United States Department of the Interior

FISH AND WILDLIFE SERVICE

Virginia Field Office
6669 Short Lane
Gloucester, VA 23061

February 25, 2016

Mr. Jay Roberts
Virginia Department of Environmental Quality
3019 Peters Creek Road
Roanoke, VA 24019

Re: Joint Permit Application Number 15-1551, Pigg River Restoration at Power Dam, Franklin County, VA

Dear Mr. Roberts:

This document transmits the U.S. Fish and Wildlife Service's (Service) responses to your February 2, 2016 information request on the referenced Joint Permit Application (JPA). The request from the Virginia Department of Environmental Quality (VDEQ) indicated that staff have evaluated this application against the requirements for a complete application found in the Virginia Water Protection Permit Regulation at 9VAC25-690-60.B and need additional information as part of the application.

Below is the information requested from VDEQ and the response from the Service.

VDEQ Statement: *We consider the application revised with the requested information dated Nov. 12, 2015 claiming the impoundment as an impact.*

Service Response: As requested by VDEQ, we included the draining of the impoundment in the list of impacts. However, draining the impoundment will result in wetland restoration and is not an impact.

VDEQ Request: *If different from the applicant, name, mailing address, telephone number, and if applicable, fax number of property owner(s) where the impacts are proposed.*

Service Response: See below for list of property owners where impacts are occurring:

Town of Rocky Mount
345 Donald Avenue
Rocky Mount, VA 24151

Phone: 540-483-7660
Fax: 540-483-8830
(temporary construction access and wetland bench creation site)

Glenna Moore and Kevin Hawkins
45 Scenic Drive
Rocky Mount, VA 24151
Phone: 540-489-1893
(woody debris removal)

Ask & C Ltd.
Kenneth L. Plybon - Agent
265 Target Lane
Hardy, VA 24101
Phone: 540-721-4868
(woody debris removal)

VDEQ Request: *Please tally the amount of wetland impacts, stream impacts in linear feet and square feet, and open water impacts. Please check impact area in Item 9 and Item 18 of the JPA for consistency.*

Service Response: Items 3 and 9 of the JPA total 8,250 square feet (ft^2) of wetland impacts, which include 3,375 ft^2 of temporary impacts to vegetated wetlands, 2,075 ft^2 of temporary stream impacts, and 2,800 ft^2 of permanent stream impacts. The open water impacts total 1,019,350 ft^2 or 10,730 linear ft calculated at base flow. The woody debris total in Item 9 (20,890 ft^2) is different than indicated in Item 18 (10,450 ft^2). The correct number is 20,890 ft^2 for both sections. The wetland bench dimensions of approximately 46 ft x 60 ft equals 2,760 ft^2 but the actual area is a polygon equal to 2,800 ft^2.

VDEQ Request: *A copy of the U.S. Army Corps of Engineers (Corps) delineation confirmation, or other correspondence from the Corps indicating their approval of the wetland boundary, shall be provided with the application as soon as it becomes available. Wetland maps may show standing water at the soil surface, such as on the right descending bank opposite the upstream end of wetland site 2 and left descending bank opposite stream site 10. Other online aerial views may indicate standing water at the soil surface on the left descending bank opposite wetland site 3.*

Service Response: Friends of the Rivers of Virginia (FORVA) provided a pre-application and site visit request to the Corps on July 11, 2015. The Corps requested a JPA in lieu of the pre-application on July 27, 2015. The JPA was submitted to the Virginia Marine Resources Commission/Corps/VDEQ on October 26, 2015 after results of the sediment capacity and fate modeling had been received. The wetland delineation maps and forms requested by VDEQ were submitted to the Corps on December 7, 2015 with a confirmation request. We received a site visit request from the Corps and VDEQ on January 28, 2016 to review the wetland sites. The Corps requires landowner permission forms be signed prior to the site visit and the forms

along with permission requests were mailed to landowners on February 10, 2016. The Corps is waiting to receive the signed landowner permission forms before scheduling a site visit.

Once the wetland confirmation is received from the Corps, FORVA will copy VDEQ if the Corps has not already done so. The wetland maps provided to VDEQ and the Corps illustrate the wetlands located by the Service on November 18, 2015 during the wetland delineation process. Hydrology in all of the wetland sites, with the exception of wetland site 1 below the Route 713 Bridge, is maintained by tributaries and side slope seepage, not reservoir levels. While it is possible there are additional unmapped wetlands, field evidence indicates these wetlands would also not be dependent on the Pigg River for hydrology. Steep slopes along this reach of the Pigg River valley preclude the formation of wetlands where tributaries and side slope seepage does not occur. Additionally, dark signatures evident in aerial photographs, including those used for wetland maps, are commonly the result of shading and can provide a false indication of surface inundation.

<u>VDEQ Request</u>: *Please further discuss the plan of mitigation for impacts to surface waters such as any additional measures taken to avoid impacts to the maximum extent practicable, measures proposed to reduce the impacts to surface waters to the maximum extent practicable, and where impacts could not be avoided, the means by which compensation will be accomplished to achieve no net loss of wetland acreage and functions or stream functions and water quality benefits. Please consider feasibility of notching the dam such that sediment releases could be "matched" to a rate that could be better processed by typical annual flows; dewatering pool through a sluice gate, gate valve, etc. prior to demolition; planting exposed sediments; etc.*

<u>Service Response</u>: The proposed notching has been minimized to the maximum extent practicable to restore channel competency to transport sediment, and promote bank stabilization and the desired geomorphological adjustments post removal. To reduce channel impacts and erosion, 50% of the dam will be left intact after notching occurs. Other efforts to avoid impacts to surface waters were detailed in the previously submitted project description under Avoidance and Minimization of Impacts to Surface Waters.

The proposed notching involves 1) removal of the dam above top of bank or that portion of the Pigg River outside the bankfull channel comprised primarily of floodplains, and 2) removal of the dam below top of bank or that portion within the active channel containing bankfull discharge. The project will leave 31% of the dam intact above design top of bank (69% removed). Below this another 52% of the dam will remain intact below top of bank to form an appropriate active flood channel (48% removed). The portion of the channel notch at the base of the dam leaves 71% of the dam remaining to promote low flow competency. Any additional removal is expected to result in an anastomosing or braided channel and poor sediment transport competency.

Appendix E Stakeholder Questions in the Power Dam Sediment Capacity and Fate Modeling Report (Kris Bass Engineering [KBE] 2015) provides more information about specific questions presented to KBE by the Service for the purpose of assessing impacts and design alternatives.

KBE assessed sediment impacts by modeling notching scenarios that included several smaller notches over time verses a single notch completed all at once. The resulting report (KBE 2015) and model results provided to VDEQ on January 15, 2015 concluded, “A notching strategy will not be an effective way of controlling the release of sediment.” and “This finding effectively eliminates the value of a notching strategy, and leads to a recommendation of implementing a full dam removal all at once.” The full dam removal referred to by KBE here is the 50% notching proposal.

Regarding the feasibility of notching the dam such that sediment releases could be “matched” to a rate that could be better processed by typical annual flows**,** KBE (2015) states in *Appendix E - Stakeholder Questions*, Answer 1 “There is no practical notch size that can limit the sediment transport below the capacity of the downstream channel during these storm events. The channel is too flat and wide to transport the volumes of sediment that are expected to be released with any realistic notching strategy.”

Unlike some dam removal projects, there are no functional sluice gates or gate valves that could be used to dewater the pool prior to breaching. The sluice gates that were present on the top of the dam have been removed or destroyed. Only the top of the sluice gate which fed the penstock is visible and this gate is not functional.

Planting or seeding of exposed reservoir sediments may occur after the river has downcut through the existing sediments to the historic river bed and established stable channel dimensions, pattern, and profile including features such as meander bends, point bars, riffles, runs, glides, and pools sufficiently to create a stable channel. To attempt to vegetatively stabilize the exposed sediment prior to natural stream channel development would result in loss of those efforts until stream stability is achieved.

The project includes monitoring and contingency funds for performing any post dam removal bank stabilization, localized sediment and woody debris removal, revegetation, and responding to other instances where unintended consequences of dam removal might occur and need to be addressed. Previous dam removal projects have demonstrated that rapid natural revegetation of exposed banks and sediments is likely to occur and an adequate seed source for revegetation is available from existing natural vegetation within the project area. Revegetation of any exposed sediments by FORVA will occur after post dam removal monitoring determines this effort will not occur naturally.

Efforts to avoid impacts to surface waters were described in the previously submitted project description. This description includes details of the 4 alternatives and the rationale for acceptance of alternatives 2 (partial dam removal) and 3 (natural remobilization of sediment) and the rejection of alternatives 1 (complete dam removal) and 4 (dredging of sediment from behind the dam).

As indicated in the project description, specifically Impact Offsets and Mitigation, an estimated 2.25 miles of instream habitat and 8.8 acres of forested riparian habitat will be created as offsets to temporary impacts resulting from activities associated with this restoration project. In

addition, 72 continuous miles of unimpeded river channel will be opened to fish passage and recreational boating. Specific offset details include:

- 1,140 ft^2 of natural subaqueous bottom will replace the footprint of the dam in the breach area;
- 8.2 acres of forested riparian wetlands will be restored upstream of the dam through natural revegetation, based on a 15 ft width on each side of the restored channel;
- 2.25 miles of instream aquatic habitat will be restored upstream of the dam through natural channel development within the former reservoir;
- 1-3 miles of more diverse and complex habitat features consisting of instream bars, vegetated benches, riffle, pools, backwaters, and woody debris will develop, and a deeper, narrower primary channel resulting from temporary fill downstream of the dam will be created.

Work will occur in 2 phases to avoid and minimize impacts. Phase I will notch the dam to an elevation that will drain the impoundment sufficiently to access and remove the woody debris blocking the channel above the dam. This work will remove flow restrictions within the channel that are diverting flood flows into, and causing erosion to, the adjacent wetland. The flow diversions are also putting the dam at risk of being flanked. If this occurs Route 713 would be at risk of washing out and the entire dam would have to be removed. Phase II will notch the center portion of the dam leaving remaining portions of the dam on either bank as protection against bank erosion, bank slumping, wetland loss, and additional sediment release.

<u>VDEQ Request</u>: *A conceptual wetland compensatory mitigation plan may be requested for unavoidable permanent impacts to wetlands after further evaluation of wetland impacts.*

<u>Service Response</u>: As described in the JPA Item 3, no permanent impacts to wetlands are proposed. The only permanent impacts are to open water. The Service considers the project to be self-mitigating because of the numerous habitat restoration components resulting from the project. Dam removal projects in Virginia are typically permitted through the Corps Nationwide Permit (NWP) 27 for Aquatic Habitat Restoration, Establishment, and Enhancement Activities. Compensatory mitigation is not required for activities authorized by this NWP since these activities must result in net increases in aquatic resource functions and services, as we have indicated will occur in the project description section Impact Offsets and Mitigation. Several examples of similar dam removal projects permitted by the Corps and VDEQ in Virginia under NWP 27 were provided to VDEQ previously as requested. Additional information regarding impact offsets and compensatory mitigation was discussed in Item 3 of the JPA under the Impact Offsets and Mitigation section of page 5, Avoidance and Minimization of Impacts To Surface Waters section on page 6, and Least Environmentally Damaging Practical Alternatives section on page 8 provided to VDEQ on January 15, 2015.

<u>VDEQ Request</u>: *Verify the existing bottom elevation, crest elevation, and height of the dam.*

Service Response: The dam bottom elevation is 931.2. The dam crest elevation is 953.6. The height of the dam is 22.4 ft. All elevations are to the 1988 North American Vertical Datum.

VDEQ Request: *The JPA lists a sediment release of 106,855 cubic yards based on 100% dam removal. The sediment transport study, Table 2, lists a 100% dam removal release of 108,855 cubic yards and a total release of 271,031 cubic yards. Please clarify the projected amount of sediment release for the project and that the sediment transport model reflects the projected release.*

Service Response: The Service interpreted Table 2 in the KBE (2015) report to indicate a total of 106,855 cubic yards (yd^3) of sediment would be released after 100% completion of the proposed notching and that the 271,031 yd^3 of sediment listed Table 2 referred to the amount of sediment available upstream, not the total amount that would be released. We conferred with KBE and a total of 271,031 yd^3 of sediment would be released after completion of the proposed notching. The JPA and project description should read a total of 271,031 yd^3 of sediment estimated to be released by the project.

VDEQ Request: *Additional analysis and discussion of the projected channel base width upstream of dam, about 40-feet, as compared to the base width of the notch width of 60-feet. Additional analysis and discussion of the projected stability of bank slopes in the modeled upstream sections. These items may have a bearing on the projected sediment release, projected morphological changes both upstream and downstream after dam removal, and duration of releases.*

Service Response: The 40-ft width was included in cross-sections provided by the Federal Emergency Management Agency (FEMA). The 60-ft width was determined by surveys performed just downstream of the dam for this project. We do not fully know the extent of the historic banks as it is not feasible to survey the historic channel buried under sediment above the dam. The FEMA cross-sections date from the 1980s and it is likely channel width has changed since that time due to increases in impervious surface within the watershed. Therefore, the notching plan based on downstream morphology is the best approach for approximating the natural stream width and depth for the impounded section of the river. In addition, the creation of a smaller notch with the possibility of being undersized (<60 ft) would result in contraction scour, bank erosion below the dam, and undue stress on portions of the dam to be left in place.

Based on the sediment modelling (KBE 2015), the upstream channel evolution process will follow this course: Streambed lowering through impoundment deposition; bank adjustment to achieve natural stability; lowering of streambed and base water levels to historic surface elevations. The linear nature of the upstream impoundment and the confinement of the valley in this area of the Pigg River are different from many dam removals where a large, wide lake exists. The models indicate that the majority of the deposited sediment will be transported downstream and the historic streambanks will be exposed and restored. Lateral adjustment of the channel will be controlled by the valley confinement and existing woody riparian vegetation. Minor lateral movement may be expected on the outside of channel bends with a

concurrent building of a point bar. Any unexpected bank movement or erosion will be monitored and addressed on a case-by-case basis with post removal contingency damage repair funds. Based on exposed bedrock in upstream areas adjacent to the impoundment, rock outcrops will be a component of the final banks upstream of the dam, which will contribute to bank stability. In addition, we are anticipating that other currently buried geologic controls, such as rock drops will constrain the bed from excessive downcutting or degradation.

In general, most dam removal projects rely on exposure of the banks and natural revegetation processes such as seedfall and seed and rhizome transport to develop vegetation on the banks, which has proved highly successful. The fine sandy loam comprising the Comus-Maggodee-Elsinboro complex soils found in the banks and floodplain of the Pigg River in this vicinity provide fertile soil for seed germination and growth, as evidenced by vegetative growth along the streambanks and floodplain in this area. The monitoring plan will assess the stability of the banks upstream over time and result in recommendations for improvements if needed.

VDEQ Request: *A copy of the post-demolition monitoring plan proposed for the project.*

Service Response: The monitoring plan will not be finalized until after receiving any terms and conditions associated with the issued permits, but will include the following:

1. Evaluate physical habitat and instream features at 9 reaches (sites) across the Pigg River study area (8 miles), pre- and post-dam removal in year 1. Thereafter, monitoring assessments will be conducted annually for a period of 4 years post-dam removal. Habitat will be evaluated by characterizing the physical structure—using morphological and instream habitat factors—along 11 equally spaced transects perpendicular to streamflow within each of the 9 selected reaches.

2. Assess physiochemical water quality at sites across the Pigg River study area, pre- and post-dam removal. Data will be collected pre- and post-dam removal for a total period of 5 years. Parameters to be monitored include water temperature, dissolved oxygen, conductivity, turbidity, and pH.

3. Characterize and assess the benthic macroinvertebrate community structure along 9 sites in the Pigg River study area, pre- and post-dam removal. Samples will be collected annually at each study site and identified back in the lab. Methods used will be similar to those used in the Rocky Mount Power Dam biomonitoring project conducted in the 2009 (Hitt et al. 2009) and will follow established methods for stream assessments from the U.S. Environmental Protection Agency (Barbour et al. 1999, U.S. Environmental Protection Agency 2007) and systems for stream classification (Rosgen 1994).

The Service is concerned regarding the statement “Please be advised that upon receipt of the requested information, additional information may still be required for DEQ to reach a permit decision.” FORVA, the Service, and other project partners have spent a significant amount of staff time and resources in the last 10 years determining the potential effects of dam removal/breaching on the biological, geomorphological, chemical, and ecological components of

the Pigg River in preparation for undertaking this restoration project. The Service determined the project will contribute to recovery of the federally listed endangered Roanoke logperch (*Percina rex*) and completed an assessment to select the best alternative to minimize impacts to the logperch. In addition, we held site visits on September 29 and November 18, 2015; webinars on October 5, 2015 and February 19, 2016; and a public meeting on January 14, 2016. We are particularly concerned about additional requests for information previously provided or addressed that may further delay issuance of any permit. We look forward to meeting with VDEQ staff at the upcoming site visit being arranged by the Corps to address any outstanding questions or concerns such that a permit can be issued shortly thereafter.

If you have any questions, please contact Will Smith of this office at (804) 824-2409, or via email at willard_smith@fws.gov.

Sincerely,

Cindy Schulz
Field Supervisor
Virginia Ecological Services

cc: Corps, Floyd, VA (Attn: Danielle Courtois)
VDGIF, Blacksburg (Attn: Mike Pinder)
VDGIF, Richmond (Attn: Amy Ewing)
VMRC, Norfolk, VA (Attn: Mike Johnson)
FORVA, Roanoke, VA (Attn: Bill Tanger)

Literature Cited

Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid bioassessment protocols for use in streams and wadeable rivers: periphyton, benthic macroinvertebrates, and fish. EPA 841-B-99-002, USEPA, Washington, D.C. 340 pp.

Hitt, N.P., J. Jones, and K. Convery. 2009. Biomonitoring for the Rocky Mount Power Dam removal project: establishing baseline conditions. Conservation Management Institute, Virginia Tech, Blacksburg, VA. 67 pp.

Kris Bass Engineering. 2015. Power Dam sediment capacity and fate modeling. Report to the Service, Friends of the Rivers of Virginia, and Town of Rocky Mount, VA.

Rosgen, D.L. 1994. A classification of natural rivers. Catena 22:169–199.

U.S. Environmental Protection Agency. 2007. National rivers and streams assessment: Field Operations Manual. EPA-841-B- 07-009. U.S. Environmental Protection Agency, Washington, DC. 354 pp.