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June 23, 2010

Appalachian Power
Hydro Generation
P O Box 2021
Roanoke, VA 24022-2121
AppalachianPower.com

VIA ELECTRONIC FILING

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

RE: Appalachian Power Company
London/Marmet Project No. 1175
Winfield Project No. 1290
Application for New License
Initial Study Report

Dear Ms. Bose:

On behalf of Appalachian Power Company (Appalachian), enclosed for filing please find a copy of the Initial Study Report describing the overall progress in implementing the study plan and schedule for the Application for New Licenses for the London/Marmet and Winfield Projects located on the Kanawha River in West Virginia. The enclosed Initial Study Report has been prepared and is being filed in accordance with the requirements of the Integrated Licensing Process (18 CFR 5, § 5.15(c)).

In accordance with the requirements of the Integrated Licensing Process (18 CFR 5, § 5.15(c)), Appalachian has scheduled a meeting with the participants and Commission staff involved in the relicensing process for the London/Marmet and Winfield Projects to discuss the progress made relative to each study. The meeting is scheduled for July 8th, 2010 at 9:00 a.m. at Appalachian's Headquarters in Charleston, West Virginia.

Any questions regarding the enclosed Initial Study Report and/or the scheduled meeting referenced above should be directed to the undersigned.

Sincerely,

Teresa P. Rogers

Teresa P. Rogers
Process Supervisor I
(540) 985-2441

cc: w/encls: Attached Distribution List
Brandi Sangunett, FERC
Mike Hreben, Kleinschmidt
Mark Hutchins, Normandeau

APPALACHIAN POWER COMPANY

LONDON/MARMET HYDROELECTRIC PROJECT No. 1175
WINFIELD HYDROELECTRIC PROJECT No. 1290

INITIAL STUDY REPORT

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Joe Scarberry	WV Department of Natural Resources, Division of Natural Resources, Office of Land and Streams
Curtis I. Taylor	WV Department of Commerce, Division of Natural Resources, Wildlife Resources Section
Susan Pierce	WV Department of Culture and History, Historic Preservation Unit
Michael Hohn	State of West Virginia Geological & Economic Survey
Richard Mulfinger	Pennsylvania Fish & Boat Commission
Frank Jezioro	WV Department of Commerce, Department of Natural Resources
Jeff Herholdt	WV Department of Commerce, Division of Energy
Shirley Stewart-Burns	WV State Historic Preservation Office, The Cultural Center
Kerry Bledsoe	WV Department of Commerce, Department of Natural Resources, Wildlife Resources Section
Susan Pierce	WV Department of Education and the Arts, State Historic Preservation Office
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Non-Governmental Organizations	
Shanda Minney	West Virginia Rivers Coalition
Marybeth Beetham	Endangered Species Coalition
Bruce Glabe	Appalachian Mountain Club
Rebecca Sherman	Hydropower Reform Coalition
Ron Scott	Izaak Walton League of America
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	National Parks Conservation Association

APPALACHIAN POWER COMPANY

LONDON/MARMET

PROJECT No. 1175

WINFIELD

PROJECT No. 1290

INITIAL STUDY REPORT

June 23, 2010

Prepared by:

Kleinschmidt

Energy & Water Resource Consultants

APPALACHIAN POWER COMPANY

LONDON/MARMET HYDROELECTRIC PROJECT No. 1175
WINFIELD HYDROELECTRIC PROJECT No. 1290

INITIAL STUDY REPORT

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APPALACHIAN POWER COMPANY

LONDON/MARMET HYDROELECTRIC PROJECT No. 1175
WINFIELD HYDROELECTRIC PROJECT No. 1290

INITIAL STUDY REPORT

1.0 INTRODUCTION

The existing license for the London/Marmet project (No. 1175) was issued by the Federal Energy Regulatory Commission (FERC) on September 23, 1983 and expires January 31, 2014. The existing license for the Winfield Project (No. 1290) was issued on September 26, 1983 and has the same January 31, 2014 expiration date as that for the London/Marmet Project. Appalachian Power Company (Appalachian/Licensee) has elected to prepare and file the Application for New License for the London/Marmet and Winfield projects (Projects) in accordance with the Integrated Licensing Process (ILP) as described under the Code of Federal Regulations (18 CFR Part 5). On August 14, 2008, the Licensee filed with the FERC the Notice of Intent to File for New License (NOI) for both Projects along with a combined Pre-Application Document (PAD). Since that filing, the Process Plan for filing the Applications for New License has been followed.

Since the filing of the NOI and PAD, the Owner filed with the FERC on January 26, 2009 the Proposed Study Plans as required under 18 CFR § 5.11. The proposed study plans filed included five studies on various resources and operations having a nexus to the projects, including: 1) cultural resources; 2) recreation management; 3) water quality; 4) effects of fish entrainment and impingement; and 5) transmission line corridor maintenance. After consultations with various stakeholders including State and Federal Agencies, local governments, and non-governmental organizations (NGOs), Appalachian filed revised study plans that incorporated comments and an additional study plan for assessing a tailwater fishing access feasibility study. By letter dated June 25, 2009, the Director of the FERC Office of Energy Projects issued the Study Plan Determination for the London/Marmet and Winfield hydroelectric projects.

A Schedule for remaining components of the ILP is included in Appendix A. An update on the status of each of the ongoing relicensing studies is provided below.

2.0 CULTURAL RESOURCES

A Phase I cultural resources survey of the London/Marmet (FERC Project No. 1175) and Winfield (FERC Project No. 1290) hydroelectric projects in Kanawha and Putnam counties, West Virginia has been completed. The draft study report will be distributed for review by mid-summer 2010. The project was conducted in general accordance with the FERC approved Cultural Resources Study Plan dated June 2009.

The project area consists of three hydroelectric facilities: the London, Marmet, and Winfield developments, all located along the Kanawha River in Kanawha and Putnam counties. Each of the facilities is located at U.S. Army Corps of Engineers (USACE) owned dams and locks, and Appalachian retains licenses to operate hydroelectric facilities at these dams. Previous investigations at the three lock and dam complexes have identified them as historically significant (Adkins and Gillenwater 1991; Sybolt 1995a, 1995b, 1995c, 1995d; Kemp 2000). These studies led to the identification of a Multiple Property Historic District, the Kanawha River Navigation System, which has been determined eligible for the National Register of Historic Places (NRHP). Although each of the previous investigations noted the presence and importance of the hydroelectric facility at each lock and dam complex, and Sybolt (1995a-d) identified the hydroelectric facilities as contributing to the eligibility of the overall systems of locks and dams on the Kanawha River, none of the previous studies identified the particular components of the hydroelectric facilities that contributed to the eligibility of the lock and dam complexes.

The purposes of the current study were: 1) to identify the historically significant architectural, engineering, and landscape components that define the historic character of the three hydroelectric facilities; 2) to identify and evaluate archaeological resources within the Area of Potential Effect (APE); and 3) to assess project-related effects, if any, on significant resources within the APE.

Architectural investigations at the three project facilities identified those components that contribute to the eligibility of the Kanawha River Navigation System Historic District. The components that contribute to the eligibility of the powerhouses include both the existing, original footprint of the three powerhouses and certain key design elements. The historic integrity of the three powerhouses, moreover, 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. The specific electrical generating and controlling equipment does not contribute to the eligibility of the powerhouses so long as the components are replaced with equivalent modern equipment in a way that maintains the basic layout of the original design. The details of these contributing features will be incorporated into a Historic Properties Management Plan (HPMP) that will guide Appalachian during the course of its new license.

From November 16–20, 2009, fieldwork for the Phase I cultural resource studies were conducted at the London, Marmet and Winfield project areas. Archaeological investigations in the three project areas resulted in the identification of one site, which is recommended ineligible for inclusion in the NRHP. The remainder of the project areas was heavily disturbed by previous construction. Based on these results, it is recommended that no further archaeological investigations are necessary within the project areas.

3.0 TRANSMISSION LINE CORRIDOR MAINTENANCE

The line study is in progress. Fieldwork will be completed by midsummer 2010 with a draft report available by late summer. A summary of study progress is provided below while additional details on the presence of Indiana bat in the projects' vicinity are provided in Appendix B. The objectives of the Transmission Corridor Study include the following:

3.1 Objectives

1) Verify the primary transmission lines associated with the Winfield Project.
2) Determine the length of the primary transmission lines for the Winfield Project.

3) Identify the current method of maintaining the lands and any waters under or near the primary transmission lines.

Kleinschmidt has completed Objectives #1 and #2 and determined that the primary transmission line associated with the Winfield Project terminates at the substation immediately adjacent to the powerhouse. Detailed results containing Critical Energy Infrastructure Information will be filed with FERC by early July 2010. Objective #3 will be completed from interviews of maintenance personnel at the developments during the summer rare, threatened or endangered plant survey scheduled for July 2010.

4) Conduct a literature search of the wildlife species located in the area of the transmission lines

5) Survey each area located under and near the primary transmission line to identify wildlife species and describe the plant community, and the location of any ponds or wetlands. At each development, emphasis will be placed on searching for Running Buffalo Clover, *Trifolium stoloniferum* and the federally threatened Virginia spiraea, *Spiraea virginiana*.

6) Survey the project boundaries and the areas located under and near primary transmission lines to identify and map any identified ponds or wetlands.

Objectives #4, #5, and #6 will be completing in July 2010. This timing was chosen to include the flowering seasons of the two emphasized plant species, Running Buffalo Clover and Virginia spiraea. The timing will also provide the study scientists an opportunity to document the resident wildlife and plant species in the project. These surveys will identify the types of habitat in the project area and the associated primary transmission line. The habitat information would likely used to identify other species that may use the habitat but were not detected in the project areas or primary transmission lines.

7) Describe the potential effects associated with the continued operation and maintenance of the projects on terrestrial resources, particularly federally listed bats and plants.

Kleinschmidt will complete Objective #7 once all other study objectives are complete. The types, amount, and maintenance of the habitat will all be important when analyzing the potential effects of the projects on the species using the habitats.

8) Investigate known occurrences of Indiana bats, as well as new or unpublished data, indicating potential occurrences of hibernacula near the transmission lines and their rights of ways as well as habitat use in, or near the transmission lines and their rights of way.

9) Document records of communications with the resource agencies and include in the study report.

To complete Objective #8, both the West Virginia Division of Natural Resources (WVDNR) and the U.S. Fish and Wildlife Service (USFWS) have been contacted to gather information about known occurrences of Indiana Bat near the Project Developments and the associated primary transmission lines. A local Indiana bat expert that was recommended by both the USFWS and WVDNR has also been interviewed for information on any known local populations of Indiana bat. Some forested areas near the developments that may provide summer roosting habitat for Indiana bat have been identified, but no local hibernacula or maternity colonies are known near the project or the associated primary transmission lines. Additional details are provided in Appendix B. A closer look at the habitat will be completed in July. Each of these conversations was documented as specified in Objective #9.

4.0 FISH ENTRAINMENT AND IMPINGEMENT

The overall objective of this study was to evaluate the relative likelihood of entrainment and turbine mortality for larval, juvenile, and adult fish species (including channel catfish, white bass, crappie, smallmouth bass, sauger, gizzard shad, bluegill, largemouth bass, and walleye). The primary tasks identified in the Study Plan and their completion status is provided below.

The Fish Entrainment and Impingement Study is ongoing. Fieldwork for this study originally scheduled for fall, 2009 was rescheduled for spring 2010 by mutual agreement of

parties attending the study kick-off meeting. The schedule was changed to reduce the potential for data collection complications due to debris (*i.e.* leaf drop) and icing conditions. The status of the each of the four tasks listed above is summarized below.

1. Literature Review of Swimming Speeds and Intake Avoidance Behavior

Information regarding species likely occurring in the vicinity of the projects (and thus potentially exposed to entrainment and/or turbine mortality) has been compiled from studies conducted by resource agency staff and also data collected by a nearby steam electric station. This list of species is being confirmed in consultation with the WVDNR. In addition, life history characteristics of the species confirmed to date were researched to identify traits which could influence a species potential for entrainment. Such traits include habitat preferences and seasonal movement patterns.

A preliminary review of swimming speeds and intake avoidance behavior literature for the above referenced species has been completed and is being applied to the empirical intake velocity data discussed below in Item 4.

2. Review of Evidence of Existing Entrainment Problems

This portion of the analysis is ongoing.

3. Literature Review and Comparative Analysis of Impingement and Entrainment Problems at Projects of Similar Design

Over sixty (60) site-specific entrainment studies that provide estimates of annual resident fish entrainment at hydroelectric sites in the United States have been reported by FERC (1995). These studies were derived from the 1992 EPRI (Electric Power Research Institute) report entitled Fish Entrainment and Turbine Mortality Review and Guidelines. Projects of similar design to the Projects have been identified using the EPRI Database (EPRI, 1997). These studies are being reviewed to identify trends in entrainment that may be applicable to these projects.

4. Velocity Profile Measurements

Empirical field data characterizing intake velocities at the Projects were collected during the week of May 10, 2010, utilizing Acoustic Doppler Current Profiler (ADCP) technology. Specifically, data were collected at a transect located immediately upstream of the Project intakes (between the concrete piers immediately of the trashracks). For each Project turbine, velocity data were collected with the turbine operating at full hydraulic capacity as well the most efficient gate setting. A minimum of three passes was collected for each turbine for each operating scenario to ensure accurate characterization of the velocity patterns.

Data were processed using the WinRiver II software package (Version 2.70) to produce cross sectional velocity profiles for each project turbine. While data are still being processed, representative profiles are included below.

Results of the ADCP assessment, in combination with engineering analyses, will be used to develop velocity profiles near the face of and through the Project trashracks. Velocity profiles in the turbine intake zones will then be compared to swim speed information for target species (discussed in Item 1) and to the entrainment database to aid in assessment the potential for impingement and/or turbine entrainment impacts.

5.0 RECREATION ASSESSMENT AND ANGLER USE STUDY

The Recreation Assessment and Angler Use Creel Survey Study began on March 1, 2010 with the first survey day occurring Thursday, March 4, 2010, at the Marmet Tailrace Angling Site. Since the start of the study period, clerks stationed at the Marmet and Winfield Tailrace Angling Sites have been conducting spot counts of vehicles and anglers and administering a Public Access Site Survey to exiting recreationists. Spot counts of vehicles and anglers have been conducted periodically throughout the sampling day with traffic count data also being obtained from the Winfield site. This data will be used to develop use estimates for the Projects. The recreation survey focuses on collecting the following information: (1) recreational use patterns, (2) user preferences, (3) need for amenities, (4) demographics, and (5) expenditures. The Angler Use Creel Survey is geared to determine (1) target species, (2) catch, harvest, and

release data, (3) angler effort, (4) angler preferences, (5) need for amenities, and (6) demographics and expenditures.

As of the end of May, the following schedule has been completed at the recreation sites.

	Winfield			***Marmet***		
Month	**Weekdays**	**Weekends**	**Holidays**	**Weekdays**	**Weekends**	**Holidays**
March	5	5	N/A	5	5	N/A
April	4 (1 study day rescheduled to May)	3 (1 study day rescheduled to June)	N/A	4 (1 study day rescheduled to May)	4 (1 study day rescheduled to May)	N/A
May	6	4	1	6	5	1

Due to extenuating circumstances involving inclement weather and staffing turnover, one weekday at each of the sites, two weekend days at Winfield, and one weekend day at Marmet were missed during the month of April. To the extent possible, those dates were rescheduled to later dates in May and June. Rescheduling of the dates, however, has been done in a manner consistent with the final approved study plan among the agencies. As of June 1st, 30 survey days have been completed at the London/Marmet Project, with 28 days completed at the Winfield Project.

Based on the completed data sheets as of June 1, 2010, 51 total surveys have been completed for the study; 30 at Marmet and 21 at Winfield. Traffic counter data for the month of March and April indicates an hour average vehicle count of three at the Winfield site. As data entry is ongoing, no analysis is available at this time.

6.0 LONDON DEVELOPMENT TAILRACE FISHING ACCESS FEASIBILITY STUDY

The objective of the London Development Tailrace Fishing Access Feasibility Study, as approved by the FERC on June 25, 2009 is to identify, analyze and compare alternatives for providing public access to the London tailrace fishing access and to identify the preferred means to re-establish access to the London tailrace fishing access. According to the Study Plan, the preferred option should provide public access to the tailrace fishing area, have minimal adverse

impacts and intrusion on the environment, and have acceptable capital and maintenance cost implications. Options include 1) replacing the bridge and 2) providing an at-grade crossing for the public. The final study is due May 2011.

After a comparison of capital and maintenance cost implications for each option, Appalachian is pursuing an at-grade crossing that could be installed during the term of the current license. CSX Corporation (CSX) and Appalachian entered into a Preliminary Engineering Agreement which resulted in the engineering, design and cost estimate for an active warning system at the existing upstream grade crossing (CSXT Milepost CA 429.3) at the London Hydro Plant. CSX and Appalachian have agreed to the type of at-grade system that should be utilized and are working towards a road easement prior to the installation of the system.

Upon successful execution of the easement and installation of the at-grade crossing, Appalachian will provide to FERC documentation of public access and request that the London Development Tailrace Fishing Access Feasibility Study be dismissed.

7.0 WATER QUALITY

A draft report of the Water Quality Study will be distributed by mid-summer 2010. The approved goal of the Water Quality Study was to gather sufficient water quality data to prepare a demonstration that details the impact, if any, of the Projects on water quality in project waters, defined as those waters both upstream and downstream of the project dams that are potentially influenced by the Projects and primarily as it relates to dissolved oxygen (DO) and temperature. This effort involved gathering, verifying, compiling, analyzing and displaying comprehensively in report format all relatively recent and reasonably available existing and newly collected water quality data. The water quality focus was on DO and temperature, because those parameters are the ones most typically affected by hydroelectric operations and also the ones that play overriding roles in supporting other aquatic resources.

Accordingly, Normandeau Associates, as a contractor of Appalachian, completed all tasks identified in the Approved Water Quality Study Plan. In particular, Normandeau has:

1. Assembled and reviewed available water quality data collected by the U. S. Army Corps of Engineers (ACOE), West Virginia Department of Environmental Protection (WVDEP) and other entities, as appropriate.
2. Supplemented the existing database by collecting additional DO, temperature, pH and conductivity data at selected locations upstream and downstream of the London/Marmet/Winfield powerhouses during high temperature/low flow conditions.
3. Characterized existing DO and temperature conditions within and downstream of the projects.
4. Identified the impacts of the Projects' operations on impoundment and downstream water quality.
5. Identified measures that could enhance DO concentrations downstream of the powerhouses, and in extreme conditions, mitigate natural drought-related DO depressions, if necessary.

This water quality study successfully collected and evaluated existing and new water quality data above and below each of the Projects as directed by the Water Quality Study Plan. All reasonably available, relatively recent (1995 − present), project-pertinent, water quality data for the Projects was retrieved and compiled. Water quality parameters reviewed for the purposes of this report focused on dissolved oxygen and temperature. Data were gathered from a variety sources including the WVDEP, the U.S. Geological Survey (USGS), the USACE, and the Ohio River Valley Water Sanitation Commission (ORSANCO).

The 2009 water quality sampling program consisted of above and below dam sampling at each of the project dams. A total of 6 above-dam transects (2 per facility) with 4 sampling stations per transect and 9 below-dam transects (3 per facility) with 3 sampling stations per transect were sampled once per week for 18 weeks. In additional, 3 tailrace sampling sites (1 at each facility) were monitored continuously using moored data loggers.

Both existing and newly collected data were displayed in a variety of graphical and tabular displays and evaluated for significance relative to West Virginia (WV) Water Quality

Standards, primarily for dissolved oxygen. From these data, the following conclusions were made:

- Dissolved oxygen levels throughout the study area have been in compliance with WV Water Quality Standards throughout the recent (since 1997) historic period of record.
- Extensive and continuously-recorded data during the summer and early fall of 2009 documented that dissolved oxygen levels were never less than 6.2 mg/l above and below both the London and Marmet hydroelectric developments or below 5.6 mg/l above and below the Winfield Hydroelectric Project.
- There was little vertical or horizontal stratification or variability in the temperature, DO, conductivity or pH anywhere in the study area.
- Although measured water quality parameters generally increased or decreased upriver to downriver, depending on the parameter, these changes appeared to be unrelated to project operations and primarily related to tributary or wastewater discharge influences.
- Although Kanawha River flow would be characterized as abnormally high during portions of the study period, there were also extended, lower flow periods during July and September when river flow was substantially below median flows. The conclusion was therefore made that this study provides a reasonable demonstration of existing water quality and probable project impacts under relatively low flow conditions.
- While high flow associated with runoff events generally improved water quality, there was no indication that smaller changes in flow during low flow periods, consistent with the flow changes that might result from changes in minimum flow regulation by the ACOE, had any appreciable effect on water quality.
- There was no indication that project operations had any impact on measured water quality parameters nor did the existing or newly collected data indicate a need for DO enhancement at any of the Projects.

APPENDIX A

FERC Relicensing Schedule

APPALACHIAN POWER COMPANY

LONDON/MARMET HYDROELECTRIC PROJECT No. 1175
WINFIELD HYDROELECTRIC PROJECT No. 1290

FERC RELICENSING SCHEDULE

Date	Pre-Filing Milestones	Responsible Party
2009/2010	Conduct studies and gather information (first season)	Appalachian
6/23/2010	File initial study report	Appalachian
7/08/2010	Hold initial study report meeting	Appalachian
7/23/2010	Meeting summary and study plan modification (if necessary)	Appalachian
8/22/2010	Comments on meeting summary	Participants
9/21/2010	Response to meeting summary comments	Appalachian
10/21/2010	Disagreement resolution and revisions of study plan	FERC
2010/2011	Conduct studies and gather information (second season as necessary)	Appalachian
6/23/2011	Update study report (as needed) and	
	Notice of Intent to file a Draft License Application (if so selected)	Appalachian
7/08/2011	Hold updated study report meeting (as needed)	Appalachian
7/23/2011	Updated study report meeting summary	Appalachian
8/12/2011	File Preliminary Licensing Proposal or Draft License Application	Appalachian
8/12/2011	File application for 401 WQ Certification from West Virginia DEQ	Appalachian
8/22/2011	Comments on meeting summary	Participants
9/21/2011	Response to meeting summary comments	Appalachian
10/21/2011	Director's study plan determination	FERC
11/10/2011	Comments on Preliminary Licensing Proposal	FERC/Participants
1/31/2012	File Application for New License	Appalachian

APPENDIX B

2010 Indiana Bat Occurrences and Habitat of West Virginia

APPALACHIAN POWER COMPANY

LONDON/MARMET AND WINFIELD PROJECTS

FERC No. 1175 and No. 1290

2010 INDIANA BAT OCCURRENCES AND HABITAT OF WEST VIRGINIA

JUNE 2010

Prepared by:

Kleinschmidt

Energy & Water Resource Consultants

APPALACHIAN POWER COMPANY

LONDON/MARMET AND WINFIELD PROJECTS
FERC No. 1175 and No. 1290

2010 INDIANA BAT OCCURRENCES AND HABITAT OF WEST VIRGINIA

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2010 INDIANA BAT OCCURRENCES AND HABITAT OF WEST VIRGINIA

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APPENDIX A

Example Letter from USFWS

APPALACHIAN POWER COMPANY

LONDON/MARMET AND WINFIELD PROJECTS
FERC No. 1175 and No. 1290

2010 INDIANA BAT OCCURRENCES AND HABITAT OF WEST VIRGINIA

1.0 INTRODUCTION

Appalachian Power Company (Appalachian) operates the London/Marmet and Winfield Hydroelectric Projects (Projects), which are licensed by the Federal Energy Regulatory Commission (FERC) as Project Nos. 1175 and 1290, respectively. The existing license for the London/Marmet Project was issued to Appalachian by FERC on September 23, 1983 and expires on January 31, 2014. The existing license for the Winfield Project was issued to Appalachian by FERC on September 26, 1983 and expires on January 31, 2014. Appalachian is applying to FERC for new licenses for the Projects. The default process for the Projects' relicensing is the Integrated Licensing Process (ILP), as defined under the rules and regulations of the Commission (18 CFR Part 5). As part of this licensing process, Appalachian has solicited input from stakeholders including governmental agencies, local governments, non-governmental organizations, and the public to identify potential project-related issues that need to be addressed during the licensing process.

On August 14, 2008, Appalachian filed the Pre-Application Document (PAD) with the FERC. The PAD identified Indiana bat (*Myotis sodalis*) a federally endangered species as occurring in the Kanawha Valley (APC, 2008). This report provides a background of the biology of the Indiana bat that is relevant to potential effects of the proposed transmission line corridor (*e.g., periods when Indiana bat may be most sensitive to disturbance*). In addition to Indiana bat biology, this report describes the known locations of Indiana bat roosts and maternity colonies near the London/Marmet and Winfield Projects.

As part of the London/Marmet and Winfield relicensing, Appalachian is planning to conduct a rare, threatened, and endangered species survey along the existing transmission line corridors. The following assessment evaluates the potential of Indiana bat occurring at the London/Marmet and Winfield Projects.

2.0 METHODS

Kleinschmidt scientists reviewed available resources related to Indiana bat including U.S. Fish and Wildlife Service (USFWS) species profile (USFWS, 2010); USFWS Indiana Bat Draft Recovery Plan (USFWS, 2007); and consulted with local experts and agency personnel.

In order to solicit information about Indiana bat, Kleinschmidt contacted agencies and local experts about known occurrences near the London/Marmet and Winfield Projects. Specifically, the areas of interest included riparian and terrestrial habitat along the Kanawha River in the towns of Winfield (Putnam County), Handley (Fayette County), and Marmet (Kanawha County). Agencies and local experts were requested to provide any known locations of Indiana bat hibernacula or maternity roosts within these specified areas.

3.0 RESULTS

3.1 Indiana Bat Biology

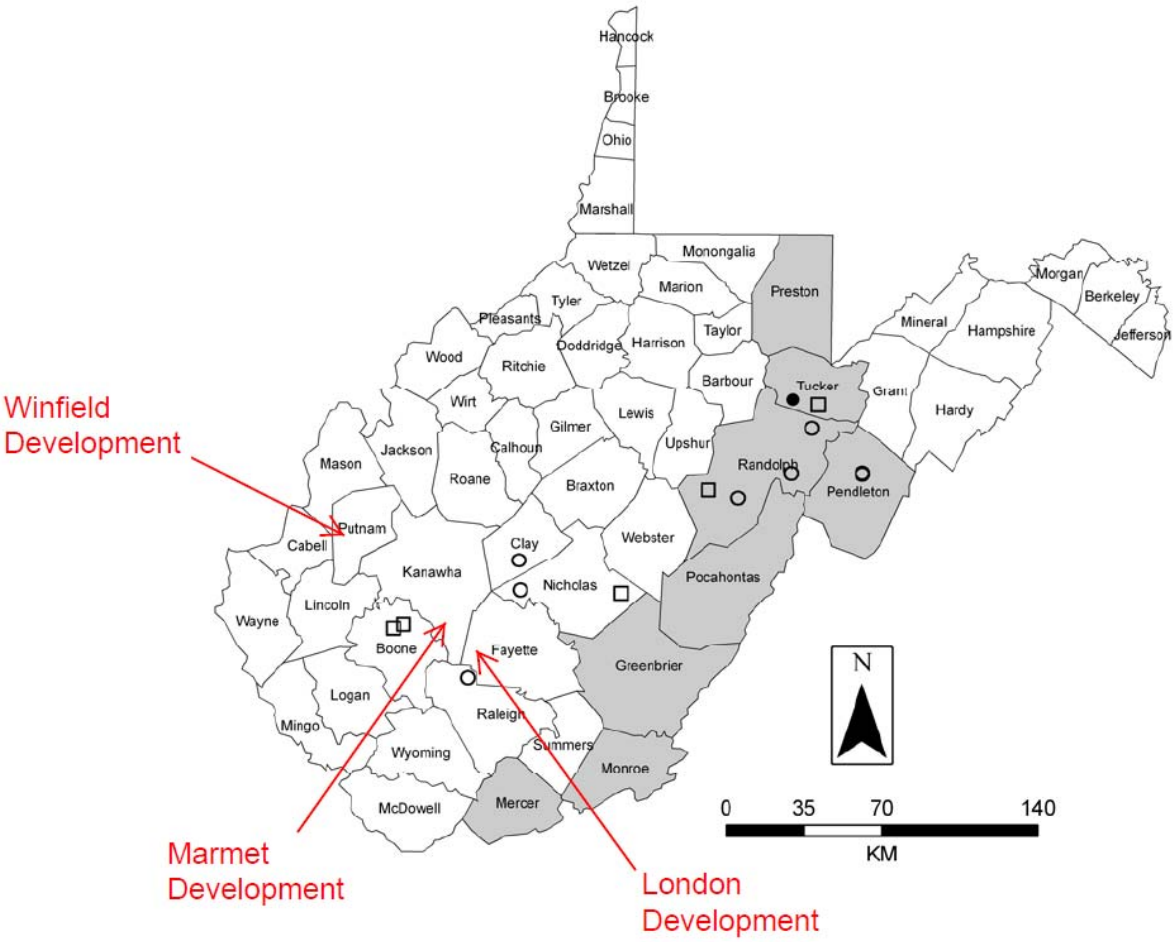
The Indiana bat is a small federally endangered bat that hibernates in caves and mines, and congregates in maternal colonies in upland and riparian forests, pastures, and open wetlands (Photo 1). Female Indiana bats congregate in these maternity colonies during early May to late June to bear and raise their pups. Indiana bat roost in dead standing trees with loose bark (DeGraaf and Yamasaki, 2001) (Photo 2). In West Virginia, reproductive females have been documented using basswood (*Tilia americana*), sugar maple (*Acer saccharum*), northern red oak (*Quercus rubra*), and scarlet oak (*Quercus coccinea*) (Beverly 2004, Beverly and Gumber, 2003, Beverly *et al.*, 2003, Sanders Environmental Inc. 2004). Roosting males have been documented using shagbark hickory (*Carya ovata*), sugar maple, American beech (*Fagus grandifolia*), white oak (*Quercus alba*), tulip tree (*Liriodendron tulipifera*), black cherry (*Prunus serotina*), red maple (*Acer rubrum*), northern red oak, chestnut oak (*Quercus montana*), white ash (*Fraxinus americana*), and red elm (*Ulmus rubra*) (Beverly and Gumber, 2005). Although it is uncertain whether this species occurs in the project area, it is known to occur in nearby Boone, Fayette, and Addison Counties (Joel Beverly, personal communication).

Photo 1. Indiana bat

Photo 2. Typical Indiana bat roosting tree

Their habitat typically consists of riparian, bottomland, or upland forest, as well as old fields or pastures with scattered trees. These bats hibernate in limestone caves and abandoned mineshafts (hibernacula) from October through April. From April through August, Indiana bats inhabit floodplain, riparian, and upland forests for roosting and foraging habitat (DeGraaf and Yamasaki, 2001). In West Virginia, Indiana bat hibernacula are limited to the eastern portion of the state (Beverly and Gumbert, 2005). There are two known maternity sites located in Boone County near the Marmet development and an unreproductive site (male Indiana bats only) in Fayette County near the London development (Figure 1).

The use of Project lands by Indiana bat would most likely occur along riparian areas during the breeding season from April to August. The flooding of these areas could impact potential roosting habitat. The rare, threatened, and endangered survey will document potential Indiana bat roosting habitat and evaluate the impact of the Projects on these areas.



Modified from Beverly and Gumbert, 2005

Figure 1. Distribution of summer reproductive and non-reproductive Indiana bat records (reproductive records are shown as squares and non-reproductive records are shown as circles). The solid circle indicates Fernow Experimental Forest, where nine male Indiana bats have been captured at or near a hibernacula (Big Springs Cave). Shading indicates counties with Indiana bat hibernacula. *Note: locations are approximate.*

3.2 Consultation

On March 17, 2010 Kleinschmidt contacted Kerry Bledsoe of the West Virginia Division of Natural Resources (WVDNR) in order to identify staff with the most knowledge of Indiana bat in the area(s) of interest. Kerry suggested contacting Craig Stihler a Wildlife Biologist and Endangered Species Specialist with the WVDNR.

Kleinschmidt contacted Craig Stihler later that same day to solicit information on the potential of Indiana bat occurring in the area(s) of interest. Craig Stihler recommended contacting Barbara Sargent an Environmental Resources Specialist with the WVDNR.

On March 19, 2010, Barbara Sargent contacted Kleinschmidt to follow up with a message left on March 17. Barbara confirmed that the closest known Indiana bat reproductive sites are located south of the Marmet development (located in Kanawha County) in Boone County. Barbara suggested contacting Joel Beverly a biological consultant with Apogee Environmental Consultants, Inc. for more information. Joel has published several reports on Indian bats in West Virginia and has conducted surveys at the existing Conservation Areas (Maternity Roosts) in Boone County south of Kanawha County. Barbara also recommended contacting Jim Zelenak, of the USFWS. Jim Zelenak has been handling bat issues in West Virginia in relation to coal mining and wind farms.

On March 19, 2010, Kleinschmidt followed up with Joel Beverly. Joel was unaware of any maternity roosts or hibernacula in the area(s) of interest. However, the area(s) of interest have not been surveyed for maternity roosts so it is possible potential habitat exists. He also confirmed that the closest reproductive sites (maternity roosts) were located in Boone County. Joel estimated these sites were approximately 8 to 9 miles from the town of Marmet, West Virginia. Joel has assisted in a long-term monitoring effort of the Boone County maternity roosts. There have been unreproductive sites (male Indiana bats) documented in nearby Fayette County (London development) which borders Kanawha County to the southeast.

Kleinschmidt inquired if any formal survey protocol exists for Indiana bat because the purpose of the rare, threatened, and endangered survey is to document Indiana bat habitat. Joel recommended focusing on riparian areas when conducting the survey. Specifically, Joel has found that snags/dead trees close to a river and with good sun exposure are more likely to provide suitable habitat for Indiana bat than shagbark hickory. By and large, males use the microhabitat provided by the sloughing bark of shagbark hickory.

On March 19 and April 14, 2010, Kleinschmidt attempted to contact Jim Zelenak of the USFWS by phone and e-mail. On April 14, 2010 Kleinschmidt contacted the West Virginia Office of the USFWS to identify any other appropriate staff in addition to Jim Zelenak. The office administrator recommended contacting Barb Douglas an endangered species specialist of the USFWS with Indiana bat experience. Kleinschmidt also attempted contacting Barb Douglas for further information by phone and e-mail.

On June 4, 2010, Kleinschmidt was successful in contacting Barb Douglas. Barb explained that a number of mist netting surveys for Indiana bat are currently taking place throughout the state. Barb was not aware of any maternity or unreproductive sites near the Projects in addition to the sites described by Joel Beverly.

Kleinschmidt inquired if there was an existing protocol set forth by the USFWS for determining Indiana bat habitat. Barb confirmed that there was no formal protocol. However, Barb did note that any forested area with trees measuring 5 inches at diameter breast height (dbh) could provide habitat for Indiana bat. If the forested area is primarily saplings measuring less than 5 inches dbh such as an open field or young regenerating clearcut then it would not be suitable for Indiana bat.

In an e-mail on June 4, 2010, Barb provided Kleinschmidt an example response letter to a threatened and endangered species request (Appendix A). The letter provides information on suitable summer roosting habitat and winter hibernacula, including caves and mine portals. Additionally, the letter explains what constitutes a “taking” as described in Section 9 of the Endangered Species Act. If the project occurs within 2.5 miles of suitable Indiana bat habitat, and requires clearing of more than 17 acres of suitable Indiana bat habitat and Indiana bat occur within the project area, then timber removal is restricted to November 15 to March 31.

4.0 CONCLUSION

After consultation with agency staff and local experts, Kleinschmidt has determined that suitable Indiana bat habitat may occur at the London/Marmet or Winfield Projects. Based on the location of the reproductive sites in Boone County, dispersing Indiana bat would most likely be found near the Marmet Development. Although some male Indiana bats have been documented in Fayette County near the London Development. The exact location of these individuals is not public information; therefore, it is difficult to determine the likelihood of observing Indiana bat at the London Development. These Projects have not been surveyed for Indiana bat or suitable habitat; therefore, we cannot rule out that this species may use Project lands. The proposed rare, threatened, and endangered study will determine if suitable Indiana bat habitat exists within the respective Project areas.

5.0 REFERENCES

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Barbara Douglas, Endangered Species Specialist, USFWS. Left message and e-mailed on April 14, 2010.

Barbara Sargent, Environmental Resources Specialist, West Virginia Division of Natural Resources, (WVDNR). Phone conversation on March 19, 2010.

Beverly, J. and M.W. Gumbert. 2005. Indiana bats in West Virginia, a review. [Online] URL: http://docs.google.com/viewer?a=v&q=cache:1s-B9g1aI3cJ:www.mcrcc.osmre.gov/PDF/Forums/Bat%2520Indiana/4-2.pdf+Beverly,+J.+and+M.W.+Gumbert,+2005.+Indiana+bats+in+West+Virginia,+a+review&hl=en&gl=us&pid=bl&srcid=ADGEESgKDlIl0T7ismhHWe6bkmWakFgSILgIC5vRLhoq1rXFTpP3JL8BEjbXcS95W0cvpJJwuNvgnbTkZkLn63aX2sB5OvY90K_A7WjuD7-F6ZTOcTfhUjrDTtxwvef-hsI-4_BxH-fF&sig=AHIEtbQNqMDNypLcnid1H9agDsP9EiEsLg. Accessed on April 16, 2010.

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DeGraaf, R.M., and M. Yamasaki. 2001. New England Wildlife: Habitat, Natural History, and Distribution. University Press of New England. Lebanon, NH.

Jim Zelenak, USFWS. Left message March 19 and April 14, 2010; emailed on March 14, 2010.

Joel Beverly, Biologist, Apogee Environmental Consultants, Inc. Phone conversation on March 19, 2010.

Kerry Bledsoe, WVDNR. Phone conversation on March 17, 2010.

Sanders Environmental Inc. 2004. Report on Indiana bat (*Myotis sodalis*) sampling at fifty-five sites on the Monongahela National Forest, WV, Summer 2004. Final Report submitted to USDA Forest Service, Monongahela National Forest. Elkins, WV. 9 pp + append.

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U.S. Fish and Wildlife Service (USFWS). 2007. Indiana bat (*Myotis sodalis)* Draft Recovery Plan: First Revision. USFWS, Fort Snelling, MN. 258 pp.

West Virginia Division of Natural Resources (WVDNR). 2010. West Virginia Wildlife Conservation Action Plan. [Online] URL: http://www.wvdnr.gov/. Accessed on April 16, 2010.

APPENDIX A

Example Letter from USFWS

West Virginia Field Office
694 Beverly Pike
Elkins, West Virginia 26241

DATE

ADDRESSEE

Re: PROJECT TITLE

Dear XXX:

This is in response to your letter dated XXX requesting threatened and endangered species information in regard to your proposed project in XXX County, West Virginia. These comments are provided pursuant to the Endangered Species Act (87 Stat. 884, as amended; 16 U. S. C. 1531 *et seq*.) (ESA).

The proposed site may provide summer foraging and roosting habitat, as well as winter habitat, for the endangered Indiana bat (*Myotis sodalis*). The Indiana bat may use the proposed site for foraging and roosting between April 1 and November 14. Indiana bats use caves or mine portals for winter habitat between November 15 and March 31. Indiana bat foraging habitat is generally defined as riparian, bottomland, or upland forest, as well as old fields or pastures with scattered trees. Roosting and maternity habitat consists primarily of live or dead hardwood tree species which have exfoliating bark that provides space for bats to roost between the bark and the bole of the tree. Tree cavities, crevices, splits, or hollow portions of tree boles and limbs also provide roost sites. Forest habitat containing trees $\geq$ 5 inches in diameter at breast height (dbh) is suitable summer roosting habitat for the Indiana bat.

To avoid liability under section 9 of the ESA, no timber removal should occur in the proposed site until the following procedure is followed. The project proponent should make a determination of the amount of suitable Indiana bat summer roosting habitat that will be removed from the proposed site.

Seventeen (17) acres is presently used as the threshold between projects which will have discountable effects on Indiana bats, and projects which may affect Indiana bats. If less than 17 acres of Indiana bat summer habitat will be removed as a result of the proposed project operation, tree removal can occur at any season of the year. If 17 or more acres of Indiana bat summer roosting habitat will be disturbed as a result of the proposed project, we recommend one of two options to avoid incidental take of the Indiana bat.

Option 1:

This option presumes that Indiana bats are present in the proposed site and to avoid incidental take, timber removal operations will be conducted between November 15 and March 31, when Indiana bats are in hibernation. If this option is chosen, a field evaluation must be conducted to calculate the percentage of suitable Indiana bat summer roosting habitat that would remain after project construction within a **2-mile radius of the center point** of the proposed disturbance. Please be sure to determine the 2-mile radius from the center of the proposed project area rather than from the project boundary.

This evaluation should be submitted for our review with a statement that timber removal operations for the proposed site will only occur between November 15 and March 31. If we determine that the extent of disturbance is not significant enough to affect the Indiana bat, the project may proceed with seasonal restrictions on timber harvest. Seasonal restriction on timber harvest will apply for the life of the project.

If we determine that the extent of disturbance may effect, and is likely to adversely affect the Indiana bat, a mist net survey may be necessary to determine if Indiana bats are present.

Option 2:

Mist net surveys can be conducted to determine if the summer foraging and roosting habitat within the proposed site is occupied by the Indiana bat. The mist net survey protocol (attached) from the Draft Indiana Bat Recovery Plan must be followed. In order to avoid insufficient or inadequate surveys, a survey plan for the proposed site should be submitted to us for concurrence prior to conducting the work. The survey must be conducted between May 15 and August 15 by a qualified mammalogist with experience in identifying Indiana bats and who holds a collection permit from the West Virginia Division of Natural Resources (WVDNR). The WVDNR's contact is Mr. Craig Stihler at the Elkins Operation Center, Ward Road, Elkins, West Virginia, 26241; phone (304)637-0245. A list of qualified mammalogists is enclosed.

The survey results should be provided to our office for review and concurrence. If no endangered bats are captured and we agree with the findings, timber harvest can proceed at any time of year. If endangered bats are captured, the West Virginia Field Office of the Fish and Wildlife Service should be notified the next business day, and we will work with the project proponent to minimize the possibility of impacts on Indiana bats.

Mist net surveys are considered current for 5 years: the summer they are done and the following four summer seasons. Mist net surveys should be repeated for any timber removal occurring after this five-year period.

Caves and Mine Portals

Regardless of which option is chosen from above, the presence of caves and mine portals, and their use by bats, must also be addressed. Indiana bats hibernate in caves between November 15 and March 31, use caves for fall-swarming activity, and male Indiana bats have been known to use caves as summer roosts. Therefore, the following

step-wise process should be followed in order to determine if any caves or abandoned mine portals in the project area are used by endangered bats.

The proposed site should be surveyed for caves and mine portals. Any caves and portals found should be evaluated for characteristics that may indicate potential use by bats. Based on current information, we believe the enclosed Draft Protocol for Assessing Abandoned Mines/Caves for Bat Use will help in the initial portal evaluation. The criteria are a working draft, and as we obtain new information on bats and mines in West Virginia, we may revise the assessment methods.

A survey, using the criteria, can be performed by mining engineers or biologists. Any caves and portals determined not to exhibit potential habitat for bats may be closed or excavated without concern for listed bat species. It should be noted that closure of caves or mine portals that are used by endangered bat species may result in violation of section 9 of the ESA.

If portals on the proposed site appear to have suitable bat habitat characteristics, a Phase I Portal Survey (enclosed) should be prepared for each portal by a qualified mammalogist. Based on current information about bats and old mine portals in West Virginia, we believe that the Phase I Portal Survey will provide the necessary information to determine if bat surveys should be conducted at the mine portals. This survey form is a working draft, and as new information on bats and mines in West Virginia is obtained, we may make revisions to these assessment methods. The data obtained from the survey should be provided to us for review.

If the caves or portals may provide suitable habitat for endangered bats, mist net surveys or trapping should be conducted for both endangered bat species. Please contact us for mist net survey or trapping protocols. The results of any surveys should be provided to our office for review and concurrence prior to proceeding with portal closure. If endangered bats are found using these caves or portals, further consultation will be necessary.

To facilitate consultation pursuant to the ESA, please provide to us the following, all at one time:

1) Data concerning either Option 1 or Option 2 (recall that clearing should be conducted prior to March 31, 2008);

2) Information on whether there are old mine portals at the proposed mine operation site and a Phase I Portal Survey, if portals exhibit potential bat habitat.

Any federal permits required by this project should not be issued until we provide a letter stating that consultation is concluded. We cannot prepare a response unless information under 1 and 2 is provided.

If you have any questions regarding these comments, please contact XXXXX at (304) 636-6586 or at the letterhead address.

Sincerely,

Deborah Carter
Field Supervisor

Enclosures (4)

cc:

Project File
Reader File

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