blasting; developing and implementing a recreational use monitoring plan; adding provisions to the land and



shoreline management plan; and requiring the filing of a sediment and erosion control plan, final excavation plan, bald eagle monitoring plan, and the final historic properties management plan with the Federal Energy Regulatory Commission (Commission) for approval prior to the commencement of construction.

### **Public Involvement and Areas of Concern**

Before filing its license amendment, PPL conducted pre-filing consultation with resource agencies. This consultation resulted in a Consent Order and Agreement between Pennsylvania Department of Environmental Protection and PPL, executed on November 21, 2007, that would allow reconfiguring the project to increase the installed and hydraulic capacities and require the implementation of fish passage improvements. After PPL filed the application for amendment, we, the Commission staff, conducted scoping to determine what issues and alternatives should be addressed in the EIS. We issued a scoping document to interested parties on March 17, 2008, and conducted two scoping meetings on April 17, 2008, in Holtwood and Lancaster, Pennsylvania. On February 21, 2008, we requested terms and conditions in response to the notice that the application was ready for environmental analysis. On April 16, 2008, Exelon Corporation and PPL jointly requested the comment date be extended an additional 2 weeks. We extended the deadline for filing comments to May 5, 2008, and the deadline for filing reply comments to June 19, 2008. On June 13, 2008, PPL and Recreational Stakeholders representing local boating organizations reached an agreement on whitewater boating issues.

The primary issues associated with the license amendment are whether the reconfiguration of the project would improve the success rate for upstream fish passage and whether existing whitewater boating opportunities would be preserved or enhanced.

### **Project Effects**

#### *Aquatic Resources*

Excavation and blasting would result in a decrease in aquatic habitat and an increase in fish mortality, while some fish would avoid important habitat areas and alter migration patterns in the short term. Over the long term, the improvements in the efficiency of the existing upstream fish passage would allow more American shad and other target species, including resident species, to move upstream of the project during the spring migration period.

#### *Terrestrial Resources*

The proposed action would permanently disturb 1.24 acres (54,000 square feet) of wetlands and 6 acres (261,360 square feet) of upland forest and could temporarily disturb bald eagles and osprey. Replacing wetlands at a suitable location, such as along Landis Run, and sequencing construction would minimize these effects. The proposed reconfigured flow release from Unit 1 could affect special status plants in the bypassed

reach. Proposed seasonal flow releases to the bypassed reach would affect some special-status plant species, and proposed monitoring would evaluate the effects of the new flow releases on these aquatic plants.

### *Recreation*

Increasing the installed and hydraulic capacities at the project would reduce existing flows over the spillway and reduce existing whitewater boating opportunities downstream of the dam. The agreement on whitewater boating would provide for whitewater boating flows that would replace comparable days of boating opportunities that would likely be lost under the proposed operations and add two new whitewater features that would replace features where use would be diminished by the reduced flows over the spillway. In addition the proposed whitewater boating agreement includes measures to ensure that potential adverse effects of the proposed action on the whitewater boating feature Storm Hole downstream of the project would be mitigated.

The proposed action would temporarily restrict access to some existing recreational facilities during construction. Water surface levels in Lake Aldred could fall below existing late summer levels during drought conditions under the proposed action. Extending new and existing boat ramps on Lake Aldred would allow continued access to the reservoir during drought conditions. Construction of new recreational facilities and improvement of existing facilities would enhance recreation opportunities and use.

### *Cultural Resources*

The proposed action could disturb archaeological sites and would change physical features of the Holtwood dam and powerhouse complex. A Memorandum of Agreement to implement a historic properties management plan would include procedures to protect archaeological sites in the project's area of potential effects and to ensure that the physical changes to the dam and powerhouse do not affect the characteristics that qualify these structures for listing in the National Register of Historic Places.

### *Land Use and Visual Resources*

The new powerhouse and expanded forebay would occupy land previously used for the production of energy and therefore would not affect current land uses; however, the ash basins proposed for the disposal of excavated materials would take up to 43 acres of land out of current agricultural use. Construction activities would introduce noise, air emissions, and night lighting in the project area, but these effects would be limited to the 3-year construction period. Designing the new and reconfigured features to be compatible with the existing dam and powerhouse would also avoid effects on the project's visual resources following construction.

Under the no-action alternative, the project's installed and hydraulic capacities would not change, the project's environmental conditions would remain the same, the

enhancements of fish passage and recreational facilities would not occur, and the license term would not change.

### **Conclusions**

Based on our analysis, we recommend approving the amendment as proposed by PPL with some staff modifications and additional measures. The recommended staff modifications include, or are based in part on, recommendations made by the federal and state resource agencies that have an interest in the resources that may be affected by the reconfiguration of the project. These modifications and additional measures include (1) defining the extent of in-water blasting prior to construction activities that involve blasting, (2) operating 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, (3) including specific provisions for mitigation of construction effects on fish passage efficiency of shad in the plan to maintain uninterrupted fish migration during construction, (4) developing and implementing a recreational use monitoring plan, (5) adding provisions to the land and shoreline management plan, and (6) requiring that final plans be filed with the Commission for approval prior to the commencement of construction.

In section 4.0 of the EIS, we estimate the annual net benefits of operating and maintaining the project under the three alternatives identified above. Our analysis shows that the annual net benefit would be about \$9 million for both the proposed action to amend the license and the staff alternative to the proposed action, and about \$35 million for the no-action alternative.

Constructing the new powerhouse and improved fish passage facilities, with our recommended measures, would (1) involve ground disturbance that would result in unavoidable short-term effects on sedimentation and turbidity in the Susquehanna River immediately upstream and downstream of the project during construction; (2) result in unavoidable fish entrainment and mortality; (3) temporarily limit access for fishing immediately upstream and downstream of the project; and (4) disturb 1.24 acres (54,000 square feet) of wetlands. Our recommended measures would ensure that state water quality standards are met. Project operation would improve upstream fish passage.

We chose the staff alternative as the preferred alternative because (1) the project would provide about 361,000 megawatt-hours annually of additional dependable electrical energy for the region; (2) the additional capacity would save the equivalent amount of fossil-fueled generation and capacity, thereby continuing to help conserve non-renewable energy resources and reduce atmospheric pollution, and (3) the recommended environmental measures proposed by PPL, as modified by staff, would enhance upstream fish passage and adequately protect environmental resources affected by the project. The overall benefits of the staff alternative to energy production and fish passage would be worth the cost of the proposed and recommended environmental measures.

**COVER SHEET**

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR  
AMENDMENT TO LICENSE  
HOLTWOOD HYDROELECTRIC PROJECT  
Docket No. P-1881-050

Section 1  
Introduction  
Pages 1 through 12

FEIS

## FINAL ENVIRONMENTAL IMPACT STATEMENT

Federal Energy Regulatory Commission  
Office of Energy Projects  
Division of Hydropower Administration and Compliance  
Washington, DC

### Holtwood Hydroelectric Project FERC Project No. 1881-050-PA

#### 1.0 INTRODUCTION

##### 1.1 APPLICATION

Application Type: Amendment of license to increase installed capacity  
Date Filed: December 20, 2007, and supplemented January 4, February 20, June 19, 2008, and October 3, 2008  
Applicant's Name: PPL Holtwood, LLC (PPL or licensee)  
Water body: Susquehanna River  
County and State: Lancaster and York counties, Pennsylvania  
Federal Lands: The project does not occupy any federal lands

##### 1.2 PURPOSE OF ACTION AND NEED FOR POWER

###### 1.2.1 Purpose of Action

The Holtwood Hydroelectric Project (Holtwood Project or project) is one of five hydroelectric projects on the lower Susquehanna River (figure 1). The 107.2-megawatt (MW) project has the lowest hydraulic capacity among the existing hydropower plants and almost half the hydraulic capacity of the upstream Safe Harbor Project. Fish passage facilities constructed in 1997 as a result of a 1993 agreement<sup>7</sup> among the upstream

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<sup>7</sup> *The 1993 Settlement and Agreement for the Development of Fish Passage Facilities at the Holtwood, Safe Harbor, and York Haven Projects in the Susquehanna River* was executed on June 1, 1993, among the Pennsylvania Power & Light Company, Safe Harbor Water Power Corporation, and York Haven Power Company, and U.S. Fish and Wildlife Service, U.S. Department of the Interior, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Resources, Maryland Department of Natural Resources, Susquehanna River Basin Commission, Upper Chesapeake Bay Watershed Association, and the Pennsylvania Federation of Sportsmen's Clubs. The Commission approved the Settlement Agreement on June 30, 1994. See 67 FERC ¶ 62, 291 (1994).

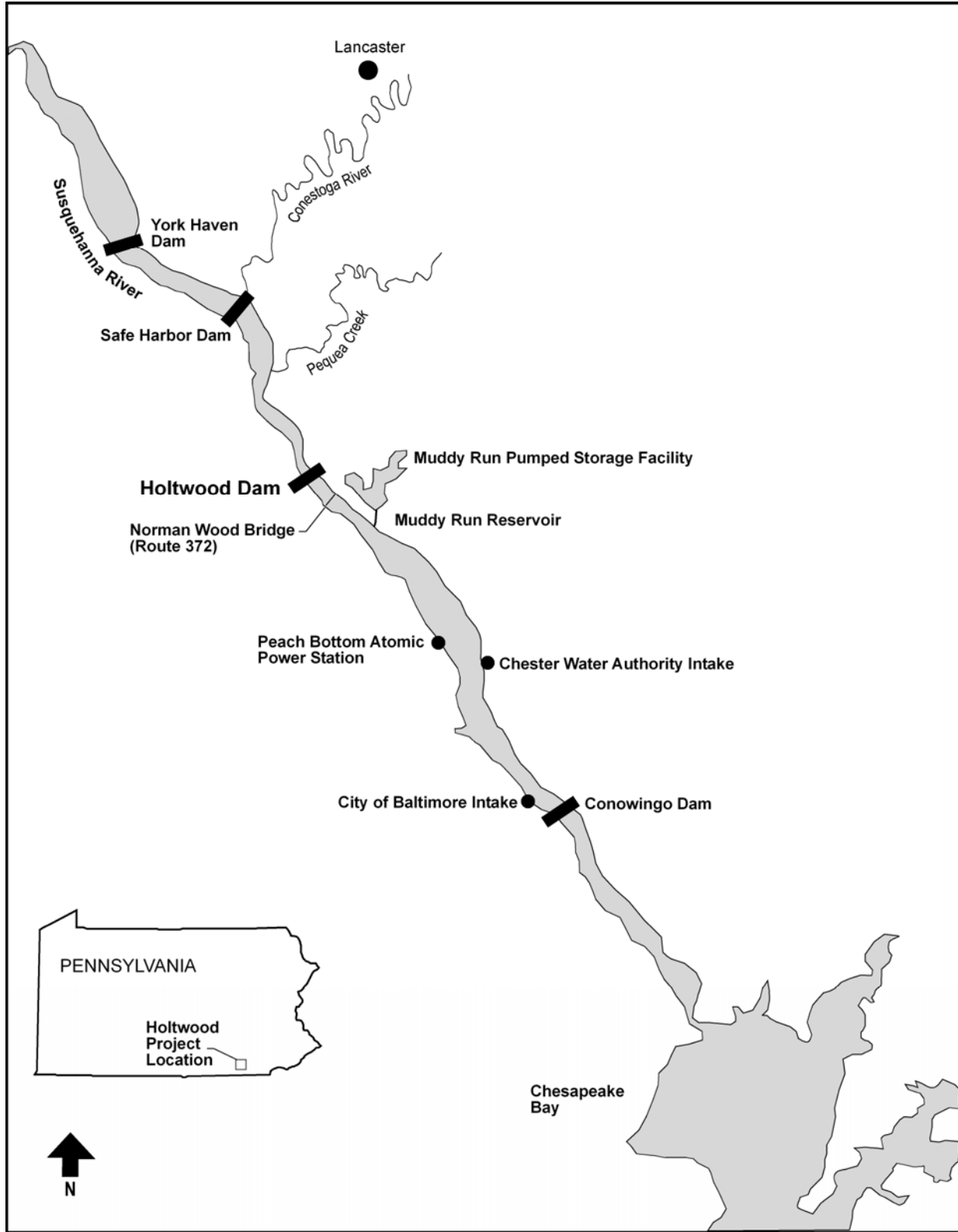


Figure 1. Location of the Holtwood Project and other facilities on the lower Susquehanna River. (Source: Rand McNally, 1999, as modified by staff).

Safe Harbor (FERC Project No. 1025) and York Haven (FERC Project No. 1888) projects and the Holtwood Project have not been effective in passing American shad upstream, especially during high flow periods, and are inhibiting the ability of other upstream projects from achieving the American shad restoration goals envisioned in the 1993 agreement. PPL has been engaged in discussions with resource agencies during the past 3 years to develop an agreement that would allow redevelopment of the project to increase the installed capacity and hydraulic capacity and reconfigure the project to improve the upstream fish passage. On November 21, 2007, Pennsylvania Department of Environmental Protection (Pennsylvania DEP) issued a Consent Order and Agreement (COA). The COA would require the implementation of various fish passage improvements at the project, as well as the provision of minimum flows and certain recreational facilities. The COA includes an appendix with partial preliminary water certification conditions as summarized in appendix A, table A-2, of this document.

The amendment requests that the Federal Energy Regulatory Commission (Commission or FERC): (1) increase the installed capacity of the project from 107.2 MW to 195.5 MW<sup>8</sup>; (2) increase the hydraulic capacity from 31,500 cubic feet per second (cfs) to 62,100 cfs; and (3) extend the license term by 16 years to August 31, 2030. The extension of license term would be set to expire at the same time as the upstream Safe Harbor Project. The existing Holtwood Project license will expire on September 1, 2014.

In this environmental impact statement (EIS) we assess the environmental effects of continuing to operate the project: (1) as proposed in the licensees' amendment application and (2) as currently licensed, which is the no-action alternative. Although the primary issue that we address is to provide improved upstream fish passage, particularly for American shad, we also consider other issues, such as aquatic and terrestrial habitat, cultural resources, and recreational use and access.

### **1.2.2 Need for Power**

The Holtwood Project is located within what is now the Reliability*First* Corporation (Reliability*First*) region of the North American Electric Reliability Corporation region. Prior to the consolidation of several North American Electric

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<sup>8</sup> The Commission issued an original license for the Holtwood Project on July 3, 1951. See Pennsylvania Power and Water Co., 10 FPC 1163 (1951). The authorized capacity when the project was re-licensed on August 14, 1980, was 107.2 MW. See Pennsylvania Power and Light Co. 21 FERC ¶ 61, 429 (1980). Since that time, the runners on six units were replaced with newer, more efficient designs, the generators on three units were rewound to higher ratings, and the two water-driven exciters were retired. The net result of these modifications increased the capacity of the project from 107.2 to 108.44 MW. The proposed project modifications would further increase the capacity of the project from 108.44 to 195.5 MW.

Reliability Corporation regions into the Reliability*First* region, the Holtwood Project was located within the Mid-Atlantic Area Council region.

Reliability*First* estimates that summer demand in the region will increase at an equivalent compound growth rate of 1.6 percent per year (29,300 MW) from 2007 to 2016 (Reliability*First*, 2006). The Reliability*First* region is heavily dependent on fossil-fueled generation, with 47 percent fueled by coal, 28 percent fueled by gas, and 7 percent fueled by oil. Nuclear power provides about 14 percent, with only 1 percent attributed to conventional hydroelectric facilities and about 2 percent provided by pumped storage hydroelectric facilities. The remaining 1 percent comes from a variety of other renewable and non-renewable fuel sources. Although some older facilities will be retired during the next 10 years and new facilities are expected to come online, the fuel-source mix percentages for the Reliability*First* region are not expected to change.

Pennsylvania's new Alternative Energy Portfolio Standards (PPUC, 2008) require that increasing amounts of power sold in Pennsylvania come from renewable resources (e.g., solar, hydro, wind). The power from the proposed expansion of the Holtwood Project may qualify as Tier 1 power under those standards. Of the projects currently expected to come online during the period 2007–2010, approximately 14 percent (2,116 MW) of the capacity will be from wind turbines (renewable energy), while the remainder will be from fossil-fuel facilities (non-renewable energy).

The proposed expansion of the Holtwood Project would increase current installed capacity by 87.06 MW and increase average annual generation by about 361,000 megawatt-hours (MWh), which would help the state of Pennsylvania achieve its renewable resource goals and provide needed energy that might otherwise be provided by fossil-fueled generation.

### 1.3 STATUTORY AND REGULATORY REQUIREMENTS

A capacity amendment for the Holtwood Project is subject to numerous requirements under the Federal Power Act (FPA) and other applicable statutes. We summarize the major regulatory requirements in table 1 and describe them below.

Table 1. Major statutory and regulatory requirements for the Holtwood Project.

<b>Requirement</b>	<b>Agency</b>	<b>Status</b>
Section 18 of the Federal Power Act (fishway prescription)	U.S. Department of the Interior	Interior filed a preliminary fishway prescription under section 18.
Section 10(j) of the Federal Power Act	U.S. Department of the Interior, Pennsylvania Fish and Boat Commission	Interior and Pennsylvania Fish and Boat Commission filed recommendations under section 10(j).



<b>Requirement</b>	<b>Agency</b>	<b>Status</b>
Clean Water Act	Pennsylvania Department of Environmental Protection	Appendix A of the Consent Order includes partial preliminary water quality certification conditions.
Clean Water Act	U.S. Army Corps of Engineers	PPL filed an application for a section 404 permit
Endangered Species Act	U.S. Fish and Wildlife Service	This draft EIS concludes that no threatened or endangered species are located in the project area.

### **1.3.1 Federal Power Act**

#### **1.3.1.1 Section 18 Fishway Prescription**

Section 18 of the FPA states that the Commission is to require construction, operation, and maintenance by a licensee of such fishways as may be prescribed by the Secretaries of Commerce or the U.S. Department of the Interior (Interior). On April 16, 2008, Interior filed a fishway prescription for the project. Interior's prescription is described under section 2.2.6, *Modifications to Applicant's Proposal—Mandatory Conditions*.

#### **1.3.1.2 Section 10(j) Conditions**

Under section 10(j) of the FPA, each hydroelectric license issued by the Commission must 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 proposed project. On April 16, 2008, and May 2, 2008, respectively, Interior and the Pennsylvania Fish and Boat Commission (Pennsylvania FBC) filed recommendations under section 10(j), as summarized in table 25 in section 5.2, *Recommendations of Fish and Wildlife Agencies*. In section 5.2, we also discuss how we address the agency recommendations and comply with section 10(j).

### **1.3.2 Clean Water Act**

Under section 401 of the Clean Water Act, a licensee applying for a capacity-related license amendment must obtain certification from the appropriate state pollution control agency verifying compliance with the Clean Water Act. Appendix A of the COA between Pennsylvania DEP and PPL includes partial preliminary water quality certification (WQC) conditions for the Holtwood Project. The COA specifies that if the final WQC contains conditions that are substantially the same as the proposed conditions in Appendix A, PPL will not challenge any of those conditions in any appeal of the final

WQC. These proposed conditions include three standard conditions applicable to all WQC conditions and specific conditions for fish passage operating procedures for upstream and downstream passage of diadromous and resident fish species, and minimum streamflows operating procedures for minimum flow releases in the bypassed reach, Piney Channel, tailrace, and from Lake Aldred. The preliminary water quality conditions are described in section 2.2.6, *Modifications to Applicant's Proposal—Mandatory Conditions*. PPL jointly applied to Pennsylvania DEP for a WQC and the U.S. Army Corps of Engineers (Corps) for a section 404 fill and dredge permit on January 30, 2008. The Pennsylvania DEP requested additional information from PPL to complete its application for a WQC on August 8, 2008, and filed a copy of its letter to PPL with the Commission.

### 1.3.3 Section 404 Permit

Section 404 of the Clean Water Act requires that anyone proposing to deposit or discharge dredged or fill material into waters of the United States, including wetlands, must receive authorization for such activities. These discharges include return water from dredged material disposed on upland property and generally any fill material like rock, sand, or dirt. Activities in wetlands for which permits may be required include, but are not limited to:

- placement of fill material;
- ditching activities when the excavated material is sidecast;
- levee and dike construction;
- mechanized land clearing;
- land leveling;
- most road construction; and
- dam construction.

Since the proposed construction of the new powerhouse and reconfiguration of the fish passage facilities are to take place within the project floodplain and wetlands, the proposed project may result in fill material being deposited in waters or wetlands of the United States or any activity in waters of the United States. PPL jointly applied to Pennsylvania DEP for a WQC and the Corps for a section 404 fill and dredge permit on January 30, 2008. The Corps received the section 404 permit application on February 12, 2008.

The Corps filed comments on September 9, 2008, and supplemented its comments on September 30, 2008. The comments, which included updated information on the status of several proposed measures that would affect wetlands and provided additional detail on potential effects on wetlands, are incorporated into the final EIS.

### **1.3.4 Essential Fish Habitat**

Pursuant to the amended Magnuson-Stevens Fishery Conservation and Management Act, the U.S. Congress mandated the identification of habitats essential to federally managed commercial fish species and the implementation of measures to conserve and enhance their habitat (Public Law 104-297). In the amended Act, Congress defined essential fish habitat for federally managed fish species as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” Essential Fish Habitat is applicable to federally managed commercial species that live out at least one component of their lifecycle in marine waters (such as anadromous species). The state of Pennsylvania and the Susquehanna River are under the jurisdiction of the Mid-Atlantic Fishery Management Council, related to federally managed commercial fish species. There are, however, no federally managed species that use the freshwater habitat of the Susquehanna River in Pennsylvania, so there is no Essential Fish Habitat in the vicinity of the Holtwood Project (NMFS, 2008).

### **1.3.5 Endangered Species Act**

Section 7 of the Endangered Species Act (ESA) requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. No federally listed threatened or endangered aquatic, plant, or wildlife species or critical habitat for listed species has been identified in the project area.

### **1.3.6 Coastal Zone Management Act**

Under section 307(c)(3)(A) of the Coastal Zone Management Act, 16 U.S.C. §1456(3)(A), the Commission cannot issue a capacity amendment to a license for a project within or affecting a state’s coastal zone unless the state’s Coastal Zone Management Act agency concurs with the license applicant’s certification of consistency with the state’s Coastal Zone Management Act program, or the agency’s concurrence is conclusively presumed by its failure to act within 180 days of its receipt of the applicant’s certification. On May 2, 2008, Pennsylvania DEP determined that the proposed action is located outside of Pennsylvania’s coastal zones and would not affect them. Therefore, the proposed action is consistent with Pennsylvania’s Coastal Zone Management Program.<sup>9</sup>

### **1.3.7 National Historic Preservation Act**

Section 106 of the National Historic Preservation Act requires that every federal agency “take into account” how each of its undertakings could affect historic properties, and provide the Advisory Council on Historic Preservation a reasonable opportunity to

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<sup>9</sup> Letter from L.J. Toth, Environmental Planner, Coastal Resources Management Program, Pennsylvania DEP, to the Commission, dated May 2, 2008.

comment. Historic properties are districts, sites, buildings, structures, traditional cultural properties, and objects significant in American history, architecture, engineering, and culture that are eligible for inclusion in the National Register of Historic Places (National Register). By letter dated April 11, 2006, the Commission designated PPL as the Commission's non-federal representative to consult with the Pennsylvania State Historic Preservation Officer (SHPO) under section 106. The SHPO reviewed the results of archaeological studies and concluded by letter dated January 22, 2007, that the proposed action would not require further archaeological survey. PPL submitted documentation of the historic significance of the Holtwood dam and powerhouse complex to the SHPO on May 22, 2008. The SHPO by letter dated July 30, 2008, reiterated that the proposed project would not affect any archaeological resources and stated that the project would have no adverse effect on the National Register-eligible Holtwood Hydroelectric Project. Subsequently, PPL conducted archaeological surveys at the locations of proposed ground-disturbing activities associated with additional recreational areas and new wetland mitigation sites. The findings and SHPO review have not as yet been provided to the Commission. However, PPL and the SHPO are currently developing a historic properties management plan to ensure the protection of archaeological and historic resources in the project area. To meet the requirements of section 106, the Commission will execute a Memorandum of Agreement that would require implementation of the final historic properties management plan.

#### **1.4 PUBLIC REVIEW AND CONSULTATION**

The Commission's regulations (18 CFR, section 4.38) require that applicants consult with appropriate resource agencies, tribes, and other entities before filing an application for a capacity amendment to a license. This consultation is the first step in complying with the Fish and Wildlife Coordination Act, ESA, National Historic Preservation Act, and other federal statutes. Pre-filing consultation for a capacity amendment must be complete and documented according to the Commission's regulations.

##### **1.4.1 Scoping**

Before preparing this EIS, we conducted scoping to determine what issues and alternatives should be addressed. We distributed a scoping document to interested agencies and others on March 17, 2008, with a request to provide written comments within 30 days. We held two publicly noticed scoping meetings on April 17, 2008, in the towns of Holtwood and Lancaster. The scoping document was noticed in the Federal Register on March 23, 2008. The scoping meetings, which were recorded by a court reporter, allowed individuals an opportunity to submit oral or written comments to the relicensing record. A total of 36 individuals and 48 representatives of agencies and non-governmental organizations attended the afternoon and evening scoping meetings. The following entities filed written comments:

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<b>Commenting Entity</b>	<b>Date of Filing</b>
American Rivers	May 2, 2008
Pennsylvania Department of Conservation and Natural Resources	May 2, 2008
U.S. Fish and Wildlife Service	May 2, 2008
Susquehanna River Basin Commission	May 2, 2008
Pennsylvania Fish and Boat Commission	May 2, 2008

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Staff carefully considered and addressed the stakeholder comments and questions within the scope of the current proceeding, examining the proposed development of the Holtwood Project, to focus the content of this document. Comments were raised about following issues, within the scope of this proceeding:

- Concern that extending the license term would preclude a cumulative effects analysis of minimum flows, fish passage, and effects on American eels and mussels.
- Concern that sufficient minimum stream flows be released to address low flow into the Chesapeake Bay.
- Requests that the EIS include assessments of the change in pattern of frequency, location, and duration of releases and spills to predict and mitigate negative impacts to wildlife and recreational users.
- Concern that there would be performance measures and triggers to determine the need for additional studies and improvements to allow adaptive management of minimum flows and fish passage.
- Concern that the fish passage improvement could raise the water level in the bypassed reach and inundate state-designated plant species.
- Concern that the new features developed as mitigation for lost whitewater boating opportunities be maintained throughout the remainder of the period of the license.
- Concern that the proposed blasting activities would affect river wildlife and could have long-term effects on the riverbed.
- Concern that the EIS consider the relative costs of operational efficiencies and conservation measures, such as demand efficiencies to meet additional power needs, and also consider alternative power generation sources to meet demand.

### 1.4.2 Comments on the License Application and Interventions

On February 21, 2008, the Commission issued a notice that PPL's application for amendment of license had been accepted for filing and solicited motions to intervene and comments, recommendations, terms, and conditions, and fishway prescription. This notice set April 21, 2008, as the deadline for filing protests and motions to intervene and comments and terms and conditions, and May 5, 2008, as the deadline for reply comments. On April 16, 2008, Exelon Corporation and PPL jointly requested the comment date be extended an additional 2 weeks. On April 18, 2008, the Commission extended the comment deadline date to May 5, 2008, and the reply comment deadline date until June 19, 2008.

<b>Entity</b>	<b>Date of Filing</b>	<b>Type of Filing</b>
U.S. Department of the Interior	February 21, 2008	Intervention
American Whitewater	March 5, 2008	Comment
Elizabeth Lynch	March 7, 2008	Comment
Pennsylvania Fish and Boat Commission	March 21, 2008	Intervention
Exelon Corporation	April 4, 2008	Intervention
Maryland Department of Natural Resources	April 15, 2008	Intervention
U.S. Department of the Interior	April 16, 2008	Comment
Pennsylvania Department of Environmental Protection	April 17, 2008	Intervention
American Whitewater/Greater Baltimore Canoe Club	April 18, 2008	Intervention
Nature Conservancy of Pennsylvania	April 18, 2008	Intervention
York Haven Power Company, LLC	April 21, 2008	Intervention
American Rivers	April 21, 2008	Intervention/Comment
Stewards of the Lower Susquehanna	April 21, 2008	Intervention/Comment
Pennsylvania Department of Conservation and Natural Resources	April 21, 2008	Comment
Pennsylvania Fish and Boat Commission	May 2, 2008	Comment

PPL filed reply comments on June 19, 2008.

### **1.4.3 Comments on the Draft Environmental Impact Statement**

The Commission issued its draft EIS for the application for amendment for the Holtwood Project on July 18, 2008. In appendix B, we summarize the comments, provide responses to those comments, and indicate, where appropriate, how we modified the text of this final EIS.

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**COVER SHEET**

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR  
AMENDMENT TO LICENSE  
HOLTWOOD HYDROELECTRIC PROJECT  
Docket No. P-1881-050

Section 4  
Developmental Analysis  
Pages 133 through 136

FEIS

#### 4.0 DEVELOPMENTAL ANALYSIS

In this section, we estimate the economic benefits of the project and estimate the cost of various environmental measures and the effects of these measures on project operations.

Under its approach to evaluating the economics of hydropower projects, as articulated in *Mead Corporation, Publishing Paper Division* (72 FERC ¶ 61,027, July 13, 1995), the Commission employs an analysis that uses current costs to compare the costs of the proposed project and likely alternative power, with no consideration for potential future inflation, escalation, or deflation beyond the order issuance date. This economic analysis provides a general estimate of the potential power benefits and costs of the project and reasonable alternatives to project-generated power.

For our economic analysis of the Holtwood Project, we used the assumptions, values, and sources shown in table 24. All dollars are year 2008 unless specified otherwise.

Table 24. Assumptions for the economic analysis of the Holtwood Project.  
(Source: PPL, staff)

Parameter	Value
Energy value	64.00 mills/kWh <sup>a</sup>
Capacity value	\$110/MW-day <sup>b</sup>
Period of analysis	16 years <sup>c</sup>
Discount rate	7.75 percent <sup>d</sup>
Federal tax rate	35.0 percent <sup>e</sup>
Local tax rate	6.5 percent <sup>e</sup>
Insurance rate	0.25 percent
Term of financing	20 years
O&M costs	\$4,500,000 <sup>f</sup>
Net investment	\$13,393,000 <sup>g</sup>

<sup>a</sup> Value taken from PJM web site for Aggregate Locational Marginal Price.

<sup>b</sup> Value taken from PJM news release dated May 15, 2008, citing capacity auction results for the period June 2011 through May 2012.

<sup>c</sup> Given that PPL has requested a 16-year extension to the current license term, we have set the analysis period equal to 16 years.

<sup>d</sup> Discount rate based on interest rate provided by PPL in exhibit D of its application.

- <sup>e</sup> PPL provided a combined federal and state tax rate of 41.5 percent in exhibit D of its application. We divided this into a typical federal tax rate of 35.0 percent and a state tax rate of 6.5 percent.
- <sup>f</sup> PPL provided a value for the O&M cost in exhibit D of its application in 2007 dollars. We escalated this value by 2.5 percent per year to adjust to 2008 dollars.
- <sup>g</sup> PPL provided a value for the net investment in exhibit D of its application as of September 1, 2007. We escalated this value by 2.5 percent per year to adjust to 2008 dollars.

#### **4.1 ECONOMICS OF THE NO-ACTION ALTERNATIVE**

Based on the information in table 24, the existing project produces approximately 594,849 MWh of energy per year, which we value at approximately \$42,374,420. The existing project provides a net annual benefit of \$35,499,540 (59.68 mills/kWh).

#### **4.2 ECONOMICS OF THE PROPOSED ALTERNATIVE**

The proposed project modifications, including license application costs, all construction costs associated with the existing and proposed generating equipment and the fishway modifications, and environmental enhancement measures, would result in a capital expenditure of approximately \$285,126,300 (excluding interest during construction) with an incremental increase in annual O&M costs of approximately \$717,500.

The resulting project would produce an additional 360,834 MWh of energy per year valued at \$26,638,620. The annual costs would increase by approximately \$53,260,340. The expanded project would provide a net annual benefit of \$8,877,820 (9.29 mills/kWh), which is \$26,621,720 lower than the no-action alternative.

#### **4.3 ECONOMICS OF THE STAFF-RECOMMENDED ALTERNATIVE**

Staff reviewed the proposed project, including the proposed environmental measures and identified a few minor additions that would increase the total cost by \$21,750. Thus, the completed project, as proposed by PPL with minor staff recommendations, would provide a net annual benefit of \$8,856,070 (9.26 mills/kWh), which is \$26,643,470 lower than the no-action alternative.

#### **4.4 COMPARISON OF ALTERNATIVES**

Table 25 summarizes the benefits, costs, and annual net power benefits of the alternatives.

Table 25. Summary of developmental costs, benefits, and annual net power benefits for the Holtwood Project alternatives. (Source: Staff)

	<b>No-Action</b>	<b>Proposed Action</b>	<b>Staff-Recommended Alternative</b>
Installed capacity (MW)	107.2	195.5	195.5
Annual generation (MWh)	594,849	955,683	955,683
Annual power value (mills/kWh)	\$42,374,420 (71.24)	\$69,013,040 (72.21)	\$69,013,040 (72.21)
Annual cost (mills/kWh)	\$6,874,880 (11.56)	\$60,135,220 (62.92)	\$60,156,970 (62.95)
Annual net benefit (mills/kWh)	\$35,499,540 (59.68)	\$8,877,820 (9.29)	\$8,856,070 (9.26)

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**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.<sup>35</sup>

- 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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<sup>35</sup> 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)

<b>Recommendation</b>	<b>Agency</b>	<b>Within the scope of section 10(j)</b>	<b>Annualized cost</b>	<b>Adopted?</b>
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

<b>Recommendation</b>	<b>Agency</b>	<b>Within the scope of section 10(j)</b>	<b>Annualized cost</b>	<b>Adopted?</b>
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.	<b>a</b>	Yes
6. Develop and implement a plan to minimize unavoidable impacts to river and wetlands from project construction and operation.	Interior	Yes	<b>a</b>	Yes
7. Develop and implement an eagle management and monitoring plan.	Interior	Yes	<b>a</b>	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>b</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>b</b>	Yes

<b>Recommendation</b>	<b>Agency</b>	<b>Within the scope of section 10(j)</b>	<b>Annualized cost</b>	<b>Adopted?</b>
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.

<sup>a</sup> These costs are included in PPL's overall cost of environmental measures.

<sup>b</sup> 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.



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- 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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**COVER SHEET**

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR  
AMENDMENT TO LICENSE  
HOLTWOOD HYDROELECTRIC PROJECT  
Docket No. P-1881-050

Section 6  
Literature Cited  
Pages 155 through 158

FEIS

## 6.0 LITERATURE CITED

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**COVER SHEET**

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR  
AMENDMENT TO LICENSE  
HOLTWOOD HYDROELECTRIC PROJECT  
Docket No. P-1881-050

Section 7  
List of Preparers  
Pages 159 through 160

FEIS



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**COVER SHEET**

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR  
AMENDMENT TO LICENSE  
HOLTWOOD HYDROELECTRIC PROJECT  
Docket No. P-1881-050

Section 8  
List of Recipients  
Pages 161 through 166

FEIS

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**COVER SHEET**

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR  
AMENDMENT TO LICENSE

HOLTWOOD HYDROELECTRIC PROJECT  
Docket No. P-1881-050

Appendix A  
Consent Order and Agreement Measures

FEIS

**APPENDIX A**  
**CONSENT ORDER AND AGREEMENT MEASURES**

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Table A-1. Summary of meetings and plans required to be implemented in conjunction with the application for Water Quality Certification. (Source: COA, dated November 21, 2007)

<b>Consent Order Paragraph</b>	<b>Description</b>
3.a.1	By November 30, 2007, PPL Holtwood, LLC (PPL or licensee) is to provide the resource agencies a report on spillway crest control alternatives and a recommended plan for approval.
3.a.2	Final modeling reports for the fish passage facilities must be provided to the resource agencies by November 30, 2007.
3.a.3	Final design plans and schedule for all structures and excavations must be provided to agencies for approval by January 31, 2008.
3.a.4	PPL is to meet with agencies by January 31, 2008, to discuss operation of fish lifts for resident species from September 1 to October 15.
3.a.5	By January 31, 2008, PPL is to provide agencies a Minimum Stream Flow Operations Procedures (MSFOP) manual to agencies for approval. This would provide detailed information on how the project would provide minimum flows, turbine sequencing, flow split between powerhouses, etc.
3.a.6, 7, 8, 9	These paragraphs require that PPL meet with agencies by January 31, 2008, to discuss a plan and schedule for passing minimum flows.
3.a.10, 11, 12	These paragraphs require that PPL provide, by February 28, 2008, a plan and schedule for implementing and monitoring minimum flows at the project, for agency approval.
3.a.13	By March 31, 2008, PPL is to provide agencies a plan, for approval, for sequencing construction to prevent impacts to anadromous fish runs.
3.a.14	By March 31, 2008, PPL is to provide agencies a fishway operating plan (FOP), for approval, that would provide details of how fish facilities would be operated and monitored.
3.a.15 and 16	By March 31, 2008, PPL is to meet with agencies to discuss a plan and schedule for determining effectiveness of upstream shad passage, and a discrete survival study for shad downstream passage.

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<b>Consent Order Paragraph</b>	<b>Description</b>
3.a.17	By June 30, 2008, PPL is to provide the agencies for approval, a plan to monitor upstream effectiveness of shad passage using passive integrated transponder (PIT) tags, including installation of PIT tag readers at Conowingo dam, if possible.
3.a.18	By June 30, 2008, PPL is to provide the agencies for approval, a plan to monitor the downstream passage survival of shad.
3.b	PPL to construct a new boat launch at Pequea Creek Access Site to replace one lost as a result of Pennsylvania Department of Transportation construction. By January 31, 2008, PPL is to meet with the agencies regarding plans for the launch, and within 30 days of the meeting provide plans for agency approval.
3.c	Allows PPL to withdraw its application for Water Quality Certification (WQC) should it withdraw the license amendment application.
3.d	PPL shall include the provisions of appendix A of the Consent Order and Agreement (COA) (proposed WQC conditions) in the final license amendment application.
3.e	PPL will not challenge the final WQC conditions if they are substantially the same as appendix A to the COA.
3.f	PPL may challenge the final WQC conditions if they are substantially different from appendix A to the COA.
3.g	PPL may challenge any final WQC conditions that are not set forth in appendix A to the COA.
3.h	Should any agency seek to require Safe Harbor to provide a minimum flow from the upstream Safe Harbor Project, PPL shall not participate in Safe Harbor's decision, nor shall oppose the effort to provide a minimum flow.

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Table A-2. Summary of the proposed Water Quality Certification conditions in appendix A of the Consent Order and Agreement.<sup>36</sup> (Source: COA, dated November 21, 2007, as modified by staff)

Condition Number	Description
I. A, B, C	Defines final agency action and PPL's right to challenge; operational modifications of the adaptive management requirements of the permit; and structural modifications.
II. A. 1 <sup>a</sup>	Requires the licensee to prepare and implement a FOP related to all operations and maintenance of each fishway, including daily and seasonal operations, attraction flows, powerhouse unit sequencing and flow split between powerhouses, and fish counting/monitoring programs for anadromous, catadromous, and riverine fishes. By December 31 of each year, the licensee shall prepare an annual operations report, describing any deviations from the FOP and measures taken to correct any deviations, and shall meet with the DEP <sup>b</sup> and agencies by January 31 to discuss any needed modifications to the FOP. Any fish passage enhancements or new facilities implemented after the license amendment shall be included in the FOP, and the modified FOP for these facilities shall be submitted to the DEP and agencies for approval 60 days prior to their initial operation.
II. A. 2 <sup>a</sup>	Requires the licensee to implement the enhancements approved by the DEP concurrent with construction of the new hydroelectric generating facilities. This includes fish lift improvements related to modifying the attraction water supply, rebuilding the skimmer wall, reconstruction of fish lift entrance C, and relocation of the tailrace crowder drive; redirection of the Unit 1 discharge through the diversion wall and into Piney Channel; excavations within the project boundary to reduce velocity barriers to fish migration in the tailrace, below the tailrace, and in Piney Channel; placement of eel monitoring ramps and traps in the tailrace and spillway; and implementing a spill control system approved by the U.S. Fish and Wildlife Service. <i>These enhancements must be operational no later than the beginning of operation of the amended project.</i>

<sup>36</sup> Where water quality conditions are similar to Interior's preliminary fishway prescription, but in some cases expand on Interior's prescription, these additional measures are shown in italics throughout this table.

Condition Number	Description
II. B. 1 <sup>a</sup>	<p>Requires the licensee to implement a monitoring plan for upstream shad passage approved by the DEP that would include annual fish counts and PIT tag monitoring. The licensee would monitor the effectiveness of upstream passage, including daily updates to the resource agencies, <i>beginning the first year of operation of the amended project</i>, for 3 years, with an annual monitoring report by December 31 of each year. Following completion of this “Tier I” study, <i>unless the results indicate that at least 75 percent of the shad that pass the downstream Conowingo Project pass through the amended Holtwood Project, and that 50 percent of the shad pass the Holtwood Project within 5 days of passage at Conowingo (annual average over the 3 years)(Tier I requirements)</i>, the licensee would consult with the DEP and agencies to develop a plan for a radio telemetry study to assess shad behavior below the project and to determine the percentage of shad that enter Holtwood Project waters and then successfully pass through the Holtwood fish passage facilities. This “Tier II” study would continue for a minimum of 4 years, concurrent with fish counts and PIT tag monitoring, to determine the need for any additional or modified fish passage facilities at the project. Daily updates would be provided to the DEP and resource agencies, and an annual report would be required on the radio telemetry study by December 31 of each year. <i>If at the end of each year of the Tier II study less than 85 percent of the shad entering Holtwood Project waters successfully pass upstream through the project, the licensee shall prepare a plan for operational changes to enhance passage in the following year, if studies indicate that such changes could enhance passage. If at the end of the Tier II monitoring period the fish passage efficiency remains at less than 85 percent, the licensee shall prepare a plan for structural changes to enhance passage, if studies indicate that such changes could enhance passage.</i></p>



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Condition Number	Description
II. B. 2 <sup>a</sup>	<p>Requires the licensee to conduct a discrete survival study for shad during downstream passage through the project, once the new powerhouse begins operation. The report on the study would be provided to DEP and agencies within 90 days of completion of the study. <i>If the study results indicate that project operations can achieve a minimum survival of 95 percent for juvenile shad and 80 percent for adult shad, those operational measures shall be incorporated into the FOP. If the study results indicate that project operations cannot achieve a minimum survival of 95 percent for juvenile shad and 80 percent for adult shad, the licensee shall consult with the DEP and agencies and propose operational or structural modifications that would be implemented in the year following the year that lower survival is documented. Any modifications shall be incorporated into the FOP by submitting plans to the DEP and agencies for approval 60 days prior to their initial operation.</i></p>

Condition Number	Description
II. C. 1 <sup>a</sup>	<ul style="list-style-type: none"><li data-bbox="513 268 1383 583">a. The trigger date for initiation of upstream eel passage measures at Holtwood shall be: when eel passage becomes operational at the downstream Conowingo Project, or when eel stocking into Conowingo reservoir begins as part of an agency-approved plan, or when the DEP and other agencies determine that available data indicate that sufficient numbers of eels are available below Holtwood to require passage.</li><li data-bbox="513 604 1383 877">b. Within 1 month of the trigger date, the licensee shall meet with DEP and resource agencies to develop a plan and schedule for a siting study for permanent eel fishway(s), with a final plan to be submitted for DEP and agency approval within 3 months of the meeting. The siting study shall be implemented on an annual basis until adequate information is available to make a siting decision.</li><li data-bbox="513 898 1383 1129">c. Once adequate information is available to make a siting decision, the licensee shall meet with DEP and resource agencies to develop a plan and schedule for constructing permanent eel fishways. Within 6 months of that meeting, the licensee shall submit design plans and a schedule for resource agency approval.</li><li data-bbox="513 1150 1383 1297">d. Within 3 months of the approval of the design plans, the licensee shall submit a plan for monitoring the effectiveness of upstream eel passage to the agencies for approval. <i>PPL shall implement the plan as approved by DEP.</i></li><li data-bbox="513 1318 1383 1476">e. Once the eel passage facilities are operational, the licensee shall implement effectiveness studies via PIT tagging or other approved methods, with an annual report provided to the agencies by December 31 of each year.</li></ul>

Condition Number	Description
II. C. 2 <sup>a</sup>	<p>a. The trigger date for initiation of downstream eel passage measures at Holtwood shall be 3 years after eel passage becomes operational at the amended Holtwood Project, or 3 years after eel stocking into Lake Aldred begins as part of an agency-approved plan, or when DEP determines that available data indicate that sufficient numbers of eels are available upstream of Holtwood to require downstream passage.</p> <p>b. <i>Within 6 months of the trigger date</i>, licensee shall submit a study plan <i>for a discrete survival study</i> to determine the effectiveness of downstream eel passage at the project to the resource agencies for approval. <i>The plan shall include balloon tag studies or other methods approved by DEP and the agencies.</i> The licensee shall implement the approved study plan and shall provide a report on the study within 90 days of its completion.</p> <p>c. <i>If the study results indicate that project operations can achieve a minimum survival of 85 percent for downstream-migrating eels, those operational measures shall be incorporated into the FOP. If the study results indicate that project operations cannot achieve a minimum survival of 85 percent for downstream-migrating eels, the licensee shall consult with the DEP and agencies and propose operational or structural modifications that would be implemented in the year following the year that lower survival is documented. Any modifications shall be incorporated into the FOP by submitting plans to the DEP and agencies for approval 60 days prior to their initial operation.</i></p> <p>d. <i>For structural modifications, the licensee shall prepare a plan for measuring the effectiveness of the modifications, and submit to DEP and agencies for approval 60 days prior to their initial operation.</i></p>

Condition Number	Description
II. D	During the first 5 years of operation of the amended project, the licensee shall operate the fish passage system for the passage of resident fish species from April 1 to June 30. All resident fish shall be identified and counted, with daily reports made available to the agencies, and an annual report by December 31 of each year of operation. At the FOP meeting prior to the end of the 5-year period, the licensee and agencies shall discuss whether any modifications to the fish passage system is needed to accommodate resident fish.
III. A	Requires the licensee to prepare and implement a MSFOP <sup>c</sup> for all operations and maintenance related to providing minimum streamflows, including daily and seasonal operations, powerhouse unit sequencing and flow split between powerhouses and tailrace/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 spillway, as well as emergency procedures. PPL shall implement the MSFOP as approved by DEP, and shall provide the approved MSFOP to the agencies. By December 31 of each year, the licensee shall prepare an annual MSFOP report, describing any deviations from the MSFOP and measures taken to correct any deviations, and shall meet with the agencies by January 31 to discuss any needed modifications to the MSFOP. Any required modifications to the MSFOP shall be implemented within 30 days of the request for the modification consistent with the approval of the DEP. PPL may request a waiver of the minimum streamflow requirements if necessary for the construction of the new powerhouse or fish passage facilities, and may deviate from the minimum streamflow requirements of the certification in the event of an emergency, followed by a notification to DEP within 24 hours and a report on the emergency within 15 days. DEP may require amendments to the MSFOP to maintain and protect existing and designated uses, and implement water quality standards, with the amendments to be reviewed and approved by the agencies and implemented by PPL consistent with DEP approval.

Condition Number	Description
III. B	Upon Commission approval of the license amendment, PPL shall operate 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 FERC to be released at the downstream Conowingo 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.
III. C	PPL shall implement a plan and schedule, approved by DEP, for providing minimum streamflows in the spillway area that would maintain and protect existing and designated uses and implement water quality standards. PPL shall implement a minimum flow monitoring plan for the spillway, and shall annually report the monitoring results by December 31 of each year, as part of the MSFOP annual report. After 3 years of operation, if monitoring indicates that existing or designated uses and water quality standards are not being maintained, DEP may require PPL to propose a plan and schedule to modify minimum flow releases, if operational changes would help to maintain and protect existing and designated uses and implement water quality standards. The plan and schedule shall be submitted to the resource agencies within 6 months of the notification that the plan is needed. PPL shall implement the plan as approved by DEP. Three years after the implementation of operational measures, if monitoring results indicate that existing or designated uses and water quality standards are still not being maintained, DEP may require PPL to propose a plan and schedule for additional modifications to minimum flows in the spillway area using operational or structural changes. The plan and schedule shall be submitted to the resource agencies within 6 months of the notification that the plan is needed. PPL shall implement the plan as approved by the DEP, and if structural changes are made, the plan must include an evaluation of the effectiveness of those structural changes.

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Condition Number	Description
III. D	<p>PPL shall implement a plan and schedule, approved by DEP, for providing minimum streamflows in the Piney Channel and the tailrace from Lake Aldred that would maintain and protect existing and designated uses and implement water quality standards. PPL shall implement a minimum flow monitoring plan for the Piney Channel and the tailrace, and shall annually report the monitoring results by December 31 of each year, as part of the MSFOP annual report. After 3 years of operation, if monitoring indicates that existing or designated uses and water quality standards are not being maintained in the Piney Channel and the tailrace, DEP may require PPL to propose a plan and schedule to modify minimum flow releases, if operational changes would help to maintain and protect existing and designated uses and implement water quality standards. The plan and schedule shall be submitted to the resource agencies within 6 months of the notification that the plan is needed. PPL shall implement the plan as approved by DEP. Three years after the implementation of operational measures, if monitoring results indicate that existing or designated uses and water quality standards are still not being maintained in the Piney Channel and the tailrace, DEP may require PPL to propose a plan and schedule for additional modifications to minimum flows in the Piney Channel and the tailrace using operational or structural changes. The plan and schedule shall be submitted to the resource agencies within 6 months of the notification that the plan is needed. PPL shall implement the plan as approved by the DEP, and if structural changes are made, the plan must include an evaluation of the effectiveness of those structural changes.</p>

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<sup>a</sup> These water quality conditions are similar to Interior's preliminary fishway prescription, but in some cases expand on Interior's prescription. These additional measures are shown in *italics*.

<sup>b</sup> All references to DEP mean Pennsylvania DEP.

<sup>c</sup> For all conditions where PPL is required to prepare a plan, the conditions also include a provision that in the event PPL fails to provide a plan as required, Pennsylvania DEP would prepare the plan in consultation with the other resource agencies and require PPL to implement it.

**COVER SHEET**

**FINAL ENVIRONMENTAL IMPACT STATEMENT FOR  
AMENDMENT TO LICENSE**

**HOLTWOOD HYDROELECTRIC PROJECT  
Docket No. P-1881-050**

**Appendix B  
Comments on the Draft Environmental Impact Statement for the  
Holtwood Hydroelectric Project  
Project No. 1881-050**

**FEIS**

**APPENDIX B**  
**COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT**  
**STATEMENT**  
**FOR THE**  
**HOLTWOOD HYDROELECTRIC PROJECT**  
**PROJECT NO. 1881-050**



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The U.S. Environmental Protection Agency (EPA) issued the notice of availability of the draft environmental impact statement (EIS) on July 18, 2008, and comments on the draft EIS were due on September 8, 2008.

In this appendix, we summarize the written comments received; provide responses to those comments; and indicate, where appropriate, how we modified the text in the final EIS. We group the comment summaries and responses by topic for convenience. The following entities filed comments on the draft EIS.

<b>Commenting Entity</b>	<b>Filing Date</b>
New York State Department of Environmental Conservation	August 7, 2008
U.S. Department of the Interior	August 12, 2008
America Whitewater	August 15, 2008
Pennsylvania Fish & Boat Commission	August 18, 2008
Exelon Corporation	August 18, 2008
Maryland Department of Natural Resources	August 25, 2008
National Marine Fisheries Service	September 8, 2008
U.S. Army Corps of Engineers	September 30, 2008

### **Statutory and Regulatory Requirements**

**Comment 1:** The Department of the Interior (Interior) notes that under section 1.3, the draft EIS does not mention the Fish and Wildlife Coordination Act that provides the basic authority for the Fish and Wildlife Service's (FWS's) involvement in evaluating impacts to fish and wildlife from proposed water resource development projects.

**Response:** In section 1.3 of the EIS, we describe the sections of the Federal Power Act (FPA) that require the Commission to address and include Interior's fishway prescriptions and FWS's section 10(j) recommendations in any license amendment issued for the project. Our analysis is limited to the statutory and regulatory requirements that affect the Commission's licensing actions.

**Comment 2:** The Corps noted that it received the section 404 permit application from PPL on February 12, 2008, and requests that the EIS include a reference to the Rivers and Harbor Act of 1899 and section 404 of the Clean Water Act to section 1.3.

**Response:** We added the information about the section 404 permit to the table in section 1.3 and the status of the permit application to section 1.3.3 of the EIS. We did not include a reference to the Rivers and Harbors Act of 1899 because it does not affect the Commission's licensing actions.

**Comment 3:** Although Interior notes that there may not be any designated Essential Fish Habitat (EFH) affected by the proposed project, the federal fishery resource agencies still have an interest in the management of diadromous fish that use the freshwater habitat of the Susquehanna River and provide ecological, economic, and social benefits along the East Coast of North America.

**Response:** We understand the importance of the Susquehanna River as existing and potential freshwater habitat for diadromous species that occur along the Atlantic coast, and as the largest source of freshwater for the Chesapeake Bay, which supports many of these same species as well as other estuarine and marine species.

**Comment 4:** NMFS commented that both the federally listed (endangered) shortnose sturgeon and the candidate species Atlantic sturgeon have been documented downstream of the Conowingo Project, but because adequate sturgeon passage is not available at Conowingo, those species are unlikely occur between the Conowingo and Holtwood Projects or upstream of Holtwood. However, if either species is encountered at the Holtwood Project, the National Marine Fisheries Service (NMFS) should be informed. In addition, if suitable sturgeon passage occur, in the future at the Conowingo Project, coordination with NMFS will be required regarding the effects of the Holtwood Project on these species.

**Response:** If either the shortnose sturgeon or Atlantic sturgeon is encountered at the Holtwood Project, we will notify NMFS and coordinate with your agency as needed.

**Comment 5:** The Corps requested that section 1.3.5 of the EIS include a reference to the Bald Eagle Management and Monitoring Plan dated July 2008.

**Response:** This section deals with federally listed threatened and endangered species. We discuss the bald eagle management and monitoring plan in section 3.3.4.2 in our analysis of potential effects on special-status wildlife.

### **Proposed Action and Alternatives**

**Comment 6:** Interior notes that section 2.1, *No-action Alternative*, should include the fact that the license term would not be extended to 2030 and relicensing would begin in 2009.

**Response:** We added this information to the description of the no-action alternative in section 2.1.

**Comment 7:** Interior notes that the description of the applicant's proposal in section 2.2, *Applicant's Proposal*, fails to mention the proposed license extension and points out that this information is important to the definition of the temporal scope of the draft EIS as defined on page 29 in section 3.2.2.

**Response:** Section 1 of the EIS clearly states that PPL requested an extension of its current license term of 16 years to 2030 based on the substantial costs of the proposed action and environmental measures. Based on the requested license term, we used 16 years as temporal scope of our cumulative effects analysis and as the period of analysis in our economic analysis. The Commission will determine the license term at the time it decides whether or not to approve the proposed action.

**Comment 8:** In reference to the last bullet on page 16 in section 2.2.1, PPL clarifies that it intends to continue to use the existing configuration of flashboards on Holtwood dam and to pass water through the existing 10-inch pipe on the dam to maintain the current rate of flow to the spillway area.

**Response:** We revised the text in section 2.2.1 of the final EIS to reflect PPL's intent to continue to use the existing configuration of flashboard and now include this revised proposed measure under proposed operational modifications.

**Comment 9:** PPL indicates that in a letter dated August 20, 2008, it has agreed to construct a wetlands mitigation project along Landis Run, Manheim Township, Lancaster County, and that details of this proposal will be provided to the Commission after it is finalized with the Pennsylvania Department of Environmental Protection (DEP).

**Response:** We revised the description of this proposed measure in section 2.2.1 of the final EIS and included this updated information in the analysis of wetlands mitigation in section 3.

**Comment 10:** PPL comments that the draft EIS did not include its proposed measure to provide moisture to the root zone of the white doll's daisy, a state threatened and endangered plant species, during the summer months.

**Response:** We acknowledge this oversight and, in response, we revised section 2.2.2 of the final EIS to include a bullet under proposed operational modifications describing this measure, and now provide an analysis of this measure in section 3.3.4, *Terrestrial Resources*.

**Comment 11:** The Corps requested that the final EIS include the following proposed measures: (a) all existing wetlands within the project area shall be accurately field-delineated and identified using orange construction fencing prior to the start of construction activities and up to the time that earth disturbance activities are completed and the site has been stabilized; (b) implement a minimum 5-year monitoring schedule at the wetland, stream and forested riparian planting mitigation sites; and (c) implement an approved Erosion and Sedimentation Control Plan.

**Response:** We note that PPL's proposal already includes erosion and sediment control plans, and we revised the final EIS to include the other two measures in section 2.2.1,

*Proposed Facilities and Construction Activities, and section 2.2.3, Proposed Environmental Measures.*

### **Engineering Review**

**Comment 12:** PPL notes that it does not propose to construct barrier dams in the bypassed reach and requests that reference to barrier dams be deleted in the final EIS.

**Response:** We understand that PPL had proposed to install barrier dams in the draft Exhibit E, but has since eliminated this proposal based on concerns raised by resource agencies during consultation on this matter. We deleted the discussion of barrier dams in the final EIS.

**Comment 13:** The Corps commented that the draft EIS states that PPL proposes to use two retired ash basins located on PPL lands in Lancaster County on the hillside above the project for disposal of approximately 1,790,000 cy of excavated rock and fill and that the 404 permit application revisions dated August 21, 2008, indicate that basin # 1 is the primary disposal area and basin #2 indicates not available for disposal.

**Response:** We revised the final EIS to indicate that only one ash basin would be used for disposal of excavated rock.

### **Aquatic Resources**

**Comment 14:** Exelon Corporation notes that the draft EIS at pages 17 and 52 characterizes PPL's commitment to release 800 cubic feet per second (cfs) or net inflow, whichever is less, as effective upon the later date of initiation of Unit 1 discharge to Piney Channel or initial operation of the planned exciter replacement units in the existing powerhouse. Exelon states that while this characterization is accurate, section 7 of the settlement agreement between PPL Holtwood and Exelon executed on May 5, 2008, further clarifies that in no event, however, shall the provision of these flows be delayed beyond 3 years after the date of the Commission's final order approving the Holtwood license amendment.

**Response:** We revised the description of the proposed operational modification in section 2.2.2 and in the water quantity analysis in section 3.3.3.2 of the final EIS to include this provision.

**Comment 15:** PPL notes that footnote number 22 on page 53 of the draft EIS states that the modeling did not include the 800-cfs minimum flow that recently was proposed as part of the Exelon-PPL Settlement Agreement. However, PPL notes that the minimum flow proposed in the PPL-Exelon settlement agreement is equal to 800 cfs or inflow and since it is inflow-based, it would not result in additional drawdown at Lake Aldred in the OASIS modeling.

**Response:** We revised the footnote number 22 on page 53 of the final EIS to reflect agreement with this comment.

**Comment 16:** Maryland Department of Natural Resources (Maryland DNR) notes that in table 9, the minimum flow from the Conowingo Project for the period of December 1 until the end of February is listed as 3,500 cfs. However, because this can be an intermittent flow with up to 6 hours of no flow for each 6 hours of flow at 3500 cfs, the daily average minimum flow is effectively 1,750 cfs, so the table should be corrected accordingly. PPL also made a similar comment about the minimum flows for the months of December, January, and February.

**Response:** We corrected table 9 in the final EIS to clarify the minimum flow for the months of December, January, and February.

**Comment 17:** Interior comments that while the description of inflow to the project on page 60 of the draft EIS is true over longer periods of time, the EIS should note the role of the Muddy Run reservoir in regulating water levels, for short periods, in the Conowingo reservoir and inflows downstream.

**Response:** We revised the text in the water quantity analysis in section 3.3.3.2 of the final EIS to indicate that the inflow and withdraw from the Muddy Run Pump-Storage Project has short-term effects on the reservoir level of the Conowingo reservoir.

**Comment 18:** Maryland DNR also notes on page 60 of the draft EIS that there is a statement that PPL would operate the amended project to release inflow to Lake Aldred, and indicates that this should be corrected to state that this inflow would be released to Conowingo Pond from Lake Aldred.

**Response:** We revised the text in the water quantity analysis in section 3.3.3.2 of the final EIS to state that during low flow conditions, the flow released to the Conowingo Project would be equal to the net inflow to Lake Aldred.

**Comment 19:** Interior points out an inconsistency on pages 67 and 68 regarding whether FWS established target survival rates for fish passage effectiveness, which, as pointed out on page 68, FWS did not.

**Response:** We corrected page 67 of the final EIS to clarify that the Interior fishway prescription does not include target survival rates.

**Comment 20:** The Pennsylvania Fish & Boat Commission, the New York State Department of Environmental Conservation, and Maryland DNR provide additional information about the value of providing for the upstream passage of resident fish, including walleye, during the fall. The agencies request that Commission staff reconsider the limited 1-year period of fall passage evaluation and ask that the Commission instead require evaluation over a 5-year period. The agencies base their request on the need to

(1) avoid atypical flow conditions that might occur during fall season, (2) better comport with the 5-year evaluation of resident fish passage during the spring, (3) average out the effect of year-class strength of a given species in the fall; and (4) better understand the recolonization of freshwater mussels via their fish hosts. The agencies note PPL's concern about potential damage to fish passage facilities operating during the fall and indicate that fall storms of a magnitude sufficient to cause damage to fish passage facilities operating during the fall occurred only 7 percent of the time over the past 75 years.

**Response:** We reconsidered the agency recommendations for fall fish lift operations for resident fish, based on the new information provided by the agencies. As a result, we changed our recommendation and now recommend 5 years of experimental fall fish lift operations. We revised the relevant sections of the final EIS to reflect the change in our recommendation.

### **Terrestrial Resources**

**Comment 21:** The Corps commented that the draft EIS does not adequately address the avoidance and minimization of adverse effects on terrestrial resources that was accomplished as a result of early coordination with the resource agencies. The Corps also requested that Kleinschmidt, PPL's consultant, prepare a summary of the avoidance and minimization measures that were performed and that this information be incorporated in the final EIS.

**Response:** We revised the final EIS to address consultation during the application preparation process. The applicant did not provide the detailed information on avoidance and minimization measures that were performed as agreed to during consultation and therefore we did not include that information in the draft EIS. Our focus is on the measures proposed for the amendment and their environmental impacts.

**Comment 22:** The Corps commented that the discussion on wetlands is lacking in necessary detail, including functions and values and direct and indirect impacts

**Response:** We revised the final EIS to address wetland functions and values and direct and indirect impacts

**Comment 23:** The Corps requested that the final EIS include square footage/acreage of impacts in addition to cubic yards of material excavated and/or discharged into Waters of the United States, including wetlands, throughout the document

**Response:** We revised the final EIS to include square footage of effects on wetlands.

**Comment 24:** The Corps requested that the final EIS remove reference to wetland mitigation at the York Furnace site and provide additional detail about the current proposed mitigation package.

Response: We revised the final EIS to include details within PPL's current mitigation package. However, we did not remove reference to the York Furnace site because that discussion is part of the project history and provides context for comments received from some agencies.

### **Recreational Resources**

**Comment 25:** American Whitewater commented on the number of days of whitewater boating provided for in the whitewater settlement agreement. American Whitewater notes that the rationale behind the whitewater settlement agreement may not be entirely clear, as evidenced by the descriptions of the proposed provision of whitewater boating flows on pages 109 and 110 of the draft EIS. American Whitewater clarifies that the provision of 264 hours is designed to mitigate for the loss of 33 days (33 x 8 hours per day = 264 hours) of whitewater boating and not 11 days as stated in the draft EIS. However, because boaters generally prefer more and shorter releases, the settlement agreement calls for the 264 hours of releases to be spread over an average of 68 days.

**Response:** We revised the final EIS to reflect this clarification.

**Comment 26:** American Whitewater questions the characterization in the draft EIS of the creation of two new whitewater features as enhancements. American Whitewater states that the constructed features, which are less valuable than natural features, simply provide 264 hours of paddling opportunities that approval of the license amendment would otherwise eliminate. Therefore, American Whitewater disagrees with the statement in the draft EIS that they would create enhanced whitewater boating conditions beyond those that currently exist within the area downstream of the spillway.

**Response:** We revised the final EIS to state that the creation of the two new whitewater features would replace features where use would be diminished by the reduced flows over the spillway.

**Comment 27:** PPL states that it does not understand the Commission staff rationale for requiring recreational use monitoring and annual reporting during the construction period. PPL states that the expected effect is that there would be no use of unavailable facilities on a temporary basis, and continued use, or potentially a temporary increase in use, of unaffected recreation facilities.

**Response:** Recreational use monitoring during the construction period would provide the means for the Commission staff to monitor the extent and duration of potential effects of the construction on recreational use associated with the project's recreational facilities and resources. This information would help Commission staff to ensure that adequate public recreational access is provided during the construction period. Therefore, we maintain our recommendation in the final EIS that PPL monitor recreational use at the project annually during the construction period.



**Comment 28:** PPL states its intent to submit to the Commission a plan to transfer up to 3,500 acres of PPL-owned lands, including project lands, to the Lancaster County Conservancy and its intent to develop a land management plan to assess recreational and preservation needs are appropriate, and anticipates, the development of this plan as a provision of the proposed lands transfer. PPL also states that it anticipates that it will propose to the Commission, with resource agency support, significant changes to management of project recreational facilities that will then require Commission reconsideration of the scope of future recreational monitoring and studies as outlined in the draft EIS.

**Response:** The draft and final EIS address the current proposal put forth by PPL. In the event that PPL files with the Commission additional proposal(s) related to project lands and recreational facilities, the Commission would assess those proposals at that time, including the potential needs for modification of future recreational monitoring and studies that may be required as part of a license.

**Comment 29:** PPL requests that the Commission staff reconsider the recommendation to submit in-water and in-the-dry blasting plans for approval prior to the initiation of construction, as this could delay construction activities that do not involve blasting.

**Response:** We revised the final EIS to recommend submission and approval of in-water and in-the-dry blasting plans prior to initiation of blasting activities, rather than prior to initiation of construction, as requested, with the understanding that blasting cannot begin until the Commission has approved the blasting plans.

**Comment 30:** In addition, as project plans continue to be revised, the final EIS needs to address the most recently revised plans, including the re-design of the Pequea Boat Ramp and the proposed compensatory wetland mitigation package.

**Response:** The EIS has been revised to reflect the most recent information submitted to the Commission related to the re-design of the Pequea Boat Ramp and the proposed compensatory wetland mitigation package.

**Comment 31:** Page 101, section 3.3.5.2, *Environmental Effects, Recreation Enhancements*—Your current descriptions for enhancements do not clearly identify the proposed impacts to Waters of the United States and adjacent forested riparian buffers in association with constructing of these enhancements. Specifically in regard to the Pequea Creek proposed improvements, the current proposal as described in your narrative does not identify any impacts. The current proposal for the Pequea Boat Ramp expansion would require the discharge of dredged or fill material into approximately 2.4 acres of the Susquehanna River for the construction of a boat ramp, handicap accessible pier and boat and trailer parking. The Corps has advised PPL that it should look to further minimize these impacts. PPL has agreed to redesign the Pequea Boat Ramp and parking to minimize impacts to Waters of the United States. The revised impacts should be clearly

addressed in the EIS as well as the direct and indirect impacts associated with the other recreational enhancements;

**Response:** We updated the EIS to include the revised PPL proposal, developed in consultation with resource agencies, to reduce the number of vehicle parking spaces to 18 spaces at the location where the 27 spaces were previously proposed. Discussions about the potential effects of the boat ramp expansion on wetlands are discussed in section 3.3.4.2, *Terrestrial Resources*.

**Comment 32:** Page 114, section 3.3.6.2, *Environmental Effects, Land Use*—Please elaborate on the primary and secondary impacts associated with your statement "Construction of temporary access roads would result in the removal of some trees." In this same section, you conclude that an effective plan should include five listed measures; however, you do not give a date for submission or implementation of this "Lands and Shoreline Management Plan." We recommend this be included in the final EIS and FERC license.

**Response:** We discuss the potential effects of the construction of the temporary access roads in section 3.3.4.2, *Terrestrial Resources*, and added a reference back to that section in the recreation effects discussion of the final EIS.

The final EIS discusses the management plans recommended by staff as part of the environmental assessment in the EIS document. The time for submittal of the plans to the Commission would be required in the license amendment order issued for the project. The time for implementation of the plans would be covered under the schedule proposed in the submitted plans, as approved by the Commission.

### **Cultural Resources**

**Comment 33:** The Corps notes that the SHPO had not reviewed the additional recreational areas or the new wetland mitigation locations where previous surveys suggest high probability of archaeological material and had stated that PPL is conducting surveys of these areas in September 2008. The Corps requests that the findings of these additional surveys be addressed in the final EIS.

**Response:** We revised sections 1.3.7 and 3.3.7 of the EIS to expand the APE and indicate that PPL is conducting additional surveys and that SHPO review and comment are pending.

### **Comprehensive Development and Recommended Alternative**

**Comment 34:** the Corps requested that the description of the Wetland Mitigation Plan be modified to state a suitable location for mitigation would be determined in consultation with the Corps and Pennsylvania DEP, and not FWS. The Corps also requested that this description of the Wetland Mitigation Plan include details present in

the current draft of the plan and that a complete applicant prepared mitigation package be incorporated in the EIS.

**Response:** The final EIS was modified to reflect this change in agencies to be consulted. A final Wetland Mitigation Plan has not been filed with the Commission, so no further details were added to the section of the final EIS. However, details of the current draft of the plan, as provided by the Corps, were included in the Affected Environment section and our analysis in section 3.3.4.

**Comment 35:** The Corps requests revising footnote 31 of the draft EIS to include the Corps.

**Response:** We revised the footnote in section 5.0 as requested.

**Comment 36:** The Corps comments that the list of proposed measures in section 5.0 of the EIS should include the dates for the submission of the various plans.

**Response:** The dates for submission of the various plans will be specified in the license conditions required in any order approving the amendment, and will be consistent with dates included in the COA.

**Comment 37:** The Corps suggests revising the first bullet under measures proposed by PPL in section 5 to include “approved” erosion and sediment control plans.

**Response:** We provide a footnote that indicates that final plans must be filed with and approved by the Commission.

Document Content(s)

01	Cover Letter.PDF.....	1
02	Table of Contents.PDF.....	12
03	Executive Summary.PDF.....	23
04	Section 1.PDF.....	28
05	Section 2.PDF.....	41
06	Section 3.PDF.....	42
07	Section 4.PDF.....	43
08	Section 5.PDF.....	48
09	Section 6.PDF.....	67
10	Section 7.PDF.....	72
11	Section 8.PDF.....	75
12	Appendix A.PDF.....	82
13	Appendix B.PDF.....	95