137 FERC ¶ 62,258
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Appalachian Power Company Project No. 739-022

ORDER ISSUING NEW LICENSE

(December 27, 2011)

Article 402. *Erosion Monitoring*. The Erosion Monitoring Plan is approved and made part of the license and may not be amended without prior Commission approval. Upon license issuance, the licensee shall implement the Erosion Monitoring Plan, filed June 29, 2009, and shall include the following modifications:

(a) add the Skyline Soil and Water Conservation District as a consulted party on the Erosion Technical Review Committee; and
(b) include quantitative method(s) (*i.e.*, bank pins) for monitoring erosion in the New River downstream from Claytor dam.

Appalachian Power Company
Claytor Project No. 739

Erosion Monitoring Plan

June 2009

Background:

The Erosion Study prepared for the relicensing of the Claytor Project identified the effects of project operations on erosion of the shoreline of the Claytor reservoir and the riverbanks downstream of the dam to the U.S. 460 bridge near Glen Lyn, VA. This was accomplished through a combination of field reconnaissance, GIS analysis and numerical modeling. For the reservoir, potential causes of erosion that were studied include water level fluctuations, wind wave and boat wakes.

The COSMOS numerical shoreline erosion model showed that the effects of wind-wave and boat wakes were the main shoreline erosion mechanisms, and the boat wakes were, by far, the most important erosion mechanism on the lake. While operational changes in water level act to adjust the location of interaction between waves and the shoreline profile, the water level fluctuations alone is not the cause of shoreline erosion. Approximately 31% of the shoreline around Claytor Lake is now under some form of erosion protection. The majority of the unprotected shoreline with bare slope faces (and therefore identified as "actively eroding") are limestone bedrock scarps around the lake, but they are eroding at a very low rate (i.e. on a geologic timescale) of retreat through solutional processes. The more erodable sapprolite or sand shorelines may be eroding at rates of up to 0.5 meters per year where they are subject to high-energy wave climates. A shoreline height of 3 to 4 feet was most common, and this reflected the removal of topsoils and sapprolite from underlying bedrock in most cases. It is likely that much of this erosion took place during the early phases of the project and is taking place at a lower rate now that most wave action is against the more resistant underlying rock. However, these bedrock faces are in direct contact with the water, and generally steep and clear of vegetation, so they were classified as actively eroding, even though the present rate of retreat is very low, due to the resistant nature of the bedrock.

Areas of accelerated erosion immediately downstream from Claytor Dam in the New River, were identified, but operational effects on erosion appear limited to the zone of fluctuating water level from Claytor dam to Radford, VA as a result of flow releases. 'Hotspots' of accelerated erosion were identified along the banks of the New River, but these were associated with disturbance from landowner activities such as overgrazing and cattle trampling the riverbank, and with geologic constructions on river channel dimensions, as opposed to the general background fluctuations from project operations. The river channel downstream from Claytor dam to the Town of Radford has approximately 2-3 feet high zone at the bottom of the river banks where the banks are eroding and tree roots are exposed. As would be expected, the overall pattern of bank erosion is sporadic, being lower in wider, slower moving sections of the river and higher in more constrained sections of the river.

1. Monitoring of Erosion:

Under the new license, Appalachian is proposing to continue monitoring the erosion along the shoreline of the reservoir and the riverbanks downstream of the dam as described below:

a) The Erosion Monitoring Plan will be implemented within one year of the Commission's approval of the Erosion Monitoring Plan.

b) Methods for Monitoring Lake Erosion: A detailed topographic survey will be conducted on the specified slope at each monitoring location. Data will be collected to provide full coverage of the bank from top to bottom. GPS data and photographs of each site will also be collected. The topographic survey will provide contour elevation data for the land surface in the area being mapped for comparison to previous surveys. Detailed topographic control elevation information (2 foot intervals) of the shoreline was obtained as part of the relicensing efforts.

c) Methods of Monitoring Downstream of Claytor Dam: Photographic documentation of areas downstream of Claytor Dam will be collected for comparison to the previous year's photos. GPS data will be collected to ensure that the same sites are monitored each year.

d) Locations to be Monitored:

Reservoir: Areas identified as having the more erodable sand or sapprolite soils as shown in the revised Shoreline Material Classification Mapping developed as part of the Claytor Relicensing Erosion Study will be monitored to document shoreline conditions and erosion. These sites cover a range of existing conditions along the shoreline including varying degrees of scarp heights, wind and wake conditions. Maps showing the location for future monitoring sites (as denoted by white dot) are provided in Appendix A of this plan.

Downstream: Ten sites below Claytor Dam as shown on the map in Appendix B will be monitored to document riverbank conditions. These are the same sites (Nos. 1 – 10) that were monitored in the Erosion Study completed as part of the relicensing efforts. These sites extend 11.6 miles downstream of the dam.

e) Frequency:

The initial survey will be completed within two years following the Commission's approval of the Erosion Monitoring Plan. An assessment will be made after the initial survey to determine the frequency of future contour mapping based on the data collected. Photographic documentation of the sites both upstream and downstream will occur each year for a minimum of five years before determining the frequency of future photographic monitoring.

f) Comparison to previous data:

Appalachian obtained detailed contour mapping in 2007 as part of the relicensing of the Claytor Project. This contour mapping was completed at 2 foot intervals up to the 1900 foot contour elevation for the Claytor Project. Following the initial survey (to be completed within 2 years following Commission's approval of the plan), a report will be developed that compares the survey data to the 2007 data and will describe the erosion rates at each of the monitored sites that have occurred over the four to five year period following the 2007 mapping. At that time, an assessment of each individual site will be made regarding the need to continue contour mapping of that site, and if so, the mapping frequency. There will also be an assessment made regarding any project-related effects.

Photographic documentation of the monitoring sites downstream of Claytor dam will be compared to previous photographic documentation. There will be an assessment made regarding any project-related effects.

GPS data will be taken for each site photographed on the reservoir and downstream of the dam. The initial selection of the shoreline stretch to be photographed at each site will take into account benchmarks along the shoreline or in the background to help in comparing photographs between years.

2. <u>Demonstration Project for Erosion Control:</u>

Appalachian will be developing a demonstration project utilizing natural methods for stabilizing eroding shoreline on Claytor reservoir. This project will be coordinated under Appalachian's Habitat Management Plan (HMP). Virginia Department of Game and Inland Fisheries (VDGIF), Virginia Department of Conservation and Recreation (VDCR) and Virginia Department of Environmental Quality (VDEQ) and other applicable local, state and federal agencies will be consulted regarding this project. The intent is to utilize natural methods that provide erosion protection and also enhances the shoreline habitat. These sites will be monitored under the HMP to assess the effectiveness of natural methods.

Once effective methods are established, they will be considered for other areas as part of the HMP. Details of effective methods will also be shared with others within the lake community.

Consultation on the demonstration projects will begin within one year of the Commission's approval of the Erosion Monitoring Plan. A proposed plan detailing the demonstration project will be provided to the Commission for review and approval prior to implementation. It will be implemented within three years of the Commission's approval of the Erosion Monitoring Plan. The site will be located along shoreline that can be easily accessed and which is owned and can be controlled by Appalachian. The final site location will be identified in consultation with the Aquatic Vegetation / Debris / Habitat / Shoreline Management and Erosion / Sedimentation Technical Committees. Success of this demonstration project to control erosion will be measured using methods analogous to and following the schedule for monitoring the sites listed in 1.d. above.

3. <u>Reporting</u>:

a) Reporting:

A report will be developed and filed with the Commission within six months of completion of the survey. The report will include the survey results, photos and an assessment of the erosion rates at the monitored sites. It will also contain input as provided from various Technical Review Committees as described in Section 4 below. This report will be provided to the Erosion / Sediment Technical Committee with representatives from VDGIF, VDCR, VDEQ, Friends of the New River and Friends of Claytor Lake for review and comments. These stakeholders will be given thirty (30) days to review and comment on the report. Appalachian will then file a report with the Commission which will include comments received from the above listed stakeholders and an updated monitoring plan.

b) Report Contents:

The Report will contain the following:

- Locations of the reservoir monitoring sites
- Locations of downstream monitoring sites
- Results of Appalachian's detailed topographic survey of monitoring sites
- Comparisons of survey data to previous survey results for reservoir sites listed in Section 1.d. above.
- Comparisons of photographic documentation for downstream sites listed in Section 1.d. above.
- An assessment of the impacts of erosion in these areas.

- Identification of any project- related effects.
- Proposed actions to be taken to address project-related effects should they be identified.
- Identification of areas to be recommended for no-wake zones to address boating wake related erosion
- Implementation schedule for any proposed actions.
- Consultation with stakeholders listed in Section 3.a above and other Technical Review Committees as listed in Section 4 below.
- Consultation with stakeholders listed in Section 2 above regarding demonstration project and details of proposed project for Commission review and approval.
- Updated monitoring plan with a schedule that identifies the next anticipated survey.

4. Coordination with Other Management Plans and Implementation Schedule:

Appalachian will prepare a draft report containing the information described in Section 3(b) above. This draft report will be provided to the Erosion / Sediment Review Committee, Aquatic Vegetation / Habitat / Debris / Shoreline Management Technical Review Committee, Aids to Navigation / Recreation Technical Review Committee and Water Quality / Water Management Technical Review Committee for review and input related to their respected areas. (Details regarding these Technical Review Committees can be found in the individual Management Plans.) These committees will be given 30 days to provide comments. Appalachian will then prepare a second draft report based on input from the various Technical Review Committee and provide that report to the stakeholders identified in Section 3.a. for their review and comment. The stakeholders will be given 30 days to provide comments. Appalachian will then prepare the final report as detailed in Section 3.b. above to the Commission.

The initial erosion contour survey under the management plan will occur within two years following Commission approval of the Erosion Monitoring Plan under the new license. An assessment will be made after the initial survey to determine the frequency of future contour surveys based on the data collected. The report required by the management plan will be filed with the Commission within six (6) months following the survey.

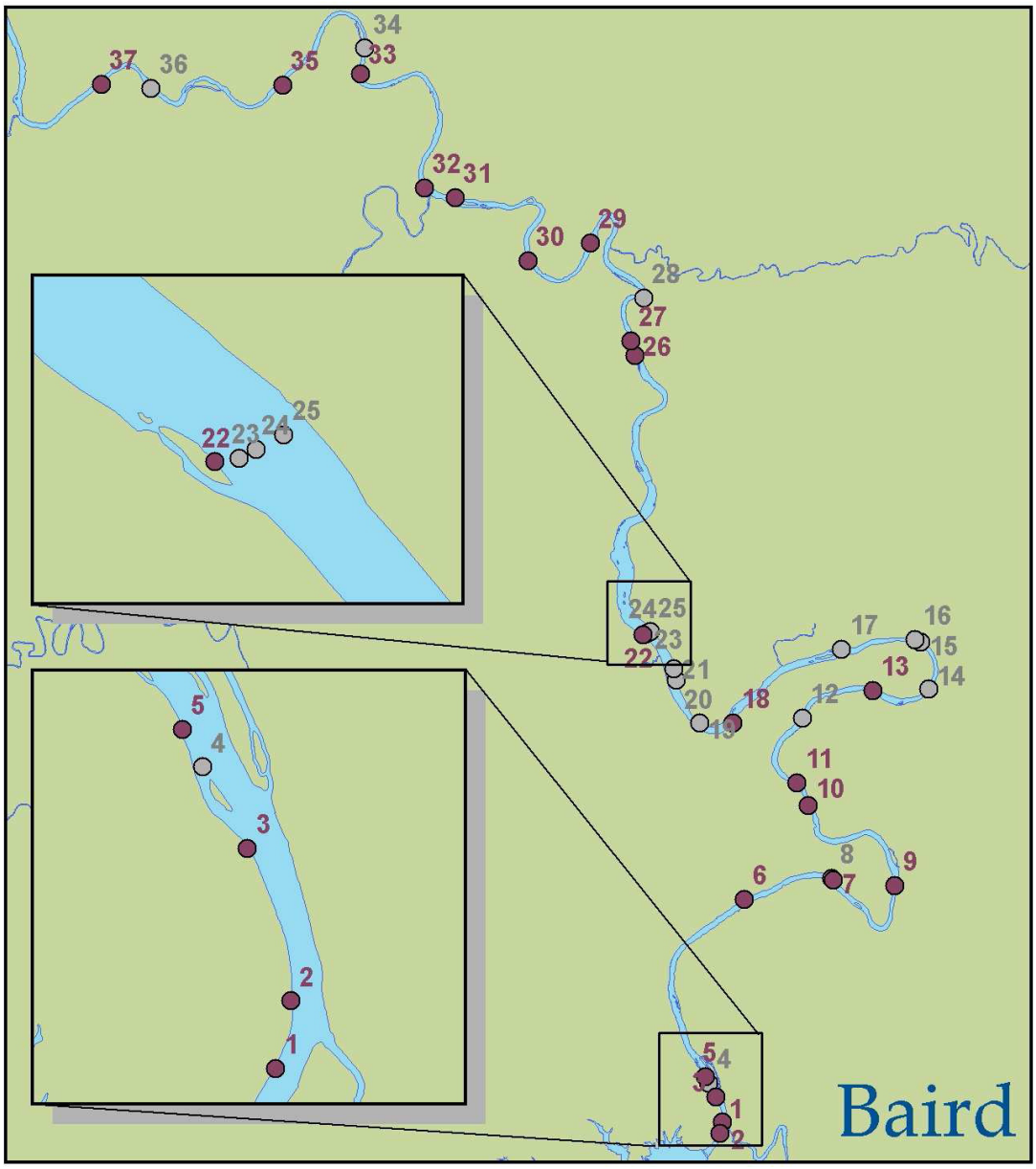
Consultation on the demonstration projects will occur within one year of the Commission's approval of the Erosion Monitoring Plan under the new license. The demonstration project will be implemented within three years following Commission approval of the plan. The demonstration project will be coordinated with the Technical Review Committee associated with the Habitat Management Plan.

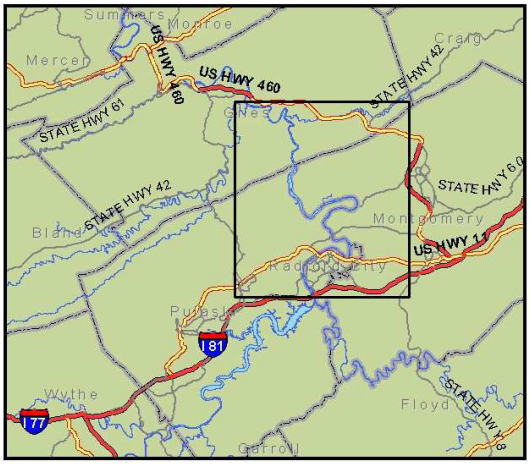
Appendix A: Scarp Height Classification Maps

Appendix B: Downstream Monitoring Locations

Appendix A: Reservoir Monitoring Locations

Appendix B: Downstream Monitoring Locations





New River

Downstream of
Claytor Hydroelectric Project

N

Survey Points included in Appendix

Survey Points not in Appendix

Water Course

Counties

Places

0 625 1,250 2,500

Feet