SCOTT'S MILL HYDRO, LLC

March 31, 2021

The Honorable Kimberly Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

RE: ***SCOTT'S MILL HYDROELECTRIC PROJECT***
FERC PROJECT NO. 14867-001
RESPONSES TO COMMISSION LETER OF OCTOBER 28, 2020

Dear Secretary Bose:

On October 28, 2020, the Federal Energy Regulatory Commission (Commission) transmitted a deficiency letter to Scott's Mill Hydro, LLC (FERC No. P-14867-001). On November 20, 2020 Scott's Mill filed an initial response to the Commission notifying the Commission that Scott's Mill intended to move forward with the exemption application. The November 2020 letter also stated that Scott's Mill was working with the U.S. Fish and Wildlife Service (USFWS) and Virginia Department of Wildlife Resources (VDWR) to convert the Agreement in Principle (AIP) to a Settlement Agreement (SA). Further, Scott's Mill informed the Commission that it was working with Liberty University (LU) to enter into a long-term lease for a parcel on the headpond in Amherst County in order to install a public boat ramp.

Because neither the SA nor the lease with LU were completed before the due date and other aspects of Scott's Mills responses were awaiting additional information, Scott's Mill requested a one-month extension from the Commission. The extension also would permit time for Scott's Mill to conduct a field survey of wetlands within the project boundary. On March 2, 2021, the Commission granted that extension.

As of the end of March, the lease with LU had not been signed. Accordingly, Scott's Mill directed its engineering consultant to remove the recreation parcel from the Exhibit G map. The Exhibit G map consists of two sheets: Sheet 1 which includes the entire project boundary upstream to the Reusens Project Boundary and Sheet 2, which is a more detailed map showing all project facilities. Sheet 2 is completed and included in this filing. Sheet 1 will be filed once our surveyor can complete their survey work and remove the LU parcel. Scott's Mill anticipates that a boat ramp will be included in the SA.

The attached responses to the Commission's deficiency letter may require an amendment to the Exemption Application once the SA is signed, which is expected in April or May. Further, a copy of the public notice is included in the responses. A Proof of Publication will be filed once the newspaper transmits it to Scott's Mill.

Both the USFWS and VDWR provided Scott's Mill with their estimate of the total costs the agencies anticipate they will incur for setting the mandatory terms and conditions for the proposed project under section 30(c) of the Federal Power Act. They have agreed to waive the fees as part of this filing and make them part of the SA. Therefore, no fee or bond has been provided with this filing.

Copies of the Commission's October 28, 2020 letter, Scott's Mill's letter of intent, and the information required in Schedules A and C have been transmitted to parties via email and have been placed on Scott's Mill web site at www.Scottsmillhydro.com. Consulted Indian tribes for which Scott's Mill does not have an email address were sent copies of this letter by US mail.

If you have any questions, feel free to contact me at (540) 320-6762 or Wayne Dyok at (916) 719-7022.

Sincerely,

for

Mark Fendig, Managing Member

Project No. 14867-001

Scott's Mill Hydropower Project Distribution

- Ms. Kimberly Bose, Secretary, Federal Energy Regulatory Commission
- Mr. Jon Smith, Federal Energy Regulatory Commission
- Mr. Jody Callihan, Federal Energy Regulatory Commission
- Division of Dam Safety and Inspection, Federal Energy Regulatory Commission
- Federal Energy Regulatory Commission, Regional Office
- Ms. Catherine Gray, Cultural Resources Specialist, Cherokee Nation
- Chief, Tuscarora Indian Nation
- Ms. Diane Shields, Monacan Tribe
- R. Duschane, Tribal Historical Preservation Officer, Absentee-Shawnee
- Kim Jumper, Tribal Historical Preservation Officer, Eastern Shawnee Tribe of Oklahoma
- Tribal Historical Preservation Officer, Shawnee Tribe
- Resources Department, Eastern Band of Cherokee Indians
- Chief, United Keetoowah Band of Cherokee Indians
- Virginia Council on Indians
- District Engineer, Norfolk District, U.S. Army Corps of Engineers (Jeanne Richardson)
- Mr. David Sutherland, U.S. Fish and Wildlife Service
- Ms. Cindy Shultz, Virginia Field Office, U.S. Fish and Wildlife Service
- Southwest Virginia Field Office, U. S Fish and Wildlife Service
- Director, National Marine Fisheries Service
- Administrator, National Oceanic and Atmospheric Admin., Fisheries Regional Office
- James River District Ranger, National Park Service
- National Park Service
- U.S. Department of Agriculture, Forest Service, Washington, DC
- U.S. Forest Service, Roanoke
- Environmental Impact Review Officer, U.S. Environmental Protection Agency

- Advisory Council on Historic Preservation
- U.S. Bureau of Indian Affairs
- U.S. Bureau of Land Management, Springfield VA Office
- Mr. Scott Smith, Virginia Department of Game and Inland Fisheries
- Mr. Greg Palmer, Virginia Department of Game and Inland Fisheries
- Manager Environmental Services Section, Virginia Dept. of Game and Inland Fisheries
- Ms. Lynn Crump, Virginia Department of Conservation and Recreation
- Mr. Robert Bennett, Virginia Department of Conservation and Recreation
- Ms. Jennifer Wampler, Virginia Department of Conservation and Recreation
- Mr. Robert Ruhr, Virginia Department of Conservation and Recreation
- Director Water Division, Virginia Department of Environmental Quality
- Ms. Amanda Grey, Virginia Department of Environmental Quality
- Mr. Brian McGurk, Env. Program Planner, VDEQ
- Blue Ridge Regional Office, VDEQ
- Ms. Roger W. Kirchen, Virginia Department of Historic Resources
- Mr. Marc Holma, Virginia Department of Historic Resources
- Ms. Julie Langan, Virginia Department of Historic Resources
- Virginia Marine Resources Commission
- Director, DCR Dam Safety
- Ms. Sara Lu Christian, Director, Amherst County
- Amherst County Library
- Bedford County Administration
- Bedford County Library
- Lynchburg Library
- Mr. Timothy Mitchell, City of Lynchburg Utilities
- Mr. Clay Simmons, City of Lynchburg
- Mr. Justin Stauder, City of Lynchburg
- Mr. Greg Poff, City of Lynchburg
- Kristian M. Dahl, McGuire Woods, LLP

SCHEDULE A

Information Needed Only for an Exemption Application (18 C.F.R. §§ 4.31, 4.107, 4.302)

1. As required by section 4.107(a) of the Commission's regulations, please include, in the revised exemption application, documentary evidence (e.g., as an appendix) showing that the applicant (Scott's Mill Hydro, LLC) has the real property interests, as defined in section 4.31(c)(2)(ii), to all lands necessary to develop and operate the proposed project, including the proposed boat ramp and parking lot area, if the applicant still wishes to include these proposed facilities as part of its proposed project.

RESPONSE
Applicant has all the property interests necessary to develop and operate the proposed project. The proposed boat ramp has been removed from the project boundary pending completion of negotiations with Liberty University (LU) which owns the parcel of interest. Islands upstream of the project are not owned by Scott's Mill and are not included in the project boundary. However, Scott's Mill has a flowage easement up to three feet on all islands and shorelines within the headpond.

Documented evidence of ownership is provided in Appendix A.

2. As required by section 4.301, please notify each fish and wildlife agency that Scott's Mill Hydro consulted with of its intent to file an exemption application and request that those agencies provide, within 90 days of such notification, a reasonable estimate of the total costs the agencies anticipate to incur for setting mandatory terms and conditions for the proposed project under section 30(c) of the FPA.

RESPONSE
The fish and wildlife agencies were notified on October 29, 2020 and requested to provide their estimate of total costs the agencies expect to incur for setting mandatory terms and conditions. After considerable coordination, responses were timely received on March 24, 2021 from both the USFWS and VDWR. Their estimated costs are shown below. The USFWS and VDWR have both agreed to waive these costs and include payment as part of the settlement agreement.

U.S. Fish and Wildlife Service
Chesapeake Bay Field Office, Annapolis, MD 21401
Cost Estimate for FERC Scotts Mill 30(C) Exemption Application
SCOTTS MILL DAM HYDROELECTRIC PROJECT, FERC P-14425, JAMES RIVER, LYNCHBURG, VA

1. Jessica Pica, Fish Passage Engineer
2. David Sutherland, Fish and Wildlife Biologist

Biologist day rate	$711
USFWS Overhead rate	22%
Overhead total	$156
Total biologist day with overhead	$867

Conference calls and summary documents from Aug-Oct 2017	3 days x 2	$5,202
Preparation and Site Visit to Scotts Mill Dam November 6, 2017	2 days x 2	$3,468
Scott's Mill Project Draft License Application review, January 2, 2018	2 days x 2	$3,468
James River Assoc Meeting, Agency Meeting, November 8, 2018	1 day	$867
Design Questions to Applicant November and December 2018	2 days x 2	$3,468
Agreement in Principal calls and drafting March 1, 2019 to February 28, 2020	7 days x 2	$12,138
ER20/0274 OEPC File Number: PEP/NRM 9043.1, June 25, 2020	4 days	$3,468
Draft Settlement Agreement January 25, 2021 to March 24, 2021	5 days	$4,335
Final Settlement Agreement drafting and coordination	5 days	$4,335
FERC Final Environmental Review and REA Notice	4 days x 2	$6,936
Post Licensing Study Review and Coordination	4 days x 2	$6,936
Total Estimate	63 days	$54,621

Scotts Mill Estimated Costs to VDWR for Terms and Conditions

Personnel

Scott Smith
Alan Weaver

Daily rate for personnel time = $435/day/person
Mileage for Weaver = $115/day

Task	Personnel Time	Mileage	VDWR Cost
Establish and Review Terms and Conditions	2 people x 3 days	0	2,610
Monitor efficacy of Terms and Conditions (Year 1)	2 people x 8 days	920	6,960
Monitor efficacy of Terms and Conditions (Year 2)	2 people x 3 days	345	2,610
Monitor efficacy of Terms and Conditions (Years 3-9)	2 people x 2 days	230	1,740
Monitor efficacy of Terms and Conditions (Years 10-20)	2 people x 5 days	575	4,350
Subtotals		2,070	18,270
Total			20,340

Notes:
Personnel rate calculated from avg hourly rate plus fringe
Mileage rate calculated at $0.52/mi.

3. As required by section 4.302(a), please include, at the time of filing, a fee or a bond in the amount defined in section 4.302(b) in a check made payable to the United States Treasury indicating the payment is for *ECPA Fees* (section 4.304); also include copies of the most recent cost estimates provided by fish and wildlife agencies [section 4.301(b)] for setting mandatory terms and conditions for the proposed project under section 30(c) of the FPA.

RESPONSE
Both the USFWS and VDWR believe that there could be mutual benefits to fish and wildlife and Virginia power off takers when the Scott's Mill Project is completed. In addition, the project will provide renewable energy and offset carbon emissions. Accordingly, the USFWS and VDWR have agreed to waive the fees for preparing terms and conditions as part of this filing. In lieu of waving the fees, all Parties have agreed to include the cost of agency participation in the settlement agreement. Scott's Mill is awaiting confirmatory emails from the resource agencies. Copies of the agency emails will be filed with the Commission when they are received.

4. As required by section 4.107(7), please indicate the planned date for beginning and completing the proposed construction or development of the generating facilities.

RESPONSE
As noted in our November 20, 2020 filing, Scott's Mill Hydro, LLC proposes to start construction in the late summer of 2022. Project completion is expected within two years.

Schedule B
Project No. 14867

SCHEDULE B

Information Needed Only for a License Application (18 C.F.R. §§ 4.32, 4.61)

1. As required by section 4.32(a)(1) of the Commission's regulations, please identify every person, citizen, association of citizens, domestic corporation, municipality, or state that has or intends to obtain and will maintain any proprietary right necessary to construct, operate, or maintain the project.

2. As required under section 4.32(a)(2), provide the names and mailing addresses of every city, town, or similar local political subdivision that has a population of 5,000 or more people and is located within 15 miles of the project, and of all Indian tribes that may be affected by the project.

3. As required under section 4.32(a)(3), please notify, via certified mail, every property owner within the bounds of the project, or adjacent to any project works, of the filing of your license application; also notify, via certified mail, the applicable entities in section 4.32(a)(2). Such notification must contain the name, business address, and telephone number of the applicant and a copy of Exhibit G contained in the application, and must state that a license application is being filed with the Commission.

4. Please revise your Initial Statement by:
   a. indicating you are applying for a license rather than an exemption, as required by section 4.61(b)(1).
   b. indicating whether you are claiming preference under section 7(a) of the Federal Power Act, as required by section 4.61(b)(5).
   c. specifying when project construction is planned to be completed in relation to license issuance, as required by section 4.61(b)(9).

5. As required under section 4.61(c)(1)(x), please provide the estimated capital costs and annual operation and maintenance expenses of each proposed environmental measure.

SCHEDULE C

Information Needed for Both an Exemption Application and a License Application (18 C.F.R. §§ 4.32, 4.34, 4.39, 4.41, 4.107)

General Content

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1. As required under section 4.32(a)(4), please provide a notarized sworn statement that the contents of the application are true, or in the alternative, as provided under 28 U.S.C. 1746, a statement in substantially the following form: "I declare (or certify, verify, or state) under penalty of perjury that the foregoing is true and correct. Executed on (date). (Signature)."

RESPONSE

The notarized sworn statement is provided at the end of this document and before the Appendices.

2. As required under section 4.32(b), please submit the application to the Secretary of the Commission in accordance with the filing procedures posted on the Commission's web site at www.ferc.gov; serve one copy of the application on the Director of the Commission's Regional Office for the appropriate region and on each resource agency, Indian tribe, and member of the public consulted pursuant to section 4.38 of the Commission's regulations. All maps and drawings filed as part of the application should conform to the requirements of section 4.39.

RESPONSE

Copies of the Application were provided to the appropriate parties per Section 4.38 of the Commission's regulations at the time the Application was filed in June 2020. Similarly, copies of the responses to the Commission's deficiency letter were emailed to the various parties on March 31, 2021. In cases where no email addresses exist, the parties were sent the responses via U.S. mail. Further, the responses are also provided on Applicant's web site at www.Scottsmillhydro.com.

3. Please publish notice of your application as required by section 4.32(b)(6) of the Commission's regulations.

Schedule C
Project No. 14867-001

RESPONSE

Notice of the Exemption Application is being published on March 31, 2021 or April 1, 2021. The proof of publication will be filed with the Commission once it is received by Scott's Mill. The notice provided to the News and Advance newspaper follows.

Scott's Mill Hydroelectric Project - Federal Energy Regulatory Commission – Application for Exemption

Scott's Mill Hydro, LLC (Scott's Mill) hereby notifies the Federal Energy Regulatory Commission (FERC or Commission) and interested parties its application for an exemption from a license was filed on June 17, 2020 and supplemented on March 31, 2021 for the Scott's Mill Hydroelectric Project to be located at the existing Scott's Mill dam on the James River in Lynchburg, Amherst County and Bedford County, Virginia.

Pursuant to the requirements set forth by 18 CFR § 4.32 (b)(6) and by the Commission's letter dated January October 28, 2020, the following information must be made public in reference to Scott's Mill's Exemption Application filed June 17, 2020 and FERC's deficiency letter dated October 28, 2020.

A. Application for an exemption to a hydropower license for a project less than 10 MW per 18 CFR § 4.32 (b)(5)

B. Response to FERC's deficiency letter dated October 28, 2020.

C. Summary of the Documents

1. Application for Exemption

An application for a hydropower exemption (less than 10 megawatts) for the Scott's Mill Hydropower Project was filed on June 17, 2020.

2. Response to FERC Deficiency Letter

The Commission identified deficiencies in the exemption application and requested additional information in a letter dated October 28,2020. The Applicant provided responses on November 20, 2020 and March 31, 2021. The exemption application and responses to the deficiencies can be found at www.scottsmillhydro.com.

1. Project Information

   License Applicant and Contact
   Scott's Mill Hydro, LLC
   Mark Fendig
   912 Wilson Highway
   Mouth-of-Wilson VA, 24363

2. Project Location and Description

The Scott's Mill Hydroelectric Project would be located at the existing Scott's Mill dam on the James River in Lynchburg, Virginia downstream of the Reusens hydroelectric dam. The existing Scott's Mill dam facilities include: 1) the dam, 2) reservoir, and 3) spillway. The dam is 15 feet high and 875 feet long. The dam impounds a 316-acre reservoir with a normal maximum water surface elevation of 516 feet mean sea level.
Scott's Mill proposes to construct a new powerhouse containing nine generating units with a total installed capacity of 4.5 MW, a new 1,200 foot-long underground transmission line, and appurtenant facilities. The project will have an estimated annual generation 20,700 megawatt-hours and will either be used by a nearby industrial facility or sold to a local utility.

D. Public Viewing of Exemption Application

Copies of these documents and the Commission's letter are available for inspection and reproduction at the following office:

Luminaire Technologies
912 Wilson Highway
Mount-of-Wilson VA, 24363

On Scott's Mill's web site at www.scottsmillhydro.com

E. Filing of Comments

The Commission will process or solicit additional study requests, as appropriate, after a revised exemption application has been filed with the Commission and the Commission will request interventions, recommendations, and terms and conditions on the application after Commission staff has reviewed its adequacy. Respondents can submit an original and eight copies of their comments to:

Office of the Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20428

Alternatively stakeholders can e-file their comments pursuant to 18 CFR § 385.2003(c) to FERC's website at http://www.ferc.gov/docs-filing/docs-filing.asp, where instructions are posted about how to file and view comments and documents in FERC's elibrary. For any comment submissions, it is important to include the project name and project number, "Scott's Mill Hydroelectric Project, FERC No. 14867" on the first page of any written comments.

Schedule C
Project No. 14867-001

4. Section 307(c)(3) of the Coastal Zone Management Act (CZMA) requires that all federally licensed and permitted activities be consistent with approved state coastal zone management programs. Although the consultation record in Appendix A provides a copy of a telephone memo from a conversation you had with the Virginia Department of Environmental Quality (Virginia DEQ), which oversees the state's coastal zone management program, please provide proof, via a letter or email from the state, of Virginia DEQ's concurrence with your conclusion that the proposed project is not located within Virginia's designated coastal zone and would not affect any resources within this zone.

RESPONSE

The following email was received from Bettina Rayfield of the Department of Environmental Quality (VDEQ) in response to the draft Record of Telephone Conversation (ROTC) prepared based on Scott's Mill's consultation with VDEQ. The ROTC presented following Ms. Rayfield's email includes VDEQ edits.

----- Forwarded Message -----
From: Rayfield, Bettina <bettina.rayfield@deq.virginia.gov>
To: luke graham <lukegraham_5@yahoo.com>
Sent: Thursday, January 3, 2019, 5:44:13 AM AKST
Subject: Re: Scott's Mill Dam Hydropower Project compliance with Coastal Zone Management Act

Luke,

I made an edit to reflect regulatory language. With these changes, it is acceptable to me.

Ms. Bettina Rayfield

Manager

Environmental Impact Review and Long Range Priorities Program

804.698.4204

Bettina.rayfield@deq.virginia.gov

Department of Environmental Quality

1111 East Main Street, Suite 1400

Richmond, Virginia 23219

Mailing address

Post Office Box 1105

Richmond, Virginia 23218

www.deq.virginia.gov

For program updates and public notices please subscribe to the OEIR News Feed

On Wed, Jan 2, 2019 at 4:00 PM luke graham <lukegraham_5@yahoo.com> wrote:

Bettina,
Thanks for your time today, I have prepared a brief summary of our discussion regarding the Scott's Mill Hydropower Project. Please look it over and note any changes that you feel would be necessary. Happy New Year.
Regards,
Luke Graham

- Bettina Rayfield DEQ Record of Conversation.docx

  13.4kB

Schedule C
Project No. 14867-001

RECORD OF TELEPHONE CONVERSATION

Person Called- Bettina Rayfield
Affiliation- Virginia Department of Environmental Quality
Phone Number- (804) 698-4204
Call Originator- Luke Graham
Date- January 2, 2019

Summary of Discussion

I contacted Bettina Rayfield of Virginia Department of Environmental Quality regarding the Scott's Mill Dam Hydropower Project and its certification of consistency with the Virginia Coastal Zone Management Program. I informed Bettina that the Scott's Mill Dam Project is a proposed major hydropower project with a capacity of less than 5 MW and will be located at the existing Scott's Mill Dam. Bettina stated that since the project falls outside the Coastal Management Zone and will be built upon an existing dam, the project is unlikely to have reasonably foreseeable effects on Virginia's coastal uses or resources and, therefore, no further action is necessary for the project.

Prepared by

Luke Graham

5. Exhibit E states a water quality certification application was submitted to Virginia DEQ on June 10, 2020. As required by section 4.34(b)(5)(i)(B), please provide proof of the date on which the certifying agency received the application for water quality certification (e.g., by providing an email or return receipt that shows when the certifying agency received the water quality certification application).

RESPONSE

The following emails document the filing of the water quality certification application and the agency's email response. The assigned application number is #20-1005.

Here is the agency tracking number for the Scotts Mill Dam Clean Water Act (CWA) Joint Permit Application (JPA). Mike Johnson is one of the env review engineers at VMRC.

Ben Leatherland, PWD, PWS

540.520.1533 mbl

bleatherland@handp.com

"Rough seas make great sailors."

From: Beth Howell [mailto:beth.howell@mrc.virginia.gov]
Sent: Thursday, June 11, 2020 11:08 AM
To: Ben Leatherland <bleatherland@handp.com>
Subject: RE: Scotts Mill Hydropower JPA

This has been assigned #20-1005. Mike Johnson will be processing this JPA.

Beth

Schedule C
Project No. 14867-001

From: Ben Leatherland <bleatherland@handp.com>
Sent: Wednesday, June 10, 2020 1:37 PM
To: JPA.permits@mrc.virginia.gov; Beth Howell <beth.howell@mrc.virginia.gov>
Cc: Wayne Dyok <dyok@prodigy.net>; Mark Fendig <mfendig@aisva.net>; Thornton James <runnerjim@gmail.com>
Subject: Scotts Mill Hydropower JPA

Hi Beth,

Attached, please find a non-tidal JPA for the proposed Scotts Mill Dam Hydropower Project. Please distribute to permitting agencies as necessary. We understand that FERC will likely be the lead federal agency. The applicant has been having protected species discussions with USFWS and VDGIF in the past 12 months or so.

Please call with any questions. Thanks, and have a great day.

Ben Leatherland, PWD, PWS
Sr. Environmental Scientist

HURT & PROFFITT
INSPIRED | RESPONSIVE | TRUSTED

2524 Langhorne Rd, Lynchburg, VA 24501
Phone: 434.847.7796 x686 - Fax: 434-847-0047 - Mobile: 540.520.1533
E-mail: bleatherland@handp.com Web: www.handp.com

6. As required under section 4.39(a), Exhibit G drawings must be stamped by a registered land surveyor. Please provide the Exhibit G drawing with the registered land surveyor stamp.

RESPONSE

Applicant has been working with LU on a long-term lease for the recreational boat ramp. Although both parties recognize that the lease is in their mutual interest, no

lease agreement has yet been finalized. Accordingly, the recreational parcel has been removed from Exhibit G. Scott's Mill is including Exhibit G, Sheet 2 with this filing. It includes the registered land surveyor's stamp. Sheet 1 will be provided after the land surveyor completes their survey work to exclude the recreational parcel and extend the project boundary to the Reusens downstream project boundary.

7. The exemption application did not include project boundary data in a georeferenced electronic format. As required under sections 4.41(h) (for a license application) and section 4.107(d) (for an exemption application), please provide an Exhibit G map that conforms to the specifications of section 4.39. In addition to the other components of Exhibit G, the applicant must provide the project boundary data in a georeferenced electronic format—such as ArcView shape files, GeoMedia files, MapInfo files, or any similar format.

RESPONSE

The Exhibit G was prepared in the electronic format required by the Commission. However, when filed only a PDF version was provided to the Commission. The georeferenced electronic format file is provided separately in this filing. At this time only Sheet 2 of the project boundary is provided. This sheet includes all the project works. Sheet 1 shows the entire project boundary from downstream of Scott's Mill Dam upstream to the downstream boundary of the Reusen's Project. Our surveyor has determined that additional information is needed to complete that portion of the map. However, no lands are included in that part of the project boundary.

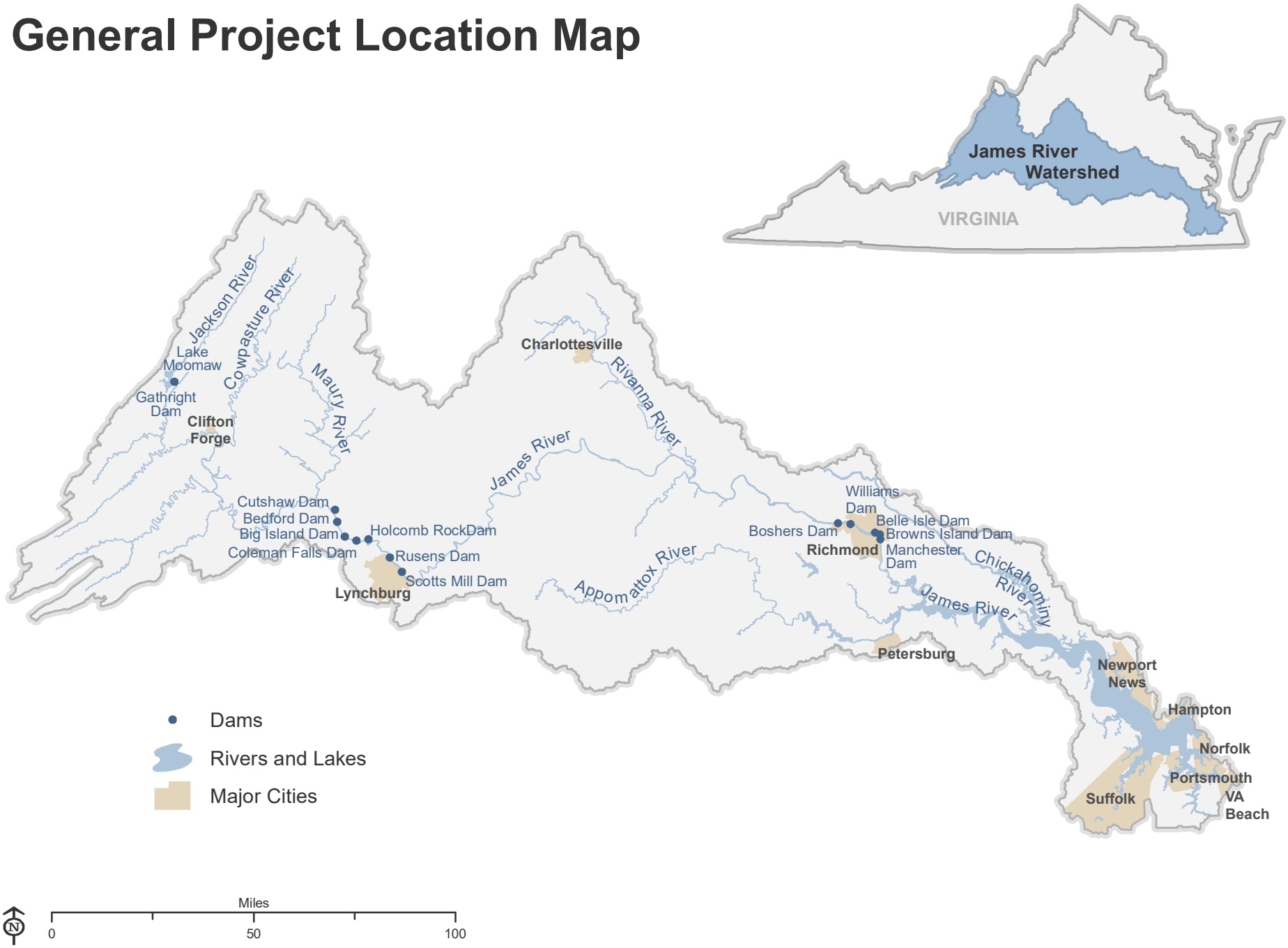
8. As required under section 4.41(h)(1), the map in Exhibit G must show the location of the project as a whole with reference to the affected stream or other body of water and, if possible, to a nearby town or any other permanent monuments or objects, such as roads, transmission lines or other structures, that can be noted on the map and recognized in the field; and also show the relative locations and physical interrelationships of the principal project works and other features described under Exhibit A. However, the map in Exhibit G does not show the relative locations and physical interrelationships of principal project works. Therefore, please depict the principal project works on the Exhibit G project boundary map.

RESPONSE
The Exhibit G (Sheet 2) has been revised to provide the relative locations and physical interrelationships of all the principal project works and other features. The islands are not included in the project boundary as they are not needed for project operations.

9. The project location map (figure A-1) in Exhibit A is difficult to read and interpret. Please modify the map by providing an inset (watershed) map that is separate from and does not blend into the main map; also include a scale bar on the main map.

RESPONSE
Figure A-1 has been modified to add a bar scale and clearly separate the inset from the location map.

General Project Location Map



10. Sections 2.4, 6.1, and Table E-6-4 of Exhibit E indicate the project is located at river mile 260 on the James River, whereas section 1.0 of Exhibit A states the project is located at river mile 252. Please clarify this discrepancy and use a consistent river mile designation for the project throughout the application.

RESPONSE
Two different data bases were used in the development of the application. The primary data base used River Miles ([RM] and River Kilometers [RKM]) according to Virginia Department of Game and Inland Fisheries, now Virginia Department of Wildlife Resources (VDWR) nomenclature. The RKM were converted to river miles. Scott's Mill is located at RKM 416. That was converted to River Mile 260 but a more accurate conversion is RM 258.5.

On page A-3, the river mile is given as RM 252. The footnote states that this is based on the Federal Emergency Management Agency (FEMA) river mile determination. To ensure a consistent database henceforth, please make the following errata changes:
Page A-3 keep as River Mile 252 referenced to FEMA, but add in parentheses (RM 258.5 based on converting VDWR RKM to RM)
Page E-3 replace River Mile 260 with River Mile 258.5
Page E-15 replace River Mile 260 with River Mile 258.5

Geology and Soils

11. Page 21 of Appendix B, which contains responses to comments on the draft license application, indicates that an erosion and sediment control plan would be prepared, but there is no mention of such a plan elsewhere in the document (i.e., in the main body of the application in Exhibit A or E). Therefore, please confirm whether you formally propose to develop an erosion sediment control plan for the proposed dredging work that would be conducted upstream and downstream of the dam.

RESPONSE
Yes, Scott's Mill proposes to prepare an erosion and sediment control plan. Such a plan is also likely to be required by the Virginia Department of Environmental Quality (VDEQ). The list of proposed environmental measures has been revised and is included in the response to Comment 21 below.

Aquatic Resources

12. Section 4.3 of Exhibit E states the impoundment serves as a backup water supply for the City of Lynchburg, whereas section 6.3.2.1.6 of Exhibit E states the backup water supply is located downstream of the project dam. Please clarify this discrepancy and describe the location and magnitude of any water supply withdrawals in the project vicinity.

RESPONSE
The City of Lynchburg has pump stations on the James River both upstream of Reusens Dam and downstream of Scott's Mill Dam in downtown Lynchburg. The pumphouse intake is located approximately 3,000 feet downstream of Scott's Mill Dam near the 5th Avenue bridge. The capacity of the pump station is 10 mgd (approximately 15.5 cfs).

13. In our comments on the draft license application (DLA), we indicated the existing water quality data that had been collected to date (limited to 2 days of sampling) was insufficient to characterize the existing baseline conditions at the proposed project and evaluate the potential effects of project operation on upstream and downstream water quality. Based on our review of the exemption application, it appears no additional water quality data has been provided or collected following our comments on the DLA. Therefore, please note that if longer-term, more representative, water quality data are not provided from upstream and downstream of the dam, staff may request, during our adequacy review of the application, that a water quality study be conducted during the low-flow high-temperature season to allow staff to describe the existing environment and support its environmental analysis of potential project effects on water quality.

RESPONSE
Commission staff requested additional long term water quality data to better characterize water quality in the vicinity of the site. Staff further noted that a more detailed water quality study may be required as part of the license order if no further data is provided. The Virginia Department of Water Quality (VDEQ) performs a bi-monthly (six times per year) sampling and analysis of key water

parameters. The licensee was able to obtain ten years of data (2010-2019) for the closest water quality sampling sites at river mile 269.3 (upstream near Holcomb Rock) and river mile 257 (downstream at the Route 29 bridge.) These sites are located approximately 11 miles upstream and 1.5 miles downstream of the existing Scotts Mill dam (river mile 258.5). The VDEQ data are summarized in Table 1. The data support the information collected by Scott's Mill and show only minor differences between the upstream and downstream sampling sites.

Table 1: James River, VA Water Quality Data
Information in the table below is for 10 years (2010 - 2019). Data based on VDEQ sampling 6 times per year at standard sampling sites.

Parameter	Units	Station							
		2-JMS270.84 - Upstream				2-JMS258.54 - Downstream			
		Count	Max	Min	Mean	Count	Max	Min	Mean
Depth	Meters	60			0.3	60	30		0.3
Temperature, Degrees Celsius	°C	60	28.8	2.2	15.84	60	30	0.96	16
Field pH	Std Units	60	8.7	6.7	7.8	60	8.8	7.1	7.8
Nitrogen, Kjeldal, Total, as N	mg/l	60	3.4	0.1	0.45	60	1.6	0.1	0.36
Nitrogen, Total, as N	mg/l	59	0.5	4.38	0.58	57	1.21	0.27	0.59
TSS Residue, Total Nonfiltrable NONFILTRABLE	mg/l	60	322	20.5	1	60	359	1	18.1
Turbidity	NTU	60	228	1.43	14.5	60	222	1.27	15.9
TS Residue, Total Solids	mg/l	60	411	212.5	115	60	313	47	183
E. Coli - MTEC - MF	NO/100ml	60	5794	10	225.8	60	2755	10	235
Fecal Coliform, Memberane Filter	CFU/100ml	60	2000	25	190.6	60	2000	25	285
Phosphorus, Total, as P	mg/l	58	0.56	0.01	0.07	60	0.47	0.01	0.47
Calcium	mg/l	2	21	17.4	19.2	2	15.4	4	9.7
Magnesium	mg/l	2	4.1	3.1	3.6	2	4	2.8	3.4
Dissolved Oxygen	mg/l	60	13.9	7.05	10.1	60	14.59	7.7	10.52
Specific Conductance	µmhos/cm	60	502	72	284	60	469	70	254
PCB, Total Concentration	pg/ml	3	600	457	388	3	3216	222	1351

14. Section 6.3.3.1.2 of Exhibit E states that muskellunge are stocked in the James River. To allow staff to assess the potential for the project to affect this managed game species (e.g., via turbine mortality or impingement), please specify where stocking occurs

in relation to the proposed project and the approximate number and sizes of fish that are stocked as well as the frequency of stocking.

RESPONSE

Commission staff asked the applicant to quantify timing, number and size of fish stocked by the Virginia Department of Wildlife Resources (VDWR) in order for staff to assess the potential for the project to affect this managed game species. The application noted that Muskellunge are stocked in the James River. However, per the VDWR, Muskellunge stocking was discontinued in 2010 as the fishery became self-supporting and stocking was no longer required.

15. Summaries of the resident fish community at the project (e.g., in section 6.3.3.1.4 of Exhibit E) are not project-specific and are instead based on sampling data that are pooled across large portions of the James River (e.g., river mile 104 to 228). To allow staff to more accurately assess the potential effects of the project on the local fish community, please provide more precise location-specific fish survey data (ideally from the project impoundment and immediately downstream of the dam). If such project specific data are not available, please report fish survey and associated catch data from the nearest available locations upstream and downstream of Scott's Mill Dam. To support staff's analysis, please include information on the sampling gear, effort, location, and dates of the fish survey data that were used, as well as any fish size data that were collected.

RESPONSE

Commission staff requested the applicant provide fish community data in proximity of the proposed project. VDWR provided fish community sampling data to Scott's Mill. Summary data are provided in Appendix B. Appendix B also provides the raw fishery data. VDWR ceased sampling the Scotts Mill Reservoir (Red & Dots, river mile 260) in 2000. The reservoir fishery data was collected between 1991 – 2000. VDWR also provided more recent data for its Lynchburg site (river mile 257, about 1.5 miles downstream of the dam) and the Monacan Pond (Monacan) site, (river mile 266) about 7 miles upstream of the dam (also above Reusens dam). The data reported for these two sites was collected from 2010 to 2019 and is also included in Appendix B.

16. Sections 4.2.1 and 6.3.3.2.3 of Exhibit E state that based on the results of computational fluid dynamics modeling, Scott's Mill Hydro may install guide vanes on the trash racks to reduce fish entrainment and impingement. So that staff can accurately assess the potential effects of the project on resident and migratory fish, including their

susceptibility to entrainment and impingement, please indicate in the application whether you propose to install the guide vanes, and if so, whether the guide vanes would result in a narrower effective clear spacing than the currently proposed trash racks that would have a 2-inch clear spacing.

RESPONSE

The vanes in the trash racks are oriented 135 degrees away from the flow. While they are on 3" centers at the front of the rack, because they are on a 45-degree diagonal, the actual spacing, measured perpendicular to the vanes themselves, is effectively 2-1/8" on center, giving rise to 2" clear spacing between adjacent vane surfaces. That being said, the proposed Scott's Mill hydropower plant has been designed so that the hydraulic flows – rather than the bar spacing as such – serve as the primary means of exclusion. The flow direction will change to some degree as different turbines in the array are brought online and/or shut down, but the essential principle is that the fish swim parallel to the trash racks and do not turn to enter the trash racks. In order for a fish to enter behind the trash rack, it would have to execute a 135 degree turn and burst-swim at about 45 degrees from upstream. While not impossible, fish passage experts at Alden, opine that it is highly improbable, as there is no attraction flow or any other reason for passing fish to execute such a course change.

17. Table E-6-4 of Exhibit E provides catch-per-unit effort (CPUE) data for eels at Scott's Mill Dam and other nearby dams on the James River, but provides no indication of the level of sampling effort upon which these data (boat electrofishing) are based. Therefore, for all CPUE estimates in Table E-6-4, to the extent that information is available, please indicate the number of hours (e.g., pedal time), dates, and locations of boat electrofishing samples upon which these CPUE estimates were based, as well as any eel length data that are available from these surveys.

RESPONSE

Commission staff requested American Eel data related to effort proximate to the Scotts Mill Dam. These data are provided in Appendix B. As noted above, the RM 260 data was collected 1991 – 2000 and the RM 257 and 266 sites 2010 – 2019. The summary data indicate that the catch per unit effort were similar in the Scott's Mill headpond and downstream of Scott's Mill Dam. However, upstream of Scott's Mill the CPUE was considerably lower. This indicates that American

eel are able to make it upstream of Scott's Mill, but have a much more difficult time passing upstream of Reusens because the Reusens Dam is considerably higher than Scott's Mill.

18. Section 6.3.3.2.4 of Exhibit E states the rotational speed of the turbines has not been finalized and that the applicant is working with the manufacturer to determine if the rotational speed of the proposed units can be decreased from 300 to 450 revolutions per minute (rpm) to 150 to 200 rpm. The survival of entrained fish is highly dependent on the rotational speed of hydropower turbines, as survival decreases with increased rotational speed. Therefore, prior to submitting the application, the design and specifications of the turbines you propose to install at the project should be developed to the extent that allows an accurate assessment of the entrainment mortality of resident and diadromous fish, including American eel. The application should include an assessment of the expected turbine mortality through the proposed turbine units chosen for the project based on field studies where similar modular-style powerhouse units have been installed or upon model-based estimates of mortality from the manufacturer (note that because the proposed turbines do not appear to be conventional Francis or Kaplan-style units, the blade strike model of Franke et al. (1997), which is based on Kaplan and Francis units, may not be applicable in estimating mortality through the proposed modular units).

RESPONSE

As discussed under Comment 16 above, the proposed turbines are essentially identical to traditional Kaplan units. The principal difference is that instead of using adjustable-pitch runner blades as would be found in a traditional Kaplan, in the turbines contemplated for use at Scott's Mill, the runner blades are fixed and, rather, the inlet guide vanes are adjustable. This is a less costly way to accomplish essentially the same thing. The logic control for the turbine optimizes for efficiency given instantaneous head and flow, by (i) articulating the guide vanes and (ii) varying the operating speed of the turbine. The maximum design speed of each turbine is assumed to be 250 RPM. The operating speed will vary from 175-250 RPM based on operating flow and head. Fish passage, to the extent relevant, can be accurately assessed by treating each unit as a fixed-blade Kaplan with a 52" runner using the peak RPM; Scott's Mill is working with the turbine manufacturer to create meaningful through-turbine survival data. Since the units act like Kaplan units, Franke et al. should be applicable. It must be reemphasized, however, that the proposed plant is being designed so as to exclude fish from the turbines altogether. If necessary, during detail design,

Scot's Mill can apply Franke et. al., if the CFD modeling indicates turbine entrainment potential.

19. Please indicate if the upstream fish passage structures for American eel and sea lamprey would consist of ramp-type structures and whether the structures would include a collection device. If a collection device is proposed, describe the methods for monitoring and releasing captured eels and sea lamprey. Also indicate the proposed season of operation for the upstream eel/lamprey passage facilities and whether the structures would be installed (and removed) on a seasonal basis or constitute permanent structures.

RESPONSE

Yes, ramp type structures are anticipated for passage of American eel and Sea Lamprey. At this time, no decision has been made whether there would be a collection device, but this is likely to be the case. This will certainly be the case if a trap and haul program is developed in conjunction with upstream hydropower owners. Based on the settlement agreement that is currently in negotiation, a collection or counting device is likely to be required.

Eel collection will be accomplished in consultation with the USFWS and VDWR. Because Scott's Mill Dam is 258.5 miles upstream from the mouth, American eels may move slightly later in the spring than at projects like Roanoke Rapids and Gaston on the Roanoke River which are closer to the mouth of the river and in a slightly warmer climate. At Roanoke Rapids, American eel move upstream during high flows when river water temperatures reach 60 ^{0}F. At Roanoke Rapids American eel typically move upstream from mid-March through mid-May and from mid-September through mid-October. A similar time table is expected at Scott's Mill, but the timing of operation will be adjusted as necessary in consultation with the USFWS and VDWR.

Because winters are not severe in this location, we anticipate that the passage facilities would be permanent structures like they are at Roanoke Rapids. However, during detail design, consideration will be given to the potential effects of large floods. Some components of the passage facility could be installed as seasonal structures.

20. Page E-57 of Exhibit E states that fish will be passed safely downstream, into the tailrace, through a 'debris and fish passage module.' Please provide a more detailed description of how this system would work and indicate if this is the primary method by which adult silver eels and juvenile sea lamprey would be passed downstream of the dam during their seaward migration.

RESPONSE

Scott's Mill anticipates that there will be two primary ways for American eel to pass downstream: over the dam and through the debris passage module. It is difficult to determine how many American eels would pass over the dam versus through the fish passage/debris module. Most of the time, the flow over the straight portion of the dam will be small relative to the powerhouse flows. Accordingly, if eels migrate downstream when flows are less than about 4,500 cfs, it is expected that the majority of eels would migrate downstream passing the powerhouse entrance and then through the fish passage module. If American eels migrate downstream during higher flows (say 8,000 cfs or more), then most of the eels would be expected to stay in the main channel of the James River and pass over the dam.

Given the success of the Sullivan Dam downstream passage structure on the Willamette River in Oregon, Scott's Mill expects that the American eels that pass through the powerhouse intake channel, we go through the fish passage module. Eels that are 1.4 to 4 feet in length are not expected to turn 135 degrees and go through the trash racks. Rather, they are more likely to proceed with the downstream current past the turbine intakes.

The debris and fish passage module will work much like an Eicher screen. As the American eels get closer to the module the flow will accelerate because cross sectional area is reduced. In essence the American eel will swim up an inclined ramp. As the eel move up the ramp the flow will accelerate sufficiently so that the American eel are swept over the top of the inclined ramp into a downstream plunge pool.

21. There are several inconsistencies between the proposed environmental measures in the main body (Exhibit E) of the application and the Agreement in Principle (AIP) reached with the resource agencies that is provided in Appendix A. First, the AIP specifies that upstream passage for anadromous species such as American shad would be

installed within 10 years of license issuance, whereas Exhibit E more generally states the powerhouse would be designed in anticipation that a vertical slot fishway or nature-like fishway would be installed in the future. Secondly, Exhibit E states that a half-inch veil flow (approximately 30 cubic feet per second [cfs]) would be provided over the spillway during normal project operation, but the AIP states the expected veil flow would be 1 inch above crest. Lastly, Exhibit E indicates that post-licensing water quality monitoring would only be conducted upstream of the dam, but the AIP indicates that such monitoring would occur both upstream and downstream of the dam. Therefore, to facilitate staff's review of the benefits, costs, and environmental effects of your proposed actions, please ensure that the application includes a cohesive and consistent set of proposed measures; also include a bulletized list of your proposed operation and environmental measures.

RESPONSE

Resource agencies and Scott's Mill are working to finalize the settlement agreement which builds upon the AIP. The agencies have taken the lead on developing the settlement agreement. Based on recent discussions with the USFWS and VDWR, Scott's Mill expects that the settlement agreement will be signed in April or May. At that time, it will be filed with the Commission and become the master document for proposed environmental measures.

We believe that the discrepancies between the AIP and Exhibit E are not significant. Nonetheless, following this response is an updated section on proposed environmental measures. It may be adjusted in future to be fully consistent with the settlement agreement once it is finalized.

Although the AIP references a 10-year horizon for installation of upstream species like American shad, the trigger is the number of shad arriving at VDWR's monitoring site downstream of Scott's Mill. The AIP assumes that this would occur within 10 years. The application was more general with respect to the future. A key that agencies and Scott's Mill agree upon is that both a vertical slot fishway and nature-like fishway will be considered. Scott's Mill is prepared to move forward with American shad passage once the trigger point is met.

With respect to the veil, a key aspect is the flow over the 735 foot-long straight section of Scott's Mill Dam needed to protect downstream water quality. Scott's

Mill estimated this to be about 30 cfs and possibly higher during low flows when air temperatures are high. Flow over the dam is an important parameter because it affects both energy generation and downstream water quality. For a 30 cfs flow, Scott's Mill originally estimated the height of the veil over the dam to be on the order of ½ inch using a discharge coefficient of 3.5. Recent data indicate that the coefficient may be on the order of 2 to 2.5 for very low flows over the dam. If that is the case, then the veil would be between .75 and .9 inches with a 30 cfs flow. Note that the flow over the dam is still subject to additional adjustment to meet downstream water quality standards.

During operations, Scott's Mill will estimate the flow for a given veil height and then manage the headpond level to achieve that veil height as a minimum water level. Based on agency consultation the veil height could be a minimum of one inch during normal operations and possibly greater during summer, low flow conditions.

We agree that monitoring both upstream and downstream may be needed. However, if upstream monitoring indicates that water quality is protected, there may not be a need to monitor downstream dissolved oxygen because flow over the dam will increase it.

PROPOSED ENVIRONMENTAL MEASURES

Applicant proposes to operate the Scott's Mill Project in a run-of-river mode to minimize downstream environmental effects and to essentially maintain existing headpond water levels during project operations. **Table A-3** and **Figure A-22** compare the existing headpond levels to the proposed operation levels from low flows through flood flows. Although much of the flow will be directed to the right side of the river, the powerplant will also discharge directly to the area behind the straight section of the dam. The tailwater levels on the left side are expected to change only slightly because of this added flow and because a sill downstream in River Edge Park causes a backwater at the dam.

Applicant intends to dredge an existing channel at the southern end of Daniel Island just upstream of the dam to allow flow from the main channel to the powerhouse. This will have the effect of increasing circulation and maintaining water quality upstream of the main section of the dam. Applicant intends to implement a soil erosion and control plan that would include dredging operations. Applicant will confirm dredging dimensions during detailed design in conjunction with the specifics of turbine discharge, but the width of the channel is expected to be about 130 feet with a length of about 100 feet. If necessary, during low flow conditions, flow can also be released over the spillway to maintain water quality. Applicant also proposes the following environmental measures:

- Monitor water quality (temperature and dissolved oxygen) upstream and downstream of Scott's Mill Dam.

- Provide immediate upstream passage for American Eel and Sea Lamprey.

- Work with other upstream dam owners, resource agencies, and other licensing participants to restore anadromous fish to the upper James River Basin (see Agreement in Principle on future fish passage in **Appendix A)**.

- Provide an approximate 1-inch veil of water over the dam, to preserve downstream environmental water quality. This would be achieved through a water level monitoring gauge upstream of the dam and using the Holcomb Rock gauge to estimate inflow and matching project output to release flows that are slightly below the inflow level. If the water level falls below 1 inch over the weir, the turbine flow will be adjusted (reduced) to enable the upstream water level to be maintained. It is likely that through this process, the water level in the headpond will result in a veil greater than 1 inch. If the water level exceeds one inch, a further adjustment can be made to increase the flow through the turbines. Applicant uses a similar strategy to maintain flows over the Cushaw dam. Such operation usually results in a more conservative operation and water levels that are greater than the 1inch veil. Coordinated operations with the upstream Reusens could also facilitate maintaining the veil.

- Direct approximately half the flow from the upstream turbines into the main channel of the James River to preserve habitat quality in the area immediately downstream of Scott's Mill Dam. This will be accomplished by orienting the upstream turbine flow discharge toward the main channel. As necessary, the area upstream of the island downstream of the dam (Anthony's Island) will be excavated to achieve this goal. Because there is already a hydraulic connection between the main channel and the channel downstream of the arch section of the dam, orientation of the turbine discharge may be sufficient.

- Avoid entrainment by orienting the powerhouse more in line with the direction of flow. Downstream migrating fish will tend to swim with the current rather than turning 135 degrees to enter the turbine intake.

- Minimize and mitigate any effects to wetlands both upstream and downstream of Scott's Mill dam.

- Provide a canoe portage around Scott's Mill Dam on the left side of the James River. The portage will skirt the proposed American Eel and Sea Lamprey ladder on the left side of the river and will be designed in coordination with that facility.

- Work with Virginia Marine Resources Commission (VMRC) and Virginia Department of Wildlife Resources (VDWR) to provide boat ramp facilities to the public at the upper end of the headpond adjacent to Harris Creek. (There are boat ramps on both sides of the river within a mile downstream of Scott's Mill Dam, so no additional boat ramps are needed downstream.) The proposed boat ramp has been removed from the Exemption Application, but will be included in a Settlement Agreement with the resource agencies.

- Provide a fishing pier on the left side of the river downstream of the dam.

- Prepare a Historic Properties Management Plan (HPMP) to protect cultural resources in the Area of Potential Effects (APE). The HPMP will include provision for signage to identify the various cultural resources in close proximity to the site (e.g., Scott's Mill Dam, Scott's Mill grist mill site, water works canal on the right bank).

- Applicant considered connector trails and public camping, but determined there is insufficient space along River Road to provide for these recreational opportunities. On the right side the existing railroad, US Pipe Company facility and the steep bank preclude connector trails to nearby existing trails.

22. The AIP indicates that upstream passage for resident fish and anadromous species such as American shad would be installed within 10 years of license issuance. However, the AIP also notes that if American shad reach the project more than 10 years after license issuance, that upstream passage would be provided immediately. Based on these statements, it is unclear if you propose to provide upstream passage for American shad within 10 years of license issuance regardless of whether this species is observed during routine sampling by Virginia Department of Wildlife Resources (Virginia DWR) that occurs downstream of the project. Therefore, in the application, please clarify when, and under what conditions, Scott's Mill Hydro proposes to install upstream passage for American shad (or anadromous species).

RESPONSE

As noted in comment response 21, the trigger for fish passage is based on American shad sampling downstream of Scott's Mill Dam. If juvenile shad are found, at VDWR's monitoring site downstream of Scott's Mill, upstream passage

of American shad will be provided. This could be less than 10 years or more than 10 years after the Commission grants the Exemption.

23. The Water Quality Study Report in Appendix J indicates that surface water temperatures in the Scott's Mill impoundment were 3.6 degrees Fahrenheit (°F) to 7.2°F cooler, and dissolved oxygen (DO) levels 1.6 milligrams per liter (mg/L) to 3.2 mg/L lower, than surface waters in the impoundment of the upstream Reusens Project (FERC Project No. 2376). This difference is attributed to the release of cooler, deeper (less oxygenated) bottom waters through the Reusens Project into the Scott's Mill impoundment. However, according to the project record for the Reusens Project, that project was not operating from 2012 through July 2017,[1] including the September 2016 sampling period at Scott's Mill Dam (during which time the Reusens Project was presumably spilling all inflow through its surface floodgates into the Scott's Mill impoundment). Therefore, to assist staff in understanding the potential effects of the operation of the upstream Reusens Project on water quality in the Scott's Mill impoundment, please clarify this discrepancy and provide an explanation for the considerably lower water temperatures and DO levels in the Scott's Mill impoundment (compared to Reusens) that were observed during September 2016.

RESPONSE

Although the Reusens project was not operating and flow was spilling through the surface spill gates, it is likely that water was being withdrawn from the top section of the water column, not just the top foot of the water column. Depending upon the level of stratification, the mixture of water released from Reusens would include cooler, less oxygenated water from the Reusens reservoir, perhaps even from depths below 10 feet.

The 7.6 mg/l DO sample in the Reusens tailrace could be the product of the 9.6 mg/l surface water and less oxygenated water at greater depths. Please note that Table 3 of the Appendix J water quality section of the Exemption Application indicates that in the Scott's Mill headpond, the DO decreases from 8.4 mg/l at the

[1] Notice of Intent and Pre-Application Document filed for the Reusens Project on February 28, 2019. Accession No. 20190228-5222.

surface to 6.9 mg/l in the DO profile taken upstream of Scott's Mill Dam. Without conducting a flow net analysis and having a DO profile in Reusens reservoir upstream of the dam, it is difficult to say for certain that this is the case, but Scott's Mill stands by its explanation in Appendix J that water is being withdrawn from the water surface and deeper areas of Reusens reservoir. The same explanation holds for water temperatures upstream and downstream of Reusens.

Terrestrial Resources

24. Page G-3 of the Terrestrial Habitat Report (Table 1, Appendix G) provides a list of vegetative species that were observed on the riverbanks and islands. In the narrative description on pages G-2 and G-3, the report indicates that the southwestern riverbank has the smallest abundance and diversity of species and the islands have the greatest abundance and diversity. To help staff understand the composition of species at the project, please specify where the species listed in Table 1 were observed and clarify if these species are present in all locations surveyed, or if some of the species are only present in specific locations (i.e., the southwestern riverbank, northeastern riverbank, or one or more of the islands).

RESPONSE

See revised table below:

Table 1: Dominant Vegetative Species Observed

TREES:	***SW Riverbank***	***NE Riverbank***	***Islands***
River birch (*Betula nigra*)	*	*	*
Tuliptree (*Liriodendron tulipifera*)	*	*	*
Sycamore (*Platanus occidentalis*)	*	*	*
Red maple (*Acer rubrum*)	*	*	*
Tree-of-Heaven (*Ailanthus altissima*)	*	*	*
Black locust (*Robinia pseudoacacia*)	*	*	*
Flowering dogwood (*Cornus florida*)			*
Shagbark hickory (*Carya ovata*)		*	*
American beech (*Fagus grandifolia*)		*	*
Chestnut oak (*Quercus prinus*)			*
Northern red oak (*Quercus rubra*)		*	*
Sweetgum (*Liquidambar styraciflua*)			*
Green ash (*Fraxinus pennsylvanica*)	*	*	*
SHRUBS:			
Hazel alder (*Alnus serrulata*)		*	*

Boxedler (*Acer negundo*)			*
Chinese privet (*Ligustrum sinense*)	*	*	*
Sweetbay (*Magnolia virginiana*)		*	*
HERBACEOUS VEG. AND WOODY VINES:			
Wild grape (*Vitis* spp.)		*	*
Poson ivy (*Toxicodendron radicans*)	*	*	*
Blackberry (*Rubus* spp.)	*	*	*
Greenbrier (*Smilax* spp.)	*	*	*
Soft rush (*Juncus effusus*)			*

25. Page 21 of Appendix B, which contains responses to comments on the DLA, states that wetland maps of the area upstream of the Scott's Mill Dam are presented in Appendices J and G. However, the only map presented in either place is a map of the wetlands on Daniel Island. Please provide wetland maps that cover the entire project area.

RESPONE

Liberty University (LU) conducted a previous 2013 wetland delineation on Daniel Island (upstream of the Scott's Mill Dam), which was then verified by the US Army Corps of Engineers (USACE) on 1/22/2014. Since verified wetland delineations are valid only for five (5) years, this delineation expired on 1/22/2019. We are aware of no changes on Daniel Island since that time which would have altered hydrology, soils, or vegetation. Current wetland boundaries may therefore be similar to prior wetland extents in 2013-2014.

Four other upstream islands (including Treasure Island Woodruff Island) and one downstream island (Percival Island) are located within the study area. US Department of Agriculture (USDA) Web Soil Survey (WSS) records indicate that these other five islands are comprised of 9A soils (Combs loam, 0-3% slopes, frequently flooded, 1-33% hydric/wetland). In contrast, only the upstream (northwestern) end of Daniel Island is composed of 9A soils, with the remaining 90% of the Daniel Island being either CT soils (Chewacla-Toccoa complex, 33-65%

hydric/wetland) or 31A soils (Sindion-Yogaville complex, 0-3% slopes, frequently flooded, 33-65% hydric/wetland). For the purpose of this wetland mapping effort, the entirety of the six primary islands (from upstream to downstream: un-named island, Woodruff Island, Treasure Island, un-named Island, Daniel Island, Percival Island) and a small area of 9A soil along the northeastern riverbank (at the NW end of Woodruff Island) are assumed to be potentially-jurisdictional wetlands (total area of approximately 160 acres). Due to steep 3-6' high slopes along the riverbanks and islands though, less than one acre of potentially-jurisdictional wetland area is likely to be affected by proposed project additional impoundment (and such effects will be similar to what these areas already experience in response to localized flooding). Appendix C contains a USDA WSS map excerpt indicating potential hydric soils within the project area.

A wetlands survey of the islands within the study boundary was conducted in March 2021. The survey indicated that the project would not affect wetlands. The consultant report is provided in Appendix C.

26. Page E-62 states that "downstream water level effects are expected to be very minor and hence, there should be little or no effect on riparian vegetation." However, the application provides very little information about riparian habitat downstream of the dam and the study area for the Terrestrial Resources Report (Appendix J) does not appear to include any of the area downstream. To support staff's analysis, please describe the riparian habitat downstream of the dam and provide an estimate of the magnitude of fluctuation downstream of the project.

RESPONSE

Dominant riparian vegetation upstream and downstream of Scott's Mill Dam is generally similar in terms of species composition, density, and diameter (see Comment 24 response species list above). However, tree and sapling diameters on the upstream (NW end) of Percival Island (also known as Anthony Island) appear to be 20-30% smaller than on islands between Scott's Mill Dam and Reusen's Dam upstream. This may be due to periodic flood flow scour here (as riverine substrate also appears to be larger diameter here than substrate within the upstream Scott's Mill Dam impoundment upstream). The extent of riparian vegetation inundation downstream of Scott's Mill Dam will likely be comparable to periodic Q1-Q5 flood flow. However, the frequency of this inundation may be more frequent.

27. Page E-62 states that proposed dredging will occur in an area of "probable" wetlands and any wetland impacts would be mitigated, as required by the U.S. Army Corps of Engineers. However, no specifics are provided regarding how you plan to mitigate those wetland impacts. To assist staff's analysis, please describe any proposed measures to mitigate impacts to the affected wetlands.

RESPONSE

In Virginia, the USACE and VDEQ have developed a compensatory mitigation hierarchy, with purchase of commercial mitigation bank credits as the first (preferred) alternative, followed by purchase of credits from the Virginia Aquatic Resources Trust Fund (VARTF - second choice), and then applicant-proposed on-site or off-site mitigation (final options). Available mitigation credits are tracked using the USACE Regulatory In-Lieu Fee and Bank Information Tracking System (RIBITS), which currently indicates 0.14 ac of available wetland credits and 27,791 lf of available stream credits from a total of seven commercial mitigation banks within the Middle James River Basin Service Area (HUC 2080203). In this river basin/service area, VARTF presently has 0.46 ac of wetland credits and 4,987 lf of stream credits available. If insufficient mitigation credits are available, the proposed project will discuss off-site mitigation options with USACE and VDEQ staff during the Clean Water Act (CWA) Section 404/401 permitting process.

Threatened and Endangered Species

28. According to U.S. Fish and Wildlife Services IPaC database,[2] the northern long-eared bat, a federally endangered species, has the potential to exist in the project area. However, no studies were conducted. Page A-54 states that, during the study planning process, it was determined that the project has the potential to impact bat roosting habitat, but based on the applicant's pre- and post-project water level studies, as well as the terrestrial study, Scott's Mill Hydro's biologist determined there would be no effect to bats based on hydrology and shoreline steepness. Page E-65 of the application states that the project "will have little effect on water levels and primarily affect steep shoreline areas" and claims "that bats were unlikely to be affected by the project." However,

[2] https://ecos.fws.gov/ipac/.

although you have determined bats will be unlikely to be affected, the federally endangered northern long-eared bat has the potential to be present in the project area. Therefore, please provide a description of any northern long-eared bat habitat that is located within the project area studied for the Terrestrial Habitat Assessment (Appendix G). Also, please clarify if you are planning any tree-clearing activities related to your proposed construction or dredging activities.

RESPONSE

Northern long-eared bat (NLEB) summer roosting habitat (mature trees larger than 2-4" in diameter, with loose bark) is present along much of the James River and throughout the surrounding region. For most land-development projects, potential bat impacts are minimized by ensuring that any required tree clearing occurs while bats are hibernating (no tree clearing within the April 15-September 15 time-of-year restriction [TOYR} period). Since the proposed Scott's Mill project should not require tree clearing, should not affect winter hibernacula (caves or structures), and should not increase upstream or downstream riparian vegetation inundation outside the normal range experienced by the river (due to periodic flooding), the potential to impact bat habitat should be minimal. The USFWS Information and Planning Consultation (IPaC) system requires a standard conclusion of "May Affect, Not Likely to Adversely Affect" for most project sites within the typical NLEB habitat range (if no tree clearing or structure demolition is proposed).

Recreation Resources

29. Page 7 of Appendix B states that, "Consultation with local recreation experts from the adjacent counties and resource agencies (e.g., Virginia Department of Conservation and Recreation and Virginia DWR), indicated the local recreation needs." To provide staff with a more accurate picture of recreation at the project, please provide a record of this consultation. The record should include the names of the experts with whom you spoke, the dates the consultation occurred, and a summary of what was discussed. If this information is already provided in the application, please indicate where it is located.

RESPONSE

Information related to local recreation consultation is spread throughout Appendix A part 1 and part 2 to Exhibit E, Record of Consultation. Examples include:

- Part 1, Pg. 16, recreation discussion at the December 2, 2015 joint meeting;
- Part 1, Pg. 25 – 27, input from the Upper James River Riverkeeper;
- Part 1, Pg. 41, VDWR no comment on recreation study plan;

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- Part 2, Pg. 26, Joint meeting May 8, 2018;
- Part 2, Pg. 55, Settlement Agreement In Principle, Jan. 20, 2020

In addition to the consultation record, Scott's Mill has extensively coordinated with Amherst County and their consultant on the County's recreational needs. The following email correspondence is but one email between the County's consultant and Scott's Mill on a whitewater study conducted by Amherst County.

From: Wayne Dyok <dyok@prodigy.net>
Sent: Tuesday, November 13, 2018 1:49 AM
To: j.anderson126@verizon.net
Cc: Mark Fendig <mfendig@aisva.net>; Luke Graham <lukegraham_5@yahoo.com>; dcrodgers@countyofamherst.com
Subject: Re: Scott's Mill Hydro - Whitewater Recreation Study

John - Attached is the FEMA flood study for the James River near Lynchburg.

Wayne

On Monday, November 12, 2018 8:52 AM, Wayne Dyok <dyok@prodigy.net> wrote:

Hi John. It was a pleasure talking with you on Friday. Based on that call, it is my understanding that you are trying to complete the whitewater study by the end of the year, but that schedule could change depending the County's review. We would appreciate an email copy of the scope of work in order for us to accurately describe the alternatives being evaluated in our license application. Our understanding is that there are a couple of alternatives that involve Scott's Mill dam. One is removal and the others may include a whitewater course on both the left and right sides of the river. If my understanding of the discussion is correct, you could use different grades (slopes) for the whitewater course. At this time you are considering about a one percent grade (i.e., whitewater class 2 or 3), but the grade could be as much as three percent. Flow would typically be in the 400 to 600 cfs range, but would not be needed all day or every day. Please correct any misunderstandings I may have. Thanks.

Also as we discussed, Scott's Mill Hydro LLC is investigating the feasibility of including a boat ramp upstream of Scott's Mill Dam on the left bank. Mark is working with Liberty University which owns a parcel on the left bank downstream from Reusens Dam to see if we can use that parcel.

Would it be possible to obtain a copy of the slides you showed Mark?

As to your request of Mark, please see my responses below.

Mark
Many thanks for your valuable input on your FERC license application and dam property. You indicated that you and your consultant team have mapping and the FEMA model for your project area and are willing to share this information with us. Kindly ask your team if they can provide us with:

1. Point file for the bathymetric survey and depth to bedrock borings. Either I or Luke Graham, my assistant, will try to get you a usable bathymetric survey map file. At Scott's Mill Dam, the dam is pretty much founded on bedrock. There are borings for the bridge that crosses the James River downstream of the dam. I believe that Hurt and Proffitt or VA DOT can provide those to you.
2. Compiled base map that includes both the bathymetric work and the overbanks. If there is a geo-referenced aerial photograph, provide that too. I will see what I can do here. It may take me a day or two to provide that info to you.
3. Certified FEMA hydraulic model and cross sections. Provide your existing effective model and proposed effective model (if different). I will send that to you later today. I have to leave now for an appointment that will take most of the day.

Thanks in advance,

Regards,
Wayne

30. Throughout the Recreational Resources Study (Appendix J), various references are made to reports, studies, and conversations without citation. Additionally, for the citations that are provided (e.g., Stanovick et al., 1991), a "Literature Cited" section is not included in the study report. So that staff can review the referenced information, please provide citations for all references, including conversations with other entities, and provide a "Literature Cited" section. If any non-published information is cited (i.e., phone conversation memos or meeting transcripts), please provide documentation of this information for the project record.

RESPONSE

Commission staff requested literature citations for the Recreation Study. Citations are as follows:

- Stantovick, J.J., Kokel, R.W., Creamer, A.E., Nielson, L.A., and D. J. Orth. 1991. James River Mainstem Investigation, Job 4-Angler Survey, Federal Aid in Fish Restoration, Project 74-R
- Amherst County Comprehensive Plan, 2007-2027, countyofamherst.com/egov/documents
- Virginia Department of Game and Inland Fisheries, 2000, James River Angler Survey
- City of Lynchburg Comprehensive Plan, 2002-2020, Chapter 13, Parks and Recreation

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31. In our comments on the DLA, we requested "…a map indicating where the proposed fishing pier and canoe portage route, put-in, take-out, and parking areas, described on page E-70, are located in relation to proposed project facilities, and the river, within a clearly delineated proposed project boundary." Figures 6-4 and 6-5 in Exhibit E, and the project boundary map provided in Exhibit G, do not display the information requested. Please provide a map that clearly displays the project boundary and the exact location of all existing and proposed recreation facilities. If an exact location for any facilities cannot be provided, please provide an outline of the estimated location(s).

RESPONSE

The recreation features proposed for the project are presented on Sheet two of Exhibit G. This map is presented below.

POINT OF BEGINNING FOR PARCEL #4

IPF

N 61°54'04"E 99.83'

DRILL HOLE IN ROCK FD.

50.32'

N 21°46'41"W

S 21°46'41"E 44.83'

N 61°54'04"E 41.43'

IPS AT 10.00'

POINT OF BEGINNING FOR PARCEL #2

188.16'

N 25°22'11"W

LAMPREY/EEL PASSAGE

LAT 37.424804 N
LONG -79.139788 W

13

28

12

SECTION - 2
MERRY - MOOR

11

10

S 14°07'08"E 836.28'

Δ= 06°17'15"
R= 3010.703'
L= 330.39'
CH= 330.22'
CB= N 18°38'04"W

PARCEL #4
1.967 ACRES

STATE ROUTE NO. 685

50' R/W

N 87°23'13"E 75.91'

IPF

S 16°45'14"E 150.15'

IPF

IPF

Δ=05°45'06"
R= 2800.618'
L= 281.14'
CH= 281.02'
CB= N 12°36'53"W

S 39°50'00"E 188.59'

N 15°29'26"W 329.45'

S 15°29'26"E 329.45'

C-1

C-2

(RIVER ROAD)

99.22'

N 09°44'20"W

S 09°44'20"E 141.82'

382.93'

N 10°22'26"W

S 39°50'00"W 51.63'

APPROX. LOCATION LOW WATER LINE

338.04'

N 16°47'16"W

N 08°22'47"W 152.16'

N 20°04'26"W 76.37'

10'x10 FISHING PIER

CANOE PORTAGE

PARCEL # 2
0.964AC.±

C-1
Δ= 06°17'12"
R= 2960.703'
L= 324.86'
CH= 324.69'
CB= S 18°38'02"E

C-2
Δ= 05°45'06"
R= 2750.618'
L= 276.12'
CH= 276.00'
CB= S 12°36'53"E

REF: PLAT BY A.E.P. DATED JUNE 10, 1941

SCALE 1" = 100'

JAMES RIVER

JAMES RIVER

PARCEL #3

DAM

RAISED PRIMARY OVERFLOW SPILLWAY (ELEV. 516.4')

PROJECT BOUNDARY

S 69°55'02"W

A.E.P.

THIS SURVEY HAS BEEN PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND DOES NOT THEREFORE, NECESSARILY INDICATE ALL ENCUMBRANCES ON THE PROPERTY.

THIS PLAT HAS BEEN PREPARED FROM AN ACTUAL FIELD SURVEY DONE AS PER DATE OF THIS PLAT AND THERE ARE NO VISIBLE EASEMENTS OR ENCROACHMENTS EXCEPT AS SHOWN HEREON.

PARCEL #5
ISLANDS IN RIVER

0.068 AC.±

0.269 AC.±

ROCKFILL SLOPE

IMPROVED CHANNEL

LIBERTY BROADCASTING

DANIEL'S ISLAND

LOWERED ARCH DAM (ELEV 508.0')

ROCKFILL SLOPE

ROCKFILL SLOPE

LYNCHBURG

ROCKFILL SLOPE

LAT 37.424104 N
LONG -79.142161 W

RECONSTRUCTED BASTION

POWERHOUSE (LPS MODULES, 9 TURBINES)

TAILRACE

CREST GATES (2)

TRAINING WALL

LAMPREY/EEL PASSAGE

3.503 AC.±

ANTHONY'S ISLAND

AMSTEAD INDUSTRIES, INC.
(GRIFFIN PIPE PRODUCTS, CO.)

APPROX. LOCATION LOW WATER LINE

IPF AT 26.07'

S 44°20'31"E 251.44'

S 79°30'30"W 166.07'

JAMES RIVER

HEADPOOL

N 71°09'30"E

S 18°31'21"E 114.15'

S 19°46'13"E 36.13'

S 40°21'31"E 140.51'

S 21°04'26"E 152.76'

S 48°25'44"E 120.87'

PARCEL #1
2.882 AC.±

STONE WALL

STONE WALL

CANAL

429.80'

NAIL & CAP SET IN CONC.

AMSTEAD INDUSTRIES, INC.
(GRIFFIN PIPE PRODUCTS CO.)

S 33°58'27"E 138.99'

IPS AT 40.00'

N 71°09'30"E 70.00'

STORAGE SHED

EXISTING RAILROAD RAILS

IPS

N 16°23'30"W

IPF

N 46°02'00"W

493.37'

12'

12'

RETAINING WALL

LAT 37.421881 N
LONG -79.142318 W

CANAL FILLED (TWO 2.5' CULVERTS INSTALLED)
CHESAPEAKE AND OHIO RAILWAY CO.

POINT OF BEGINNING FOR PARCEL #1

LYNCHBURG, VA

Exhibit G

Scott's Mill Project

FERC No. P-14867

Project Boundary

NOTE:
PARCEL #5 PLOTTED FROM MAP OF LYNCHBURG DAM BY APPALACHIAN POWER COMPANY DATED JUNE 10, 1941. NO FIELD SURVEY WAS DONE OF PARCEL #5 AT THIS TIME.

THIS FIGURE IS INTENDED FOR ILLUSTRATIVE PURPOSES ONLY. PROPOSED FEATURES HAVE NOT BEEN SURVEYED/STAKED. PROPOSED FEATURES ARE SHOWN PER SCOTT'S MILL HYDRO (M. FENDIG, W. DYOK), 3/30/21

COMMONWEALTH OF VIRGINIA
DOUGLAS A. LEE
No 1691
Dec. 10, 98
LAND SURVEYOR

SOURCE OF TITLE:

APPALACHIAN ELECTRIC POWER CO. DOCUMENT NO. 1302 FROM THE CHESAPEAKE AND OHIO RAILWAY CO. DATED JUNE 17, 1940.

SCALE: 1" = 75 FEET

LEE SURVEYING, INC.
"Surveying the world one piece at a time"
8404 Timberlake Road • Lynchburg, VA 24502
Ph. (804) 237-8820 FAX (804) 237-4253

100 50 0 100 200
GRAPHIC SCALE IN FEET

PLAT SHOWING RESURVEY OF PARCELS 1 - 6, PROPERTY OF
A. E. P.
MADISION DISTRICT, AMHERST COUNTY
CITY OF LYNCHBURG, VIRGINIA

DATE: DEC. 10, 1998 | DRAWN BY: DAL
COMM • 981214 | FILE •

SHEET 2 OF 2

32. Pages 8 and 9 of Appendix B state that an existing informal parking area is used by recreationalists to access the project area and that this area is owned by Liberty University. Because Scott's Mill Hydro is proposing to use this site to install a boat ramp and improve the parking area, it needs to be included within the project boundary pursuant to section 4.41(h)(2) of the Commission's regulations. Therefore, please provide a revised Exhibit G that clearly indicates this area within the project boundary, pursuant to section 4.41(f)(7)(vii)(D) of the Commission's regulations. In addition, please provide a detailed explanation of the improvements you intend to make to this area and how many parking spaces the formalized lot would accommodate. Finally, so that staff can understand the current condition of the site at which the boat ramp and associated parking lot would be installed, please provide photos of this area.

RESPONSE

The parcel owned by Liberty University (LU) upon which the boat ramp is to be located was included in the Exhibit G map included in the Exemption Application. However, as noted in the transmittal letter and in the response to comment 6, Scott's Mill has not yet consummated an agreement with LU. Therefore, the boat ramp parcel has been removed from Exhibit G. The final Settlement Agreement is expected to include a boat ramp.

33. Pages E-65 to E-67 of Exhibit E provide a list of recreational opportunities within 60 miles of the project. However, not all the locations listed are within 60 miles. For example, Cass Scenic Railroad State Park is approximately 139 miles from the project area. So that staff can better understand the recreational setting and what recreational opportunities are available in the region, please clarify how far these opportunities are located from the project, preferably grouped in a list by decreasing distance intervals (e.g., 60, 20, and 5 miles from the project).

RESPONSE

Replace Section 6.3.6.1.1 with the following.

The Scotts Mill Project is within 60 miles (approximately a one-hour drive) of numerous recreational opportunities including boating, fishing, hiking, camping and viewing nature. These opportunities, which are managed by Federal, State, local and non-governmental entities are listed below with distances from the project in miles:

Federal

- Appomattox Courthouse National Historic Park -22;
- Blue Ridge Parkway (managed by the National Park Service) - 22;
- Otter Lake Waterfalls – 22 Miles;
- George Washington National Forest; - 24;
- Jefferson National Forest – 24;
- Appalachian National Scenic Trail – 24;
- James River Face Wilderness Area – 24 and
- Shenandoah National Park – 59.

Virginia

- Appomattox-Buckingham State Forest – 32;
- Holiday Lake State Park – 34;
- Natural Bridge State Park – 36;
- •Smith Mountain Lake State Park – 39;
- Lake Nelson (also managed by VDWR) – 40;
- Horsepen Lake WMA – 40;
- James River State WMA – 42;
- Mount Pleasant Special Management Area – 42;
- Lake Robertson State Recreation Area – 51;
- High Bridge State Park – 55;
- Staunton River Battlefield State Park – 57 and
- Bear Creek Lake State Park – 60.

Local

- The City of Lynchburg, Virginia, (operates and maintains 850 acres of parkland) – 0;
- City of Bedford (two natural area parks, 1 skate board park, two athletic field parks -26;
- The City of Lexington, Virginia, (operates and maintains 2600 acres of parkland) - 44 and
- City of Roanoke; (14,000 acres of public land) 56 Miles

Other

- Paradise Lake Family Campground – 14;
- Lynchburg RV Resort – 18;

- Lynchburg Blue Ridge Parkway KOA – 19;
- Yogi Bear's Jellystone Park Camp-Resort (Natural Bridge Station) – 36;
- Lake Nelson Family Campground (Arrington) – 39;
- Smith Mountain Pumped Storage Hydroelectric Project (Smith Mountain Lake and Leesville Lake) – 40;
- Wintergreen Resort – 51;
- Misty Mountain Camp Resort (Greenwood) – 59;
- Shenandoah Acres Resort (Stuarts Draft) – 59;
- Charlottesville KOA – 60 and
- Goshen Scout Reservation – 60.

Land Use and Aesthetic Resources

34. In our comments on the DLA, we requested information on land use in the project area, however, this information was not provided in the exemption application. Page E73 of Exhibit E categorizes the land use surrounding the project as a mixture of riparian, forested, and recreational. The descriptions are vague and do not provide enough detail to identify the land use within the proposed project boundary. In the application, please provide the following information:

a. the types of land use within the project boundary (i.e., industrial, urban, rural, forested, riparian, undeveloped, recreational, residential, etc.);
b. the amount, in acres, for each category; and
c. a map depicting land use categories.

Also, please identify the percentage of lands within each category that are applicant owned and privately owned.

RESPONSE

The actual land included within the project boundary is minimal. It includes only the land upstream and downstream of Scott's Mill Dam needed for project purposes. Scott's Mill owns all these lands. On the north side of Scott's Mill Dam, the project boundary extends about 200 feet upstream and 550 feet downstream of the dam. In this area the project lands extend from the shoreline to VDOT property on River Road. The width of this sliver of land is only about 50

feet wide for a total area of about 0.9 acres. This entire area has steep banks and is comprised of riparian and forested habitat.

On the south side of the river, approximately 0.3 acres of Daniel Island is included in the project area. Part of this area is needed to divert flow toward the powerhouse from the main channel of the James River. Daniel Island is primarily riparian habitat. Only about 0.2 acres will be needed to accommodate the channel connecting the main channel with the intake channel. About 3 acres of Anthony Island (also known as Perceval Island) downstream of Scott's Mill Dam are included to ensure that a portion of the powerhouse flow can be diverted to the main channel to maintain water quality. This island is vegetated with riparian habitat. The remaining land needed for construction and operation of the powerhouse is industrial. It consists mainly of land leased to U.S. Pipe. There is a small amount of riparian vegetation along the riverbank, but the area is otherwise industrial. Approximately one acre of the industrial land will be needed to construct and operate the powerhouse. No lands upstream are necessary to operate and maintain the project. Scott's Mill has a flowage easement on the islands upstream of Scot's Mill Dam, but the islands themselves are excluded from the project boundary since they are unnecessary for project operation. These areas are depicted on Exhibit G, presented in the response to comment 31.

35. The operation of the proposed project would result in a reduction in flow over the main spillway (river left, looking downstream) because a large portion of the flow that currently spills over the dam (e.g., up to 4,500 cfs) would be diverted to the opposite side of the impoundment and through the modular powerhouses (on river right). Page J-64 of Appendix J, Visual Resources Report, presents the aesthetic values of these current and future flow conditions over the dam in such a way that makes it difficult for staff to determine the level of potential impact (e.g., describing the aesthetic qualities of various flows by using an inconsistent range of cfs values). Please present this information using the same cfs ranges and descriptors to compare existing aesthetic conditions to future aesthetic conditions (e.g., by comparing the aesthetic value of existing 800- to 1,200-cfs flows to the aesthetic value of future 800- to1,200-cfs flows). For example, flows (spill over the dam) in the 800 cfs to 1,200 cfs range are considered visually impressive and currently occur X percent of the time. Once the project is constructed and operational, flows over the dam in the 800 cfs to 1,200 cfs range would occur only Y percent of the time. Additionally, please provide a map indicating the locations of the key viewing areas (KVAs) used for the analysis.

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RESPONSE

Replace Section 6.3.7.2.2 Aesthetics impacts and recommendations with the following.

"The most significant aesthetic impact will be the reduction in flows over the dam. Applicant intends to provide a constant flow of water over the dam during post-project operations. For flows up to the hydraulic capacity of the project (i.e., 4500 cfs), Applicant proposes a thin veil of about 1 inch depth over the dam crest. This veil will be present about 77 percent of the time. It will not be visually significant. Under existing conditions, flows at 800 cfs are not visually significant. Based on photographs taken at flows of 800 cfs, 1400 cfs, 1500 cfs and 1800 cfs, flows become more visually attractive but not spectacular. In general, it appears that at discharges below 1,000 cfs, flow could be considered not visually significant. Such flows occur about 25 percent of the time.

Flows at 3,000 and above were given a spectacular visual rating. Based on the visual character of flows between 1,800 cfs and 3,200 cfs, Applicant concluded that flows between 1,000 cfs and 3,000 could be considered visually attractive. Visually attractive flows between 1,000 cfs and 3,000 cfs occur about 40 percent of the time. Spectacular flows between 3,000 cfs and 4,500 cfs (the hydraulic capacity of the powerhouse) occur about 12 percent of the time.

The following table illustrates the percent of time that the aesthetic resources are "not visually significant", "visually appealing" or "spectacular category."

Table - Waterfall Visual Resource Assessment

SM Flow (cfs)	Pct. of Time	Exist. Cond.	Dam Flow	Post Proj. Rating
<1,000	25	Not. Sig.	30	Not. Sig.
1,000-3,000	40	Appealing	30	Not. Sig.
3,000-4,500	12	Spectacular	30	Not. Sig.
4,500-5,500	6	Spectacular	30-1,000	Not Sig.
5,500-7,500	6	Spectacular	1,000-3,000	Appealing
>7,500	11	Spectacular	>3000	Spectacular

In summary, under existing conditions 25 percent of the time the flow is not visually significant, 40 percent of the time it is appealing and 35 percent of the time it is spectacular. During project operations, 83 percent of the time the visual resources of water flowing over the dam are not

visually significant. Six percent of the time they are appealing and 11 percent of the time they are spectacular. The more spectacular visual flows will occur only 11 percent of the time under project operations compared to 35 percent under existing conditions.

Because views of the flow of water over the dam are limited from River Road and the view from the 5th Street bridge is distant, the impacts from these key viewing areas (KVAs) are not as significant as they might otherwise be. The most significant effect will be to the seven homes on Norwood Street and from the passerby view on the street. However, a large part of their view is also toward the U.S. Pipe industrial site and the railroad. Because there are few observers with unobstructed views of the dam and because they will be able to observe the higher flows 11 percent of the time (i.e., about 40 days per year), Applicant does not propose any further mitigative measures to preserve the aesthetics of the water flowing over the dam, other than to provide a veil over the dam 77 percent of the of the time that the flow is less than the hydraulic capacity of the turbines.

The powerhouse should blend into the surrounding and generally will be shielded from most viewing locations (see **Photograph 22 in Appendix C**). This should not be a significant impact on the environment. Since the Applicant is not proposing significant changes to the headpond elevation, there should not be any impacts to the natural surrounding.

Construction noise should only be a minor nuisance because the U.S. Pipe facility and adjacent railroad contribute significantly to the ambient noise level and there are no close-by sensitive receptors. The north side is quieter, but during construction recreational use at the dam site will be precluded. Therefore, noise effects would impact only those fishing from boats and the intermittent noise generated from the one-year construction of the fishway and recreational facilities will be partially drowned out by the noise for water flowing over the dam."

A map of the KVAs (5th Street bridge, River Road and Norwood Street) is presented below.


Key Viewing Areas
Scotts Mill Rd
F St
E St
Norwood St
D St
Cabell St
Hancock St
C St
B St
A St
Stonewall St
James River
River Rd
S Amherst Hwy
Rivermont Ave
Church St
5th St
Main St
Commerce
7th St
5th St
Rocky Hill Rd
Lynchs Ferry Rd
Feet
0
250
500
N

Cultural Resources

36. Pages B-10 and B-11 of Appendix B state that the Virginia State Historic Preservation Officer (SHPO) has identified the area of potential effects (APE) as the project boundary, and that the project boundary was extended to include the head pond. Please provide a map showing the APE, as well as the project boundary. Additionally, please clarify whether the Virginia SHPO approved the APE that includes the extended project boundary.

RESPONSE

Exhibit G presents the project boundary. Since the APE corresponds with the area within the project boundary, no purpose is served preparing a second map showing the APE. The SHPO has reaffirmed that the APE includes the extended project boundary, less the upstream islands.

Roberts, Timothy <tim.roberts@dhr.virginia.gov>
To: Jim Thornton
Cc: Wayne Dyok
Tue, Mar 30 at 12:47 PM

Good afternoon Jim.,

The Virginia Department of Historic Resources (DHR) has received your request for concurrence with the dimensions of the expanded area of potential effects (APE) for the referenced project. DHR understands the revised boundaries of the APE have been expanded to include the entirety of the new project boundary that extends from just downstream of the existing Scott's Mill Dam to just below Reusen's Dam upstream. DHR concurs with this expanded boundary. Please let this email serve as DHR's official response to the request for comment.

Thank you for consulting with our office.

Best regards,

Tim

Show original message

--
Timothy Roberts, Archaeologist
Review and Compliance Division
Department of Historic Resources
2801 Kensington Avenue
Richmond, VA 23221

Schedule C
Project No. 14867-001

(804) 482-6103
www.dhr.virginia.gov

Engineering Issues

37. There are two spillways at the proposed project, a 735-foot-long primary spillway and a secondary, 140-foot-long (arch-shaped) spillway. Scott's Mill Hydro proposes to install a 2-foot-high concrete cap on the crest of the primary spillway and to remove a portion of the secondary spillway to help divert flow into the proposed powerhouse. In order to address any upstream inundation effects of the proposed installation of a 2-foothigh concrete cap on the crest of the primary spillway and reduced total length of the spillways (due to the proposal to remove a portion of the secondary spillway), an analysis is required comparing the upstream inundation effects under existing and proposed conditions. To evaluate the inundation effects, the analysis must include:

a. A study of historical storms/floods that occurred near the dam. This analysis could entail preparing a hydrologic model to develop inflow and outflow hydrographs based on observed precipitation and flow data and existing river basin characteristics;
b. a flood frequency analysis of historical inflows and outflows in order to determine the annual recurrence interval of observed maximum flood events;
c. a comparison of upstream impacts on non-project properties and structures (e.g., residences, campgrounds, businesses) based on the existing and proposed conditions under normal flow and flood scenarios;
d. inundation maps for all scenarios evaluated, including electronic shapefiles; and
e. input/output files of any model simulations used in the analysis.

RESPONSE

As noted by Commission staff, there are two components of the spillway: a 735-foot long primary straight section and a 140-foot long arch shaped section. A 2-foot cap will be placed on the primary section. The crest elevation of the straight spillway is 514.4 feet. Scott's Mill proposes to increase that elevation to 516.4 feet. The crest elevation of the arch section is 514.8 feet. Once the proposed project is completed the top portion of the arch section will be removed. The powerhouse will become the new control for the arch section of the dam. The new

crest elevation will be 521.5 feet. The effective length of this section is 164 feet (i.e., 18 modules each 8 feet wide). The powerhouse is designed to allow overflow once upstream water levels exceed 521.5 feet. This corresponds to a flow of about 50,000 cfs, which is equivalent to a flood level that is less than the 10-year flood. During detail design, this elevation may be refined in consultation with Commission staff. Once a headpond of 521.5 feet is reached, the powerhouse will act like a spillway.

As water levels exceed elevation 524 feet (i.e., 10-year flood level of 79,00 cfs), the complexity of flow increases because bank overflow is occurring. Under existing conditions, per FEMA results, there is still about a 6-foot water level differential and Scott's Mill Dam remains a control point for upstream water levels. However, as flows increase above the 10-year flood level, the backwater becomes more dominant and Scott's Mill becomes less of a control point. At the 500-year flood, there is only a two-foot elevation differential upstream and downstream of Scott's Mill Dam. As flows increase above the 10-year flood level more and more flow passes around the dam.

To assess the effect of increasing the crest elevation of the straight portion of the spillway by 2 feet and eliminating the arch portion of the spillway, but replacing it with a new effective powerhouse spillway at a crest elevation of 521.5 feet, the weir equation can be used to calculate the change in upstream water levels. Under existing conditions, FEMA calculated that the head difference at 79,100 cfs (10-year flood) was 6 feet. The corresponding downstream water level would be about 518 feet, submerging the crest of the main spillway by about 3.6 feet. Assuming a weir coefficient of 4.2, applying a 6-foot head over Scott's Mill Dam (5.6 feet over the arch section), the total flow over the dam would be 53,000 cfs and the remaining flow would be overbank flow. The 26,000 cfs of overbank flow is obviously more than the actual amount that would occur. Given the likely error band in FEMA calculations, a more reasonable estimate of head might be 7.5 feet[3]. Using the weir equation, this would yield a flow of 63,400 cfs over the main spillway, 11,100 cfs over the arch section and 4600 cfs of overbank flow. This appears to be a more reasonable estimate of flow distribution.

The 7.5 foot of head also appears to be a reasonable estimate of head based on examination of measured headwater and tailwater levels. The measured head

[3] It is assumed that the headwater level remains at elevation 524 feet and the error band is associated with the tailwater level.

difference at a flow of 25,100 cfs was 10.7 feet (Table A-3 of the Exemption Application). At a flow of 8,800 cfs the head difference was 12 feet. Therefore, a head difference of 7.5 feet at 79,100 cfs seems reasonable.

Using the weir equation, assuming post project conditions and ignoring any overbank flow changes, Scott's Mill calculated that the equivalent head to pass 79,100 cfs over the main spillway and powerhouse would be 8.1 feet, or an increase of 0.6 feet at the dam[4]. In this calculation a coefficient of 4.2 was used for the main spillway to be consistent with existing conditions. However, for the powerhouse overflow, a coefficient of 3 was assumed. Scott's Mill also assumed a tailwater of 516.5 feet to be consistent with the existing condition calculations above. At this flow, Scott's Mill remains a flow control.

For the 10-year flow, Table A-3 of the exemption application ignored overbank flow and flow over the powerhouse to yield a maximum water level differential of 2.2 feet. The current calculations are an improvement over the earlier water level estimates. At higher flood frequencies, the water level differential at the dam would decrease and become close to zero because Scott's Mill is no longer a control point. Therefore, the maximum upstream inundation change occurs at a flow of about 25,000 cfs when the powerhouse shuts down and all flow passes over the spillway.

At 25,100 cfs, the measured head over the dam crest was 4.1 feet over the main spillway and 3.7 feet over the arch section. Using a weir coefficient of 3.5 results in 21,400 cfs flowing over the main spillway and 3500 cfs over the arch section for a total of 24,900 cfs. Therefore, at a flow of 25,000 cfs a weir coefficient of 3.5 seems appropriate.

For post project conditions, at 25,100 cfs, all flow will be over the main spillway and the new crest elevation will be 516.4 feet rather than 514.4 feet. Using a weir coefficient of 3.5, the head over the crest would be 4.6 feet or at elevation 521 feet

[4] If it is assumed that the FEMA error band is totally with the upstream water level and not the tailwater, then the headwater level would be 526.1 feet (i.e., 8.1 feet above a tailwater elevation of 518 feet) rather than 524 feet and more water would pass over the powerhouse.

as presented in table A-3 of the exemption application (i.e., 2.5 feet higher than water levels during existing conditions).

The key to inundation of upstream areas during flows above the hydraulic capacity of the powerhouse is the change in water levels at Scott's Mill Dam between existing conditions and post construction, operational conditions and propagating those water levels upstream. Using Manning's equation, the upstream water levels can be estimated. Standard practice is to conduct an hydraulic modeling using a model such as HEC-RAS. Data inputs are flows, cross sections (geometry data and plan data), starting water levels, and roughness coefficients). Scott's Mill has bathymetry information and could expend the effort to conduct such a modeling analysis. However, the critical information to be gained is the change in water level upstream. Based upon a maximum water level change of 2.5 feet at a flow of about 25,000 cfs, Scott's Mill does not believe that it is cost effective or necessary to conduct hydraulic modeling. Sufficient information exists from FEMA's analysis to estimate upstream water level changes at flows of 25,000 cfs. Upstream water level changes would be less than 2.5 feet as discussed below.

Manning's equation is Q=1.49/n*AR**(2/3)*S**0.5, where Q is the flow in cfs, n is Mannings n (or a roughness coefficient), A is the cross sectional area, R is the hydraulic radius defined as cross sectional area divided by perimeter, and S is the hydraulic gradient. Although measurements on Google and in the Exemption Application suggest that the distance between Ruesen's Dam and Scott's Mill Dam is 3.6 miles, the FEMA studies indicate a distance of 3.15 miles. Hence the estimates of upstream water levels will assume 3.15 miles.

Based on FEMA's studies, the 10-year flood of 79,100 cfs has a surface water level differential of 9.4 feet. This decreases slightly as flows increase to 255,000 cfs (500-year flood).[5] For a flow of 25,000 cfs, the surface water differential is likely to be on the order of 10 feet. (Since the analysis considers the differential, a 10 foot or 11foot water level difference will not significantly affect the results.) Based on the distance between dams, the hydraulic gradient under existing conditions is 0.0006 feet per foot.

[5] For a 500-year flood (255,000 cfs), the FEMA water differential between Reusens and Scott's Mill was 7.5 feet, for the 100-year flood (159,000 cfs) it was 8.5 feet, and for the 10-year flood (79,000 cfs), it was 9.4 feet. Hence for a flow of 25,000 cfs, a water level differential is likely to be between 10 or 11 feet.

Because the James River is relatively wide compared to its average depth, the wetted perimeter is essentially the width of the river (i.e., the typical width of the river upstream of Scott's Mill Dam under normal flow conditions is on the order of 600 to 700 feet based on the bathymetry study). Therefore, the width and the perimeter become almost the same number. Accordingly, the hydraulic radius can be represented by the average depth. Since the cross-sectional area is equal to the width times the average depth, Manning's equation can be rewritten as Q=1.49/n*W*D**1.67*S**0.5. If a Manning's n of 0.326 is assumed (a reasonable assumption based on V. T. Chow), the average width is 800 feet, the average depth is 8 feet, and the slope is 0.0006, the calculated discharge is 25,000 cfs. The calculated velocity would be about 4 feet per second which appears reasonable. With a depth increase of 2 feet at the dam, the velocity would decrease to about 3 feet per second immediately upstream of the dam. Because head loss in a stream is a function of the velocity squared, the head loss of 0.0006 feet per foot (or 0.6 feet per thousand feet) during post project conditions with a 2-foot increase would be about 56 percent of the head loss under existing conditions. Hence instead of the water level rising 0.6 feet in that first 1000 feet upstream, it would only rise about 0.34 feet. The water level differential would be 2.5 feet less 0.26 feet or about 2.24 feet. This calculation could be redone for every 1000 feet, but in essence in roughly 10,000 feet (or two miles), pre-project conditions would persist from that point upstream to Reusens.

A check on the estimates for velocities, widths, and depths for the 25,000 cfs case can be undertaken by examining FEMA's analysis for the 100-year flood (159,000 cfs). The cross-sectional area at FEMA RM 253.43 was 23,648 square feet and the width was 1070 feet, resulting in an average velocity of 6.7 feet per second. Average depth was 22.1 feet. For a flow of 25,000 cfs, the average velocity will be significantly less than 6.7 feet per second. Based on the bathymetric survey, the James River average width at 25,000 cfs is on the order of 700 or 800 feet. Therefore, the average depth would be between about 6 and 9 feet. In examining the bathymetric data, for a flow of 25,000 cfs, the average depth is more likely to be in the range of 8 feet, as used in the above analysis.

Scott's Mill maintains there is no need to consider historical storms that occurred in the area. FEMA's study of the 10, 50, 100 and 500 year events do just that. The maximum flood of record that occurred in 1985 has between a 100 and 500

year return interval. Further FEMA has conducted a detailed flood frequency analysis.

Because the storage is small in the Scott's Mill headpond, during floods there would only be minor attenuation. For example, the surface acreage of the headpond is 318 acres at average flows. For a 10 foot increase in water level as would occur when flows increase from 3,000 cfs to over 80,000 cfs, and assuming some increase in reservoir width (e.g., from 700 to 900 feet), the total volume stored would be on the order of 5,000 acre-feet. That is the equivalent of about 2500 cfs for one day.

As discussed throughout the Exemption Application and in this response above, the impacts to non-project properties and structures would not be significant because the changes in water level do not exceed 2.5 feet under worst case conditions and these water level differences attenuate upstream. The shoreline banks are steep and the changes in velocity and water level on erosion, wetlands, vegetation, terrestrial habitat, docks, or any nearby structures would exhibit only minor effects. In fact, the greater stability of water levels during flows that are less than 4,500 cfs may be considered as a benefit by adjacent property owners as there is currently about a one-foot water level change from low flows to about 4,500 cfs, which is the hydraulic capacity of the powerhouse. Again because of the bank steepness, inundation maps would be of little value. Scott's Mill invites Commission staff to observe field conditions during natural flow variations. The changes from project operations would do little to affect these variations except when flows are below 4,500 cfs.

38. The stability analyses in the Preliminary Supporting Design Report only includes calculations for the powerhouse units (LPS Modules). The applicant should also provide stability analyses, under all probable loading conditions, for the existing Scott's Mill Dam primary overflow section and masonry bastion section. The stability analyses should be based on the proposed configuration of each structure as shown in Exhibit F of the application. Please include free body diagrams for each structure with the analyses including the proposed powerhouse.

RESPONSE

Scott's Mill contracted with McMillan Jacobs (MJ) to conduct a stability analysis of the primary overflow section of the dam (see Appendix D). Given that the FEMA studies indicate a one-foot elevation difference in water levels between

upstream and downstream water levels, high flood flows with low frequencies of occurrence were determined not to be controlling factors for the stability analysis.

MJ considered the stability of the Scott's Mill Dam with and without ice loading. Although the James River can experience cold winter weather, the Scott's Mill headpond has not iced over in recent memory. Extreme weather conditions may occur with climate change, such as occurred in February of this year, but the duration and magnitude of cold temperatures are very unlikely to be long enough or cold enough to result in significant ice loading. Hence the ice loading conditions analyzed are not presented in the MJ report. Similarly, seismically, the area is stable and stability analysis with earthquake loading was not undertaken for this level of design. However, during detail design, Scott's Mill will conduct a full stability analysis in coordination with the Commission and Commonwealth of Virginia.

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

CERTIFICATION

Commonwealth of Virginia
County of Amherst]

I, Mark Fendig, Managing Partner ofScott's Mill Hydro, LLC, (FERC Project No. P-14867), 733 Elon Road, Big Island, Virginia 24539, being duly sworn, certifiesunder penalty of perjury that the foregoing and documents attached hereto are true and correct.

Mark Fendig
Managing Partner
Scott's Mill Hydro, LLC

State of North Carolina

Subscribed and sworn to before me, a notary public of the ~~Commonwealth of Virginia,~~ this 29th day of March, 2021.

Allison Harrell

ALLISON HARRELL
Notary Public
Surry Co., North Carolina
My Commission Expires Oct. 31, 2022

APPENDIX A

PROOF OF PROPERTY OWNERSHIP

12,000.00 6,000.00 Cty

BOOK 1092 PAGE 580

5933

P. C. 6
Slide 998100

THIS DEED, made this 6th day of May, 1999, by and between APPALACHIAN POWER COMPANY, a Virginia corporation, as Grantor, and LUMINAIRE TECHNOLOGIES, INC., a Virginia corporation, having a mailing address of 9932 Wilson Highway, Mouth - of - Wilson, VA., 24363, as Grantee.

WITNESSETH:

That in consideration of the sum of Ten Dollars ($10.00) cash in hand paid, and other good and valuable consideration, the receipt of which is hereby acknowledged by Grantor, Grantor does hereby BARGAIN, SELL, GRANT and CONVEY, with Special Warranty of Title, unto Luminaire Technologies, Inc., all of those three (3) certain lots or parcels of land more particularly described in Part One of this Deed as follows:

PART ONE

Parcel 1

Situate in the City of Lynchburg, Virginia:

BEGINNING at an iron pin found at the common corner with the Chesapeake and Ohio Railway Co. (CSX Transportation) and Griffin Pipe Products Co. (Amsted Industries, Inc.), as shown on a plat by Lee Surveying, Inc. dated December 10, 1998 (a copy of which is recorded with this Deed, in Map Book 2, page 349), and labeled "Point of Beginning for Parcel 1"; thence with the property of C & O Railway N. 16° 23' 30" W. 493.37 feet to an iron pin set; thence N. 71° 09' 30" E. 70.00 feet, passing an iron pin set at 40.00 feet to a point on the low water line of the James River; thence with the river S. 33° 58' 27" E. 138.99 feet to a point; thence S. 18° 31' 21" E. 114.15 feet to the corner of the rock abutment; thence along the eastern face of the abutment S. 19° 46' 13" E. 36.13 feet to the southern corner of said abutment; thence leaving said abutment S. 40° 21' 31" E. 140.51 feet to a point on the low water line of the James River; thence S. 24° 04' 26" E. 152.76 feet along the river to a point; thence continuing along the low

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This instrument prepared by Daniel F. Layman, Jr., Woods, Rogers & Hazlegrove, P.L.C., P.O. Box 14125, Roanoke, VA 24038, for and on behalf of Appalachian Power Company.

water line S. 48° 25' 44" E. 120.87 feet and S. 44° 20' 31" E. 251.44 feet to an iron pin found; thence leaving the river and running with the property of Amsted Industries, Inc. S. 79° 30' 30" W. passing an iron pin found at 26.07 feet, a total of 166.07 feet to a nail & cap set; thence N. 46° 02' 00" W. 429.80 feet to the point of beginning and containing 2.882 +/- acres.

Parcel 2

Situate in the Madison District of Amherst County, Virginia:

BEGINNING at a point on the low water line of the James River as shown on the above-referenced plat by Lee Surveying, Inc. dated December 10, 1998 and labeled "Point of Beginning for Parcel 2"; thence N. 61° 54' 04" E. passing an iron pin set at 10.00 feet, a total of 41.43 feet to a point on the western right of way of State Route 685; thence with the right of way S. 21° 46' 41" E. 44.83 feet to a point; thence with a curve to the right with a radius of 2960.703 feet, a length of 324.86 feet and a chord bearing of S. 18° 38' 02" E. with a chord distance of 324.69 feet to a point; thence S. 15° 29' 26" E. 329.45 feet to a point; thence with a curve to the right with a radius of 2750.618 feet, a length of 276.12 feet and a chord bearing of S. 12° 36' 53" E. with a chord distance of 276.00 feet to a point; thence leaving said right of way S. 39° 50' 00" W. 51.63 feet to a point on the low water line of the James River; thence with the river N. 10° 22' 26" W. 382.93 feet to a point; thence N. 16° 47' 16" W. 338.04 feet to a point; thence N. 08° 22' 46" W. 155.66 feet to a point on the western face of the dam abutment; thence along said abutment N. 20° 04' 26" W. 76.37 feet to the corner of the abutment; thence along the low water line N. 25° 22' 11" W. 188.16 feet to the point of beginning, containing 0.964 +/- acre.

Parcel 3

That certain dam across the James River, commonly known as the "Lynchburg Dam", situate partly in the City of Lynchburg, Virginia, and partly in Amherst County, Virginia, constructed, lying, and being on, and extending between, the aforesaid Parcels 1 and 2; the land, whether submerged or not, occupied thereby and owned by the Grantor; and such easements, rights and privileges owned by the Grantor, for the location, construction and maintenance of said dam in the bed of the James River, as were acquired by Grantor's predecessors in title by or under sundry acts of the General Assembly of the State of Virginia relating to said dam or as were otherwise acquired by them.

Parcels 1, 2 and 3 are, however, conveyed SUBJECT TO the following restriction, which shall be a covenant running with the title to said Parcels 1, 2 and 3 and binding on the Grantee and its successors in title to said Parcels:

This conveyance is made subject to the restriction that, so long as the federal license for operation of the Reusens Hydroelectric Project, located in the James River upstream from the property herein described, requires the provision of minimum water flows from that project as necessary to maintain certain water levels in the pool created by the dam located on the property herein conveyed, the owner of the property herein conveyed will give to Grantor, Appalachian Power Company, (or Grantor's successor as owner of the Reusens Project) at least six (6) months' written notice of any proposed structural modifications to the dam located on the property herein conveyed which will or might alter the crest elevation of said dam. The notice shall contain sufficient specific information about the proposed modifications to enable Grantor, Appalachian Power Company, to determine the effect of the proposed modifications on the water levels below the Reusens Project dam. This restriction shall be a covenant running with the title to Parcels 1, 2 and 3 of the property herein conveyed, binding on Grantee and Grantee's successors and assigns.

AND SUBJECT FURTHER to the following rights of others:

(A) The rights of Griffin Pipe Products Company in Parcel 1 described above under lease dated April 1, 1969, from Appalachian Power Company to Griffin's predecessor, Glamorgan Pipe & Foundry Company; (B) the rights of the City of Lynchburg under deed dated August 5, 1881 from the Richmond and Alleghany Rail Road, as amended by agreement dated May 6, 1964, among Appalachian Power Company, the City of Lynchburg, and Glamorgan Pipe & Foundry Company; and (C) the water rights of Griffin Pipe Products Company under lease dated October 18, 1932, between its predecessor, Glamorgan Pipe & Foundry Company, and the Chesapeake and Ohio Railway Company.

Appalachian Power Company further conveys, transfers and assigns to Grantee all machinery, equipment and fixtures located on said Parcels 1, 2 and 3 or in any improvement located thereon.

PART TWO

AND for the same consideration, the Grantor, Appalachian Power Company, does hereby QUITCLAIM and RELEASE unto Luminaire Technologies, Inc. all of its right, title, and interest, and all of its claims, if any, upon, or rights in, the following four (4) lots or parcels of land, or interests in land, described in Part Two of this Deed as follows:

Parcel 4

Situate in the Madison District of Amherst County, Virginia:

BEGINNING at an iron pin found as shown on the above-referenced plat by Lee Surveying, Inc. dated December 10, 1998 and labeled "Point of Beginning for Parcel 4", common corner with Lots 13 & 28 of Section 2, Merry-Moor subdivision; thence with the subdivision line S. 14° 07' 08" E. 836.28 feet to an iron pin found; thence N. 87° 23' 13" E. 75.91 feet to an iron pin found; thence S. 16° 45' 14" E. 150.15 feet to an iron pin found; thence S. 39° 50' 00" E. 188.59 feet to a point on the right of way of State Route 685; thence with the right of way of State Route 685 N. 09° 44' 20" W. 99.22 feet to a point; thence with a curve to the left with a radius of 2800.618 feet, a length of 281.14 feet and a chord bearing of N. 12° 36' 53" W. with a chord distance of 281.02 feet to a point; thence N. 15° 29' 26" W. 329.45 feet to a point; thence with a curve to left with a radius of 3010.703 feet, a length of 330.39 feet, and a chord bearing of N. 18° 38' 04" W. with a chord distance of 330.22 feet to a point; thence N. 21° 46' 41" W. 50.32 feet to a drill hole found; thence leaving said right of way and running with the line of Lot 28, Section 2 Merry-Moor, N. 61° 54' 04" E. 99.83 feet to the point of beginning, containing 1.967 acres.

Parcel 5

All islands and parts of islands and all lands (exclusive of the bed of James River in its natural state), whether or not now submerged, situate in, or submerged by the waters of, James River, and lying and being between (1) the northern boundary line of the aforesaid Parcel 1 (course N. 71° 9' 30" E.), extended across James River and the islands therein to the natural low water line of said James River on its Amherst County, Virginia, shore, and (2) the southeastern boundary line of the aforesaid Parcel 2 (course S. 39° 50' 00" W.), extended across James River to the natural low water line of said James River along the property of Griffin Pipe Products Company on the Lynchburg City side of said River.

LESS and EXCEPT, however, that certain island or parcel of land surrounded by the waters of the James River, the upper end of which is approximately 190 feet below the Lynchburg Dam and opposite the lands of the Grantor, Appalachian Power Company, on the Amherst or eastern side of the River and the lands of Griffin Pipe Products Company on the Lynchburg or western side of the River, the same being shown as "Anthony's Island" on maps recorded with the deed from The Chesapeake and Ohio Railway Company to Appalachian Electric Power Company dated June 17, 1940, and recorded in the Clerk's Office of the Circuit Court of the City of Lynchburg, Virginia, in Deed Book 219, page 216, and which was conveyed to Glamorgan Pipe and Foundry Company by Appalachian Electric Power Company by deed dated February 8, 1956, recorded in the aforesaid

Clerk's Office in Deed Book 305, page 243.

BUT there was reserved from the above-described conveyance of Anthony's Island to Glamorgan Pipe and Foundry Company, and Parcels 1, 2 and 3 above are hereby conveyed TOGETHER WITH, the right and easement to overflow, to diminish the flow past, and to affect the said Anthony's Island in any other manner whatsoever by or with the waters of said River in the construction, raising, reconstruction, maintenance and/or operation of the said Lynchburg Dam and of any power station which now exists or may be constructed in connection with or appurtenant to said dam, and particularly including the right at any time to enlarge the channel between the right or westerly bank of the James River and the said island by dredging or excavating that channel to a greater depth and/or by widening it by means of removing by excavation part or all of the island, all as may be deemed desirable by the owner of the Lynchburg Dam, to which this right and easement is appurtenant; together with the right, but not the duty, to cut and remove from said island at any time and from time to time any trees or underbrush growing or existing thereon.

Parcel 6

A perpetual easement of right of way upon, over and along that certain strip or parcel of land now or formerly owned by The Chesapeake and Ohio Railway Company and extending from the westerly line of Adams Street (near Orange Street) in the City of Lynchburg, Virginia, across the property of the James River Subdivision of The Chesapeake and Ohio Railway Company to the southerly line of Parcel 1 above, as granted to the Grantor by The Chesapeake and Ohio Railway Company by deed dated December 7, 1948, said easement being twelve (12) feet wide and being six (6) feet on each side of the center line described as follows:

> Beginning on the westerly line of Adams Street (near Orange Street) at a point in the existing right of way line, 120 feet more or less northeasterly at right angles from center line of westbound main track, at or near station 1423 plus 95; thence northwesterly, approximately along the center of the concrete team track driveway, to its end at station 1434 plus 58, more or less, equals station 0 plus 00; thence continuing on tangent, N. 25° 43' W. to station 0 plus 46.92; on a 13° 07' curve to the right, to station 1 plus 16.77; and on tangent N. 16° 33' W. to station 5 plus 49.52, a total distance of 1625 feet, more or less, to a point in the southerly line of the Lynchburg Dam property and the existing Railway right of way line; said point being 48.73 feet, more or less, northeasterly at right angles from said center line of westbound main track at

station 1440 plus 10, more or less, at center line of easement, and containing 0.45 acre, more or less;

For the free and unobstructed passage to and from the aforesaid Parcel 1, in and about the works and business of the Grantee, its successors and assigns, at any time maintained or conducted upon or in connection with the Lynchburg Dam property granted to the Grantor by The Chesapeake and Ohio Railway Company by the aforesaid deed dated June 17, 1940, for all automobiles, trucks and trailers and all other vehicles of like or different nature owned or operated by or for the Grantee, its successors or assigns, or by or for any other person, firm or corporation, and for like passage for all persons, whether or not in the employ of the Grantee, its successors or assigns, and for access to and from the property by this deed so granted. The Railway shall be under no obligation to pave said strip or to maintain any portion thereof in condition suitable for use by persons or vehicles, but the Grantee shall be at liberty to use any pavement provided by the Railway over any portion thereof;

Provided, however, that with respect to that portion of said strip lying between Adams Street and station 1434 plus 58, the rights hereby granted to the Grantee for passage shall be used and enjoyed in common with others making use of the same as a means of access to and from the sidings of the Railway and the facilities by it to be constructed and located upon the property adjoining said easement, for the purpose of loading and unloading railway cars;

Provided further that nothing herein contained shall be construed to prevent the maintenance, use and operation by The Chesapeake and Ohio Railway Company of its railroad tracks now crossing the aforesaid strip or parcel, with respect to which this easement is granted, or of any additional railroad tracks which the Railway may hereafter desire to construct across said strip or parcel, the Grantee to bear all costs of constructing, repairing, and maintaining its roadway or pavement at any such crossing, where such roadway or pavement is being used solely under the easement hereinbefore granted to Grantee and while it is so used.

Parcel 7

(a) All and singular the riparian rights, water rights, flowage rights and other rights in and to the James River, and all rights in and to the bed of the James River and the water therein, as are owned by Grantor, Appalachian Power Company, as are appurtenant to or susceptible to use on or in connection with said tracts or parcels of land designated as Parcels 1 through 5 herein conveyed.

(b) All and singular the rights, titles, interests and privileges, and the right of use and enjoyment, of the Grantor, Appalachian Power Company, in and to the entire flow of water in the James River at said "Lynchburg Dam" and at said tracts or

parcels of land designated as Parcels 1, 2, 4 and 5 herein conveyed, including all appurtenant or other flowage and riparian rights now owned by Grantor, Appalachian Power Company, in connection with the operation of said "Lynchburg Dam"; subject, however, to the rights of the City of Lynchburg as reserved in the deed between the Richmond & Alleghany Railroad Company and the City of Lynchburg, dated August 5, 1881, recorded in the Clerk's Office of the Circuit Court of the City of Lynchburg, Virginia, in Deed Book "GG", page 240, and in Deed Book 72, page 356, of the records of said Circuit Court; and subject further to the rights of the lessees under the lease from The Chesapeake and Ohio Railway Company to Glamorgan Pipe & Foundry Company, dated October 18, 1932, both hereinabove referred to.

(c) The perpetual right and easement to overflow and submerge the lands and structures of The Chesapeake and Ohio Railway Company situate at or near Lynchburg, Virginia, to the extent which will result from the construction and maintenance of flashboards (or the equivalent thereof) which the Grantee, its successors or assigns, may erect upon and along the entire spillway crest of said "Lynchburg Dam" to a height of not more than three (3) feet above the crest of its straight spillway and from the construction, maintenance and operation of a hydroelectric power station which the Grantee, it successors or assigns, may construct in lieu of a portion of said dam, provided, however, that during major floods, which are hereby defined as those which, with said flashboards (or the equivalent thereof) in place, cause the water, within one hundred (100) feet upstream from said dam, to rise an elevation of six (6) feet or more above the presently existing masonry crest of the straight spillway of said dam (it being understood that the said crest is at elevation 515.4 per U.S. Geological Survey Local System of Elevations), said flashboards (or the equivalent thereof) shall be either removed or lowered to approximately the elevation of the said present spillway crest; provided, however, that, whenever said flashboards (or the equivalent thereof) are removed or lowered, such removal or lowering shall be accomplished as gradually as practicable; and provided, further, that the Railway Company has reserved the right to construct on, along and adjacent to the land over and with respect to which this perpetual right and easement for overflowage and submergence is hereby granted and conveyed, such additional tracks and other structures as are necessary for the operation of the Railway Company's railroad, and to extend its tracks, structures, fills, embankments, and appurtenances upon and across the said land and into the James River, and also the right to take and divert from the James River, bordering on the property and rights herein conveyed, such quantity of water as may be needed by the Railway Company for the construction, operation and maintenance of its line of railroad, but not for any other purpose, such, for illustration, as the operation of power stations.

SUBJECT, HOWEVER, to the conditions that the Grantee shall, by use of the

foregoing rights set forth in this paragraph (c), be deemed to have agreed to hold harmless the Grantor, Appalachian Power Company, its successors and assigns, and Railway Company and its successors and assigns, from all claims for damage to the property and employees of the Railway Company, and damage to the property of others, and injury to persons other than employees of the Grantor, Appalachian Power Company, resulting from or caused by the failure or neglect of the Grantee, its successors and assigns, to remove or lower said flashboards (or the equivalent thereof) during said major floods designated and defined in the foregoing paragraph.

And the said Grantee, for itself, its successors and assigns, further covenants and agrees with the Grantor, Appalachian Power Company, its successors and assigns, and Railway Company and its successors and assigns, that if the present straight spillway of the said "Lynchburg Dam" is raised by the Grantee, its successors and assigns, by more than two (2) feet by means of flashboards or tainter gates, or the equivalent thereof, the said Grantee, its successors or assigns, will replace, at its sole cost and expense, the present eighteen (18) foot culvert of the Railway Company at Pigeon Creek, at Station 1569/83 of the survey of the Railway Company, with an open girder span bridge of specifications and construction to be approved by the Railway Company.

(d) The right at any time and from time to time to construct and thereafter to maintain one or more cut-off walls or diaphragms extending from the western boundary of said Parcel 1 westerly onto and into the land of The Chesapeake and Ohio Railway Company and under its tracks for a distance or distances sufficient in the opinion of the Grantee to prevent leakage of water from the upper pool formed by the said "Lynchburg Dam" around the westerly end of the said Dam; provided, however, that the Grantee, its successors and assigns, shall be under no obligation to construct any such cut-off or diaphragm, and provided further, that, if the Grantee, its successors and assigns, elects to construct any such cut-off or diaphragm, the top thereof shall be at least three (3) feet below the base of any track-rail of the Railway Company located immediately above said cut-off wall or diaphragm and that in any case the design and method of construction of any such cut-off or diaphragm shall be subject to the approval of the Railway Company, its successors or assigns, and provided further, that the Grantee, its successors and assigns, shall assume, and hereby covenants and agrees to assume, liability for, and will indemnify and save harmless the Grantor and the Railway Company, their successors and assigns, from and against, all loss, damage and injury to which either may be put or be subject on account of the construction and maintenance of any such cut-off wall or diaphragm, and all cost and expense which may be occasioned by the Grantor, Appalachian Power Company, or the Railway Company in consequence thereof.

(e) All and singular rights, titles and interests of the Grantor, Appalachian Power

Company, in and to what is known as the "Water Works Canal" situate in the City of Lynchburg, Virginia, and which is described as the way for a canal with water 5 feet deep, 20 feet wide at the bottom and 35 feet wide at the surface of the water, beginning at the southerly boundary of said Parcel 1 herein conveyed and running thence in a southerly direction to the City Water Works immediately below Williams Bridge, together with all rights and privileges of access to and from said canal for its maintenance and operation; subject, however, to the rights of the City of Lynchburg and the Griffin Pipe Products Company therein.

By its acceptance and recordation of this Deed, Grantee acknowledges that Grantor has made no covenant, representation or warranty as to the suitability of the property hereby conveyed and any improvements thereon for the present use or any other use, or as to the physical or environmental condition of said property or any improvements thereon or machinery or equipment therein for any purposes whatsoever, or as to the compliance by said property or improvements or equipment with any applicable laws or regulations. Grantee accepts said property, improvements and equipment "as is" and has relied upon its own examination and inspection thereof with respect to physical and environmental conditions, usefulness, suitability for any purpose, value, character, and size.

In addition to the foregoing matters, this conveyance is also made subject to all other easements, conditions, restrictions and reservations of record affecting the properties hereby conveyed, and to applicable zoning regulations and restrictions.

WITNESS the authorized signature of the Grantor, as of the date first above written.

APPALACHIAN POWER COMPANY

By: _____

Roger L. Wheeler
Manager, Land Management
American Electric Power
Service Corporation
Authorized Signer

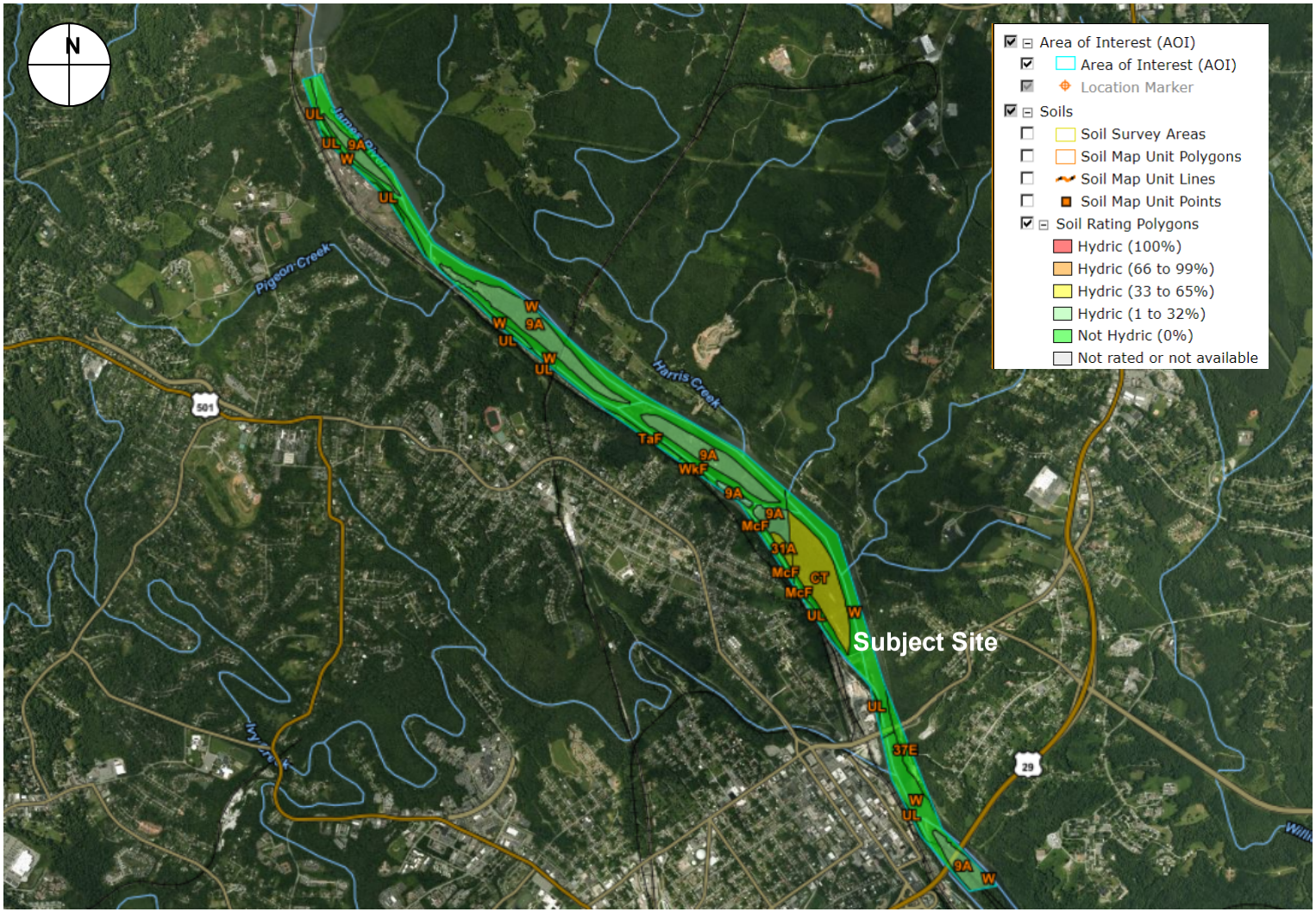
APPENDIX B

VIRGINIA DEPARTMENT OF WILDLIFE RESOURCES FISHERY DATA

Appendix B is filed as a separate Excel file

APPENDIX C

WETLAND ASSESSMENT



HURT & PROFFITT INCORPORATE
2524 LANGHORNE ROAD
LYNCHBURG, VA 24501
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434.847.0047 FAX
WWW.HANDP.COM

Scotts Mill Dam
James River
Lynchburg, Virginia

Source: USDA WSS (2021), NTS

Hydric Soils Map

Figure 14

March 26, 2021

Mark Fendig
Scott's Mill Hydro, LLC
9932 Wilson Highway
Mouth of Wilson, VA 24363

RE: Scott's Mill Dam Hydropower Project
Wetland Assessment
H&P Project 20150824
Bedford County / Amherst County / City of Lynchburg, Virginia

Dear Mark:

On 3/12/21, Hurt & Proffitt (H&P) environmental scientists assessed potential wetland areas on the James River islands and riverbanks that could be affected by the Scott's Mill Dam Project. Due to steep riverbanks (15-20' in many areas), no potentially-jurisdictional wetlands were observed in the study area. Potential wetlands were evaluated using 1987 US Army Corps of Engineers (USACE) Wetland Delineation Manual procedures and 2012 USACE Eastern Mountain and Piedmont (EMP) Supplement protocols.

The 3.5-mile long study area included island margins and riverbanks, to elevations approximately 6.5' higher than the water surface (on the day of the assessment). This elevation was selected by using data from the USGS Holcomb Rock Gage (Station 02025500, located approximately 10 miles upstream) to determine one standard deviation around the mean annual water depth, identifying the water surface elevation on the day of the fieldwork, and then adding two feet to the highest water surface elevation of this standard deviation (based on the proposed Scott's Mill Dam height increase of two feet). To determine approximate water slope, FEMA Zone AE Base Flood Elevation (BFE) slopes were calculated. This approach indicated an approximate BFE water surface slope of less than 0.001% from the Scott's Mill Dam to the upstream end of Treasure Island, with a steeper water surface slope of approximately 0.008% from the upstream end of Treasure Island to the upstream end of Woodruff Island. Assuming a similar river base flow water surface elevation slope, the effects of a two-foot dam height increase would likely become negligible from the midpoint of Woodruff Island upstream. This approach suggests that the Scott's Mill Dam impoundment extends upstream approximately two miles (at which point river velocity was observed to increase significantly, and gravel/cobble bars became evident).

FEMA Approximate BFE's *(upstream to downstream):*
Unnamed island: 539' MSL
Woodruff Island: 536'-534' MSL
Treasure Island: 533.4'-533' MSL
Unnamed island: 533' MSL
Daniel's Island: 533' MSL
Unnamed island (downstream of dam): 530'-532' MSL

Approximately 5% of the observed riverbanks had lower-gradient slopes and depositional areas, though these do not appear to have sufficient indicators to be considered jurisdictional wetlands. Upstream and downstream lat/long extents of these areas are included in Attachment A. Alluvial sediment deposits in these areas are mostly fine-grained silts and organic matter. These areas were most-frequently observed in sheltered portions of northeastern island riverbanks. Geomorphic indicators suggest that these low-gradient areas are part of the active river channel (below the regulatory Ordinary High Water Mark [OHWM] elevation).

Stream channels/tributaries entering the James River within the study area (including Harris Creek, Buck Branch, and Pigeon Creek) were also evaluated. Streambanks along these channels were generally found to be steep, frequently-eroded, and often 6-10' in height. No wetlands were observed adjacent to these channels. These tributaries are incised into the larger James River floodplain.

Based on visual indicators, some low-lying areas within the interiors of the noted islands may contain jurisdictional wetland areas. However, these areas are outside the study area, are approximately 5-10' higher in elevation that the anticipated water surface elevation, and would not likely be inundated by the proposed dam height increase.

Please contact us with any questions you may have. We can be reached at 540.520.1533 or bleatherland@handp.com.

Sincerely,
Hurt & Proffitt, Inc.

Ben Leatherland, PWS, PWD
Sr. Environmental Scientist

cc: Wayne Dyok, file

Attachments

Attachment A

Lat/Long Coordinates of Low-Gradient Island Shoreline Areas

Location/Feature	Lat	Long
LOW AREA 1A	37.436046	-79.148171
LOW AREA 1B	37.436581	-79.148949
LOW AREA 2A	37.442580	-79.163356
LOW AREA 2B	37.442831	-79.163608
LOW AREA 3A	37.438720	-79.157767
LOW AREA 3B	37.438549	-79.157496
LOW AREA 4A	37.432579	-79.145700
LOW AREA 4B	37.432304	-79.145358
LOW AREA 5A	37.431996	-79.144934
LOW AREA 5B	37.431114	-79.144050

Attachment B

Photographs

Photograph 1 – Typical island riverbank, with low-gradient depositional area

Photograph 2 – Typical island riverbank

Photograph 3 – Typical low-gradient island riverbank

Photograph 4 – Typical low-gradient area along island riverbank

Photograph 5 – Harris Creek (tributary), note steep streambanks and stone ruins

Photograph 6 – Typical island riverbank, with low-gradient depositional area

Photograph 7 – Typical riverbank (here with relic stonework from previous canal)

Photograph 8 – Typical riverbank, roadway, and culverts

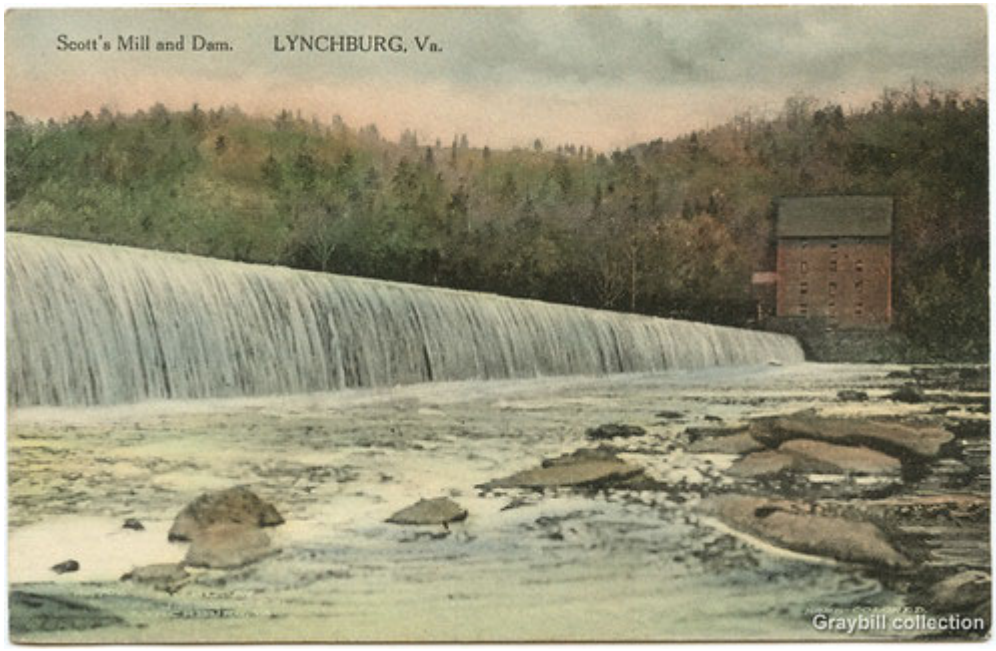
APPENDIX D

SCOTT'S MILL DAM
STABILITY ANALYSIS

Scott's Mill Hydro, LLC
Scott's Mill Hydroelectric Project

FERC Project No. 14867-001-Virginia
State Dam No. 95-10

Preliminary Stability Analysis Report



DRAFT

McMILLEN JACOBS ASSOCIATES

March 2021

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1.0 Introduction and Background Information

This Technical Memorandum (TM) presents a summary of the Scott's Mill Dam Stability Analysis performed by McMillen Jacobs Associates at the request of Scott's Mill Hydro, LLC. The TM contains background information, a summary of the design criteria, basic design assumptions, derivation of load effects, load combinations, and analysis results for the needle beam spillway and radial gate spillway. The basis for the analysis was the Scott's Mill Hydro, LLC Exhibit F - Preliminary Supporting Design Report.

Scott's Mill Dam is an existing dam consisting of a stone masonry primary overflow section and a stone masonry "arch dam" section at the right abutment. The dam initially went into service around 1839 with its primary purpose to supply hydropower to a mill and more recently utilized as a back-up water supply to the City of Lynchburg, VA. The dam is approximately 875 feet long and 15 feet high. The proposed Scotts Mill Hydroelectric Project (FERC Project No. P-14867) will involve the construction of a series of concrete LPS modules placed downstream of the arch dam section between the right bank and the existing bastion block. The existing arch dam section will be lowered to facilitate flow to the LPS turbine stacks. The existing primary overflow section will be raised by two feet (concrete cap) to increase the upstream impoundment normal pool elevation close to existing water levels under mean flow conditions and to increase the hydraulic head.

2.0 Design Criteria and Pertinent Data

Section 2 presents design loading criteria and described the basis of the analysis.

2.1 LOADING FORCES

Four loading scenarios (or Load Cases) were analyzed in this study, per the recommended approach detailed in Chapter 3 - Section 3-3 of FERC, 2016 (these scenarios are also generally consistent with the two loading combinations described as applicable to "other dams" configurations as described in Chapter 10 of the same reference). The two loading combinations considered include the section of the dam with or without the proposed 2-foot concrete cap. The Scott's Mill Dam project has been analyzed as gravity type structure, therefore the guidelines from Chapter 3 of FERC, 2016 apply.

The following loads and forces were considered in stability analyses for Gravity Dam Type Structure (loading combinations provided below):

- Dead loads
- External water imposed loads
- Buoyant hydrostatic loads
- Earth and silt pressures

Earthquake forces were not considered in this analysis.

2.1.1 Dead Loads

Dead loads consist of the weight of the structure including appurtenances such as additional 2'-0" concrete cap. Dam geometry was based on the October 2018 FERC license application Exhibit F drawings, including dam plan and sections. All analyses were performed for the generic rock-masonry section of the dam.

2.1.2 External Water Imposed Loads

External Water Imposed Loads were taken as a linear distribution of the static water pressure acting normal to the surface of the dam. Where applicable, the influence of water weight over the structure has been considered. Note that due to the location of the water-retaining bulkhead at the downstream end of the module stack, the deadweight of water within the stack acts vertically upon the base pad. Section 3.0 (above) lists headwater and tailwater elevations under various scenarios.

2.1.3 Buoyant Hydrostatic Loads

Buoyant Hydrostatic Loads are assumed at the bottom of the dam. The hydrostatic uplift is assumed to be linear from upstream to downstream. Cutoff walls are not assumed to be present beneath the dam.

2.1.4 Earthquake Forces

Earthquake forces were not included in this analysis but should be considered during refinement of calculations as the project design advances.

2.2 LOADING COMBINATIONS CONSIDERED

Loading combinations for dams are prescribed in the FERC guidelines, Section 3-3.2, and the two load cases considered for this analysis are presented below, and are consistent with the FERC naming convention:

Load Case I: Usual Loading Combination – Normal Operating Condition

The reservoir elevation is at the normal power pool (controlled operating pool), as governed by the crest elevation of an overflow structure, or the top of the closed spillway gates whichever is greater. Normal tailwater is used. Horizontal silt pressure should also be considered, if applicable.

Headwater elevation 514.4 ft NAVD88 (no concrete cap assumed) Tailwater elevation (low)

Tailwater elevation (high) 499.40 ft NAVD88

Load Case II: Usual Loading Combination – Normal Operating Condition (with 2-ft Concrete Cap)

The reservoir elevation is at the normal power pool (controlled operating pool), as governed by the crest elevation of an overflow structure, or the top of the closed

spillway gates whichever is greater. Normal tailwater is used. Horizontal silt pressure should also be considered, if applicable.

Headwater elevation 516.4 ft NAVD88 (assumed primary overflow section raised 2 feet by the concrete cap) Tailwater elevation (low)

Tailwater elevation (high) 499.40 ft NAVD88

2.3 ACCEPTANCE CRITERIA

Minimum factors of safety for low hazard facilities with stability not relying on cohesion (i.e., c = 0 psi) are prescribed in FERC Guidelines; a summary table of the relevant desired safety factors is provided below. For purposes of global stability assessment at Scott's Mill Dam, minimum sliding criteria are based on Table 2A of the FERC guidelines (FERC, 2016) and minimum overturning (rotational stability) criteria are based on the USACE's engineering manual for gravity dams EM 1110-2-2200 (USACE, 2005). Flotation acceptance criteria are based on the USACE's engineering manual for concrete structures EM 1110-2-2100 (USACE, 2005).

Minimum required factors of safety adopted by this analysis are summarized below in **Table 1**.

Table 1: Minimum Requirements for Stability Analysis

Load Case	Loading Condition	Against Sliding [1, 2] (FERC, 2016)	Against Overturning (USACE, 2005)	Against Flotation (USACE, 2005)
Normal Pool	Usual	1.5	Middle 1/3	1.3

Notes:

1. Assumed no cohesion.
2. Per Table 2A of Chapter 3 of FERC Guidelines, Flood load factor of safety requirement is 1.5 if the flow is NOT the PMF.

2.4 RESULTS

The results of the two Load Cases Combinations considered are presented below. The calculated use factor of safety (FOS) against sliding and overturning in both scenarios were found to be less than 1.0.

Table 2: Calculated Stability Analysis Results

Load Case Combination ID	Calculated FOS Against Sliding	Calculated FOS Against Sliding	Calculated FOS Against Flotation
Load Case I (Normal Pool) Without 2-ft Tall Concrete Cap	0.65	Outside Middle 1/3	0.95
Load Case II (Normal Pool) With 2-ft Tall Concrete Cap	0.56	Outside Middle 1/3	0.90

3.0 References

American Society of Civil Engineers (ASCE), Minimum Design Loads for Buildings and Other Structures (ASCE 7-16), 2016

Concrete Reinforcing Steel Institute (CRSI), Evaluation of Reinforcing Bars in Old Reinforced Concrete Structures, 2001.

Federal Energy Regulatory Commission (FERC), Engineering Guidelines for the Evaluation of Hydropower Projects, Chapter 3 – Gravity Dams, 2016

U.S. Army Corps of Engineers (USACE). 2005. Stability Analysis of Concrete Structures (EM) 1110-2-2100. Department of the Army, Washington, DC. 1 December 2005.

4.0 Appendix-Calculations

The following provides the calculations used in determining the stability analysis results presented in Section 2.

Scott's Mill Stability Analysis - Load Combination I (without 2-ft Concrete Cap)

McMILLEN JACOBS ASSOCIATES

PROJECT	Scotts Mill Dam		SHEET
SUBJECT	Dam Stability		DATE
BY	GAC	CHECKED	PROJECT NO.

Bridge @ Derby Dam
Nevada DOT
Drainage Manual

$\sum M_A = \emptyset$ check OT'ing

$$\frac{1{,}684\,psf(27')(27'/3)}{2} + \frac{517\,psf(23')}{2}(23'/3) + 748(14')(14'/2)$$

$$+20\,psf(17'\times 17'/2 + 12') + \frac{(1{,}684-748)(14')}{2}(2/3\times 14') = 391{,}608\ ft\#$$

$$M_{Righting} = 125\,pcf(23'\times 14'\times \frac{14'}{2}) + \frac{125\,pcf(4'\times 14')}{2}(14'/3)$$

$$+62.4\,\#/ft^3\,(4'\times\frac{14'}{2})(2/3\times 14') + 748\,psf(\frac{12'}{2}\times 12'/3) + 1115\,psf(\frac{5.5'}{2}\times\frac{5.5}{3})$$

$$= 337{,}950\ ft\#$$

$$\frac{M_R}{M_{OT}} = \frac{337{,}950}{391{,}608} = \underline{\emptyset.86}$$

Check sliding

$\sum F_V = \emptyset$

$$125\,pcf(23'\times 14') + 125\,pcf(4'\times 14'/2) + 62.4\,\#/ft^3(4'\times 14'/2)$$
$$-748\,psf(14') - (1684-748)(14'/2) = R_H$$

$$R_H = 28{,}473\,\#$$

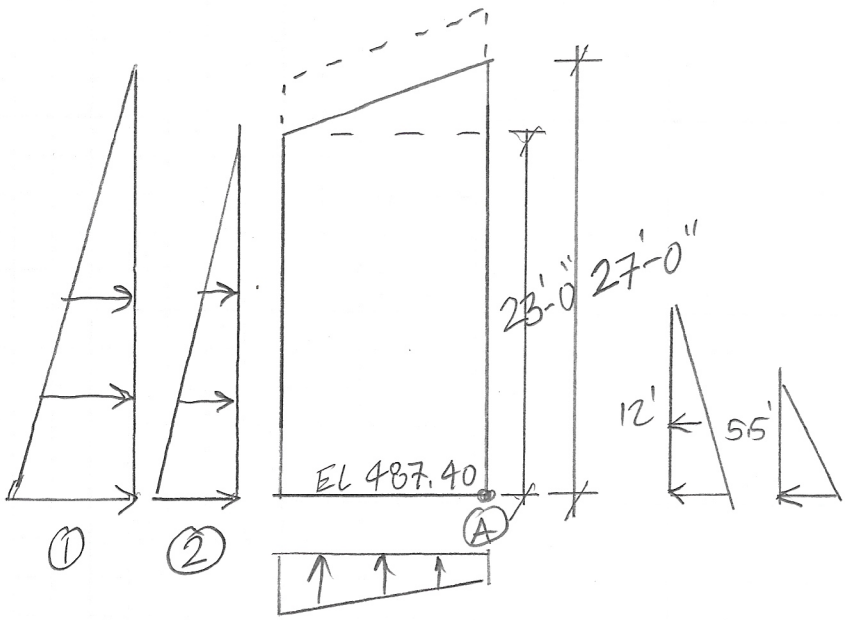
$$FOS\ sliding = \frac{[(748\,psf\times 12'/2) + 1{,}115\,psf(5.5'/2)] + (31{,}791)(\emptyset.35)}{1{,}684(27'/2) + 517(23'/2)}$$

$$= \emptyset.65$$

McMILLEN JACOBS ASSOCIATES	PROJECT Scotts Mill Dam		SHEET
	SUBJECT Dam Stability		DATE
	BY GAC	CHECKED	PROJECT NO.

Scott's Mill Stability Analysis - Load Combination I (without 2-ft Concrete Cap)

Stability Analysis w/out concrete cap



① Pressure @ Base = 62.4 #/ft³ (27') = 1,684 psf

② Pressure @ Base = .33(130-62.4)(27-4) = 517 psf

③ Pressure Max = 62.4 #/ft³ (27') = 1,684 psf

Pressure Min = 62.4 #/ft³ (12') = 748 psf

④ Pressure @ Base = 62.4 #/ft³ (12') = 748 psf

⑤ Pressure @ Base = 3.0(130-62.4)(5.5) = 1,115 psf

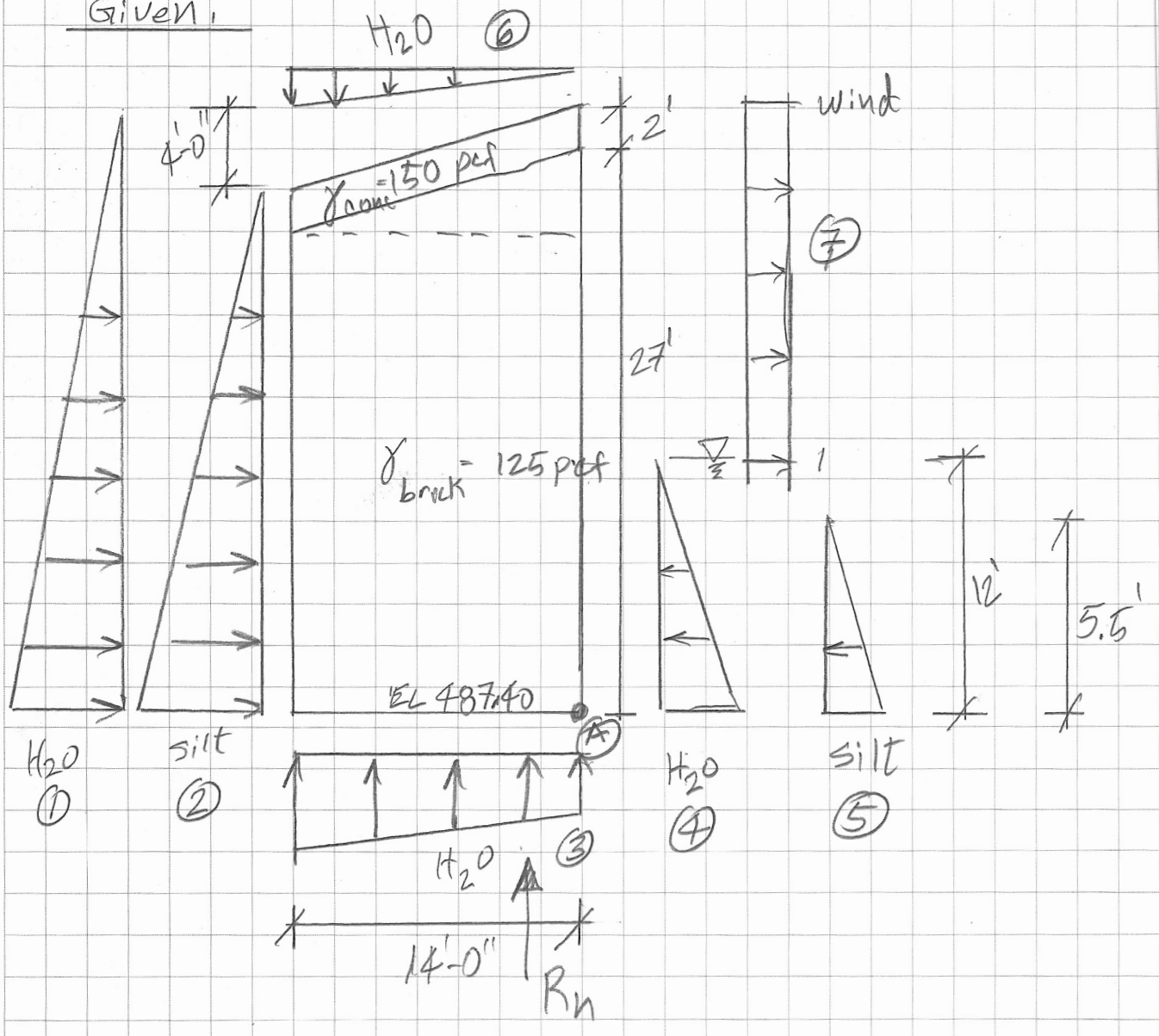
⑥ Pressure @ Base = 62.4 #/ft³ (4') = 250 psf

⑦ = 20 psf

Determine:

Stability of rock-masonry dam

Given:



Assumptions:

$\gamma_{silt\ saturated}$ = 130 pcf

γ_{H_2O} = = 62.4 pcf

ϕ = = 30°

$K_a = \frac{1-\sin 30^\circ}{1+\sin 30^\circ} = 0.33$

$K_p = (K_a)^{-1} = 3.0$

Designed by: GAC

Checked by:

Lateral Loads

① Pressure @ Base = $62.4\ \#/ft^3 (29') = 1{,}810$ psf

② pressure @ Base = $.33(130 - 62.4)(29' - 4') = 563$ psf

③ Pressure Max = $62.4\ \#/ft^3 (29') = 1{,}810$ psf
pressure Min = $62.4\ \#/ft^3 (12') = 748$ psf

④ pressure @ Base = $62.4\ \#/ft^3 (12') = 748$ psf

⑤ pressure @ Base = $3.0(130 - 62.4)(5.5') = 1{,}115$ psf

⑥ pressure Max = $62.4\ pcf (4') = 250$ psf

⑦ Assumed wind Load = 20 psf

$\sum M_A = \emptyset$ Check overturning

OT'ing

$$\frac{1{,}810\ psf (29')}{2}(29'/3) + \frac{563\ psf (25')}{2}(25'/3) + 748\ psf (14' \times 14'/2)$$

$$+ 20\ psf (17' \times 17'/2 + 12') + \frac{(1810 - 748)(14')}{2}(2/3)(14')$$

$$= 461{,}936\ ft\text{-}\#$$

Designed by: GAC Checked by:

Scott's Mill Stability Analysis - Load Combination II (with 2-ft Concrete Cap)

$M_{R\,righting} = 125\,pcf(29'-4'-2')(14')(14'/2) + 125\,pcf\frac{(4')(14')}{2}(\frac{14'}{3})$

$150\,pcf(14')(2')(14'/2) + 62.4\,\#/ft^3\frac{(4')(14')}{2}(2/3)(14')$

$+ 748\,psf\frac{(12')}{2}(12'/3) + 1,115\,psf\frac{(5.5')}{2}(5.5'/3)$

$= \underline{367,362\ ft\cdot\#}$

$\frac{M_R}{M_{OT\,ing}} = \frac{367,362}{461,936} = 0.79 < 1.50$

$\therefore$ Dam will overturn

---

check sliding

$\sum F_V = 0$

$125\,pcf(29'-2'-4')(14') + 125\,pcf(4')(14')/2 + 150\,pcf(2')(14')$

$+ 62.4\,pcf(4')(14')/2 - 748\,psf(14') - (1,810-748)\frac{(14')}{2} = R_n$

$R_n = \underline{31,791}\ \#$

$FOS\ SLIDING = \frac{\left[748\,psf(12')/2 + 1,115\,psf(5.5'/2)\right] + (31,791)(.35)}{1,810(29'/2) + 563(25'/2)}$

$= 0.56$ $\therefore$ No Good for sliding

Designed by: GAC Checked by: