

**NATIVE AND EXOTIC AQUATIC VEGETATION
REVISED STUDY PLAN**

**Claytor Hydroelectric Project
Application for New License
FERC Project No. 739-018**

October 2006

NATIVE AND EXOTIC AQUATIC VEGETATION REVISED STUDY PLAN

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1.0 Introduction

Appalachian Power Company (Appalachian) is making an application to the Federal Regulatory Commission (FERC or Commission) for a new license for the Claytor Hydroelectric Project (No. 739), located on the New River in southwestern Virginia. The existing Project license was issued to Appalachian by the FERC on July 1, 1981, and expires June 30, 2011. The process being utilized to apply for a new license is the Integrated Licensing Process (ILP), as defined under rules and regulations of the Commission (18 CFR Part 5). As part of this licensing process, Appalachian has solicited input from stakeholder meetings, including governmental agencies and non-governmental organizations, to identify potential project-related issues needing to be addressed during the licensing process.

As part of this licensing process, Appalachian filed the Pre-Application Document (PAD) with the FERC on January 6, 2006. In that document, Appalachian presented available information addressing each identified relicensing issue, and also presented its position regarding issues needing further study. Study plans have been prepared to address each issue needing further study. Initial study plan meetings were held with the stakeholders on July 19 and 20, 2006. The following study plan addresses the issue of native and exotic aquatic vegetation at the Claytor Hydroelectric Project (Project). This version of the study plan incorporates decisions and recommendations made by the study workgroup during the meeting held on August 10, 2006 and comments received since then.

2.0 Background

The Claytor Project is an existing conventional hydroelectric project located on the New River in Pulaski County. The Claytor Project has four generating units, with a combined hydraulic capacity of 10,000 cfs and generating capacity of 75 MW. A location map is provided in Figure 2.1.

The Claytor Dam has an overall length of 1,142 feet and a maximum height of 137 feet above the streambed. The dam consists of concrete gravity dam with gated spillway; integral intake; and powerhouse, switching equipment, and appurtenant facilities. The reservoir behind the dam has an approximate length of 21.5 miles, a surface area of 4,472 acres, and shoreline distance of 100 miles at the normal full pond elevation of 1,846.0 feet. The reservoir storage capacity is estimated to be 225,000 acre-feet. The maximum and mean depths of the reservoir are approximately 115 and 49 feet, respectively.

The upstream Project boundary generally follows the reservoir at the 1,850 foot NGVD contour. The downstream Project boundary extends along the riverbanks approximately 2,000 feet below the dam. Effects of flows from project operations can be seen at the USGS river gage located at Glen Lyn, Virginia.

The Claytor Project powerhouse and intake are located on the right bank of the river and have 4–16 foot diameter penstocks conveying water to the four turbine-generator units.

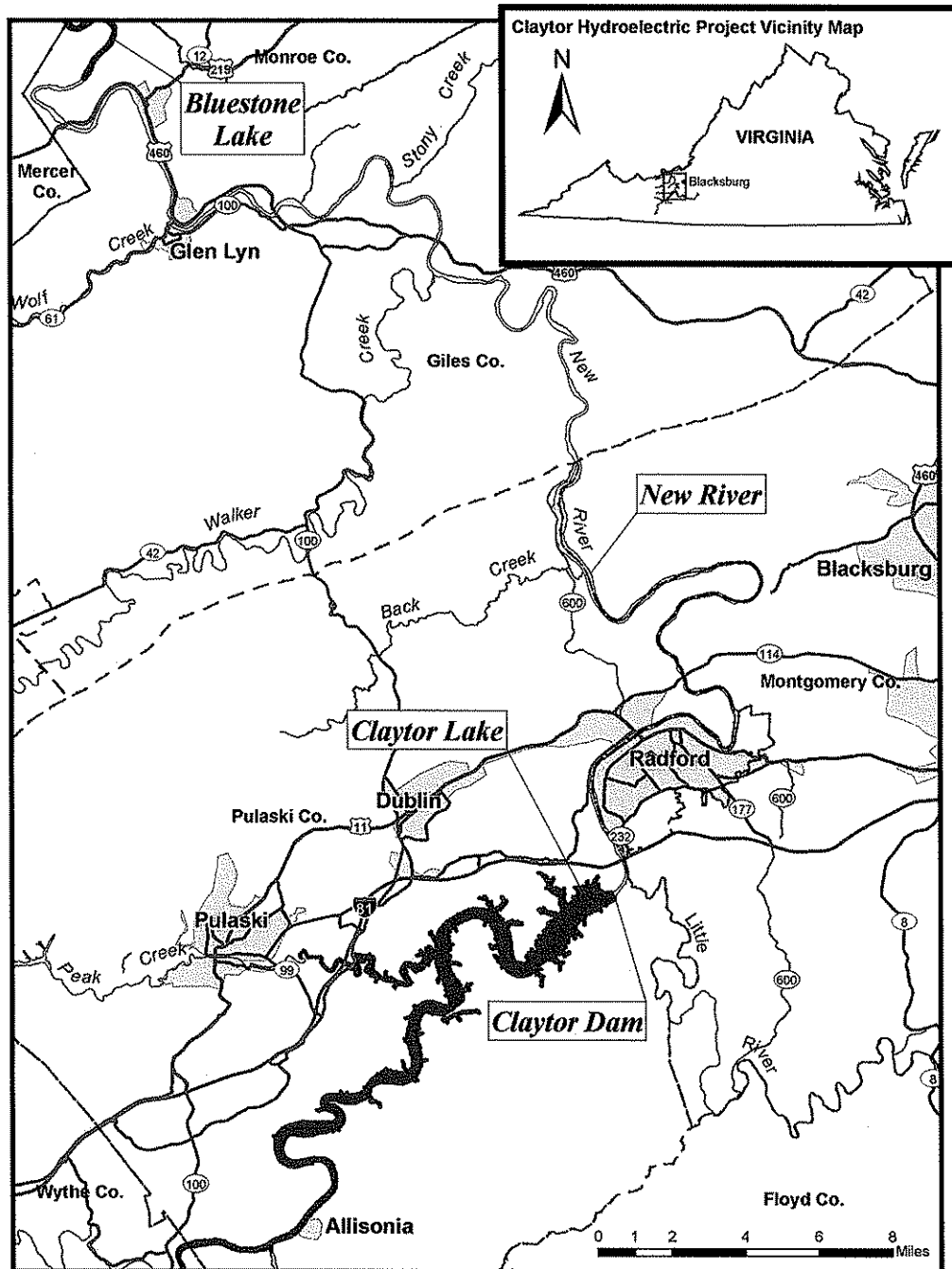


Figure 2.1 Claytor Hydroelectric Project Location, VIRGINIA

The intake section is 176 feet wide with the invert located approximately 61 feet below the reservoir surface. Each hydro unit has two intake bays per penstock, with each bay measuring approximately 38 feet tall and 14 feet wide. The intake screens are vertically aligned.

The Claytor Project is operated on a weekly cycle as a peaking facility from October 16 – April 14. Historical hydro unit outflow releases are normally in the range of 750–8,000 cfs. Daily reservoir fluctuations are typically less than 1 foot, with overall weekly fluctuations of 1-2 feet. During April 15 to June 15, the Project is operated to maintain reservoir elevations at or above 1844 feet to protect spawning habitat for shallow-water spawning fish. Also during recreation season (April 15 – October 15), Appalachian voluntarily operates the project to maintain more constant downstream flows to enhance downstream recreation opportunities by limiting peaking operation. The reservoir is drawn down 5 feet in the late fall or early winter to facilitate lake residence maintenance and/or repairs to docks, bulkheads, and boat ramps. The Claytor Project is operated to provide a minimum average daily flow of 750 cfs.

Aquatic Vegetation

Recently, the non-profit organization Friends of Claytor Lake (FOCL) hired a contractor to survey the aquatic vegetation in Claytor Lake (p. communication, Coley). Three invasive aquatic plant species were identified:

1. Hydrilla (*Hydrilla verticillata*);
2. Brittle Naiad or Brittle Pondweed (*Najas minor*); and
3. Southern Naiad or Southern Pondweed (*Najas guadalupensis*).

Additionally, in 2004, the Virginia Department of Game and Inland Fisheries (VDGIF) identified stands of hydrilla near Claytor Lake State Park (p. communication, Copeland). Estimates of the areal extent of hydrilla on Claytor Lake range from 100 to 200 acres (p. communication, Powers). These non-native freshwater plants form dense mats of vegetation that can greatly reduce fish and wildlife habitat and interfere with recreation at the reservoir. Dense stands of these invasive plants are prevalent from the Lowman's Ferry Bridge upstream towards Allisonia.

Because the growth of hydrilla in some areas of the reservoir, a group of homeowners hired Aquatic Nuisance Plant Control Inc. (Littleton, North Carolina) to treat the hydrilla stands. In summer 2005, Aquatic Nuisance Plant Control applied a contact herbicide treatment (Komeen) to approximately 14 acres at Claytor Lake (p. communication, Coley).

There is no information available about native aquatic vegetation in Claytor Lake.

3.0 Study Objectives

To assess the effects of the Claytor Project operations on native and exotic aquatic vegetation, the primary tasks that will be undertaken are as follows:

1. Determine the composition and distribution of native and exotic aquatic vegetation in Claytor Lake and map sites of verified vegetation beds.
2. Identify beneficial native aquatic vegetation for potential protection measures.
3. Determine the need for a program to control exotic aquatic plants including but not limited to follow-up surveys, public education, and/or an application/permitting program.

4.0 Relicensing Relevance

An overabundance of exotic aquatic vegetation could potentially affect water quality, water intake structures, recreation (i.e., swimming, fishing, boating), fish habitat, native/beneficial vegetation, and other important resources. For these reasons, an assessment to determine the abundance, types, and locations of native and exotic/invasive aquatic plants will be accomplished.

5.0 Methods and Geographic Scope

The geographic scope of this study plan will be Claytor Lake as formed at 1,850 foot NGVD contour. The entire area of Claytor Lake will be surveyed following the methods described below:

1. A search will be conducted to determine if late summer / early fall 2006 high resolution aerial color photographs are available of Claytor Lake. If these photos are available, they will be obtained and reviewed to see if they are usable for purposes of this study. If photographs are unavailable or if existing photographs are not usable, then other methodologies for obtaining this information will be determined with input from the workgroup. If aerial photography is utilized, it will be reviewed by a qualified biologist, familiar with aquatic vegetation signatures, to identify the presence of significant beds of submerged aquatic vegetation in Claytor Lake. The location of any significant beds of submerged aquatic vegetation will be recorded through the use of the Global Positioning System (GPS) for field verification at a later date. Information obtained to identify beds of submerged vegetation will be field verified.
2. Additional information, such as National Wetland Inventory maps, will also be reviewed to identify areas for potential field surveys. Additionally, areas containing submerged aquatic vegetation as identified by the Virginia Department of Game and Inland Fisheries and the FOCL will be reviewed for areas of potential field surveys. Lastly, a brief overview will be conducted by boat to determine additional areas where significant beds of submerged aquatic vegetation exist in Claytor Lake. This brief overview will be performed shortly

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- before starting the field reconnaissance surveys during the late summer/early fall time period.
3. After locations for potential survey have been identified, field reconnaissance surveys to determine the composition and verify the distribution of beds of submerged aquatic vegetation in Claytor Lake will be conducted during the late summer/early fall time period.
 4. Prior to performing the field surveys, consultation with the appropriate state and federal agencies, the FOCL, and other interested stakeholders will be conducted to discuss the survey sites, the dates and timing of the surveys, and to finalize the methods to be employed.
 5. Each location identified for survey will have at least one transect chosen and sampled. An estimated 50 transects will be required for this survey. Additional transects may possibly be needed depending on the size of the beds of submerged aquatic vegetation, variations in the species composition in different areas of the beds, and other site specific characteristics such as available substrate. Each transect will have a minimum of three sampling points. Enough samples will be obtained to reach a 95% confidence level but no less than 10% percent of the vegetation identified from the reconnaissance will be sampled. Vegetation at each sampling point will be collected via a "throw rake" or similar sampling tool starting at a location closest to the shoreline and moving lakeward, perpendicular to the shoreline, until a lack of submerged aquatic vegetation occurs.
 6. At each sampling point, a GPS location and depth reading as well as lake bottom substrate composition will be recorded. All submerged aquatic vegetation will be identified to the species level and verified using a comprehensive key or suitable field guide. In addition, relative abundance will be estimated and recorded for each species collected at every sample point. A voucher sample of each species will be collected for future reference and verification.
 7. All of the data recorded in the field will be used to generate a computer database showing all of the information in a digital format. Additionally, a map will be generated showing the location of all beds of submerged aquatic vegetation located in Claytor Lake.
 8. After the field surveys of Claytor Lake are completed and the data analyzed, an assessment of the condition and composition of the beds of submerged aquatic vegetation will be made. Additionally, utilizing the findings of the field survey, recommendations as to the need for an application/permitting program to control exotic/invasive plants in Claytor Lake will be made. These recommendations may include, but not be limited to follow-up surveys and development of public education programs to help control the spread of exotic/invasive aquatic plants within and into Claytor Lake.

6.0 Analysis and Reporting of Results

Upon completion of analysis, Appalachian will prepare a draft report of the results. Preparation of the draft report will be accomplished in consultation with the stakeholders and agencies. Based upon the comments received regarding the draft report, Appalachian will prepare a final report to be incorporated into the final Application for New License.

The report will include the following:

1. Collected raw data on native and exotic aquatic vegetation (mapped locations, graphs, and other figures), abundances, field measurements, and digital photographs.
2. Information on the general species ecology of the native and exotic/invasive species documented in the Project area.
3. Assessment of native and exotic aquatic vegetation communities in Claytor Lake, including positive and negative effects on fish habitat, recreation, water quality, water intake structures, and other factors.
4. Recommendations for control and/or educational programs.

7.0 Schedule

A pre-study meeting will be held in January 2007. The aquatic vegetation field data collection will be scheduled in the late summer/early fall of 2007. At a minimum, study plan progress updates will be provided to the Commission, as well as the stakeholders involved in the relicensing of the Claytor Project, in May 2007 and November 2007. Additional progress reports will be provided to the stakeholders as information becomes available and meetings will be scheduled with stakeholders at key decision points to seek input and recommendations. All information will be made available in printed format as well as electronic format in accordance with the Information Distribution Protocol for the relicensing of the Claytor Project. Meetings will be scheduled and stakeholders notified in accordance with the Communications protocol for the relicensing of the Claytor Project. Individuals, agencies, governments, etc. will be given at least thirty (30) days time prior to a meeting to review the information to be discussed. Information will also be posted on the web site established for the relicensing of the Claytor Project (www.claytorhydro.com) as appropriate.

8.0 Costs

The estimated cost for performing the Native and Exotic Aquatic Vegetation Study components identified in this plan is \$74,000. These costs include field studies and labor for both consultants and Appalachian.

9.0 References

Appalachian Power Company. 2006. Pre-Application Document (PAD). Integrated Licensing Process, Claytor Hydroelectric Project (FERC Project No. 739). Vol. I. 163 pp.

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Powers, Ron. 2005. Friends of Claytor Lake. Personal communication.