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OFFICE OF ENERGY PROJECTS

Project No. 739-018 – Virginia
Claytor Project
Appalachian Power Company

Ms. Teresa Rogers
Appalachian Power Company
40 Franklin Road
Roanoke, Virginia 24011

Reference: Study Plan Determination for the Claytor Project

Dear Ms. Rogers:

Pursuant to 18 CFR § 5.13(c) of the Commission regulations, this letter contains my study plan determination for Appalachian Power Company's (Appalachian Power) Claytor Project. This determination is based on staff's review of the revised study plan, comments on the proposed and revised study plans, and the verbal record, including comments made at the study plan meetings.

Many study issues have been resolved. The basis for my finding on the issues still in dispute is discussed in Appendix A. A list of the approved studies is attached as Appendix B.

Background

On June 14, 2006, Appalachian Power filed a proposed study plan that included studies on cultural resources; debris; erosion; fish entrainment and impingement; fisheries, mussels, and fringed mountain snail; instream flow needs and reservoir elevations; native and exotic aquatic vegetation; navigational systems; recreation and angler use; sedimentation; water quality; and wetlands, riparian, woody debris, and littoral habitat.

On July 19 and 20, 2006, Appalachian Power held study plan meetings to discuss the study plans, and subsequently met on several occasions with stakeholders in work groups to discuss the details of the study plans. Following the conclusion of the study plan and work group meetings, Appalachian Power filed a revised study plan on October 17, 2006. Comments on the revised study plan were filed separately on November 2,

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2006, by the Virginia Department of Game and Inland Fisheries (Virginia Game and Inland Fish) and the Friends of the New River.

Study Plan Determination

The applicant's study plan filed on October 17, 2006, is approved, with the following modifications:

Aquatic Resources Assessment

In order to ensure that an adequate assessment of mussels is conducted within the drawdown zone of Claytor Lake and downstream of Claytor dam, the revised Aquatic Resources Assessment study plan should be modified as follows:

- Item 1(a) of the Phase II Field Reconnaissance and Survey should be revised by removing the reference to the 10 sampling transects and adding text that states that the level of sampling intensity needed to obtain a statistically valid estimate of mussel numbers will be determined based on the amount of suitable habitat obtained from the bathymetric survey and consultation with the Virginia Department of Game and Inland Fisheries.
- Similarly, item 1(b) of the Phase II Field Reconnaissance and Survey should be revised by removing the reference to the 10 sampling transects and adding text that states the level of sampling intensity needed will be based on the amount of potential habitat identified during reconnaissance surveys and consultation with the Virginia Department of Game and Inland Fisheries.

Hellbender survey

Because it appears that the primary objective of this survey would be to obtain distribution information and relative abundance data, it is not clear how this information relates to project effects. Therefore, the hellbender survey included in the Aquatic Resources Assessment study plan is not required at this time. Should data on the habitat requirements of hellbender be found to be lacking in the literature, site specific studies could be required during the second field season.

Instream Flow Needs and Reservoir Elevations

In order to address concerns raised by the stakeholders on the study objectives of the Instream Flow Needs and Reservoir Elevations study, the study plan should be modified as follows:

- The first paragraph of section 3.0 of the study plan should be clarified to explain what is meant by “two phases” or the reference to “two phases” should be deleted.
- Study objective 3 should be clarified to indicate that the “species of concern” are the same suite of species developed during the work group meetings and are listed on page 9 of the revised study plan.
- Study objective 6 should be revised to read that the instream flow tools will be used to evaluate how project operations affect aquatic habitat over a range of flows including low-flow and high-flow releases.
- Study objective 7 should be deleted since it appears to be redundant to study objective 4.

Fringed Mountain Snail Survey

In order to ensure that Virginia fringed mountain snail habitat is not damaged during surveys, the revised Aquatic Resources Assessment study plan’s fringed mountain snail section should be modified as follows:

- In Phase II, Field Reconnaissance and Survey: During field verification of potential fringed mountain snail habitat, the applicant shall not excavate or otherwise modify potential snail habitat. After field verification of habitat sites and the initial study report, the applicant shall consult with the U.S. Fish and Wildlife Service and the Virginia Department of Game and Inland Fisheries on the need for more intensive surveying or sampling.

Bald Eagle Habitat Study Plan

In order to ensure that eagle habitat along the impoundment is properly documented, the revised bald eagle habitat study plan should be modified as follows:

- In section 5.5, “*Verifying and Mapping the Bald Eagle Habitat*,” the applicant shall conduct eagle nesting surveys during the January 1st through May 31st nesting season. The study area shall include all land within 200 feet of the project’s shoreline. The surveys shall be conducted either on the ground, in a boat, or through aerial surveys as necessary to determine nesting sites.

Recreation Assessment and Angler Use Survey

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In order to adequately describe any ongoing project effects and assess potential modifications to project operation, the revised Recreation Assessment and Angler Use Survey should be modified as follows:

- Section E, Existing Boating Density Analysis, should state that an over-flight will occur on a day near the beginning of each seasonal sampling period (spring, summer, fall), at least one weekend, and cover the entire downstream study area (Zones 1, 2, and 3 combined).
- Item number (8) of section B, page 5 of the Recreation Use and Needs Assessment, should include text that states that “key aesthetic places and areas shall be photographically documented and qualitatively ranked and prioritized for potential protection.”
- The methodology described in section 5.C of the Recreation Use and Needs Assessment should be modified to describe how impacts on recreation from changes in project operation (flows and reservoir levels) will be assessed.
- Consistent with what is being proposed for the angler survey at Claytor Lake, the study objectives for the Recreation Use and Needs Assessment should include gathering similar information on recreation spending for the New River downstream of Claytor dam to the U.S. 460 bridge at Glen Lyn, and describing how recreation spending could change under different project operation scenarios.

If you have any questions, please contact John Smith at (202) 502-8972.

Sincerely,

J. Mark Robinson
Director
Office of Energy Projects

Enclosure A: Appendix A, Response to Comments on Revised Study Plan
Enclosure B: Appendix B, Study Plan Summary

cc: Mailing List

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Public Files

APPENDIX A – STUDY REQUEST ISSUES

Staff's Response to Comments on the Revised Study Plan

Below we discuss comments and recommendations filed November 2, 2006, by the Virginia Department of Game and Inland Fisheries (Virginia Game and Inland Fish) and Friends of the New River on the revised study plan, and provide the basis for requiring or not requiring certain modifications to the revised study plan.

Green floater mussel survey

As part of its Aquatic Resources Assessment (formerly Fish, Mussels, and Fringed Mountain Snail), Appalachian Power proposes to conduct surveys for the green floater mussel in the mainstem of the New River downstream of the Claytor dam to the Route 460 Highway bridge at Glen Lyn, Virginia, and within the zone of project effects of two tributaries--Wolf and Walker Creeks. Appalachian Power proposes to conduct a desktop analysis and literature review to compile known information on mussel distribution and abundance and to conduct field reconnaissance and surveys. For the field portion of the study, Appalachian Power would sample approximately 10 transects within the mainstem New River and effected tributary reaches. The revised study plan indicates that more transects could be added later based on the availability of habitat. Appalachian Power states that it will coordinate the details of the sampling protocol with Virginia Game and Inland Fish prior to conducting the field work.

Virginia Game and Inland Fish, in its comments filed November 2, 2006, recommends that specific tributary reaches be sampled to determine the distribution of the green floater mussel. Virginia Game and Inland Fish indicate that although these reaches may be beyond the hydrological extent of project operations, these areas may represent the only viable populations due to past and continuing impacts of the project such as fragmentation. Appalachian Power has agreed to sample mussels in two tributaries downstream of Claytor dam but only in those areas affected by backwatering due to project operations.

Virginia Game and Inland Fish has not provided sufficient rationale for surveying these tributary reaches. Staff does not recommend surveys of tributaries that occur above the backwater effect of any flow fluctuations caused by the Claytor Project, because there does not appear to be a nexus to project operation.

Virginia Game and Inland Fish recommends that the proposed sampling effort for the mainstem New River sites of 10 transects be increased to 25 transects. Virginia Game and Inland Fish did not provide a basis for the 25 transects. Similarly, Appalachian Power does not provide a basis for sampling a minimum of 10 transects. Pursuant to section 5.9(b)(6), studies must explain how any proposed methodology is consistent with generally accepted practice in the scientific community. Virginia Game

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and Inland Fish and Appalachian Power did not provide this explanation with regard to the sampling effort. Therefore, because the desktop analysis, literature review, and reconnaissance portions of the green floater mussel survey have not been completed, it would be premature to definitively determine the number of transects needed. As such, the study plan should be modified so that the number of transects or sampling sites are based on the potential habitat sites identified through the literature review and reconnaissance portions of the study in consultation with Virginia Game and Inland Fish. Further, in accordance with section 5.9(b)(6) of the Commission's regulations, the resulting study protocol must be consistent with generally accepted practice in the scientific community.

Mussel survey during fall drawdown

As part of its Aquatic Resources Assessment, Appalachian Power proposes to conduct surveys for mussels along the exposed shoreline of Claytor Lake during the fall drawdown. Appalachian Power proposes to conduct a desktop analysis and literature review to compile known information on mussel distribution and abundance and to conduct field reconnaissance and surveys. For the fieldwork portion of the study, Appalachian Power would sample approximately 10 transects within the project reservoir. The study plan indicates that more transects could be added at a later date based on the availability of littoral habitat. Appalachian Power states that it will coordinate the details of the sampling protocol with Virginia Game and Inland Fish prior to conducting the field work.

Virginia Game and Inland Fish, in its comments filed November 2, 2006, recommends that the level of sampling effort be based on the potential suitable habitat determined from the results of the bathymetric survey proposed by Appalachian Power. Further, Virginia Game and Inland Fish state that reaches or quadrats may be more appropriate sampling methods than transects.

As we said above regarding the level of effort needed to sample mussels downstream of Claytor dam, staff recommend that the amount of potential habitat be determined first before establishing the number of transects or quadrats that are needed. Therefore, the study plan should be modified so that the sampling intensity needed to obtain a statistically valid estimate of mussel numbers will be determined based on the amount of suitable habitat obtained from the bathymetric survey in consultation with Virginia Game and Inland Fish. Further, in accordance with section 5.9(b)(6) of the Commission's regulations, the resulting study protocol must be consistent with generally accepted practice in the scientific community.

Virginia Game and Inland Fish also asked how frequently the drawdown survey will be conducted and who will be conducting the survey beyond 2007. Based on the

notes of the work group meeting held on August 10, 2006, Appalachian Power intends to conduct the survey in 2007. Additional surveys could be requested for the second season of studies (2008) upon a showing of good cause as specified in section 5.15(e) of the Commission's regulations.

Crayfish and hellbender surveys

As part of its Instream Flow Needs and Reservoir Elevations study, Appalachian Power includes crayfish and hellbender as aquatic resources that would be evaluated for flow-related effects. Appalachian Power proposes to conduct a literature review to determine the importance of flow-related effects on life history requirements. If habitat suitability curves are available, they would be used in a PHABSIM¹ model. If curves are not available, the results from the literature review and expert testimony would be used to infer flow-related effects on the aquatic species or a surrogate species with available suitability curves may be used. In addition, Appalachian Power proposes to conduct a field survey to document the distribution of hellbender in the New River downstream of Claytor dam. Appalachian Power would coordinate the details of a sampling protocol with Virginia Game and Inland Fish prior to conducting the study.

In its November 2, 2006, comment letter, Virginia Game and Inland Fish states that no comprehensive published information exist for crayfish in the New River downstream of Claytor dam and, therefore, recommend a crayfish survey. Regarding the hellbender survey, Virginia Game and Inland Fish states that the biology and habitat use of the species dictates that night sampling be allowed as necessary and that sampling should be conducted only by trained and experienced surveyors.

Virginia Game and Inland Fish did not request the crayfish and hellbender surveys in accordance with section 5.9(b) of the Commission's regulations. In its letter filed September 18, 2006, Virginia Game and Inland Fish list both surveys as "Potential New River Projects for Claytor Lake Dam Relicensing." Although Appalachian Power has agreed to conduct the hellbender survey and literature reviews of both resources, Appalachian Power also did not address the seven study criteria described under section 5.9(b). Appalachian Power believes that the hellbender survey is needed but that any effects due to project operations on these species would best be determined through the Instream Flow Needs Study.

Because the study criteria were not addressed for the above surveys, it is not clear what the goals and objectives of the two surveys are, or how the study results would inform the development of license requirements. It appears that the primary objective of

¹ PHABSIM software is used to develop the relationship between streamflow and physical habitat for various species life stages of aquatic organisms.

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these surveys would be to obtain distribution information and relative abundance data, but it is not clear how this information relates to project effects. Of more importance to the relicensing and the potential effects of project operations on the two resources is information on habitat type, depth, and substrate composition that could be incorporated into the Instream Flow Needs Study.

Staff recommends that the effects of project operations on crayfish and hellbender be addressed through the Instream Flow Needs and Reservoir Elevations Study as provided in the revised study plan. If information on habitat needs and flow-related effects on life history requirements of crayfish and hellbender are not available from literature accounts or expert testimony as proposed by Appalachian Power, the data must be obtained from field surveys. Therefore, the crayfish and hellbender surveys recommended by Virginia Game and Inland Fish are not required at this time. Should data on the habitat requirements of crayfish or hellbender be found to be lacking in the literature, site specific studies could be required during the second field season.

Instream Flow Needs and Reservoir Elevations

Appalachian Power proposes to use the Instream Flow Incremental Methodology (IFIM) and the Nature Conservancy's Indicators of Hydrologic Alteration (IHA) to describe the effects of project operation on downstream aquatic habitat. In its November 2, 2006, comment letter, Virginia Game and Inland Fish indicates that the proposed studies do not address the long-term effects of project operations on biota. As such, Virginia Game and Inland Fish recommend an adaptive management approach in any license issued that includes monitoring target resources that would allow the stakeholders to re-evaluate and possibly alter license conditions. Virginia Game and Inland Fish state that this approach would be very applicable to mussels, crayfish, and water willow and suggest a specific monitoring protocol for mussels. Lastly, Virginia Game and Inland Fish recommend that study objective 6 be expanded to include an assessment of effects on aquatic habitat during low-flow events as well as high-flow events.

Because Virginia Game and Inland Fish's comments regarding adaptive management are essentially a recommendation for a license condition and not a study request, the study plan does not need to be modified. Regarding study objective 6, staff believes that this objective was intended to address the effects of peaking operations on aquatic habitat. However, we agree with Virginia Game and Inland Fish that the overall assessment should not be limited to high-flow effects. Therefore, study objective 6 should be revised to read that the instream flow tools will be used to evaluate how project operations affect aquatic habitat over a range of flows including low-flow and high-flow releases.

Friends of the New River recommend that the objectives of the Instream Flow

Needs study include an assessment of operation effects on biota and other beneficial uses downstream of the dam rather than just aquatic habitat. They recommend that field studies for mussels, crayfish, and amphibians be conducted both upstream and downstream of the project and contend that one or two field seasons of study are not sufficient to understand the project's effects on populations over time. Friends of the New River also make several specific comments about the wording used in the study objectives. In addition, Friends of the New River reiterate their request for an explicit collaboration process. We address each of these points below.

Appalachian Power proposes to use the IFIM methodology and principally, PHABISM software to determine the effects of project operations on downstream aquatic resources. Staff recognizes that PHABSIM models the relationship between streamflow and physical habitat for various species life stages of aquatic organisms rather than directly measuring population effects. However, in its revised study plan Appalachian Power proposes to also perform a literature review of the species identified during the work group meetings to determine the importance of flow-related effects on their life histories. Appalachian Power also proposes to use the IHA to evaluate a variety of hydrologic parameters that are known to influence ecosystem functions. Staff find that this suite of approaches would be adequate to provide a factual basis for a licensing decision regarding project operations. As we mention above, future monitoring of populations over time as requested by Friends of the New River would be more appropriately addressed as a recommendation for a future license condition. Staff's findings regarding mussel, crayfish, and amphibian surveys are discussed above under the appropriate headings.

Friends of the New River provide several specific recommendations regarding the language of the study objectives that staff recommend that Appalachian Power address. The first paragraph of section 3.0 of the study plan states that the primary tasks will be separated into two phases. We agree with Friends of the New River that it is not clear what these two phases refer to, as the list of objectives are not separated into phases. Second, study objective 3 should be clarified to indicate that the "species of concern" are the same suite of species developed during the work group meetings and are listed on page 9 of the revised study plan. As we stated previously, we agree with Friends of the New River that study objective 6 should be revised to read that the instream flow tools will be used to evaluate how project operations affect aquatic habitat over a range of flows including low-flow and high-flow releases. Last, we agree that study objective 7 is vague. Staff recommends that study objective 7 be deleted since study objective 4 appears to address the effect of project flows on spawning.

Friends of the New River originally framed their recommendation for a collaborative stakeholder process in the form of a study request filed on May 5, 2006. Throughout the study plan process, including the work group meetings and comment

letters including its most recent letter of November 2, 2006, Friends of the New River has expressed concern about a number of aspects of the licensing process to date including the means with which Appalachian Power has documented agreement and disagreement among the stakeholders, how consensus will be determined, and how terms such as “experts” and “stakeholders” will be defined. Friends of the New River recommends that two workshops be sponsored; one where independent experts evaluate the scientific literature on the relationship between flow regime and relevant natural resources and then identify data gaps, and another workshop among the stakeholders which would occur at the completion of the scientific studies with a goal of obtaining a consensus on an appropriate flow regime.

Appalachian Power states that it does not object to working with Friends of the New River and other stakeholders in developing consensus related to the relicensing of the Claytor Project. Appalachian Power contends that the objectives proposed by Friends of the New River are contained within the framework of the Commission’s Integrated Licensing Process. Further, they intend to continue holding stakeholder work group meetings throughout study plan implementation and beyond into license application development, as necessary. Appalachian Power does not believe that Friends of the New River’s request satisfies the purpose of a study to provide necessary information to determine project effects on the environment and inform a licensing decision. We agree with Appalachian Power and do not consider Friends of the New River’s request to be a study per section 5.9 of the Commission’s regulations. However, this is not meant to disparage the usefulness of seeking independent expert advice when needed or to hold stakeholder workshops during the remainder of the relicensing process.

Water Quality

Virginia Game and Inland Fish recommend that the revised water quality study plan fully address water quality impacts downstream of the project and note that a 1-year study may not be sufficient to assess problems.

Appalachian Power proposes to characterize dissolved oxygen and temperature conditions downstream of Claytor dam to the U.S. Route 460 bridge near Glen Lyn using existing information and by collecting additional data from June 15 through September 15 during the study year. In addition, Appalachian Power would review existing water temperature data collected on a continuous basis for a full year by Virginia Game and Inland Fish and determine the need for additional data collection.

In its November 2, 2006, comment letter, Friends of the New River recommends that dissolved oxygen, temperature, and pH data be collected from upstream of the project reservoir and recommends several additional modifications to the revised water quality study plan: (1) replace weekly sampling for dissolved oxygen and water

temperature during pre-dawn or early morning periods with continuous sampling; (2) include benthic invertebrate sampling; and (3) include sampling for contaminated sediments.

Appalachian Power proposes to collect water quality data at three transects upstream of Claytor dam: the project forebay; 1 kilometer (km) upstream of the dam; and near the mouth of Dublin Hollow about 2 km upstream of the dam. In addition, Appalachian Power proposes to review data collected by Virginia Game and Inland Fish upstream and downstream of Claytor dam. Appalachian Power contends that there is no project nexus to collect additional water quality data upstream of the project boundary at Allisonia, Virginia but has agreed to monitor temperatures at a mussel bed upstream of the project boundary.

In order to determine whether the Claytor Project is affecting water temperature downstream of Claytor dam, it would seem necessary to understand the thermal regime of the New River above Claytor Lake. Appalachian Power's proposal to collect temperature information from a mussel bed monitoring station above Allisonia, Virginia would be useful in describing the incoming thermal regime.

Regarding continuous sampling, Appalachian Power's study plan includes a provision under objective 4 where weekly data would be reviewed by the Virginia Department of Environmental Quality (Virginia DEQ) and the need for continuous monitoring determined. The study plan lists several triggers that would indicate the need for continuous monitoring including high water temperatures, which was also mentioned as a trigger by Friends of the New River.

In its study request and comment letters, Friends of the New River did not explain its proposed methodology for benthic invertebrate sampling and how it is consistent with generally accepted practice in the scientific community. Further, Friends of the New River did not explain how the sampling results would inform the development of license requirements. Staff acknowledge that benthic invertebrate sampling along with its associated metrics can be used as a tool to evaluate water quality impairment (Plafkin, et al., 1989). However, while benthic invertebrate metrics such as the EPT index² provide insight into the condition of a water body, the cause of the impairment is left to the expertise of the investigator. Based on existing information and the work group meetings, dissolved oxygen and water temperature were identified as potentially being affected by project operations. As such, Appalachian Power's revised study plan proposes sampling for these parameters upstream and downstream of Claytor dam during

² EPT Index: Count of the number of taxa (families) in each of the three generally pollution-sensitive orders – Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies).

the first study season. The benefits of adding a benthic invertebrate component to the revised study plan is not apparent.

Friends of the New River contend that it is likely that project operations from dredging and rapidly raising and lowering lake levels, can resuspend contaminated sediments, increasing their bioavailability within the reservoir and downstream. Friends of the New River recommend that sediment samples be taken at locations downstream of likely sources of contamination such as the depositional area where Peak Creek enters the project reservoir. Virginia DEQ indicates in its May 3, 2006, study request letter that the project reservoir is listed as impaired for polychlorinated biphenols (PCBs) in fish tissue.

PCBs do not break down easily in the environment and are known to bind strongly to organic particles and bottom sediments although small amounts may dissolve in the water column (www.atsdr.cdc.gov/tfacts17.html). To address the issue of PCB contamination, Appalachian Power proposes to conduct a literature review of activities that disturb sediments and affect water quality and identify which types of activities occur in the project area. Further, Appalachian Power proposes to review and summarize existing data on fish tissue analysis, sediment monitoring, and PCB results.

Based on available information and the Friends of the New River's study request and comment letters, a sufficient nexus has not been demonstrated between PCB contamination and project effects such as fluctuating water levels. In addition, although dredging is not currently proposed by Appalachian Power, any dredging activities that might occur in the future would not necessarily take place at locations where sediments were sampled. If Appalachian Power's literature review demonstrates that project-related effects could increase the availability and uptake of PCBs in the environment, it would seem to be more appropriate to sample sediments prior to and at the location of any proposed activity.

In summary, Appalachian Power's proposed water quality studies appear to be adequate to characterize dissolved oxygen and temperature effects of the project downstream of Claytor dam during the 2007 study season. The water quality study does not need to be modified to replace weekly dissolved oxygen and water temperature sampling with continuous monitoring prior to the proposed triggers and consultation with the Virginia DEQ, sampling benthic invertebrates, and sampling sediments for PCB contamination. However, an additional year of data collection, if necessary, could be requested for the second season of studies (2008) upon a showing of good cause as specified in section 5.15(e) of the Commission's regulations.

Sedimentation

Friends of the New River recommend that the Sedimentation study be expanded to incorporate an assessment of the project's effect on large woody debris downstream of the dam based on concerns expressed at an instream flow study work group meeting. Friends of the New River did not request the woody debris evaluation according to the study criteria of section 5.9(b). Therefore, it is not clear how the methodologies proposed in the sedimentation study could be modified to incorporate a woody debris study or whether a separate woody debris study is appropriate. We note that there are two proposed studies that may address Friends of the New River's concerns. First, the IFIM methodology under the Instream Flow Needs study would include documentation of cover objects such as woody debris when collecting transect data. These data would provide some measure of woody debris availability within the habitat types sampled. Second, the proposed Debris study plan includes objectives for debris removal options and a debris management plan. If woody debris is found to be lacking during the Instream Flow Needs study, the option of introducing woody debris obtained from removal efforts in Claytor Lake into the river downstream of the dam could be evaluated in any debris management plan. Therefore, staff does not recommend modifying the Sedimentation study plan.

Fringed Mountain Snail Survey

Within the revised Aquatic Resources Assessment study plan, Appalachian Power proposes to identify potential fringed mountain snail habitat, based on existing information. Appalachian Power proposes to then perform mapping verification and reconnaissance of the identified potential suitable and non-suitable habitat in the project area, which is defined as project lands above the 1,850-foot contour. During field verifications of potential habitat sites, Appalachian Power would observe evidence of the presence of extant or potential populations, including live or dead specimens (empty shells), signature burrows, associated vegetation/geology, and determine the need to conduct sampling.

Virginia Game and Inland Fish, in its comments filed November 2, 2006, notes that the fringed mountain snail does not leave a signature burrow. Thus, presence/absence through live specimens or shell material would require excavation sampling.

We agree with Virginia Game and Inland Fish that surveys for fringed mountain snail burrows would not likely be successful. Chapter 7 of Virginia's Comprehensive Wildlife Conservation Strategy (Virginia Game and Inland Fish, 2005) explains that the snails may burrow from 10 to 60 centimeters deep, and excavation of soils for the purpose of surveys may cause long-term damage to the habitat. Thus, the report states that survey methods should only disturb rocky habitat as a last resort, and should instead

focus on finding recently-dead shells following periods of rain. In the case that shells are found, follow-up surveys conducted during the spring, when the snails are likely to be closer to the surface, may provide verification of active burrows (Virginia Game and Inland Fish, 2005).

Though Appalachian Power does not specifically propose measures that would alter snail habitat, the study plan, for the sake of clarification, is being modified to exclude excavation and sampling from the fringed mountain snail surveys unless the agencies (U.S. Fish and Wildlife Service and Virginia Game and Inland Fish) find it necessary.

Bald Eagle Habitat Study Plan

In the Wetlands, Riparian, Woody Debris, Littoral, and Bald Eagle study plan, Appalachian Power proposes to form a preliminary bald eagle habitat map based on aerial photography and existing information on bald eagle; the study area for this desktop survey is defined as areas within 200 feet of the shore. Appalachian Power would then conduct a field survey to verify the known or potential habitat, and map all known and potential bald eagle habitat; the study area for this field survey is restricted to “within the project boundary.” The approximate location of perching and roosting habitat and the precise location of bald eagle nests would be identified on maps.

The study area for the field survey should be identical to that of the preliminary, desktop survey, in order to survey for all eagle nests within 200 feet of the project waters. The breeding activity of eagles in this riparian zone could be affected by project-related activities. The revised study plan, therefore, is being modified to include this entire study area in the field surveys for eagle nests. These surveys should take place during the eagle nesting season, between January and May.

In their letter filed November 2, 2006, Virginia Game and Inland Fish note that they were unable to comment on the bald eagle habitat portion of the revised study plan. They express concern that the plan for nesting surveys may be inadequate and that aerial surveys may be required.

The revised study plan did not specify how field verification or on-the-ground surveys will be conducted. Due to the difficult terrain, it is likely that surveys by foot may be difficult or impossible in some areas, perhaps necessitating surveys by boat. Aerial surveys for bald eagle nests would be a suitable substitute for on-the-ground surveys. In addition, aerial surveys may be more cost-effective, particularly if done in conjunction with another study. It is, however, left to the discretion of the applicant to define which methods to use. The study plan is being modified to clarify that all lands within 200 feet of the project’s shoreline shall be surveyed for eagle nests during the

appropriate season, and that these surveys may be conducted aerially or from ground level.

Recreation Assessment and Angler Use Survey

Aerial Surveys

In section E., Existing Boating Density Analysis, of the revised Recreation and Angler Use Survey, Appalachian Power proposes to assess boating density on Claytor Lake by taking aerial photographs on 11 randomly chosen days between Memorial Day and Labor Day. On three of the fly-over days, aerial photography would be extended downstream to include one of three randomly-chosen study zones (Zones 1, 2 and 3, where Zone 1 is closest to the dam) designated for the lower New River below Claytor dam. This photographic coverage of the lower river area would be used to verify on-ground counting efforts also taking place at these times.

Virginia Game and Inland Fish, in a letter filed November 2, 2006, recommends that more flights take place over the New River below the dam to provide additional information on the river. Virginia Game and Inland Fish does not, however, state what additional information it wants.

Appalachian Power notes that the purpose of the three downstream flights is to calibrate ground counts and surveys taken by field staff, and not collect additional data. The cost of increased flights, Appalachian Power states, would far outweigh the benefits, especially if the field counts are comparable to the flight counts.

It is unclear what additional information Virginia Game and Inland Fish has in mind in recommending additional downstream over-flights and we are disinclined to require additional flights on that basis alone. However, because the downstream over-flights will primarily be used to verify the on-ground surveys, these over-flight days should occur near the beginning of the seasonal sampling period and cover the entire downstream zone so any needed adjustments can be made in a timely manner. For instance, downstream over-flight verification should occur on one of the first survey dates in the spring, summer, and fall, and should include at least one holiday.

Scenic Resources

In items numbered (7) and (8) of section B of the Recreation Use and Needs Assessment, page 5, Appalachian Power proposes to identify through spot count exit surveys key aesthetic areas and places that add to the recreation experience at Claytor Lake. Staff recommends that these key aesthetic areas and places be photographically documented, and qualitatively ranked and prioritized for possible future protection.

Assessing Changes in Project Operation

The study objectives for the Recreation Use and Needs Assessment (section 3.B) include “identifying and assessing potential impacts on downstream and reservoir-based recreation due to the project, its operation or proposed modification.” However, it is unclear from section 5.C. (Methods) how the user surveys and questionnaires will provide information on whether the recreation experience changes for better or worse under different reservoir levels and downstream flow regimes. Therefore, the methodology needs to be further refined to describe how impacts on recreation from changes in project operation (flows and reservoir levels) will be assessed. Serious consideration needs to be given to coordinating the pertinent sections of the Recreation Use and Needs Assessment with the Instream Flow Needs and Reservoir Elevation study.

Economic Analyses

The study objectives for the angler use survey include quantifying trip expenditures at Claytor Lake and at the Virginia Game and Inland Fish boat ramp immediately downstream of Claytor dam. The methodology described for the angler use survey includes collecting data on trip expenditures and consumer surplus for Claytor Lake and Claytor Dam Landing, an access point directly below the dam (see section 5., F. Angler Use Survey, pages 12 and 13). Virginia Game and Fish, in its letter filed November 2, 2006, recommends that the economic analyses include the New River below Claytor dam.

We do not typically require studies that attempt to place a monetary value on recreation resources. However, spending and consumer surplus data are proposed to be collected for the project reservoir and at a downstream access point near the dam, and because project effects on instream flows and recreation extend downstream, it would seem to make sense that the study objective for the Recreation Use and Needs Assessment include gathering similar information for the New River downstream of Claytor dam to the U.S. Route 460 bridge at Glen Lyn, Virginia. For the trip expenditures and consumer surplus portion of the recreation assessment and angler use survey to have value beyond an expression of existing conditions, the methodology would need to specify how expenditures and consumer surplus would change under different project operation scenarios.

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References

Plafkin, James J., Michael T. Barbour, Kimberly D. Porter, Sharon K. Gross, and Robert M. Hughes. 1989. Rapid Bioassessment Protocols for use in Streams and Rivers: Benthic Macroinvertebrates and Fish. U.S. Environmental Protection Agency, Assessment and Watershed Protection Division. Washington, D.C.

Virginia Department of Game and Inland Fisheries (Virginia Game and Inland Fish). *Virginia's Comprehensive Wildlife Conservation Strategy*. 2005.

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APPENDIX B
APPROVED STUDIES

#	Study Name
1	Aquatic Resources Assessment (formerly Fish, Mussels and Fringed Mountain Snail)
2	Cultural Resources
3	Debris
4	Erosion
5	Fish Entrainment and Impingement
6	Instream Flow Needs and Reservoir Elevation
7	Native and Exotic Aquatic Vegetation
8	Navigational Systems
9	Recreation Assessment and Angler Use Survey
10	Sedimentation
11	Water Quality
12	Wetlands, Riparian, Woody Debris, Littoral, and Bald Eagle