

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Appalachian Power Company

Project Nos. 1175-015 and 1290-012

NOTICE OF AVAILABILITY OF ENVIRONMENTAL ASSESSMENT

(December 4, 2012)

In accordance with the National Environmental Policy Act of 1969 and the Federal Energy Regulatory Commission's regulations, 18 CFR Part 380 (Order No. 486, 52 FR 47897), the Office of Energy Projects has reviewed the application for a new license for the 28.8-megawatt (MW) London-Marmet Hydroelectric Project and the 14.76-MW Winfield Hydroelectric Project located on the Kanawha River in Fayette, Kanawha, and Putnam Counties, West Virginia, and has prepared an Environmental Assessment (EA). In the EA, Commission staff analyzes the potential environmental effects of relicensing the projects and concludes that issuing new licenses for the projects, with appropriate environmental measures, would not constitute a major federal action significantly affecting the quality of the human environment.

A copy of the EA is on file with the Commission and is available for public inspection. The EA may also be viewed on the Commission's website at <http://www.ferc.gov> using the "eLibrary" link. Enter the docket number excluding the last three digits in the docket number field to access the document. For assistance, contact FERC Online Support at FERCOnlineSupport@ferc.gov or toll-free at 1-866-208-3676, or for TTY, (202) 502-8659.

You may also register online at <http://www.ferc.gov/docs-filing/esubscription.asp> to be notified via email of new filings and issuances related to this or other pending projects. For assistance, contact FERC Online Support.

Comments on the EA should be filed within 30 days from the date of this notice. Comments may be filed electronically via the Internet. See 18 CFR 385.2001(a)(1)(iii) and the instructions on the Commission's website <http://www.ferc.gov/docs-filing/efiling.asp>. Commenters can submit brief comments up to 6,000 characters, without prior registration, using the eComment system at <http://www.ferc.gov/docs-filing/ecomment.asp>. You must include your name and contact information at the end of your comments. For assistance, please contact FERC Online Support. Although the Commission strongly encourages electronic filing, documents may also be paper-filed. To paper-file, mail an original and seven copies to: Kimberly D. Bose, Secretary, Federal

Energy Regulatory Commission, 888 First Street, NE, Washington, DC 20426. Please affix “London-Marmet Hydroelectric Project No. 1175-015 and/or Winfield Hydroelectric Project No. 1290-012” to all comments.

For further information, contact Brandi Sangunett at (202) 502-8393.

Kimberly D. Bose,
Secretary.

ENVIRONMENTAL ASSESSMENT
FOR
NEW HYDROPOWER LICENSES

London-Marmet and Winfield Projects

FERC Nos. 1175-015 and 1290-012

West Virginia

Federal Energy Regulatory Commission
Office of Energy Projects
Division of Hydropower Licensing
888 First Street, N.E.
Washington, DC 20426

December 2012

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ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power
APE	area of potential effects
CAGR	compound annual growth rate
cfs	cubic feet per second
certification	water quality certification
Commission	Federal Energy Regulatory Commission
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DO	dissolved oxygen
EA	environmental assessment
EPAct	Energy Policy Act of 2005
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
°F	degrees Fahrenheit
FERC	Federal Energy Regulatory Commission
FPA	Federal Power Act
fps	feet per second
FS	Forest Service
FWS	U.S. Fish and Wildlife Service
HPMP	Historic Properties Management Plan
Interior	U.S. Department of the Interior
kW	kilowatt
kWh	kilowatt-hour
mg/l	milligrams per liter
MOA	memorandum of agreement
MOU	memorandum of understanding
msl	mean sea level
MW	megawatt
MWh	megawatt-hour
NGVD	National Geodetic Vertical Datum
NHPA	National Historic Preservation Act of 1966
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
ORSANCO	Ohio River Valley Water Sanitation Commission
PA	Programmatic Agreement
Park Service	National Park Service
PCBs	polychlorinated biphenyl
Register	National Register of Historic Places
RM	river mile

RTE	rare, threatened or endangered species
SHPO	State Historic Preservation Officer
TMDL	total maximum daily load
USGS	U.S. Geological Survey
WQC	water quality certification
West Virginia DNR	West Virginia Division of Natural Resources
West Virginia DEP	West Virginia Department of Environmental Protection

EXECUTIVE SUMMARY

Proposed Action

On January 31, 2012, Appalachian Power Company (Appalachian) filed an application with the Federal Energy Regulatory Commission (Commission) for new licenses to operate and maintain its London-Marmet and Winfield Hydroelectric Projects. The projects are located on the Kanawha River in Fayette, Kanawha, and Putnam Counties, West Virginia (figure 1). The London-Marmet and Winfield Projects occupy 11.51 and 8.25 acres, respectively, of federal land managed by the U.S. Army Corps of Engineers (Corps).

Project Description

As licensed, the London-Marmet Project consists of two developments. The existing London Development utilizes the head created by the Corps' 26-foot-high London dam located at river mile (RM) 82.8 on the Kanawha River and consists of: (1) a forebay area protected by a log boom; (2) screened intake structures; (3) a concrete powerhouse containing three turbine-generator units with a total installed capacity of 14.4 megawatts (MW); (4) a tailrace 420 feet long; (5) a substation containing two, three phase transformers and two auxiliary transformers; and (6) two 0.38-mile-long, 46-kilovolt (kV) transmission lines running parallel from the London powerhouse to the London substation. Project recreation facilities at the London Development include a parking area and a tailrace fishing pier.

As licensed, the Marmet Development utilizes the head created by the Corps' 34-foot-high Marmet dam located at RM 67.7 on the Kanawha River and consists of: (1) a forebay area protected by a log boom; (2) screened intake structures; (3) a concrete powerhouse containing three turbine-generator units with a total installed capacity of 14.4 MW; (4) a tailrace 450 feet long; (5) a substation containing two, three phase transformers and two auxiliary transformers; and (6) two 0.78-mile-long, 46-kV transmission lines that transmit power from the Marmet powerhouse to the Belle substation. Project recreation facilities at the Marmet Development include a parking area and a tailrace fishing pier.

The London-Marmet Project has a total installed capacity of 28.8 MW and generates about 147,391 megawatt-hours (MWh) annually.

As licensed, the Winfield Project utilizes the head created by the Corps' 38-foot-high Winfield dam located at RM 31.1 on the Kanawha River and consists of: (1) a forebay area protected by a 410-foot-long log boom; (2) screened intake structures; (3) a concrete powerhouse containing three turbine-generator units with a total installed capacity of 14.76 MW; (4) a tailrace 410 feet long; (5) a substation containing a generator

step-up bank of three transformers and three auxiliary transformers; and (6) two 0.38-mile-long, 46-kV transmission lines. Project recreation facilities at the Winfield Project include a parking area and a tailrace fishing pier. The project generates about 106,193 MWh annually.

Appalachian proposes to remove from the Winfield Project boundary, two currently licensed 0.38-mile-long, 46-kV transmission lines because there are no primary transmission lines associated with the project. Appalachian also proposes that the London substation and Belle substation in the current license for the London-Marmet Project be removed from the project boundary because they are multi-use facilities.

Project Operation

The Corps operates the London, Marmet, and Winfield dams to maintain a navigational channel at least 9 feet deep through the impoundments and upstream to the limit of navigability at RM 90.57. Operation of the London-Marmet and Winfield Projects is governed by an operating agreement¹ between Appalachian and the Corps and the conditions in the existing licenses. Appalachian maintains frequent contact with the Corps' lockmasters to ensure coordination of hydropower generation and lock operations. From time to time, the Corps may request that Appalachian plant operators maintain certain water elevations for special navigation purposes. Each development has a total hydraulic capacity of 10,000 cubic feet per second (cfs). When stream flow is less than 10,000 cfs, Appalachian controls the impoundments' elevations, within the allowable limits for navigation established by the Corps. When stream flow is greater than 10,000 cfs, the Corps' dam operator assumes control of impoundment elevations. Releases from each development are routed back to the Kanawha River via each development's tailrace.

The operating agreement allows the London Development to be operated as a peaking facility with a maximum allowable drawdown in the London impoundment established by the Corps at 3.0 feet from a normal full pond elevation of 614.00 feet above mean sea level (msl) to 611.00 feet msl. In addition, to protect and enhance fish spawning habitat, the current licenses limit impoundment fluctuations to 1.5 feet (from 614.00 to 612.50 feet msl) from March 1 through April 30, and 2.0 feet (from 614.00 to 612.00 feet msl) from May 1 through June 15. Historically, Appalachian would begin operating the Marmet Development a few minutes prior to the start of peaking releases at the London Development because of the limited storage capability of the Corps' Marmet dam. The Winfield Development would begin operation about 1 hour after the drawdown at the London Development began and would continue making releases for about 1 hour after the London Development reduced its load to refill the London

¹ See Lower Kanawha Operating Plan as required for P-1175 license article 41 and P-1290 license article 40, filed September 3, 1985, Accession No. 19851217-0316.

impoundment. The maximum allowable drawdown for the Marmet and Winfield developments as established in the operating agreement is 0.3 foot (from normal full pond elevation 590.0 feet msl to 589.7 feet msl) and 0.2 foot (from normal full pond elevation 566.0 feet msl to 565.8 feet msl), respectively. All three developments are limited to a drawdown rate of 0.5 foot per hour.

However, for the past 20 years, Appalachian has voluntarily operated the London Development within an impoundment level of 0.3 foot and has not used the maximum allowable impoundment fluctuation for power generation purposes.² As such, the three developments have operated within impoundment drawdown limits between 0.2 and 0.3 foot.

Proposed Environmental Measures

Appalachian proposes to implement the following environmental measures:

- operate the three developments in run-of-release mode;
- implement an avian protection plan, currently being finalized by Appalachian's parent company, American Electric Power (AEP), for all of its holdings, to protect migratory birds from electrocution and collision with power lines and substations at the three developments;
- maintain the recently reopened London tailrace fishing access;
- install portable restrooms and trash receptacles at the London, Marmet, and Winfield Developments to accommodate existing and future recreation use; and
- implement an Historic Properties Management Plan (HPMP) at each project to be developed in consultation with the West Virginia State Historic Preservation Officer (SHPO) and other interested stakeholders.

Alternatives Considered

This environmental assessment (EA) analyzes the effects of the proposed action and recommends conditions for any licenses issued for the projects. This EA considers the following alternatives: (1) Appalachian's proposal, as outlined above; (2) Appalachian's proposal with staff modifications (staff alternative); and (3) no action.

² Personal Communication with Teresa Rogers, American Electric Power Service Corporation, October 23, 2012.

Under the staff alternative, the project would include most of Appalachian's proposed measures, as outlined above. In addition, the staff alternative would include:

- developing a project operation and compliance monitoring plan that includes provisions for documenting compliance with any Corps' operating requirements and establishing a schedule for reporting project compliance/non-compliance during normal operation and emergencies;
- developing a vegetation maintenance plan for all three developments to minimize the effects of project maintenance on native plant communities, wetlands, and wildlife within the project boundaries of the three developments;
- developing an avian protection plan with site-specific measures and practices to reduce bird mortality at each development, rather than implementing the general avian protection plan being finalized by AEP;
- developing a recreation plan for each project that includes operation and maintenance provisions for new and existing facilities and an implementation schedule; and
- revising the project boundary for the London Development to include the road used to access the tailrace fishing area, the parking area, and the path to the fishing pier to ensure that these facilities and associated public recreational access would be maintained by Appalachian over the term of any new license.

Under the no-action alternative, the projects would continue to operate under the terms and conditions of the existing licenses, and no new environmental protection, mitigation, or enhancement measures would be implemented.

Public Involvement and Areas of Concern

Before filing its license application, Appalachian conducted a pre-filing consultation process in accordance with the Commission's integrated licensing process. As part of the pre-filing process, staff conducted scoping to determine what issues and alternatives should be addressed. Staff distributed a scoping document to stakeholders and other interested entities on October 14, 2008. Two scoping meetings were held on November 12, 2008, in Charleston, West Virginia.

On September 2, 2011, Appalachian filed its preliminary licensing proposal, which addressed issues raised by participating agencies, non-governmental organizations, and the public. Appalachian filed its license application on January 31, 2012. On June 8, 2012, staff requested comments, recommendations, and terms and conditions, in response to a notice that the license application was ready for environmental analysis.

The primary issues associated with licensing the London-Marmet and Winfield Projects are project operation, fish entrainment/impingement, and public access for recreation.

Staff Alternative

Aquatic Resources

Operating the three developments in a run-of-release mode and limiting impoundment fluctuations as proposed by Appalachian, in accordance with flows established by the Corps, would maintain impoundment and tailwater fluctuations similar to those experienced under natural hydrologic conditions (i.e. inflow equals outflow). These flow conditions would continue to protect fish and mussel habitat both in the Corps' impoundments and downstream of the projects. Maintaining relatively stable impoundment levels would also minimize the potential for adverse effects to wetlands and shallow water and shoreline habitats important to fish, waterfowl and water birds.

Run-of-release operation would also ensure that downstream water quality standards (i.e., temperature, pH, and dissolved oxygen) are not affected by the projects' operations. Additionally, operating the projects' three developments in a run-of-release mode would ensure that the Corps' impoundment levels are held relatively stable thus limiting any erosion of shoreline areas and resultant turbidity due to the projects' operations.

An operation and compliance monitoring plan would specify provisions for documenting compliance with any Corps' operating requirements and establish a schedule for reporting project compliance/non-compliance during normal operation and emergencies.

Operation of the projects would continue to entrain and impinge fish to some degree. The majority of the fish involved would likely consist of young fish and be composed of highly prolific species that have the ability to compensate for losses. Therefore, we do not expect continued project operation to adversely impact the fishery in the Kanawha River.

Terrestrial Resources

Approximately 1.5 miles of transmission line are associated with the London and Marmet Developments, and the Winfield Development includes a substation; the design of these features contributes to potential bird mortality through collision or electrocution by direct contact with infrastructure. Appalachian proposes to implement an avian protection plan being finalized by its parent company, AEP, for all of its holdings, although it does not provide a time-table for completion of this general plan. An avian

protection plan with site-specific measures and practices to reduce bird mortality at each development would be more effective at minimizing the potential for bird collisions or electrocution with transmission lines or related structures within the three developments rather than waiting for a more general plan to be finalized and implemented at some unknown future time.

Although Appalachian currently uses mechanical and chemical means to maintain vegetation at the three developments, it does not currently have a formal vegetation maintenance plan that describes routine and periodic maintenance protocols. A vegetation maintenance plan would identify the timing, extent, and methods employed in maintaining lands within the project boundaries, and ensure that activities such as tree removal and herbicide application would be conducted in a manner that would minimize effects to native plant communities, wetlands, and wildlife within the project boundaries of the three developments.

Threatened and Endangered Species

The U.S. Fish and Wildlife Service (FWS) list of federally threatened and endangered species indicates that four terrestrial species (Virginia spiraea, running buffalo clover, Indiana bat, and Virginia big-eared bat) and five aquatic species (pink mucket mussel, Northern riffleshell mussel, fanshell mussel, tubercled-blossom pearly mussel, and the spectaclecase mussel) may occur in the vicinity of the three developments.

Based on the degree of development within the London-Marmet and Winfield Projects, there is limited available habitat to support the federally threatened Virginia spiraea, which requires scoured banks along high gradient streams in the absence of substantial competition from other plants, or the federally endangered running buffalo clover, which requires recently disturbed areas to propagate in the absence of substantial competition from invasive plant species. Neither plant species has been documented at the projects. Endangered Indiana and Virginia big-eared bats may use the three developments for foraging and roosting activity during the summer, but such use has also not been documented.

A vegetation maintenance plan would help ensure protection of potential foraging habitat for bats. Because no significant ground-disturbing activities are proposed and the projects would operate in a run-of-release mode under the staff alternative, continued project operation would not be likely to adversely affect these four terrestrial species.

Past surveys have indicated that some listed freshwater mussels (pink mucket mussel and the spectaclecase mussel) are present in the Marmet and Winfield impoundments. Operating the projects' three developments in a run-of-release mode would ensure that there would be no project-related effects on water quality,

impoundment levels, and flows downstream of the project. Therefore, the continued operation of the London-Marmet and Winfield Projects under the staff alternative is not likely to adversely affect these federally listed mussels.

Recreation and Land Use

Throughout the relicensing process, Appalachian proposed to re-establish public access to the closed London tailrace fishing access area. Before this environmental assessment was issued, Appalachian was able to reopen the London site. Providing trash and restroom facilities at the tailrace fishing access areas at all three of the developments would enhance the user experience. A recreation plan for each project would formalize proposals for the trash and restroom facilities and establish maintenance and operation of the existing parking areas, paths, stairs, and tailrace fishing piers.

Currently, not all of the amenities related to the recreation facilities at the London Development are included in its project boundary. Revising the project boundary for the London Development to include the road used to access the tailrace fishing area, the parking area, and the path to the fishing pier would ensure that these facilities and associated public recreational access are maintained over the term of any new license.

The current license for the London-Marmet Project also includes in the project boundary, the London and Belle substations. Removing the London and Belle substations from the project boundary as proposed by Appalachian is consistent with staff's determination that these substations are multi-use facilities and should not be part of the licensed project. The current project boundary for the Winfield Project includes two 0.38-foot-long transmission lines departing the Winfield substation. Removing these lines from the project boundary as proposed by Appalachian is consistent with staff's determination that there are no primary transmission lines at the Winfield Project.

Cultural Resources

Operating and maintaining the powerhouses at the London-Marmet and Winfield Projects could affect the integrity of these historic resources. The HPMP proposed by Appalachian would provide guidelines, policies, and procedures for the development and implementation of measures to avoid, minimize, or mitigate any adverse impacts to historical and cultural resources.

No-Action Alternative

Under the no-action alternative, environmental conditions at the project site would remain the same.

Conclusions

Based on our analysis, we recommend licensing the project as proposed by Appalachian with some staff modifications and additional measures.

In section 4.2 of the EA, we compare the total project cost of obtaining power from a likely alternative source of power in the region, for each of the alternatives identified above. Our analysis shows that under the no-action alternative, the London-Marmet Project would produce power at a cost which is \$745,000 or \$5.06/MWh less than the cost of alternative power. The Winfield Project would produce power at a cost which is \$773,000 or \$7.28/MWh less than the cost of alternative power.

Under the applicant's proposal, the London-Marmet Project would produce power at a cost which is \$702,000 (\$4.76/MWh) less than the cost of alternative power. The Winfield Project would produce power at a cost which is \$769,000 (\$7.24/MWh) less than the cost of alternative power.

Under the staff alternative, the London-Marmet Project would produce power at a cost which is \$661,000 (\$4.49/MWh) less than the cost of alternative power. The Winfield Project would produce power at a cost which is \$766,000 (\$7.21/MWh) less than the cost of alternative power.

We chose the staff alternative as the preferred alternative because: (1) the projects would provide a dependable source of electrical energy for the region (147,391,000 kilowatt-hours annually at the London-Marmet Project and 106,193,000 kilowatt-hours annually at the Winfield Project); (2) the 28.80 MW of electrical energy from the London-Marmet Project and the 14.76 MW of electrical energy from the Winfield Project comes from a renewable resource which does not contribute to atmospheric pollution; (3) the recommended environmental measures proposed by Appalachian, as modified by staff, would adequately protect and enhance environmental resources affected by the projects.

On the basis of our independent analysis, we conclude that issuing licenses for operation of the projects, with the environmental measures that staff recommend, would not be a major federal action significantly affecting the quality of the human environment.

ENVIRONMENTAL ASSESSMENT

Federal Energy Regulatory Commission
Office of Energy Projects
Division of Hydropower Licensing
Washington, D.C.

London-Marmet and Winfield Projects FERC Nos. 1175-015 and 1290-012, West Virginia

1.0 INTRODUCTION

1.1 APPLICATION

On January 31, 2012, the Appalachian Power Company (Appalachian) filed an application with the Federal Energy Regulatory Commission (Commission) for new licenses to operate and maintain its London-Marmet and Winfield Hydroelectric Projects. The projects are located on the Kanawha River in Fayette, Kanawha, and Putnam Counties, West Virginia (figure 1). The London-Marmet and Winfield Projects would occupy 11.51 and 8.25 acres, respectively, of federal land managed by the U.S. Army Corp of Engineers (Corps). The London-Marmet Project generates an average of about 147,391 megawatt-hours (MWh) annually. The Winfield Project generates an average of about 106,193 MWh annually.

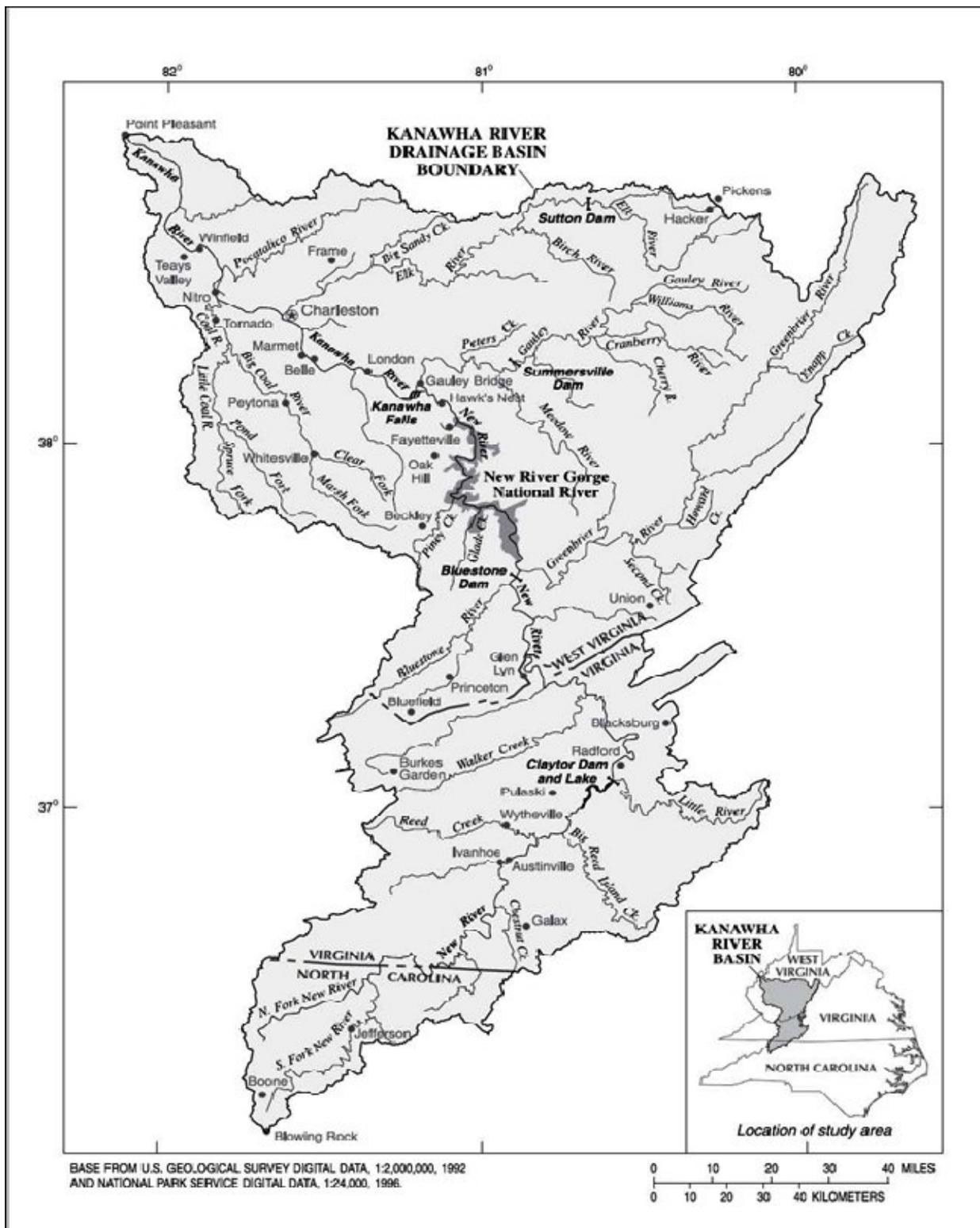


Figure 1. General Vicinity Map of London-Marmet and Winfield Projects (Source: Appalachian, as modified by staff).

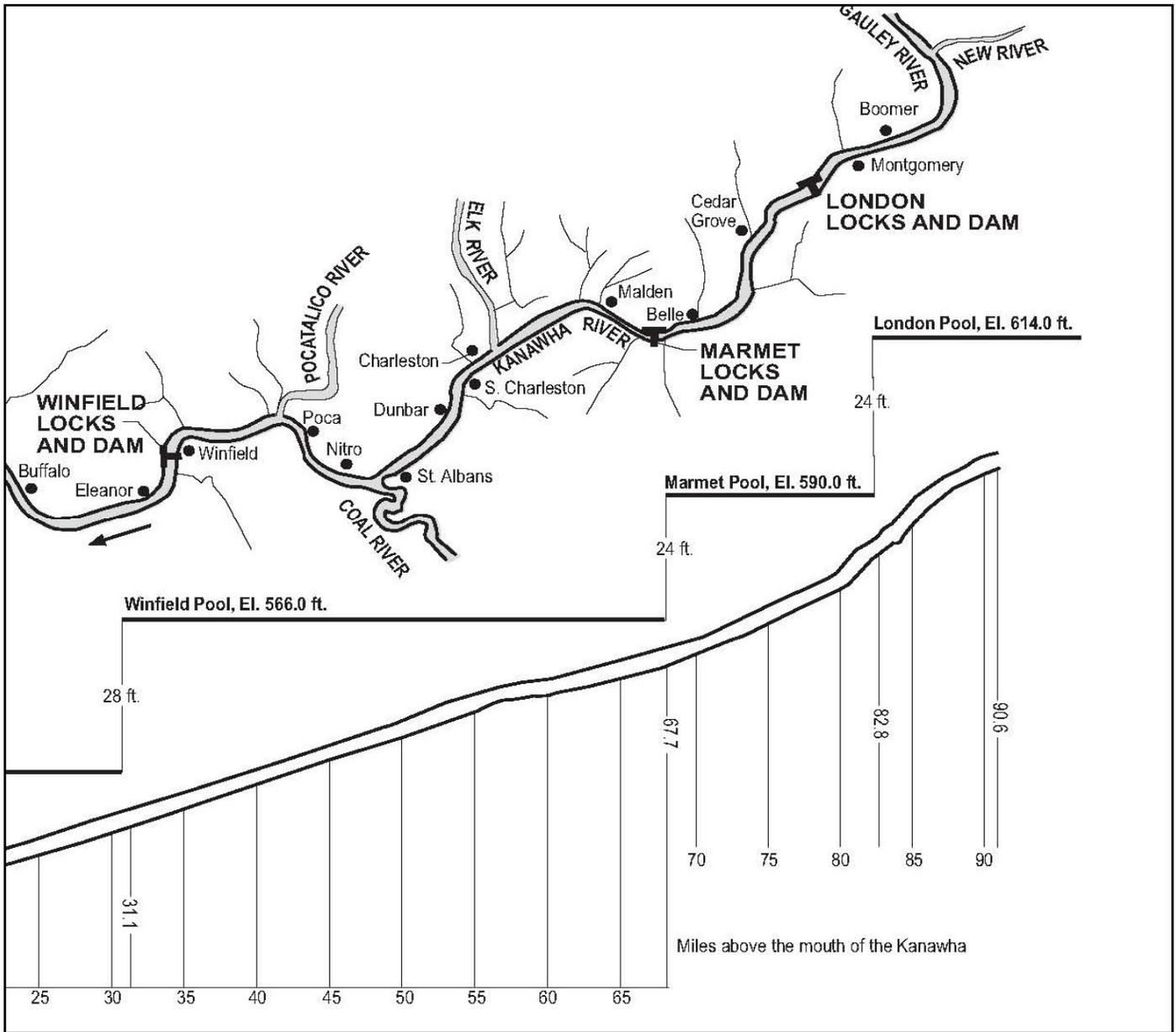


Figure 2. General Project Location and Kanawha River Profile (Source: Appalachian).

1.2 PURPOSE OF ACTION AND NEED FOR POWER

1.2.1 Purpose of Action

The purpose of the London-Marmet and Winfield Projects is to continue to provide a source of hydroelectric power. Therefore, under the provisions of the Federal Power Act (FPA), the Commission must decide whether to issue licenses to Appalachian for the London-Marmet and Winfield Projects and what conditions should be placed on any licenses issued. In deciding whether to issue a license for a hydroelectric project, the Commission must determine that the project will be best adapted to a comprehensive plan for improving or developing a waterway. In addition to the power and developmental purposes for which licenses are issued (such as flood control, irrigation, or water supply), the Commission must give equal consideration to the purposes of: 1) energy conservation; 2) the protection of, mitigation of damage to, and enhancement of fish and wildlife resources; 3) the protection of recreational opportunities; and 4) the preservation of other aspects of environmental quality.

In this environmental assessment (EA) staff evaluates the effects of: 1) continued project operation as proposed by Appalachian (proposed action); 2) as proposed by Appalachian with staff modifications (staff alternative); and 3) no action (continued operation with no changes). Important issues that are addressed include water quality, fish entrainment and impingement, vegetation management, recreational access, and protection of cultural resources.

1.2.2 Need for Power

The London-Marmet Project has a combined installed capacity of 28.8 MW. The Winfield Project has an installed capacity of 14.76 MW. Average annual generation is equal to 147,391 MWh, and 106,193 MWh for the London-Marmet and Winfield Projects, respectively.

Appalachian, a unit of American Electric Power (AEP), operates the London-Marmet and Winfield Projects to generate electricity that is merged with power being generated at AEP's other hydroelectric, nuclear, and coal-and-gas-fired power plants within the United States. The AEP system and its customers have a need for generating capacity. Without the capacity of the projects, the AEP system would need to find alternate resources. The needs assessment considers the projection of: 1) peak demand; 2) long-term wholesale sale positions; 3) existing capacity resources; 4) current demand-side management impacts on peak demand; 5) regional capacity; and 6) reserve margin criteria.

Internal peak demand forecasts reflected in table 1 are based on the AEP Economic Forecasting group's 2011 forecast, completed in March 2011. The internal demand grows at a 0.9 percent compound annual growth rate (CAGR) for the period

2011 through 2025. This equates to roughly a 200 to 205 MW per year increase over the same 10-year period. The capability forecast of the existing AEP System – East Zone generating fleet reflects 70 MW in upward re-ratings over the 10-year period, largely associated with various turbine efficiency upgrade projects for selected 1,300- and 800-MW-series coal units. The capability forecast of the existing generating fleet also reflects 216 MW in unit de-ratings associated with environmental retrofits (largely scrubbers) over the planning period.

Several of the system’s older generating units are potential retirement candidates, due not only to age but also to increasingly stringent environmental requirements. The potential for retirements aggregates to about 4,585 MW by 2016. There are 24 interruptible customers³ served by the AEP System - East Zone, with interruptible contract demands totaling over 1,000 MW. Based on historical consumption patterns and the particular nature of each interruptible contract, the estimated available interruptible load coincident with AEP System - East Zone peak demand is estimated at roughly 560 MW. In addition to interruptible rates and special contracts, AEP operating companies offer a number of rates and tariffs with “demand-side” features. These rates and tariffs are intended to encourage changes in customer load patterns.

Figure 3 presents the capacity position under the base demand projection and the current capacity supply portfolio of the AEP System - East Zone. Figure 3 demonstrates the need for additional capacity on the system, which prior to 2025 is supplied by annual market purchases. If the system did not have the generation from the London-Marmet and Winfield Projects, that capacity would have to be replaced with additional purchases.

The power generated by the London-Marmet and Winfield Projects helps meet the electricity needs of AEP’s customers while fulfilling public interest in environmentally sound sources of renewable energy. Operation of these hydroelectric projects helps to balance AEP’s energy portfolio and reduces the acid rain and greenhouse effects associated with coal- and oil-fired generation.

We conclude that power from the London-Marmet and Winfield Projects would help a need for power in the AEP System - East Zone in both the short and long-term. The projects provide low-cost power that displaces generation from non-renewable

³ A special electricity or natural gas arrangement under which, in return for lower rates, the customer must either reduce energy demand on short notice or allow the electric or natural gas utility to temporarily cut off the energy supply for the utility to maintain service for higher priority users. This interruption or reduction in demand typically occurs during periods of high demand for the energy (summer for electricity and winter for natural gas).

sources. Displacing the operation of non-renewable facilities may avoid some power plant emissions, thus creating an environmental benefit.

Table 1. AEP System - East Zone Peak Demand Projection (Source: Appalachian)

Summer Season (Year)	Internal Demand (MW)	Annual Growth (MW)
2011	21,128	-
2012	21,413	285
2013	21,726	313
2014	21,898	172
2015	22,054	156
2016	22,171	117
2017	22,350	179
2018	22,534	184
2019	22,743	209
2020	22,908	165
2021	23,170	262
2022	23,369	199
2023	23,525	156
2024	23,666	141
2025	23,919	253
CAGR 2011-25 Average	0.9 percent	199

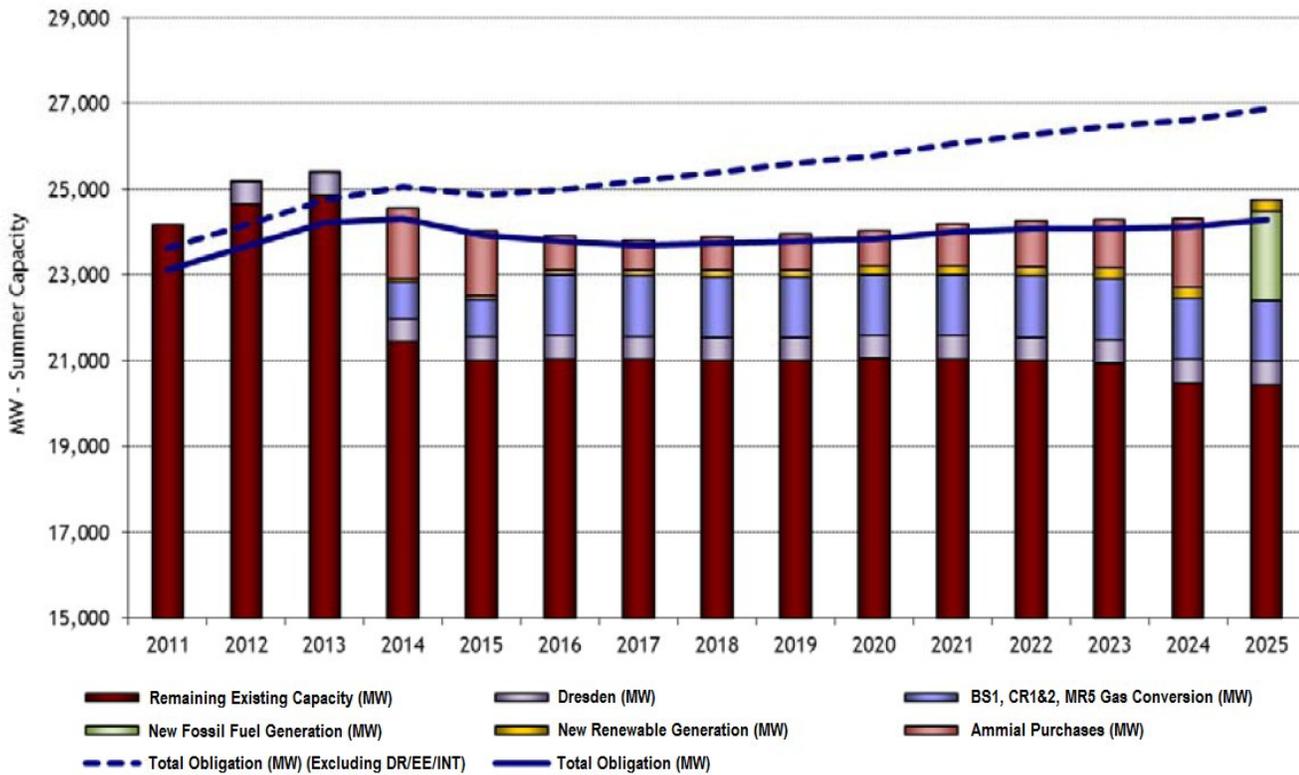


Figure 3. AEP System-East Zone Projected Capacity Deficiency (Source: Appalachian)

1.3 STATUTORY AND REGULATORY REQUIREMENTS

Licenses for the London-Marmet and Winfield Projects are subject to numerous requirements under the Federal Power Act (FPA) and other applicable statutes. The major regulatory and statutory requirements are summarized in table 2 and described below.

Table 2. Major Statutory and Regulatory Requirements for the London-Marmet and Winfield Projects (Source: Staff).

Requirement	Agency	Status
Section 18 of the FPA (fishway prescriptions)	U.S. Department of the Interior (Interior)	Interior has neither prescribed fish passage nor requested reservation of authority to prescribe fish passage.
Section 10(j) of the FPA	West Virginia Division of Natural Resources (West Virginia DNR)	West Virginia DNR filed 10(j) recommendations on August 7, 2012.

Requirement	Agency	Status
Clean Water Act - water quality certification	West Virginia Department of Environmental Protection (West Virginia DEP)	West Virginia DEP received Appalachian's request for 401 water quality certification for both projects on August 7, 2012.
Endangered Species Act	U.S. Fish and Wildlife Service (FWS)	Staff found that the listed species are not likely to be adversely affected.
National Historic Preservation Act	West Virginia State Historic Preservation Officer (SHPO)	Staff found that cultural resources could be adversely affected.

1.3.1 Federal Power Act

1.3.1.1 Section 18 Fishway Prescriptions

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 Interior. No fishway prescriptions were filed for the project.

1.3.1.2 Section 10(j) Recommendations

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 project. The Commission is required to include these conditions unless it determines that they are inconsistent with the purposes and requirements of the FPA or other applicable law. Before rejecting or modifying an agency recommendation, the Commission is required to attempt to resolve any such inconsistency with the agency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency.

The West Virginia DNR timely filed, on August 7, 2012, recommendations under section 10(j), as summarized in table 13, in section 5.4.1, *Recommendations of Fish and Wildlife Agencies*. In section 5.4, we also discuss how we address the agency recommendations and comply with section 10(j).

1.3.1.3 Section 10(a) Recommendations

Under section 10(a) of the FPA, each hydroelectric license issued by the Commission should 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 waterpower development; for the adequate protection, mitigation, and enhancement of fish and wildlife; and for other beneficial public uses, including irrigation, flood control, water supply, recreation, and other purposes.

1.3.2 Clean Water Act

Under section 401(a)(1) of the Clean Water Act (CWA), license applicants must obtain either certification that any discharge from a project would comply with applicable provisions of the CWA, or a waiver of certification by the appropriate state agency. On August 6, 2012, Appalachian applied to the West Virginia DEP for 401 water quality certification (certification) for both projects on August 6, 2012. West Virginia DEP received the request on August 7, 2012. West Virginia DEP has not yet acted on the certification request.

1.3.3 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 threatened or endangered species or result in the destruction or adverse modification of the critical habitat of such species.

The federally listed Virginia spiraea (threatened), running buffalo clover (endangered), Indiana bat (endangered), Virginia big-eared bat (endangered), pink mucket mussel (endangered), Northern riffleshell mussel (endangered), fanshell mussel (endangered), turbercled-blossom pearly mussel (endangered), and the spectaclecase mussel (endangered), could be present in the projects' areas.

Based on the degree of development within the London-Marmet and Winfield Projects, there is limited available habitat to support the federally threatened Virginia spiraea, which require scoured banks along high gradient streams in the absence of substantial competition from other plants, or the federally endangered running buffalo clover, which requires recently disturbed areas to propagate in the absence of substantial competition from invasive plant species. Neither plant species has been documented within the project boundaries. Endangered Indiana and Virginia big-eared bats may use the three developments for foraging and roosting activity during the summer, but such use has not been documented within the project boundaries.

The implementation of a vegetation maintenance plan would maintain the current level of potential foraging habitat for bats. Because no significant ground-disturbing activities are proposed and the projects would operate in a run-of-release mode under the staff alternative, continued project operation would not be likely to adversely affect these four terrestrial species.

Mussel surveys conducted in 2002 in the Marmet impoundment and in 2005 in the Winfield impoundment documented the presence of only one live spectaclecase mussel and one relic pink mucket mussel. Suitable habitat for these and other endangered mussel species and access to their host fish is likely no longer available in the project area due to the construction of the Corps' locks and dams. Operating the projects' three developments in a run-of-release mode would ensure that there would be no project-related effects on water quality, impoundment levels, and flows downstream of the project. Therefore, staff concludes that continued operation of the London-Marmet and Winfield Projects is not likely to adversely affect these federally listed mussels.

1.3.4 National Historic Preservation Act

Section 106 of the National Historic Preservation Act of 1966 (NHPA)⁴ and its implementing regulations⁵ requires that every federal agency "take into account" how each of its undertakings could affect historic properties. 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).

Operating and maintaining the powerhouses at the London-Marmet and Winfield Projects on a regular basis could lead to adverse effects to the integrity of these historic resources. Appalachian's proposal to prepare an historic properties management plan (HPMP) would provide guidelines, policies, and procedures for the development and implementation of measures to avoid, minimize, or mitigate any adverse impacts to historical and cultural resources. To date, Appalachian has not filed an HPMP with the Commission. The Commission intends to execute a programmatic agreement (PA) with the West Virginia SHPO for the protection of historic properties from the effects of continued operation of the London-Marmet and Winfield Projects which would require Appalachian to develop and implement an HPMP. On October 13, 2011, Appalachian received a letter from the West Virginia State SHPO stating that it would provide comments upon receipt of the HPMP.

1.4 PUBLIC REVIEW AND COMMENT

The Commission's regulations (18 CFR, section 5.1-5.16) require that applicants consult with appropriate resource agencies, tribes, and other entities before filing an application for a license. This consultation is the first step in complying with the Fish and Wildlife Coordination Act, ESA, NHPA, and other federal statutes. Pre-filing consultation must be complete and documented according to the Commission's

⁴ 16 U.S.C. § 470 et seq. (2006).

⁵ 36 C.F.R. Part 800 (2012).

regulations.

1.4.1 Scoping

Before preparing this EA, we conducted scoping to determine what issues and alternatives should be addressed. We issued a scoping document on October 14, 2008, and requested that interested parties file comments with the Commission by December 12, 2008. We held a public site visit on November 12, 2008. The West Virginia DNR provided written comments on December 12, 2008.

On February 13, 2009, Commission staff issued a letter stating that because no new issues were identified during scoping that it would not be issuing a revised scoping document and the comments received during scoping would be addressed in the EA for the projects.

1.4.2 Interventions

On June 8, 2012, the Commission issued a notice that Appalachian had filed an application to relicense the London-Marmet and Winfield Projects. This notice set a deadline of August 7, 2012, for filing protests and motions to intervene. West Virginia DNR filed motions to intervene for both projects on July 30, 2012.

1.4.3 Comments on the Application

On June 8, 2012, the Commission issued a public notice requesting comments, final recommendations, conditions and prescriptions with a filing deadline of August 7, 2012. West Virginia DNR filed comments for both projects on August 7, 2012. On September 21, 2012, Appalachian filed reply comments.

1.4.4 U.S. Army Corps of Engineers – Terms and Conditions

Pursuant to the memorandum of understanding (MOU) between the Commission and the Department of the Army,⁶ licensed hydropower facilities that would be an integral part of or that could affect the structural integrity or operation of Corps' projects shall be designed, constructed, and operated in consultation with and subject to the review and approval of the appropriate Corps District Engineer. Consistent with the MOU, the Commission routinely includes special license articles which do the following:

⁶ See *Memorandum of Understanding between the United States Army Corps of Engineers and the Federal Energy Regulatory Commission on Non-federal Hydropower Projects*, March 2011. <http://www.ferc.gov/legal/maj-ord-reg/mou/mou-usace.pdf>

- require the licensee to submit final plans and specifications for cofferdams and deep excavations to the Corps and Commission for review and approval;
- require the licensee to enter into a comprehensive agreement with the Corps within 90 days after a license is issued to coordinate its plans for access to and site activities on lands and property administered by the Corps, so that the authorized purposes, including operation of the federal facilities, are protected;
- authorize the Corps to (a) inspect the construction, operation, and maintenance of any licensed facilities that may affect the structural integrity or operation of the Corps' project, and (b) order the licensee to stop any activity that may endanger the structural integrity or safety of the Corps' project;
- require the licensee to submit a regulating (or operating) plan to the Corps for approval at least 60 days prior to the start of construction, and to enter into an operating Memorandum of Agreement (MOA) with the Corps describing the detailed operation of the power facilities acceptable to the Corps;
- provide that the licensee shall have no claim under the license against the United States arising from the effect of any changes made in the operation or impoundment levels of the Corps' project; and
- require the licensee to provide the Commission's Regional Director two copies of all correspondence between the licensee and the Corps and provide that the Commission's Regional Director shall not authorize construction until the Corps provides final written approval of the project.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 NO-ACTION ALTERNATIVE

Under the no-action alternative, the projects would continue to operate under the terms and conditions of the existing license, and no new environmental protection, mitigation, or enhancement measures would be implemented. We use this alternative as the baseline environmental condition for comparison with other alternatives.

2.1.1 Existing Project Facilities

As licensed, the London-Marmet Project consists of two developments. The existing London Development utilizes the head created by the Army Corps of Engineers' (Corps) 26-foot-high London dam located at river mile (RM) 82.8 on the Kanawha River and consists of: (1) a forebay area protected by a log boom; (2) screened intake structures; (3) a concrete powerhouse containing three turbine-generator units with a total installed capacity of 14.4 megawatts (MW); (4) a tailrace 420 feet long; (5) a substation containing two three phase transformers and two auxiliary transformers; and (6) two 0.38-mile-long, 46-kilovolt (kV) transmission lines running parallel from the London powerhouse to the London substation. Project recreation facilities at the London Development include a parking area, a path from the parking area to the fishing pier, the stairs to the fishing pier, and the tailrace fishing pier.

As licensed, the Marmet Development utilizes the head created by the Corps' 34-foot-high Marmet dam located at RM 67.7 on the Kanawha River and consists of: (1) a forebay area protected by a log boom; (2) screened intake structures; (3) a concrete powerhouse containing three turbine-generator units with a total installed capacity of 14.4 MW; (4) a tailrace 450 feet long; (5) a substation containing two three phase transformers and two auxiliary transformers; and (6) two 0.78-mile-long, 46-kV transmission lines that transmit power from the Marmet powerhouse to the Belle substation. Project recreation facilities at the Marmet Development include a parking area, the path from the parking area to the fishing pier, the stairs to the fishing pier, and the tailrace fishing pier.

The London-Marmet Project has a total installed capacity of 28.8 MW and generates about 147,391 MWh annually.

As licensed, the Winfield Project utilizes the head created by the Corps' 38-foot-high Winfield dam located at RM 31.1 on the Kanawha River and consists of: (1) a forebay area protected by a 410-foot-long log boom; (2) screened intake structures; (3) a concrete powerhouse containing three turbine-generator units with a total installed capacity of 14.76 MW; (4) a tailrace 410 feet long; (5) a substation containing a generator step-up bank of three transformers and three auxiliary transformers; and (6) two 0.38-mile-long, 46-kV transmissions lines. Project recreation facilities at the Winfield Project

include a parking area, the path from the parking area to the fishing pier, the stairs to the fishing pier, and the tailrace fishing pier. The project generates about 106,193 MWh annually.

The project boundary for each of the three developments includes the forebays, powerhouses, tailraces, switchyards, recreational facilities, and transmission lines. With the exception of the transmission lines, the projects' facilities are located at the opposite end of the Corps' dams from the locks. The dams, locks, and impoundments are not part of the licensed hydroelectric facilities. The project boundaries include all of the land and facilities necessary to safely operate the projects.

Most of the lands within the project boundaries are owned by the Corps except for some transmission line right-of-ways and about 1.45 acres at the Marmet Development owned by Appalachian. Federal lands within the projects' boundaries at each of the developments consist primarily of the areas immediately around the powerhouse – approximately 4.31 acres for the London Development, 6.78 acres for the Marmet Development, and 8.25 acres at the Winfield Project.

2.1.2 Project Safety

Under new hydropower licenses, the proposed London-Marmet and Winfield Projects would be subject to the Commission's project safety requirements. As part of the licensing process, Commission staff would evaluate the adequacy of the proposed project facilities. Special articles would be included in any licenses issued relating to construction, operation, and maintenance, and accepted engineering practices and procedures. Once the project begins operation under a new license, Commission engineers would inspect it on a regular basis. Because the London, Marmet, and Winfield dams are owned and operated by the Corps, the Commission would coordinate with the Corps to fulfill its obligation to ensure that the project safety requirements are met.

2.1.3 Existing Project Operation

The Corps operates the London, Marmet, and Winfield dams to maintain a navigational channel at least 9 feet deep through the impoundments and upstream to the limit of navigability at RM 90.57. Operation of the London-Marmet and Winfield Projects is governed by an operating agreement⁷ between Appalachian and the Corps and the conditions in the existing licenses. Appalachian maintains frequent contact with the Corps' lockmasters to ensure coordination of hydropower generation and lock operations. From time to time, the Corps may request that Appalachian plant operators maintain

⁷ See Lower Kanawha Operating Plan as required for P-1175 license article 41 and P-1290 license article 40, filed September 3, 1985, Accession No. 19851217-0316.

certain water elevations for special navigation purposes. Each development has a total hydraulic capacity of 10,000 cubic feet per second (cfs). When stream flow is less than 10,000 cfs, Appalachian controls the impoundments' elevations, within the allowable limits for navigation established by the Corps. When stream flow is greater than 10,000 cfs, the Corps' dam operator assumes control of impoundment elevations. Releases from each development are routed back to the Kanawha River via each development's tailrace.

The operating agreement allows the London Development to be operated as a peaking facility with a maximum allowable drawdown in the London impoundment established by the Corps at 3.0 feet from a normal full pond elevation of 614.00 feet above mean sea level (msl) to 611.00 feet msl. In addition, to protect and enhance fish spawning habitat, the current licenses limit impoundment fluctuations to 1.5 feet (from 614.00 to 612.50 feet msl) from March 1 through April 30, and 2.0 feet (from 614.00 to 612.00 feet msl) from May 1 through June 15. Historically, Appalachian would begin operating the Marmet Development a few minutes prior to the start of peaking releases at the London Development because of the limited storage capability of the Corps' Marmet dam. The Winfield Development would begin operation about 1 hour after the drawdown at the London Development began and would continue making releases for about 1 hour after the London Development reduced its load to refill the London impoundment. The maximum allowable drawdown for the Marmet and Winfield developments as established in the operating agreement is 0.3 foot (from normal full pond elevation 590.0 feet msl to 589.7 feet msl) and 0.2 foot (from normal full pond elevation 566.0 feet msl to 565.8 feet msl), respectively. All three developments are limited to a drawdown rate of 0.5 foot per hour.

However, for the past 20 years, Appalachian has voluntarily operated the London Development within an impoundment level of 0.3 foot and has not used the maximum allowable impoundment fluctuation for power generation purposes.⁸ As such, the three developments have operated within impoundment drawdown limits between 0.2 and 0.3 foot.

2.1.4 Existing Environmental Measures

Existing environmental measures implemented by Appalachian are as follows:

- maintenance of recreational facilities associated with each development; and
- limit impoundment fluctuations at the London Development to 1.5 feet (from 614.00 to 612.50 feet msl) from March 1 through April 30, and 2.0

⁸ Personal Communication with Teresa Rogers, American Electric Power Service Corporation, October 23, 2012.

feet (from 614.00 to 612.00 feet msl) from May 1 through June 15, with a maximum drawdown rate of 0.5 foot per hour at all times to protect and enhance fish spawning habitat.

2.2 APPLICANT'S PROPOSAL

2.2.1 Proposed Project Facilities

Appalachian does not propose any new project facilities except for the reestablishment of public access to the London tailrace fishing area, which was recently completed. However, Appalachian proposes to remove from the project boundary, two currently licensed 0.38-mile-long, 46-kV transmission lines from the Winfield Project because there are no primary transmission lines associated with the project. Appalachian also proposes that the London substation and Belle substation in the current license for the London-Marmet Project be removed from the project boundary because they are multi-use facilities.

2.2.2 Proposed Project Operation

Appalachian is proposing to limit impoundment fluctuation due to project operation to 0.3 foot from elevation 613.7 to 614.0 at the London Development. Appalachian is not proposing any changes to the current operation described above for either the Marmet Development or the Winfield Project.

2.2.3 Proposed Environmental Measures

Appalachian proposes to implement the following environmental measures:

- operate the three developments in run-of-release mode;
- implement an avian protection plan, currently being finalized by Appalachian's parent company, AEP, for all of its holdings, to protect migratory birds from electrocution and collision with power lines and substations at the three developments;
- maintain the recently reopened London tailrace fishing access;
- install portable restrooms and trash receptacles at the London, Marmet, and Winfield Developments to accommodate existing and future recreation use; and
- implement an HPMP at each project to be developed in consultation with the West Virginia SHPO and other interested stakeholders.

2.3 STAFF ALTERNATIVE

Under the staff alternative, the project would include most of Appalachian's proposed measures, as outlined above. In addition, the staff alternative would include the following additional measures:

- developing a project operation and compliance monitoring plan that includes provisions for documenting compliance with any Corps' operating requirements and establishing a schedule for reporting project compliance/non-compliance during normal operation and emergencies;
- developing a vegetation maintenance plan for all three developments to minimize the effects of project maintenance on native plant communities, wetlands, and wildlife within the project boundaries of the three developments;
- developing an avian protection plan with site-specific measures and practices to reduce bird mortality at each development, rather than implementing the general avian protection plan being finalized by AEP;
- developing a recreation plan for each project that includes operation and maintenance provisions for new and existing facilities and an implementation schedule; and
- revising the project boundary for the London Development to include the road used to access the tailrace fishing area, the parking area, and the path to the fishing pier to ensure that these facilities and associated public recreational access would be maintained over the term of any new license.

Proposed and recommended measures are discussed under the appropriate resource areas in section 3 and summarized in section 5 of the EA.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

We considered several alternatives to the applicant's proposal, but eliminated them from further analysis because they are not reasonable in the circumstances of this case. They are: 1) issuing a non-power license, 2) federal takeover of the project, and 3) project retirement.

2.4.1 Issuing a Non-power License

A non-power license is a temporary license that the Commission will terminate when it determines that another governmental agency will assume regulatory authority and supervision over the lands and facilities covered by the non-power license. At this

point, no agency has suggested a willingness or ability to do so. No party has sought a non-power license and we have no basis for concluding that the project should no longer be used to produce power. Thus, we do not consider issuing a non-power license a realistic alternative to relicensing in this circumstance.

2.4.2 Federal Government Takeover of the Project

We don't consider federal takeover to be a reasonable alternative. Federal takeover and operation of the project would require Congressional approval. While that fact alone wouldn't preclude further consideration of this alternative, there is no evidence to indicate that federal takeover should be recommended to Congress. No party has suggested federal takeover would be appropriate, and no federal agency has expressed an interest in operating the project.

2.4.3 Retiring the Project

Project retirement would require denying the relicense application and surrender or termination of the existing license(s) with appropriate conditions. There could be significant costs involved with retiring the projects and/or removing any project facilities. The project(s) provide a viable, safe, and clean renewable source of power to the region, as well as recreation opportunities. With project retirement, the projects would no longer be authorized to generate power.

No participant has suggested that project retirement would be appropriate in this case, and we have no basis for recommending it. Thus, project retirement is not a reasonable alternative to relicensing the projects with appropriate protection, mitigation, and enhancement measures.

3.0 ENVIRONMENTAL ANALYSIS

This section includes: 1) a general description of the project vicinity; 2) an explanation of the scope of our cumulative effects analysis; and 3) our analysis of the proposed action and recommended environmental measures. The section is organized by resource area (aquatic, recreation, etc.). Under each resource area, historic and current conditions are first described. The existing condition is the baseline against which the environmental effects of the proposed action and alternatives are compared, including an assessment of the effects of proposed mitigation, protection, and enhancement measures, and any potential cumulative effects of the proposed action and alternatives. Staff conclusions and recommendations are discussed in section 5.2 of the EA, *Comprehensive Development and Recommended Alternative*.⁹

3.1 GENERAL DESCRIPTION OF THE RIVER BASIN

The Kanawha River originates at the North Fork and South Fork of the New River in the mountainous northwestern corner of North Carolina. After the New River is formed by the confluence of the North and South forks in Ashe County, North Carolina, it flows into Virginia where it is joined by the Little River, and then into West Virginia where it is joined by the Bluestone and Greenbrier rivers. A few miles northwest of Fayetteville, West Virginia, the New River merges with the Gauley River to form the Kanawha River. The Kanawha River is a tributary to the Ohio River, which is in turn a tributary to the Mississippi River. From the origins of the South Fork New River in Watauga County, North Carolina, to the confluence of the Kanawha and Ohio rivers at Point Pleasant, West Virginia, the New/Kanawha River is 450 miles long. The New River enters Virginia 335 miles upstream of the Ohio River and enters West Virginia 188 miles upstream of the Ohio River. In southern West Virginia, the New River is reregulated by the Corp's Bluestone dam, near the town of Hinton. Bluestone dam is the only dedicated flood control project on the entire 450 miles of the New/Kanawha River.

The drainage basin for the Kanawha River includes portions of West Virginia, Virginia, and North Carolina. Three significant tributaries enter the Kanawha River between the Marmet and Winfield dams: the Elk, Coal, and Pocatalico Rivers. The total drainage areas upstream of the London, Marmet, and Winfield dams are 8,490; 8,816; and 11,813 square miles, respectively. The average daily flow at the London, Marmet, and Winfield dams is estimated at 12,432; 12,880; and 17,259 cfs, respectively.

The projects are located in the mountainous Appalachian Plateau physiographic province of West Virginia. The area surrounding the projects generally experiences mild winters and warm humid summers with an average annual temperature of 55 degrees

⁹ Unless noted otherwise, the sources of our information are the license application (Appalachian 2012a) and additional information filed by Appalachian (2012b).

Fahrenheit (°F). Average winter and summer temperatures measure 44 °F, and 66 °F, respectively. Rainfall amounts within the projects' areas average approximately 42 inches and snowfall averages 25 to 40 inches annually.

3.2 SCOPE OF CUMULATIVE EFFECTS ANALYSIS

According to the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (40 CFR § 1508.7), an action may cause cumulative effects on the environment if its impacts overlap in time and/or space with the impacts of other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time, including hydropower and other land and water development activities.

Based on our review of the license application and agency and public comments, we have identified water quality and fisheries as resources having the potential to be cumulatively affected by continued operation of the London-Marmet and Winfield Projects in combination with other activities in the basin. These effects are discussed in section 3.3.2 *Aquatic Resources*.

3.2.1 Geographic Scope

The geographic scope of the analysis defines the physical limits or boundaries of the proposed action's effect on the resources. Because the proposed action would affect the resources differently, the geographic scope for each resource may vary.

The geographic scope for water resources would be the Kanawha River from the project boundary of the London-Marmet Project, downstream to stream reaches affected by operational flow releases associated with the Winfield Project. This boundary was selected because of the direct interaction between the London-Marmet and Winfield Projects, and because of the indirect association with other water users (e.g., the Corps locks and dams, navigation uses, consumptive uses, and discharges into the Kanawha River) in the area.

For fishery resources we chose the Kanawha River from the upstream end of the London Development boundary, and extending downstream to river reaches affected by releases from waters below the Winfield Development. We chose the above geographic boundary because the presence and operation of the London-Marmet and Winfield Projects could affect the movements of fish and fish populations in the Kanawha River.

3.2.2 Temporal Scope

The temporal scope of our cumulative effects analysis includes a discussion of the past, present, and reasonably foreseeable future actions and their effects on each resource

that could be cumulatively affected. Based on the potential new license term, the temporal scope looks 30 to 50 years into the future, concentrating on the effects on the resources from reasonably foreseeable future actions. The historical discussion is limited, by necessity, to the amount of available information. We identified the present resource conditions based on the license application, agency comments, and comprehensive plans.

3.3 PROPOSED ACTION AND ACTION ALTERNATIVES

In this section, we discuss the effects of the project alternatives on environmental resources. For each resource, we first describe the affected environment, which is the existing condition and baseline against which we measure effects. We then discuss and analyze the site-specific environmental effects and any cumulative effects.

Only the resources that would be affected, or about which comments have been received, are addressed in detail in this EA. Based on this, we have determined that aquatic, terrestrial, threatened and endangered species, recreation, cultural, and aesthetic resources may be affected by the proposed action and action alternatives. We have not identified any substantive issues related to geology and soils and socioeconomics associated with the proposed action, and therefore, this resource is not assessed in the EA. We present our recommendations in section 5.2, *Comprehensive Development and Recommended Alternative*.

3.3.1 Aquatic Resources

3.3.1.1 Affected Environment

Water Quantity

West Virginia DEP lists 12 facilities on the Kanawha River that divert a total of 99 cfs and discharge a total of 38 cfs to the Kanawha River. During average low-flow conditions in September, this net loss from water usage represents 1.25 percent of the total flow.

The London-Marmet and Winfield projects are located at a series of three Corps lock and dams. Kanawha River flows have been measured since 1877 at the U.S. Geological Survey (USGS) gauge No. 131930000 located about 12 miles upstream from the London Project. The mean monthly flows for the period 1938 to 2010 ranged from 4,870 cfs in September to 23,400 cfs in March (figure 4). From 1938 to 2010, the average annual flow was 12,114 cfs.

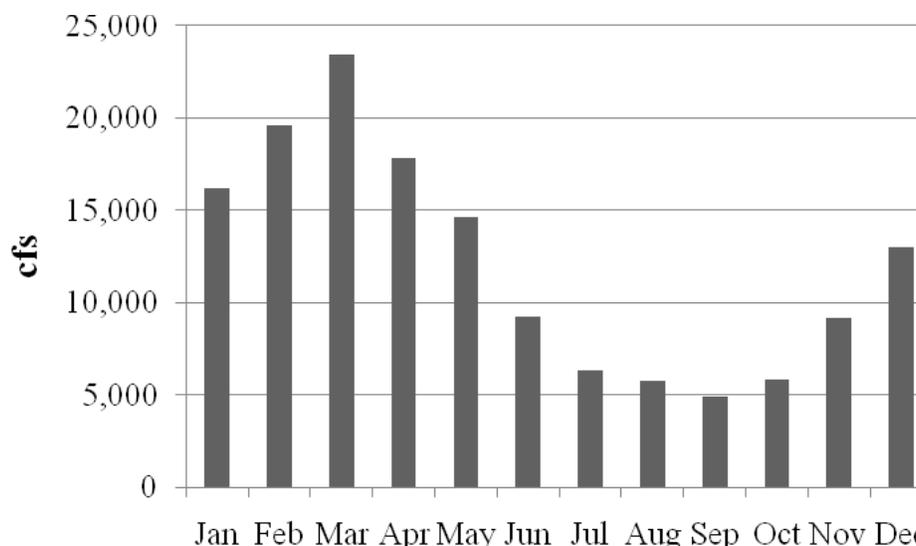


Figure 4. Mean Monthly Flow Statistics for USGS Gauge No. 131930000 for the Period 1938 to 2010 (Source: Appalachian).

London-Marmet Project

The Corps' London dam forms a 910-acre impoundment at the normal full pool elevation of 614.0 feet NGVD. Although the dam and impoundment are not part of the project, Appalachian is allowed to fluctuate the impoundment up to 3 feet between full pool and an elevation of 611.0 feet NGVD for project generation purposes. For the past 20 years, Appalachian has voluntarily operated the London Development in run-of-release mode with a 0.3-foot maximum impoundment fluctuation limit rather than utilizing the allowed fluctuation for peaking operation. The drainage area of the Kanawha River at the London dam is 8,490 square miles with an estimated average daily flow of 12,432 cfs. The London impoundment extends from the dam upstream approximately 9.4 miles, near the base of Kanawha Falls. The storage capacity of the London impoundment is estimated to be 19,000 acre-feet.

The Corps' Marmet dam forms a 1,420-acre impoundment at the normal full pool elevation of 590.0 feet NGVD. Although the dam and impoundment are not part of the project, Appalachian is allowed to fluctuate the impoundment up to 0.3 foot between full pool and an elevation of 589.7 feet NGVD for project generation purposes. The drainage area of the Kanawha River at the Marmet Development is 8,816 square miles with an estimated average daily flow of 12,880 cfs. The Marmet impoundment extends from the dam upstream approximately 15.2 miles, to the base of London dam. The impoundment has a surface area of 1,420 acres at the normal full impoundment elevation of 590.0 feet NGVD and approximately 36 miles of shoreline (including backwater into tributaries, excluding islands). The storage capacity of the impoundment is estimated to be 12,000 acre-feet.

Winfield Project

The Corps' Winfield dam forms a 3,738-acre impoundment at the normal full pool elevation of 566.0 feet NGVD. Although the dam and impoundment are not part of the project, Appalachian is allowed to fluctuate the impoundment up to 0.2 foot between full pool and an elevation of 565.8 feet NGVD for project generation purposes. The total drainage area of the Winfield dam is 11,813 square miles with an estimated average daily flow of 17,259 cfs. The Winfield impoundment extends from the dam upstream approximately 35.7 miles, to the base of Marmet dam. The impoundment has a surface area of 3,738 acres at the normal full impoundment elevation of 566.0 feet NGVD and approximately 139 miles of shoreline (including backwater into tributaries, excluding islands). The storage capacity of the impoundment is estimated to be 59,600 acre-feet.

Water Quality

During the 1950's and 1960's, the Kanawha River downstream from Charleston was widely regarded as one of the most polluted rivers in the Nation. However, upstream, near Kanawha Falls, the river's ecosystem remained healthy, supporting diverse fish and macroinvertebrate communities. Until about 1983, the Kanawha River downstream from Charleston was typically anoxic during the summer, and supported few, if any fish, and only pollution-tolerant invertebrates such as midges and earthworms. Cleanup efforts began with voluntary, phased effluent reductions in the 1950's and 1960's. Federally mandated effluent reductions in the 1970's restored enough dissolved oxygen (DO) to the Kanawha River for game fish populations to be reestablished by the early 1980's (USGS 1997). In addition, the Surface Mining Control and Reclamation Act of 1977, has resulted in an improvement in pH, total iron, total manganese, and sedimentation levels in the Kanawha River between about 1980 and 1998.

Table 3 displays the current water quality standards for many chemical parameters in the Kanawha River mainstem. West Virginia DEP water quality standards designate the Kanawha River from RM 0 to RM 72 near Diamond, West Virginia as Zone 1, and from RM 72 up river to its beginning and all undesignated tributaries as Zone 2. Both of these zones are designated for water use category B (propagation and maintenance of fish and other aquatic life) and category C (water contact recreation). The dissolved oxygen standard for zone 1 is not less than 4.0 milligrams per liter (mg/l) and for zone 2 is not less than 5.0 mg/l.

Currently, much of the Kanawha River mainstem does not meet its designated use classifications for aquatic life or human health. The entire Kanawha River mainstem is listed as impaired due to elevated concentrations of Polychlorinated Biphenyls (PCBs) in fish tissue. All areas between the Winfield and Marmet locks and dams are listed for mercury impairment and the Lower Kanawha River downstream from the Elk River is listed for dioxin and fecal coliform. Fish consumption advisories are in effect for the

entire Kanawha River. Most of these impairments are caused by the historical industrial discharges mentioned earlier. A Superfund site is located on the Kanawha River near Nitro, West Virginia where clean up of dioxin contaminated sediments is occurring along a 14-mile reach between RM 46 and 32 (EPA 2012).

In addition to establishing water quality standards, the state of West Virginia conducts studies to establish discharge limits or total maximum daily load (TMDL) for a given pollutant. The TMDL study for dioxin was completed in 2000 for the lower Kanawha River. TMDL studies for mercury and fecal coliform are projected to be completed by 2015 and for PCBs by 2020. The completion of these studies will likely result in further reduction of pollutants in the Kanawha River.

Table 3. Select water quality standards applicable to the mainstem Kanawha River. Values shown are maximum limits with the exception of DO. (Source: Appalachian).

PARAMETER	USE DESIGNATION				
	AQUATIC LIFE (WARMWATER AND WETLANDS)		HUMAN HEALTH		ALL OTHER USES
	ACUTE	CHRONIC	WATER SUPPLY	CONTACT RECREATION	
Dissolved oxygen (mg/l)	≥5.0		≥5.0	≥5.0	≥5.0
Dissolved oxygen, Kanawha River RM 0 to RM 72 (mg/l)	≥4.0				
Fecal coliform (number per 100 ml)					
a. Monthly geometric mean of ≥ 5 samples			a. 200	a. 200	
b. Percent of samples exceeding 400			b. 10	b. 10	
Mercury, total organism body burden of methylmercury for any aquatic species (ug/g)			0.5	0.5	
Total mercury in any unfiltered water sample (ug/l)	2.4		0.14	0.15	
Methylmercury in water column (ug/l)		.012			
PCB (ng/l)		14.0	0.044	0.045	0.045
Dioxin (2,3,7,8-TCDD)(pg/l)			0.013	0.014	0.014
Temperature, Kanawha River mainstem (°F)					
a. rise above natural temperature	a. 5				
b. maximum	b. 90				

Normandeau Associates completed a water quality study, as part of the relicensing process in order to: 1) review existing water quality data; 2) characterize the DO and temperature within the Corps' impoundments and downstream of the projects; 3) collect additional data during low flow/high temperature conditions; 4) identify project operation impacts on water quality; and 5) describe mitigation measures that enhance DO concentrations, if necessary. The study area includes the section of the Kanawha River from just above the London Development (RM 82.8) near Handley, West Virginia to just below the Winfield Project (RM 31.1) in Winfield, West Virginia.

A review of existing water quality data, from 1995 to the present, available from the Corps, West Virginia DEP, the Ohio River Valley Water Sanitation Commission (ORSANCO), and the USGS showed that DO levels throughout the study area have been in compliance with State of West Virginia water quality standards (greater than or equal to 5 mg/l). The few non-compliant DO levels measured were very sporadic and likely associated with monitoring issues rather than actual environmental conditions.

Additional water quality data was collected by Normandeau Associates from June 15 to October 17, 2009. During portions of the study period, Kanawha River flows were abnormally high. However, there were extended periods during July and September when flows were substantially below median flow. This range of flow conditions provides a demonstration of existing water quality under both high and low flow conditions.

During the low flow/high temperature conditions in 2009, DO levels were greater than or equal to 6.2 mg/l above and below the London-Marmet Project and greater than or equal to 5.6 mg/l above and below the Winfield Project. In addition, there was little vertical or horizontal stratification in temperature, DO, conductivity, or pH in the Corps' impoundments. However, water quality parameters showed the following trends from upstream to downstream (London impoundment to Winfield tailrace): temperature increased; DO levels decreased; specific conductivity increased; and pH decreased. These changes appear to be unrelated to the projects' operations and primarily related to tributary or wastewater discharges. Smaller changes in flow under low-flow conditions, such as those that might be seen as a result of flow regulation by the Corps, did not appear to have any effect on water quality.

During high-flow conditions, water quality generally improved. High flows associated with run-off events that occurred during the study resulted in a decrease in temperature, pH, and conductivity in the study area; an increase in DO; and a reduction in daily DO fluctuations. Therefore, the study concluded that impoundment fluctuations due to Appalachian's operations have little effect on water quality within the Corps impoundments and downstream of the projects.

The study results showed that DO levels downstream of each development were essentially the same as those upstream. The data did show occasional increases in temperature immediately above one or more of the dams. These were most likely due to the time of day the samples were collected or from the dams themselves rather than project operation. Although the feasibility of several methods of DO enhancement were evaluated, the report concluded that there was no evidence that project operations had any impact on water quality and that DO enhancement is unnecessary.

Fisheries

The Kanawha River in the vicinity of the London, Marmet, and Winfield Developments is located in an industrial/urban setting, is classified as a large river, and serves as a means of commercial navigation.

The impoundments created by the London, Marmet, and Winfield dams provide a homogeneous, low-value habitat type that is relatively abundant in the Kanawha River. However littoral zones bordering the navigational channels do provide some quality habitat for the aquatic resources found within each impoundment. The projects' tailwaters below the dams consist of coarse substrate, swift currents, and relatively shallow depths. The tailwaters represent a valuable remnant of pre-impoundment conditions.

In the mid-1960s, fish kills occurred routinely along the Kanawha River. Industrial pollution, untreated sewage, and untreated mine discharges wreaked havoc on the river's fish. DO levels became so low during hot summers that even more tolerant species such as catfish and carp died off (McCoy 2012). Federally mandated effluent reductions in the 1970's restored enough DO to the Kanawha River for game fish populations to be reestablished by the early 1980's (USGS 1997). However, fish consumption advisories are in effect for the entire Kanawha River due to PCB, dioxin, and mercury contamination (WVDHHR 2012).

Appalachian conducted a review of various fisheries surveys conducted in the projects' areas for its desktop entrainment analysis. This review showed that forty-nine fish species representing 15 families have been documented in the vicinity of the London, Marmet, and Winfield Developments. The fishery is dominated by redhorse sp., hog sucker sp., gizzard shad, bluegill, longnose gar, white bass, and channel catfish. Creel survey data collected in 1987 by West Virginia DNR in the Marmet and Winfield tailwaters indicate that channel catfish, white bass, freshwater drum, and crappie comprised 73 percent of all fish caught during the 7-month survey period. Creel survey data collected by Kleinschmidt in 2010 suggest that freshwater drum, hybrid striped bass, catfish, and smallmouth bass were the top species caught and released. Appalachian's sampling conducted in the Marmet impoundment in 2002 and 2003 resulted in the collection of 35 species of fish, dominated by Catostomids, Cyprinids, and Centrarchids. Appalachian's sampling in the Marmet impoundment from October 2005 to December 2006 documented the presence of 28 fish species, dominated by bluegill and gizzard shad which comprised 81 percent of all fish caught during the 1-year-long survey.

In recent years, West Virginia DNR has initiated programs to restore populations of paddlefish and sturgeon to the Kanawha River, and has begun stocking a river-adapted strain of walleye from the New River. West Virginia DNR records indicate that in one or more years between 2003 and 2007 the agency also stocked sauger in the London

impoundment; and blue catfish, largemouth bass, muskellunge, paddlefish, sauger, shovelnose sturgeon, and walleye in the Winfield impoundment (letter from K. Bledsoe, Fishery Biologist, West Virginia DNR, Charleston, WV, to Teresa Rogers, Appalachian, Roanoke, VA dated June 30, 2008).

Freshwater Mussel Community

Historically, the Kanawha River supported 39 freshwater mussel species. More recently, these species can only be found in the upstream-most 5 miles of the river between the head of navigation at RM 90.6 and the base of Kanawha Falls at RM 95.5, the location of the only viable mussel bed in the vicinity of the projects. It is likely that the decline in mussel species is due to severe pollution caused by industrial discharges during the 1950's and 1960's. Additionally, declines could have been associated with the construction of the Corps' locks and dams in 1935, which likely excluded or restricted the movement of host fish necessary for mussel reproduction and dispersal.¹⁰ Additionally, construction of the locks and dams would have likely altered flows and substrates reducing the availability of suitable habitat for species requiring stable sand or gravel bottom reaches (USGS 1997).

In 2002, EnviroScience, Inc. conducted a freshwater mussel survey in the Marmet impoundment between RMs 77.8 and 78.7. This survey yielded a total of 29 live or freshly dead mussels and 10 relic/sub-fossils representing 18 native mussel species. Four of the 18 species were collected as relic/sub-fossil specimens only, indicating that the species may not be successfully reproducing. The spectacle case and the pink mucket (relic only) were the only federally listed species collected. Fourteen of the live or freshly dead collected species are listed as imperiled or vulnerable to extirpation by the state of West Virginia including the mucket, threeridge, elephantear, longsolid, plain pocketbook, fluted shell, fragile papershell, round pigtoe, threehorn wartyback, pink heelsplitter, kidneyshell, giant floater, pimpleback, mapleleaf, and rainbow. The pink heelsplitter was the most abundant species comprising 27 percent of the live mussels collected. Two exotic species, the Asian clam and the zebra mussel, were also present.

In 2005, a mussel survey was conducted by EnviroScience, Inc. in the Winfield impoundment between RMs 38 and 39. This survey yielded 16 live mussels and 2 freshly dead shells representing three different species: the mapleleaf, pink heelsplitter, and the white heelsplitter. The pink heelsplitter is listed as somewhat vulnerable to extirpation by the state of West Virginia. Low abundance and species diversity found in

¹⁰ Reproduction in freshwater mussels begins when the male releases sperm into the current and the female siphons the sperm to fertilize the eggs. Larvae are released into the water column and find a host fish to attach to until they grow to juveniles. Juveniles detach from the host fish and settle on the river bottom to grow.

this reach indicates that habitat is marginally suitable and does not support self sustaining populations of freshwater mussels. The substrate found in this reach consisted of loose sand or silt which is not suitable habitat for most freshwater mussels. The three species found in the area are known to be more tolerant of siltation and capable of inhabiting less suitable habitat.

Species of Special Concern

Paddlefish

Paddlefish (*Polyodon spathula*) are characterized by a long paddle-like snout or rostrum extending to about one third of their body length. Coloration of their scaleless, torpedo-shaped body is blue-grey to black along the back and dark grey to white on the underside. Paddlefish grow to over 5 feet in length and commonly weigh more than 60 pounds. They can live beyond 30 years of age and have been known to reach weights of up to 198 pounds. Their skeletal system is composed primarily of cartilage and the jaws of adults have no teeth. Instead, comblike structures, called gill rakers (attached to the gills) are used to filter zooplankton (microscopic animals), their primary food, from the water as they swim along with their mouths open. Males and females take several years to mature and may not spawn every year (FWS 2001a).

Significant declines in paddlefish stocks have occurred over their entire natural range. One of the primary reasons for the decline in paddlefish populations is the loss of spawning and rearing habitat due to environmental alteration. Dam construction has eliminated spawning sites, interrupted natural spawning migrations, altered water flow, and eliminated backwaters that were important as nursery and feeding areas. Industrial contaminants, illegal fishing, and overexploitation by commercial and recreational anglers have also contributed to the decline. Like sturgeon, paddlefish eggs are harvested for caviar which also contributes to its decline (FWS 2001a).

The West Virginia DNR is participating in a coordinated effort with fish and wildlife agencies in Kentucky, Indiana, Illinois, Ohio, and Pennsylvania to restore paddlefish to large rivers. As a result of stocking juveniles in the Ohio and Kanawha Rivers, paddlefish are now frequently encountered by biologists within the Winfield impoundment of the Kanawha River.

Shovelnose Sturgeon

The shovelnose sturgeon (*Scaphirhynchus albus*), has a flattened and shovel-shaped snout and is distinguished by pale, bony plates instead of scales, a reptile-like body, a sucker-type mouth and large barbells or whisker-like sensors next to its mouth. The shovelnose sturgeon uses its strongly fringed barbells to sense the river bottom and to identify prey, and then capture it with its protrusible, vacuum cleaner-like mouth.

Shovelnose sturgeon are usually found in the strong currents and deep channels of large rivers over sand and gravel substrates. During high water stages in the spring they frequent areas downstream of wing dams or other obstructions and remain near shore, while during summer low water levels they remain near mid-channel. Shovelnose sturgeon are opportunistic feeders; taking any aquatic insects, mussels, worms, or crustaceans that are available (FWS 2001b).

Males mature at age 5, females at age 8 at lengths of approximately 20 inches and 25 inches, respectively. Weights at maturity range between 2 and 3 pounds, but some individuals have been recorded to weigh nearly 15 pounds. Spawning normally occurs from April through early July with mature shovelnose sturgeon migrating upriver to spawn over rocky substrates in flowing water between 66 and 70 °F. Females do not spawn every year, and spawning chronology is not readily evident. The shovelnose sturgeon is also important as the host to glochidia (larvae) of the Pimpleback, Hickorynut, and Yellow sandshell mussels. Like many other species of sturgeon, its eggs are harvested for caviar but overharvest has not been a major detriment to this species. Alteration of large rivers by channelization, construction of high dams, and construction of navigation locks and dams have contributed significantly to the decline of this species by blocking access to spawning and feeding habitat (FWS 2001b).

In an effort to enhance the shovelnose sturgeon population, a restoration program was initiated in 2005. West Virginia DNR collects adult shovelnose sturgeon from the Wabash River and transports them to the Palestine State Fish Hatchery, where they are spawned. The fry are ultimately released into the Kanawha River just downstream of Kanawha Falls and the Little Kanawha River. More than 20,000 shovelnose sturgeon were stocked into these rivers in 2007.

3.3.1.2 Environmental Effects

Aquatic Resources

Habitat Effects Due to Project Operation

Fluctuations in impoundment levels and instream flows downstream of hydropower projects have the potential to adversely affect aquatic habitats by contributing to shoreline erosion; increasing water turbidity; dewatering macroinvertebrates, mussels, fish and fish nests; and preventing the establishment of aquatic vegetation that can provide cover and forage for fish. The extent of such effects depends on the timing, magnitude, and frequency of the fluctuations.

Currently, the three hydroelectric facilities' operations are synchronized with the operation of the Corps' locks at each dam. The developments at the London-Marmet and Winfield Projects operate within allowable impoundment elevation limits as established

by the Corps. The London impoundment elevation is allowed to fluctuate between 611.0 feet and 614.0 feet NGVD (3 feet). The Marmet Impoundment elevation is allowed to fluctuate between 589.7 feet and 590.0 feet NGVD (0.3 foot). The Winfield impoundment elevation is allowed to fluctuate between 565.8 feet and 566.0 feet NGVD (0.2 foot). All three impoundments can be drawn down at a maximum rate of 0.5 feet per hour.

Appalachian proposes to operate all three developments in a run-of-release mode and limit fluctuations in the Corps' impoundments to 0.3 foot at the London Development, 0.3 foot at the Marmet Development, and 0.2 foot at the Winfield Project as it has done for the last 20 years.

West Virginia DNR (10(j) recommendation no. 2) recommends that the developments at the London-Marmet and Winfield Projects operate in a "run-of-the-river" mode as proposed by Appalachian and that the existing flow regime of the Kanawha River established by the Corps should not be modified to accommodate power generation.¹¹ West Virginia DNR states that operating the projects in a peaking mode can result in dewatering shallow water habitats within the impoundment, increase bank erosion, and increase the rate of entrainment of fish through the turbines. Because Appalachian has agreed not to pursue peaking, West Virginia DNR did not request studies to evaluate the impacts associated with peaking operations.

Staff Analysis

Although the current license and current operating agreement with the Corps allows peaking at the London Development, Appalachian has operated all three of the projects' developments in a run-of-release mode with minimal impoundment fluctuations (i.e., 0.2 to 0.3 foot) and in accordance with the flow regime established by the Corps for the last 20 years or so. Operating the project in a run-of-release mode and limiting impoundment fluctuations as proposed by Appalachian, in accordance with flows established by the Corps, would maintain impoundment and tailwater fluctuations similar to those experienced under natural hydrologic conditions (i.e. inflow equals outflow). These normative flow conditions would continue to reduce the potential for impacts to fish and mussel habitat both in the Corps' impoundments and downstream of the projects. Maintaining relatively stable impoundment levels would also minimize the potential for adverse effects to wetlands and shallow water and shoreline habitats important to fish, waterfowl, and water birds. Erosion of shoreline areas and resultant turbidity would also continue to be minimized when the impoundment is held relatively stable.

¹¹ Because the projects' developments would only operate off of flows made available to them by the Corps, we interpret West Virginia DNR's recommendation for run-of-river operation to be equivalent to run-of-release operation.

Water Quality Effects Due to Project Operation

One of the major environmental issues associated with hydroelectric power production is the effect of project operation on water quality; particularly DO concentrations in the water released from the dam. DO problems in the discharges from hydroelectric impoundments most often occur as a result of seasonal warming and the consequent thermal stratification of impounded water. The timing and duration of flow releases can substantially impact water quality below dams, especially during stratification (DOE 2003).

As stated above, Appalachian proposes to operate all three developments in a run-of-release mode and limit fluctuations in the Corps' impoundments to 0.3 foot at the London Development, 0.3 foot at the Marmet Development, and 0.2 foot at the Winfield Project as it has done for the last 20 years.

West Virginia DNR (10(j) recommendation no. 2) recommends that the developments at the London-Marmet and Winfield Projects operate in a "run-of-the-river" mode as proposed by Appalachian and that the existing flow regime of the Kanawha River established by the Corps should not be modified to accommodate power generation.

Staff Analysis

The Kanawha River in the vicinity of the projects is currently meeting state water quality standards for DO and has been for some time. Other water quality concerns, such as higher than acceptable levels of PCBs, dioxin, mercury, and fecal coliform, can be attributed to past and current wastewater discharges.

While the projects are not directly contributing the above pollutants to the system, they could affect the attenuation of these pollutants through impacts to flows, DO, or temperature. Low flows, low DO, and high temperatures could reduce the river's ability to dilute these pollutants. As previously discussed, the flows through the projects are determined by the Corps, with some minor fluctuation of the impoundments allowed, thus project operation has little control of flows through the system. Fluctuating water levels in the Corps' impoundments range between 0.2 and, 0.3 feet while the rate at which the impoundments can be lowered is limited to a maximum of 0.5 feet per hour.

Appalachian's water quality study concluded that the current projects' operations have little effect on DO or temperature in the system. The current allowable project-related fluctuations are a fraction of those that occur during run-off events. Observed increases in temperatures from upstream to downstream through the study area appear to be caused by waste water and tributary discharges rather than the projects' operations. Occasional increases in temperature immediately above one or more of the Corps' dams

were most likely due to the time of day the samples were collected or from the Corps' impoundments rather than due to project-related effects.

Maintaining run-of release operation at the projects with minimal fluctuations in the Corps' impoundments would minimize the residence time of the water in this portion of the system and increase the dilution of waste discharges which would continue to benefit aquatic habitat for fisheries and mussel communities. Therefore, continued operation of the projects would not affect water quality in the Kanawha River.

Project Operation and Compliance Monitoring

Appalachian has not proposed specific measures for how compliance with its proposed run-of-release mode of operation would be documented. Implementation of a project operation and compliance monitoring plan would provide a mechanism for Appalachian to collect and record data needed to document compliance with run-of-release operation. Generally, Commission licenses for non-federal projects at Corps' dams require the licensee to develop an operating plan and a MOA with the Corps.¹² The operating plan describes the mode of hydropower operation, impoundment flow diversion and regulation requirements for the Corps' projects and integration of operation of the hydroelectric facility in the Corps' emergency action plan. The MOA describes the detailed operation of the projects acceptable to the Corps and any restrictions needed to protect the purposes of the Corps' project for navigation. A project operation and compliance monitoring plan would incorporate this MOA and include provisions for documenting compliance with any Corps' operating requirements and establishing a schedule for reporting project compliance/non-compliance during normal operation and emergencies. Operation of the projects in accordance with an MOA with the Corps and implementation of a project operation and compliance monitoring plan would ensure run-of-release operation and continued minimization of impacts to aquatic resources and water quality that would otherwise occur under fluctuating impoundment elevations.

Fisheries Habitat Improvement Plan

Entrainment of fish at the projects could occur when fish are unable to escape water flowing into intakes and could result in injury or mortality to entrained fish that pass through the projects' turbines when the projects are operating. In addition to entrainment effects, fish can become impinged on the bars of a trash rack if they are not able to overcome the approach velocity.

¹² Memorandum of Understanding between the Federal Energy Regulatory Commission and the Department of the Army regarding Non-federal hydropower development dated March 30, 2011.

To mitigate for the anticipated loss of fishery resources due to entrainment, West Virginia DNR recommended (10(j) recommendation no. 3) that Appalachian implement a habitat improvement plan, in collaboration with the West Virginia DNR. West Virginia DNR recommended that the plan include the deployment of structures in the project area targeted for fish reproduction and protection of young-of-the-year fish to increase recruitment and fish survival. Specifically, the plan should focus on instream habitat improvements designed to promote increased spawning, nursery habitat, and bank stabilization. West Virginia DNR stated that the monetary value of fish lost over the anticipated 50-year life of a license would be much higher than the anticipated cost of habitat structures.

West Virginia DNR recommends that trash rack spacing be no greater than 2-inches to reduce the rate of fish entrainment. However, the London and Marmet Developments and the Winfield Project have trash racks with 3.5-inch-wide spacing. Based on Appalachian's study, the West Virginia DNR states that using a conservative estimate of fish mortality of entrained fish at both projects combined could range from over 585,000 in a dry year to over 840,000 in a wet year.

Appalachian does not believe that the recommended habitat improvement measure would be appropriate given that: 1) the mortality estimates are very low for these developments; 2) the majority of entrained fish are young-of-the-year of a number of common species, particularly gizzard shad; and 3) there is no evidence that entrainment mortality associated with these developments has had a significant adverse impact on any species, and in particular species such as gizzard shad that occur in great abundance throughout the Kanawha River. Appalachian further stated that the inappropriateness of compensatory mitigation in the absence of a demonstration of significant adverse impact has been well-established in past FERC proceedings on hydro project relicensing, based on the 1996 circuit court ruling in *City of New Martinsville v. FERC*.

Finally, Appalachian stated that its run-of-release operation of these projects has already provided a significant habitat enhancement benefit to the Kanawha River that addresses the specific improvement objectives listed by West Virginia DNR, such as increased spawning, nursery habitat, and bank stabilization.

Staff Analysis

The current 3.5-inch trashrack spacing at the three developments would exclude adult fish larger than 3.5 inches in all dimensions (length, width, and depth) and these fish would be subject to impingement. Fish less than 3.5 inches in at least one dimension would have the potential to pass through the racks and therefore be subject to entrainment. Fortunately, studies at other projects have generally concluded that small fish (less than 4 inches) account for the majority of fish entrained (EPRI 1997). The survival of these smaller fish is expected to be relatively high because they are less prone

to mechanical injury from turbine passage than larger fish. Smaller fish are also less prone to injury resulting from shear stresses and rapid pressure changes.

Predominant water velocities measured at the trash racks of all units at the three developments ranged from 1.7 to 3 feet per second (fps). Due to the 3.5-inch clear bar spacing, we would expect most fish that are not able to avoid the intake would pass through the turbine rather than become impinged. Only very large fish would be susceptible to impingement and these large individual fish would be expected to escape the current intake velocities. To escape the influence of a trash rack, fish are capable of swimming at a burst speed, which is defined as a short, intense swimming effort generally sustainable for about 1 second or less (Bell 1991). Beamish (1978) reports that most fish can burst at a speed equal to about 10 times their body length in centimeters per second. For example, the burst speed of a 9-inch bass is about 7.5 fps, therefore, they would be easily expected to escape the 1.7- to 3.0-fps intake velocities. Larger fish such as common carp are reported to have sustained speeds of 4 fps and darting speeds of over 12 fps, which are also well above the intake velocities at the projects (Bell 1991).

Appalachian conducted a desktop fish entrainment study as part of relicensing to determine project impacts to fish communities due to entrainment, impingement, and turbine mortality. The study estimated that the total number of fish to be entrained at the London-Marmet Project during a dry and wet year was 7,419,924 and 10,900,926 fish, respectively (estimates for each development were doubled to reflect total entrainment for the project). Estimated entrainment at the Winfield Development during a dry and wet year was 4,285,646 and 5,937,335 fish, respectively. Turbine survival was also estimated for all three project developments. Turbine survival was estimated to be high for all project developments and ranged from 96.5 percent to 98.5 percent for fish less than 8 inches, 89.1 percent to 96.3 percent for fish between 8 and 15 inches, and 84.4 percent to 91.7 percent for fish larger than 15 inches.

The entrainment study concluded that the magnitude of entrainment in a given year would likely be strongly influenced by environmental conditions such as river flow and other factors that influence spawning success and ultimately year-class strength. While all species are potentially subject to entrainment, the vast majority of entrainment and turbine mortality is expected to consist of gizzard shad. This species is a very prolific forage species and its population would not likely be affected by entrainment. Further, the majority of the entrained fish were expected to consist of small fish (less than 8 inches); primarily young-of-the-year. Natural populations are structured such that losses of fish in this age group likely don't affect the fish community. Effects would only be expected if losses were of a magnitude that hindered recruitment to the older life stages. There is no evidence that such losses currently occur at the London, Marmet, or Winfield Developments.

In summary, most fish would be able to avoid impingement on the trash rack but most small and medium size fish would be susceptible to entrainment through the project turbine. The results of the entrainment study suggest that fish entrained into the London, Marmet, and Winfield turbine units have a low probability of blade strike and that survival is quite high for most small and medium size fish likely to be entrained. Furthermore, nothing in the record for the London-Marmet and Winfield Projects suggests that entrainment is currently having an adverse effect on fish populations in the project areas.

3.3.1.3 Cumulative Effects

Based on our review of the license application and agency and public comments, we have identified water quality and fisheries as resources having the potential to be cumulatively affected by continued operation of the London-Marmet and Winfield Projects in combination with other activities in the basin.

Water pollution and the presence of dams continue to affect the fisheries and mussel communities in the Kanawha River. However, as discussed above, operating the three developments in a run-of-release mode and as directed by the Corps would minimize the effect of the projects on water quality and aquatic habitat for fish, fish spawning, and mussels. Although operation of the projects would continue to entrain and impinge fish to some degree, the results of the entrainment study suggest that fish entrained into the London, Marmet, and Winfield turbine units have a low probability of blade strike and that survival is quite high for most small and medium size fish likely to be entrained. The majority of the fish involved would likely consist of young fish of highly prolific species that have the ability to compensate for losses. Furthermore, nothing in the record for the London-Marmet and Winfield Projects suggests that entrainment is currently having an adverse effect on fish populations in the project areas.

3.3.2 Terrestrial Resources

3.3.2.1 Affected Environment

The London, Marmet and Winfield Developments are located in an industrialized section of the mountainous Appalachian Plateau Physiographic Province along the Kanawha River, and the deciduous hardwood-dominated Central Hardwood Forest region of West Virginia (Fralish 2003). There is a long history of industrial and commercial development along the Kanawha River Valley for the timber, salt, and coal industries (West Virginia DEP 1999). Much of the land immediately adjacent to the river has been substantially modified for these activities and is classified as urban land due to the presence of disturbed urban soils. Currently, residential, commercial, and industrial land uses surround all three developments.

London Development

The London Development occupies approximately 6 acres, which includes an approximately 0.38-mile-long, 1.61-acre primary transmission line corridor. From the powerhouse, the transmission line follows the steeply sloped, rip-rapped south bank of the Kanawha River, through an area of mowed lawn adjoined by a small maintenance road and early successional forest to the south of the primary transmission line. The transmission line crosses to the north side of the river and extends over the landscaped Corps facilities and into a wooded slope adjacent to a residential area of the unincorporated town of London. The primary transmission line terminates at the London substation within a mixed forest of tulip poplar, sycamore, sweetgum, silver maple, river birch, and white ash. Most trees within or adjacent to the transmission line corridor are greater than 70 feet tall. Plant species within the understory of the development included common species as would be expected in a largely developed area with urban soils, such as common mullein, ragweed, Queen Anne's lace, American elderberry, thin-leaved sunflower, spreading dogbane, and poison ivy.

Marmet Development

The Marmet Development occupies approximately 13 acres, which includes an approximately 0.78-mile-long, 4.38-acre primary transmission line corridor. From the powerhouse, the transmission line along the western bank of the Kanawha River is over a residential development. The transmission corridor extends south approximately 3,500 feet through the residential area, over mowed lawn and a relatively narrow band of woodlands along the river, which included scarlet oak, black walnut, boxelder, silver maple, sycamore, and other tree species. After crossing the river, the transmission line corridor terminates at the Belle substation; the surrounding area is largely paved and characterized by industrial uses, with rip-rap for bank stabilization and limited scrub-shrub vegetation along the shoreline. Plant species within the understory of the development included common species as would be expected in a largely developed area with urban soils, including pokeweed, ragweed, staghorn sumac, and poison ivy.

Winfield Development

The Winfield Development occupies approximately 8 acres. As the project substation is located adjacent to the powerhouse there is no primary transmission line. To the west of the powerhouse, land within the project boundary is largely unvegetated, and includes rip-rap for bank stabilization along the river, and above the bank, a narrow area of mowed lawn and paved road. East of the powerhouse, the Winfield Substation is located on a gravel area, adjacent to a paved parking lot, a rip-rapped bank, and an area of mowed lawn. A residential parcel with forest cover along the shoreline abuts the eastern edge of the project boundary.

Wetland Habitat

The riverine habitat of the Kanawha River is the principal wetland habitat within the project boundary for the three developments. The river is described on National Wetlands Inventory (NWI) maps as permanently flooded, riverine habitat with an unconsolidated bottom, indicating relatively little (less than 30 percent) vegetated cover (FWS 2012). The river in the vicinity of the Winfield Development is classified as lower perennial, indicating a potentially lower gradient and slower water velocity as compared to the river in the vicinity of the London and Marmet Developments (unknown perennial). No additional wetland habitat appears on NWI maps within or adjacent to the Marmet and Winfield Developments.

In general, few wetlands are found within the Kanawha River watershed in the vicinity of the developments. Human modification within the watershed began with navigational improvements starting in the early 1800s, and the presence of wetlands along the river has been impacted by land development, bank stabilization, and flood control operations (West Virginia DEP 1996). There are riparian habitats with natural shoreline along parts of the river outside of the immediate project boundaries. Approximately 900 feet east of the London Development project boundary, along the south shore of the river, there are three NWI-mapped wetlands: two seasonally-flooded, palustrine forested-shrub wetlands (approximately 0.2 acre each) and one temporarily-flooded, palustrine forested-shrub wetland (approximately 1.75 acres).



Figure 5. Stream Channel and Wetland at the London Development (Source: Appalachian, modified by Staff).

Kleinschmidt observed a stream channel during its 2010 surveys in the vicinity of the London substation, feeding into an unmapped wetland characterized by forested and emergent vegetation.¹³ A small seep flowing downslope passes under the substation and emerges from a pipe on the western side of the substation pad. It then passes under a small portion of the primary transmission line corridor, and terminates in the receiving wetland downslope of the substation and north of Route 60 (figure 5). A maintenance road to the substation abuts the wetland area¹⁴ to the east and south. Kleinschmidt also noted that dumping of household refuse was evident within the wetland.

Riparian Habitat

Riparian habitats are important transitional areas between terrestrial and aquatic ecosystems, and may contain wetland or upland plant species within their boundaries (FWS 2009). The three developments, due to the amount of stabilized shoreline within the project boundaries, have little riparian habitat. The Marmet Development has a long, relatively narrow corridor of riparian habitat (approximately 3 acres) within the transmission line corridor between the powerhouse and the tower where the transmission line crosses to the Belle Substation, with sycamore, silver maple, and tulip poplars. The London Development has less than 0.5 acre of riparian habitat, with similar tree species as observed at the Marmet Development. The Winfield Development, due to its limited project boundary and lack of transmission line, has no riparian habitat.

Littoral Habitat

The littoral zone is commonly defined as the near-shore area extending from the seasonal high-water level to the deepest extent of rooted aquatic vegetation (Wetzel 1975). Littoral habitat within the three developments is limited to the tailrace and forebay. Appalachian did not identify any substantial littoral zone habitat within the three developments, including mudflats, bars, or submerged aquatic vegetation. While the tailraces may provide coarse substrate, swift currents, and relatively shallow depths suitable for aquatic species, the Corps regulates the impoundments for navigation and lock and dam operations (Corps 1993). As the shorelines within the project boundaries are largely rip-rapped with steep slopes, the growth of submerged aquatic vegetation along the shoreline of the three developments is not readily accommodated.

¹³ As noted in Appalachian's May 21, 2012, additional information response, Appalachian determined this unmapped wetland to be outside of the project boundary. A full description of this wetland (i.e., size, location, delineation, description, and supporting documentation) was not collected during the survey. The survey team recalled that the wetland included both forest and emergent vegetation.

¹⁴ Based on staff review of aerial imagery, the wetland area appears to be less than 1 acre in size.

Wildlife

Wildlife habitat within the three developments includes the Kanawha River, where various waterbird species (waterfowl, herons, gulls) would be expected to forage and roost throughout the year. The open landscaped areas surrounding the development facilities and adjacent residential areas, and structures (including buildings, lock and dam structures, and other facilities) are likely to support wildlife species tolerant of human-modified landscapes, including mammals (white-tailed deer, Virginia opossum, raccoon), birds (northern mockingbird, American robin, and brown-headed cowbird) and possibly reptiles and amphibians, although few would be expected where the shorelines are steep and stabilized with rip-rap.

A limited amount of natural habitat exists within the developments, including the narrow bands of riparian habitat at the London and Marmet developments, and the forest, scrub, and wetland habitat at the London Development. These habitats have the potential to support a wider range of resident and transient wildlife species. During its 2010 surveys, Kleinschmidt observed several species of birds (turkey vulture, tree swallow, cedar waxwing) and evidence of one reptile species (eastern box turtle, in the vicinity of the London substation) at the London and Marmet Developments.

Species of Special Concern

State-listed Bat Species

There are several state-listed bat species with the potential to occur within the developments for foraging and roosting. These include the eastern (or Rafinesque's) big-eared bat, silver-haired bat, eastern small-footed bat, and evening bat. In West Virginia, each of these rare species forages on insects in a variety of open habitats, including deciduous woodlands, open water, transmission corridors, and roadsides. In general, they all form nursery colonies during late spring in hollow tree cavities, crevices, or man-made structures, and have the potential to roost in a variety of natural and man-made sites including under loose bark of trees, rock crevices, buildings, culverts, and bridges (WVU 1999, Erdle and Hobson 2001, BCI 2012, VDGIF 2012). At least one of these species (eastern small-footed bat) is susceptible to White-Nose Syndrome, a disease spreading through the Eastern and Midwestern U.S. that is resulting in significant mortality to hibernating bats (FWS 2011a). None of these bat species were observed during Kleinschmidt's 2010 surveys and are not likely to use habitat in the project developments for roost sites, maternity sites, or hibernacula.

Osprey

The osprey is a fish-eating raptor that is found in large river habitats and coastal areas. They are present within West Virginia from April to August, and overwinter in the

southeastern U.S. to South America. Ospreys were rare breeders in West Virginia through the 1970's due to the scarcity of suitable nest sites and range-wide declines due to pesticide use in the mid 20th century. Since the 1980's, both the translocation of young birds from Virginia and Maryland and natural population growth have led to increases in osprey populations in West Virginia (West Virginia DNR 2012). Therefore, ospreys have the potential to breed, forage, and roost in the vicinity of each of the developments. As noted above, an osprey was observed at the London Development during Kleinschmidt's 2010 surveys. In addition, the 2012 West Virginia Breeding Bird Atlas lists a probable breeding osprey pair in the vicinity of the Winfield Development (West Virginia DNR 2012).

Invasive Plant Species

Several invasive plant species were observed by Kleinschmidt during its 2010 surveys (Kleinschmidt 2011). Kudzu, tree of heaven, Japanese knotweed, multiflora rose, and Japanese stiltgrass were observed within the London Development. At the Marmet Development, Japanese honeysuckle was observed along the wooded shoreline. These species are widespread in West Virginia (Potomac Highlands CWPMA undated).

3.3.2.2 Environmental Effects

Project Operation

Although Appalachian's existing project operation at the three developments involve only one activity that directly affects upland terrestrial habitats (transmission corridor maintenance, discussed below), project operation has the potential to effect riverine, riparian, and littoral habitat within the project area. For instance, impoundment fluctuation can affect the distribution, species composition, and productivity of riparian and littoral habitat.

Under the existing licenses, water levels in the Corps' impoundments resulting from project operation are allowed to fluctuate up to 3.0 feet, 0.3 foot, and 0.2 foot at the London, Marmet, and Winfield Developments, respectively. The maximum rate the Corps' impoundments can be lowered is 0.5 foot per hour. Appalachian proposes to maintain its current project operation at the Marmet and Winfield Developments. For the London Development, Appalachian proposes to decrease the maximum allowable drawdown from 3.0 feet to 0.3 foot, and operate the facility in run-of-release mode, in coordination with the Corps, which would more closely reflect how the developments have been operated for the last 20 years.¹⁵

¹⁵ Personal communication on October 23, 2012 between Teresa Rogers, AEP and Brandi Sangunett, FERC.

In its August 7, 2012, letter, West Virginia DNR recommended that the London-Marmet and Winfield Projects be operated in run-of-release mode.

Staff Analysis

Water level fluctuations used to generate power are largely dictated by the Corps for commercial navigation, rather than operation, at the three developments. Littoral habitat is limited within the Corps' impoundments, and no substantial emergent or submerged aquatic vegetation beds were noted in surveys. Existing operation of the London-Marmet and Winfield Projects would likely have a minimal effect on littoral habitat during generation times when impoundments are minimally lowered.

The proposed change in operation at the London Development, from a maximum allowable drawdown of 3.0 feet to 0.3 feet, has already been in place for approximately 20 years. Therefore, the proposed operation would likely maintain the existing minimal impacts to littoral habitat as a result of project generation.

Riparian habitat within the Winfield Development is non-existent, thus no impact would be expected. At the London and Marmet Developments, the existing riparian habitat along the shoreline is adjacent to rip-rap stabilized banks and bounded by transmission corridors, residential and industrial land uses, and roads. The ability of riparian habitat to expand beyond its current footprint is hampered by the degree of urban development. We conclude that continued project operation at Winfield and Marmet Developments, and the proposed change in operation at the London Development, would result in no measurable impacts to riparian habitat.

Vegetation Maintenance

At the London and Marmet Developments, Appalachian maintains the primary transmission line corridors approximately every 4 years. Mechanical maintenance includes mowing during the growing season, cutting trees, and pulling stumps, as needed. Residential and industrial property owners also use the transmission line corridor on their properties and may maintain some segments of the transmission line through their activities, which is typically mowing and trimming of understory vegetation. While Appalachian has not used herbicide for transmission line maintenance, Appalachian has applied herbicide to remove vegetation in the upper rip-rapped sections of shoreline. Appalachian states that herbicide use is performed as specified on herbicide labels, appropriate buffers are maintained near shoreline areas and only herbicides labeled as safe for aquatic use are applied adjacent to shorelines.

At the Winfield Development, the majority of the project boundary is paved or covered with gravel, and the shoreline is largely stabilized with rip-rap. Appalachian's vegetation maintenance activity, as recently as 2011, consist of periodic mowing to

maintain the lawn areas and the periodic application of herbicides to upper areas of rip-rap. Appalachian does not propose any modifications to its vegetation maintenance activities and currently does not have a formal vegetation maintenance plan for the land within the three developments. None of the resource agencies commented on Appalachian's vegetation maintenance activities.

Staff Analysis

Appalachian uses mechanical and chemical methods to control vegetation surrounding the facilities, recreation areas, and within transmission line corridors at the three developments. The several invasive plant species observed within the project boundaries, including kudzu, tree of heaven, and Japanese knotweed, are recognized as noxious weeds and reflective of the surrounding land use (NRCS 2012). The operation of the London-Marmet and Winfield Projects has not likely been an important factor in the introduction or spread of these species. However, the presence of invasive species is a threat to the limited forest and riparian resources within the project boundaries. For instance, kudzu can spread rapidly over the ground, and cover areas of native vegetation, and can girdle or uproot trees.

Within the transmission line corridors for the London-Marmet Project, there are areas with mature forest (trees approximately 70 feet tall) that likely provide roosting habitat for wildlife, including the state-listed bat species noted above, Indiana and Virginia big-eared bats (see section 3.3.4 *Threatened and Endangered Species*), and raptors. During routine maintenance, removal of large trees suitable for roosting sites would reduce the value of the limited forest resources within the project boundary.

Regarding wetland and riparian habitats, the use of herbicides for vegetation maintenance within shoreline areas or transmission corridors could lead to unintended consequences on adjacent areas. For instance, Kleinschmidt observed a receiving wetland within the London Development that appears to be hydrologically connected to a stream channel passing beneath the London Substation. This wetland, although not within the project boundary, could be affected by transmission corridor maintenance activity conducted upslope, through sedimentation or erosion caused by vegetation removal or the transmission of herbicides used within the transmission corridor or substation and transmitted via the stream channel. Herbicides may impair aquatic organisms, including insect larvae, fish, and amphibians, if they occur in significant concentrations (EPA 2012). In addition to impacts to wetland or riparian vegetation, there could be a reduction of habitat value for wildlife.

The three developments and the surrounding non-project lands are highly modified environments. There are portions of the developments however, that have value to plants and wildlife. The maintenance of these areas should be conducted with the goal of both maintaining the safe operation and transmission of power, and the protection of terrestrial

resources. Sufficient detail was not provided about Appalachian's vegetation maintenance protocols, including the type of herbicides used adjacent to aquatic habitats or the circumstances that require mature trees adjacent to powerlines to be trimmed or removed. Therefore, the development of a vegetation maintenance plan for the London-Marmet and Winfield Projects could allow for a defined approach to maintenance of the project vegetation and could minimize the effects of vegetation maintenance on wetlands, forest resources, and wildlife.

Avian Protection Plan

Migratory birds can come into contact with transmission lines and associated structures, including substations, during flight, foraging, roosting, and nesting. Mortality due to interaction with transmission lines and associated structures has been noted since the 1900s (APLIC 2006). Raptors including eagles and other large-bodied birds may be at higher risk for collision or electrocution due to their large size, hunting strategies, and nesting preferences (APLIC 2006).

Both the London and Marmet Developments have relatively short segments of primary transmission corridors (0.38-mile-long and 0.78-mile-long transmission corridors, respectively) with portions that cross the Kanawha River, and portions that are directed through forested habitat. Appalachian proposes the adoption of an avian protection plan. Appalachian's parent company, AEP, is a member of the Avian Power Line Interaction Committee (APLIC) and is finalizing an avian protection plan for all of its holdings to address potential bird mortality issues associated with electric utility facilities, including transmission lines and structures within the London-Marmet and Winfield Projects. Once finalized by AEP, the avian protection plan would be implemented by Appalachian. Portions of the plan have already been implemented by Appalachian, including training and reporting collisions to resource agencies.¹⁶ None of the resource agencies commented on Appalachian's proposal for an avian protection plan.

Staff Analysis

The three developments are located on a major river and have forested habitat within riparian and upland areas. Thus it is likely that raptors and other large-bodied birds would occur during the year for foraging, roosting, and possibly nesting. Development of an avian protection plan to address mortality potentially caused by interactions with transmission lines and related structures would result in an overall beneficial impact to birds at risk. Such an avian protection plan could include site-specific measures to reduce mortality, including modifications to structures or line

¹⁶ Appalachian did not provide any recent data on observed bird mortality due collision and electrocution within transmission line corridors or related structures in its license application.

arrangement as necessary.

Recreational Enhancements

Appalachian proposes to install portable restrooms and trash receptacles at all three developments.

Staff Analysis

The presence of trash receptacles may increase the use of the recreation areas by scavenging species. Although it is likely that some amount of refuse was previously discarded within the area. Due to the small footprints of the proposed features and the fact that the recreation locations are pre-existing, it is unlikely that the proposed recreational enhancements would significantly impact terrestrial resources, including wildlife.

3.3.3 Threatened and Endangered Species

3.3.3.1 Affected Environment

Appalachian consulted with the FWS and West Virginia DNR regarding the occurrence of federally listed endangered, threatened, and candidate species in the vicinity of the three developments. According to the FWS web site, listed species that could occur at the projects include the Virginia spiraea, running buffalo clover, Indiana bat, Virginia big-eared bat, pink mucket mussel, Northern riffleshell mussel, fanshell mussel, turbercled-blossom pearly mussel, and the spectaclecase mussel (FWS 2011b).

Pink Mucket Mussel

The federally endangered pink mucket mussel (*Lampsilis abrupta*) prefers areas of mud and sand in shallow riffles free of silt. The pink mucket has been documented at RM 88.5 and at Kanawha Falls (RM 95.5). The pink mucket reproductive cycle is similar to that of other mussels where the male releases sperm into the current and the female siphons the sperm to fertilize the eggs. Larvae are released into the water column and find a host fish to attach to until they grow to juveniles. Juveniles detach from the host fish and settle on the river bottom to grow. Habitat degradation and poor water quality caused by industrial runoff as well as pollution from chemicals and toxins has contributed to the low populations of mussels. The FWS issued a recovery plan for pink mucket pearly in 1985. At the time of the recovery plan no critical habitat was designated for this species.

Northern Riffleshell Mussel

The federally endangered Northern riffleshell mussel (*Epioblasma torulosa*)

rangiana) is known to occur in the Kanawha River and was reported at a location opposite Falls View, West Virginia. This mussel tends to prefer firmly packed sand and gravel and requires a stable substrate with sufficient populations of host fish to complete the reproduction process. The FWS issued a recovery plan for the Northern riffleshell in 1994. However, no critical habitat has been identified.

Fanshell Mussel

The federally endangered fanshell mussel (*Cyprogenia stegaria*) is known to occur in the Kanawha River and has been documented at Kanawha Falls. The fanshell like other mussels buries itself in sand or gravel and prefers rivers with swift currents and deep water. The fanshell has a unique way of attracting host fish; it releases the larvae in spiral form resembling a worm. When the worm look-alike is approached by a predatory fish, the larvae attach themselves to the gills of the fish. The FWS issued a recovery plan for the fanshell in 1991, but no critical habitat was identified.

Tubercled-Blossom Pearly Mussel

The federally endangered tubercled-blossom pearly mussel (*Epioblasma torulosa torulosa*) prefers large rivers consisting of sand and gravel bottoms with swift currents. The FWS states that the last individual collected was a freshly dead specimen below Kanawha Falls in 1969 and no sightings have been documented since. The FWS issued a recovery plan for the tubercled-blossom pearly mussel in 1985 but no critical habitat was identified.

Spectaclecase Mussel

The federally endangered spectaclecase mussel (*Cumberlandia monodonta*) prefers the backwater of large rivers. The life history of the spectaclecase is similar to the other mussel species, feeding on plankton and releasing larvae to disperse on the gills of fish. The spectaclecase was not known to occur in the Kanawha River until a very old live specimen was discovered near Glasgow, Kanawha County in 2002. This site is at RM 78.2 approximately 20 miles downstream of Kanawha Falls, within the Marmet impoundment. West Virginia DNR stated that there is likely no longer a viable spectaclecase population in the Kanawha River.

Virginia Spiraea

The federally threatened Virginia spiraea (*Spiraea virginiana*) is a perennial shrub that occurs on the scoured banks of high gradient streams. This species is found in mountainous areas in the southern Appalachians and requires high-velocity scouring floods and other disturbances for dispersal and to eliminate local competition from other woody species. They are found in sand, silt, or clay soils, typically at an elevation range of 1,000 to 2,400 feet (FWS 2010). Virginia spiraea has been documented along the

Gauley, Meadow, Bluestone, and Greenbrier rivers in West Virginia (West Virginia DNR undated).

Threats to this species include natural and human modifications to suitable habitat that inundates, restricts, or stabilizes water flows, including impoundments, road construction and maintenance, and beaver damage. They are also susceptible to habitat disturbance, pollution, browsing by deer, off-road vehicle use, and a variety of other factors (FWS 2010; West Virginia DNR undated).

Running Buffalo Clover

The federally endangered running buffalo clover (*Trifolium stoloniferum*) is a perennial herbaceous plant that is found in mesic habitats with filtered sunlight and some recent evidence of disturbance, including woodlots, mowed areas, old logging roads, trails, and along streams (FWS 2007; FWS 2003; West Virginia DNR undated). It is possible that this species could be found along other linear cleared features, including transmission line corridors in woodland habitats. Running buffalo clover is known to occur in the West Virginia counties of Barbour, Brooke, Fayette, Pendleton, Pocahontas, Randolph, and Tucker (West Virginia DNR undated).

Threats to this species include habitat alteration, reduction in open woodland habitat, and competition from invasive species. Bison and other large herbivores may have played an important role in the creation of suitable habitat and seed dispersal (FWS 2007).

Indiana Bat

The federally endangered Indiana bat (*Myotis sodalis*) is native to the northeastern and midwestern U.S., including West Virginia (West Virginia DNR undated; figure 6). Males and females hibernate in limestone caves and abandoned mineshafts from October through April and forage and roost in riparian, bottomland or upland forest, as well as old fields or pastures with scattered trees between April and August (DeGraaf and Yamasaki 2001). Females congregate in maternity colonies in upland and riparian forests, pastures, and open wetlands during early May to late June to bear and raise young.

Indiana bats roost in dead standing trees with loose bark (DeGraaf and Yamasaki 2001). In West Virginia, reproductive females have been documented using basswood, sugar maple, northern red oak, and scarlet oak for roosting (Beverly 2004; Beverly and Gumbert 2003; Sanders Environmental Inc. 2004). Roosting males have been documented using various tree species present within the developments including white ash and slippery elm (Beverly and Gumbert 2005).

Approximately 5 percent of the total known Indiana bat population has been

documented within West Virginia (FWS 2011c). One cave hibernaculum (Hellhole Cave in Pendleton County) has been designated by FWS as critical habitat for Indiana bat and two conservation areas have been established in Boone County (FWS 2011b). Several other Indiana bat hibernacula have been discovered in West Virginia, mainly in the eastern portion of the state (Beverly and Gumbert 2005). There is at least one known Indiana bat hibernaculum in Fayette County, where the London Development is partially located. Indiana bat potentially use summer habitat in Putnam County, where the Winfield Development is partially located. There are two known Indiana bat reproductive sites located near the Marmet Development, approximately 8 to 9 miles south of Marmet, in Boone County.

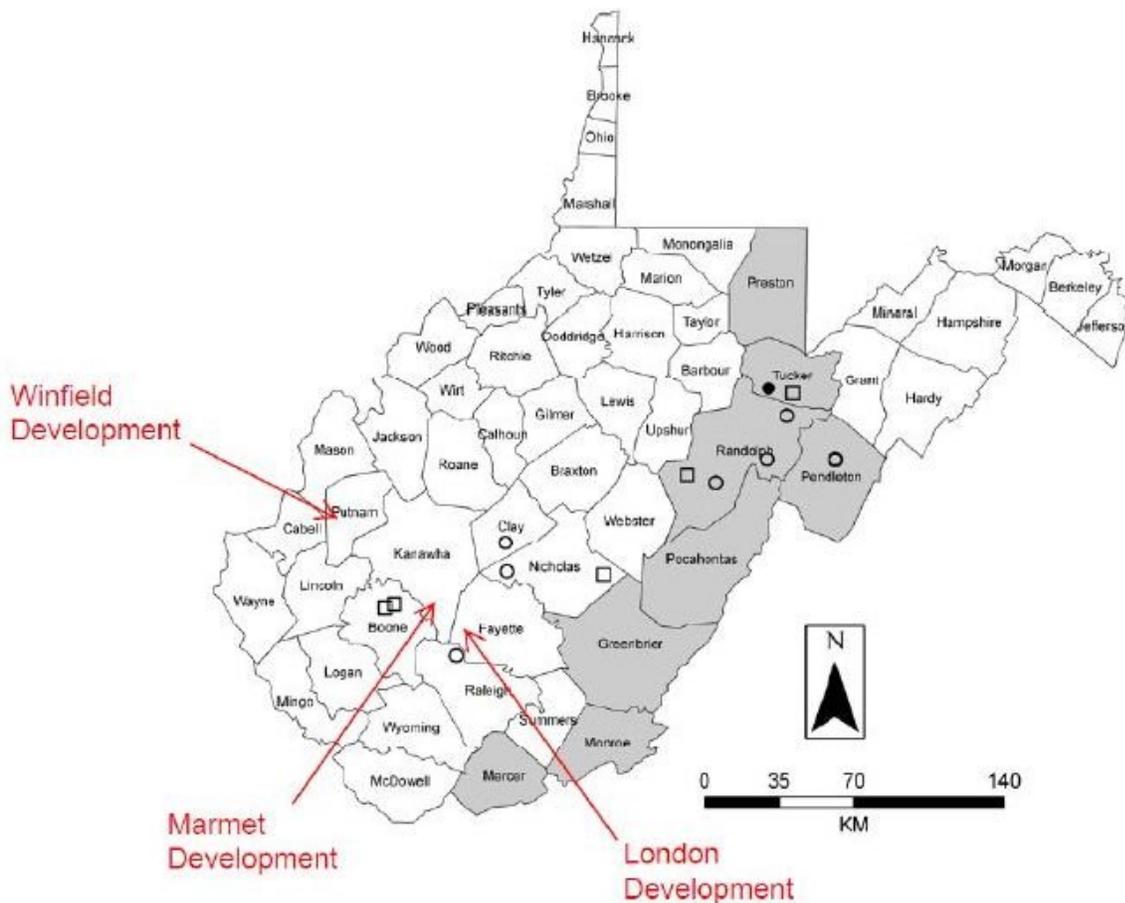


Figure 6. Distribution of Indiana Bat Records (Source: Appalachian).¹⁷

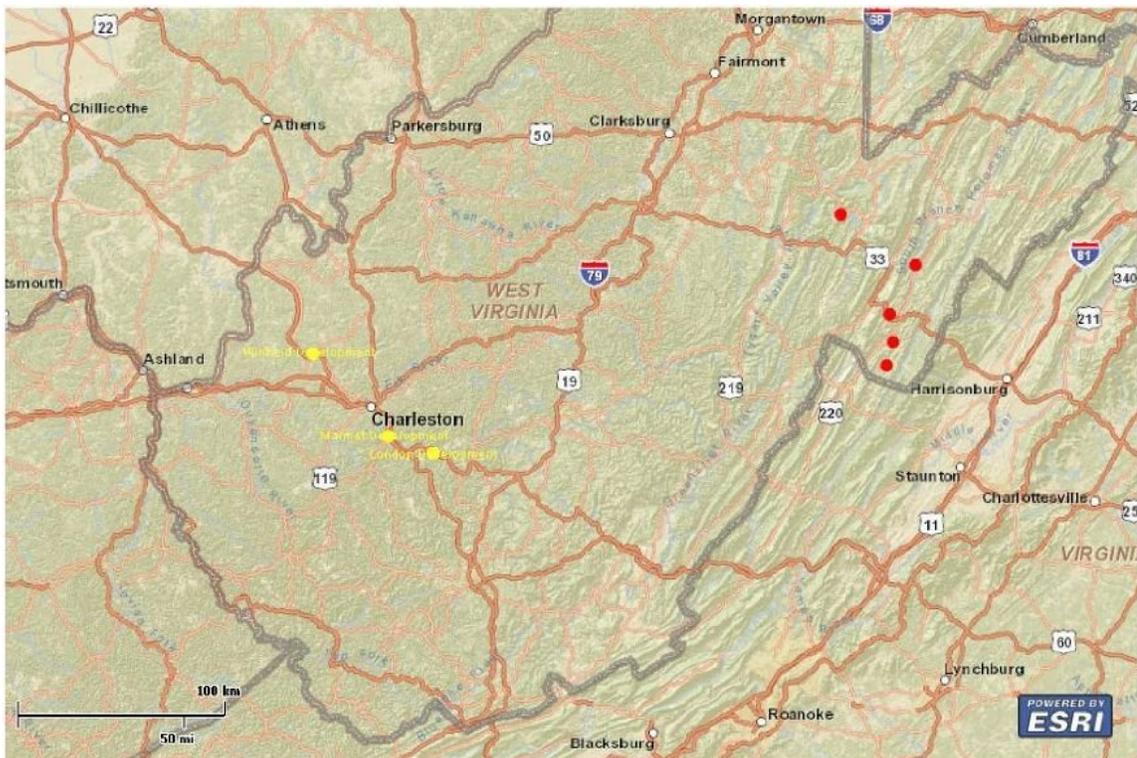
Threats to the survival of Indiana bats include human disturbance (largely at unprotected cave sites), predation by mammals, loss of foraging habitat (particularly old

¹⁷ Locations are approximate. Shading indicates the counties with Indiana bat hibernacula. Circles indicate capture of males, squares indicate females. The solid circle in Tucker County indicates Fernow Experimental Forest, where nine male Indiana bats were captured at or near a hibernaculum.

field and hayfields), collisions at wind energy developments, and natural changes in cave environments that alter conditions. Indiana bats are known to be susceptible to White-Nose Syndrome and have experienced severe mortality as a result. White-Nose Syndrome has been documented at several hibernacula in Pendleton County, West Virginia, in various bat species, including Indiana bat (FS 2009).

Virginia Big-eared Bat

The federally endangered Virginia big-eared bat (*Townsendii virginianus*) uses caves throughout the year for hibernation, roosting, and establishing maternity colonies (West Virginia DNR 2006). The majority of this species' hibernacula and maternity colonies have been documented in West Virginia, where the core of the population is believed to reside (FWS 2008). This species has been documented within the West Virginia counties of Fayette, Grant, Hardy, Pendleton, Preston, Randolph, and Tucker (NatureServe 2009). Fayette County, where the London Development is partially located, has been identified for winter use by this species (FWS 2008). The FWS has designated critical habitat for the Virginia big-eared bat in West Virginia, which are all caves known to support hibernacula or maternity colonies (figure 7).



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Figure 7. Virginia Big-eared Bat Critical Habitat in West Virginia (Source: Appalachian).¹⁸

¹⁸ Red dots denote critical habitat designated by the FWS. Yellow dots represent

Virginia big-eared bats forage in habitats such as old fields, hayfields, and forests (West Virginia DNR undated). When foraging, Virginia big-eared bats leave cave roosts at night and may temporarily roost in trees or man-made structures during periods of rest between foraging activities. Virginia big-eared bats tend to remain close to roost sites, typically traveling short distances (6.5 miles on average) from roost sites to foraging areas using the same foraging areas repeatedly (West Virginia DNR 2006). This species has been documented to move up to 20 miles between summer roosts and hibernacula (FWS 2008, West Virginia DNR 2006).

Threats to the survival of Virginia big-eared bats include human disturbance (largely at unprotected cave sites), predation by mammals, loss of foraging habitat (particularly old field and hayfields), collisions at wind energy developments and natural changes in cave environments that alter conditions. Virginia big-eared bats have not been identified as susceptible to White-Nose Syndrome, although this disease has been confirmed in West Virginia at hibernacula occupied by this species (FWS 2008).

3.3.3.2 Environmental Effects

Terrestrial Listed Species

None of the terrestrial federally listed species (the Virginia spiraea, running buffalo clover, Indiana bat, and Virginia big-eared bat) were observed during the transmission corridor surveys conducted by Kleinschmidt in 2010, although surveys specifically designed to detect the presence of bats were not part of the study methodology.

In terms of the federally listed Virginia spiraea and running buffalo clover, the West Virginia DNR suggests that it is unlikely that threatened, endangered or special status plants would occur at the three developments, based on the highly disturbed and urban nature of the habitat. The FWS states that, based on the range of Indiana bat, all of West Virginia is considered summer use habitat for Indiana bat, including foraging, roosting, and establishing maternity roosts. West Virginia DNR states that, while either Indiana or Virginia big-eared bat could fly through the developments, it does not appear to have substantial habitat for roosting, maternity sites, or hibernacula.

Appalachian does not propose any specific measures to protect or enhance rare, threatened, or endangered species. FWS recommended that, as Indiana bats may use habitat within the three developments during the summer, any tree clearing should occur during the winter season (personal communication between Jim Zelenak, FWS and

the locations of the three developments.

Kleinschmidt, June 17, 2010 as cited in Kleinschmidt 2011).

Staff Analysis

Based on soil requirements, the regulated flow patterns within the Corps' impoundments, and the bank stabilization throughout much of the project boundaries, *Virginia spiraea* is unlikely to occur within the three developments' boundaries. A small amount of habitat exists along the river bank portion of the Marmet Development's transmission corridor, where bank stabilization appears to be minimal. Although competition with invasive species and the lack of evidence of regularly occurring scouring flows suggests that this area would not be likely to support *Virginia spiraea* populations.

Potential habitat for running buffalo clover is located within the northern forested portion of the London Development in the vicinity of the London Substation. As several invasive plant species have colonized the London Development, competition from invasive species would be likely. Further, vegetation maintenance occurring within the London transmission corridor would not likely create the type of disturbance that fosters growth by this species. Running buffalo clover is unlikely to occur within either the Marmet or Winfield Developments due to the lack of suitable shaded understory conditions required by this species.

There are no known hibernacula, maternity, or roosting sites for either bat species within the three developments' boundaries. In Boone and Fayette counties, there are documented Indiana bat hibernacula and roost sites within range of the three developments, indicating that Indiana bats have the potential to occur within project lands for foraging. There is a possibility of Virginia big-eared bat foraging in the project areas based on its winter presence in Fayette County. Suitable forested habitat for Indiana and Virginia big-eared bats is only present within the vicinity of the London Substation and primary transmission line on the north side of the Kanawha River and a narrow band of mature riparian forest occurring along the south bank of the river along the Marmet Development's primary transmission line. Foraging and possibly roosting activity would only be expected during the summer season, from approximately April to August.

Maintenance of transmission corridors, where most of the suitable habitat for listed terrestrial species exists, is conducted approximately every 4 years and includes the use of mechanical techniques (mowing, tree cutting, stump removal) and occasional application of herbicides within shoreline areas. Given this degree of maintenance activity occurring within the developments' project boundaries, we conclude that the proposed projects are not likely to adversely affect *Virginia spiraea*, running buffalo clover, or Indiana and Virginia big-eared bats that potentially occur within the three developments boundaries. Additionally, the projects would have no effect on designated critical habitat for Indiana or Virginia big-eared bats, which currently comprises cave

hibernacula that are not located within or adjacent to the project boundaries.

The development of a vegetation maintenance plan, specifically managing the trimming or removal of trees that provide suitable habitat for roosting Indiana or Virginia big-eared bats, could minimize effects to habitat that may support these species. For instance, limiting tree removal to the winter season (September to March) would largely eliminate the chance of mortality to roosting bats inhabiting those trees.

Aquatic Listed Species

Aquatic habitat within the projects' boundaries is limited to the forebay and the tailrace. The forebays are located in impoundments whose water levels are managed by the Corps for navigational purposes. The impoundments provide a homogeneous, low-value habitat type that is relatively abundant in the Kanawha River and not suitable for many sensitive mussel species. The projects' tailwaters provide coarse substrate, swift currents, and relatively shallow depths that represent a valuable remnant of pre-impoundment conditions which may provide more suitable habitat for mussels. The only significant viable mussel bed known in the Kanawha River is below Kanawha Falls, approximately 12 miles upstream of the London Development at the extreme upstream end of the London impoundment.

Currently the London Development maintains the water levels according to the navigational requirements of the Corps, which allows for impoundment levels to be reduced up to 3 feet. However, Appalachian is working with the Corps to establish a new agreement which would reduce the amount of allowable fluctuation to 0.3 foot, which more closely reflects the mode of operation during the last 20 years.

None of the resource agencies commented on impacts to freshwater mussels at the projects.

Staff Analysis

Suitable habitat for these endangered mussel species and access to their host fish are likely no longer available in the project area due to the construction of the Corps' locks and dams. Operating the projects in a run-of-release mode with project-related fluctuations in the Corps' impoundments limited to 0.2 to 0.3 foot would continue to maintain the current amount of persistent, wetted area benefiting any endangered mussel species found within the impoundments and downstream of the projects. Because the projects have no effect on water quality or flows, continued operation of the London-Marmet and Winfield Projects is not likely to adversely affect these endangered mussels.

3.3.4 Recreation and Land Use

3.3.4.1 Affected Environment

Project Recreation Facilities

Project recreation facilities provided at the London Development include a tailwater angling access area that is composed of a gravel parking area which can accommodate approximately 25 vehicles, a gravel walkway to the stairway, a stairway with handrails from the top of the river bank to the tailrace, and a tailrace fishing pier with handrails. Appalachian provides dusk to dawn lighting, sirens, and signage to warn and protect the public of potential hazards of project operation and to restrict the public from certain project structures.

Project facilities provided at the Marmet Development include a tailwater angling access area that is composed of a gravel parking area which can accommodate approximately 28 vehicles, a gravel walkway to the stairway, a stairway with handrails from the top of the river bank to the tailrace, and a tailrace fishing pier with handrails. Appalachian provides dusk to dawn lighting, sirens, and signage to warn and protect the public of potential hazards of project operation and to restrict the public from certain project structures.

Recreation facilities provided at the Winfield Project include a tailwater angling access area that is composed of a gravel parking area which can accommodate approximately 28 vehicles, a gravel walkway to the stairway, a stairway with handrails from the top of the river bank to the tailrace, and a tailrace fishing pier with handrails.¹⁹ Appalachian provides dusk to dawn lighting, sirens, and signage to warn and protect the public of potential hazards of project operations and to restrict the public from certain project structures.

Project Recreation Use

Appalachian conducted a Recreation Assessment and Angler Creel Use Study from March 1, 2010 to November 30, 2010 at the Marmet and Winfield tailrace access areas. The London tailrace access area was not included in this survey because it was closed permanently on February 16, 2009.²⁰ The purpose of the survey was to

¹⁹ Recreation facilities provided by the Corps at the Winfield Project include a paved parking area which provides 4 accessible parking spaces. From the paved parking area, the Corps has provided an accessible ramp which allows angling access to the tailrace but does not connect to the tailwater fishing pier. These facilities are owned and operated by the Corps and are not included the project boundary.

²⁰ The access bridge over the railroad tracks had deteriorated significantly and

characterize recreational use and needs for the project tailrace access areas for angling and other recreational purposes. The study also included a literature review, data search, a recreation site inventory, and on-site monitoring.

Survey participants were asked to provide identifying information (age, gender, group size, etc.), recreation activities at the access area, expenditures during their visit, perceptions of crowdedness, the condition of the site, their water level preference, any potential hazards at the sites, and suggestions for improvements. During the study period, surveys were taken at the Marmet Development on 89 days: 5 holidays, 41 weekdays, and 43 weekend days; and at the Winfield Project on 86 days: 5 holidays, 43 weekdays, and 38 weekend days. A total of 307 surveys were useable; 154 of which were individuals who had previously been surveyed. Those who had been previously surveyed were asked on their subsequent visits solely about their recreation activities, expenditures, and crowding from that particular visit. The Winfield tailrace access area received approximately 62 percent of total use (6,160 recreation days) between the two developments, while the Marmet tailrace access area received approximately 38 percent of total use (3,760 recreation days). Table 4 shows the total recreation use for the study period.

Appalachian was unable at the time to complete negotiations with CSX, the owner of the railroad, to rehabilitate or modify the bridge for continued use as an access point to the London tailrace.

Table 4 Public Recreation Use at Winfield and Marmet Access Areas from March 2010 to November 2010. (Source: Appalachian, as modified by staff)

Month	Day Type	Recreation Days		Total
		Winfield	Marmet	
March	Weekend	30	10	40
	Weekday	30	10	40
April	Weekend	140	180	320
	Weekday	180	310	490
May	Weekend	120	190	310
	Weekday	620	300	920
	Holiday	410	90	500
June	Weekend	430	330	760
	Weekday	700	440	1,140
July	Weekend	160	110	270
	Weekday	310	270	580
	Holiday	160	30	190
August	Weekend	390	110	500
	Weekday	840	170	1,010
September	Weekend	160	350	510
	Weekday	400	150	550
	Holiday	80	60	140
October	Weekend	200	70	270
	Weekday	460	110	570
	Holiday	110	400	510
November	Weekend	50	0	50
	Weekday	180	60	240
	Holiday	0	10	10
Total	Weekend	1,680	1,350	3,030
	Weekday	3,720	1,820	5,540
	Holiday	760	590	1,350
Total		6,160	3,760	9,920

The survey results showed that 45 percent of yearly use occurs in June, July, and August; 29 percent of use occurs in September, October, and November; 19 percent of use occurs during March, April, and May; and 7 percent of use occurs in December, January, and February. The most popular activity at the access areas was pier fishing (85 percent of respondents) followed by bank/shoreline fishing, sightseeing, and picnicking. The creel survey results showed that bass and catfish tended to be the most targeted species at both tailraces. Other targeted species included walleye, sauger, saugeye, and crappie.

Recreation use was also measured by parking capacity during the survey season.

Average daily vehicle counts were taken on the survey days and then compared to the parking capacity at each access area. The highest use recorded at the Winfield access area was 64 percent on Memorial Day weekend. The highest use recorded at the Marmet access area was 70 percent on Columbus Day weekend. For non-holiday weekends, June was the busiest month at Winfield and September was the busiest month at Marmet. At all other survey times, the parking areas were well below 35 percent of full capacity.

Perceptions of crowdedness and site conditions were measured during the survey. Crowdedness ranged from light at Marmet to moderate at Winfield with the highest reports of crowdedness at Marmet in April and at Winfield in May. Site conditions were ranked good at both sites with recommendations for restrooms and trash receptacles occurring most often.

Land Use

The London-Marmet and Winfield Projects are located within Kanawha and Putnam Counties in the Kanawha River Basin. Land use within the Kanawha River Basin is primarily forested (approximately 81 percent) and agriculture (approximately 16 percent). The remaining land uses include urban, developed areas, and barren land such as mines and quarries (Messinger and Hughes 2000).

There are approximately 578,050 acres in Kanawha County where the London-Marmet Project is located. An estimated 40,000 acres (7 percent) is developed. The remainder is agricultural, wetlands, waterways, barren, or forestland (Kanawha County, 2000). Putnam County, where the Winfield Project is located, is approximately 221,440 acres. The largest land use in the county is for agriculture (30 percent); Putnam County is one of the most productive agricultural regions in the state (Putnam County 2011; USDA 2007).

Lands within the project boundaries at each of the developments consist primarily of the areas immediately around the powerhouse – approximately 4.40 acres for the London Development, 8.64 acres for the Marmet Development, and 8.25 acres at the Winfield Project. The lands within the projects' boundaries are owned by the Corps except for some transmission line right-of-ways and 1.33 acres at the Marmet Development owned by Appalachian.

3.3.4.2 Environmental Effects

Project Recreation Facilities and Use

Cordell *et al.* (2004) reports that, "Population has been, is, and will be the major driver of outdoor recreation participation growth in this country." While the Kanawha County population is expected to decline approximately 4.7 percent from 2010 to 2035,

Putnam County population figures are expected to increase approximately 8.1 percent over the same period (Putnam County 2011). If use of the Winfield and Marmet tailrace access areas follows similar population growth patterns, angling pressure is expected to remain relatively stable over the next 25 years.

During the relicensing process, Appalachian provided information on four access alternatives due to the London tailrace closure. However, as a result of recent negotiations with CSX, Appalachian reached agreement to establish an at-grade crossing for entry into the London tailrace access area. Appalachian stated in its September 21, 2012, letter that the crossing would be completed by the end of September 2012.²¹ In addition, Appalachian proposes to provide restroom facilities, trash receptacles, and a 25-car gravel, lighted parking area. Appalachian also proposes to install portable restrooms and trash receptacles at the Marmet and Winfield tailrace access areas to accommodate existing and future use.

The West Virginia DNR recommends that Appalachian prepare a recreational access enhancement plan to include provisions for an at-grade crossing to access the London tailrace, as well as parking areas, restroom facilities, and solid waste receptacles at all three developments.

Staff Analysis

Now that the London tailrace access area has been reopened to the public, the access area is likely to return to similar usage levels before the access area was closed. Although, neither the Marmet nor the Winfield tailrace access areas experienced a drastic increase of users while the London tailrace access area was closed, the re-opening of the London site may affect some of the usage documented at Marmet and Winfield. This may be beneficial to all users at the three access areas.

Appalachian's proposed improvements including portable restrooms and trash receptacles for all three access areas should enhance the recreation experience at each location.

Incorporating Appalachian's recreation facilities and proposed improvements into a recreation plan for each project would provide clear guidelines for the development of existing and future recreation facilities.

²¹ On October 25, 2012, Teresa Rogers from Appalachian confirmed that the railroad crossing had been completed and that the London tailrace fishing access was reopened on October 15, 2012.

Project Boundary

Project recreation facilities at the London Development that are currently enclosed within the existing project boundary include the tailrace fishing pier and the stairs leading to the fishing pier. However, the road used to access the parking area, the parking area, and the path to the fishing pier are not enclosed within the project boundary. At the Marmet Development and Winfield Development, all of the project recreation facilities including the parking areas, paths to the fishing piers, stairs to the fishing pier, and the tailrace fishing piers are enclosed within their respective project boundaries. In addition to the project recreation facilities, the Corps owns and maintains an ADA accessible parking area and two paths at the Winfield Project that are not project facilities and not included within the project boundary.

Revising the project boundary at the London Development to encompass the existing paths, roads, and parking areas that lead to the fishing pier would be consistent with the Commission's policy on recreational development (18 CFR § 2.7 (a)), which requires licensees to include within their project boundaries enough land to assure optimum development of the project's recreational resources. Inclusion of these facilities within the project boundary would provide a mechanism for the Commission to ensure that Appalachian develops and maintains these facilities to provide for public access through the term of any new license that may be issued.

The current license for the Winfield Project includes within its project boundary two 0.38-foot-long transmission lines departing the Winfield substation. These lines run from the Winfield substation to the junction of the Teays and Bancroft transmission lines which then lead to the Teays and Bancroft substations, respectively. Power from the Winfield generating units is transmitted across a short jumper from the powerhouse to the adjacent multi-use Winfield substation (a project facility), which acts as an isolation and switching point for transmission and distribution. Appalachian completed a transmission line corridor study for relicensing to determine which powerlines associated with the projects should be considered primary and therefore should be included as part of the project facilities. The study found that there should be no primary transmission line for the Winfield Project. In addition, the current license for the London-Marmet Project includes within its project boundary the London substation and Belle substation. Appalachian states that these are not project facilities because they serve multiple uses and should be removed from the project boundary. Revising the project boundary to remove the transmission lines from the Winfield Project and the substations from the London-Marmet Project would ensure that only project facilities are included within the project boundaries.

3.3.5 Cultural Resources

3.3.5.1 Affected Environment

Area of Potential Effect

The Advisory Council on Historic Preservation defines an area of potential effect (APE) as the geographic area or areas in which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The APE for the London, Marmet, and Winfield Projects includes: 1) lands enclosed by the project boundary; and 2) a 300-foot-long corridor upstream and downstream from each development.

Historical Background

The London, Marmet, and Winfield locks and dams are part of the originally named Great Kanawha Navigation System which was completed in 1898. The system provided year-round water transportation for 90 miles of the Kanawha River from Boomer, West Virginia to Point Pleasant, West Virginia on the Ohio River. The system's 10 original locks and dams were replaced by four high lift dams with German roller gates in the early 1930's (London, Marmet, and Winfield on the Kanawha River, and R.C. Byrd on the Ohio River).

Previous archaeological investigations (Sypolt 1995a, 1995b, 1995c, 1995d; Kemp 2000) identified the London, Marmet, and Winfield dam complexes as being historically significant as part of the Kanawha River Navigation System. The hydroelectric facilities at each development contribute to their historical integrity. The studies Appalachian conducted as part of the relicensing process determined that the Kanawha River Navigation System, a Multiple Property Historic District, was eligible for listing on the National Register of Historic Places (National Register) (Green *et al.* 2010).

Historic Properties

Due to the presence of the Kanawha River Navigation System, Appalachian conducted a Cultural Resources Survey at each of the developments. Elements of the survey included an historic architectural survey of the projects' facilities and a Phase I archaeological survey of the APE within 300 feet of the facilities on both banks upstream and downstream. The architectural survey revealed that the significance of the powerhouses lies not just in their architectural design, but in their function as hydroelectric generation stations. The historic integrity of the powerhouses requires that the buildings continue to serve as hydroelectric powerhouses, which places certain requirements on the licensee regarding maintenance and upgrades to the electrical equipment. No archaeological sites were discovered at the London or the Marmet Developments. One archaeological site was identified at the Winfield Project, however,

heavy disturbance around the site and the shallow depth of artifact recovery deemed the site ineligible for inclusion in the National Register.

There are no known tribal lands or Native American traditional cultural properties within the project boundaries or in the vicinity of the projects.

3.3.5.2 Environmental Effects

Historic Resource Management

Appalachian proposes to prepare an HPMP for the management of cultural resources at the London-Marmet and Winfield Projects. The HPMP would be developed in consultation with the West Virginia SHPO and other interested parties. The HPMP would contain policies and procedures for identifying effects of the projects' operations on historic properties over the term of any new licenses. The HPMP would also contain policies and procedures for the development and implementation of measures to avoid, minimize, or mitigate any adverse effects.

Staff Analysis

Continued operation of the London-Marmet and Winfield Projects would maintain the historic facilities for the purpose for which they were originally designed and built, and would, therefore, be beneficial. However, operating the projects under the protections afforded by section 106 does not ensure that there would be no adverse effects. Adverse effects may occur to licensed historic project features due to repairs and modifications that, while necessary for the continued safe and efficient operation of these projects, are not in keeping with the projects' historic character. While adverse effects on historic properties may be acceptable because of the need to continue operating the projects safely and efficiently, they should nevertheless be taken into account. Also, there may be undiscovered historic properties in the APE which could be adversely affected by future changes in project operation or by project-related activities.

Appalachian proposes to continue using the London-Marmet and Winfield Projects to produce hydropower. The impact of using a historic resource on a regular basis could lead to adverse effects to the historical integrity of the structures. At the London-Marmet and Winfield Projects, the constant use of the equipment, wear and tear on the facilities, physical pressure of the water, and other factors could diminish the character of the historic facilities. The continued operation of the projects for the life of any license issued could adversely affect the powerhouses and possibly any unknown archaeological sites at each development.

Appalachian proposes to implement an HPMP to ensure that adverse effects on historic properties, arising from project operation or project-related activities over the

term of any new licenses, would be mitigated, lessened, or avoided. Appalachian would need to develop and implement separate HPMP's for each project. The HPMP's should include principles and procedures to address the continued maintenance of properties that are eligible for listing in the National Register, as well as principles and procedures to respond to accidental discovery of cultural resources during project operations. Implementation of HPMP's for the London-Marmet and Winfield Projects, in consultation with the West Virginia SHPO, would ensure that any adverse effects to historic properties would be appropriately resolved in accordance with section 106 of the NHPA.

As part of its obligation under section 106, the Commission plans to execute a programmatic agreement (PA) for each project requiring Appalachian to submit separate HPMP's for the projects to the Commission. The PA's will afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. Appalachian would be invited to participate in the PA's as a concurring party. If licenses are ultimately issued, the PA's would be incorporated into the licenses by reference.

3.4 NO-ACTION ALTERNATIVE

Under the no-action alternative the projects would continue to operate as they have in the past. None of the licensee's proposed measures or the resource agencies' recommendations would be required. Aquatic resources would not be enhanced by the reduction in the allowable water level fluctuation in the Corps' London impoundment. Additional amenities including trash and bathroom facilities would not be provided at any of the three developments. Migratory birds and wetlands may be impacted by transmission line interactions. Wetlands, forests, and wildlife may be impacted by vegetation maintenance practices.

4.0 DEVELOPMENTAL ANALYSIS

In this section, we look at the London-Marmet and Winfield Projects use of environmental resources for hydropower purposes to see what effect various environmental measures would have on the project's costs and power generation. Under the Commission's approach to evaluating the economics of hydropower projects, as articulated in *Mead Corp.*,²² the Commission compares the current project cost to an estimate of the cost of obtaining the same amount of energy and capacity using a likely alternative source of power for the region (cost of alternative power). In keeping with Commission policy as described in *Mead*, our economic analysis is based on current electric power cost conditions and does not consider future escalation of fuel prices in valuing the hydropower project's power benefits.

For each of the licensing alternatives, our analysis includes an estimate of: 1) the cost of individual measures considered in the EA for the protection, mitigation, and enhancement of environmental resources affected by the project; 2) the cost of alternative power; 3) the total project cost (i.e. for operation, maintenance, and environmental measures); and 4) the difference between the cost of alternative power and total project cost. If the difference between the cost of alternative power and total project cost is positive, the project produces power for less than the cost of alternative power. If the difference between the cost of alternative power and total project cost is negative, the project produces power for more than the cost of alternative power. This estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license. However, project economics is only one of many public interest factors the Commission considers in determining whether, and under what conditions, to issue a license.

In the following sections, we analyze the project's power benefits for three alternatives: 1) no action, 2) the applicant's proposed project; and 3) the proposed project with staff-recommended measures.

4.1 POWER AND ECONOMIC BENEFITS OF THE PROJECT

The London-Marmet Project has a combined installed capacity of 28.8 MW. The Winfield Project has an installed capacity of 14.76 MW. Average annual generation is equal to 147,391 MWh for the London-Marmet Project and 106,193 MWh for the

²² See *Mead Corporation, Publishing Paper Division*, 72 FERC ¶ 61,027 (July 13, 1995). In most cases, electricity from hydropower would displace some form of fossil-fueled generation, in which fuel cost is the largest component of the cost of electricity production.

Winfield Project. Appalachian proposes to operate in a run-of-release mode and would comply with the Corps' impoundment operating guidelines.

Tables 5 and 6 summarize the parameters and economic information we use in our analysis for the London-Marmet and Winfield Projects, respectively. Appalachian provided some of this information in its license application. We find that the values provided by Appalachian are reasonable for the purposes of our analysis. Cost items common to all alternatives include: taxes and insurance costs, net investment, estimated future capital investment required to maintain and extend the life of plant equipment and facilities, relicensing costs, and normal operation and maintenance costs. Throughout this section all dollars are 2011 unless otherwise specified.

Table 5. Parameters for Economic Analysis of the London-Marmet Project (Source: Appalachian, modified by Staff).

Parameters	Value	Source
Period of analysis	30 years	Staff
Term of financing	20 years	Staff
Installed capacity London-Marmet Project	28.80 MW	Appalachian
Generation under existing operation London-Marmet Project	147,391 MWh ^a	Appalachian
Dependable capacity London-Marmet Project	16 MW	Appalachian
Total net investment London-Marmet Project	\$10,300,000 ^b	Appalachian
Future capital cost London-Marmet Project	\$32,000,000	Appalachian
Cost of FERC license application	\$ 506,500 ^c	Appalachian, Staff
Operation and Maintenance costs London-Marmet Project	\$2,900,000	Appalachian
Federal and state tax rate	34 percent	Staff
Property rate	3 percent	Staff
Start date	February 2014	Staff
Escalation rate	0 percent	Staff
Alternative cost: Energy and Capacity value	94.08 \$/MWh	Appalachian

- ^a Average annual generation of the plant for the 11-year period of 2001 to 2011.
^b Dollars in 2014.
^c Fifty percent of Appalachian's total FERC license application cost for London-Marmet and Winfield Projects.

Table 6. Parameters for Economic Analysis of the Winfield Project (Source: Appalachian, modified by Staff).

Parameters	Value	Source
Period of analysis	30 years	Staff
Term of financing	20 years	Staff
Installed capacity Winfield Project	14.76 MW	Appalachian
Generation under existing operation Winfield Project	106,193 MWh ^a	Appalachian
Dependable capacity Winfield Project	19 MW	Appalachian
Total net investment Winfield Project	\$5,300,000 ^b	Appalachian
Future capital cost Winfield Project	\$20,000,000	Appalachian
Cost of FERC license application	\$ 506,500 ^c	Appalachian, Staff
Operation and Maintenance costs Winfield Project	\$2,200,000	Appalachian
Federal and state tax rate	34 percent	Staff
Property rate	3 percent	Staff
Start date	February 2014	Staff
Escalation rate	0 percent	Staff
Alternative cost: Energy and Capacity value	94.08 \$/MWh	Appalachian

- ^a Average annual generation of the plant for the 11-year period of 2001 to 2011.
^b Dollars in 2014.
^c Fifty percent of Appalachian's total FERC license application cost for London-Marmet and Winfield Projects.

4.2 COMPARISON OF ALTERNATIVES

Appalachian is not proposing any changes to the current operational scenarios for either the Marmet or Winfield Developments. Within the current license, Appalachian may fluctuate the London impoundment levels up to 3 feet. Appalachian, in discussion with resource agencies and the Corps, is proposing to operate the London Development in a run-of-release mode with a maximum allowable water level fluctuation in the Corps' impoundment of 0.3 foot. Due to the fact that current operation limits impoundment fluctuations to levels similar to the proposed 0.3 foot, substantial effects to generation are not anticipated.

A summary of the annual generation, annual cost of alternative power, estimated annual project cost, and the difference between the cost of alternative power and the estimated annual project cost for each of the alternatives for the London-Marmet and Winfield Projects are described below in tables 7 and 8.

Table 7. Estimated Annual Generation and Project Cost for Each Alternative for the London-Marmet Project (Source: Staff).

Parameter	No Action	Applicant's Proposal	Staff Alternative
Installed capacity (MW)	28.80	28.80	28.80
Annual generation (MWh)	147,391	147,391	147,391
Dependable capacity (MW)	16.00	16.00	16.00
Annual cost of alternative power(\$)	5,617,000	5,617,000	5,617,000
\$/MWh	38.11	38.11	38.11
Annual project costs (\$)	4,872,000	4,915,000	4,956,000
\$/MWh	33.06	33.35	33.63
Difference between the cost of alternative power and project cost (\$)	745,000	702,000	661,000
\$/MWh	5.06	4.76	4.49

Table 8. Estimated Annual Generation and Project Cost for Each Alternative for the Winfield Project. (Source: Staff).

Parameter	No Action	Applicant's Proposal	Staff Alternative
Installed capacity (MW)	14.76	14.76	14.76
Annual generation (MWh)	106,193	106,193	106,193
Dependable capacity (MW)	19.00	19.00	19.00
Annual cost of alternative power(\$)	4,251,000	4,251,000	4,251,000
\$/MWh	40.03	40.03	40.03
Annual project costs (\$)	3,478,000	3,482,000	3,486,000
\$/MWh	32.75	32.79	32.82
Difference between the cost of alternative power and project cost (\$)	773,000	769,000	766,000
\$/MWh	7.28	7.24	7.21

No-action Alternative

Under the no-action alternative, Appalachian would continue to operate the London-Marmet and Winfield Projects under the terms and conditions of the existing license and no new environmental protection, mitigation, or enhancement measures would be implemented.

The London-Marmet Project would have an installed capacity of 28.80 MW and generate an average of 147,391 MWh of electricity annually. The average annual cost of alternative power would be \$5,617,000 or about \$38.11/MWh. The estimated annual project cost would be \$4,872,000 or about \$33.06/MWh. Overall, the project would produce power at a cost which is \$745,000 or \$5.06/MWh, less than the cost of alternative power.

The Winfield Project would have an installed capacity of 14.76 MW and generate an average of 106,193 MWh of electricity annually. The average annual cost of alternative power would be \$4,251,000 or about \$40.03/MWh. The estimated annual project cost would be \$3,478,000 or about \$32.75/MWh. Overall, the project would produce power at a cost which is \$773,000 or \$7.28/MWh less than the cost of alternative power.

Applicant's Proposal

For the proposed action, we present the annual costs that include operating the London-Marmet and Winfield Projects with Appalachian's proposed environmental measures.

Based on the parameters in table 5 and the cost of measures identified in table 9, we estimate that the annual cost of Appalachian's proposed London-Marmet Project would be about \$4,915,000 (\$33.75/MWh). The cost of alternative power would be \$5,617,000 (\$38.11/MWh) for the estimated annual generation of 147,391 MWh. The resulting difference between the cost of alternative power and the estimated annual project cost would be \$702,000 (\$4.76/MWh).

We estimate that the annual cost of Appalachian's proposed Winfield Project would be about \$3,482,000 (\$32.79/MWh) based on the parameters in table 6 and the cost of measures identified in table 10. The cost of alternative power would be \$4,251,000 (\$40.03 /MWh) for the estimated annual generation of 106,193 MWh. The resulting difference between the cost of alternative power and the estimated annual project cost would be \$769,000 (\$7.24/MWh).

Staff Alternative

The staff alternative, as described herein, includes measures that are part of the proposed action, with additional staff-recommended measures.

Based on the parameters in table 5 and the cost of measures identified in table 9, we estimate that the annual cost of Appalachian's proposed London-Marmet Project would be about \$4,956,000 (\$33.63/MWh). The cost of alternative power would be \$5,617,000 (\$38.11/MWh) for the estimated annual generation of 147,391 MWh. The resulting difference between the cost of alternative power and the estimated annual project cost would be \$661,000 (\$4.49/MWh).

We estimate that the annual cost of Appalachian's proposed Winfield Project would be about \$3,486,000 (\$32.82/MWh) based on the parameters in table 6 and the cost of measures identified in table 10. The cost of alternative power would be \$4,251,000 (\$40.03/MWh) for the estimated annual generation of 106,193 MWh. The resulting difference between the cost of alternative power and the estimated annual project cost would be \$766,000 (\$7.21/MWh).

4.3 COST OF ENVIRONMENTAL MEASURES

Tables 9 and 10 give the cost of each of the environmental enhancement measures for the London-Marmet and Winfield Projects considered in our analysis, respectively.

We have used costs provided by Appalachian where available (e.g., recreation measures) and estimated the cost of measures recommended by other entities or by staff, based on similar measures implemented at other recently relicensed projects. We convert all costs to equal annual (levelized) values over a 30-year period of analysis to give a uniform basis for comparing the benefits of a measure to its cost.

Table 9. Cost of Environmental Measures Considered in Assessing the Environmental Effects of Operating the London-Marmet Project (Source: Appalachian and Staff).

Enhancement/Mitigation Measure	Entity	Capital Cost	Annual Cost	Levelized Annual Cost
Aquatic Resources				
Run-of-release operation	Appalachian, West Virginia DNR, FERC	\$0	\$0 ^a	\$0
Project operation and compliance monitoring plan	FERC	\$10,000	\$4,500	\$5,347
Terrestrial Resources				
Vegetation maintenance plan	FERC	\$3,500	\$0 ^b	\$296
Avian protection plan	Appalachian, FERC	\$2,000	\$0	\$169
Recreation Resources				
Recreation plan at London-Marmet	Appalachian, West Virginia DNR, FERC	\$0	\$4,500	\$4,500
Cultural Resources				
Historic properties management plan	Appalachian, FERC	\$4,000	\$1,000	\$1,339

^a Because the project's developments can only operate off of flows made available to it by the Corps (run-of-release) it represents no change from current operation and thus would not require an additional cost.

^b This measure would not likely require an additional cost beyond the O&M cost.

Table 10. Cost of Environmental Measures Considered in Assessing the Environmental Effects of Operating the Winfield Project (Source: Appalachian and Staff).

Enhancement/Mitigation Measure	Entity	Capital Cost	Annual Cost	Levelized Annual Cost
Aquatic Resources				
Run-of-Release Operation	Appalachian, West Virginia DNR, FERC	\$0	\$0 ^a	\$0
Project Operation and Compliance Monitoring Plan	FERC	\$10,000	\$4,500	\$5,347
Terrestrial Resources				
Vegetation maintenance plan	FERC	\$1,500	\$0 ^b	\$127
Avian protection plan	Appalachian, FERC	\$1,000	\$0	\$85
Recreation Resources				
Recreation plan	Appalachian, West Virginia DNR, FERC	\$0	\$4,500	\$4,500
Cultural Resources				
Historic properties management plan	Appalachian, FERC	\$4,000	\$1,000	\$1,339

^a Because the project's developments can only operate off of flows made available to it by the Corps (run-of-release) it represents no change from current operation and thus would not require an additional cost.

^b This measure would not likely require an additional cost beyond the O&M cost.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 COMPARISON OF ALTERNATIVES

In this section, we compare the developmental and environmental effects of Appalachian's proposal; Appalachian's proposal with staff modifications (staff alternative), and a no-action alternative (continued operation with no changes). We summarize the environmental effects of the different alternatives in table 11, below.

We estimate the annual generation of the project under the four alternatives identified above. Our analysis shows that the annual generation would be 147,391 MWh at the London-Marmet Project and 106,193 MWh at the Winfield Project for the proposed action, staff alternative, and no action.

Table 11 Comparison of Alternatives for the London-Marmet and Winfield Projects (Source: Staff).

Resource	No-Action Alternative – existing conditions	Proposed Action	Staff Alternative
Annual Generation London-Marmet Project Winfield Project	147,391 MWh 106,193 MWh	147,391 MWh 106,193 MWh	147,391 MWh 106,193 MWh
Aquatic Resources	Existing run-of-release operation, with specific impoundment fluctuations authorized by the Corps.	Run-of-release operation with the Corps' authorized fluctuation of London impoundment reduced from 3.0 feet to 0.3 foot would minimize erosion, and provide a more stable environment upstream and downstream of the Corps' London dam.	Same as proposed action. A project operation and compliance monitoring plan would ensure run-of-release operation and continued minimization of impacts to aquatic resources that would otherwise occur under fluctuating impoundment elevations.

Resource	No-Action Alternative – existing conditions	Proposed Action	Staff Alternative
Terrestrial Resources	No known existing terrestrial resource measures implemented, although vegetation within the project boundaries, including recreation areas, is currently maintained by Appalachian.	AEP's facility-wide avian protection plan, would protect migratory birds from electrocution or collision with powerlines and substations when finalized.	<p>An avian protection plan developed with site-specific measures and practices would reduce bird mortality associated with electrocution from collision with powerlines and substations.</p> <p>Development of a vegetation maintenance plan would minimize the effects of project maintenance on wetlands, forest resources, and wildlife.</p>
Recreation	London-Marmet and Winfield tailrace access areas would not receive portable restrooms or trash receptacles.	Place portable restrooms and trash receptacles at London-Marmet and Winfield tailrace access areas.	Same as the proposed action plus a recreation plan for each project that creates a timeline for installing the new facilities as well as a regular maintenance schedule.

Resource	No-Action Alternative – existing conditions	Proposed Action	Staff Alternative
Cultural Resources	Appalachian would continue to comply with section 106 on a case-by-case basis.	Preparing and implementing an HPMP for each project would ensure that cultural resources are considered at the project sites.	Same as the proposed action. Executing PA's with the West Virginia SHPO would ensure that the HPMP's are implemented.

5.2 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 relicensing the London-Marmet and Winfield Projects.

A. Recommended Alternative

Based on our independent review and evaluation of the environmental and economic effects of no action, the proposed action, and the proposed action with additional staff-recommended measures (staff alternative), we recommend the staff alternative.

We recommend the staff alternative because: 1) issuing new licenses would allow Appalachian to continue operating the projects as beneficial and dependable sources of electric energy; 2) the 43.47 MW of electric energy comes from a renewable resource which does not contribute to atmospheric pollution; and 3) the recommended environmental measures would protect water quality, fish and wildlife resources, and cultural resources, and would improve public recreational access.

Measures Proposed by Appalachian

Based on our environmental analysis of Appalachian's proposal discussed in section 3 and the costs discussed in section 4, we recommend including the following environmental measures proposed by Appalachian in any license issued for the London-Marmet and Winfield Projects:

- operate the three developments in run-of-release mode;
- implement an avian protection plan, currently being finalized by Appalachian's parent company, AEP, for all of its holdings, to protect migratory birds from electrocution and collision with power lines and substations at the three developments;
- maintain the recently reopened London tailrace fishing access;
- install portable restrooms and trash receptacles at the London, Marmet, and Winfield Developments to accommodate existing and future recreation use; and
- implement an HPMP at each project to be developed in consultation with the West Virginia SHPO and other interested stakeholders.

In addition to the above environmental measures, Appalachian proposes to remove from the project boundary, two currently licensed 0.38-mile-long, 46-kV transmission lines from the Winfield Project because there are no primary transmission lines associated with the project. Appalachian also proposes that the London substation and Belle substation in the current license for the London-Marmet Project be removed from the project boundary because they are multi-use facilities.

Additional Staff-Recommended Measures

Under the staff alternative, the project would include most of Appalachian's proposed measures, as outlined above. In addition, the staff alternative would include the following additional measures:

- developing a project operation and compliance monitoring plan that includes provisions for documenting compliance with any Corps' operating requirements and establishing a schedule for reporting project compliance/non-compliance during normal operation and emergencies;

- developing a vegetation maintenance plan for all three developments to minimize the effects of project maintenance on native plant communities, wetlands, and wildlife within the project boundaries of the three developments;
- developing an avian protection plan with site-specific measures and practices to reduce bird mortality at each development, rather than implementing the general avian protection plan being finalized by AEP;
- developing a recreation plan for each project that includes operation and maintenance provisions for new and existing facilities and an implementation schedule; and
- revising the project boundary for the London Development to include the road used to access the tailrace fishing area, the parking area, and the path to the fishing pier to ensure that these facilities and associated public recreational access would be maintained over the term of any new license.

We discuss the rationale for the measures we are recommending or not recommending below.

Run-of-Release Operation

Under the current operating agreement with the Corps, the London impoundment elevation is allowed to fluctuate between 611.0 feet and 614.0 feet NGVD although Appalachian currently does not use this allowable fluctuation range. The Marmet impoundment elevation is allowed to fluctuate between 589.7 feet and 590.0 feet NGVD. The Winfield impoundment elevation is allowed to fluctuate between 565.8 feet and 566.0 feet NGVD. All three impoundments can be drawn down at a maximum rate of 0.5 foot per hour. When stream flow exceeds the maximum turbine discharge (10,000 cfs), the responsibility for control of the impoundment elevations passes to the Corps' personnel.

Appalachian proposes to operate the projects in a run-of-release mode and to limit impoundment fluctuations at the London Development to 0.3 foot. The West Virginia DNR recommends run-of-release operation. Operating the projects' three developments in a run-of-release mode, which would include formally limiting impoundment fluctuations at the London Development to 0.3 foot, would ensure that water quality and aquatic habitats are protected. There would be no additional cost associated with operating the projects in a run-of-release mode. Staff recommends this proposed mode of operation.

Project Operation and Compliance Monitoring Plan

Appalachian proposes to operate the projects in a run-of-release mode meaning

that the projects' three developments would operate off of flows established by and made available to them by the Corps. Appalachian's proposal, however, did not specify how it would document compliance with the run-of-release operation or how it would coordinate its operations with the Corps.

Generally, Commission licenses for non-federal projects at Corps' dams require the licensee to develop an operating plan and a MOA with the Corps.²³ The operating plan describes the mode of hydropower operation, impoundment flow diversion, and regulation requirements for the Corps' projects, and integration of operation of the hydroelectric facility in the Corps' emergency action plan. The MOA describes the detailed operation of the projects acceptable to the Corps and any restrictions needed to protect the purposes of the Corps' projects for navigation.

Therefore, we recommend that any license issued for this project require Appalachian to develop an operation and compliance monitoring plan in consultation with the West Virginia DNR and the Corps, and enter into an operating MOA with the Corps. A project operation and compliance monitoring plan should include provisions for documenting compliance with any Corps' operating requirements and establish a schedule for reporting project compliance/non-compliance during normal operation and emergencies. A project operation and compliance monitoring plan would ensure run-of-release operation and continued minimization of impacts to aquatic resources that would otherwise occur under fluctuating impoundment elevations. We estimate that the levelized annual cost of developing the operation and compliance monitoring plan would be \$10,694 for both projects and conclude that the benefits of this measure outweigh the costs.

Vegetation Maintenance Plan

Appalachian conducts routine maintenance of primary transmission lines and other project lands to ensure safe access to the project facilities and recreational features, and continued transmission of power. However, Appalachian provided limited information about the details of these practices, including the type of mechanical or chemical methods employed and any precautionary measures taken. Appalachian's periodic use of herbicides has the potential to reduce the habitat value of existing forested resources and aquatic habitat. Additionally, trimming or removal of trees could impact suitable habitat for roosting bats or birds. We recommend that Appalachian develop a vegetation maintenance plan for both the London-Marmet and Winfield Projects. Such a plan would allow for a defined approach to maintenance of the projects' vegetation and would minimize the effects of maintenance practices on wetlands, forests, and wildlife.

²³ Memorandum of Understanding between the Federal Energy Regulatory Commission and the Department of the Army regarding Non-federal hydropower development dated March 30, 2011.

The plan should provide: 1) a description of all mechanical and chemical treatment methods used to maintain project lands; 2) a list of known or suspected target species for chemical treatment within natural and man-made (i.e., rip-rap) habitats; 3) standard buffer distances to minimize the chance of chemicals entering the Kanawha River or any other waterway or wetland within or hydrologically connected to the three developments; and 4) standard criteria identifying when trees of a certain height or state of health (i.e., dead or dying trees) must be trimmed or removed to insure safe delivery of power and when they can be preserved to provide wildlife habitat. The plan should also address the trimming or removal of trees that provide suitable habitat for roosting Indiana or Virginia big-eared bats to maximize suitable roost habitat for these species. Whenever possible, suitable roost trees should be preserved. In addition, tree removal should be limited to the winter season (September to March) to eliminate the chance of mortality to roosting bats inhabiting those trees. Such a plan would be worth the levelized annual cost of \$423 for all three developments.

Avian Protection Plan

Appalachian proposes to implement an avian protection plan that is currently being finalized by its parent company, AEP, for each of AEP's holdings, including the London-Marmet and Winfield Projects. The development of a site-specific avian protection plan, however, would be more effective at minimizing the potential for bird collisions or electrocution with transmission lines or related structures within the project boundaries. Therefore, staff recommends that an avian protection plan be a requirement of any licenses issued for the London-Marmet and Winfield Projects, and that the plans include site-specific measures and practices to reduce bird mortality, including recommended modifications to structures or line arrangement, as necessary. The development of this plan would be worth the levelized annual cost of \$254 for all three developments.

Recreation Plan

Appalachian originally proposed to install portable restrooms and trash receptacles at the Marmet and Winfield tailrace access areas. Throughout the relicensing process, Appalachian sought to re-establish public access at the London tailrace, which had been closed since 2009. The pedestrian bridge providing access to the London tailrace had deteriorated significantly and became unsafe for anyone crossing over the CSX railroad tracks. Appalachian recently confirmed that negotiations with CSX were successful and that access was restored as of October 15, 2012. As a result of the agreement to establish the at-grade crossing, Appalachian stated that it would provide and maintain portable restrooms and trash receptacles at the London access site. Appalachian also stated that it would construct and maintain a 25-car gravel, lighted parking area at the London tailrace access area.

The West Virginia DNR recommends that a recreation access enhancement plan be prepared for the London-Marmet and Winfield Projects and that it include an at-grade crossing for the London tailrace access area, as well as parking areas, restroom facilities, and solid waste receptacles at all three developments.

Restoring access to the London tailrace would once again provide opportunities for tailrace fishing that have been unavailable for the past 3 years. Providing trash and restroom facilities at the access areas would enhance the user experience by providing a place for trash as opposed to leaving it on the ground and allowing the user to stay longer at the projects without having to leave to find a restroom.

These proposed facilities and measures should be discussed in greater detail in separate recreation plans for the London-Marmet Project and Winfield Project. In the recreation plans, Appalachian should create a timeline for installing the new facilities as well as a regular maintenance schedule. These facilities would assist in maintaining a cleaner environment for all recreation users and would be worth the levelized annual cost of \$9,000 for both projects.

Historic Properties Management Plan

To ensure that adverse effects on known and potential historic properties, and to any as-yet unidentified archaeological resources, are satisfactorily resolved over the term of a new license, we recommend that the Commission execute two PA's with the West Virginia SHPO for the London-Marmet and Winfield Projects. Appalachian would be invited to participate as a concurring party. The PA's would require Appalachian to file an HPMP for each project with the Commission. The HPMP's for the projects should contain principles and procedures to address the proposed continued use, and protection of, historic properties; mitigation of unavoidable adverse effects; compliance with laws and regulations governing human remains; and discovery of previously unidentified resources over the term of any license issued. The levelized annual cost of these plans for both projects would be \$2,678. We find that the benefits of the plans outweigh the costs; therefore, we recommend that Appalachian prepare and implement an HPMP for each project.

Project Boundary Revisions

Project recreation facilities at the London Development that are not currently enclosed within the existing project boundary include the road to the parking area for the tailrace fishing access area, the parking area, and the path to the fishing pier. At the Marmet and Winfield Developments, all of the project recreation facilities including the parking areas, paths to the fishing piers, stairs to the fishing piers, and the tailrace fishing piers are enclosed within the project boundary.

Revising the London Project boundary to encompass the existing paths, roads, and parking area that lead to the fishing pier would be consistent with the Commission's policy on recreational development (18 CFR § 2.7 (a)), which requires licensees to include within their project boundaries enough land to assure optimum development of the project's recreational resources. Inclusion of these facilities within the project boundary would provide a mechanism for the Commission to ensure that Appalachian develops and maintains these facilities to provide for public access through the term of any new license that may be issued.

The current license for the Winfield Project includes within its project boundary two 0.38-foot-long transmission lines departing the Winfield substation. These lines run from the Winfield substation to the junction of the Teays and Bancroft transmission lines which then lead to the Teays and Bancroft substations, respectively. Power from the Winfield generating units is transmitted across a short jumper from the powerhouse to the adjacent multi-use Winfield substation (a project facility), which acts as an isolation and switching point for transmission and distribution. Appalachian completed a transmission line corridor study for relicensing to determine which powerlines associated with the projects should be considered primary and therefore should be included as part of the project facilities. The study found that there should be no primary transmission line for the Winfield Project. Staff agrees and recommends that these two 0.38-foot-long transmission lines should be removed from the project boundary because they are not considered primary transmission lines as set forth in §3(11) of the FPA. In addition, the current license for the London-Marmet Project includes within its project boundary the London substation and Belle substation. Appalachian states that these are not project facilities because they serve multiple uses and should be removed from the project boundary. Staff recommends revising the project boundary to remove the substations from the London-Marmet Project to ensure that only project facilities are included within the project boundaries.

B. Measures Not Recommended

Fisheries Habitat Improvement Plan

To mitigate for the anticipated loss of fishery resources due to entrainment, West Virginia DNR recommended that Appalachian implement a habitat improvement plan, in collaboration with the West Virginia DNR. West Virginia DNR recommends that the plan include the deployment of structures in the project area targeted for fish reproduction and protection of young-of-the-year fish to increase recruitment and fish survival. Specifically, the plan should focus on instream habitat improvements designed to promote increased spawning, nursery habitat, and bank stabilization. West Virginia DNR states that the monetary value of fish lost over the anticipated 50-year life of a license would be much higher than the anticipated cost of habitat structures.

The West Virginia DNR recommends that trash rack spacing be no greater than 2-inches to reduce the rate of entrainment of fish. However, the London and Marmet Developments and the Winfield Project have trash racks with 3.5-inch-wide spacing. Based on Appalachian's study, the West Virginia DNR states that using a conservative estimate of fish mortality of entrained fish at both projects combined could range from over 585,000 in a dry year to over 840,000 in a wet year.

Appalachian disagrees that 2-inch versus 3.5-inch trash rack spacing would have a significant effect on fish entrainment. Appalachian further stated that the inappropriateness of compensatory mitigation in the absence of a demonstration of significant adverse impact has been well-established in past Commission proceedings on hydropower project relicensing, based on the 1996 circuit court ruling in *City of New Martinsville v. FERC*.

West Virginia DNR did not provide specific recommendations for its habitat improvement projects regarding the locations of the projects, or the specific species that the habitat improvement projects would be designed for, or how much they would cost. Therefore, staff was unable to evaluate the costs and benefits of the recommendation. Nevertheless, while the operations of the projects would entrain some fish, the majority of the fish involved would likely consist of young fish and be composed of highly prolific species that have the ability to compensate for losses. Furthermore, there is no evidence suggesting that entrainment is negatively affecting fish populations in the projects' areas. Therefore, we do not recommend adopting West Virginia DNR's recommended fisheries habitat improvement plan.

5.3 UNAVOIDABLE ADVERSE EFFECTS

Operation of the projects would continue to entrain some fish. However, the majority of the fish involved would likely consist of young fish and be composed of highly prolific species that have the ability to compensate for losses.

5.4 FISH AND WILDLIFE AGENCY RECOMMENDATIONS

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 the federal and state fish and wildlife agencies for the protection, mitigation, and enhancement of fish and wildlife resources affected by the project. Section 10(j) of the FPA states that whenever the Commission finds 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 such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of the agency.

In response to the Ready for Environmental Analysis notice, West Virginia DNR (letter filed August 7, 2012) recommended three fish and wildlife measures. Table 12 lists the 10(j) recommendations and whether the measures are recommended by staff. Recommendations that we consider outside the scope of 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 12. Analysis of Fish and Wildlife Agency Recommendations for the London-Marmet and Winfield Projects (Source: Staff).

Recommendation	Agency	Within scope of section 10(j)?	Annual cost	Recommend adopting?
Operate in Run-of-River (run-of-release) mode as allowed by the Corps.	West Virginia DNR	Yes	\$0	Yes.
Fisheries Habitat Improvement Plan	West Virginia DNR	No. Not a specific measure to protect, mitigate, or enhance fish and wildlife resources	\$0 ^a	No. Not specific enough regarding location, species, and costs. Furthermore, continued project operations do not adversely impact fisheries in the Kanawha River.
Recreational Access Enhancement Plan	West Virginia DNR	No. Not a specific measure to protect, mitigate, or enhance fish and wildlife resources	\$4,500	Yes.

^a Not specific enough to determine costs.

5.5 CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2) of the FPA, 16 U.S.C § 803(a)(2)(A) (2006), requires the Commission to consider the extent to which a project is consistent with federal and state comprehensive plans for improving, developing or conserving waterways affected by the project. We reviewed seven comprehensive plans that are applicable to the London-Marmet and Winfield Projects located in West Virginia. No inconsistencies were found. The plans include:

West Virginia

Ohio River Basin Commission. 1977. Kanawha River Basin comprehensive coordinated joint plan. Cincinnati, Ohio. July 1977.

West Virginia Division of Natural Resources. 1976. Wildlife Resources Division strategic plan, 1975 - 1985. Charleston, West Virginia. 122 pp.

West Virginia Division of Natural Resources. 1977. Today's plan for tomorrow's wildlife: a strategic plan for fish, game, and nongame management, 1975 - 1985. Charleston, West Virginia. 59 pp.

West Virginia Division of Natural Resources. Soil Conservation Service of the Department of Agriculture. 1985. Lower Kanawha River Basin, Volume III: problems, concerns, alternative solutions, and a suggested plan. Charleston, West Virginia. 158 pp.

West Virginia Governor's Office of Community and Industrial Development. 1989. West Virginia State Comprehensive Outdoor Recreation Plan (SCORP), 1988- 1992. Charleston, West Virginia.

United States

National Park Service. 1982. The nationwide rivers inventory. Department of the Interior, Washington, DC. January 1982.

U.S. Fish and Wildlife Service. Undated. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Washington, DC.

6.0 FINDING OF NO SIGNIFICANT IMPACT

If the London-Marmet and Winfield Projects are relicensed as proposed with the additional staff-recommended measures, the projects would operate while providing protective measures for aquatic, terrestrial, recreational, and cultural resources in the project area.

On the basis of our independent analysis, we find that the issuance of licenses for the London-Marmet and Winfield Projects, with our recommended environmental measures, would not constitute a major federal action significantly affecting the quality of the human environment.

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APPENDIX A: LICENSE ARTICLES RECOMMENDED BY STAFF FOR THE LONDON-MARMET PROJECT NO. P-1175

Draft Article 201. *Administrative Annual Charges.* The licensee shall pay the United States annual charges, effective the first day of the month in which the license is issued, and as determined in accordance with provisions of the Commission's regulations in effect from time to time, for the purposes of:

(a) reimbursing the United States for the cost of administration of Part I of the Federal Power Act. The authorized installed capacity for that purpose is 28.8 megawatts; and

(b) recompensing the United States for the utilization of surplus water or water power from a government dam.

Draft Article 202. *Exhibit F Drawings.* Within 45 days of the date of issuance of the license, the licensee shall file the approved exhibit drawings in aperture card and electronic file formats.

(a) Three sets of the approved exhibit drawings shall be reproduced on silver or gelatin 35mm microfilm. All microfilm shall be mounted on type D (3-1/4" X 7-3/8") aperture cards. Prior to microfilming, the FERC Project-Drawing Number (i.e., P-1175-#### through P-1175-####) shall be shown in the margin below the title block of the approved drawing. After mounting, the FERC Drawing Number shall be typed on the upper right corner of each aperture card. Additionally, the Project Number, FERC Exhibit (i.e., F-1, etc.), Drawing Title, and date of this license shall be typed on the upper left corner of each aperture card.

Two of the sets of aperture cards shall be filed with the Secretary of the Commission, ATTN: OEP/DHAC. The third set shall be filed with the Commission's Division of Dam Safety and Inspections New York Regional Office.

(b) The licensee shall file two separate sets of exhibit drawings in electronic raster format with the Secretary of the Commission, ATTN: OEP/DHAC. A third set shall be filed with the Commission's Division of Dam Safety and Inspections New York Regional Office. Exhibit F drawings must be identified as Critical Energy Infrastructure Information (CEII) material under 18 C.F.R. § 388.113(c) (2012). Each drawing must be a separate electronic file, and the file name shall include: FERC Project-Drawing Number, FERC Exhibit, Drawing Title, date of this license, and file extension in the following format [P-1175-####, F-1, Description, MM-DD-YYYY.TIF]. Electronic drawings shall meet the following format specification:

IMAGERY - black & white raster file
 FILE TYPE – Tagged Image File Format (TIFF), CCITT Group 4
 RESOLUTION – 300 dpi desired (200 dpi min)
 DRAWING SIZE FORMAT – 24” X 36” (min), 28” X 40” (max)
 FILE SIZE – less than 1 MB desired

Draft Article 203. Exhibit G Drawings. Within 90 days of the effective date of the license, the licensee shall file, for Commission approval, revised Exhibit G drawings for the London Development enclosing within the project boundary all principal project works necessary for operation and maintenance of the project, including the road used to access the tailrace fishing area, the parking area, the path to the fishing pier, the stairs leading to the fishing pier, and the tailrace fishing pier. The Exhibit G drawings must comply with sections 4.39 and 4.41 of the Commission’s regulations.

Draft Article 204. Amortization Reserve. Pursuant to section 10(d) of the Federal Power Act, a specified reasonable rate of return upon the net investment in the project shall be used for determining surplus earnings of the project for the establishment and maintenance of amortization reserves. The licensee shall set aside in a project amortization reserve account at the end of each fiscal year one half of the project surplus earnings, if any, in excess of the specified rate of return per annum on the net investment. To the extent that there is a deficiency of project earnings below the specified rate of return per annum for any fiscal year, the licensee shall deduct the amount of that deficiency from the amount of any surplus earnings subsequently accumulated, until absorbed. The licensee shall set aside one-half of the remaining surplus earnings, if any, cumulatively computed, in the project amortization reserve account. The licensee shall maintain the amounts established in the project amortization reserve account until further order of the Commission.

The specified reasonable rate of return used in computing amortization reserves shall be calculated annually based on current capital ratios developed from an average of 13 monthly balances of amounts properly included in the licensee’s long-term debt and proprietary capital accounts as listed in the Commission’s Uniform System of Accounts. The cost rate for such ratios shall be the weighted average cost of long-term debt and preferred stock for the year, and the cost of common equity shall be the interest rate on 10-year government bonds (reported as the Treasury Department’s 10-year constant maturity series) computed on the monthly average for the year in question plus four percentage points (400 basis points).

Draft Article 205. Headwater Benefits. If the licensee’s project was directly benefited by the construction work of another licensee, a permittee, or the United States on a storage impoundment or other headwater improvement during the term of the original license (including extensions of that term by annual licenses), and if those headwater benefits were not previously assessed and reimbursed to the owner of the

headwater improvement, the licensee shall reimburse the owner of the headwater improvement for those benefits, at such time as they are assessed, in the same manner as for benefits received during the term of this new license. The benefits will be assessed in accordance with Part 11, Subpart B, of the Commission's regulations.

Draft Article 206. *Project Land Rights Progress Report.* No later than four years after license issuance, the licensee shall file a report with the Commission describing the status of acquiring title in fee or the rights for all the lands within the project boundary. The report must provide an overview map of each parcel and summary table identifying the licensee's rights over each parcel within the project boundary. The report shall also include specific supporting documentation showing the status of the land rights on all parcels of land within the project boundary that: (1) have been acquired up to the date of filing of the report, including pertinent deeds, lease agreements, and/or bill of sale information that specifically verify the licensee's rights; and (2) the licensee's plan and schedule for acquiring all remaining project lands prior to the five-year deadline, including a history of actions taken, current owner information, the type of ownership to be acquired whether in fee or by easement, and the timeline for completing property acquisition.

Draft Article 3XX. *Licensee's Project Safety Program.* Within 90 days from the issuance date of the license, the licensee shall submit to the Commission's Division of Dam Safety and Inspections-New York Regional Engineer, a Safety Program which among other items demonstrates a clear acknowledgement of the licensee's responsibility for the safety of the project, an outline of the roles and responsibilities of the safety staff, and access of the safety official to the Chief Executive Officer (CEO). For guidance on what constitutes a good dam safety program the licensee should reference the information posted on the FERC website at www.ferc.gov/industries/hydropower/safety/initiatives/odsp.asp.

Draft Article 3XX. *Project Modification Resulting From Environmental Requirements.* The planning and design of any permanent or temporary modification which affects the project works or operation resulting from environmental requirements shall be coordinated as early as feasible with the Commission's Division of Dam Safety and Inspections (D2SI) –New York Regional Engineer. Within 90 days of issuance date of the license a letter is to be sent to the D2SI-New York Regional Engineer providing a plan and schedule of any proposed modifications to the project operations or to the water retaining and/or conveyance features of the project in the planning and design phase resulting from environmental requirements of the license. The schedule is to allow sufficient review time for the Commission to insure that the proposed work does not adversely affect the project works, dam safety, or project operation.

Draft Article 3XX. *Agreement with U.S. Army Corps of Engineers (Corps).* The licensee shall within 90 days from the issuance date of the license, enter into an

agreement with the Corps to coordinate its plans for access to and site activities on lands and property administered by the Corps so that the authorized purposes, including operation of the dam facilities, are protected. In general, the agreement shall not be redundant with the Commission's requirements contained in this license, shall identify the facility, and the study and construction activities, as applicable, and terms and conditions under which studies and construction will be conducted. The agreement shall be mainly composed of reasonable arrangements for access to the Corps site to conduct studies and construction activities, such access rights to be conditioned by the Corps as may be necessary to protect the federally authorized project purposes and operations. Should the licensee and the Corps fail to reach an access agreement, the licensee shall refer the matter to the Commission for resolution.

Draft Article 3XX. Periodic and Continuous Inspections by the U.S. Army Corps of Engineers (Corps). The construction, operation and maintenance of the project works that, in the judgment of the Corps may affect the structural integrity or operation of the Corps' project shall be subject to periodic or continuous inspections by the Corps. Any construction, operation, and maintenance deficiencies or difficulties detected by the Corps' inspection shall be immediately reported to the Division of Dam Safety and Inspection (D2SI)-New York Regional Engineer. Upon review, the D2SI-New York Regional Engineer shall refer the matter to the licensee for appropriate action. In cases when construction, operation, or maintenance practices or deficiencies may create a situation posing imminent danger to the structural integrity and safety of the Corps' project, the Corps' inspector has the authority to stop construction or maintenance while awaiting the resolution of the problem. The licensee shall immediately inform the D2SI-New York Regional Engineer of the circumstances surrounding the cessation of construction, operation, or maintenance activities. The licensee shall not resume construction, operation, or maintenance activities until notified by the D2SI-New York Regional Engineer that the problem or situation has been resolved.

Draft Article 3XX. Operating Plan. Within six months of license issuance, the licensee shall file, for Commission approval, an operating plan that has been approved by the U.S. Army Corps of Engineers (Corps), which describes (a) the designed mode of hydropower operation, (b) impoundment flow diversion and regulation requirements for operation of the Corps' project during construction, as established by the Corps, and (c) integration of the operation of the hydroelectric facility into the Corps' Emergency Action Plan. In addition, the licensee, prior to start of power plant operation, shall enter into an operating Memorandum of Agreement (MOA) with the Corps describing the detailed operation of the powerhouse acceptable to the Corps. The MOA shall specify any restrictions needed to protect the primary purposes of the Corps' project. The Division of Dam Safety and Inspection (D2SI)-New York Regional Engineer shall be invited to attend meetings regarding the agreement. The MOA shall be subject to revision by mutual consent of the Corps and licensee as experience is gained by actual project operation. Should the licensee and the Corps fail to reach an agreement, the matter will

be referred to the Director, Office of Energy Projects for resolution. Copies of the Corps' approved operating plan and a signed MOA between the Corps and the licensee, and any revision thereof, shall be filed with the Commission.

Draft Article 3XX. No Claim. The licensee shall have no claim under this license against the United States arising from the effect of any changes made in the operation or reservoir levels of the U.S. Army Corps of Engineers' project.

Draft Article 3XX. U.S. Army Corps of Engineers' (Corps) Written Approval. The licensee shall provide the Commission's Division of Dam Safety and Inspection (D2SI)-New York Regional Engineer two copies of all correspondence between the licensee and the Corps. The D2SI-New York Regional Engineer shall not authorize construction of any project work until the Corps' written approval of construction plans and specifications has been received by the D2SI-New York Regional Engineer.

Draft Article 4XX. Run-of-Release Operation. The licensee shall operate the project in a run-of-release mode meaning that the licensee shall not deviate from the flow constraints, including flow releases, established by the U.S. Army Corps of Engineers (Corps) according to Article 3XX. If operation of the project causes a deviation from the Corps' flow constraints, the licensee shall notify the Commission and the Corps as soon as possible, but no later than 10 days after each such incident.

Draft Article 4XX. Operation Compliance Monitoring Plan. Within six months of license issuance, the licensee shall file with the Commission, for approval, an operation compliance monitoring plan that describes how the licensee will comply with the operational requirements of this license.

The plan shall include, but not necessarily be limited to, the following:

- (a) provisions to monitor compliance with the operational requirements of the license, including implementing the operating plan required by Article 3XX and operating the project in a run-of-release mode as required by Article 4XX;
- (b) a description of the steps the licensee will take to ensure run-of-release operation continues during planned and emergency shutdowns;
- (c) a description of all gages or recording devices that will be used to monitor operation compliance;
- (d) the method of calibration of each gage and/or measuring device;
- (e) the frequency of recording for each gage and/or measuring device;

(f) procedures for recording, maintaining, and reporting the monitoring data to the Commission;

(g) a provision to maintain a log of project operation; and

(h) a schedule of reporting project compliance/non-compliance during normal operation and in the event of an emergency.

The licensee shall prepare the plan after consultation with the U.S. Fish Wildlife Service, West Virginia Division of Natural Resources, and the West Virginia Department of Environmental Protection. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Draft Article 4XX. Vegetation Maintenance Plan. Within six months of license issuance, the licensee shall file for Commission approval, a vegetation maintenance plan for the London-Marmet Project. The purpose of this plan is to: (1) clarify the vegetation maintenance methods used to maintain project lands, including primary transmission line corridors; (2) designate best management practices for maintenance activities that occur at or adjacent to wetlands; (3) provide a method to identify and manage invasive exotic terrestrial plants that occur on project lands when they pose a direct risk to important wildlife habitat components (i.e., roost trees for federally or state-listed bat species) and rare plant communities; and (4) identify criteria for preserving trees that offer suitable habitat for wildlife, particularly listed bat species.

The vegetation maintenance plan shall include, but not be limited to:

(a) a description of all mechanical and chemical treatment methods used to maintain project lands;

(b) a list of known or suspected target species for chemical treatment within natural and man-made (i.e., rip-rap) habitats;

(c) a schedule of regular treatments for any invasive plant species targeted for control, particularly those that pose a risk to wildlife habitat, particularly for federally and state-listed bat species;

(d) a provision that provides standard buffer distances to minimize the chance of herbicides entering the Kanawha River or any other waterway or wetland within, or hydrologically connected to, the London and Marmet developments;

(e) a provision that identifies criteria by which suitable roost trees for Indiana, Virginia big-eared, or other state-listed bat species will be preserved, provided the trees are not a hazard to safety or safe operation of the project; and

(f) a provision that, whenever possible, limits tree trimming and cutting to the winter season (September to March) to minimize the risk of mortality or harassment to roosting Indiana or Virginia big-eared bats potentially inhabiting those trees.

The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the U.S. Fish and Wildlife Service and the West Virginia Division of Natural Resources, and specific descriptions of how the agencies' comments and recommendations are accommodated by the plan. The licensee shall allow 30 days for the agencies to comment and make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Draft Article 4XX. Avian Protection Plan. Within six months of license issuance, the licensee shall file for Commission approval, an avian protection plan for the London-Marmet Project. The purpose of this plan is to minimize the potential for bird collisions or electrocution with transmission lines or related structures.

The avian protection plan shall include provisions for site-specific measures and practices to reduce bird mortality, including recommended modifications to structures or line arrangement, in accordance with the following raptor protection guidelines: (1) *Avian Protection Plan Guidelines: A Joint Document prepared by the Edison Electric Institute's Avian Power Line Interaction Committee (APLIC) and U.S. Fish and Wildlife Service*; (2) *APLIC's Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006*; and (3) *APLIC's Mitigating Bird Collisions with Power Lines: The State of the Art in 1994*, or the most current editions of these documents.

The plan shall be prepared after consultation with the U.S. Fish and Wildlife Service and West Virginia Division of Natural Resources. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Draft Article 4XX. Recreation Plan. Within 6 months of license issuance, the licensee shall file for Commission approval, a recreation plan. The plan shall include, but not necessarily be limited to, the following: (1) a schedule for installing restroom and trashcan facilities; (2) a schedule for maintenance of the new and existing facilities; (3) a provision to operate and maintain the facilities over the term of the license; and (4) a discussion of how the needs of the disabled were considered in the planning and design of the facilities.

The licensee shall prepare the plan after consultation with the West Virginia Division of Natural Resources and the U.S. Army Corps of Engineers. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons based on project-specific information.

The Commission reserves the right to require changes to the plan. Implementation of the plan shall not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee shall implement the plan according to the approved schedule, including any changes required by the Commission.

Draft Article 4XX. Programmatic Agreement. The licensee shall implement the Programmatic Agreement Between the Federal Energy Regulatory Commission and the West Virginia State Historic Preservation Office for Managing Historic Properties that may be Affected by Issuing a New License to Appalachian Power Company for the Continued Operation of the London-Marmet Project in Kanawha County, West Virginia (FERC No. 1175), executed on [pending], including but not limited to the *Historic*

Properties Management Plan (HPMP) for the project. In the event that the Programmatic Agreement is terminated, the licensee shall continue to implement the provisions of its approved HPMP. The Commission reserves the authority to require changes to the HPMP at any time during the term of the license. If the Programmatic Agreement is terminated, the licensee shall obtain approvals from or make notifications to the Commission and the West Virginia State Historic Preservation Office where the HPMP calls upon the licensee to do so.

Draft Article 4XX. Use and Occupancy. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, canceling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 water craft at a time and where said facility is intended to serve single-family type dwellings; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; and (4) food plots and other wildlife enhancement. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would

not change the basic contour of the impoundment shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of project lands for: (1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project impoundment. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 water craft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina; (6) recreational development consistent with an approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from project waters at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 60 days before conveying any interest in project lands under this paragraph (d), the licensee must file a letter with the Commission stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G map

may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Commission's authorized representative, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraph (c) or (d) of this article:

(1) Before conveying the interest, the licensee shall consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved report on recreational resources of an Exhibit E; or, if the project does not have an approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include the following covenants running with the land: (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; (ii) the grantee shall take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project; and (iii) the grantee shall not unduly restrict public access to project waters.

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project shall be consolidated for consideration when revised Exhibit G drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article shall not apply to any

part of the public lands and reservations of the United States included within the project boundary.

APPENDIX B: LICENSE ARTICLES RECOMMENDED BY STAFF FOR THE WINFIELD PROJECT NO. P-1290

Draft Article 201. *Administrative Annual Charges.* The licensee shall pay the United States annual charges, effective the first day of the month in which the license is issued, and as determined in accordance with provisions of the Commission's regulations in effect from time to time, for the purposes of:

(a) reimbursing the United States for the cost of administration of Part I of the Federal Power Act. The authorized installed capacity for that purpose is 14.76 megawatts; and

(b) recompensing the United States for the utilization of surplus water or water power from a government dam.

Draft Article 202. *Exhibit Drawings.* Within 45 days of the date of issuance of the license, the licensee shall file the approved exhibit drawings in aperture card and electronic file formats.

(a) Four sets of the approved exhibit drawings shall be reproduced on silver or gelatin 35mm microfilm. All microfilm shall be mounted on type D (3-1/4" X 7-3/8") aperture cards. Prior to microfilming, the FERC Project-Drawing Number (i.e., P-1290-#### through P-1290-####) shall be shown in the margin below the title block of the approved drawing. After mounting, the FERC Drawing Number shall be typed on the upper right corner of each aperture card. Additionally, the Project Number, FERC Exhibit (i.e., F-1, G-1, etc.), Drawing Title, and date of this license shall be typed on the upper left corner of each aperture card.

Two of the sets of aperture cards along with form FERC-587 shall be filed with the Secretary of the Commission, ATTN: OEP/DHAC. The third set shall be filed with the Commission's Division of Dam Safety and Inspections New York Regional Office. The remaining set of aperture cards (Exhibit G only) and a copy of Form FERC-587 shall be filed with the Bureau of Land Management (BLM) office at the following address:

Bureau of Land Management
Branch of Lands (ES-930)
7450 Boston Blvd
Springfield, VA 22153

(b) The licensee shall file two separate sets of exhibit drawings in electronic raster format with the Secretary of the Commission, ATTN: OEP/DHAC. A third set shall be filed with the Commission's Division of Dam Safety and Inspections New York Regional Office. Exhibit F drawings must be separated from other project exhibits and identified

as Critical Energy Infrastructure Information (CEII) material under 18 C.F.R. § 388.113(c) (2012). Each drawing must be a separate electronic file, and the file name shall include: FERC Project-Drawing Number, FERC Exhibit, Drawing Title, date of this license, and file extension in the following format [P-1290-#####, G-1, Project Boundary, MM-DD-YYYY.TIF]. Electronic drawings shall meet the following format specification:

IMAGERY - black & white raster file
 FILE TYPE – Tagged Image File Format (TIFF), CCITT Group 4
 RESOLUTION – 300 dpi desired (200 dpi min)
 DRAWING SIZE FORMAT – 24” X 36” (min), 28” X 40” (max)
 FILE SIZE – less than 1 MB desired

Each Exhibit G drawing that includes the project boundary must contain a minimum of three known reference points (i.e., latitude and longitude coordinates, or state plane coordinates). The points must be arranged in a triangular format for GIS geo-referencing the project boundary drawing to the polygon data, and must be based on a standard map coordination system. The spatial reference for the drawing (i.e., map projection, map datum, and units of measurement) must be identified on the drawing and each reference point must be labeled. In addition, each project boundary drawing must be stamped by a registered land surveyor.

(c) The licensee shall file two separate sets of the project boundary data in a geo-referenced electronic file format (such as ArcView shape files, GeoMedia files, MapInfo files, or a similar GIS format) with the Secretary of the Commission, ATTN: OEP/DHAC. The filing shall include both polygon data and all reference points shown on the individual project boundary drawings. An electronic boundary polygon data file(s) is required for each project development. Depending on the electronic file format, the polygon and point data can be included in single files with multiple layers. The geo-referenced electronic boundary data file must be positionally accurate to ± 40 feet in order to comply with National Map Accuracy Standards for maps at a 1:24,000 scale. The file name(s) shall include: FERC Project Number, data description, date of this license, and file extension in the following format [**P-1290**, boundary polygon/or point data, MM-DD-YYYY.SHP]. The filing must be accompanied by a separate text file describing the spatial reference for the geo-referenced data: map projection used (i.e., UTM, State Plane, Decimal Degrees, etc), the map datum (i.e., North American 27, North American 83, etc.), and the units of measurement (i.e., feet, meters, miles, etc.). The text file name shall include: FERC Project Number, data description, date of this license, and file extension in the following format [**P-1290**, project boundary metadata, MM-DD-YYYY.TXT].

In addition, for those projects that occupy federal lands, a separate geo-referenced

polygon file(s) is required that identifies transmission line acreage and non-transmission line acreage affecting federal lands for the purpose of meeting the requirements of 18 C.F.R. § 11.2. The file(s) must also identify each federal owner (e.g., BLM, Forest Service, Corps of Engineers, etc.), land identification (e.g., forest name, Section 24 lands, national park name, etc.), and federal acreage affected by the project boundary. Depending on the geo-referenced electronic file format, the polygon, point, and federal lands data can be included in a single file with multiple layers.

Draft Article 203. *Amortization Reserve.* Pursuant to section 10(d) of the Federal Power Act, a specified reasonable rate of return upon the net investment in the project shall be used for determining surplus earnings of the project for the establishment and maintenance of amortization reserves. The licensee shall set aside in a project amortization reserve account at the end of each fiscal year one half of the project surplus earnings, if any, in excess of the specified rate of return per annum on the net investment. To the extent that there is a deficiency of project earnings below the specified rate of return per annum for any fiscal year, the licensee shall deduct the amount of that deficiency from the amount of any surplus earnings subsequently accumulated, until absorbed. The licensee shall set aside one-half of the remaining surplus earnings, if any, cumulatively computed, in the project amortization reserve account. The licensee shall maintain the amounts established in the project amortization reserve account until further order of the Commission.

The specified reasonable rate of return used in computing amortization reserves shall be calculated annually based on current capital ratios developed from an average of 13 monthly balances of amounts properly included in the licensee's long-term debt and proprietary capital accounts as listed in the Commission's Uniform System of Accounts. The cost rate for such ratios shall be the weighted average cost of long-term debt and preferred stock for the year, and the cost of common equity shall be the interest rate on 10-year government bonds (reported as the Treasury Department's 10-year constant maturity series) computed on the monthly average for the year in question plus four percentage points (400 basis points).

Draft Article 204. *Headwater Benefits.* If the licensee's project was directly benefited by the construction work of another licensee, a permittee, or the United States on a storage impoundment or other headwater improvement during the term of the original license (including extensions of that term by annual licenses), and if those headwater benefits were not previously assessed and reimbursed to the owner of the headwater improvement, the licensee shall reimburse the owner of the headwater improvement for those benefits, at such time as they are assessed, in the same manner as for benefits received during the term of this new license. The benefits will be assessed in accordance with Part 11, Subpart B, of the Commission's regulations.

Draft Article 205. *Project Land Rights Progress Report.* No later than four years

after license issuance, the licensee shall file a report with the Commission describing the status of acquiring title in fee or the rights for all the lands within the project boundary. The report must provide an overview map of each parcel and summary table identifying the licensee's rights over each parcel within the project boundary. The report shall also include specific supporting documentation showing the status of the land rights on all parcels of land within the project boundary that: (1) have been acquired up to the date of filing of the report, including pertinent deeds, lease agreements, and/or bill of sale information that specifically verify the licensee's rights; and (2) the licensee's plan and schedule for acquiring all remaining project lands prior to the five-year deadline, including a history of actions taken, current owner information, the type of ownership to be acquired whether in fee or by easement, and the timeline for completing property acquisition.

Draft Article 3XX. Licensee's Project Safety Program. Within 90 days from the issuance date of the license, the licensee shall submit to the Commission's Division of Dam Safety and Inspections-New York Regional Engineer, a Safety Program which among other items demonstrates a clear acknowledgement of the licensee's responsibility for the safety of the project, an outline of the roles and responsibilities of the safety staff, and access of the safety official to the Chief Executive Officer (CEO). For guidance on what constitutes a good dam safety program the licensee should reference the information posted on the FERC website at www.ferc.gov/industries/hydropower/safety/initiatives/odsp.asp.

Draft Article 3XX. Project Modification Resulting From Environmental Requirements. The planning and design of any permanent or temporary modification which affects the project works or operation resulting from environmental requirements shall be coordinated as early as feasible with the Commission's Division of Dam Safety and Inspections (D2SI) –New York Regional Engineer. Within 90 days of issuance date of the license a letter is to be sent to the D2SI-New York Regional Engineer providing a plan and schedule of any proposed modifications to the project operations or to the water retaining and/or conveyance features of the project in the planning and design phase resulting from environmental requirements of the license. The schedule is to allow sufficient review time for the Commission to insure that the proposed work does not adversely affect the project works, dam safety, or project operation.

Draft Article 3XX. Agreement with U.S. Army Corps of Engineers (Corps). The licensee shall within 90 days from the issuance date of the license, enter into an agreement with the Corps to coordinate its plans for access to and site activities on lands and property administered by the Corps so that the authorized purposes, including operation of the dam facilities, are protected. In general, the agreement shall not be redundant with the Commission's requirements contained in this license, shall identify the facility, and the study and construction activities, as applicable, and terms and conditions under which studies and construction will be conducted. The agreement shall be mainly

composed of reasonable arrangements for access to the Corps site to conduct studies and construction activities, such access rights to be conditioned by the Corps as may be necessary to protect the federally authorized project purposes and operations. Should the licensee and the Corps fail to reach an access agreement, the licensee shall refer the matter to the Commission for resolution.

Draft Article 3XX. Periodic and Continuous Inspections by the U.S. Army Corps of Engineers (Corps). The construction, operation and maintenance of the project works that, in the judgment of the Corps may affect the structural integrity or operation of the Corps' project shall be subject to periodic or continuous inspections by the Corps. Any construction, operation, and maintenance deficiencies or difficulties detected by the Corps' inspection shall be immediately reported to the Division of Dam Safety and Inspection (D2SI)-New York Regional Engineer. Upon review, the D2SI-New York Regional Engineer shall refer the matter to the licensee for appropriate action. In cases when construction, operation, or maintenance practices or deficiencies may create a situation posing imminent danger to the structural integrity and safety of the Corps' project, the Corps' inspector has the authority to stop construction or maintenance while awaiting the resolution of the problem. The licensee shall immediately inform the D2SI-New York Regional Engineer of the circumstances surrounding the cessation of construction, operation, or maintenance activities. The licensee shall not resume construction, operation, or maintenance activities until notified by the D2SI-New York Regional Engineer that the problem or situation has been resolved.

Draft Article 3XX. Operating Plan. Within six months of license issuance, the licensee shall file, for Commission approval, an operating plan that has been approved by the U.S. Army Corps of Engineers (Corps), which describes (a) the designed mode of hydropower operation, (b) impoundment flow diversion and regulation requirements for operation of the Corps' project during construction, as established by the Corps, and (c) integration of the operation of the hydroelectric facility into the Corps' Emergency Action Plan. In addition, the licensee, prior to start of power plant operation, shall enter into an operating Memorandum of Agreement (MOA) with the Corps describing the detailed operation of the powerhouse acceptable to the Corps. The MOA shall specify any restrictions needed to protect the primary purposes of the Corps' project. The Division of Dam Safety and Inspection (D2SI)-New York Regional Engineer shall be invited to attend meetings regarding the agreement. The MOA shall be subject to revision by mutual consent of the Corps and licensee as experience is gained by actual project operation. Should the licensee and the Corps fail to reach an agreement, the matter will be referred to the Director, Office of Energy Projects for resolution. Copies of the Corps' approved operating plan and a signed MOA between the Corps and the licensee, and any revision thereof, shall be filed with the Commission.

Draft Article 3XX. No Claim. The licensee shall have no claim under this license against the United States arising from the effect of any changes made in the operation or reservoir levels of the U.S. Army Corps of Engineers' project.

Draft Article 3XX. U.S. Army Corps of Engineers' (Corps) Written Approval. The licensee shall provide the Commission's Division of Dam Safety and Inspection (D2SI)-New York Regional Engineer two copies of all correspondence between the licensee and the Corps. The D2SI- New York Regional Engineer shall not authorize construction of any project work until the Corps' written approval of construction plans and specifications has been received by the D2SI-New York Regional Engineer.

Draft Article 4XX. Run-of-Release Operation. The licensee shall operate the project in a run-of-release mode meaning that the licensee shall not deviate from the flow constraints, including flow releases, established by the U.S. Army Corps of Engineers (Corps) according to Article 3XX. If operation of the project causes a deviation from the Corps' flow constraints, the licensee shall notify the Commission and the Corps as soon as possible, but no later than 10 days after each such incident.

Draft Article 4XX. Operation Compliance Monitoring Plan. Within six months of license issuance, the licensee shall file with the Commission, for approval, an operation compliance monitoring plan that describes how the licensee will comply with the operational requirements of this license.

The plan shall include, but not necessarily be limited to, the following:

- (a) provisions to monitor compliance with the operational requirements of the license, including implementing the operating plan required by Article 3XX and operating the project in a run-of-release mode as required by Article 4XX;
- (b) a description of the steps the licensee will take to ensure run-of-release operation continues during planned and emergency shutdowns;
- (c) a description of all gages or recording devices that will be used to monitor operation compliance;
- (d) the method of calibration of each gage and/or measuring device;
- (e) the frequency of recording for each gage and/or measuring device;
- (f) procedures for recording, maintaining, and reporting the monitoring data to the Commission;
- (g) a provision to maintain a log of project operation; and

(h) a schedule of reporting project compliance/non-compliance during normal operation and in the event of an emergency.

The licensee shall prepare the plan after consultation with the U.S. Fish Wildlife Service, West Virginia Division of Natural Resources, and the West Virginia Department of Environmental Protection. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Draft Article 4XX. Vegetation Maintenance Plan. Within six months of license issuance, the licensee shall file for Commission approval, a vegetation maintenance plan for the Winfield Project. The purpose of this plan is to: (1) clarify the vegetation maintenance methods used to maintain project lands, including primary transmission line corridors; (2) designate best management practices for maintenance activities that occur at or adjacent to wetlands; (3) provide a method to identify and manage invasive exotic terrestrial plants that occur on project lands when they pose a direct risk to important wildlife habitat components (i.e., roost trees for federally or state-listed bat species) and rare plant communities; and (4) identify criteria for preserving trees that offer suitable habitat for wildlife, particularly listed bat species.

The vegetation maintenance plan shall include, but not be limited to:

(a) a description of all mechanical and chemical treatment methods used to maintain project lands;

(b) a list of known or suspected target species for chemical treatment within natural and man-made (i.e., rip-rap) habitats;

(c) a schedule of regular treatments for any invasive plant species targeted for control, particularly those that pose a risk to wildlife habitat, particularly for federally and state-listed bat species;

(d) a provision that provides standard buffer distances to minimize the chance of herbicides entering the Kanawha River or any other waterway or wetland within, or hydrologically connected to, the Winfield Project;

(e) a provision that identifies criteria by which suitable roost trees for Indiana, Virginia big-eared, or other state-listed bat species will be preserved, provided the trees are not a hazard to safety or safe operation of the project; and

(f) a provision that, whenever possible, limits tree trimming and cutting to the winter season (September to March) to minimize the risk of mortality or harassment to roosting Indiana or Virginia big-eared bats potentially inhabiting those trees.

The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the U.S. Fish and Wildlife Service and the West Virginia Division of Natural Resources, and specific descriptions of how the agencies' comments and recommendations are accommodated by the plan. The licensee shall allow 30 days for the agencies to comment and make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Draft Article 4XX. Avian Protection Plan. Within six months of license issuance, the licensee shall file for Commission approval, an avian protection plan for the Winfield Project. The purpose of this plan is to minimize the potential for bird collisions or electrocution with transmission lines or related structures.

The avian protection plan shall include provisions for site-specific measures and practices to reduce bird mortality, including recommended modifications to structures or line arrangement, in accordance with the following raptor protection guidelines: (1) *Avian Protection Plan Guidelines: A Joint Document prepared by the Edison Electric Institute's Avian Power Line Interaction Committee (APLIC) and U.S. Fish and Wildlife Service*; (2) *APLIC's Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006*; and (3) *APLIC's Mitigating Bird Collisions with Power Lines: The State of the Art in 1994*, or the most current editions of these documents.

The plan shall be prepared after consultation with the U.S. Fish and Wildlife Service and West Virginia Division of Natural Resources. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific

descriptions of how the agencies' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Draft Article 4XX. Recreation Plan. Within 6 months of license issuance, the licensee shall file for Commission approval, a recreation plan. The plan shall include, but not necessarily be limited to, the following: (1) a schedule for installing restroom and trashcan facilities; (2) a schedule for maintenance of the new and existing facilities; (3) a provision to operate and maintain the facilities over the term of the license; and (4) a discussion of how the needs of the disabled were considered in the planning and design of the facilities.

The licensee shall prepare the plan after consultation with the West Virginia Division of Natural Resources and the U.S. Army Corps of Engineers. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons based on project-specific information.

The Commission reserves the right to require changes to the plan. Implementation of the plan shall not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee shall implement the plan according to the approved schedule, including any changes required by the Commission.

Draft Article 4XX. Programmatic Agreement. The licensee shall implement the Programmatic Agreement Between the Federal Energy Regulatory Commission and the West Virginia State Historic Preservation Office for Managing Historic Properties that may be Affected by Issuing a New License to Appalachian Power Company for the Continued Operation of the Winfield Project in Putnam County, West Virginia (FERC No. 1290), executed on [pending], including but not limited to the *Historic Properties Management Plan* (HPMP) for the project. In the event that the Programmatic Agreement is terminated, the licensee shall continue to implement the provisions of its approved HPMP. The Commission reserves the authority to require changes to the HPMP at any time during the term of the license. If the Programmatic Agreement is

terminated, the licensee shall obtain approvals from or make notifications to the Commission and the West Virginia State Historic Preservation Office where the HPMP calls upon the licensee to do so.

Draft Article 4XX. Use and Occupancy. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, canceling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 water craft at a time and where said facility is intended to serve single-family type dwellings; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; and (4) food plots and other wildlife enhancement. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the impoundment shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of

administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of project lands for: (1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project impoundment. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 water craft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina; (6) recreational development consistent with an approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from project waters at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 60 days before conveying any interest in project lands under this paragraph (d), the licensee must file a letter with the Commission stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Commission's authorized representative, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the

intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraph (c) or (d) of this article:

(1) Before conveying the interest, the licensee shall consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved report on recreational resources of an Exhibit E; or, if the project does not have an approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include the following covenants running with the land: (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; (ii) the grantee shall take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project; and (iii) the grantee shall not unduly restrict public access to project waters.

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project shall be consolidated for consideration when revised Exhibit G drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

Document Content(s)

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