PRE-APPLICATION DOCUMENT (PAD)

MUNICIPAL HYDROELECTRIC PROJECT

FERC PROJECT NO. 1235

Prepared for:

The City of Radford
Radford, Virginia

Prepared by:

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May 2014

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DEFINITIONS OF TERMS, ACRONYMS, AND ABBREVIATIONS

af	Acre-foot, the amount of water needed to cover one acre to a depth of one foot
APE	Area of Potential Effect as pertaining to Section 106 of the National Historic Preservation Act
Applicant	The City of Radford, Radford VA
BIA	Bureau of Indian Affairs, an agency of the DOI
BLM	Bureau of Land Management, an agency of the DOI
CFR	Code of Federal Regulations
cfs	cubic feet per second
Commission	Federal Energy Regulatory Commission
CWA	Clean Water Act
DLA	Draft License Application
DO	dissolved oxygen, generally expressed in units of parts per million (ppm)
DOE	U.S. Department of Energy
DOI	U.S. Department of Interior
EA	Environmental Assessment
EAP	Emergency Action Plan
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EL	elevation
EPA	U.S. Environmental Protection Agency
ESA	Federal Endangered Species Act
FEA	Final Environmental Assessment
FERC	Federal Energy Regulatory Commission
FLA	Final License Application
FPA	Federal Power Act
FWCA	Fish and Wildlife Coordination Act
GIS	Geographic Information Systems
GWh	gigawatt-hour (equals one million kilowatt-hours)
Hp	horsepower
Hz	hertz (cycles per second)
Installed Capacity	The generating output capacity of the facility.
Interested Parties	Individuals and entities that have an interest in a proceeding
kW	kilowatt
kWh	kilowatt-hour
kV	kilovolts
Licensee	The City of Radford, Radford VA
Relicensing	The process of acquiring a subsequent FERC license for an existing hydropower project
Licensing Participants	Individuals and entities that are actively participating in the licensing proceeding
MW	megawatt
MWh	megawatt-hour
NEPA	National Environmental Policy Act
NGO	Non-governmental organization
NMFS	National Marine Fisheries Services, also known as NOAA Fisheries

NOAA	National Oceanic and Atmospheric Administration, including NMFS
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NOI	Notice of Intent to file an application for license
Normal Operating Capacity	The maximum MW output of a generator or group of generators under normal maximum head and flow conditions
NWI	National Wetlands Inventory
PAD	Pre-Application Document
PBL	Project Boundary Line
PDF	Portable Document Format
PM&E	Protection, Mitigation and Enhancement Measures
PMF	Probable Maximum Flood
Project	Municipal Hydroelectric Project (FERC No. 1235)
Project Area	The Project Area is located within the FERC Project Boundary
Project Boundary	The boundary line defined in the Project license issued by FERC that surrounds those areas needed for Project purposes
Project Vicinity	The Project Vicinity, for the purposes of describing the existing environment around a project or proposed project, is the general geographic area in which the Project is located. For this PAD, the Project Vicinity has been assumed to be roughly a radius of 3 miles surrounding the Project.
RM	river mile
RTE Species	Rare, threatened, endangered, and special status species which, for purposes of this PAD, is defined to include (1) all species (plant and animal) listed, proposed for listing, or candidates for listing under the Federal and state Endangered Species Acts and those listed by the USFWS or state agencies as sensitive, special status or watch list.
Service List	A list maintained by FERC of parties who have formally intervened in a proceeding. There is no Service List until the license application is filed with and accepted by FERC.
SHPO	State Historic Preservation Officer
Tailrace	Channel through which water is discharged from the turbine(s)
TLP	Traditional Licensing Process
USFWS	U.S. Fish and Wildlife Service, an agency of the DOI
USGS	U.S. Geological Survey
VDEQ	Virginia Department of Environmental Quality
VDGIF	Virginia Department of Game and Inland Fisheries
WQC	Water Quality Certification, issued under Section 401 of the Federal Clean Water Act

1.0 INTRODUCTION

This Pre-Application Document (PAD) and the accompanying Notice of Intent (NOI) were prepared by the City of Radford, Virginia (City or Licensee) for the relicensing of the existing Municipal Hydroelectric Project (FERC No. 1235) (Project). The Project is located on the Little River, in Montgomery and Pulaski Counties, Virginia. As determined by the Federal Power Act, the Federal Energy Regulatory Commission (FERC or Commission) administers hydroelectric licensing. The current license, as issued by the FERC, is due to expire on May 31, 2019. The City of Radford intends to file an application for a subsequent license by May 31, 2017.

This PAD was prepared in accordance with §5.6 of the Commission's regulations at 18 CFR and provides existing, relevant, and reasonably available information to the Commission and interested stakeholders to enable these entities to identify issues and related information needs, to develop study requests and study plans (to the extent they are necessary and have a direct nexus to the Project), and to prepare documents analyzing any Application that may be filed with the Commission.

2.0 PROCESS PLAN AND SCHEDULE [§ 5.6 (D)(1)]

2.1 PRE-APPLICATION CONSULTATION, INFORMATION GATHERING, AND STUDIES

Concurrent with the filing of this PAD, the City is requesting the use of a Traditional Licensing Process (TLP) in accordance with the Commission's regulations at 18 CFR § 5.3. Typically, the TLP follows 3 stages, as outlined in 18 CFR § 4.38. The first stage consists of coordination between the Licensee, resource agencies, affected Indian tribes, and the public. This coordination includes the sharing of Project information, notification of interested parties, and study planning and implementation through the PAD. The second stage involves implementation of studies (to the extent that they are necessary and have a nexus to the Project) and the gathering of additional data, as well as the development of a draft license application (DLA) and review of the application by resource agencies and, possibly, FERC. The third stage commences with filing the final license application (FLA), whereby FERC initiates its own review and public comment process, environmental analysis under the National Environmental Policy Act (NEPA), and ultimately issues a subsequent license for the Project.

The City is requesting the use of the TLP for several reasons including the relative small size of the Project. Additionally, the Project is expected to be without complex issues often associated with relicensing. The Licensee also believes that implementing the TLP process will assist FERC in issuing a timely license for this small hydropower Project. For these reasons, the City has developed a schedule based upon the assumption that the TLP will be approved for this Project.

Although the Licensee has requested the TLP as a preferred licensing approach, the Licensee intends to provide adequate opportunities to involve all interested parties. The Licensee will carefully document the relicensing process, including any information received from the interested parties and communication records. The Licensee will maintain records of licensing and other information that will be publicly available at the City of Radford Department of Electric Utilities offices, located at 701 17th Street, Radford, VA 24141.

The Process Plan and Schedule is based on actions by FERC, the Licensee, and other licensing participants through the license application filing. The Licensee plans early and frequent coordination with FERC and state and federal resource agencies to identify potential issues and

possible field studies early in the process. The Licensee will adopt an efficient and timely schedule for consultation with the agencies and document production.

Comments on the request to use the TLP are due within 30 days of filing the NOI, making them due on or before June 23, 2014. The Licensee's request to use the TLP will then be addressed by the Commission on or before July 23, 2014. Additionally, depending on consultation with resource agencies, the City intends to file a DLA with the Commission on or before January 31, 2017 and a FLA with the Commission on or before May 31, 2017.

2.2 PROPOSED LOCATION AND DATE FOR JOINT AGENCY MEETING AND FOR THE SITE VISIT [§ 5.8 (B)(3)(VIII)]

If the use of the TLP is approved by FERC, the City will host a joint agency and public meeting (JAM) and site visit of the Municipal Hydroelectric Project per 18 CFR § 16.8 (b)(A) within 30 to 60 days of the TLP approval. This meeting provides stakeholders the opportunity to visit the Project and discuss the information provided in the PAD, as well as initiate the process of identifying Project-related issues. The City is proposing to hold the JAM at the Radford Public Safety Building, 10 Robertson Street, Radford, Virginia on September 4, 2014; however, the exact meeting date and location may be changed after consultation with jurisdictional agencies and interested participants pending FERC's decision on approval of the Licensee's request for the TLP.

3.0 PROJECT LOCATION, FACILITIES, AND OPERATIONS [§ 5.6 (D)(2)]

3.1 CONTACT INFORMATION OF EACH PERSON AUTHORIZED TO ACT AGENT FOR APPLICANT (EXACT NAME, BUSINESS ADDRESS, AND PHONE NUMBER)

Mr. Tim Logwood
Director of Electric Utilities
City of Radford Electric Utilities
701 17th Street
Radford, VA 24141
Phone: 540.731.3641
Email: tlogwood@radford.va.us

3.2 MAPS OF LAND USE WITHIN PROJECT BOUNDARIES (TOWNSHIP, RANGE AND SECTION, STATE, COUNTY, RIVER, RIVER MILE, AND CLOSEST TOWN) AND, IF APPLICABLE, FEDERAL AND TRIBAL LANDS, AND LOCATION OF PROPOSED FACILITIES

The Project is located on the Little River, at RM 0.45, which is approximately 2,500 feet upstream of its confluence with the New River, near Radford, Virginia in Montgomery and Pulaski counties. The Project boundary includes all the lands, waters, and rights necessary for operation of the Project and encompasses the Little River for a length of approximately 3.5 miles upstream of the Project Dam (also known as "Municipal Dam", "Little River Dam", or "Radford Dam"). Project boundary maps (Exhibit G Maps) are included in Appendix C of this PAD. No Federal or Tribal lands are located within the Project boundary.

FIGURE 3-1. PROJECT LOCATION MAP

3.3 DETAILED DESCRIPTION OF EXISTING AND PROPOSED FACILITIES

3.3.1 COMPOSITION, DIMENSIONS, AND CONFIGURATION OF DAMS, SPILLWAYS, PENSTOCKS, POWERHOUSES, TAILRACES, INCLUDED AS PART OF THE PROJECT

The Project consists of the following: a buttress slab concrete dam approximately 293 feet long and 58 feet high; a 350-acre reservoir with a gross storage capacity of 1,600 acre-feet at an elevation of 1,760 msl (normal pool elevation is 1,772 feet); a 96-inch steel-lined concrete penstock, regulated by a headgate with a trashrack; eight tainter gates, each 13 feet high by approximately 20 feet wide; two 30-inch by 36-inch sluice gates located between buttresses 9 and 10; a concrete and brick powerhouse containing one 1,585 hp (1,185 kW) Smith-Kaplan turbine coupled to a 1,275 kW[1] generator; a concrete tailrace; a 4.16 kV distribution line 1.8 miles long[2]; and appurtenant facilities. The existing Project operates at a gross head of 40 feet.

3.3.2 RESERVOIR NORMAL MAXIMUM WATER SURFACE AREA AND ELEVATION AND GROSS STORAGE CAPACITY

The Project reservoir is approximately 350 acres with a gross storage capacity of 1,600 acre-feet at an elevation of 1,760 feet msl. Normal pool elevation is 1,772 feet msl.

3.3.3 NUMBER, TYPE AND CAPACITIES OF TURBINES AND GENERATORS, AND INSTALLED (RATED) CAPACITY OF PROPOSED TURBINES OR GENERATORS

The Project contains one 1,585 hp (1,185 kW) Smith-Kaplan turbine with a 1.0-MVA, three-phase, 1,275 kW Westinghouse synchronous generator. The turbine is rated at 1,585 hp under a head of 40 feet and has a rated hydraulic capacity of 430 cfs.

3.3.4 NUMBER, LENGTH, VOLTAGE, AND INTERCONNECTIONS OF ANY PRIMARY TRANSMISSION LINES

The primary distribution line at the Project is a three-phase, 4.16 kV line, 1.8 miles in length, and begins at the Project switch yard and terminates at the 34.5 kV Industrial Center Substation (Figure 3-2).

[1] In 1978, the Licensee performed work on the generating unit to repair flood damage to the Project. The repair work included rewinding the generator. The rewinding increased the capacity of the generator to 1,275 kW (previously 1,000 kW). In 1995, the Commission determined that the Project's authorized installed capacity for annual charge purposes should be based on the lesser of the rating of the generator or turbine units. Therefore, it was determined that the authorized installed capacity is 1,185 kW for the purposes of annual charges.

[2] The current license notes that the transmission line is 2.7 miles long. However, the Industrial Center Substation was added in 1998, which decreased the overall Project transmission line length.

FIGURE 3-2. TRANSMISSION LINE TIE-IN

3.3.5 ENERGY PRODUCTION (ESTIMATE OF DEPENDABLE CAPACITY, AVERAGE ANNUAL, AND AVERAGE MONTHLY ENERGY PRODUCTION)

Average annual energy production for the past 30 years (1984 through 2013) is approximately 4,550 MWh. Average monthly energy production is provided below. Dependable capacity for hydroelectric projects is generally evaluated by determining adverse conditions for generation. During low flow conditions, usually experienced during the late summer and early fall, the Licensee is typically able to generate at full capacity for 2 to 3 hours per day. Therefore, the Project's dependable capacity would consist of 2 hours of operation at 1,185 kW.

MONTH	MWH
Jan	416
Feb	434
Mar	539
Apr	530
May	522
Jun	408
Jul	290
Aug	251
Sep	246
Oct	227
Nov	286
Dec	352

3.4 PROJECT OPERATION, INCLUDING ANY DAILY OR SEASONAL RAMPING RATES, FLUSHING FLOWS, RESERVOIR OPERATIONS, AND FLOOD CONTROL OPERATIONS

The Project is operated as a modified run-of-river facility. The Project reservoir operates at a normal elevation of 1,772 feet. The Project maintains a minimum flow of 25 cfs, or inflow (whichever is less) to the Little River downstream of the dam. Presently, the 25 cfs minimum flow is maintained by allowing leakage around the side seals and bottom seals of the closed tainter gates.

The Project is operated remotely. Under 'normal' conditions, a hydro operator checks conditions at the dam in the morning and evening and monitors inflows at the upstream USGS gaging station at Graysontown (USGS Gage No. 03170000). Under high water conditions, or other adverse weather, the operator checks the plant with increased frequency. During flood conditions, or any other unusual event, City personnel will remain at the Project dam until conditions are normal. Spillway gate operations will be implemented as necessary in accordance

with the Project O&M manual. Typical automatic start and stop levels are presented in Table 3-1. Operations are modified depending on flow conditions, such as flooding or drought.

TABLE 3-1. AUTOMATIC RESERVOIR START AND STOP ELEVATIONS

SEASON	TIME INTERVAL	START ELEVATION	STOP ELEVATION
Fall & Winter	07:00 to 18:00	-0.4 ft	-3.0 ft
	18:00 to 23:00	-0.4 ft	-2.0 ft
	23:00 to 07:00	-0.1 ft	-1.0 ft
Spring & Summer	11:00 to 18:00	-0.4 ft	-3.0 ft
	18:00 to 23:00	-0.6 ft	-2.5 ft
	23:00 to 11:00	-0.1 ft	-1.0 ft

3.5 DESCRIPTION OF CURRENT LICENSE REQUIREMENTS

The current License contains several project-specific requirements in addition to the general L-form license articles required of all FERC licensees. Specific requirements relating to the operation of the Project are detailed below.

Article 401: The licensee shall discharge from the Municipal Hydroelectric Project a continuous minimum flow of 25 cubic feet per second, or inflow to the project, whichever is less, in the Little River to protect the fisheries resources in the downstream reaches. These flows may be temporarily modified if required by operating emergencies beyond the control of the licensee, or for short periods, upon mutual agreement between the licensee and the Virginia Department of Game and Inland Fisheries.

3.6 A SUMMARY OF PROJECT GENERATION AND OUTFLOW RECORDS

A summary of Project generation from 1984 through 2013 is presented in section 3.3.5. The Licensee maintains a minimum flow of 25 cfs, or inflow (whichever is less) to the Little River downstream of the dam.

3.7 CURRENT NET INVESTMENT

The current net book value for the Project is approximately $167,000.

3.8 PROJECT COMPLIANCE HISTORY

The Project has been operated in compliance with license requirements, including Article 401, detailed above.

3.9 PLANS FOR FUTURE DEVELOPMENT OR REHABILITATION OF THE PROJECT, AND CHANGES IN PROJECT OPERATION

The Licensee is not proposing changes to Project operations or the construction of new facilities or components at this time.

3.10 REFERENCES

The City of Radford, Virginia. 2007. Final Supporting Technical Information: Standard Operating Procedures. October 3, 2007. Submitted to FERC as Critical Energy Infrastructure Information.

Federal Energy Regulatory Commission (FERC). 2012. Dam Safety Inspection Report: Radford Hydroelectric Project. Performed September 18, 2012. Critical Energy Infrastructure Information.

Federal Energy Regulatory Commission (FERC). 2011. Dam Safety Inspection Report: Radford Hydroelectric Project. Performed March 24, 2011. Critical Energy Infrastructure Information.

Federal Energy Regulatory Commission (FERC). 1989. Order Issuing New License: Municipal Hydroelectric Project (FERC No. 1235). City of Radford, Virginia.

4.0 EXISTING ENVIRONMENT AND RESOURCE IMPACTS [§ 5.6 (D)(3)(I)]

The Project is a small facility and operates in accordance with the existing license. Continued Project operations only have the minor potential for affecting surrounding resources. The Licensee has reviewed available information related to potentially affected resources. The following sections provide information on the existing environmental, cultural, recreational, and socioeconomic resources in the area surrounding the Project, as well as a discussion of potential Project effects on those resources.

For this PAD, the term ***Project Vicinity*** has been defined as an approximate 3-mile radius surrounding the Project. The term ***Project Area*** refers to the lands within the FERC project boundary line (PBL), as detailed on Exhibit G drawings.

4.1 GEOLOGY AND SOILS

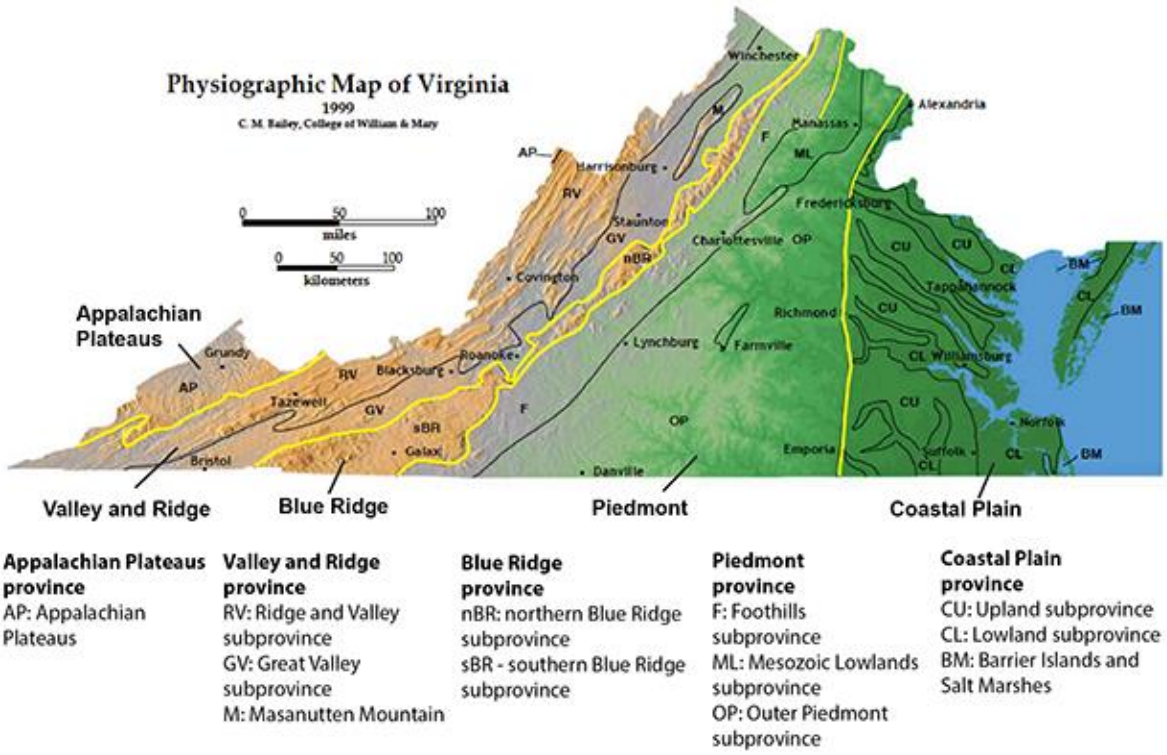
4.1.1 DESCRIPTION OF GEOLOGICAL FEATURES, INCLUDING BEDROCK LITHOLOGY, STRATIGRAPHY, STRUCTURAL FEATURES, GLACIAL FEATURES, UNCONSOLIDATED DEPOSITS, AND MINERAL RESOURCES

The Project is located in southwest Virginia, within the Valley and Ridge physiographic province. This province is characterized by elongate parallel ridges and valleys, which formed on thick, folded beds of sedimentary rock (CWM, 2014). Specifically, the Project is located in the Great Valley sub-province, which is described as a broad valley with low to moderate slopes underlain by carbonate rocks. Elevations in this area range from 1,200 feet to 2,300 feet above sea level. The Great Valley sub-province is bordered by the Blue Ridge Mountains to the east and the Allegheny Mountains to the west (CWM, 2014).

Within the Valley and Ridge province, local relief is determined by the erosion of the sandstones, shales, and carbonate rocks that comprise the lithology of this region (RU, 2014). Generally, the ridgetops are capped by sandstone, which protects the underlying softer bedrock from erosion. The lowlands and valleys of the region are composed of limestones and other carbonate rocks. Because of the soft nature of the carbonate bedrock, which dominates the lithology of the Great Valley sub-province, the region is defined by its karst topography, which

has a high occurrence of sinkholes along the ground surface and caves and caverns below the surface (RU, 2014).

FIGURE 4-1. PHYSIOGRAPHIC REGIONS OF VIRGINIA



4.1.2 DESCRIPTION OF SOIL TYPES, OCCURRENCE, PHYSICAL AND CHEMICAL CHARACTERISTICS, ERODABILITY AND POTENTIAL FOR MASS SOIL MOVEMENT, AND SOIL CHARACTERISTICS

The soil types found within the Project Vicinity are depicted in Table 4-1 and Figure 4-2 below. Generally, the soils found near the Project consist of bedrock covered by silty loams. While a variety of soils are found within the Project Vicinity (see Table 4-1 and Figure 4-2) two main soil types directly surround the Project. Soils found on the northern side of the Project are characterized as a Caneyville-Opequon-Rock outcrop complex, with slopes ranging from 25 to 60 percent. These soils tend to be well drained, with a typical profile including silt loam, clay and a thick layer of bedrock. To the south, soils at the Project are described as a Carbo-Rock outcrop complex, with slopes ranging from 10 to 45 percent. These soils are well drained and are characterized by a layer of silty clay loam, followed by a layer of clay and finally bedrock.

TABLE 4-1. LIST OF SOILS BY TYPE, SIZE (ACRES), AND PERCENT IN THE PROJECT VICINITY

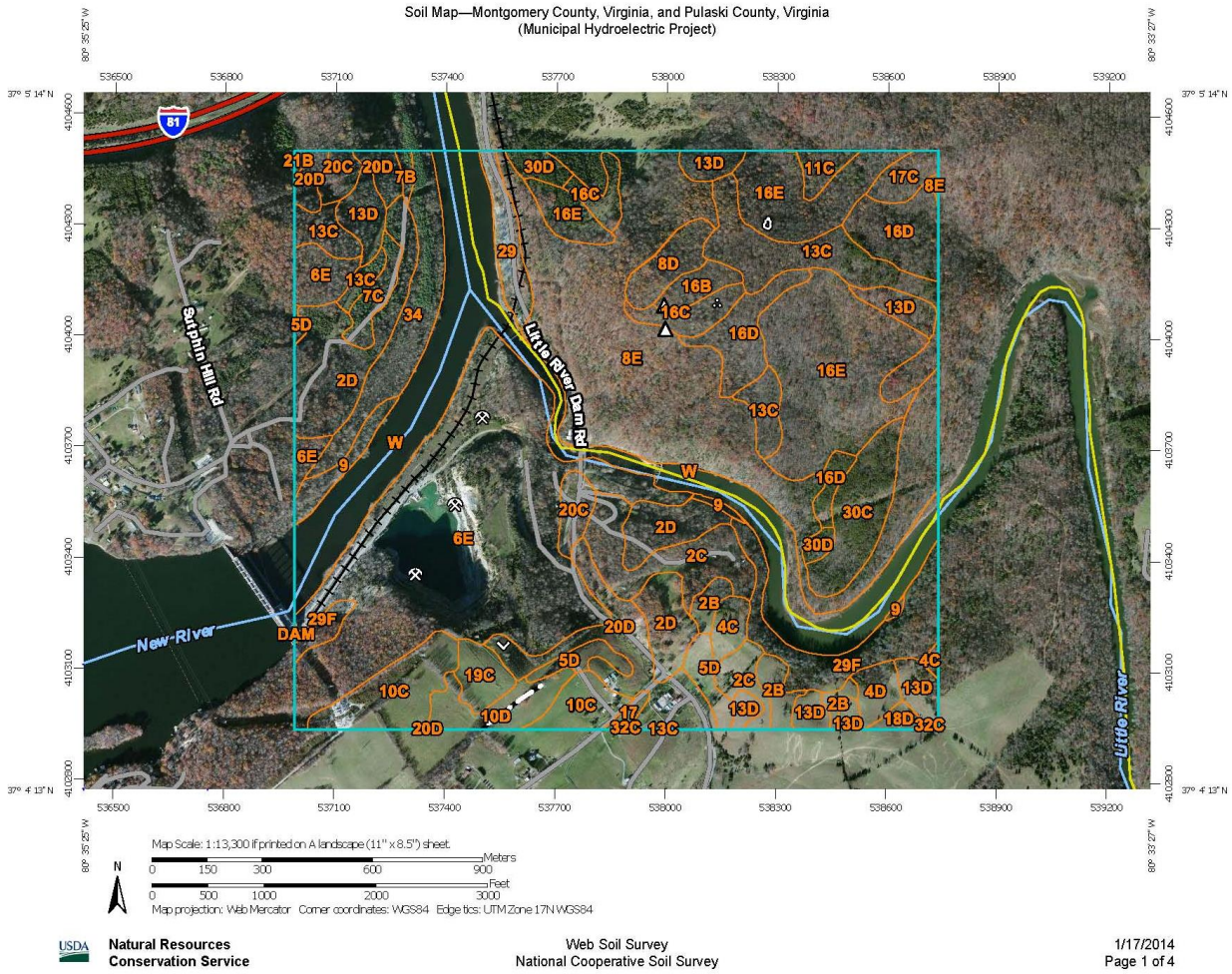
MONTGOMERY COUNTY, VIRGINIA (VA121)			
MAP UNIT SYMBOL	**MAP UNIT NAME**	**ACRES IN AOI**	**PERCENT OF AOI**
W	Water	19.7	2.9%
8D	Caneyville-Opequon-Rock outcrop complex, 7 to 25 percent slopes	6.7	1.0%
8E	Caneyville-Opequon-Rock outcrop complex, 25 to 60 percent slopes	100.4	14.8%
11C	Duffield-Ernest complex, 7 to 15 percent slopes	3.0	0.4%
13C	Frederick and Vertrees gravelly silt loams, 7 to 15 percent slopes	25.2	3.7%
13D	Frederick and Vertrees gravelly silt loams, 15 to 25 percent slopes	6.8	1.0%
16B	Groseclose and Poplimento soils, 2 to 7 percent slopes	4.2	0.6%
16C	Groseclose and Poplimento soils, 7 to 15 percent slopes	8.5	1.3%
16D	Groseclose and Poplimento soils, 15 to 25 percent slopes	22.9	3.4%
16E	Groseclose and Poplimento soils, 25 to 60 percent slopes	61.5	9.1%
17C	Groseclose and Poplimento gravelly soils, 7 to 15 percent slopes	4.3	0.6%
29	Udorthents and Urban land	7.1	1.0%
30C	Unison and Braddock soils, 7 to 15 percent slopes	14.2	2.1%
30D	Unison and Braddock soils, 15 to 25 percent slopes	19.7	0.6%
SUBTOTALS FOR SOIL SURVEY AREA		**288.6**	**42.5%**
TOTALS FOR AREA OF INTEREST		**679.0**	**100.0%**

PULASKI COUNTY, VIRGINIA (VA155)			
MAP UNIT SYMBOL	**MAP UNIT NAME**	**ACRES IN AOI**	**PERCENT OF AOI**
W	Water	56.0	8.3%
4D	Carbo silty clay loam, 15 to 35 percent slopes	4.1	0.6%
5D	Carbo silty clay loam, very rocky, 15 to 30 percent slopes	7.8	1.1%
6E	Carbo-Rock outcrop complex, 10 to 45 percent slopes	116.6	17.2%
7B	Cotaco loam, 2 to 7 percent slopes	1.1	0.2%
7C	Cotaco loam, 7 to 15 percent slopes	4.5	0.7%
9	Fluvaquents, nearly level	5.4	0.8%
10C	Frederick loam, 7 to 15 percent slopes	20.2	3.0%
10D	Frederick loam, 15 to 30 percent slopes	8.8	1.3%
13C	Groseclose and Poplimento silt loams, 7 to 15 percent slopes	6.4	0.9%
13D	Groseclose and Poplimento silt loams, 15 to 30 percent slopes	13.7	2.0%
17	Lindside-Nolin silt loams	1.2	0.2%
18D	Lodi loam, 15 to 30 percent slopes	1.7	0.3%
19C	Lodi gravelly loam, 7 to 15 percent slopes	5.3	0.8%
20C	Lowell silt loam, 7 to 15 percent slopes	7.0	1.0%
20D	Lowell silt loam, 15 to 30 percent slopes	24.6	3.6%
21B	Lowell-Urban land complex, 2 to 7 percent slopes	0.3	0.1%
29F	Rock outcrop-Newbern-Carbo complex, 30 to 65 percent slopes	20.4	3.0%

PULASKI COUNTY, VIRGINIA (VA155)			
MAP UNIT SYMBOL	**MAP UNIT NAME**	**ACRES IN AOI**	**PERCENT OF AOI**
32C	Slabtown silt loam, 7 to 15 percent slopes	0.3	0.0%
34	Wheeling sandy loam	18.1	2.7%
DAM	Dam	0.1	0.0%
SUBTOTALS FOR SOIL SURVEY AREA		**390.4**	**57.5%**
TOTALS FOR AREA OF INTEREST		**679.0**	**100.0%**

Source: USDA, 2014

FIGURE 4-2. SOILS MAP



4.1.3 Description Of Reservoir Shorelines And Streambanks, Including Steepness, Composition (Bedrock And Unconsolidated Deposits), And Vegetative Cover

Soils within the Project area are typically well drained and primarily composed of loam and silty loam surface soils with clay subsoils. Bedrock in the area is composed mostly of limestone and shale formations. Slopes are typically high and range from 10 to 60 percent throughout the Project area. Reservoir shorelines are composed primarily of steep rock outcrops, with pockets of silty and sandy clay loam and slopes of 0 to 2 percent. Spanning out from the dam, the area surrounding the Project is heavily forested up to the shoreline.

4.1.3.1 Existing Erosion, Mass Soil Movement, Slumping, Or Other Forms Of Instability, Including Identification Of Project Facilities Or Operations That Are Known To Or May Cause These Conditions

Although there are steep slopes surrounding the reservoir, there are no significant shoreline or riverbank erosions, slides or instability at the Project.

4.1.4 Potential Adverse Effects And Issues

As no changes to Project facilities are proposed at this time, no potential adverse effects for this resource would result from continued Project operations.

4.1.5 Proposed Mitigation And Enhancement Measures

The Licensee is not planning any mitigation or enhancement measures related to this resource, since no adverse effects are expected. However, in the event major structural changes to the Project are planned, construction activities would be undertaken in compliance with appropriate sediment and erosion control requirements.

4.1.6 References

College of William & Mary (CWM). 2014. Department of Geology. Valley & Ridge Province: The Geology of Virginia. [Online] URL: http://web.wm.edu/geology/virginia/provinces/valleyridge/valley_ridge.html Accessed January 17, 2014.

Radford University (RU). 2014. Physiographic Provinces of Virginia. [Online] URL: http://www.radford.edu/~swoodwar/CLASSES/GEOG202/physprov/physprov.html Accessed January 17, 2014.

U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS). 2012. Web Soil Survey. [Online] URL: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx Accessed January 17, 2014.

4.2 WATER RESOURCES § 5.6 (D)(3)(III)

The Little River originates from headwaters located in northeastern Floyd County, VA and flows west-northwest approximately 93 miles to its confluence with the New River at the Pulaski/Montgomery County Line. The Project is located on the Little River, approximately 0.5 miles upstream from the New River confluence. Other hydroelectric projects in the vicinity include the Claytor Hydroelectric Project (FERC No. 739) owned and operated by Appalachian Power Company. This 75 MW facility is located on the New River approximately 0.5 miles upstream from the Little River's confluence with the New River (VDEQ, 2011b; Appalachian, 2009).

4.2.1 DRAINAGE AREA

The Little River watershed is part of the New/Kanawha River Basin and is located in USGS hydrologic unit code (HUC) 05050001. The Little River drainage area encompasses 225,000 acres. Primary land uses within the drainage area include forest lands and pasturelands (VDEQ, 2011b).

4.2.2 INFLOWS, OUTFLOWS AND MONTHLY FLOW DURATION CURVES

Inflows to the Project are measured at the Little River gage at Graysontown (USGS number 03170000). This gage is located approximately 8 miles upstream of the dam and approximately 4 miles upstream of the upper extent of the PBL. For the period of record (1928 to 2013), average annual flow at this gage is 491 cfs. For the period of record, the instantaneous maximum and minimum flows recorded at this gage are currently 4,110 cfs and 80 cfs, respectively. August is the month of minimum streamflow at the Project. Monthly flow duration curves are included in Appendix A. Table 4-2 depicts monthly flow statistics for the Little River as measured at the Graysontown Gage between 1928 and 2013.

TABLE 4-2. MONTHLY AVERAGE, MAXIMUM, AND MINIMUM FLOWS MEASURED AT GRAYSONTOWN (USGS GAGE NO. 03170000) FOR THE PERIOD ON RECORD (1928 TO 2013)

MONTH	AVERAGE (CFS)	MAXIMUM (CFS)	MINIMUM (CFS)
Jan	403	1050	108
Feb	461	1055	113
Mar	533	1213	220
Apr	500	1444	146
May	410	810	168
Jun	341	942	101
Jul	270	1017	98
Aug	245	1584	54
Sept	251	988	77
Oct	282	1458	80
Nov	301	916	89
Dec	337	860	115

The Little River Reservoir Gage (USGS 03170500) is located at the dam and measures reservoir storage and stage for operational purposes. A minimum flow of 25 cfs is maintained by allowing leakage around the side seals and bottom seals of the closed tainter gates. The Licensee maintains a separate gage at Project facilities to ensure that minimum flow is maintained downstream of the Project.

4.2.3 EXISTING AND PROPOSED USES OF PROJECT WATERS

In addition to hydroelectric generation, the Little River is utilized for agriculture and recreation (VDEQ, 2011). All waters within Virginia are designated for recreation, the propagation and growth of indigenous aquatic life, wildlife, and the production of edible and marketable natural resources (VDEQ, 2014). The Project is not located within a navigable portion of the basin and does not affect hydraulics or downstream navigation (FERC, 1989). The Virginia Pollution Discharge Elimination System (VPDES) is Virginia's version of the National Pollutant Discharge Elimination Systems, and is mandated by regulations implementing the federal Clean Water Act. A query of the EPA Envirofacts Database indicates that there are no VDEQ regulated facilities on the Little River in the vicinity of the Project (EPA, 2014).

Reportable surface water withdrawals include, but are not limited to, those for public water supply, manufacturing, mining, commercial uses, institutional uses, livestock watering, artificial fish culture, and steam-electric power generation. The Virginia Water Withdrawal Reporting Regulation (9 VAC 25-200-10 *et seq.*) requires that individuals or facilities that withdraw water at volumes greater than 300,000 gallons in a month obtain a permit from VDEQ. Currently, there are no VDEQ permitted water withdrawals on the Little River within Montgomery and Pulaski counties. The City of Radford withdraws water from the New River, downstream of the Little River confluence for water supply. Hydroelectric power is not considered a consumptive water use and thus is not considered a water withdrawal (VDEQ, 2012).

4.2.4 RELEVANT FEDERALLY-APPROVED WATER QUALITY STANDARDS APPLICABLE TO PROJECT WATERS

Virginia's Water Quality Standards (9 VA 25-260) are promulgated to protect each of the designated uses of water bodies in the Commonwealth, including aquatic life (wildlife), recreation, public water supply, shellfish (commercial), and fish consumption. Applicable Virginia Water Quality Standards and designations that apply to the New River and its tributaries from the Montgomery-Giles county line upstream to the Virginia-North Carolina state line (which includes the Little River) from its confluence are as follows, and are detailed in Table 4-3:

- *Class IV Mountainous Zone* (9 VAC 25-260-50)
- *v* (Special Temperature Standard) (9 VAC 25-260-310)

In 2007, EPA Region 3 approved nutrient criteria for lakes and reservoirs and amended water quality standards. According to the current standards, nutrient criteria for the Little River Reservoir are 35 µg/L for Chlorophyll *a* and 40 µg/L for total phosphorus (VAC, 2014; SWCB, 2008).

TABLE 4-3. APPLICABLE WATER QUALITY STANDARDS FOR CLASS IV WATERS

DISSOLVED OXYGEN (MG/L)	PH	MAXIMUM TEMP. (°C)	BACTERIA - *E. COLI*	BACTERIA - FECAL COLIFORM[1]
4.0 (minimum) / 5.0 (daily average)	6.0-9.0	29ºC (84ºF)[2]	single sample maximum of 235 colonies/100 ml of water geometric mean[3] of 126 colonies/100 ml of water	no more than 10% of the total samples taken during any calendar month can exceed 400 fecal coliform colonies/100 ml of water geometric mean of 200 colonies/100 ml of water

[1] This criterion no longer applies once 12 samples of E. coli are collected at a site or after June 30, 2008, whichever is first.

[2] Although the WQS for most Class IV waters is 31º, there is a special temperature standard for the New River and its tributaries, except trout waters, from the Montgomery-Giles County line upstream to the Virginia-North Carolina state line (VAC 25-260-310).

[3] For two or more samples taken during any calendar month.

4.2.5 PROJECT EFFECTS ON SEASONAL VARIATION OF WATER QUALITY DATA, INCLUDING EXISTING WATER QUALITY WITHIN THE PROJECT VICINITY

Little River Water Quality

Water quality data analyzed during the previous project relicensing indicates that water temperatures directly downstream and 8.4 miles upstream of the Project ranged from 0 to 29 degrees C. Dissolved oxygen levels ranged from 5.4 mg/l to 13.19 mg downstream of the Project and from 1.2 mg/l to 13.8 mg/l at the station 8.4 miles upstream of the Project (FERC, 1989).

More recent water quality data (January 1, 2000 through March 10, 2014) is available from the VDEQ through their Ambient Water Quality Monitoring Program (McLeod, VDEQ, electronic mail, 2014). Monitoring includes physical parameters such as dissolved oxygen, temperature, pH and conductivity along with nutrients, suspended and dissolved solids, bacteria and biological assessments. There are five VDEQ monitoring stations on the Little River from RM 0 to RM 12.53. These stations are presented in Table 4-4.

TABLE 4-4. VDEQ AMBIENT MONITORING PROGRAM STATIONS, LOCATIONS, AND AVAILABLE PARAMETERS

VDEQ STATION NUMBER	STATION LOCATION	APPROXIMATE DISTANCE FROM PROJECT DAM	RECENT AVAILABLE PARAMETERS
9-LRV000.34	Route 605 Bridge - South of Radford	Approx. 750-Ft downstream of Project Dam	sediment, solids, temperature, DO, pH, specific conductance, nitrogen, phosphorus, fecal coliform, turbidity
9-LRV000.44	Little River Reservoir at Dam	--	temperature, DO, pH, specific conductance, nitrogen, phosphorus, fecal coliform, turbidity
9-LRV004.89	Downstream of Graysontown USGS Station	Approx. 4.5-miles upstream of Project Dam	sediment, metals, solids, temperature, DO, pH, specific conductance, nitrogen, phosphorus, fecal coliform, turbidity
9-LRV009.11	Route 693 Bridge at Graysontown	Approx. 8-miles upstream of Project Dam	solids, temperature, DO, pH, specific conductance, nitrogen, phosphorus, fecal coliform, turbidity
9-LRV012.58	Route 787 Pull-off	Approx. 12-miles upstream of Project Dam	temperature, DO, pH, specific conductance, nitrogen, phosphorus, fecal coliform, turbidity

A Total Maximum Daily Load (TMDL) has been developed for the Little River, as certain stream segments do not meet water quality standards for bacteria, temperature, and sediment. Waters within the Project Vicinity have been listed as being impaired for bacteria, while temperature and sediment impairments are identified higher within the watershed.

For the purposes of this PAD, the parameters of temperature, DO, and pH are summarized for each station identified in Table 4-4.

Station 9-LRV000.34 - Downstream of Project Dam

The collection period for this site ranged from January 2000 through November 2008. Summer water temperatures (July and August) ranged from 20.1 to 25.9 degrees C. Dissolved oxygen (DO) ranged from a low of 6.3 mg/L in September of 2007 to a high of 14.5 mg/L in March of 2001. Field pH measurements during this time period ranged from 6.6 to 8.91.

Station 9-LRV000.44 - Little River Reservoir

The collection period for this site ranged from April through October 2000. Water temperature ranged from a high of 25.6 degrees C in August to a low of 11.3 degrees C in October. Dissolved oxygen (DO) ranged from a low of 4.5 mg/L at a depth of 5 feet in the reservoir (7.5 mg/L from a surface sample at this date/time), to a high of 8.8 mg/L at a depth of 4 feet in the reservoir (9.4 mg/L surface sample at this date/time). Field pH measurements during this time period ranged from 6.8 in April to 8.1 in September.

Station 9-LRV004.89 - Downstream of USGS Gage

Temperature, DO and pH were only sampled on two occasions at this site: May 3 and October 6, 2005. In May, water temperature was measured at 11.42 degrees C, DO was measured at 11.33 mg/L and pH was 8.09. In October, DO was not sampled, water temperature was measured at 19.04 degrees C and pH was 7.8.

Station 9-LRV009.11 - Route 693 Bridge

The collection period for this site ranged from July 2001 through February 2014. Summer water temperatures (July and August) ranged from 20.4 to 26.5 degrees C. Dissolved oxygen (DO) ranged from a low of 7.8 mg/L in July of 2011 to a high of 13.9 mg/L in January of 2011. Field pH measurements during this time period ranged from 6.6 to 8.6.

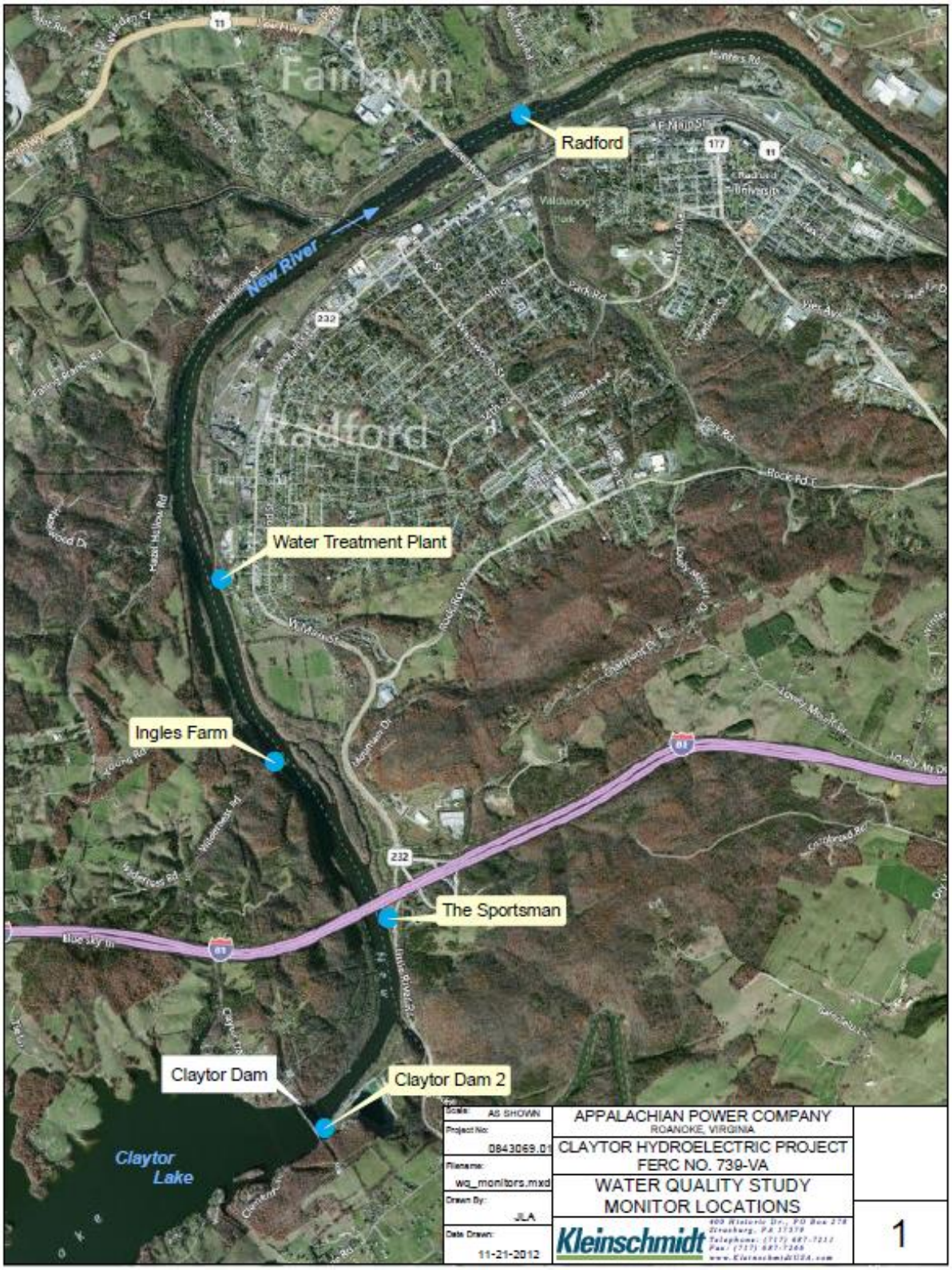
Station 9-LRV012.58 - Route 787 Pull-off

Temperature, DO and pH have currently only been sampled on two occasions at this site: January and February 2014. In January, water temperature was measured at 5.7 degrees C, DO was measured at 11.6 mg/L and pH was 7.5. In February, water temperature was measured at 4.1 degrees C, DO was measured at 12.6 mg/L, and pH was 7.5.

Downstream (New River) Water Quality

Dissolved oxygen and water temperature in the New River, downstream of the confluence of the Little River is being monitored annually, beginning in 2012, by the Appalachian Power Company in accordance with Article 406 of their operating license for the Claytor Hydroelectric Project. Four sites are located directly downstream of the Little River confluence and one site is located within the Claytor Dam tailrace. Sampling sites are depicted in Figure 4-3.

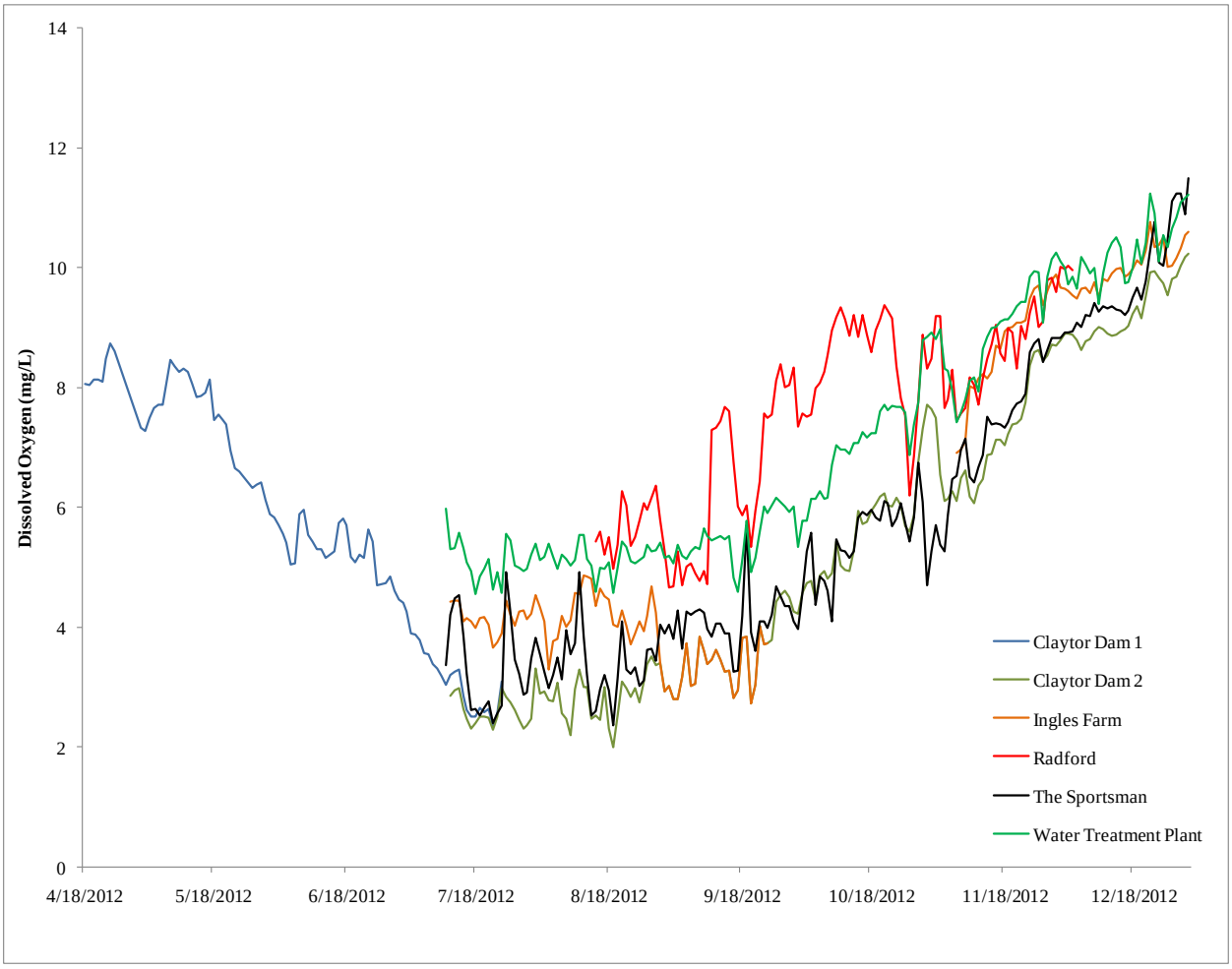
FIGURE 4-3. APPALACHIAN POWER COMPANY NEW RIVER WATER QUALITY SAMPLING SITES (SOURCE: APPALACHIAN, 2013)



Dissolved oxygen (DO) and temperature sampling in the New River, downstream of Claytor Dam, was conducted from the beginning of July 2012 through December 2012. Appalachian is continuing to monitor water quality throughout 2013 and 2014 and through the end of the 5-year monitoring period specified in their operating license for the Project. Yearly reports are issued in late spring of the following year. Data for 2013 and the following years will be available for consideration during the Project relicensing (Appalachian, 2013).

Water temperatures generally ranged from 20 to 25 degrees C in the summer months, with temperatures increasing slightly as distance from Claytor Dam increased. Diel DO fluctuation in the New River is evident at the sites sampled in 2012. Diel influences were found to be the highest the Water Treatment Plant site, which has lower water velocities and greater aquatic macrophyte presence. As is typical with high head sites where reservoir stratification is present, there were periods of time where dissolved oxygen dropped below instantaneous standard of 4.0 mg/L during the summer months. However, as depicted in Figure 4-4, DO increases with distance from the Claytor Dam. Average daily DO at the Water Treatment Plant sampling station and the Radford sampling station indicates that daily average DO's are near the 5.0 mg/L daily average standard. Dissolved oxygen (DO) levels show an increasing trend around mid-September. It should be noted that low-flow conditions in 2012 potentially exacerbated DO levels downstream of Claytor Dam (Appalachian, 2013).

FIGURE 4-4. NEW RIVER DAILY AVERAGE DISSOLVED OXYGEN AT DOWNSTREAM NEW RIVER SAMPLING SITES (SOURCE: APPALACHIAN, 2013)



Fish Consumption Advisories

Fish consumption advisories are issued by the Virginia Department of Health (VDH) when fish taken from a waterbody are found to contain potentially harmful levels of contaminants. The VDH has issued fish consumption advisories for the contaminant of PCBs for the New River, including the Little River tributary, from below Claytor Dam to the Virginia/West Virginia state line (approximately 68 miles). Species affected include carp (advisory: do not eat), flathead catfish and channel catfish (advisory: no more than two meals a month) (VDH, 2014).

4.2.5.1 EFFECTS OF PROJECT OPERATIONS ON EXISTING WATER QUALITY

Water quality data collected from the Little River in the vicinity of the Project indicates that water quality standards are generally met for the parameters temperature and DO; the parameters

that are typically greatest affected by hydroelectric operations. A 4.5 mg/L field measurement of DO was sampled by the VDEQ within the Project reservoir on August 30, 2006 at a depth of 5 feet. However, the surface sample take at approximately the same time measured 7.5 mg/L. Although thermal and chemical stratification is typically most pronounced in lakes deeper than 40 feet, some stratification may occur near the Project dam during the warm summer months causing a slight decline in temperature and DO levels. When assessing DO data in preparation of Clean Water Act 305(b) and 303(d) reports, VDEQ designates waters as naturally impaired when low dissolved oxygen concentrations are the result of non-anthropogenic sources such as thermal and chemical stratification. Although not sampled in 2006, water quality samples directly downstream of the Project dam on the Little River never dropped below State standards. Continuing Project effects to DO and temperature as a result of Project operations would likely be apparent during the sampling timeframe.

Project operations are not likely to affect water quality within the New River. Average daily flow of the Little River is 491 cfs (USGS Gage No. 0317000 Little River at Graysontown, VA). Average daily flow for the period of record (74 years) for the New River as recorded at the USGS Gage No. 03171000 New River at Radford, VA is 5,380 cfs (includes Little River input). Furthermore, water quality within the Little River, downstream of the Project meets State water quality standards.

4.2.6 RESERVOIR SURFACE AREA, VOLUME AND SUBSTRATE COMPOSITION

The Little River impoundment has a surface area of 350 acres with a normal pool elevation of 1,772 feet msl and 1,600 acre-feet of storage. Substrates generally consist of rocks, mud and silt. No significant shoreline or riverbank erosions, slides or instability have been observed during routine dam safety inspections.

4.2.7 GRADIENT FOR AFFECTED DOWNSTREAM REACHES

Elevations remain consistent throughout the .45-mile reach of the Little River until the confluence with the New River. Elevations below the Project Dam are 1730.1 ft msl. The elevation at the Little River/New River confluence is also 1730.1 ft msl.

4.2.8 POTENTIAL ADVERSE IMPACTS AND ISSUES

The Project is operated so that there is a continuous minimum flow of at least 25 cfs downstream to maintain aquatic communities. The Licensee does not propose any changes to this minimum flow.

As noted above, water quality standards are generally met within the Project Area, with the exception of bacteria, for which a TMDL has been issued. Bacterial impairments have been identified as potentially being caused by point and non-point sources such as permitted dischargers, residential sewage treatment systems, agricultural practices and livestock (VDEQ, 2011a). The VDEQ is currently implementing measures to bring bacteria levels within State standards. Continued Project operations will not have an effect on bacteria levels in the Little River.

4.2.9 PROPOSED MITIGATION AND ENHANCEMENT MEASURES

The Licensee believes that there is sufficient water quality data available to analyze potential Project effects within the Little and New Rivers during relicensing. Furthermore, the VDEQ is continuing water quality sampling in the Project Vicinity through their Ambient Water Quality Monitoring Program. Additional available data will be reviewed through the relicensing process. The Licensee is not proposing any additional water quality studies or mitigation and enhancement measures at this time.

4.2.10 REFERENCES

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4.3 FISH AND AQUATIC RESOURCES [§ 5.6 (D)(3)(IV)]

4.3.1 IDENTIFICATION OF EXISTING FISH AND AQUATIC COMMUNITIES

Within the Project Vicinity, the Little River consists of an upstream unimpounded riverine segment, a 350-acre reservoir formed by the project dam and riverine conditions in the tailwater downstream of the dam for approximately 2,500 feet to the confluence with New River. Approximately 650 feet downstream of the Project dam, the streambed elevation rises, creating a riffle area during certain water flows and a pool area immediately downstream of the dam. Water releases from the Claytor Dam on the New River also provide for backwatering effects to the tailwaters below the Project dam due to the uniform elevations through the Little River tailwaters and the New River tailwaters (FERC, 1986).

4.3.1.1 FISH SPECIES

In 2013, personnel from Virginia Department of Game and Inland Fisheries (VDGIF) and Virginia Tech conducted an electrofishing survey within the proximity of the Project on Little River (Copeland, VDGIF, electronic mail, 2014). Six sampling reaches included: the Little River Upper Reservoir, Little River Lower Reservoir, Little River tailwater and Claytor tailwater. A total of 32 fish species were collected and identified from the sampling reaches including: redbreast sunfish (n = 304), rock bass (n = 226), smallmouth bass (n = 166), white sucker (n = 124), bluegill (n = 116), largemouth bass, walleye, northern hogsucker, spottail shiner, whitetail shiner, common carp, spotted bass, white shiner, gizzard shad, striped bass, green sunfish, telescope shiner, black crappie, black jumprock, bigmouth chub, muskellunge, pumpkinseed, flathead catfish, silver shiner, common logperch, bluntnose minnow, brown bullhead, central stoneroller, greenside darter, margined madtom, striped bass hybrid, and yellow perch.

Generally, the upstream unimpounded segments had higher numbers of cyprinids and catostomids than in the other sampling reaches. Within the reservoir, the fish community is generally dominated by common carp and white sucker. Below the dam in the tailwater reach and in New River, there was a more diverse fish community including several species of game fishes including smallmouth bass and walleye.

4.3.1.2 HERPTILE SPECIES

Within proximity of the Project there are a variety of terrestrial and aquatic habitats for reptiles and amphibians. According to the Virginia Herpetological Society (2014), there are 55 species in Montgomery County and 48 species in Pulaski County. These species are presented in Appendix D. In addition, Section 4.6, *Rare, threatened, and Endangered Species* discusses threatened and endangered reptiles and amphibians that may occur in the Project Vicinity. No federally listed amphibian species have been identified within the Project Vicinity. However, the state listed hellbender, *Cryptobranchus alleganiensis*, (rank S2/S3) has been identified as potentially occurring in the area surrounding the Project.

4.3.1.3 MACROINVERTEBRATE SPECIES

The macroinvertebrate community of the Project Vicinity likely inhabits natural gravel and sand bars along the Little River. These areas may contain common species of Ephemeroptera (mayflies), and Tricoptera (caddisflies), and Plecoptera (stoneflies). These three families are termed "EPT" and discussed in more detail within Section 4.3.3.3.

Two biological monitoring surveys were conducted by VDEQ in 2004 on Little River at the monitoring station 9-LRV035.03 which is located upstream of Laurel Fork Mouth at RM 35.03 (VDEQ, 2011). The survey identified that conditions were impaired in April of 2004, but were not impaired in September of that year. In 2009, a survey was conducted at monitoring station 9-LRV032.72 at Rt. 617 Bridge. The results indicated that conditions were not "impaired".

As part of the surveys, habitat assessments were conducted. One parameter, Sediment Deposition, was classified as marginal or poor, indicating that a significant amount of stream bed was covered in sediment. The VDEQ will provide additional data for the Project Vicinity in their 2014 assessment and the report(s) will be made available for future use (McLeod, VDEQ, electronic mail, 2014).[3]

4.3.1.4 UNIONID SPECIES

The Commonwealth of Virginia has 82 mussel species present and of those, 26 are listed as federally endangered, threatened, proposed and candidate species (USFWS, 2013) and 40 species

[3] Mike McLeod, VDEQ, "Little River Macro Sampling" e-mail message, February 25, 2014.

with special legal status (VDGIF, 2013). Within the Project Vicinity, some mussel surveys have been conducted but those have focused mainly on the New River instead of the Little River.

Of the 11 freshwater mussels that have been reported in New River (Jirka and Neves, 1985), seven can be considered common. Jirka and Neves (1992) collected four species of mussels from the New River near State Route 652 at McCoy, Virginia in Montgomery County. They were the mucket, spike, purple wartyback, and pistolgrip. Pinder et al. (2002) conducted mussel surveys on the New River below Claytor Lake. It was determined that mussel abundance and diversity were slowly declining and no live specimens of the state threatened green floater and pistolgrip were collected during 1998-1999 efforts. Other species collected included purple wartyback, spike, pocketbook, wavy-rayed lampmussel, Tennessee hillsplitter, and elktoe. In 2008, Appalachian Power Company collected mussel species at downstream survey sites on New River (Alderman, 2008). The closest sampling location was approximately 4.5 miles downstream of Claytor Dam near Radford, Virginia. The second location was located further downstream near Back Creek that is near Parrott, Virginia. Species collected and identified included purple wartyback, pocketbook, giant floater, and pistolgrip.

4.3.1.5 INVASIVE AQUATIC SPECIES

The USGS maintains the Nonindigenous Aquatic Species data base (USGS, 2013) and has no records of exotic aquatic animal species within the proximity of the Project. However, the electrofishing survey mentioned previously collected and identified 23 common carp. Jenkins and Burkhead (1993) state that this fish now occurs in all major drainages of Virginia and is continuously distributed through main river channels but it must be noted that the severity of their impacts may not be as great as previously thought.

There are multiple invasive plant species that have been identified in Montgomery and Pulaski Counties, Virginia (EDDMapS, 2013). In Montgomery County, these include six species: brittleleaf naiad, giant chickwee, hydrilla, reed canarygrass, watercress, and yellow iris. In Pulaski County, these include eight species: Australian water clover, curly-leaved pondweed, Eurasian water-milfoil, giant chickweed, narrow-leaved cattail, parrotfeather, reed canarygrass, and yellow iris.

4.3.2 IDENTIFICATION OF ESSENTIAL FISH HABITAT AS DEFINED UNDER THE MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT AND ESTABLISHED BY THE NATIONAL MARINE FISHERIES SERVICE

Pursuant to the amended Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C§ 1801 *et seq*), Congress mandated that habitats essential to federally managed commercial fish species be identified, and that measures be taken to conserve and enhance habitat. In the amended act, Congress defines essential fish habitat for federally managed fish species as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (NMFS, 2011). Essential fish habitat is only applicable to federally managed commercial fish species that live out at least one component of their lifecycle in marine waters (NMFS, 2011). The Licensee is not aware of any essential fish habitat in the Project Vicinity.

4.3.3 TEMPORAL AND SPATIAL DISTRIBUTION OF FISH AND AQUATIC COMMUNITIES AND TRENDS

4.3.3.1 FISH SPECIES TEMPORAL/LIFE HISTORY INFORMATION

Fish habitat within the Project Vicinity consists of both riverine and impounded habitats. Fish species adapted to riverine habitats include: redbreast sunfish, rock bass, smallmouth bass, bluegill, walleye, spottail shiner, whitetail shiner, gizzard shad, striped bass, telescope shiner, bigmouth chub, black jumprock, muskellunge, pumpkinseed, flathead catfish, logperch, margined madtom, striped bass hybrid, and yellow perch. These species were collected below Little River Dam or in the New River below Claytor Dam.

Impounded habitats are also present within Project Area and some species were collected predominately or only in Little River Reservoir. These species included redbreast sunfish of (> 50% of species collected during surveys were collected in the reservoir), smallmouth bass (>50% of species collected during surveys were collected in the reservoir), white sucker, largemouth bass, northern hogsucker, common carp, spotted bass, white shiner, spotted bass, green sunfish, black crappie, silver shiner, bluntnose minnow, brown bullhead catfish, and central stoneroller.

A number of sport/game fish including bass, sunfish, walleye, yellow perch, muskellunge, and catfish were collected within the Project Area. Many of these species utilize a variety of habitats including deepwater, small streams, and larger streams (Jenkins and Burkhead, 1993). Depending on time of year and requirements, these species will migrate to different habitats such

as in deepwater during winter months to overwinter or will move to shallow areas for breeding once water temperatures increase and increased food resources are available (Jenkins and Burkhead, 1993). Some of the more common species are discussed below.

Black Bass

These species belong to the genus, *Micropterus*, and includes smallmouth bass, largemouth bass, and spotted bass. The largemouth and smallmouth bass have been collected outside their native ranges throughout North America (Etnier and Starnes, 1993; Jenkins and Burkhead, 1993). Though the spotted bass is less widespread it is found in the south-central United States (Etnier and Starnes, 1993). Spawning is similar for each species and occurs April - June when water temperatures are 15 - 20 ^{o}C. Substrate use is mostly gravel but can include both soft and hard bottom substrates.

Sunfish Species

Species within Project Area include redbreast sunfish, rock bass, bluegill, green sunfish, and pumpkinseed. Spawning periods include spring and summer seasons and species overlap is present (Etnier and Starnes, 1993; Jenkins and Burkhead, 1993). Breeding habitat preference includes shallow reaches of the littoral zone and sunfish are considered colonial spawners and nest builders (Etnier and Starnes, 1993; Jenkins and Burkhead, 1993). Vegetation can be used as well.

Temperate Bass

Temperate basses included striped bass and striped bass x white bass hybrid. Both have been maintained within Project Area through annual stocking activities in Claytor Lake (Appalachian, 2006). Because juvenile fish utilize shoreline habitats, these areas are important for the fishery.

Walleye

Walleye are stocked in Claytor Lake as fingerlings because natural spawning is not able to maintain the population (Appalachian, 2006). Juvenile walleye may pass downstream through Claytor project structures. According to Jenkins and Burkhead (1993), walleye will spawn when water temperatures are as low as 2 ^{o}C and they are broadcast spawners therefore no parental care is provided. Both juveniles and adults utilize the littoral zone and can forage at night (McMahon et al., 1984).

No anadromous or catadromous fish were collected or identified in the 2013 sampling effort by VDEQ and Virginia Tech.

4.3.3.2 HERPTILE SPECIES TEMPORAL/LIFE HISTORY INFORMATION

FROGS AND TOADS

Frogs and toads (anurans) require a variety of habitats for breeding, egg deposition, larval development, and life as an adult. Anurans generally occur in wetland areas. Toads are less restricted to permanent wetlands. Habitat preferences vary among species, ranging from permanent bodies of water to more open semi-permanent wetlands. Some require permanent bodies of water, including ponds, lakes, and slow moving streams (Mirarchi, 2004).

SALAMANDERS

Salamanders, like frogs and toads, also undergo a complex life cycle from egg to larvae to adult. Salamanders generally remain underground in burrows, or under rotting logs. Typically, salamanders require landscapes with moist soils and water-filled depressions; however, some species can occur in more developed habitat including open fields, prairies, cultivated fields, pastures, and open forest. (Mirarchi, 2004).

The Eastern hellbender, a state listed species, prefers cool, well-oxygenated water with substrates dominated by large rubble (Nickerson et al., 2002) and water velocities that are moderate to fast (VDGIF, 2013). It is believed that water quality including temperature and conductivity may limit suitable habitat use. Reproduction occurs in late summer and the externally fertilized eggs are deposited in nests built and guarded by the males. Species longevity is greater than 25 years and adults are considered to be nocturnal scavengers on fish or prey upon crayfish and juveniles feed on arthropods, crustaceans and worms (VDGIF, 2013).

TURTLES

Most turtles require an aquatic environment; however, some species may occur in shallow marshes, ponds, or similar wetlands with lots of emergent vegetation and little to no current. Turtles typically breed and lay eggs between April and late-June as water levels rise and stabilize. Turtles typically nest in riparian sites but may nest up to ½ mile away from shore, preferring gravel/sand substrate near water but high above water level. Turtles also require areas

of partially submerged logs and rocks for basking and temperature regulation (Degraaf and Rudis, 1986; Mirarchi, 2004).

4.3.3.3 MACROINVERTEBRATE SPECIES TEMPORAL/LIFE HISTORY INFORMATION

Ephemeroptera (mayfly) nymphs are aquatic and mature into winged terrestrial insects. They generally live in unpolluted habitats with fresh, flowing water making them an ideal indicator species. Mayfly nymphs' diet consists of algae and other aquatic plant life scavenged from surrounding habitat, though adult mayflies do not feed. Most adult mayflies have a very short lifespan; emerging, reproducing, and dying in a single day (NCSU, 2006).

Plecoptera (stoneflies) encompass over 1,700 recorded species worldwide. Stoneflies begin life as an aquatic insect and mature into a terrestrial insect that is generally found on the banks of the rivers and streams from which they emerged. The nymphs live in the benthic zone of lakes and streams and their preferred habitat is rocky streams with noticeable current. Their dependence on cool, well-oxygenated water makes them a useful indicator species for water quality (NCSU, 2006).

Trichoptera (caddisfly) larvae live in aquatic environments and prefer cool water. Caddisfly larvae are typically herbivores, scavengers, or predators. Many species of caddisfly live within protective cases that they build from their own silk and stones, twigs, leaf fragments, or other natural materials. Larval growth and development occurs within the case. Adult caddisflies live in moist environments, such as along riverbanks, are nocturnal and relatively short-lived (NCSU, 2006).

Other macroinvertebrates likely to occur in the Project Area (*e.g.*, crayfish) are also important fish forage (Lehmkuhl, 1979). Crayfish are generally found in fresh water, lotic environments, and those environments which provide shelter, such as rocks and logs, against predators. As with EPT, most crayfish species are intolerant of pollution, though some invasive species are more robust. Crayfish are most active at night when they feed largely on snails, algae, insect larvae, worms, tadpoles, and aquatic vegetation. Crayfish lifespan is generally less than two years, and therefore, this species reproduces often. Generally, crayfish become sexually mature and mate in the fall and lay up to 800 eggs in the spring (BYU, 2008).

4.3.3.4 UNIONIDS SPECIES TEMPORAL/LIFE HISTORY INFORMATION

Of the 11 mussel species collected and identified in New River below Claytor Lake, two species were most commonly present during the survey activities (present in at least three of the surveys): pistolgrip and purple wartyback, are further discussed.

The pistolgrip is located in rivers throughout the central and southeastern United States (Williams et al., 1993). Preferred habitat includes mud, sand, or gravel substrate in small to large rivers with moderate current and good water quality (Watters et al., 2009). Several species of catfish have been listed as potential host species including yellow bullhead, brown bullhead, and flatheads (Howells, 1996; Pepi and Hove, 1997; Hove et al., 1998; Hove et al., 2011). The species is tachytictic (short-term brooder) and the females brood their glochidia in April - July (Hove et al., 2011).

The purple wartyback is a nearctic species that is located in the Upper Mississippi River drainage, Lake St. Clair drainage, and from Pennsylvania northwest to southern Michigan and northwestern Wisconsin, south to Iowa, Missouri, and Arkansas (Parmalee and Bogan, 1998). This species limits its distribution to riverine conditions with strong current but can also be found in smaller rivers if the waters are clear preferring better quality systems (Watters,1995). Habitat preferences include gravel/mud bottoms with water depths up to 20 feet deep (Parmalee and Bogan, 1998). Currently it is unknown which fish host this species but it has been proposed that catfish are likely candidates including black and yellow bullhead, channel and flatheads (Hove et al., 1994).

4.3.4 POTENTIAL ADVERSE IMPACTS AND ISSUES

A 25 cfs minimum flow is maintained downstream of the Project to protect fishery habitat. Reservoir fluctuations are minimal and continued operations are not anticipated to have an effect on native fish species. The reservoir supports a healthy fish community, including littoral spawners such as sunfish and smallmouth bass. Recent survey activities found that greater than 50 percent of the redbreast sunfish and smallmouth bass individuals collected throughout the study area were collected from the reservoir. As reservoir fish populations are healthy, the entrainment and impingement of fish species through Project structures likely is not affecting the resource. Water quality within the Project Area meets state standards for the parameters of temperature and DO and likely does not affect aquatic species populations.

Mussel species in the Little River, below the Project dam are anticipated to be similar in composition to that in the New River due to the Project's close proximity to the Little River/New River confluence and the backwatering effects of Claytor operations within the Little River. Project minimum flows within the Little River will continue to maintain mussel habitat, even during periods of low flow, when back-watering may not occur.

4.3.5 PROPOSED MITIGATION AND ENHANCEMENT MEASURES

At this time, the Licensee does not propose any studies, mitigation or enhancement measures relating to aquatic resources. The Licensee believes that there is enough existing information available to analyze the potential effects of continued operations on the resource.

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4.4 WILDLIFE AND BOTANICAL RESOURCES [§ 5.6 (D)(3)(V)]

4.4.1 UPLAND HABITAT(S) IN THE PROJECT VICINITY, INCLUDING THE PROJECT'S TRANSMISSION LINE CORRIDOR OR RIGHT-OF-WAY AND A LISTING OF PLANT AND ANIMAL SPECIES THAT USE THE HABITAT(S)

The Project is located within the Ridge and Valley Ecoregion (67) that includes the states of New York, New Jersey, Pennsylvania, Maryland, West Virginia, Virginia, Tennessee, Georgia, and Alabama (USEPA, 1999). The Ridge and Valley are divided into level IV ecoregions and assigned the letters, a - i based upon different characteristics. Two ecoregions are located within Project Vicinity: Southern Limestone/Dolomite Valleys and Low Rolling Hills (67f) and the Southern Shale Valleys (67g). The first is characterized by heavily farmed areas in the fertile valleys that have a low drainage density due to the presence of limestone and dolomite. Agricultural practices dominate the landscape due to the warmer climate that has a growing season of around 180 days annually. Much of the woodland is on steeper slopes and forests include Oak-Hickory-Pine Forest (hickory, longleaf pine, shortleaf pine, loblolly pine, white oak, and post oak) in the northern sections and to the south, Appalachian Oak Forest is present. The second ecoregion, Southern Shale Valleys, is located from the James River, Virginia south to Tennessee. The area contains rolling valleys and low hills and due to the geology of the underlying fine grained rock, surface streams are larger and drainage density is higher compared to 67(f). Forests include Appalachian Oak Forest and Bottomland Forests.

According to the VDGIF Fish and Wildlife Information Service (VFWIS) search report (2013), there are over 575 known or likely to occur animal species within a 3-mile radius of the Project. These species are listed in Appendix D.

The immediate vicinity surrounding Little River Dam is predominately forested. These areas likely provide habitat for a number of species that include: common gray and red fox; white-tailed deer; Virginia opossum; eastern fox, red, and northern gray squirrel; and southern flying squirrel. Other small mammal species include: long-tailed, least, pygmy, smoky, southeastern and ashen-masked shrew; common golden, deer, eastern harvest, house, northern white-footed, and woodland jumping mouse; and Indiana, Virginia big-eared, northern long-eared, big brown, eastern red, evening, hoary, little brown, and silver-haired bat (VDGIF, 2014).

Typical birdlife of the Project Area includes game species such as bobwhite quail, wild turkey, and mourning dove. Resident songbirds include: downy, hairy, pileated, red-bellied, and red-headed woodpecker; American robin; eastern bluebird; and eastern meadowlark. Neotropical migrants are also present including eight warbler species and four vireo species. Raptors known to occur in the region include American kestrel; northern goshawk; broad-winged, Cooper's, red-shouldered, red-tailed, rough-legged, and sharp-shinned hawk; and barred, great horned, short-eared, eastern screech, northern sawwhet, and barn owl (VDGIF, 2014).

The Little River littoral zone could provide habitat for northern river otter, southwestern mink, common muskrat, and American beaver; and for waterfowl and wading birds including American black and wood duck; black-crowned night, yellow-crowned night, green, and great blue heron; and great egret (VDGIF, 2014). Open water habitat is utilized by Franklin's gull, osprey, purple martin, and belted kingfisher.

The vegetative cover types adjacent to the Project include forests, wetlands, agricultural fields, and residential areas. The vegetation is typical of a mixed hardwood/conifer forest with white oak, red maple, northern red oak, white ash, white pine, and Virginia pine on the southern and southwestern slopes and scarlet oak and chestnut oak on the northern and northeastern slopes (MCGC, 2004). Representative upland plant species likely to occur within Montgomery and Pulaski Counties, Virginia are included in Appendix D.

4.4.2 EXOTIC UPLAND PLANT AND WILDLIFE SPECIES

There are a number of exotic wildlife species documented as potentially occurring within the areas surrounding the Project. Exotic bird species include the rock pigeon and European starling and exotic mammal species include the Norway rat and house mouse (VDGIF, 2014). Invasive plant species documented in the areas surrounding the Project include tree of heaven, autumn olive, multiflora rose, bush honeysuckle, Japanese knotweed, tall fescue, Japanese honeysuckle, oriental bittersweet. A complete list of exotic plant species documented within Montgomery and Pulaski Counties are listed in Appendix D (EDDMapS, 2014). Exotic insects documented as potentially occurring in the areas surrounding the Project include emerald ash borer and gypsy moth.

4.4.3 TRANSMISSION LINE CORRIDOR – UPLAND HABITAT

The Project's distribution line corridor consists of a 1.8 mile-long maintained corridor depicted in Figure 3-2. Much of the corridor runs along existing roadways and through developed areas. Vegetation is trimmed away from lines as necessary. No significant terrestrial habitat is located within this corridor.

4.4.4 TEMPORAL OR SPECIAL DISTRIBUTION OF COMMERCIALLY, RECREATIONALLY, OR CULTURALLY IMPORTANT SPECIES

The Licensee does not know of any commercially or culturally important species occurring within the Project Vicinity. Recreational fish and hunting does occur in the Project Area, and the Licensee provides access for anglers.

General temporal patterns of species common to the area surrounding the Project can be discerned based upon life histories of species and taxa groups. Migratory waterfowl species including gadwall, American widgeon, and American black and wood duck, would be expected to occupy the Project Area during the overwintering period including December - February. Neotropical avian species are expected to occupy the Project Vicinity during the spring, summer, and fall before returning to the tropics of Central and South America during winter including ruby-throated hummingbird; purple martin; Acadian, alder, great-crested, least, and willow flycatcher; and 12 warbler species. Spatial distribution patterns will be observed within the Project Vicinity as well. Wading birds such as black-crowned and yellow-crowned night, great blue, and green heron and great egret, and waterfowl species are more likely to be distributed in shallow, vegetated littoral areas. Open-water areas will also be utilized by Franklin's gull, common tern, and other raptor species.

4.4.5 POTENTIAL ADVERSE IMPACTS AND ISSUES

The Licensee does not expect the Project or operation to affect wildlife that may use the upland or littoral habitats in the Project Vicinity due to the limited Project footprint. Activities conducted during routine maintenance, or repairs to Project structures, have the potential to adversely impact local vegetation communities and associated wildlife species with invasive weed dispersal. The Licensee will implement Best Management Practices (BMPs) during maintenance or repairs to prevent adverse effects. Moreover, the Licensee will discuss the need for resource studies with state and federal agencies during licensing activities.

4.4.6 PROPOSED MITIGATION AND ENHANCEMENT MEASURES

At this time, the Licensee has not proposed any studies, mitigation or enhancement measures relating to wildlife or botanical resources. The Licensee believes that there is enough existing information available to analyze the potential effects of continued operations on the resource.

4.4.7 REFERENCES

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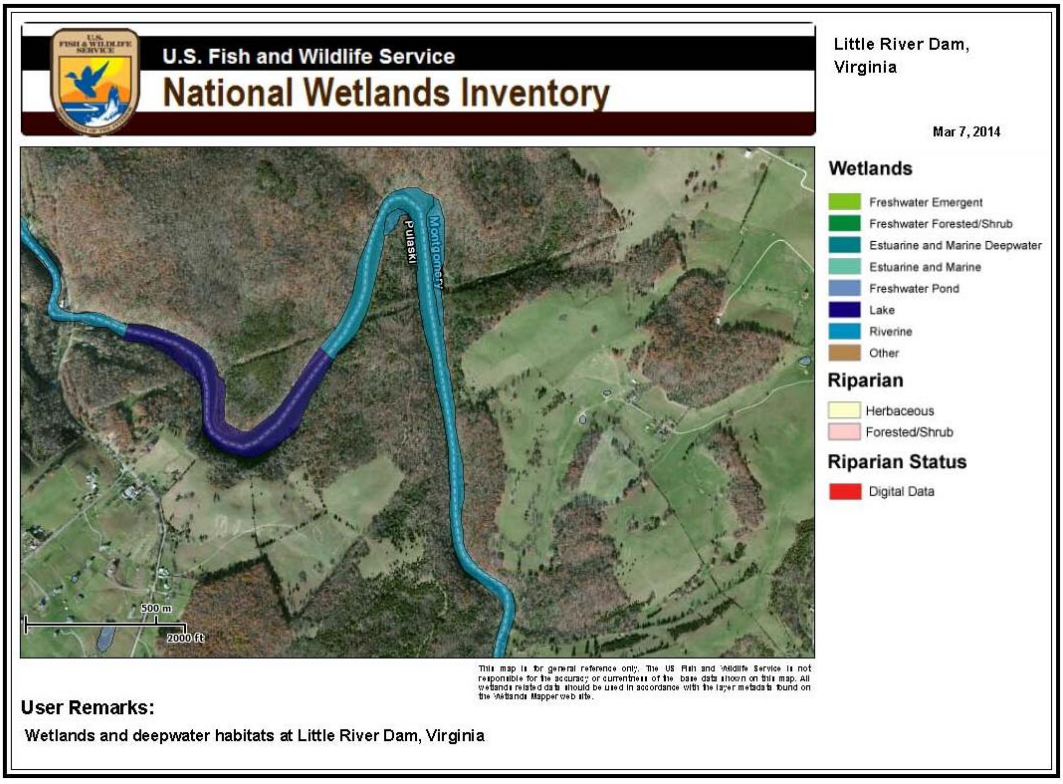
4.5 FLOODPLAINS, WETLANDS, RIPARIAN, AND LITTORAL HABITAT [§ 5.6(D)(3)(VI)]

The USFWS maintains the National Wetlands Inventory (NWI) that provides reconnaissance-level information on the location, type, and size of wetlands and deepwater habitats (USFWS, 2014). The NWI indicates that the Project Area is dominated by lake and riverine habitat. These habitat types are discussed in more detail in the following paragraphs.

4.5.1 MAP OF WETLANDS, RIPARIAN AND LITTORAL HABITAT

Figure 4-5 and Figure 4-6 depict the habitat types present within the Project Area, with Little River flowing right to left in each figure. The NWI classifications associated with habitats of the Project Area are described in Table 4-5.

FIGURE 4-5. NWI WETLANDS AND DEEPWATER HABITATS UPSTREAM OF LITTLE RIVER DAM, VIRGINIA.



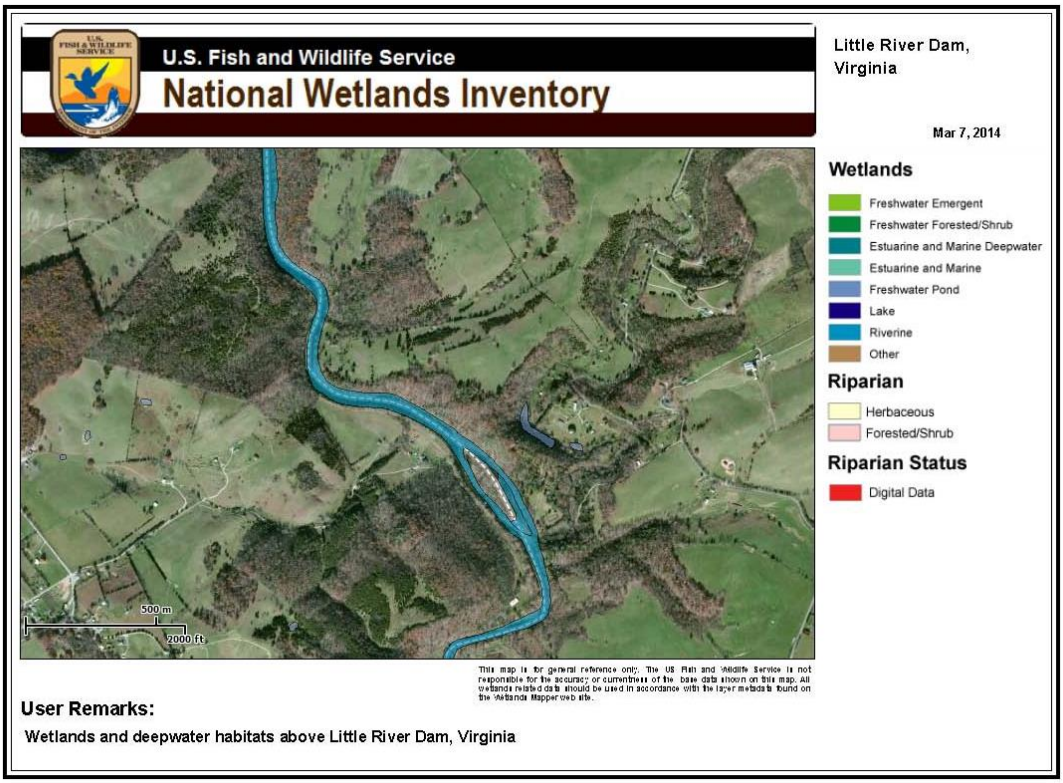


FIGURE 4-6. NWI WETLANDS AND DEEPWATER HABITATS SURROUNDING LITTLE RIVER DAM, VIRGINIA.

TABLE 4-5. WETLANDS AT THE LITTLE RIVER DAM PROJECT (NWI MAPS) (USGS, 2014).

SITE IDENTIFICATION	GENERAL DESCRIPTION	CHARACTERISTICS	EXTENT
L1UBHh	Lacustrine, limnetic, unconsolidated shore, temporarily flooded, extends outward from littoral boundary and includes all deep-water habitats	Situated in a depression or dammed river channel; lacking trees, shrubs, persistent emergents, emergent mosses or lichens with greater than 30% areal coverage	Total area approximately 23 acres.
L2USAh	Lacustrine, littoral, unconsolidated shore, temporarily flooded	Situated in a dammed river channel; lacking trees, shrubs, persistent emergents, emergent mosses or lichens with greater than 30% areal coverage	Total area less than 2.0 acres. Extends from shoreward to 6.6 feet below annual low water. Aquatic beds are considered to be in the littoral subsystem.

SITE IDENTIFICATION	GENERAL DESCRIPTION	CHARACTERISTICS	EXTENT
R2UBH	Riverine, continuously contains flowing water or forms links between standing water bodies	Low gradients and slow water velocity, no tidal influence, sand and mud substrate, well developed floodplain, >25% cover smaller particles,	Total area exceeds 200 acres that includes habitat above and below Little River Dam.
R2USC	Riverine, periodically or continuously contains flowing water, can connect water bodies, water table is variable	Low gradients and slow water velocity; no tidal influence; sand and mud substrate; well developed floodplain; mostly stones, boulders, and bedrock cover	Total area less than 6.0 acres.
R2USA	Riverine, temporary flooded for brief periods during growing season, water table is usually below soil surface	Low gradient and slow water velocity; no tidal influence; mostly sand and mud with beaches, bars, and flats; well defined floodplain; plants that grow in uplands and wetlands can be present	Total area less than 2.0 acres.

LAKE

The freshwater lake habitat in the Project Vicinity is comprised of permanently flooded/impounded lower perennial riverine habitat (NWI code L1UBHh and L2USAh), located above the Little River Dam. These classifications are typical of deepwater habitats formed by dammed river channels. Both habitats are characterized by unconsolidated bottom communities with at least 25% cover of particles smaller than stone, lack a large stable surface for plant and animal attachment, and the vegetative cover is less than 30%. Subsystem 1 is limnetic and extends from the littoral boundary to include all deep-water habitats. Subsystem 2 is littoral and extends from the shoreward boundary to 2 meters (6.6 ft) below annual low water. (USFWS, 2014).

RIVERINE

The Little River represents the riverine habitat in the Project Vicinity. The habitat is located both upstream and downstream of Little River Dam. The downstream habitat, tailwaters, is classified as lower perennial unconsolidated bottom (NWI code R2UBH). These areas have no tidal

influence but have water flow throughout the year and are surrounded by a well developed floodplain. This habitat is also present upstream of the freshwater lake habitat described above.

There are additional riverine habitat types present upstream of the Project dam and freshwater lake habitat. This includes the riverine habitat R2USC and R2USA. R2USC has the same system and subsystem as described above (R2UHB), but differs by including unconsolidated substrates with less than 75% aerial coverage of stones, boulders or bedrock, and contains less than 30% vegetative aerial coverage. Landforms include beaches, bars, and flats. This habitat type is seasonally flooded and water becomes absent by the end of the growing season most years. R2USA has a temporary flooded water regime with a water table that usually lies well below the soil surface for most of the growing season. Because of this, plants that grow in both uplands and wetlands are present (USFWS, 2014).

PONDS

There are multiple freshwater ponds located throughout the Project Vicinity but most are small, < 1.0 surface acres in size, and are associated with agricultural or other activities such as fishing. Though these are included in the wetland inventory, it is unlikely that these ponds or are a significant habitat source to wildlife or native plant species of the Project Area due to their size and distance from the Project.

4.5.2 A LIST OF PLANT AND ANIMAL SPECIES, INCLUDING INVASIVE SPECIES, THAT USE THE WETLAND, LITTORAL, AND RIPARIAN HABITAT

As noted, there are no significant wetland resources in the Project Area and most of the area is dominated by upland vegetative cover. The banks of the New River and associated tributaries are generally steep in nature and there is little opportunity for the establishment of wetlands and associated wetland vegetation. Nevertheless, some littoral/wetland species persist in along the riverbanks including ash, willow, sycamore, buckeye and cattail (FERC, 1986). Multiple mammal and bird species typically utilize these plant communities (VDGOF, 2013). The lacustrine littoral and riverine habitats generally provide amphibian breeding areas; spawning and rearing habitat for fish and mussels; habitat for semi-aquatic mammals including river otter, mink, and beaver; and refuge and feeding areas for resident and migratory waterfowl including numerous duck species and wading birds including heron and egret. Native plant and animal and invasive species lists are provided in Appendices D.

4.5.3 POTENTIAL ADVERSE IMPACTS AND ISSUES

The Licensee does not anticipate any potential adverse impacts because there are no wetlands present within the Project Area. The distribution line has already been established and is located in a developed area along a major roadway.

4.5.4 PROPOSED MITIGATION AND ENHANCEMENT MEASURES

The Licensee is not proposing any additional studies, mitigation or enhancement measures with regards to wetland resources.

4.5.5 REFERENCES

United States Environmental Protection Agency (USEPA). 1999. Level III and IV ecoregions of Delaware, Maryland, Pennsylvania, Virginia, and West Virginia. USEPA National Health and Environmental Effects Research Laboratory. Corvallis, Oregon. 62 pages.

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4.6 RARE, THREATENED, AND ENDANGERED SPECIES [§ 5.6 (D)(3)(VII)]

4.6.1 DESCRIPTION OF LISTED RARE, THREATENED AND ENDANGERED, CANDIDATE, OR SPECIAL STATUS SPECIES IN THE PROJECT VICINITY

The presence of rare, threatened and endangered (RT&E) and candidate or special status species in the Project Vicinity was determined by reviewing USFWS RT&E species lists, the VDCR Natural Heritage Inventory, and the VDGIF Comprehensive Wildlife Conservation Strategy. The VDGIF's searchable database was utilized to generate a list of animal species that are known or likely to occur within a 3-mile radius of the Project. Forty-two (42) state or federally listed or candidate animal species were identified as potentially occurring within a 3-mile radius of the Project and are presented in Table 4-6. A vascular plant species list was generated based upon county occurrences in Montgomery and Pulaski Counties and are listed in Table 4-7 (VDCR, 2013).

TABLE 4-6. KNOWN OR LIKELY TO OCCUR SPECIES WITHIN A 3-MILE RADIUS OF THE PROJECT WITH A STATUS CONCERN FOR CONSERVATION (VDGIF, 2013).

SCIENTIFIC NAME	COMMON NAME	TIER*	STATUS**	LAST YEAR*** OBSERVED
Percina rex	Roanoke logperch	I	FESE	1986
Myotis sodalis	Indiana bat	I	FESE	1947
Glaucomys sabrinus fuscus	Virginia northern flying squirrel	I	FESE	
Polygyriscus virginianus	Virginia fringed mountain snail	I	FESE	1989
Corynorhinus townsendii virginianus	Virginia big-eared bat	II	FESE	
Clemmys muhlenbergii	Bog turtle	I	FTSE	
Thryomanes bewickii	Bewick's wren	I	SE	
Cambarus veteranus	Big Sandy crayfish	II	FSSE	
Falco peregrinus	Peregrine falcon	I	ST	
Bartramia longicauda	Upland sandpiper	I	ST	
Lanius ludovicianus	Longerhead shrike	I	ST	
Ammodramus henslowii	Henslow's sparrow	I	ST	2000
Pyrgus wyandot	Appalachian grizzled skipper	I	FSST	1975
Noturus gilberti	Orangefin madtom	II	FSST	
Lasmigona subviridis	Green floater	II	ST	
Pseudotremia cavernarum	Ellett Valley Pseudotremia	II	FSST	
Tritogonia verrucosa	Pistolgrip	IV	ST	

SCIENTIFIC NAME	COMMON NAME	TIER*	STATUS**	LAST YEAR*** OBSERVED
Lanius ludovicianus migrans	Migrant loggerhead shrike		ST	
Myotis septentrionalis	Northern long-eared bat		FP	
Alosa pseudoharengus	Alewife	IV	FC	
Speyeria idalia idalia	Regal fritillary	I	FS	1985
Atrytone arogos arogos	Arogos skipper	I	FS	
Haliaeetus leucocephalus	Bald eagle	II	FS	
Erynnis persius persius	Persius duskywing butterfly	II	FS	
Moxostoma ariommum	Bigeye jumprock	III	FS	
Stygobromus abditus	James Cave amphipod	III	FS	
Speyeria diana	Diana fritillary	IV	FS	
Etheostoma osburni	Candy darter	II	CC	
Cryptobranchus alleganiensis alleganiensis	Eastern hellbender	II	CC	1979
Crotalus horridus	Timber Rattlesnake	IV	CC	
Loxia curvirostra	Red crossbill	I		
Sphyrapicus varius	Yellow-bellied sapsucker	I		
Dendroica virens	Black-throated green warbler	I		
Vermivora chrysoptera	Golden-winged warbler	I		
Ambloplites cavifrons	Roanoke bass	II		
Pseudacris brachyphona	Mountain chorus frog	II		
Botaurus lentiginosus	American bittern	II		
Anas rubripes	American black duck	II		
Aegolius acadicus	Northern saw-whet owl	II		
Dendroica cerulea	Cerulean warbler	II		
Limnothlypis swainsonii	Swainson's warbler	II		
Troglodytes troglodytes	Winter wren	II		

Notes: * I=VA Wildlife Action Plan- Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need.
** FE=Federal; Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed FC=Federal Candidate; FS=Federal Species of Concern; CC=Collection Concern
***Based upon county records

TABLE 4-7. VASCULAR PLANTS THAT ARE FEDERALLY LISTED, PROPOSED, CANDIDATE SPECIES, AND SPECIES OF CONCERN AND/OR NATURAL HERITAGE RESOURCES IN PULASKI AND MONTGOMERY COUNTIES, VIRGINIA (VDCR, 2013).

COMMON NAME	SCIENTIFIC NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS	LAST YEAR OBSERVED
Pulaski County						
Piratebush	*Buckleya distichophylla*	G2		SOC		
A Bittercress	*Cardamine flagellifera*	G3	S1			1939
Chestnut Lipfern	*Cheilanthes eatonii*	G5?	S2			1981
Fee's Lipfern	*Cheilanthes feei*	G5	S1			1998
Smooth coneflower	*Echinacea laevigata*	G2	S2	LE	LT	2004
Creeping Aster	*Eurybia surculosa*	G4G5	S1			1974
Sweet-scented Indian-plantain	*Hasteola suaveolens*	G3	S2			1976
Plains Muhly	*Muhlenbergia cuspidate*	G4	S2			1991
Stiff Goldenrod	*Oligoneuron rigidum var. rigidum*	G5T5	S2			1991
Canby's mountain-lover	*Paxistima canbyi*	G2		SOC		
Sword-leaved phlox	*Phlox buckleyi*	G2		SOC		
Prostrate Blue Violet	*Viola walteri*	G4G5	S2			1991
Montgomery County						
Piratebush	*Buckleya distichophylla*	G2	S2	LE		2002
Canada Anemone	*Anemone Canadensis*	G5	S1			1986
Cooper's Milkvetch	*Astragalus neglectus*	G4	S2			2003
Crested Sedge	*Carex cristatella*	G5	S2			1974
Inland Sedge	*Carex interior*	G5	S1			2003
A sedge	*Carex juniperorum*	G2		SOC		

COMMON NAME	SCIENTIFIC NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS	LAST YEAR OBSERVED
Schweinitz's Sedge	*Carex schweinitzii*	G3G4	S1			2001
Chestnut Lipfern	*Cheilanthes eatonii*	G5?	S2			2002
Addison's Leatherflower	*Clematis addisonii*	G2		SOC		
Fleshy Hawthorn	*Crataegus succulenta*	G5	A1			2003
Matted Spikerush	*Eleocharis intermedia*	G5	S1			1993
Spotted Joe-pye Weed	*Eupatorium maculatum var. maculatum*	G5T5	S2			1980
Glade Spurge	*Euphorbia purpurea*	G3	S2			1980
	Gentianella quinquefolia ssp.occidentalis	5T4T5	S1?			2003
Fringed Gentian	*Gentianopsis crinita*	G5	S1			1984
Small-head Rush	*Juncus brachycephalus*	G5	S2			2001
Torryey's Rush	*Juncus torreyi*	G5	S2			1973
Star Duckweed	*Lemna trisulca*	G5	S1			1972
Loesel's Twayblade	*Liparis loeselii*	G5	S2			1996
Four-flowered Loosestrife	*Lysimachia quadriflora*	G5?	S1			1981
Stiff Goldenrod	*Oligoneuron rigidum var. rigidum*	G5T5	S2			1993
Large-leaved Grass-of-parnassus	*Parnassia grandifolia*	G3	S2			2001
Canby's mountain-lover	*Paxistima canbyi*	G2		SOC		
Sword-leaved phlox	*Phlox buckleyi*	G2		SOC		
A Bluegrass	*Poa saltuensis*	G5	S2			1987
Dwarf	*Quercus*	G5	S1			1936

COMMON NAME	SCIENTIFIC NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS	LAST YEAR OBSERVED
Chinquapin Oak	*prinoides*					
Alderleaf Buckhorn	*Rhamnus alnifolia*	G5	S1			2001
Capillary Beakrush	*Rhynchospora capillacea*	G4	S1			1937
Prairie Rose	*Rosa setigera*	G5	S1			2001
Pinnate-lobed Black-eyed Susan	*Rudbeckia triloba var. pinnatiloba*	G5T3	S1			1993
Whorled Nutrush	*Scleria verticillata*	G5	S2			1993
Upright Greenbriar	*Smilax ecirrata*	G5?	S1			2001
Shining Ladies'-tresses	*Spiranthes lucida*	G5	S1			1996
Great Plains Ladies'-tresses	*Spiranthes magnicamporum*	G4	S1			2003
Longleaf Dropseed	*Sporobolus compositus var. compositus*	G5T5	S1S2			2000
Small Dropseed	*Sporobolus neglectus*	G5	S2			1992
American Purple Vetch	*Vicia Americana ssp. Americana*	G5T5	S1S2			1971
Prostrate Blue Violet	*Viola walteri*	G4G5	S2			2003

Notes: *This species has been documented in an adjacent county and may occur in this county.
Explanation of Global Ranking: G1 = highly globally rare. G2 = globally rare. G3 = either very rare and local throughout its range or distributed locally. G4 = apparently secure globally. G5 = demonstrably secure globally. G? = the species has not yet been ranked.
Definition of State Conservation Status Ranks: S1 = critically imperiled. S2 = imperiled. S3 = Vulnerable. S4 = apparently secure. S5= secure. S? = the species has not yet been ranked.
Definitions of Federal Status: LE = listed endangered. LT = listed threatened. SOC = species of concern.
Definitions of State Status: SC = Special Concern.

Currently USFWS is investigating the green floater mussel as a candidate for federal listing. The mussel is under review as a state threatened species by VDGIF (p. communication J. Copeland, VDGIF). There are four other Tier IV species identified from the search: pistolgrip (mussel), Diana fritillary (butterfly), alewife (fish) and timber rattlesnake (snake). These species are

designated because they have demonstrated a significant declining trend and if the trend continued, the species will likely qualify for a higher tier and greater protection.

The state listed eastern hellbender, *Cryptobranchus alleganiensis alleganiensis*, (rank S2/S2) has been identified as potentially occurring in the area surrounding the Project and is known to occur in Montgomery and Pulaski counties (VDGIF, 2013). The species is vulnerable because it is an obligate aquatic organism with low annual recruitment and is sensitive to water quality changes (VDGIF, 2013). This species prefers cool, well-oxygenated water with substrates dominated by large rubble (Nickerson et al., 2002) and water velocities that are moderate to fast (VDGIF, 2013). It is believed that water quality including temperature and conductivity may limit suitable habitat use. Reproduction occurs in late summer and the externally fertilized eggs are deposited in nests built and guarded by the males. Species longevity is greater than 25 years and adults are considered to be nocturnal scavengers on fish or prey upon crayfish and juveniles feed on arthropods, crustaceans and worms (VDGIF, 2013).

4.6.2 IDENTIFICATION OF HABITAT REQUIREMENTS FOR FEDERALLY LISTED SPECIES

4.6.2.1 AQUATIC AND SEMI-AQUATIC SPECIES

There are no critical habitats listed in the Project Vicinity (USFWS, 2013). A detailed discussion of federally listed species, federal candidate species, and species of concern, and their habitats, can be found below.

ROANOKE LOGPERCH

The Roanoke logperch was listed as Endangered on July 18, 1989 (54 FR 34468 34472). It was listed due to its relatively low densities and limited extent of range. Typical habitats for this species include riffles, runs, and pools with sand to boulder-strewn bottoms within warm and clear medium-sized streams. The Roanoke logperch is endemic to the Roanoke River drainage and the Nottoway River drainage in south-central Virginia. The species predominantly occurs in those portions of the drainage within the Piedmont and Ridge and Valley physiographic provinces. The Roanoke Logperch Recovery Plan, established March 20, 1992, called for the protection and enhancement of habitat that contained populations in addition to expanding populations within river corridors that historically supported populations or currently do. Rivers systems to be monitored under the recovery plan included the upper Roanoke River, Pigg River,

Smith River, and Nottoway River (USFWS, 1992). The New River is part of the Ohio River Drainage and as such would likely not contain the Roanoke logperch.

BIG SANDY CRAYFISH

The Big Sandy crayfish is a state endangered and a federal species of concern. Typical habitat for this species includes unpolluted streams of moderate width and permanent, fast-flowing pools that are at elevations above 1,500 feet on the Allegheny Plateau (VDGIF, 2013). Habitat preference includes large, flat rocks on top of unconsolidated gravel and sand (VDGIF, 2013).

ORANGEFIN MADTOM

The orangefin madtom is a state threatened and federal species of concern. The species is limited to Craig Creek and the Roanoke drainage above Salem in Virginia (VDGIF, 2013). The species is found in medium to large, cool to warm streams of moderate gradient and lives beneath shelter or larger gravel, rubble, and boulders (VDGIF, 2013).

4.6.2.2 UPLAND SPECIES

There are no critical habitats upland species listed in the Project Vicinity (USFWS, 2013). A detailed discussion of federally listed species, federal candidate species, and species of concern, and their habitats, can be found below.

FRINGED MOUNTAIN SNAIL

The Fringed Mountain Snail is a globally rare land snail that endemic to the New River in Pulaski County, Virginia. This snail was listed as federally endangered by the USFWS in January 1983 (USFWS, 1983). The snail occurs beneath the surface of the soil from 10-60 cm. This species is found in damp, calcium rich rocky soil, and the habitat surface generally lacks a leaf litter layer. No specific stresses to this species were reported, but potential threats to the species include: herbicide spraying, road widening, and reactivation of a local quarry. The VDGIF did not define any specific conservation actions specific to this species in the CWCS. The USFWS has published a Recovery Plan (1983) for this species, which list several conservation actions including: protection of known habitat areas through easements, cooperative agreements and acquisitions, summer and fall surveys, and the establishment of monitoring and management programs.

Research has indicated that the Virginia fringed mountain snail has been documented as occurring on a river bluff in Radford, Virginia which is located downstream of the Project on the New River. A review of VDGIF and VDCR maps showed that species may occur in close proximity to the Project; however, because distribution maps are often based upon county occurrence reports, it is not possible to determine if this species is found within the Project Area.

INDIANA BAT

The federally and state endangered Indiana bat may utilize the Project Area for foraging and roosting. 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 mine shafts (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). During this period, they use loose and peeling bark of large (16 inches or more in diameter) trees for maternity colony roosting sites (DeGraaf and Yamasaki, 2001). Favored trees include ash, hickory, elm, and sycamore – all floodplain forest trees which occur in the Project Area.

VIRGINIA BIG-EARED BAT

The Virginia big-eared bat is both a federal and state endangered species. This species of bat is typically located in karst regions dominated by oak-hickory or beech-maple-hemlock communities. They will use caves in these habitats in both winter and summer (Bagley, 1984). The concentration of these bats in a few caves is what makes this species vulnerable to being extirpated. Protecting caves known to have Virginia big-eared bat is critical to protecting this species.

APPALACHIAN GRIZZLED SKIPPER

The Appalachian grizzled skipper is a state threatened species and a federal species of concern. Typical habitat for this species includes grassland scrub habitat that is in close proximity (usually less than 30 m) to oak or pine forests. The larval host plant for this species is the dwarf cinquefoil (*Potentilla canadensis*). The decline of this species has been linked to insecticide applications that target gypsy moth (NJDEP, 2009).

ELLETT VALLEY PSEUDOTREMIA MILLIPEDE

This millipede is a cave dwelling species that has only been found in caves in Ellett Valley, Montgomery County, Virginia. The Ellett Valley pseudotremia millipede is an endangered species in Virginia because it has only been found in four caves. If this species were found in Project Area the likely habitat would include small caves and crevices in limestone outcrops (Simon, 1995).

REGAL FRITILLARY

The regal fritillary is a federal species of concern. Habitat includes tall-grass prairie and other open locations including damp meadows, marshes, wet fields, and mountain pastures (BAMONA, 2014).

AROGOS SKIPPER

The Arogos skipper is a federal species of concern. It has been observed in Suffolk City and in Montgomery County, Virginia (VDGIF, 2013). Habitat preferences are relatively undisturbed grasslands, prairies, sand prairies, and serpentine barrens (BAMONA, 2014).

BALD EAGLE

On July 9, 2007 the bald eagle was removed from protection under the Endangered Species Act, but is still protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act (72 FR 37345-37372). Bald eagles typically nest within 0.25 to one mile of large bodies of open water such as lakes and large rivers. Eagles nest in large, super-canopy trees or snags often in late-successional forest. They prefer a nest site at the edge of the forest, near foraging areas, unobstructed views, and little human disturbance (McGarigal et al., 1991). Most eagles forage primarily on fish, with lesser quantities of waterfowl, carrion, and small mammals (Gough et al., 1998).

PERSIUS DUSKYWING BUTTERFLY

The Persisus duskywing is a federal species of concern. This species has not been reported in either county. Habitat preferences are open areas that include mountain grasslands, marshes, sand plains, seeps, and streamsides (BAMONA, 2014).

BIGEYE JUMPROCK

The bigeye jumprock is a federal species of concern. It has been collected in Montgomery County, Virginia and occupies the Roanoke River and its forks above Roanoke and upper Smith River above Philpott Reservoir (VDGIF, 2013). According to Jenkins and Burkhead (1993) this species prefers warm streams of moderate gradient that can be silted. Generally the bigeye utilizes deep runs and pools with rubble, boulder, and jagged outcrops.

JAMES CAVE AMPHIPOD

The James Cave amphipod is a federal species of concern. It has been collected in Pulaski County, Virginia (VDGIF, 2013). Life histories of the species are unknown at this time.

DIANA FRITILLARY

The Diana Fritillary is a federal species of concern. The species has been collected in both counties of the Project (VDGIF, 2013). Habitat preferences are in stream-bottom lands in mountainous areas and in forests with opens for feeding including alder and rhododendrons (VDGIF, 2013).

SMOOTH CONEFLOWER

The smooth coneflower is a state threatened and federally endangered species. The flower grows in open woods, cedar barrens, roadsides, dry limestone bluffs, and utility line rights-of-way, usually on magnesium and calcium rich soils. The primary threats to this species include the suppression of fire and destruction of habitat for development and silviculture (USFWS, 1995).

4.6.3 REFERENCES TO KNOWN BIOLOGICAL OPINION, STATUS REPORTS, OR RECOVERY PLANS PERTAINING TO A LISTED SPECIES

The following sources of information were used to describe rare, threatened, and endangered species and their habitats at or in the vicinity of the Project:

- US Fish and Wildlife Service (USFWS) Lists of RT&E Species and Species of Concern for Pulaski and Montgomery Counties
- Virginia Department of Conservation and Recreation (VDCR) Natural Heritage Inventory
- Virginia Department of Game and Inland Fisheries (VDGIF) Draft Virginia Comprehensive Wildlife Conservation Strategy

- Virginia's Precious Heritage – A Report on the Status of Virginia's Natural Communities, Plants, and Animals, and Plan for Preserving Virginia's Natural Heritage Resources

4.6.3.1 SPECIES-SPECIFIC PLANS

There are currently no Natural Community Conservation Plans (NCCP) or Habitat Conservation Plans (HCP) in place for the habitats provided by the Project (USFWS, 2013; VDCR, 2014). Recovery plans are currently in place for the smooth coneflower, Roanoke logperch and the Virginia fringed mountain snail. A draft recovery plan is available for the Indiana bat.

4.6.4 EXTENT AND LOCATION OF FEDERALLY-DESIGNATED CRITICAL HABITAT OR OTHER HABITAT FOR LISTED SPECIES IN THE PROJECT AREA

The USFWS has not designated critical habitat within Little River, Virginia for any aquatic or terrestrial species (USFWS, 2013).

4.6.5 POTENTIAL ADVERSE IMPACTS AND ISSUES

Due to the limited footprint of the Project and operation mode of the Project, the Licensee does not anticipate any significant Project effects related to RT&E species. The habitat requirements of the majority of the listed species likely exclude these species from the Project Area. However, the Licensee will discuss the potential occurrence of RT&E species within the Project Area during the relicensing process.

4.6.6 PROPOSED MITIGATION AND ENHANCEMENT MEASURES

As noted, the Licensee will discuss the potential occurrence of RT&E species within the Project Area during the relicensing process. At this time, no studies, mitigation or enhancement measures are proposed.

4.6.7 REFERENCES

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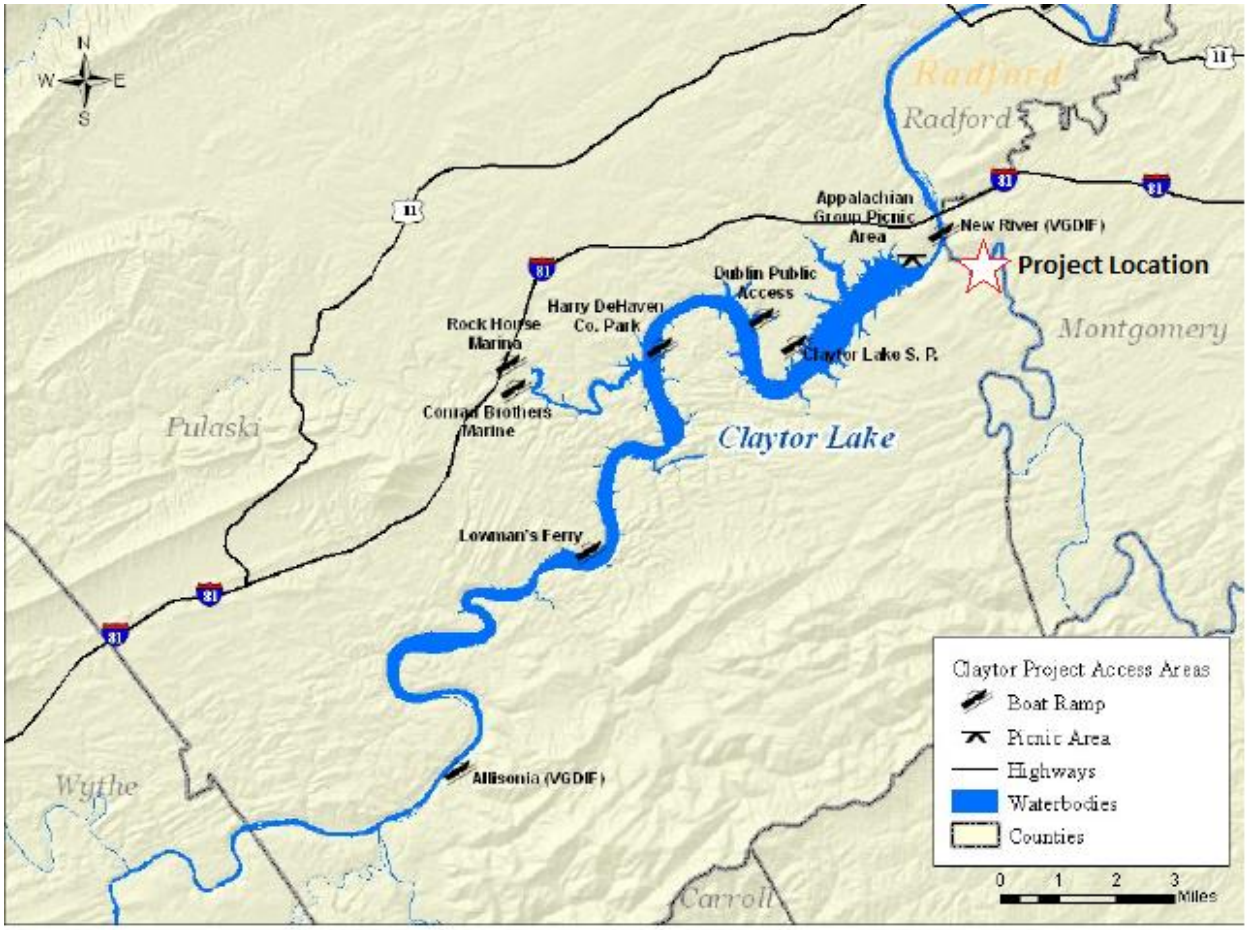
4.7 RECREATION AND LAND USE [§ 5.6 (D)(3)(VIII)]

4.7.1 EXISTING RECREATIONAL FACILITIES

Although the Project Area is relatively small, the Licensee provides recreation facilities at the Project which include a boat ramp located upstream of the Project Dam to provide access to the reservoir, parking lot, canoe portage, and picnic area. Public safety signage has also been installed at the Project.

There are other recreational opportunities available in the Project Vicinity, but not directly associated with the Project itself. Claytor Lake is located only a short distance from the Project. Recreational opportunities available at Claytor Lake include boating, angling, hiking, camping, swimming, canoeing/kayaking, and picnicking. There are several public recreation sites at and around Claytor Lake, including three boat launch areas maintained by the VDGIF known as Allisonia, Dublin Boat Launch, and New River boat launch (Appalachian, 2009). Harry DeHaven County Park is also located at Claytor Lake and is maintained by Pulaski County. Claytor Lake State Park encompasses 472 acres with approximately 3 miles of shoreline along Claytor Lake and includes a full-service marina, three boat launches, two angling docks, a swimming beach, 3 miles of hiking trails, and a playground, among other amenities (APPALACHIAN, 2009). New River Trail State Park stretches 57 miles through southwestern Virginia near the town of Allisonia. The Appalachian Group Picnic Area is located adjacent to Claytor Dam on 10 acres and includes a picnic pavilion, picnic tables, garbage cans, benches, bathroom facilities, courtesy pier, and a boat dock. All of these recreation facilities are depicted in Figure 4-7 (APPALACHIAN, 2009).

FIGURE 4-7. RECREATION FACILITIES AT CLAYTOR LAKE



Source: Berger, 2008, modified by Kleinschmidt

4.7.2 RECREATIONAL USE OF LANDS AND WATERS

Recreational activity in the Project Area includes canoeing and kayaking, fishing, hunting and swimming. Boating and fishing occurs both upstream and downstream of the dam. Recreational use estimates collected during the most recent FERC Form 80 submittal period indicate approximately 375 recreation days per year, with a peak weekend average of 5 recreation days.

4.7.3 EXISTING SHORELINE BUFFER ZONES WITHIN THE PROJECT BOUNDARY

The Licensee owns, or owns flowage rights on, all of the shorelines within the Project Boundary. Shorelines within the Project Boundary are generally left to their natural conditions, with limited development surrounding the Project reservoir. No significant shoreline or riverbank erosion, slides or instability has been observed in the Project Area.

4.7.4 CURRENT AND FUTURE RECREATION NEEDS FROM EXISTING STATE OR REGIONAL PLANS

The following plans do not identify any planning issues or related recommendations that would bear relevance to the Project lands or existing recreation facilities or the continued current operation of the Project:

- 2007 Virginia Outdoors Plan (VOP)
- Pulaski County Comprehensive Plan, 2007-2009
- Montgomery County, 2025: Montgomery County, Virginia Comprehensive Plan

4.7.5 CURRENT SHORELINE MANAGEMENT PLAN OR POLICY

Due to the small size of the Project, and the limited number of surrounding landowners, no shoreline management plan is necessary.

4.7.6 DISCUSSION OF WHETHER THE PROJECT IS LOCATED WITHIN OR ADJACENT TO A DESIGNATED OR UNDER STUDY FOR INCLUSION IN THE NATIONAL WILD AND SCENIC RIVER SYSTEM

No designated National Wild and Scenic Rivers are located within or adjacent to the Project Area. Downstream of the Project, a 20-mile stretch of the New River from Glen Lyn, Virginia to Bluestone Lake is being examined for National Wild and Scenic River determination. However, this determination has not yet been made. Moreover, this area is well out of the influence of Project operations.

4.7.6.1 A STATE-PROTECTED RIVER SEGMENT

No state-protected river segments are in the Project Area or affected by the Project. However, the section of the Little River which stretches from Route 8 to the New River convergence and includes the Project is currently being considered for designation as a Scenic River of Virginia (VDCR, 2007). Additionally, the New River from Claytor Lake to the West Virginia border is also currently under consideration for listing under the Virginia Scenic River Program. This stretch of the New River was evaluated under the Program and found to be worthy of designation, which then requires an act of legislation (VDCR, 2007). The New River converges with the Little River approximately one-half miles downstream of the Project.

4.7.7 DESCRIPTION OF PROJECT LANDS UNDER STUDY FOR INCLUSION IN THE NATIONAL TRAILS SYSTEM OR AS A WILDERNESS AREA

There are no Project lands under study for inclusion in the National Trails System or as Wilderness Areas. The New River Trail, a National Scenic Trail, follows 39 miles of the New River including the upstream reaches of Claytor Lake and the Appalachian Trail passes through the state of Virginia approximately 40 miles west of the Project.

4.7.8 REGIONALLY OR NATIONALLY IMPORTANT RECREATION AREAS

There are no known regionally or nationally important recreation areas in the vicinity of the Project.

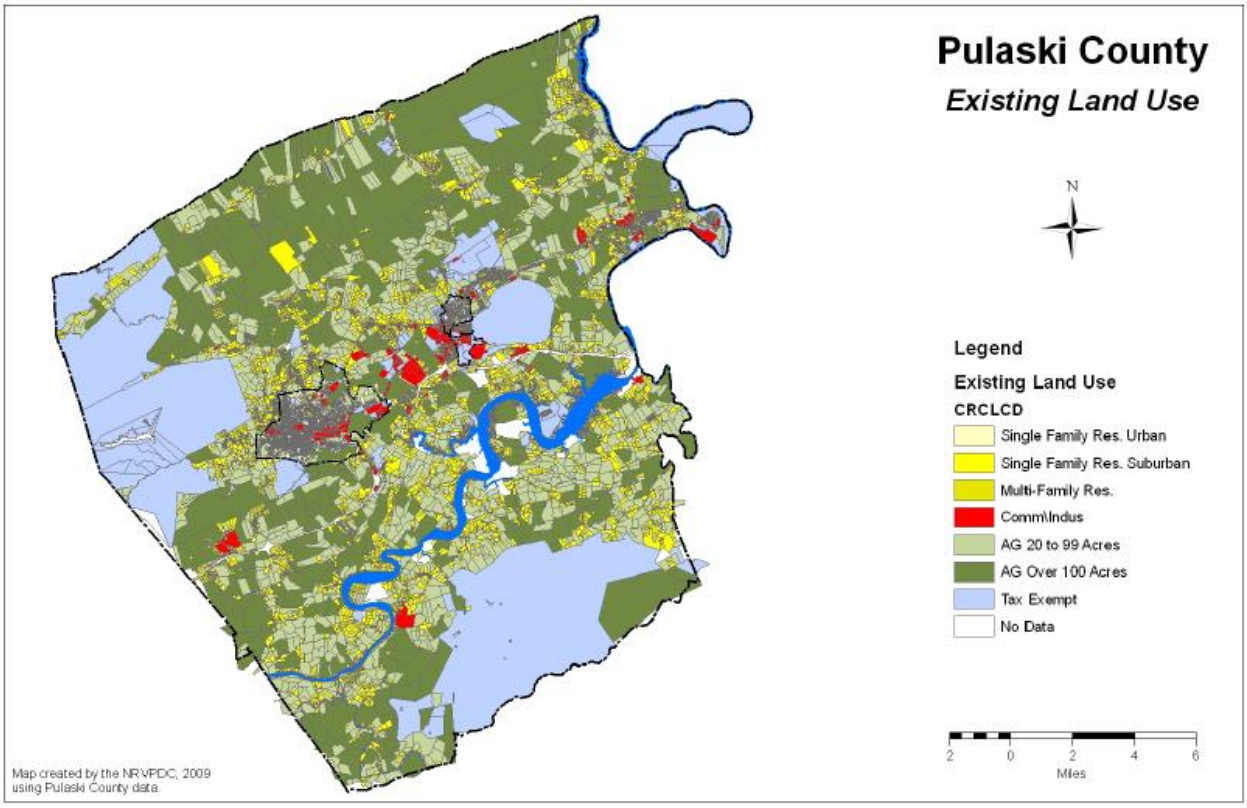
4.7.9 NON-RECREATIONAL LAND USE AND MANAGEMENT WITHIN THE PROJECT BOUNDARY

Besides the lands set aside for recreation, the land included within the PBL includes only the land necessary for Project operations. These lands are maintained by the City of Radford and managed solely for the purpose of the Project.

4.7.10 RECREATIONAL AND NON-RECREATIONAL LAND USE AND MANAGEMENT ADJACENT TO THE PROJECT BOUNDARY

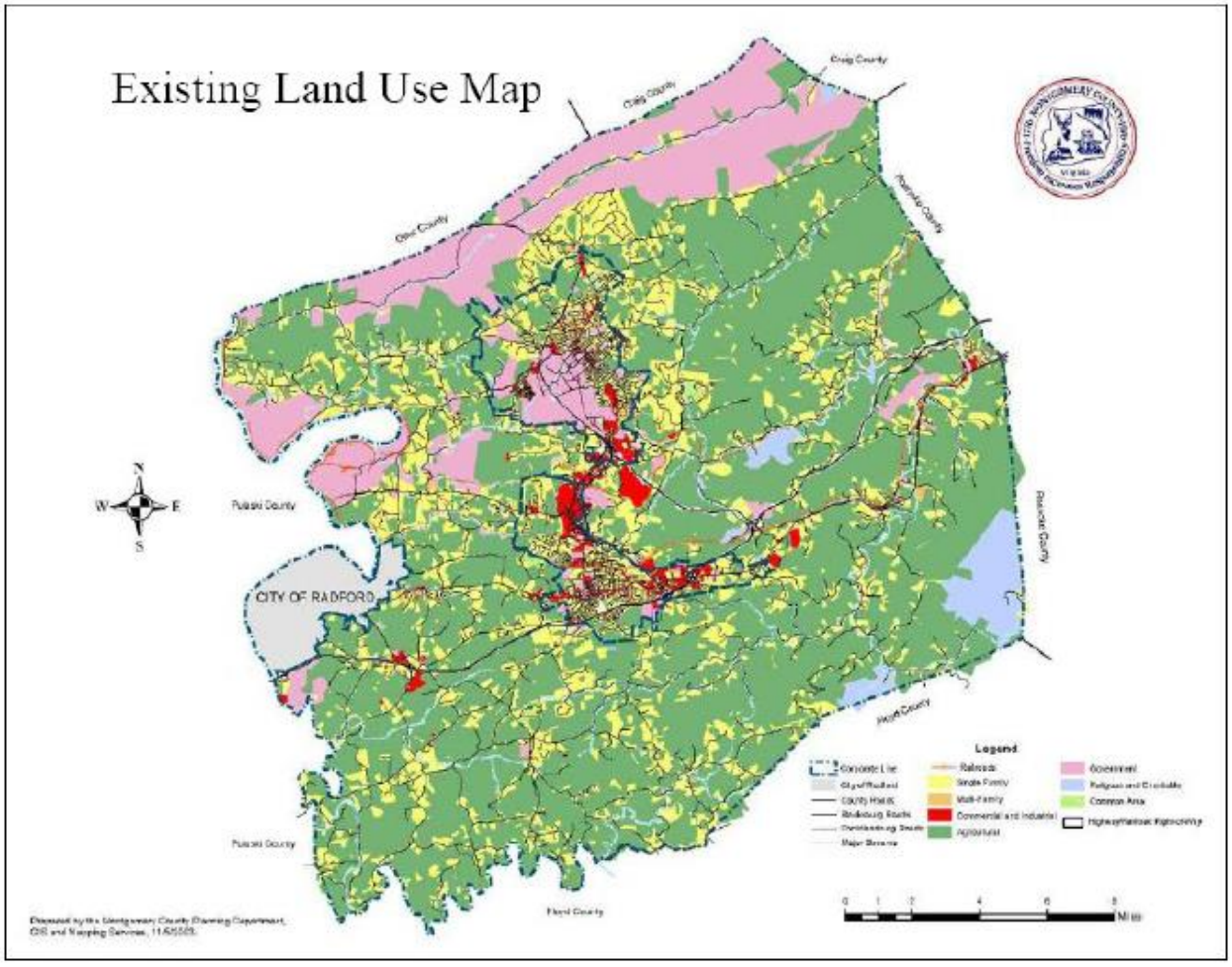
The Project is located in Pulaski and Montgomery Counties, Virginia. Together these counties encompass approximately 700 square miles (U.S. Census, 2014a) (U.S. Census, 2014b). Existing land uses for Pulaski County and Montgomery County are depicted in Figure 4-8 and Figure 4-9. A large majority of the lands surrounding the Project are used for agricultural and residential purposes. The City of Radford is also located within close proximity to the Project, which includes a heavy concentration of commercial and residential development.

FIGURE 4-8. EXISTING LAND USE FOR PULASKI COUNTY



Source: Pulaski County, 2009

FIGURE 4-9. EXISTING LAND USE FOR MONTGOMERY COUNTY



Source: Montgomery County, 2004

4.7.11 POTENTIAL ADVERSE IMPACTS AND ISSUES

The Licensee proposes no changes to Project operations or structures through this relicensing. Additionally, due to the small size of the Project and the limited land included in the PBL, the Licensee does not expect any adverse effects with regards to recreation or land use within the PBL or the surrounding areas.

4.7.12 PROPOSED MITIGATION AND ENHANCEMENT MEASURES

The Licensee believes that there is enough existing information available to analyze the potential effects of continued operations on recreation and land use. As such, no studies are being proposed for these resource areas. Furthermore, Project recreation areas are not being used in a capacity that would necessitate mitigation or enhancement measures at this time.

4.7.13 REFERENCES

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Virginia Department of Conservation and Recreation (VDCR). 2007. 2007 Virginia Outdoors Plan. [Online] URL: http://www.dcr.virginia.gov/recreational_planning/vop.shtml. Accessed February 25, 2014.

4.8 AESTHETIC RESOURCES [§ 5.6 (D)(3)(IX)]

The Project is located within the New River Valley region of Virginia, which is surrounded by the Blue Ridge Mountains to the south and the Appalachian Mountains to the north. The majority of land within the region is forested (68.3%) and includes the Little River which is relatively undeveloped (NRVPDC, 2014). The area immediately surrounding the Project is heavily forested with pockets of agricultural fields. Shorelines surrounding the Project and associated reservoir are highly sloped and consist mainly of limestone and shale bedrock. The severe topography of the area gives rise to cliffs, making the area appear rugged and scenic. The Project is mostly hidden from public view, located in a somewhat isolated location encompassed by the gently sloping mountains. It is however visible to the public when crossing the Highway 605 Bridge, which is located downstream of the Project. The visible structures at the Project include a small powerhouse, a concrete dam that is 293 feet long and 58 feet high, and a concrete tailrace. There is also one distribution line stemming from the powerhouse which is 1.8 miles long.

4.8.1 POTENTIAL ADVERSE IMPACTS AND ISSUES

As the Project was originally constructed in 1934 and no additional construction or structural changes are proposed, no adverse impacts to the aesthetic resources within the Project Vicinity are expected to occur. Because of this, and because the Licensee believes that sufficient existing information is available to address any concerns associated with Project effects on aesthetics, the Licensee is proposing no additional studies associated with this resource area.

4.8.2 PROPOSED MITIGATION AND ENHANCEMENT MEASURES

No mitigation or enhancement measures associated with potential Project effects on aesthetics are proposed at this time.

4.8.3 REFERENCES

New River Valley Planning District Commission (NRVPDC). 2014. Virginia's New River Valley. [Online] URL: http://www.nrvpdc.org/newrivervalley.html. Accessed January 21, 2014.

4.9 CULTURAL RESOURCES [§ 5.6 (D)(3)(X)]

Brief Historic Overview of Radford

The City of Radford and the Municipal Hydroelectric Project are located in the New River Valley in western Virginia. The earliest inhabitants of this area include members of the Powhatan, Shawnee, and Cherokee Indian tribes (Virginia, 2014). The first recorded exploration of the valley was in 1654 by Colonel Abram Woods (Virginia, 2014). In the 1970, the first permanent settlements were established by Germans at Dunkard's Bottom, which is now located under Claytor Lake, and Draper's Meadow in Blacksburg. With the arrival of English, Scottish and Irish settlers, a series of Indian wars occurred, which included the Draper's Meadow Massacre in 1755. During this massacre, Mary Draper Ingles was kidnapped by members of the Shawnee tribe and later escaped to Ohio (Radford, 2014).

At the New River crossing of the Wilderness Road, which is present day Rock Road in Radford, William and Mary Ingles established Ingles Ferry in 1762. It wasn't until 1836 that a post office was established and the mid 1800s when the railroad arrived (Radford, 2014). The town officially became named Radford in 1887 in honor of Dr. John Blair Radford, a prominent local physician. On January 22, 1892, the Virginia General Assembly granted the town of Radford independent status, whereupon it became known as the City of Radford (Radford, 2014).

Area of Potential Effect

The Advisory council on Historic Preservation (Advisory Council) defines an Area of Project Effect (APE) as the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The City of Radford will consult with the Virginia State Historic Preservation Office (SHPO), the Eastern Band of Cherokee Indians (ECBI), and the Virginia Council of Indians (VCI) to determine the APE for the Municipal Hydroelectric Project. While an APE has not yet been formally established, for the purpose of this PAD, it is assumed that the APE for this Project will consist of only the lands and waters within the Project Boundary and possibly other lands immediately adjacent to the Project.

4.9.1 IDENTIFICATION OF ANY HISTORIC OR ARCHAEOLOGICAL SITE IN THE PROJECT VICINITY

The National Register of Historic Places (NRHP) and the Virginia Landmarks Register (VLR) were both consulted to determine if any important listed cultural resources are located in the Vicinity of the Project. Seven sites located within the City of Radford are listed on the NRHP and are listed below (NPS, 2014) (VDHR, 2013).

- Arnheim at 40 Dalton Drive (#02000589)
- East Radford Historic District including Norwood, Stockton, and Downey Sts. And Grove Avenue (#00000491)
- Glencoe at First Street (#00001439)
- Halwyck at 915 Tyler Avenue (#97001074)
- Harvey House at 706 Harvey Street (#76002228)
- La Riviere at 5 Ingles Street (#94000991)
- West Radford Commercial Historic District including 100, 200 and 300 blocks of W. Main Street (#04001541)

Additionally, the following sites are located in Pulaski and Montgomery counties, near the City of Radford (NPS, 2014) (VDHR, 2013).

- Ingles Ferry located N of jct. of Rtes. 611 and 624 (#69000275)
- James Charlton Farm located at VA 666, 1.3 mi. SW of VA 724 (#89001816)
- Ingles Bottom Archeological Sites located at an undisclosed location (#78003032)

Although the sites listed above are located in the vicinity of the Project, they are not located in the Project Boundary or in the expected APE for the Project. Project operations will have no effect on any of these sites.

As part of the relicensing effort for the Claytor Hydroelectric Project (FERC # 739), Appalachian Power Company conducted a cultural resources study in 2007 in consultation with the SHPO, the Eastern Band of Cherokee Indians and the Virginia Council of Indians (Appalachian, 2009). The Claytor Project is located approximately 0.5 miles from the Municipal Project on the New River. This study identified 12 previously recorded archaeological sites and 15 new archaeological sites and two isolated finds in the vicinity of the Claytor Project (Appalachian, 2009). Seven of these sites were recommended potentially eligible for inclusion in

the NRHP, with five of these being found as experiencing Project-related effects including subjection to active erosion. The study determined that two of these five archaeological sites were eligible for the NRHP, which includes sites 44PU162 and 44PU164 (Appalachian, 2009). To protect these sites over the term of the new license for Claytor, Appalachian Power Company is developing a Historic Properties Management Plan (HPMP).

4.9.2 Existing Discovery Measures, Such As Surveys, Inventories, And Limited Subsurface Testing Work, For The Purpose Of Locating, Identifying, And Assessing The Significance Of Historic And Archaeological Resources That Have Been Undertaken Within Or Adjacent To The Project Boundary

Currently, there are no existing measures in place for the purpose of locating, identifying and assessing the significance of historic and archaeological resources within or adjacent to the Project Boundary.

4.9.3 Identification Of Indian Tribes That May Attach Religious And Cultural Significance To Historic Properties

The Licensee will consult with the Cherokee Band of Indians and the Virginia Council of Indians to develop the APE for the Project as well as identify any religious or culturally significant historic properties in the APE.

4.9.4 Potential Adverse Impacts And Issues

There are no new ground-disturbing activities associated with the continuing operation of the Project, and therefore it is not expected that the continued operation of the Project will adversely affect the cultural resources located in or around the expected Project APE.

4.9.5 Proposed Mitigation And Enhancement Measures

Although no adverse effects are anticipated as part of the continued operation of the Project, the Licensee will consult with the Virginia State Historic Preservation Officer as well as the Cherokee Band of Indians and the Virginia Council of Indians to determine the Project APE and if any mitigation or enhancement measures should be considered as part of this relicensing.

4.9.6 REFERENCES

Appalachian Power Company (Appalachian). 2009. Claytor Hydroelectric Project: Preliminary Licensing Proposal.

National Park Service (NPS). 2014. National Register of Historic Places. [Online] URL: http://www.nps.gov/nr/research/ Accessed February 27, 2014.

Radford, Virginia. 2014. The New River City Radford, Virginia: Radford Then & Now. [Online] URL: https://www.radford.va.us/virginia-jobs-radford.html. Accessed February 27, 2014.

Virginia. 2014. Wilderness Road: Virginia's Heritage Migration Route. [Online] URL: http://www.virginia.org/wildernessroad/wrCommunity.asp?community=10 Accessed February 27, 2014.

Virginia Department of Historic Resources (VDHR). 2013. Historic Registers Homepage. [Online] URL: http://www.dhr.virginia.gov/registers/register.htm Accessed February 27, 2014.

4.10 SOCIO-ECONOMIC RESOURCES [§ 5.6 (D)(3)(XI)]

Below is a summary of selected socioeconomic variables for the Project Vicinity, which includes Montgomery and Pulaski counties, Virginia. The nearest populated town to the Project is Radford, Virginia.

4.10.1 POPULATION PATTERNS

In 2012, an estimated 95,194 people were living in Montgomery County, Virginia and an estimated 34,736 people were living in Pulaski County, Virginia. From 2010 to 2012, populations in Montgomery County grew slightly (0.8 percent) while populations in Pulaski County dropped slightly (-0.4 percent). These population changes were well below the growth experienced throughout the state of Virginia, which saw an overall increase of 2.3 percent. Populations densities are significantly higher in Montgomery County (243.9 persons per square mile) compared to Pulaski County (109.0 persons per square mile) as well as statewide densities (202.6 persons per square mile) (U.S. Census, 2014a) (U.S. Census, 2014b).

TABLE 4-8. POPULATION STATISTICS AS OF 2012

	MONTGOMERY COUNTY	PULASKI COUNTY	VIRGINIA
Population			
Population (2012)	95,194	34,736	8,186,628
Population (2010)	94,392	34,872	8,001,031
Population Growth (2010 to 2012)	0.8%	-0.4%	2.3%
Geography (2010)			
Land area in square miles	387.01	319.86	39,490.09
Population Density (ppl/sq mi)(2010)	243.9	109.0	202.6
Gender (2012)			
Male	51.8%	49.8%	49.1%
Female	48.2%	50.2%	50.9%
Age (2012)			
Persons under 5 years old	4.4%	4.7%	6.2%
Persons under 18 years old	15.8%	18.7%	22.7%
Persons 65 years old and over	10.5%	19.4%	13.0%
Race (2012)			
Caucasian	85.5%	91.4%	64.1%
Black	4.1%	5.3%	19.7%
American Indian and Alaska Native	0.3%	0.2%	0.5%
Asian	5.6%	0.6%	6.0%
Native Hawaiian and Other Pacific Islander	0.1%	--	0.1%
Hispanic or Latino	2.9%	1.3%	8.4%
Two or more races	2.1%	1.4%	2.6%

Source: U.S. Census, 2014

4.10.2 HOUSEHOLD/FAMILY DISTRIBUTION AND INCOME

In 2012, Montgomery County had a total of 34,739 households, while Pulaski County had only 14,874 households. In Montgomery County, there were 2.41 persons per household, compared to 2.28 persons per household in Pulaski County. The state of Virginia averaged 2.59 persons per household. Median household income in 2012 was $44,166 for Montgomery County and $43,072 for Pulaski County. Median household income was significantly lower in these two counties compared to the statewide average of $63,636. Approximately 24.4% of the persons in Montgomery County are below the poverty level where only 14.7% of persons in Pulaski County are below the poverty level (U.S. Census, 2014a)(U.S. Census, 2014b).

4.10.3 PROJECT VICINITY EMPLOYMENT SOURCES

Within Montgomery County, the largest source of employment is education and health care services, followed by arts, entertainment, recreation, accommodation and food services and retail trade (U.S. Census, 2014a). Education and health care services are also the primary source of employment within Pulaski County with the second and third largest sources of employment being manufacturing and retail trade (U.S. Census, 2014b).

4.10.4 THE REGIONAL ECONOMY

Three industries contribute to nearly half of Virginia's total economy including education and health care services; professional, scientific, management, administrative and waste management services; and retail trade. However other industries important to Virginia's economy include arts, entertainment and recreation, public administration, manufacturing and construction (U.S. Census, 2014a). In 2012, the gross domestic product for the state of Virginia was approximately $450 billion and the median household income was $63,636. Approximately 11.1 percent of people living in Virginia are below the poverty level (U.S. Census, 2014a).

4.10.5 POTENTIAL ADVERSE IMPACTS AND ISSUES

There are no expected adverse effects with regards to socioeconomics associated with this Project. Instead, this Project provides a low cost source of renewable energy to the region. The Licensee believes that sufficient socioeconomic data are available for the Project Vicinity and therefore proposes no studies related to this resource area.

4.10.6 REFERENCES

U.S. Census. 2014a. QuickFacts: Montgomery County, Virginia. [Online] URL: http://quickfacts.census.gov/qfd/states/51/51121.html Accessed January 21, 2014.

U.S. Census. 2014b. QuickFacts: Pulaski County, Virginia. [Online] URL: http://quickfacts.census.gov/qfd/states/51/51155.html Accessed January 21, 2014.

4.11 TRIBAL RESOURCES [§ 5.6 (D)(3)(XII)]

None of the historic sites listed on the NRHP near the Municipal Project in Radford are associated with tribal interests. Additionally, through the course of outreach to date, the Licensee has not identified any Indian tribes, tribal lands, and interests that the Project may affect. However, as stated, the Licensee will consult with the Eastern Band of Cherokee Indians and the Virginia Council of Indians to determine if the continued operation of the Project will have any effect on tribal lands or interests.

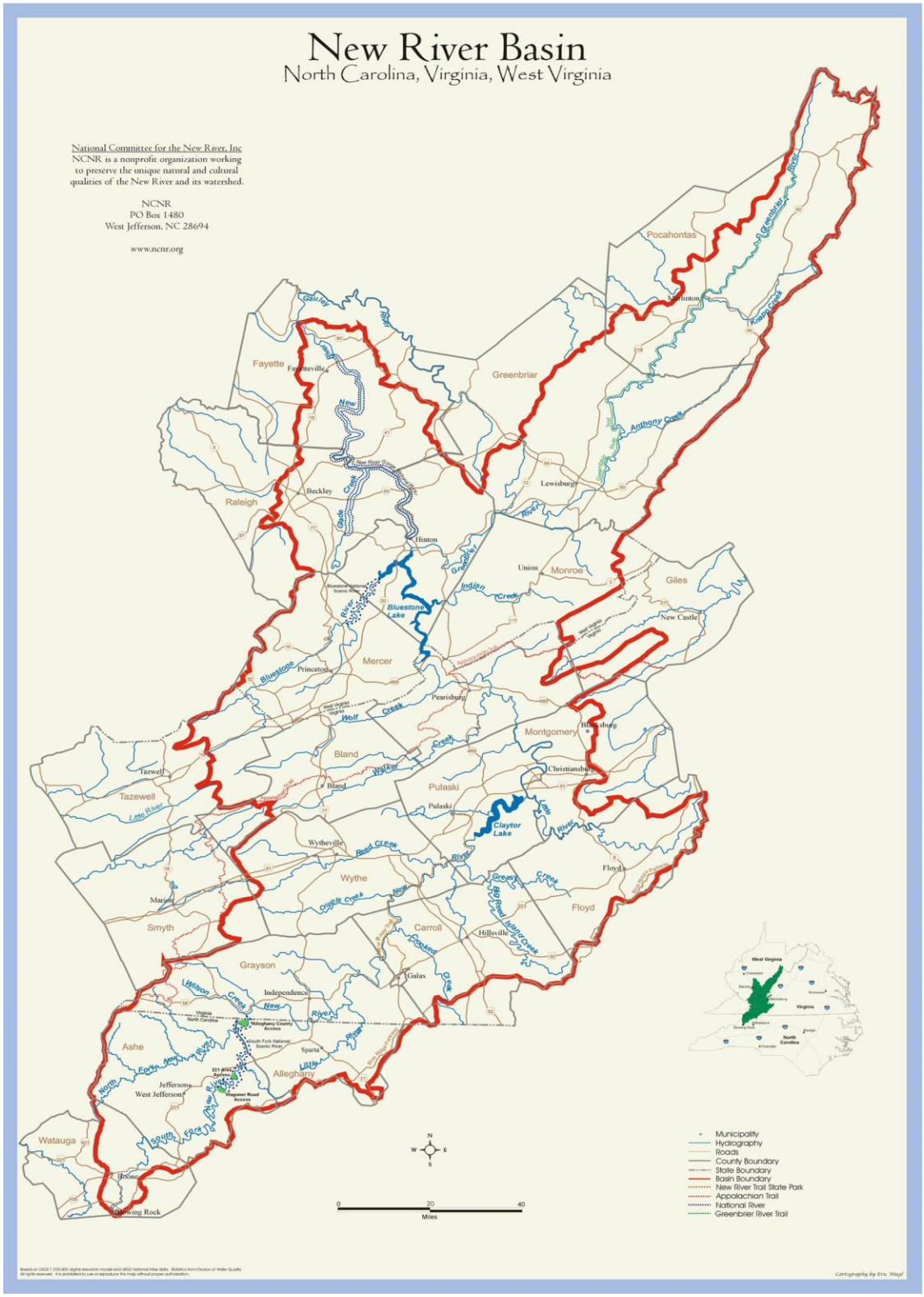
4.12 RIVER BASIN DESCRIPTION [§ 5.6 (D)(3)(XIII)]

4.12.1 AREA OF RIVER BASIN AND SUB-BASIN AND LENGTH OF STREAM REACHES

The Little River flows for approximately 93 miles through southwest Virginia. The Little River and its watershed are located primarily in Floyd County, Virginia, with smaller portions in Pulaski and Montgomery counties, Virginia (VDEQ, 2011). The Little River headwaters originate near Copper Hill in northeastern Floyd County and flow west-northwest downstream to its confluence with the New River at the Pulaski and Montgomery county line, south of Radford, Virginia. The drainage area for the Little River is approximately 225,000 acres (VDEQ, 2011).

The Little River watershed is part of the Kanawha River Basin, also known as the New River Basin, which drains the Mississippi River into the Gulf of Mexico. The Kanawha River Basin covers approximately 12,223 square miles in North Carolina, Virginia and West Virginia (USGS, 2000).

FIGURE 4-10. NEW RIVER BASIN



Source: National Committee for the New River, Inc. (NCNR)

4.12.2 MAJOR LAND AND WATER USE IN PROJECT AREA

4.12.2.1 LAND USE

Land use within the Valley and Ridge province, where the Project is located, consists of approximately 82 percent forest, 15 percent agriculture, two percent urban and one percent mining and other disturbed lands (USGS, 2000). There is one major industrial area within the basin that is located along the Kanawha River, approximately 20 miles from Charleston, Virginia. About 7 percent of the coal mined in the United States from this basin, and is mined in the Appalachian Plateaus in West Virginia (USGS, 2000). However, neither of these industrial areas is located within the Project Area.

Approximately 57 percent of the Little River's 225,000 acre drainage area is comprised of forest lands. Another third of the drainage area is covered in pasturelands, with the remaining area split among small percentages or developed, cropland, wetlands and water surfaces (VDEQ, 2011).

FIGURE 4-11. LAND USE IN KANAWHA RIVER BASIN

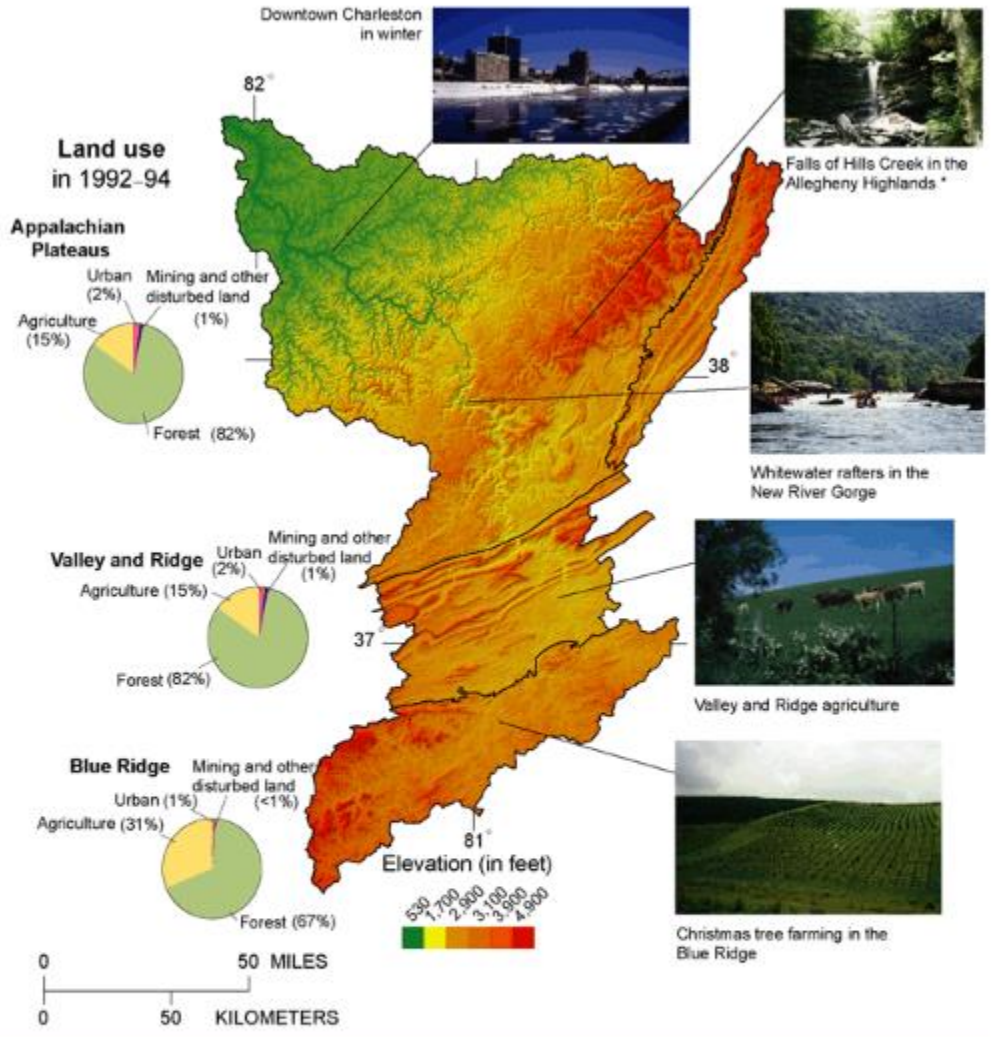


Figure 1. In the mountainous Kanawha-New River Basin, elevation ranges from over 4,000 feet in the Allegheny Highlands of the Appalachian Plateaus Province and the Blue Ridge Province to about 560 feet at the mouth of the river at Point Pleasant,W. Va. Forest accounted for 81 percent of the land cover in 1993 (Multi-Resolution Land Characteristics Interagency Consortium, 1997). Logging is a major industry throughout the basin. The entire basin was logged by the early 20th century, and no undisturbed areas remain (Clarkson, 1964). Coal mining is prevalent in the Appalachian Plateaus. The Blue Ridge Province contains proportionally more agricultural land than the Appalachian Plateaus and Valley and Ridge Provinces. Cattle, hay, and corn grown as cattle feed are the primary agricultural products (National Agriculture Statistics Service, 1999). Physiographic provinces from Fenneman, 1938. **Photograph by Julie Archer, and used by permission.*

4.12.2.2 WATER USE

In 1995, 61 percent of the Kanawha River basin's population depended on surface water supplies for domestic needs, while another 30 percent relied on domestic water wells (USGS, 2000). The remaining nine percent used public supply water wells (USGS, 2000).

4.12.3 ALL DAMS AND DIVERSION STRUCTURES IN THE BASIN

The Kanawha River Basin river system is regulated by four major flood-control dams, three navigation dams and several smaller dams. The two largest dams include the Summersville Dam located on the Fauley River and the Sutton Dam located on the Elk River (USGS, 2000). The other two major dams are located on the New River. Navigational dams located on the Kanawha River include Winfield Dam, Marmet Dam and London Dam (ORSANCO, 2014).

Just upstream of the confluence with the Little River is Claytor Dam, which is located at river mile 252 on the New River in Pulaski County, Virginia (Appalachian, 2009). Three other FERC licensed hydropower projects exist upstream of Claytor on the New River, including the Buck and Byllesby multi-development project and the Fries Project (Appalachian, 2009). Eighty-eight miles downstream of the Claytor Dam, the Army Corps of Engineers operates the Bluestone Dam in Hinton, West Virginia (Appalachian, 2009). Additionally, the Municipal Hydroelectric Project dam is located on the Little River.

4.12.4 TRIBUTARY RIVERS AND STREAMS

The Little River, which is a tributary to the New River, is approximately 93 miles long and originates in Copper Hill, Virginia. Tributaries to the Little River include Big Laurel Creek, Burks Run, Big Indian Creek, Big Branch, Bush Creek, Camp Creek, Dodd Creek, Meadow Run, Meadow Creek, and Pine Creek (VDEQ, 2011).

4.12.5 REFERENCES

Appalachian Power Company (Appalachian). 2009. Claytor Hydroelectric Project: Preliminary Licensing Proposal.

Ohio River Valley Water Sanitation Commission (ORSANCO) 2014. Kanawha River Navigational Dams. [Online] URL: http://www.orsanco.org/navigational-dams/6-mainpages/river-facts--conditions/174-kanawha-river-navigational-dams Accessed March 6, 2014.

USGS. 2000. Introduction to the Kanawha-New River Basin. [Online] URL: http://pubs.usgs.gov/circ/circ1204/introduction.htm Accessed March 6, 2014.

Virginia Department of Environmental Quality (VDEQ) 2011. Little River and Tributaries Water Quality Implementation Plan. [Online] URL: http://www.deq.virginia.gov/Portals/0/DEQ/Water/TMDL/ImplementationPlans/littleippublic.pdf Accessed March 6, 2014.

5.0 PRELIMINARY ISSUES AND STUDIES LIST FOR EACH RESOURCE AREA [§ 5.6 (D)(4)]

5.1 ISSUES PERTAINING TO THE IDENTIFIED RESOURCES AND POTENTIAL STUDIES AND INFORMATION GATHERING REQUIREMENTS ASSOCIATED WITH THE IDENTIFIED ISSUES

A primary purpose of this PAD is to identify potential environmental issues associated with continued operation of the Project and to determine if additional information is necessary to understand potential Project effects on environmental resources. The Licensee used existing, relevant, and reasonably available information to develop baseline descriptions of the resources described above in Section 4.0. Additionally in Section 4.0, the Applicant discusses preliminary issues associated with potentially affected resources.

As described, no changes to project structures or operations are currently proposed. Furthermore, the Licensee has identified limited environmental effects associated with the continued operation of the Project. These effects primarily include minor disturbances related to maintenance of project facilities, as summarized below:

- **Geology and Soils** – Although there are steep slopes surrounding the reservoir, there is no significant shoreline or riverbank erosion, slides or instability present at the Project. Since no changes to Project facilities are proposed, no adverse effects are expected to occur with continued Project operation. For these reasons, no studies, mitigation or enhancement measures are planned at this time for this resource. However, in the event that major structural changes are considered for the Project, appropriate sediment erosion control requirements will be undertaken during construction.
- **Water Resources** – In conjunction with this relicensing, the Licensee will submit a 401 Water Quality Certification application that includes a summary of all existing water quality data for the Project. Existing water quality sampling indicates that water quality standards are generally met within the Project Area, with the exception of bacteria, for which a TMDL has been issued. In the event further data collection efforts are needed for the VDEQ to make a determination regarding a 401 Water Quality Certificate, the Licensee will address those in consultation with resource agencies.
- **Fish & Aquatic Resources** – A 25 cfs minimum flow is maintained downstream of the Project to protect fishery habitat. Existing studies indicate that the Project area supports a diverse aquatic community. The Licensee believes that there is enough existing information available to determine the potential for Project effects resulting from continued operations. The Licensee has not identified the need for mitigation or enhancement measures at this time.
- **Wildlife & Botanical Resources** – Due to the limited Project footprint, the Licensee has not identified any adverse effects to wildlife that use the upland or littoral habitats in the

Project Vicinity. While routine maintenance or repairs to Project structures allow for the potential of adverse effects to local wildlife and botanical resources through invasive weed dispersal, the Licensee maintains Best Management Practices during these activities to minimize and prevent any impacts. While the Licensee plans to discuss the need for resource studies with state and federal agencies, no studies are identified as necessary for this resource area at this time.

- **Floodplains, Wetlands, Riparian and Littoral Habitat** – No significant wetland resources exist within the Project Vicinity. The shorelines surrounding the Project are generally steep and support mostly upland vegetation.
- **Rare, Threatened, and Endangered Species** – Several federally listed threatened or endangered species have been documented as potentially occurring within a 3-mile radius of the Project Area, including: Roanoke logperch (FE), Virginia fringed mountain snail (FE), Indiana bat (FE), Virginia big-eared bat (FE), and smooth coneflower (FE). The habitat requirements of the majority of the listed species likely exclude these species from the Project Area. Nevertheless, the Licensee will consult with state and federal resource agencies regarding the potential for RT&E species in the Project Area during relicensing.
- **Recreation and Land Use** - A limited amount of recreation use occurs in the Project Area and the Project provides facilities that are sufficient to accommodate the current level of use. Furthermore, no changes are proposed to Project facilities or operations that would affect existing land use. As such, no studies or mitigation measures are proposed for this resource area.
- **Aesthetic Resources -** As the Project was originally constructed in 1934 and no additional construction or structural changes are proposed, no adverse effects to the aesthetic resources within the Project Vicinity are expected to occur. No studies are proposed for this resource area.
- **Cultural and Tribal Resources -** As discussed in Section 4.9, literature searches were conducted during the development of this PAD. There are no new ground-disturbing activities associated with the continuing operation of the Project, and therefore it is not expected that the continued operation of the Project will adversely affect the cultural resources located in or around the expected Project APE. The Licensee will consult with the Virginia State Historic Preservation Officer as well as the Cherokee Band of Indians and the Virginia Council of Indians to determine if any mitigation or enhancement measures should be considered as part of this relicensing.
- **Socioeconomic Resources -** Because the Licensee believes that sufficient socioeconomic data is available for the areas surrounding the Project, no studies or mitigation or enhancement measures related to this resource area are proposed.

5.2 RELEVANT QUALIFYING FEDERAL AND STATE OR TRIBAL COMPREHENSIVE WATERWAY PLANS

Section 10(a) of the Federal Power Act (FPA), 16 U.S.C. § 803(a)(2)(A), requires FERC to consider the extent to which a project is consistent with Federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the Project. On April 27, 1988, FERC issued Order No. 481—A revising Order No. 481, issued October 26, 1987, establishing that FERC will accord FPA Section 10(a)(2)(A) comprehensive plan status to any Federal or state plan that:

- is a comprehensive study of one or more of the beneficial uses of a waterway or waterways
- specifies the standards, the data, and the methodology used
- is filed with the Secretary of the Commission

FERC currently lists comprehensive plans for the State of Virginia and U.S. resources. Of these listed plans, 6 are potentially relevant to the Project, as listed below in Table 5-1. These plans may be useful in the relicensing proceeding for characterizing desired conditions.

TABLE 5-1. LIST OF QUALIFYING FEDERAL AND STATE COMPREHENSIVE PLANS POTENTIALLY RELEVANT TO THE PROJECT

RESOURCE	COMPREHENSIVE PLAN
Recreation Resources/Water Quality and Quantity	National Park Service. The Nationwide Rivers Inventory. Department of the Interior, Washington, D.C. 1993.
Recreation/Land Use	Ohio River Basin Commission. 1977. Kanawha River Basin comprehensive coordinated joint plan. Cincinnati, Ohio. July 1977.
Wildlife Resources	U.S. Fish and Wildlife Service. Canadian Wildlife Service. 1986. North American waterfowl management plan. Department of the Interior. Environment Canada. May 1986.
Aquatic Resources	U.S. Fish and Wildlife Service. n.d. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Washington, D.C

RESOURCE	COMPREHENSIVE PLAN
Recreation Resources	Virginia Department of Conservation and Recreation. The 2007 Virginia outdoors plan (SCORP). Richmond, Virginia.
Recreation Resources	Virginia Department of Conservation and Historic Resources. n.d. Virginia's scenic rivers. Richmond, Virginia.

Source: FERC Revised List of Comprehensive Plans, June 2013

5.2.1 REFERENCES

Federal Energy Regulatory Commission. 2013. List of Comprehensive Plans. December, 2013. [Online] URL: http://www.ferc.gov/industries/hydropower/gen-info/licensing/complan.pdf. Accessed February 2014.

6.0 SUMMARY OF CONTACTS [§ 5.6 (D)(5)]

The Licensee is distributing this PAD and accompanying NOI simultaneously to FERC, federal and state resource agencies, local governments, Native American tribes, NGOs, and others potentially interested in the licensing proceeding. Appendix B details the distribution list for the PAD and NOI. This PAD appropriately references all information sources cited and Appendix B contains a record of all contacts made with agencies and other organizations to date to discuss the Project.

7.0 PURPA BENEFITS [§ 5.6 (E)]

The Licensee is not currently seeking PURPA benefits for the Project.

APPENDIX A

FLOW DURATION CURVES

APPENDIX B

DISTRIBUTION LIST AND CORRESPONDENCE

APPENDIX C

PROJECT BOUNDARY MAPS

APPENDIX D

SPECIES LIST