Southern Company

Southern Company Generation.
241 Ralph McGill Boulevard, NE
BIN 10193
Atlanta, GA 30308-3374
404 506 7219 tel

June 15, 2020

FERC Project No. 2354
North Georgia Project Non-Capacity Related License Amendment

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C.

Dear Secretary Bose:

Georgia Power Company (Georgia Power) is the Federal Energy Regulatory Commission (FERC) licensee for the North Georgia Project (FERC No. 2354). Pursuant to the requirements of 18 CFR Section 4.201, Southern Company on behalf of Georgia Power, files the attached Application for a Non-Capacity Related Amendment for the North Georgia Project (Project). The Project consists of six separate developments: Burton, Nacoochee, Mathis-Terrora, and Tallulah Falls on the Tallulah River; and Tugalo and Yonah on the Tugaloo River.

Georgia Power's application for amendment includes a proposal to replace and upgrade two (2) generating units in the Mathis-Terrora powerhouse (hereinafter "Terrora"), including refurbishing the turbines, replacing the turbine runners, rewinding the generators, and replacing the control room panels and intake trash racks. The proposed scope of work for the Terrora Development is detailed in Attachment A.

The proposal does not change any of the Project features or operations and will not impact water control capabilities of the Terrora powerhouse. The unit modifications are expected to increase the generator rating for each unit by about 2.4 MW each and increase each unit's efficiency. The installed capacity would increase by 4.8 MW total. The existing nameplate rated capacity is 8 MW each for units 1 and 2 (9.7 MW each at full gate) and following the upgrade, the units will be approximately 10.4 MW each (11.5 MW each at full gate).

The full gate discharge of each unit is expected to marginally increase from 800 cubic feet per second (cfs) to approximately 819 cfs (2.3 percent increase) well below the 15 percent FERC criterion for a capacity related amendment. The increase in hydraulic capacity would have an insignificant effect on water quality, including dissolved oxygen and temperature. The proposed replacement of trash racks at the Terrora intake would also result in an increase of approach velocities of 0.08 ft/sec (from 1.54 to 1.62 ft/sec) at full gate. Additional details on the trash rack replacement and potential effects are discussed in Attachment A.

The Terrora upgrade proposal also includes replacing existing control panels with new industry standard panels in the powerhouse control room. Installing and maintaining the new panels would require some alterations to the control room. As part of agency consultation, Georgia Power conducted a cultural resources assessment and provided it to the Georgia State Historic Preservation Officer (SHPO) for review and comment. Details on Georgia Power's Memorandum of Agreement with the Georgia SHPO are provided in Attachment B.

The Project will continue to operate under the terms of its current FERC license and applicable Water Quality Certification. No environmental resources are adversely affected by the proposed upgrade and all existing protection, mitigation, and enhancement measures required by the Project license would not change.

Pursuant to the consultation requirements in 18 CFR 4.38(a)(7), Georgia Power consulted with the U.S. Forest Service, U.S. Fish and Wildlife Service, the Georgia Department of Natural Resources - Environmental Protection Division; Georgia Department of Natural Resources -Wildlife Resources Division; and Georgia Department of Natural Resources - Historic Preservation Division regarding the proposed upgrade. Attachment B contains all the agency consultation documentation related to the proposal. Additionally, Georgia Power also provided an opportunity for agency review and comment of the Draft Non-Capacity Related Amendment Application on June 5, 2020. Attachment D contains the agency consultation documentation of the Draft Non-Capacity Related Amendment Application.

Georgia Power is submitting a revised Exhibit A as it is the only exhibit affected by the proposed Terrora upgrade (Attachment C). There are no proposed changes to operations (Exhibit B), environmental resources (Exhibit E), or the project boundary (Exhibit G).

Georgia Power met with FERC staff in 2019 to discuss Georgia Power's extensive modernization program. The Terrora upgrade is the first plant in the North Georgia modernization projects. Future project schedules and budgets will be based on the Georgia Public Service Commission approval and are affected by the Terrora completion date. The COVID-19 pandemic and its associated restrictions have affected the construction window for this upgrade. To meet the schedule for completing the Terrora upgrade, Georgia Power respectfully requests that FERC conduct an expedited review and approval of the Terrora upgrade application. Since there are no agency objections to the upgrade and it will not impact environmental resources, Georgia Power respectfully requests an expedited review to include limiting the public comment period on the upgrade application to 15 days.

If you have any questions about the Non-Capacity Related Amendment Application and/or revised license exhibit, or if you require additional information, please contact me on my cell phone at 404-797-9432 or by email at cromara@southernco.com.

Sincerely,

Courtenay R. O'Mara

Courtenay R. O'Mara, P.E.
Hydro Licensing & Compliance Supervisor

Attachments:

A – Application for Non-Capacity Related Amendment of License
B – Documentation of Consultation on Proposal
C – Revised Exhibit A – Project Description
D – Documentation of Consultation on Draft Non-Capacity Related Amendment Application

ATTACHMENT A

APPLICATION FOR NON-CAPACITY RELATED AMENDMENT OF LICENSE

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Georgia Power Company) FERC Project No. 2354

APPLICATION FOR NON-CAPACITY RELATED
AMENDMENT OF LICENSE

Pursuant to Section 4.200 of the Federal Energy Regulatory Commission's (Commission or FERC) regulations,[1] Georgia Power Company (Georgia Power), hereby submits this Application for Non-Capacity Related Amendment of License (Application) for the North Georgia Project, FERC Project No. 2354 (Project). In filing this Application, Georgia Power seeks to amend the license[2] by upgrading two generating units in the Mathis-Terrora powerhouse, refurbishing the turbines, replacing the turbine runners, rewinding the generators and replacing the control room panels and intake trash racks.

INITIAL STATEMENT

1. Georgia Power Company (Georgia Power) applies to the Federal Energy Regulatory Commission (FERC or Commission), under 18 CFR § 4.201, for a non-capacity amendment of the North Georgia Project (Project) license, a major existing water power project over 5 megawatts (MW), as described in the attached exhibit. This application is for a non-capacity upgrade of two generating units in the Mathis-Terrora powerhouse, and includes replacing the turbine runners, rewinding the generators and replacing the balance of plant equipment and intake trash racks. The existing nameplate rated capacity[3] is 8 MW each for units 1 and 2 (9.7 MW each at full gate) and following the upgrade, the units will be approximately 10.4 MW each (11.5 MW each at full gate).

2. The exact name and business address and telephone number of the applicant are:

   Georgia Power Company
   241 Ralph McGill Boulevard, NE
   BIN 10193
   Atlanta, Georgia 30308-3374

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[1] 18 C.F.R. § 4.200.
[2] Accession Number 19961008-0044.
[3] Nameplate rated capacity is "best gate".

Communication and correspondence pertaining to this application should be addressed to:

Courtenay O'Mara
241 Ralph McGill Boulevard, NE
BIN 10193
Atlanta, Georgia 30308-3374
404-506-7219

3. Georgia Power is a domestic corporation and is licensee for the waterpower project, designated as Project No. 2354 in the records of the Federal Energy Regulatory Commission, issued on the 3rd day of October 1996.
4. The amendments of license proposed and the reason(s) why the proposed changes are necessary, are:
    a. CURRENT CONDITIONS

    The Mathis-Terrora Development (Terrora) is the third of six hydroelectric developments that comprise the Project, located on the Tallulah River and was put into service in 1925. The development consists of the Mathis Dam and Terrora powerhouse and the impoundment, Lake Rabun.

    The Mathis Dam is located at mile 354 on the Tallulah River. The dam is concrete slab and buttress dam with the main concrete dam structure at 617-foot long and a maximum height of 115-feet. Lake Rabun is 780-acre reservoir with 31,000 acre-feet storage capacity and 21,900 acre-feet useable capacity at a full pond elevation of 1,689.6 feet msl. Minimum flow is maintained through flow in a pipe in Mathis Dam that discharges into the Tallulah River at a rate of 10 cubic feet per second (cfs). This minimum flow converges with the Mathis Dam turbine discharge directly in Tallulah Falls Lake.

    The Terrora powerhouse is located 5.6 miles downstream of Mathis Dam at the head of the impoundment of the Tallulah Falls Development. The mile-long power tunnel cuts through a mountain to connect the impoundment (Lake Rabun) and the Terrora penstocks. The powerhouse is a steel, reinforced concrete, and masonry structure 127'4 feet long, 57'4 feet wide and about 100 feet tall at the downstream face. It houses two generating units, a control room, and a machine shop.

    The generating units supply power at 6600 volts and are complete with steel penstocks, 84" hydraulically operated penstock valves, steel pressure cases, Woodward governors, conical steel draft tubes and other minor auxiliary equipment. Voltage at the powerhouse is increased to 46-kilovolt (kV) via transformers located at the powerhouse. This 46-kV line connects Terrora powerhouse to the Terrora Hydro substation.

    The plant is operated to help meet the demand of the Georgia Power system during peak periods of the day. Operation is modified run-of-river; Lake Rabun stores inflow over short periods of time, which is utilized to provide generation from Terrora powerhouse during peak power demand hours. The reservoir is kept at or near full pool elevation throughout the year.

b. PROPOSAL

The Terrora development is experiencing chronic maintenance issues and increasing failures that have impacted Terrora's operating performance and reliability. These events confirm that the major electrical, mechanical, and civil systems, and components at these stations are at the end of their service life according to industry-recognized standards. As a result, Georgia Power is planning to modernize and extend the life of the Mathis-Terrora (Terrora) turbine and generating units and the balance of plant electrical/mechanical systems, and instrumentation and controls for another 40 to 50 years. Terrora's Unit 2 runner has failed and must be replaced to return the unit to service. The failure of the Unit 2 runner confirmed the need for removal and refurbishment/upgrade of the turbine components. There are two generating units in the Terrora powerhouse. Unit 2 will be modernized in 2020 and Unit 1 will be modernized in 2021.

Units 1 and 2 are driven by vertical, Francis type turbines. Unit 1 went into service March of 1925, while Unit 2 began operating three months later in July. The condition of the hydraulic surfaces has deteriorated; based on prior industry experience, this leads to a loss in efficiency. The original hydraulic design is prone to cavitation damage and repair and welding has been completed on a routine basis. Normally the process of welding will introduce distortion to the hydraulic surfaces, which adds to a further reduction in turbine efficiency.

The turbines have been in operation for approximately 93 years and their components are therefore considered to be well past industry recognized recommended service life between overhauls (per EPRI Hydropower Plant Modernization Guide). The turbines must be completely disassembled to facilitate the upgrade

The planned modernization scope of work for Terrora includes the following.

- Units 1 and 2 runners will be replaced and the associated turbine components will be overhauled and rehabilitated.
- Units 1 and 2 generators will be rewound and other refurbishment as determined by component testing and inspection.
- Field pole pieces on the generator rotor will be refurbished. Consideration will be given to additional electrical work necessary on the generators.
- The generator current transformers (CTs), the generator potential transformers (PTs), and the neutral grounding transformers and associated resistors will be replaced.
- Instrumentation and controls instrumentation as required to support the turbine, electrical, and mechanical scope of work. Also included are necessary interfaces between newly installed electrical, mechanical and turbine equipment to the plant control system.
- Electrical balance of plant systems associated with Unit 1 and Unit 2 including replacement of station service transformers, cable bus and switchgear. Demolition and removal of existing conduit and cable tray associated with these items as

necessary to accommodate new cable and equipment.

- Mechanical balance of plant systems associated with Unit 1 and 2 including replacement of bearing lube oil, thrust bearing high pressure oil lift, governor oil hydraulic pumping unit, generator brake air lines, automatic grease unit, and bearing oil cooling system.
- Install new intake trash racks with 3/8" vertical bars spaced 3" on center.
- Remodel of the control room to accommodate controls and instrumentation upgrades.

Table 1 shows the rated generating and maximum hydraulic capacities of the existing units with the expected performance of the upgraded units. Performance of the upgraded units may vary slightly based on final design, head conditions, and fabrication.

TABLE 1 RATED GENERATING AND MAXIMUM HYDRAULIC CAPACITIES

UNIT	Existing Rated Capacity (MW)	Existing Max Capacity (MW)	Existing Max Hydraulic Capacity (cfs)	Proposed Best Gate/Rated Capacity (MW)	Proposed Max Capacity[4] after Upgrade (MW)	Proposed Max Hydraulic Capacity after Upgrade (cfs)
1	8	9.7	800	10.4	11.5	819.5
2	8	9.7	800	10.4	11.5	819.5

Each upgraded unit will increase rated capacity from 8 MW to 10.4 MW (9.7 MW to 11.5 MW at full gate). Following the upgrade, there will be an increase of approximately 19.5 cfs in the full gate hydraulic capacity for an increase of 2.3 percent. Georgia Power will operate the Terrora powerhouse with no change to existing lake levels at Lake Rabun and Tallulah Falls Lake.

5. (i) The statutory or regulatory requirements of the state(s) in which the project would be located that affect the project as proposed with respect to bed and banks and to the appropriation, diversion, and use of water for power purposes are as follows:

    1) Georgia Power is a public electric utility serving retail customers in the State of Georgia and as such, is required to operate and exist under the general laws of the State of Georgia regulating public utilities as codified in the Official Code of Georgia Annotated (O.C.G.A.) Title 46 Chapter 3A. Specifically, § 46-3A-2 which requires utilities to file an Integrated Resource Plan (IRP) with the Georgia Public Service Commission.

    2) Section 401(a) of the Clean Water Act of 1977, requires that an applicant for a federal license to construct or operate facilities, which may result in any discharge into navigable waters, must provide the federal agency with a certificate from the state in which the discharge originates or from the appropriate interstate water pollution control agency. In Georgia, Water Quality Certifications (WQC) are issued by the

[4] Maximum Capacity is also referred to as "full gate".

Georgia Environmental Protection Division (Georgia EPD) as part of the Georgia Department of Natural Resources wetland regulatory program via O.C.G.A. Title 12 Chapter 5-21.

3) Section 7 of the Endangered Species Act requires consultation pertaining to the potential impact to threatened or endangered species. Georgia Power reviewed the U.S. Fish and Wildlife Service Environmental Conservation Online System (ECOS) Information for Planning and Consultation (IPaC) tool and also discussed the proposed upgrade with the USFWS and Georgia DNR. Georgia DNR is authorized by O.C.G.A. Title 27 Chapter 3 Article 3 (§ 27-3-132) as well as Rule 391-4-10 and the Endangered Wildlife Act of 1973 to make decisions, approve permits and determine potential impacts to any resident species as endangered, threatened, rare or unusual species.

4) Section 106 of the National Historic Preservation Act (NHPA) requires FERC to take into account any adverse effects to historic properties before issuing the Order approving a license amendment. Terrora powerhouse is eligible for listing on the National Register of Historic Places (NRHP) and, therefore, a historic property per the NHPA.

(ii) The steps which the Applicant has taken, or plans to take to comply with each of the laws cited above, are:

1) Per the IRP Act, the IRP must be filed every 3 years, with the most recent being submitted on January 31, 2019.

The January 2019 IRP included modifications and plans for modernization of the Terrora, Tugalo and Nacoochee plants in the North Georgia Project, including those upgrades to the Terrora Plant as discussed in this application. This IRP was approved by the Public Service Commission on July 29, 2019. Money approved by the Public Service Commission is only available in the years approved. Therefore, it is essential that FERC review this application in an expeditious manner to meet the schedule required by the Public Service Commission. The schedule outlined for the three North Georgia Projects are as follows:

Terrora – Unit 2 in 2020; Unit 1 in 2021

Tugalo – First Unit in 2022, Second Unit in 2023, Third Unit in 2024, and Fourth Unit in 2025

Nacoochee – Unit 2 in 2024

The year stated is the year for actual turbine runner replacement and generator rewinds. Detailed scoping and engineering for each project occurs in years prior to the installation. Once sufficient engineering work is complete for each unit, agency consultation can begin and license amendments submitted to FERC. At this time only engineering and consultation for Terrora is available; however, license amendments will be submitted to FERC for the remaining projects as the information becomes available. It is expected that the future license amendments will be in-kind equipment replacement like Terrora.

2) Georgia Power was issued a 401 Water Quality Certification (WQC) for the North Georgia Project on August 15, 1991 and has been operating in compliance with the WQC since the license order was granted. Georgia Power consulted with the Georgia

EPD (see Attachment B) and received confirmation that the existing and proposed unit modifications would continue to meet water quality criteria. According to FERC's guidance for license amendments in the *Hydroelectric Project Handbook for Filings Other than Licenses and Exemptions* (Section 4.1), "Evidence of a new request for water quality certification is only required if the amendment would result in a material adverse effect on the water quality in the discharge from the project or proposed project."

Based on the calculations provided and discussed in the Georgia EPD consultation there will be no material adverse effect on the water quality and therefore; a new 401 water quality certification would not be necessary.

3) Section 7 of the Endangered Species Act requires consultation pertaining to potential impacts of proposed actions to federally threatened or endangered species. There may be listed species in the area of the Terrora development. Georgia Power reviewed the USFWS' IPaC tool and found that the Gray bat (*Myotis grisescens*), the Northern Long-eared bat (*Myotis sepentrionalis*), and the Bog turtle (*Clemmys muhlenbergii*) may be present in the Terrora development area. The majority of the upgrade activities occur in the powerhouse and do not require any ground disturbance or cutting of trees; therefore, there would be no effect on the bats. The Bog turtle generally occupies open-canopy, herbaceous sedge meadows and fens bordered by wooded areas; Georgia Power does not anticipate any effect on this species. Finally, there are five federally-listed flowering plants but no effect is anticipated because the proposed upgrade does not involve ground distributing activities. In addition, Georgia Power consulted with the Georgia DNR on state listed species. Three aquatic species are described for the greater facility area (Tallulah River HUC10 watershed [0306010201]) based on review of Georgia WRD's web-based Natural Heritage Inventory on May 18, 2020. Highscale Shiner (*Notropis hypsilepis*), primarily found in tributary streams, is State listed as Rare. Smokey Dace (*Clinostomus funduloides*) and Brassy Jumprock (*Moxostoma sp*. 4) are neither federal nor state listed. The facility upgrades are not expected to have any impact on current flow, lake levels, aquatic life, or recreation.

4) The proposed replacement of the trash racks at the Terrora intake would result in an increase of approach velocities of 0.08 feet per second (ft/sec) (from 1.54 to 1.62 ft/sec) at full gate. The majority of species typically entrained through hydroelectric projects are in the herring or sunfish families. Based on swim speed studies, most if not all species excluded by the existing and proposed trash racks are capable of swimming faster than the intake velocities and would be able to avoid impingement. Therefore, the increased approach velocities associated with the proposed trash racks would result in negligible changes in the potential for fish entrainment compared to existing conditions.

5) The Terrora upgrade proposal includes replacing the control system and associated components. With the replacement of the control system, some of the control room panels will require some alteration. Georgia Power conducted a cultural resources assessment and provided it to the Georgia State Historic Preservation Officer (SHPO) for review and comment. Georgia Power and the Georgia SHPO agreed that the proposed construction would constitute an adverse effect on historic properties. Georgia Power, in consultation with SHPO, developed a draft Memorandum of Agreement (MOA) to mitigate adverse effects. Specific mitigation measures include

preparing a Permanent (photographic) Archival Record (PAR) pursuant to the SHPO's *Guidelines for Establishing a Photographic Permanent Archival Record.* The SHPO consultation was previously filed with FERC on April 24, 2020, docket number P-2354-147. The MOA is provided in Attachment B. Georgia Power's current Cultural Resources Management Plan does not give it the non-federal designee status to consult with tribes. Because the proposed upgrade was focused on the architectural aspects of the powerhouse and does not involved ground disturbing activities that could impact archaeological sites, Georgia Power did not consult with the tribes.

a. As the project is constructed and operating under the above described laws and rules as well as its existing FERC license and plans no changes in operation associated with the non-capacity license amendment, it will remain in compliance with the above cited rules and regulations. Future FERC license amendments will be submitted for the Tugalo and Nacoochee projects separately once mechanical and electrical design work is further completed.

In accordance with 18 CFR §4.201(c), only the following applicable exhibit(s) that require revision are made part of this Application:

a) Exhibit A – Project Description (Attachment C)

Exhibits A, F, and G were incorporated into the License Order for Project No. 2354. Georgia Power notes that the proposed upgrade will not change 1) project operations (Exhibit B), 2) the existing Project boundary (Exhibit G), or 3) the Recreation Plan; therefore, no revisions are needed for the other license exhibits and plans and therefore, not applicable to this amendment. Exhibit A (Project Description) requires an update; therefore, Georgia Power is attaching a revised Exhibit A in track change. At this time, it is not anticipated that any changes will be needed for Exhibit F, but if needed, Georgia Power will provide any updates to Exhibit F after the as-builts drawings are complete.

Commission regulations under 18 CFR § 4.38(a)(7) require Georgia Power to consult with resource agencies and Indian tribes, to the extent that the proposed amendment would affect their interests. Georgia Power has contacted the following agencies:

a. U.S. Forest Service

b. U.S. Fish and Wildlife Service

c. Georgia Department of Natural Resources - Environmental Protection Division

d. Georgia Department of Natural Resources -Wildlife Resources Division

e. Georgia Department of Natural Resources - Historic Preservation Division

Georgia Power submitted a summary of the upgrade to the aforementioned agencies and provided an opportunity to meet and discuss the proposed upgrade (Attachment B) beginning in early 2020. Therefore, Georgia Power has in effect been consulting for over 60 days with the applicable agencies; therefore, we are requesting a waiver of the 60-day review of the application so that Georgia Power can file the amendment application and request expedited FERC review. Georgia Power also provided a draft Non-Capacity Related License Amendment Application for agency review and comment on June 4, 2020.

SUMMARY

This Non-Capacity Related License Amendment would allow for turbine upgrades and associated modernization efforts described herein at the Mathis-Terrora development for continued operation of the generating units. The Terrora upgrade is the first plant in the North Georgia modernization projects for which Georgia Power is seeking FERC approval. Future project schedules will be affected by the Terrora completion date. Money approved by the Public Service Commission is only available in the years approved (see (ii)1). Therefore, it is essential that FERC review this application in an expeditious manner to meet the schedule required by the Public Service Commission. Based on the information contained in this application, Georgia Power respectfully requests FERC limit the public comment period to 15 days, expedite its review, and approve this application to amend the license for the North Georgia Power Project consistent with this proposal.

SIGNATURE Courtenay R. O'Mara
Herbie N. Johnson for

ATTACHMENT B

DOCUMENTATION OF CONSULTATION ON PROPOSAL

U.S. FISH AND WILDLIFE SERVICE

USFWS Meeting Invite

Crabbe, Melissa C.

Subject: Hydro Modernization
Location: Skype Meeting

Start: Tue 3/24/2020 10:00 AM
End: Tue 3/24/2020 10:30 AM

Recurrence: (none)

Meeting Status: Accepted

Organizer: O'Rouke, Patrick Michael
Required Attendees Glassmeyer, Scott T; Zapata, Martha J
Optional Attendees: Crabbe, Melissa C.; Dodd, Anthony Ray; O'Mara, Courtenay R.

Attaching briefing card for discussion in a few minutes

Join Skype Meeting

Trouble Joining? Try Skype Web App

Join by phone

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8-999-2663 (Southern Company Internal Use),,9227827# (United States)		English (United States)
+1 (205) 257-2663,,9227827# (United States)	English (United States)	
+1 (404) 460-0605,,9227827# (United States)	English (United States)	

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Georgia Power

USFWS Digital Handout

North Georgia Project (FERC No. 2354) License Amendment
Mathis-Terrora Unit Upgrade

- From upstream to downstream, the Mathis-Terrora development is the third of six hydroelectric developments in the Federal Energy Regulatory Commission (FERC) licensed North Georgia Project (FERC No. 2354) (Figure 1). Lake Burton is the headwater development of the North Georgia Project. Water for generation at Mathis-Terrora comes from rainfall in the Tallulah River basin upstream of the Mathis dam.

- The Mathis-Terrora development consists of Mathis dam, Terrora powerhouse and the impoundment, Lake Rabun. Operation is modified run-of-river; Lake Rabun stores inflow over short periods of time, which is utilized to provide generation from Terrora powerhouse during peak power demand hours. Terrora powerhouse discharges directly into the downstream Tallulah Falls Lake.

- Georgia Power is proposing to amend the North Georgia Project license to upgrade the two generating units in the Terrora powerhouse. This upgrade includes refurbishing the turbines, replacing the turbine runners, rewinding the generators[1] (Figure 2), and replacing intake trashracks. This work will begin in 2019-2020.

- The table below compares the rated generating and maximum hydraulic capacities of the existing units with the expected performance of the upgraded units. Performance of the upgraded units may vary slightly based on final design, head conditions, and fabrication.

UNIT	Existing Rated Capacity MW	Existing Max Hydraulic Capacity CFS	Proposed Capacity after Upgrade (MW)	Proposed Max Hydraulic Capacity (CFS) after Upgrade
1	8	800	11.5	819.5
2	8	800	11.5	819.5

- Following the upgrade, Georgia Power will operate the Terrora powerhouse with no change to existing lake levels at Lake Rabun and Tallulah Falls Lake.

- The approach velocities expected with new trashracks are estimated to be 1.33 and 1.62 foot per second (ft/s) at best and full gate flows, respectively. This is an increase of 0.17 and 0.08 ft/s increase from the estimated approach velocities at best and full gate flow with the existing trashracks and existing units.

- No public recreation facilities will be affected by the turbine runner and generator upgrades.

- Georgia Power is preparing a non-capacity license amendment application to file with FERC. The amendment application will conform with 18 C.F.R. §4.201 (c). Georgia Power's non-capacity amendment would include a description of the proposed turbine upgrade and any license exhibits that require revision in light of the nature of the proposed amendment (i.e., Exhibit A, B, C, etc). Georgia Power will consult with state and federal agencies prior to filing the application. Non-capacity amendment applications typically have few, if any, effects on environmental, recreational, and cultural resources; however, any potential issues would be disclosed in the application to FERC and in the pre-filing consultation.

- FERC typically issues a notice of the application and may ask Georgia Power for additional information prior to its analysis of the proposed upgrade at the Mathis-Terrora development. Georgia Power may request that FERC conduct an expedited review of this amendment application to facilitate the equipment procurement and work at the Terrora powerhouse.

[1] Generators have insulated copper bars or cables (windings) in both the stationary and rotating portions of the generator. Windings are supported by a stack of thin layers of steel. During a rewind, the old copper windings and steel are removed and replaced

USFWS Digital Handout

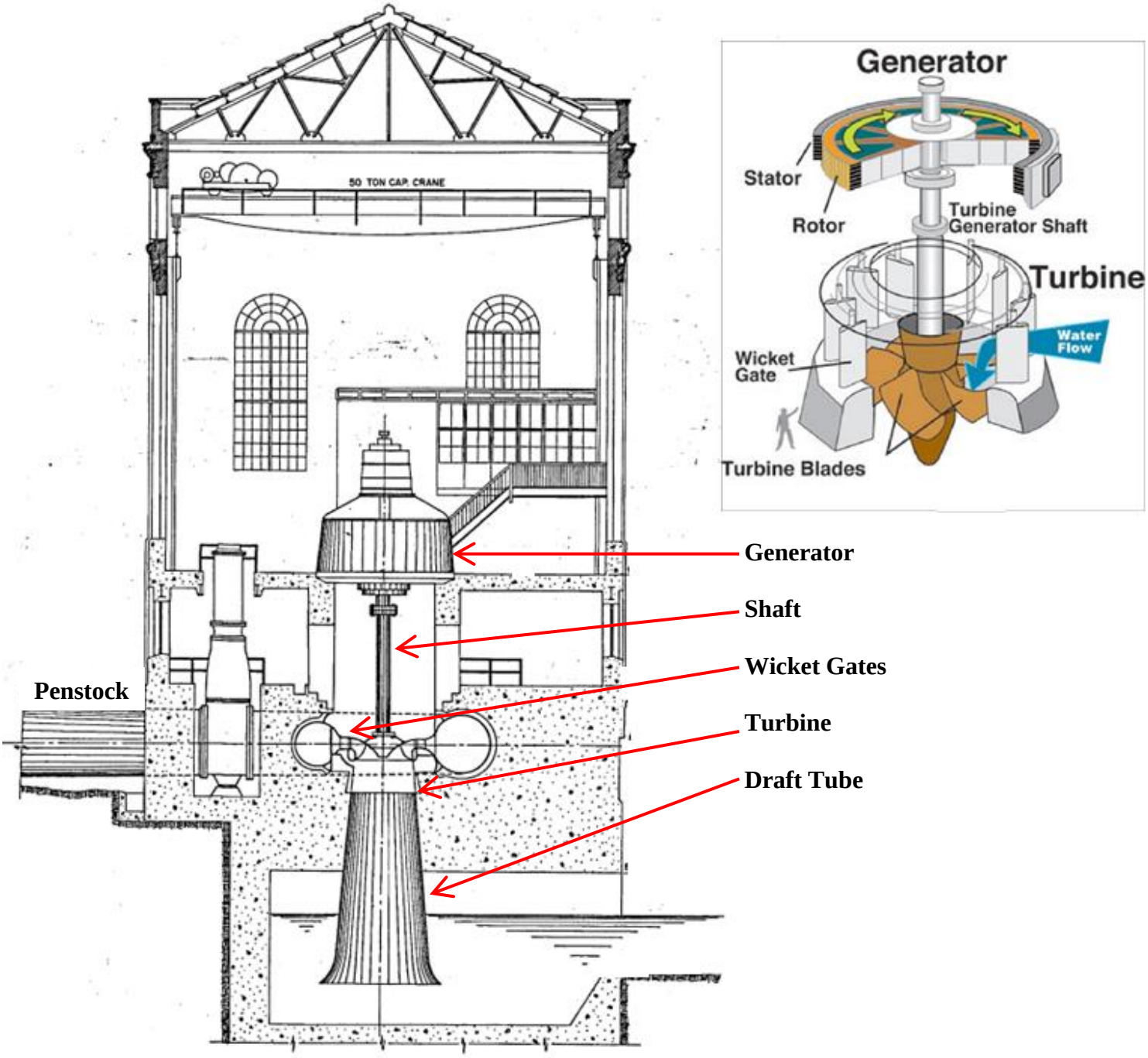


Figure 2: Terrora Powerhouse Cross-section

Written Correspondence with USFWS

Crabbe, Melissa C.

From: O'Rouke, Patrick Michael
Sent: Thursday, March 26, 2020 4:04 PM
To: Glassmeyer, Scott T
Cc: Zapata, Martha J; O'Mara, Courtenay R.; Crabbe, Melissa C.
Subject: Re: Georgia Power Mathis-Terrora Hydro upgrades

Got it, thank you for taking the time to look it over. I agree that it would probably be negligible since it is discharging into a reservoir.

Talk soon,
Patrick

Patrick O'Rouke
Fisheries Biologist
Georgia Power

From: Glassmeyer, Scott T <scott_glassmeyer@fws.gov>
Sent: Thursday, March 26, 2020 3:50:26 PM
To: O'Rouke, Patrick Michael <PMOROUKE@southernco.com>
Cc: Zapata, Martha J <martha_zapata@fws.gov>
Subject: Georgia Power Mathis-Terrora Hydro upgrades

EXTERNAL MAIL: Caution Opening Links or Files

Hi Patrick,

Thanks for setting up the meeting to talk and learn more about the upgrades to the Mathis-Terrora dam. I don't think that the flows changes will have impacts downstream but it could alter sand and gravel bars. The only concerns would be longer low flow duration because of the slight increase in discharge. However, it would probably be negligible in that part of the river. Let us know if anything changes with the proposed project plans.

Scott Glassmeyer
Georgia Ecological Services
US Fish and Wildlife Service
RG Stephens, Jr. Federal Building
355 East Hancock Avenue, Room 320, Box 7
Athens, GA 30601
706-208-7533

NOTE: This email correspondence and any attachments to and from this sender is subject to the Freedom of Information Act (FOIA) and may be disclosed to third parties.

U.S. FOREST SERVICE

Meeting Reservation for In-Person USFS Meeting

Crabbe, Melissa C.

Subject:	Consultation with Forest Service
Location:	Chattooga Ranger District, Tallulah Falls
Start:	Fri 1/17/2020 3:00 PM
End:	Fri 1/17/2020 4:00 PM
Show Time As:	Out of Office
Recurrence:	(none)
Organizer:	O'Rouke, Patrick Michael

USFS Meeting Summary

Georgia Power

North Georgia Hydroelectric Project

FERC Projects #2354

Communication Date: January 17, 2020

Communication Type: In-Person Meeting at U.S. Forest Service (USFS) Chattooga Ranger District, Lakemont, GA

List and attach pertinent written correspondence: Briefing Card

List persons attending from Southern Company/Georgia Power:

Patrick O'Rouke, Biologist, Georgia Power Company (GPC);

List organization name and persons attending from other organization:

David Vinson, District Biologist, Chattahoochee-Oconee National Forest, USFS

Subject: Discussion about upcoming amendment of the North Georgia Hydroelectric Project license for unit upgrades at the Terrora Development

Comments/Discussions/Requests:

-Patrick shared 3-page briefing titled "North Georgia Project (FERC No. 2354) License Amendment, Mathis-Terrora Unit Upgrade" with David and described the project and coming FERC process

-David explained that the main concern of USFS in this would be impacts to any federal lands

-Based on a quick look at existing GIS layers, there did not appear to be any species of concern within federal lands within the project or anywhere else that could be impacted by the proposed change; David will double-check to be sure that's the case

-Forest Service EAs do look 1 mile downstream of proposed effects, so areas downstream of the project would be included for assessment

-David specifically asked if the changes would affect boating access at Rabun Beach on Lake Rabun; Patrick clarified that it would not, as the operating range of the reservoir would not change

-David noted that he would check with the USFS cultural resources staff member to check against their database of sensitive sites

-Patrick explained that no comments were needed at the time from USFS unless there were any concerns that could be addressed immediately, FERC process will allow time for agency comments once the amendment application is filed

Follow-up Requirements: Written response to the discussion and briefing card review.

Form Completed By: Patrick O'Rouke

Georgia Power

Handout Provided to USFS

North Georgia Project (FERC No. 2354) License Amendment
Mathis-Terrora Unit Upgrade

- From upstream to downstream, the Mathis-Terrora development is the third of six hydroelectric developments in the Federal Energy Regulatory Commission (FERC) licensed North Georgia Project (FERC No. 2354) (Figure 1). Lake Burton is the headwater development of the North Georgia Project. Water for generation at Mathis-Terrora comes from rainfall in the Tallulah River basin upstream of the Mathis dam.

- The Mathis-Terrora development consists of Mathis dam, Terrora powerhouse and the impoundment, Lake Rabun. Operation is modified run-of-river; Lake Rabun stores inflow over short periods of time, which is utilized to provide generation from Terrora powerhouse during peak power demand hours. Terrora powerhouse discharges directly into the downstream Tallulah Falls Lake.

- Georgia Power is proposing to amend the North Georgia Project license to upgrade the two generating units in the Terrora powerhouse. This upgrade includes refurbishing the turbines, replacing the turbine runners, rewinding the generators[1] (Figure 2), and replacing intake trashracks. This work will begin in 2019-2020.

- The table below compares the rated generating and maximum hydraulic capacities of the existing units with the expected performance of the upgraded units. Performance of the upgraded units may vary slightly based on final design, head conditions, and fabrication.

UNIT	Existing Rated Capacity MW	Existing Max Hydraulic Capacity CFS	Proposed Capacity after Upgrade (MW)	Proposed Max Hydraulic Capacity (CFS) after Upgrade
1	8	800	11.5	819.5
2	8	800	11.5	819.5

- Following the upgrade, Georgia Power will operate the Terrora powerhouse with no change to existing lake levels at Lake Rabun and Tallulah Falls Lake.

- The approach velocities expected with new trashracks are estimated to be 1.33 and 1.62 foot per second (ft/s) at best and full gate flows, respectively. This is an increase of 0.17 and 0.08 ft/s increase from the estimated approach velocities at best and full gate flow with the existing trashracks and existing units.

- No public recreation facilities will be affected by the turbine runner and generator upgrades.

- Georgia Power is preparing a non-capacity license amendment application to file with FERC. The amendment application will conform with 18 C.F.R. §4.201 (c). Georgia Power's non-capacity amendment would include a description of the proposed turbine upgrade and any license exhibits that require revision in light of the nature of the proposed amendment (i.e., Exhibit A, B, C, etc). Georgia Power will consult with state and federal agencies prior to filing the application. Non-capacity amendment applications typically have few, if any, effects on environmental, recreational, and cultural resources; however, any potential issues would be disclosed in the application to FERC and in the pre-filing consultation.

- FERC typically issues a notice of the application and may ask Georgia Power for additional information prior to its analysis of the proposed upgrade at the Mathis-Terrora development. Georgia Power may request that FERC conduct an expedited review of this amendment application to facilitate the equipment procurement and work at the Terrora powerhouse.

[1] Generators have insulated copper bars or cables (windings) in both the stationary and rotating portions of the generator. Windings are supported by a stack of thin layers of steel. During a rewind, the old copper windings and steel are removed and replaced

Handout Provided to USFS

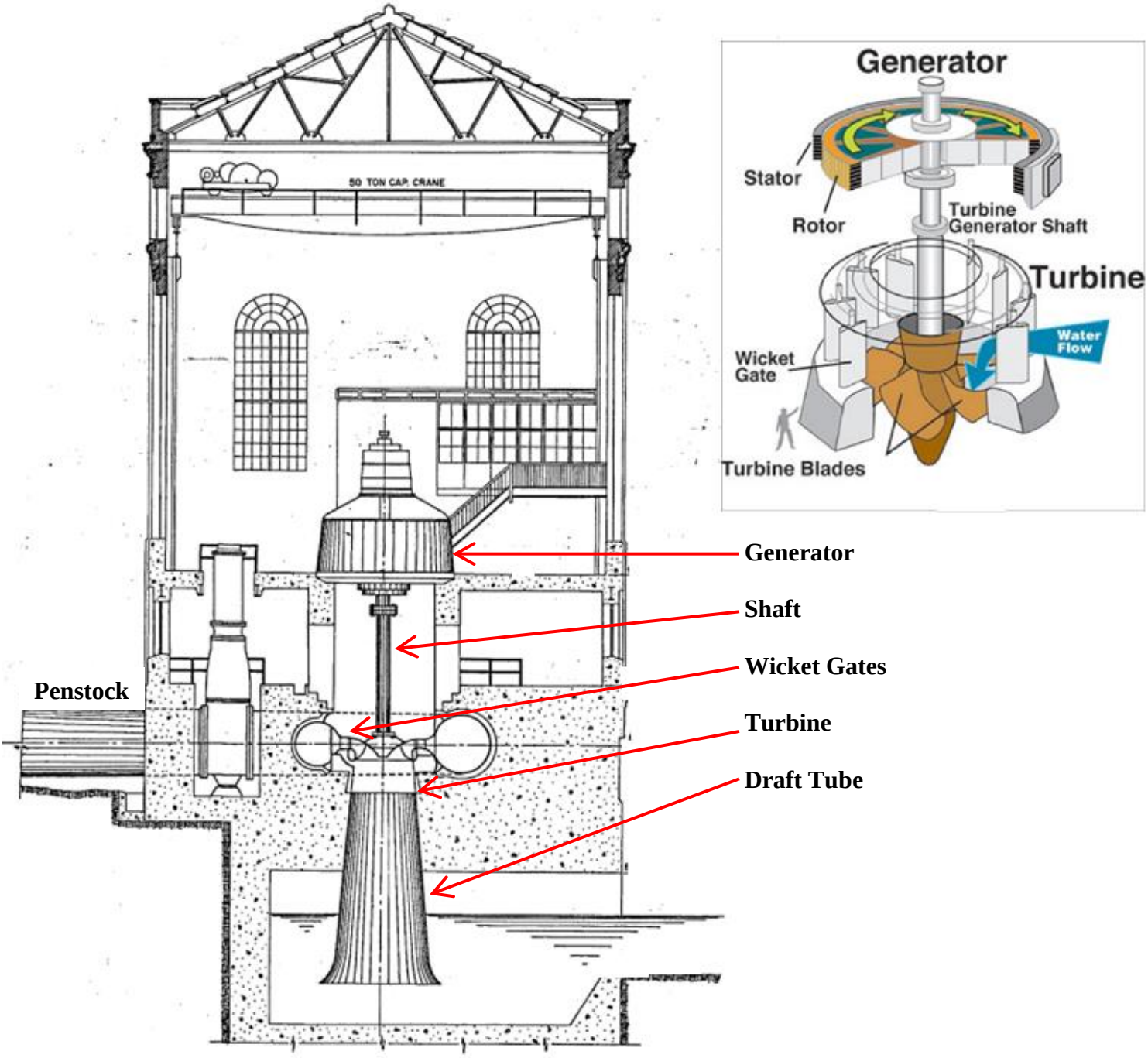


Figure 2: Terrora Powerhouse Cross-section

GEORGIA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Crabbe, Melissa C.

Subject: GPC Terrora Hydro Plant Modernization Consultation
Location: Skype Meeting

Start: Fri 3/27/2020 10:30 AM
End: Fri 3/27/2020 11:00 AM

Recurrence: (none)

Meeting Status: Accepted

Organizer: O'Mara, Courtenay R.
Required Attendees Booth, Elizabeth; Lamarre, Paul; Parsons, Tyler; Weatherill, Dominic J.; Brown, Jean Shepherd; Crabbe, Melissa C.; Dodd, Anthony Ray

This is for us to discuss any questions you may have. Thanks!

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Crabbe, Melissa C.

Subject:	GPC Terrora Hydro Plant Modernization Consult Follow-up
Location:	Skype Meeting
Start:	Thu 5/7/2020 1:00 PM
End:	Thu 5/7/2020 2:00 PM
Recurrence:	(none)
Meeting Status:	Accepted
Organizer:	O'Mara, Courtenay R.
Required Attendees:	O'Mara, Courtenay R.; Wei.Zeng@dnr.state.ga.us; Liang, Hailian; Stephen.Wiedl@dnr.ga.gov; Fenwick, Whitney; audra.dickson@dnr.ga.gov; Booth, Elizabeth; Weatherill, Dominic J.; Brown, Jean Shepherd; Crabbe, Melissa C.; Dodd, Anthony Ray
Optional Attendees:	Zeng, Wei

Thanks,

Courtenay R. O'Mara, P.E.
Hydro Licensing and Compliance Supervisor
Southern Company
241 Ralph McGill Blvd. – Bin 10193
Atlanta, Georgia 30308
Tel 404.506.7219
Mobile 404.797.9432
southerncompany.com

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O'Mara, Courtenay R.

From: Wiedl, Stephen <Stephen.Wiedl@dnr.ga.gov>
Sent: Friday, June 12, 2020 5:09 PM
To: O'Mara, Courtenay R.
Cc: Zeng, Wei; Smith, Bradley; Booth, Elizabeth; Gossett, Kaela; Dodd, Anthony Ray
Subject: RE: GPC Terrora Hydro Plant Modernization Consult Follow-up
Attachments: EPD Consultation for Terrora Modernization Info.pdf

EXTERNAL MAIL: Caution Opening Links or Files

Ms. O'Mara,

Based on project information conveyed in March and May, 2020 by Southern Company/Georgia Power Company via virtual meeting consultations, E-mail, and relevant associated electronic documents, the Georgia Environmental Protection Division's Wetlands (401) Unit concurs that state water quality criteria are currently being met in the relevant waterways and will continue to be met after Terrora Powerhouse modernization activities are complete, and that indeed there will be no material adverse effect on water quality. We therefore provide response that no new 401 Water Quality Certification would be necessary for the subject Terrora Powerhouse modernization.

Thank you for the information you have provided and for your coordination efforts on this project. Best wishes.

Stephen C. Wiedl, PWS
Manager – Wetlands Unit
Georgia Environmental Protection Division
7 Martin Luther King, Jr. Drive, Suite 450
Atlanta, GA 30334

404-452-5060
Stephen.Wiedl@dnr.ga.gov

From: O'Mara, Courtenay R. <CROMARA@SOUTHERNCO.COM>
Sent: Tuesday, May 12, 2020 8:17 PM
To: Zeng, Wei <Wei.Zeng@dnr.ga.gov>; Liang, Hailian <Hailian.Liang@dnr.ga.gov>; Wiedl, Stephen <Stephen.Wiedl@dnr.ga.gov>; Fenwick, Whitney <whitney.fenwick@dnr.ga.gov>; Dickson, Audra <Audra.Dickson@dnr.ga.gov>; Booth, Elizabeth <Elizabeth.Booth@dnr.ga.gov>; Weatherill, Dominic J. <DJWEATHE@SOUTHERNCO.COM>; Brown, Jean Shepherd <JEABROWN@SOUTHERNCO.COM>; Crabbe, Melissa C. <MCCRABBE@SOUTHERNCO.COM>; Dodd, Anthony Ray <ARDODD@southernco.com>
Cc: Zeng, Wei <Wei.Zeng@dnr.ga.gov>
Subject: RE: GPC Terrora Hydro Plant Modernization Consult Follow-up

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Hey everyone-
Sorry for the late email, but we are working crazy hours these days!

I've attached a summary of our conversations and the data that we have shared. We also went back and revised the temperature assessment to reflect the change in flows that Wei suggested (in this revision we also decided to move from just January and August analysis to monthly analysis). Our conclusions from this recalculation follow, which are also in the attached documents. We are looking for specific feedback from EPD on this with a reply email being ok for us to use in our FERC license amendment submittal.

Conclusions:

- Georgia Power's calculations show that state water quality criteria is being and will continue to be met even after Terrora Powerhouse modernization activities are complete. A summary of calculated monthly temperature projections is presented below:

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV[2]	DEC
Temp in the Forebay (°C)	4.6	5.5	6.8	9.4	11.0	13.2	17.7	19.1	18.9	16.4	12.8	9.3
Temp in the Forebay (°F)	40.3	41.9	44.3	49.0	51.8	55.8	63.8	66.4	65.9	61.5	55.1	48.7
Temp Leaving the Turbine Cooler (°C)	4.9	5.8	7.1	9.7	11.3	13.5	18.0	19.4	19.2	16.7	13.1	9.6
Temp Leaving the Turbine Cooler (°F)	40.8	42.4	44.9	49.5	52.3	56.3	64.4	66.9	66.5	62.0	55.7	49.3
Flow Leaving the Cooler (NPDES Max Permitted Amt)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Tallulah River Temp (°C)	1.6	8.0	12.7	17.7	18.3	22.8	22.2	26.6	20.7	14.8	11.3	5.1
Tallulah River Temp (°F)	34.9	46.4	54.9	63.9	64.9	73.0	72.0	79.9	69.3	58.6	52.3	41.2
Tallulah River Flow	32.4	31.9	34.3	37.7	27.0	31.1	17.6	14.9	20.0	22.6	22.9	37.3
Mixed River Flow Temp (°C)	1.7	8.0	12.6	17.6	18.2	22.7	22.1	26.4	20.7	14.8	11.3	5.2
Mixed River Flow Temp(°F)	35.0	46.3	54.7	63.7	64.7	72.8	71.7	79.5	69.2	58.7	52.4	41.3
Delta Temp (°C)	0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	0.0	0.0	0.0	0.1
Delta Temp (°F)	0.1	-0.1	-0.1	-0.2	-0.2	-0.3	-0.2	-0.4	-0.1	0.1	0.0	0.1

[2] November forebay temperature was not measured due to a drawdown during the study period. The November forebay temperature used for this assessment is the average of the October and December forebay temperature measurements.

- Guidance language is provided by FERC on 401 water quality certifications during a FERC license amendment process. The language is from FERC's *Hydroelectric Project Handbook for Filings Other Than Licenses and Exemptions.* Section 4.1 states:

  "Evidence of a new request for water quality certification is only required if the amendment would result in a material adverse effect on the water quality in the discharge from the project or proposed project."

- Georgia Power believes that based on the calculations attached/summarized above that there will be no material adverse effect on the water quality and we do not believe a new 401 water quality certification would be necessary. However, we would like to have EPD's concurrence.

Please let us know if you need any additional information or if we need to get back together to answer any questions you may have. Thanks for your time on this.

Courtenay R. O'Mara, P.E.
Hydro Licensing and Compliance Supervisor
Southern Company
241 Ralph McGill Blvd. – Bin 10193
Atlanta, Georgia 30308
Tel 404.506.7219
Mobile 404.797.9432
southerncompany.com [gcc01.safelinks.protection.outlook.com]



-----Original Appointment-----
From: O'Mara, Courtenay R.
Sent: Thursday, April 30, 2020 1:32 PM
To: O'Mara, Courtenay R.; Wei.Zeng@dnr.state.ga.us; Liang, Hailian; Stephen.Wiedl@dnr.ga.gov; Fenwick, Whitney; audra.dickson@dnr.ga.gov; Booth, Elizabeth; Weatherill, Dominic J.; Brown, Jean Shepherd; Crabbe, Melissa C.; Dodd, Anthony Ray
Cc: Zeng, Wei
Subject: GPC Terrora Hydro Plant Modernization Consult Follow-up
When: Thursday, May 7, 2020 1:00 PM-2:00 PM (UTC-05:00) Eastern Time (US & Canada).
Where: Skype Meeting

Thanks,

Courtenay R. O'Mara, P.E.
Hydro Licensing and Compliance Supervisor
Southern Company
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Crabbe, Melissa C.

From: Booth, Elizabeth <Elizabeth.Booth@dnr.ga.gov>
Sent: Wednesday, May 13, 2020 10:10 AM
To: O'Mara, Courtenay R.; Zeng, Wei; Liang, Hailian; Wiedl, Stephen; Fenwick, Whitney; Dickson, Audra; Weatherill, Dominic J.; Brown, Jean Shepherd; Crabbe, Melissa C.; Dodd, Anthony Ray
Cc: Zeng, Wei
Subject: RE: GPC Terrora Hydro Plant Modernization Consult Follow-up

EXTERNAL MAIL: Caution Opening Links or Files

Courtney,

Thanks for the follow-up. This is most helpful. I can see that the based on the flows through the turbines, the temperature increases provided of the water running through the turbines and the flows and temperatures of the Tullulah River downstream, there is not a violation of temperature water quality criteria.

Thanks Liz

From: O'Mara, Courtenay R. <CROMARA@SOUTHERNCO.COM>
Sent: Tuesday, May 12, 2020 8:17 PM
To: Zeng, Wei <Wei.Zeng@dnr.ga.gov>; Liang, Hailian <Hailian.Liang@dnr.ga.gov>; Wiedl, Stephen <Stephen.Wiedl@dnr.ga.gov>; Fenwick, Whitney <whitney.fenwick@dnr.ga.gov>; Dickson, Audra <Audra.Dickson@dnr.ga.gov>; Booth, Elizabeth <Elizabeth.Booth@dnr.ga.gov>; Weatherill, Dominic J. <DJWEATHE@SOUTHERNCO.COM>; Brown, Jean Shepherd <JEABROWN@SOUTHERNCO.COM>; Crabbe, Melissa C. <MCCRABBE@SOUTHERNCO.COM>; Dodd, Anthony Ray <ARDODD@southernco.com>
Cc: Zeng, Wei <Wei.Zeng@dnr.ga.gov>
Subject: RE: GPC Terrora Hydro Plant Modernization Consult Follow-up

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I've attached a summary of our conversations and the data that we have shared. We also went back and revised the temperature assessment to reflect the change in flows that Wei suggested (in this revision we also decided to move from just January and August analysis to monthly analysis). Our conclusions from this recalculation follow, which are also in the attached documents. We are looking for specific feedback from EPD on this with a reply email being ok for us to use in our FERC license amendment submittal.

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Delta Temp (°C)	0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	0.0	0.0	0.0	0.1
Delta Temp (°F)	0.1	-0.1	-0.1	-0.2	-0.2	-0.3	-0.2	-0.4	-0.1	0.1	0.0	0.1

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Courtenay R. O'Mara, P.E.
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Atlanta, Georgia 30308
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Mobile 404.797.9432
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Southern Company

-----Original Appointment-----
From: O'Mara, Courtenay R.
Sent: Thursday, April 30, 2020 1:32 PM
To: O'Mara, Courtenay R.; Wei.Zeng@dnr.state.ga.us; Liang, Hailian; Stephen.Wiedl@dnr.ga.gov; Fenwick, Whitney; audra.dickson@dnr.ga.gov; Booth, Elizabeth; Weatherill, Dominic J.; Brown, Jean Shepherd; Crabbe, Melissa C.; Dodd, Anthony Ray
Cc: Zeng, Wei
Subject: GPC Terrora Hydro Plant Modernization Consult Follow-up
When: Thursday, May 7, 2020 1:00 PM-2:00 PM (UTC-05:00) Eastern Time (US & Canada).
Where: Skype Meeting

Thanks,

Courtenay R. O'Mara, P.E.
Hydro Licensing and Compliance Supervisor
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Atlanta, Georgia 30308
Tel 404.506.7219
Mobile 404.797.9432
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Georgia Power

North Georgia Hydroelectric Project

FERC Project #2354

Communication Date: March 27, 2020 and May 7, 2020

Communication Type: Skype Web-Meetings

List and attach pertinent written correspondence:

Map of Dams/River

DO and Temperature Results from Water Quality Investigations for the North Georgia Hydro Facilities Group (1990)

Heat Transfer and Mixing Calculation Summary

List persons attending from Southern Company/Georgia Power:

Southern Company: Courtenay O'Mara, P.E. and Melissa Crabbe, P.E.

Georgia Power Company (Georgia Power): Tony Dodd, Dominic Weatherill, and Jeanne Brown

List organization name and persons attending from other organization:

Georgia Department of Natural Resources, Environmental Protection Division (Georgia EPD) -

Dr. Elizabeth Booth (March 27, 2020)

Dr. Wei Zeng, Dr. Hailian Liang, Bradley Smith and Whitney Fenwick (May 7, 2020)

Subject: Consultation and Follow-up Consultation on the Modernization of the North Georgia Project Terrora Powerhouse including Georgia EPD Information Needs and Calculations

Comments/Discussions/Requests:

Consultations occurred via Skype on March 27, 2020 and May 7, 2020, and follow-up via email on May 12, 2020.

March 27, 2020 Consultation

On March 27, 2020 Southern Company/Georgia Power met via Skype with Dr. Elizabeth Booth of Georgia EPD and discussed the upgrades that Georgia Power has planned for the Terrora Powerhouse.

- Overview of modernization program across Georgia Power hydro fleet over the next 12 years
- Specifically, for Terrora, which is a part of the North Georgia Hydroelectric Project (1 of 6 dams) the timeframe is in 2020 and 2021 and includes turbine runner replacement, generator rewind, cooling system upgrade (pipes remain the same)
- The map was reviewed
- There will be no minimum flow changes, a slight increase in turbine discharge (800 cfs to 820 cfs at full gate) no lake elevation changes, a small power increase (19.4 MW to 23 MW) - theoretically more heat is produced with increase in MW
- Georgia Power will file a FERC license amendment and needs to consult with agencies; We have consulted with U.S. Fish and Wildlife Service and Georgia Department of Natural Resources, Wildlife Resources Division and they did not have any issues with the proposed modernization of Terrora
- Extent of existing water quality sampling data was discussed, most dating back to the last FERC relicensing in the mid-1990s; Georgia Power described the seasonal water quality data that was collected back then as well as described that Georgia EPD had issued a 401 water quality certificate based on that data
- Dr. Booth wanted Georgia Power to expand the EPD group that is involved in consultation and requested to be briefed on Georgia Power's data from the last relicensing on dissolved oxygen in the Terrora Powerhouse tailrace and requested the BTU rating of the new coolers that Georgia Power plans to install in the powerhouse.

May 7, 2020 Consultation

On May 7, 2020, a consultation with the expanded Georgia EPD group was convened via Skype. The following items were discussed in that consultation:

- Georgia Power provided a recap of information that was discussed with Dr. Booth on March 27, 2020:
  - Georgia Power provided a graph showing the historical dissolved oxygen (DO) and temperature measurements that were measured in the Terrora powerhouse tailrace during the last relicensing when Georgia EPD issued a 401 water quality certificate.

  - Monthly DO measurements (collected in the Tallulah River 0.9 mile upstream of the Terrora discharge) were no less than 8 mg/L and monthly temperature readings were no more than 27 °C / 80.6. °F
  - At the time of relicensing the North Georgia Hydroelectric Projects, warm season DO concentrations were detected below the State standard in the Burton Dam tailrace which was ultimately corrected by permanently closing a low-level sluice since the FERC license issuance in 1993. Subsequent monitoring demonstrated that the closure of the sluice corrected the low DO and that no other measures were necessary to achieve Georgia water quality standards. Lakes Seed (Nacoochee Dam) and Rabun (Mathis Dam) are situated between Burton Dam and the Terrora discharge.
- Georgia Power provided an assessment of change in temperature within the Terrora cooling water system and its discharge with the new cooling water system per Dr. Booth's March 27, 2020 consultation request.
  - Cooling water for units is taken off the penstock and discharged through the draft tube; the discharge is permitted under the NPDES permit for the facility
  - BTU rating – New cooler information provided by the modernization team design engineers indicates that the system has a capability of 64,831 BTU/hr
  - Calculations were based off of a 5-YR low daily average flow and monthly water temperature measurements and focused on January as the coolest water temperature and August as the warmest water temperature
  - Results indicated that in January there will be an estimated 0.1 °C / 0.1°F increase in temperature to the receiving stream and in August there will be an estimated -0.1 °C / -0.2°F (decline) in temperature to the receiving stream
  - Dr. Zeng asked how the 5-YR low flow (24.9 cfs) that was used in the mixing calculation was developed and Georgia Power explained that a USGS gage was installed just upstream of the Terrora Powerhouse in late 2014 and that the 24.9 cfs that was used in the calculation was the lowest daily average flow that was measured over the 5-year time period from 2015-2019, when data was available.
  - Dr. Zeng asked if this period was the lowest drought for this area and, if not, if we could analyze/estimate if there were lower flow periods to ensure we had analyzed the worst flow conditions. Georgia Power agreed to evaluate and follow-up with the entire group.
  - Georgia Power discussed the relevant state water quality standards that applied to the Terrora Powerhouse discharge and the receiving Tallulah River (which is in the Tallulah Falls lake headwater). The stream's

designated uses are Recreation and Fisheries. The water quality criteria require that the temperature not exceed 90°F and cannot cause a temperature change exceeding 5°F

- Georgia Power discussed the guidance language provided by FERC on 401 water quality certifications during a FERC license amendment process. The language is from FERC's *Hydroelectric Project Handbook for Filings Other Than Licenses and Exemptions.* Section 4.1 states:

  "Evidence of a new request for water quality certification is only required if the amendment would result in a material adverse effect on the water quality in the discharge from the project or proposed project."
- Dr. Zeng advised that Bradley Smith and Steve Wiedl's group would likely be our point of contact for final comments/concurrence on topic.

Follow-up to May 7, 2020 Consultation (provided via email May 12, 2020):

- The following discussion is intended to provide the additional information that Dr. Zeng requested.
  - As summarized above the Terrora Powerhouse gage only has data available for 2015-2019. There are extreme droughts that have occurred in Georgia that happened prior to this period.
  - Georgia Power looked at nearby gages that have been measuring flows for a longer period of time to compare low flow patterns so that adjustments could be made to the flows used in our evaluation, as necessary. Simulated flows were used that lowered the flow numbers used for certain months based on the flow patterns of the nearby Clayton gage.
  - Georgia Power also decided to expand the analysis from only January and August to every month, because even though the water temperatures are cooler, the historically drier months occur in September, October, and November in Georgia which could potentially have a bigger impact to the temperature of the receiving stream.
  - Temperature assessment and calculated delta temperatures for the receiving stream are included in the attachment.

Conclusions:

- Georgia Power's calculations show that state water quality criteria is being and will continue to be met even after Terrora Powerhouse modernization activities are complete. A summary of calculated monthly temperature projections is presented below:

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV[2]	DEC
Temp in the Forebay (°C)	4.6	5.5	6.8	9.4	11.0	13.2	17.7	19.1	18.9	16.4	12.8	9.3
Temp in the Forebay (°F)	40.3	41.9	44.3	49.0	51.8	55.8	63.8	66.4	65.9	61.5	55.1	48.7
Temp Leaving the Turbine Cooler (°C)	4.9	5.8	7.1	9.7	11.3	13.5	18.0	19.4	19.2	16.7	13.1	9.6
Temp Leaving the Turbine Cooler (°F)	40.8	42.4	44.9	49.5	52.3	56.3	64.4	66.9	66.5	62.0	55.7	49.3
Flow Leaving the Cooler (NPDES Max Permitted Amt)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Tallulah River Temp (°C)	1.6	8.0	12.7	17.7	18.3	22.8	22.2	26.6	20.7	14.8	11.3	5.1
Tallulah River Temp (°F)	34.9	46.4	54.9	63.9	64.9	73.0	72.0	79.9	69.3	58.6	52.3	41.2
Tallulah River Flow	32.4	31.9	34.3	37.7	27.0	31.1	17.6	14.9	20.0	22.6	22.9	37.3
Mixed River Flow Temp (°C)	1.7	8.0	12.6	17.6	18.2	22.7	22.1	26.4	20.7	14.8	11.3	5.2
Mixed River Flow Temp(°F)	35.0	46.3	54.7	63.7	64.7	72.8	71.7	79.5	69.2	58.7	52.4	41.3
Delta Temp (°C)	0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	0.0	0.0	0.0	0.1
Delta Temp (°F)	0.1	-0.1	-0.1	-0.2	-0.2	-0.3	-0.2	-0.4	-0.1	0.1	0.0	0.1

[2] November forebay temperature was not measured due to a drawdown during the study period. The November forebay temperature used for this assessment is the average of the October and December forebay temperature measurements.

- Georgia Power believes that based on the calculations attached/summarized above that there will be no material adverse effect on the water quality and we do not believe a new 401 water quality certification would be necessary. However, we would like to have EPD's concurrence.

Terrora Temperature Assessment – May 7, 2020 Consultation with EPD

Southern Company's Hydro Services group conducted a temperature assessment to estimate temperature changes that would occur in the Terrora Powerhouse tailrace after new coolers are installed. This assessment is comprised of two calculations; a heat exchange calculation and a mixing calculation. The heat exchange calculation uses the new cooler rating, the NPDES permitted cooling water flow, and representative winter and summer forebay temperatures (at the intake depth range) to determine the temperature of the cooling water discharge. The mixing calculation uses a 5-Year Minimum Daily Average Tallulah River flow coming past the Terrora Powerhouse, representative winter and summer Tallulah River temperatures, and the cooling water discharge temperature to determine the resulting tailrace temperature after plant and river flows mix. Parameters used in the assessment below are numbered and correspond with the numbered references on Page 3.

Terrora Winter Data

1.	Temperature in Forebay at Headgate Depths (meters 10-14):	4.6°C / 40.3°F
2.	Permitted Maximum Cooling Water Flow Rate	240 GPM or 0.53 cfs
3.	New Cooler Rating	64,831 BTU/hr
4.	Temperature of Cooling Water Discharge – New System	4.9°C / 40.8°F
5.	5-YR receiving stream daily average low flow (Tailrace)[1]	24.9 ft^3/sec
6.	Temperature of River Flowing Past Terrora Powerhouse	1.6°C / 34.9°F

Temperature Calculation

Tailrace (downstream) temperature after cooling water discharge

= (1.6°C * 24.9 ft^3/sec + 4.9°C * 0.53 ft^3/sec)/

(24.9 ft^3/sec + 0.53 ft^3/sec)

= 1.7°C / 35.0 °F

Temperature rise = 1.7°C – 1.6°C = 0.1°C

Temperature rise = 35.0°F – 34.9°F = 0.1°F

[1] The temperature mixing calculation considers a unit motoring condition in which the only discharges from the plant are cooling water discharges.

Terrora Summer Data

1.	Temperature in Forebay at Headgate Depths (meters 10-14):	19.1°C / 66.4°F
2.	Permitted Maximum Cooling Water Flow Rate	240 GPM or 0.53 cfs
3.	New Cooler Rating	64,831 BTU/hr
4.	Temperature of Cooling Water Discharge – New System	19.4°C / 66.9°F
5.	5-YR Receiving Stream Daily Average Low Flow (Tailrace)	24.9 ft^3/sec
6.	Temperature of River Flowing Past Terrora Powerhouse	26.6°C / 79.9°F

Temperature Calculation

Tailrace (downstream) temperature after cooling water discharge

= (26.6°C * 24.9 ft^3/sec + 19.4°C * 0.53 ft^3/sec)/

(24.9 ft^3/sec + 0.53 ft^3/sec)

= 26.5°C / 79.7°F

Temperature rise = 26.5°C – 26.6°C = -0.1°C

Temperature rise = 79.7°F-79.9°F= -0.2°F

References:

1. **Temperature in Forebay at Headgate Depths (Meters 10-14)**

   Tables A-13 and A-20, Water Quality Investigations at the North Georgia Hydro Group Facilities (1990)

   This is the study completed in the last FERC relicensing of North Georgia Hydro where a 401 water quality certificate was issued by EPD.

2. **Permitted Maximum Cooling Water Flow Rate**

   2016 NPDES Permit Application

3. **New Cooler Rating (64,831 BTU/hr)**

   Internal Design Information provided by Southern Company Engineers

4. **Temperature of Cooling Water Discharge:**

   Internal Heat Transfer Calculation Using Cooler Rating and Forebay Temperature completed by Southern Company Engineers

   This represents the temperature of the cooling water after it has cooled the turbine/thrust bearing equipment.

5. **Flow of River Flowing Past Terrora Powerhouse (5-YR receiving stream daily average low flow (Tailrace)**

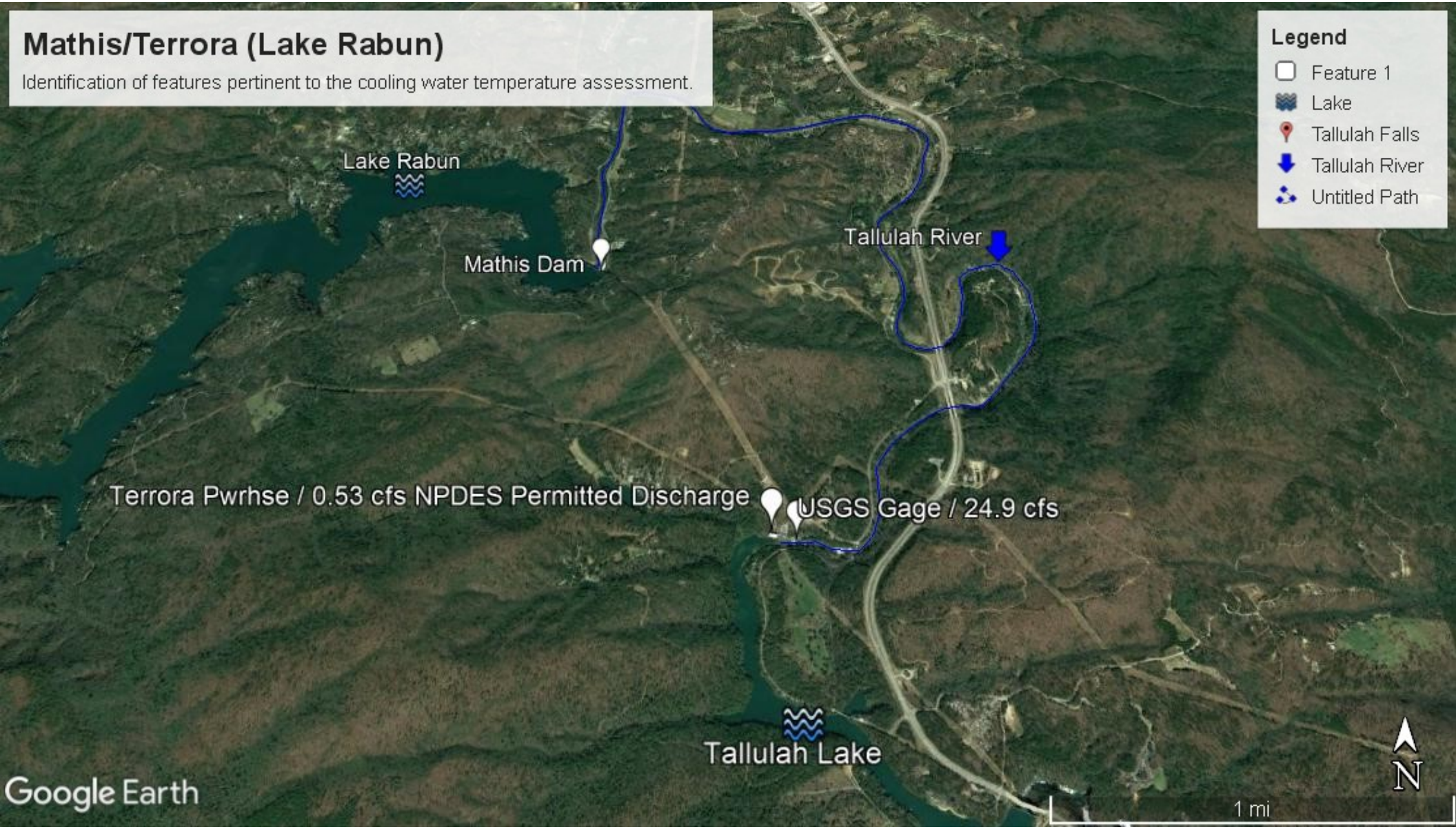
   USGS Tallulah R at Terrora Pwrhse, NR Tallulah Falls, GA

   https://waterdata.usgs.gov/ga/nwis/uv/?site_no=02181350&PARAmeter_cd=00065,00060,00062,00010

6. **Temperature Tallulah River**

   Table A-38, 1990 Water Quality Investigations at the North Georgia Hydro Group Facilities

   This is the study completed in the last FERC relicensing of North Georgia Hydro where a 401 water quality certificate was issued by EPD.


Mathis/Terrora (Lake Rabun)
Identification of features pertinent to the cooling water temperature assessment.
Legend
Feature 1
Lake
Tallulah Falls
Tallulah River
Untitled Path
Lake Rabun
Mathis Dam
Tallulah River
Terrora Pwrhse / 0.53 cfs NPDES Permitted Discharge
USGS Gage / 24.9 cfs
Tallulah Lake
Google Earth
N
1 mi

Attachment to Georgia Power's 5/12/2020 Email to EPD

Terrora Temperature Assessment – Revised Based on May 7, 2020 Consultation with Georgia EPD

Southern Company's Hydro Services group conducted a temperature assessment to estimate temperature changes that would occur in the Terrora Powerhouse tailrace after new coolers are installed. This assessment is comprised of two calculations; a heat exchange calculation and a mixing calculation. The heat exchange calculation uses the new cooler rating, the NPDES permitted cooling water flow, and forebay temperatures (at the intake depth range) to determine the temperature of the cooling water discharge. The mixing calculation uses a minimum or simulated minimum daily average Tallulah River flow coming past the Terrora Powerhouse, Tallulah River temperature, and the cooling water discharge temperature to determine the resulting tailrace temperature after plant and river flows mix. Both cooling water and tailrace temperatures were calculated once for each month to account for seasonal changes in water temperature and flows. Parameters used in the assessment below are numbered and correspond with the numbered references on Page 3.

Calculation Parameters

1.	Temperature in Forebay at Headgate Depths (10-14 meters)	Varies Monthly
2.	Permitted Maximum Cooling Water Flow Rate	240 GPM or 0.53 cfs
3.	New Cooler Rating	64,831 BTU/hr
4.	Temperature of Cooling Water Discharge – New System	Varies Monthly
5.	22-year receiving stream minimum daily average flow (Tailrace)[1]	Varies Monthly
6.	Temperature of River Flowing Past Terrora Powerhouse	Varies Monthly

[1] The temperature mixing calculation considers a unit motoring condition in which the only discharges from the plant are cooling water discharges.

Attachment to Georgia Power's 5/12/2020 Email to EPD

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV[2]	DEC
Temp in the Forebay (°C)	4.6	5.5	6.8	9.4	11.0	13.2	17.7	19.1	18.9	16.4	12.8	9.3
Temp in the Forebay (°F)	40.3	41.9	44.3	49.0	51.8	55.8	63.8	66.4	65.9	61.5	55.1	48.7
Temp Leaving the Turbine Cooler (°C)	4.9	5.8	7.1	9.7	11.3	13.5	18.0	19.4	19.2	16.7	13.1	9.6
Temp Leaving the Turbine Cooler (°F)	40.8	42.4	44.9	49.5	52.3	56.3	64.4	66.9	66.5	62.0	55.7	49.3
Flow Leaving the Cooler (NPDES Max Permitted Amt)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Tallulah River Temp (°C)	1.6	8.0	12.7	17.7	18.3	22.8	22.2	26.6	20.7	14.8	11.3	5.1
Tallulah River Temp (°F)	34.9	46.4	54.9	63.9	64.9	73.0	72.0	79.9	69.3	58.6	52.3	41.2
Tallulah River Flow	32.4	31.9	34.3	37.7	27.0	31.1	17.6	14.9	20.0	22.6	22.9	37.3
Mixed River Flow Temp (°C)	1.7	8.0	12.6	17.6	18.2	22.7	22.1	26.4	20.7	14.8	11.3	5.2
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Delta Temp (°C)	0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	0.0	0.0	0.0	0.1
Delta Temp (°F)	0.1	-0.1	-0.1	-0.2	-0.2	-0.3	-0.2	-0.4	-0.1	0.1	0.0	0.1

[2] November forebay temperature was not measured due to a drawdown during the study period. The November forebay temperature used for this assessment is the average of the October and December forebay temperature measurements.

References:

1. **Temperature in Forebay at Headgate Depths (Meters 10-14)**

   Tables A-13 through A-24, Water Quality Investigations at the North Georgia Hydro Group Facilities (1990)

   This is the study completed in the last FERC relicensing of North Georgia Hydro where a 401 water quality certificate was issued by EPD.

2. **Permitted Maximum Cooling Water Flow Rate**

   2016 NPDES Permit Application

3. **New Cooler Rating (64,831 BTU/hr)**

   Internal Design Information provided by Southern Company Engineers

4. **Temperature of Cooling Water Discharge:**

   Internal Heat Transfer Calculation Using Cooler Rating and Forebay Temperature completed by Southern Company Engineers

   This represents the temperature of the cooling water after it has cooled the turbine/thrust bearing equipment.

5. **Flow of River Flowing Past Terrora Powerhouse (receiving stream daily average flow (Tailrace)**

   USGS Tallulah R at Terrora Pwrhse, NR Tallulah Falls, GA and USGS 02178400 Tallulah River Near Clayton, GA

   https://waterdata.usgs.gov/ga/nwis/uv/?site_no=02181350&PARAmeter_cd=00065,00060,00062,00010

   https://waterdata.usgs.gov/ga/nwis/uv/?site_no=02178400&PARAmeter_cd=00065,00060,00062

A minimum daily average is used in this calculation to represent a low-flow critical condition for an analysis to determine if cooling water discharges may impact the temperature of the receiving stream. EPD consultation conducted on May 7, 2020 suggested this method would be more appropriate than the 5-YR minimum daily average that were discussed on that date. USGS 02181350 TALLULAH R AT TERRORA PWRHSE, NR TALLULAH FALLS, GA gage (Terrora Powerhouse gage) was installed upstream of the Terrora Powerhouse in late 2014, so the only complete years of data available are 2015-2019.

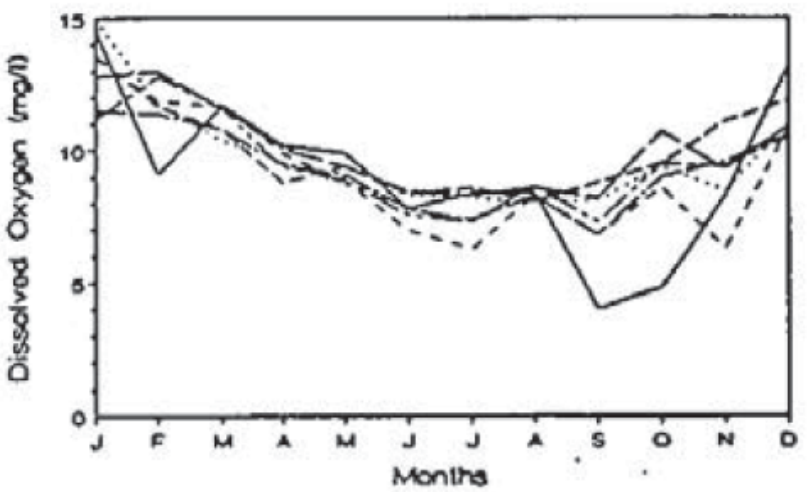
To address EPD's comment that a lower minimum daily average might have occurred in previous drought years, Southern Company simulated minimum daily flow patterns for the Terrora Powerhouse gage for 1998-2014 based on the flow record of nearby USGS 02178400 Tallulah River Near Clayton, GA gage (Clayton gage). If the minimum daily average flow occurred in the years 2015-2019 at the Clayton gage, then the actual flow recorded at the Terrora Powerhouse was used for the calculation as the minimum daily average flow. If the minimum daily average flow occurred in prior drought years at the Clayton gage, then a simulated flow was used. The simulated flow was determined by taking the minimum daily average flow that occurred at the Clayton gage divided by the longer term 1998-2019 minimum daily average as a percentage. This percentage was then applied to the Terrora powerhouse gage minimum daily flow from years 2015-2019, in order to reduce this flow as if it would have occurred in the drier year prior to 2015.

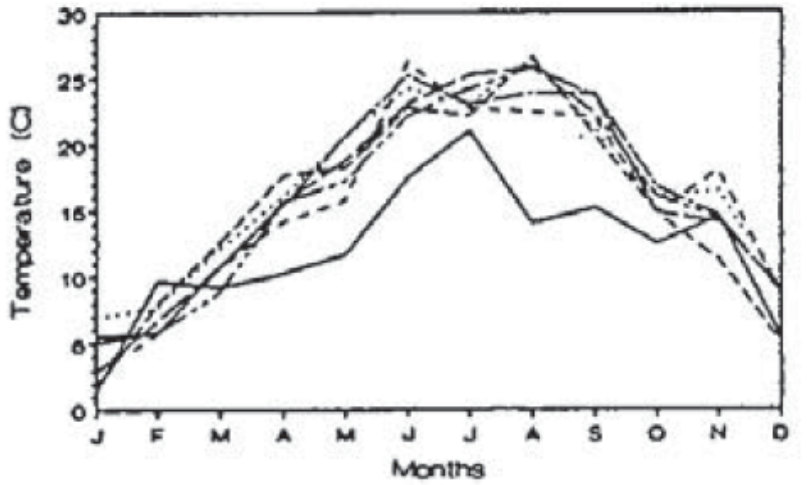
6. **Temperature Tallulah River**

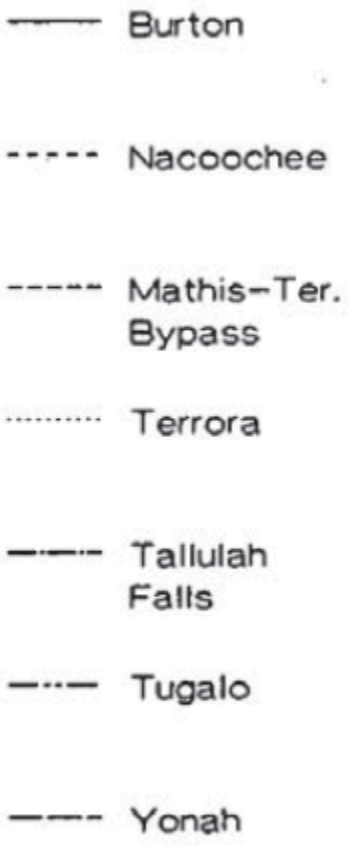
   Table A-38, 1990 Water Quality Investigations at the North Georgia Hydro Group Facilities

   This is the study completed in the last FERC relicensing of North Georgia Hydro where a 401 water quality certificate was issued by EPD.

Monthly Dissolved Oxygen and Temperature Measured in the Terrora Tailrace







* At the time of relicensing the North Georgia Hydroelectric Projects, warm season DO concentrations were detected below the State standard in the Burton Dam tailrace which was ultimately corrected by permanently closing a low-level sluice since the FERC license issuance in 1993. Subsequent monitoring demonstrated that the closure of the sluice corrected the low DO and that no other measures were necessary to achieve Georgia water quality standards.

GEORGIA DEPARTMENT OF NATURAL RESOURCES
WILDLIFE RESOURCES DIVISION

WRD Consultation Meeting Invite

Crabbe, Melissa C.

Subject: GPC Hydro Modernization
Location: Skype Meeting

Start: Wed 3/25/2020 2:00 PM
End: Wed 3/25/2020 2:30 PM

Recurrence: (none)

Meeting Status: Accepted

Organizer: O'Rouke, Patrick Michael
Required Attendees Rabern, Anthony
Optional Attendees: Dodd, Anthony Ray; O'Mara, Courtenay R.; Crabbe, Melissa C.

Attaching a briefing card for informational purposes

Join Skype Meeting

Trouble Joining? Try Skype Web App

Join by phone

+1 (404) 506-2663,,9227827# (United States)	English (United States)	
8-999-2663 (Southern Company Internal Use),,9227827# (United States)		English (United States)
+1 (205) 257-2663,,9227827# (United States)	English (United States)	
+1 (404) 460-0605,,9227827# (United States)	English (United States)	

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Georgia Power

Digital Handout Provide to WRD

North Georgia Project (FERC No. 2354) License Amendment
Mathis-Terrora Unit Upgrade

- From upstream to downstream, the Mathis-Terrora development is the third of six hydroelectric developments in the Federal Energy Regulatory Commission (FERC) licensed North Georgia Project (FERC No. 2354) (Figure 1). Lake Burton is the headwater development of the North Georgia Project. Water for generation at Mathis-Terrora comes from rainfall in the Tallulah River basin upstream of the Mathis dam.

- The Mathis-Terrora development consists of Mathis dam, Terrora powerhouse and the impoundment, Lake Rabun. Operation is modified run-of-river; Lake Rabun stores inflow over short periods of time, which is utilized to provide generation from Terrora powerhouse during peak power demand hours. Terrora powerhouse discharges directly into the downstream Tallulah Falls Lake.

- Georgia Power is proposing to amend the North Georgia Project license to upgrade the two generating units in the Terrora powerhouse. This upgrade includes refurbishing the turbines, replacing the turbine runners, rewinding the generators[1] (Figure 2), and replacing intake trashracks. This work will begin in 2019-2020.

- The table below compares the rated generating and maximum hydraulic capacities of the existing units with the expected performance of the upgraded units. Performance of the upgraded units may vary slightly based on final design, head conditions, and fabrication.

UNIT	Existing Rated Capacity MW	Existing Max Hydraulic Capacity CFS	Proposed Capacity after Upgrade (MW)	Proposed Max Hydraulic Capacity (CFS) after Upgrade
1	8	800	11.5	819.5
2	8	800	11.5	819.5

- Following the upgrade, Georgia Power will operate the Terrora powerhouse with no change to existing lake levels at Lake Rabun and Tallulah Falls Lake.

- The approach velocities expected with new trashracks are estimated to be 1.33 and 1.62 foot per second (ft/s) at best and full gate flows, respectively. This is an increase of 0.17 and 0.08 ft/s increase from the estimated approach velocities at best and full gate flow with the existing trashracks and existing units.

- No public recreation facilities will be affected by the turbine runner and generator upgrades.

- Georgia Power is preparing a non-capacity license amendment application to file with FERC. The amendment application will conform with 18 C.F.R. §4.201 (c). Georgia Power's non-capacity amendment would include a description of the proposed turbine upgrade and any license exhibits that require revision in light of the nature of the proposed amendment (i.e., Exhibit A, B, C, etc). Georgia Power will consult with state and federal agencies prior to filing the application. Non-capacity amendment applications typically have few, if any, effects on environmental, recreational, and cultural resources; however, any potential issues would be disclosed in the application to FERC and in the pre-filing consultation.

- FERC typically issues a notice of the application and may ask Georgia Power for additional information prior to its analysis of the proposed upgrade at the Mathis-Terrora development. Georgia Power may request that FERC conduct an expedited review of this amendment application to facilitate the equipment procurement and work at the Terrora powerhouse.

[1] Generators have insulated copper bars or cables (windings) in both the stationary and rotating portions of the generator. Windings are supported by a stack of thin layers of steel. During a rewind, the old copper windings and steel are removed and replaced

Digital Handout Provide to WRD

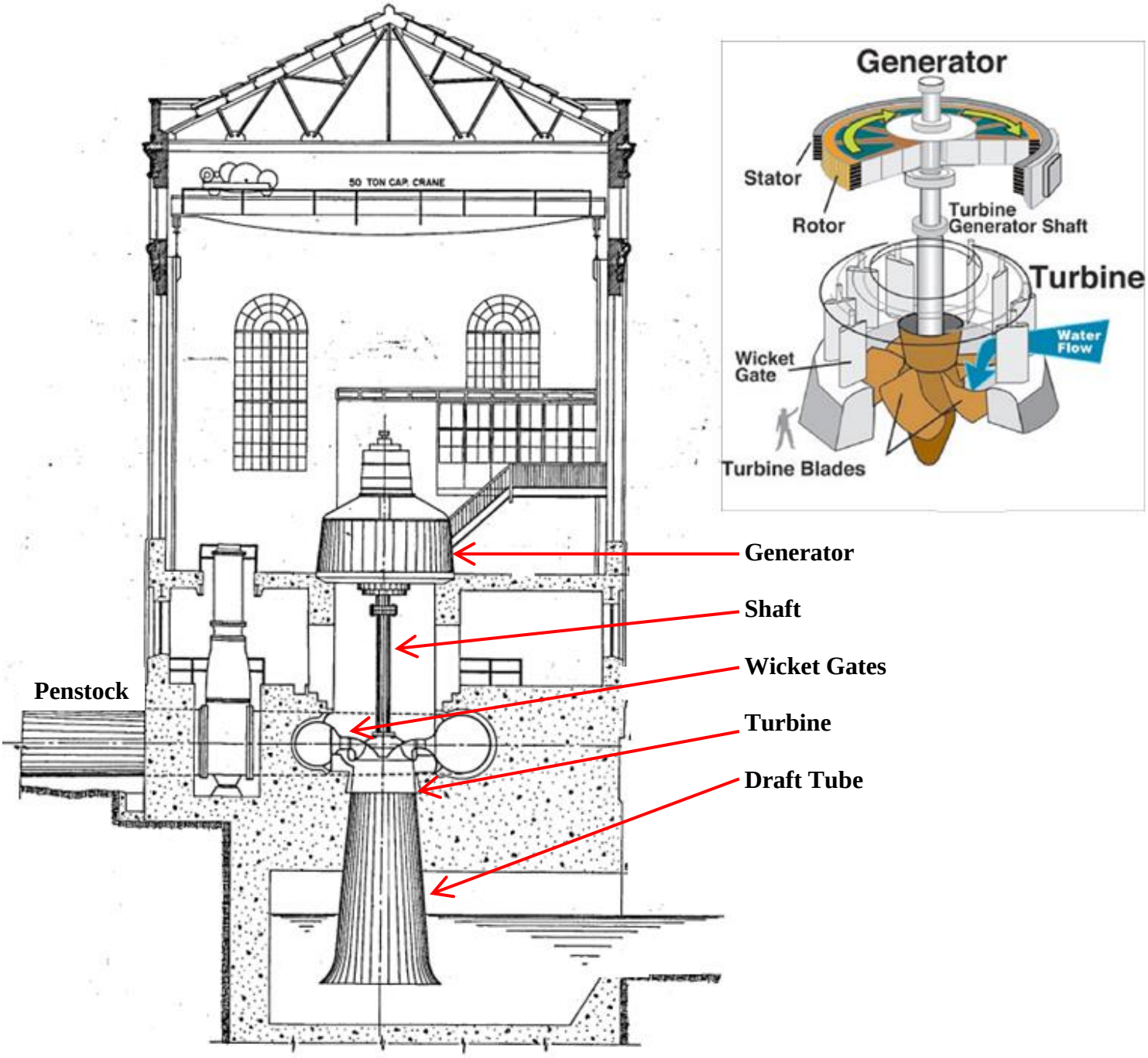


Figure 2: Terrora Powerhouse Cross-section

Written Summary of WRD Consultation Meeting

Georgia Power

North Georgia Hydroelectric Project

FERC Projects #2354

Communication Date: March 25, 2020

Communication Type: Conference Call

List and attach pertinent written correspondence: Briefing Card

List persons attending from Southern Company/Georgia Power:

Melissa Crabbe, Southern Company Services (SCS) Hydro Generation

Courtenay O'Mara, SCS Hydro Generation Services, Supervisor

Patrick O'Rouke, Georgia Power Company (GPC)

Tony Dodd, Georgia Power Company (GPC)

List organization name and persons attending from other organization:

Anthony Rabern, Georgia Department of Natural Resources, Wildlife Resources Division

Subject: Discussion about upcoming amendment of the North Georgia Hydroelectric Project license for unit upgrades at the Terrora Development

Comments/Discussions/Requests:

Patrick O'Rouke gave an overview of Georgia Power's proposal to upgrade the Terrora units. Federal Energy Regulatory Commission (FERC) Licensees have to apply for a FERC license amendment for the North Georgia Project because we are expecting to gain MW capacity as a result of this upgrade. As part of Georgia Power's most recent Integrated Resource Plan, Georgia Power proposed and gained approval from the PSC to conduct several upgrades of the course of the next 12 years. This will be the first and more will follow in Anthony Rabern's territory of the DNR. The unit upgrade will result in a minimal hydraulic capacity increase. Courtenay O'mara provided an overview of the FERC process on this amendment application.

Patrick O'Rouke asked what DNR's information needs on this proposal would be other than the provided briefing card. Anthony appreciated the opportunity to review and comment on our proposal to amend the license and upgrade units at Terrora. Anthony had no concerns regarding the proposal.

Follow-up Requirements: Patrick stated that he would also forward the briefing card to Thom Litts, DNR WRD Fisheries Chief and let him know that we have spoken with Anthony.

Form Completed By: Melissa Crabbe

Written Correspondence with WRD

Crabbe, Melissa C.

From: Crabbe, Melissa C.
Sent: Friday, March 27, 2020 7:18 AM
To: Crabbe, Melissa C.
Subject: FW: Hydro Modernization at Terrora

From: Litts, Thom <Thom.Litts@dnr.ga.gov>
Sent: Wednesday, March 25, 2020 2:33 PM
To: O'Rouke, Patrick Michael <PMOROUKE@southernco.com>; Rabern, Anthony <Anthony.Rabern@dnr.ga.gov>
Subject: RE: Hydro Modernization at Terrora

EXTERNAL MAIL: Caution Opening Links or Files

Hey Patrick,

I appreciate the opportunity to review. Anthony and I spoke yesterday, and he is the lead on the review. If Anthony is good, I am good. If needed we can pick it up in the FERC process, as you noted.

Thanks again for coordinating with us on the modernization.

Lets talk soon. Stay safe. Thom

Thom Litts
Chief, Fisheries

Wildlife Resources Division [georgiawildlife.com]
(706) 557-3236 | M: (404) 323-7668

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From: O'Rouke, Patrick Michael <PMOROUKE@southernco.com>
Sent: Wednesday, March 25, 2020 2:23 PM
To: Litts, Thom <Thom.Litts@dnr.ga.gov>; Rabern, Anthony <Anthony.Rabern@dnr.ga.gov>
Subject: RE: Hydro Modernization at Terrora

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Thom:

We were able to speak with Anthony just a few minutes ago via Skype to walk him through this. I'm going to attach a briefing card about what we're doing…the basic gist is that we're upgrading old turbines at Terrora (the plant at the top of Tallulah Falls Lake that has water piped from Lake Rabun). That's going to raise the MW output considerably from the old ones, so we have to file for a license amendment with FERC. The max flow velocity coming through the turbines and into Tallulah Falls will go up slightly, but there shouldn't be any noticeable changes in daily operations at either Rabun or Tallulah Falls and we wouldn't anticipate any impacts to fisheries or angler/boater access.

Written Correspondence with WRD

Just let me know if you've got any questions or need any other information. If you feel like it's important for us to talk about this via phone or Skype, I'm very flexible. If not, don't worry about making this a huge priority. There will be plenty of opportunity to formally comment within the FERC process if you need to, but we just wanted to have some initial consultation to make sure you guys were comfortable with everything.

Thank you!

Patrick

From: O'Rouke, Patrick Michael
Sent: Monday, March 23, 2020 9:21 AM
To: Litts, Thom <Thom.Litts@dnr.ga.gov>; Rabern, Anthony <Anthony.Rabern@dnr.ga.gov>
Cc: Slaughter, Joe Ernest <JESLAUGH@southernco.com>
Subject: RE: Hydro Modernization at Terrora

More of an "as soon as we can get it done" thing...I don't know that the construction side was as aware of the regulatory side as they could have been. I've already done Forest Service and USFWS is tomorrow, so you'll be the last one I need to do. If this week is possible that would be great…if not, if at all possible I'd like to get it done by the end of next week.

Patrick

From: Litts, Thom <Thom.Litts@dnr.ga.gov>
Sent: Friday, March 20, 2020 9:04 PM
To: O'Rouke, Patrick Michael <PMOROUKE@southernco.com>; Rabern, Anthony <Anthony.Rabern@dnr.ga.gov>
Cc: Slaughter, Joe Ernest <JESLAUGH@southernco.com>
Subject: RE: Hydro Modernization at Terrora

EXTERNAL MAIL: Caution Opening Links or Files

Patrick, let me know when you need to file by and we will work to make that happen. Obviously, as you stated, a lot going on. Thom

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: "O'Rouke, Patrick Michael" <PMOROUKE@southernco.com>
Date: 3/20/20 10:32 AM (GMT-05:00)
To: "Litts, Thom" <Thom.Litts@dnr.ga.gov>, "Rabern, Anthony" <Anthony.Rabern@dnr.ga.gov>
Subject: Hydro Modernization at Terrora

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Written Correspondence with WRD

Thom and Anthony:

The PSC approved some hydro upgrades at the Terrora/Mathis project earlier this year in our IRP, and we need to consult with you prior to filing with FERC for a license amendment. I can set up a Skype call for me to show you the details and walk through potential (minimal) impacts. Thom, you and I discussed this a little back on our trip to Lake Oconee, so you let me know if you need to be on this call or if it's something you just want me to do with Anthony given all that is going on administratively right now. This ought to take less than 30 minutes, and all I need right now is documentation that we met with you in advance, so no workload on the back end unless you determine it's necessary.

Let me know what days might work in the near future for this. I'm out in the field next Wednesday but I'm mostly clear for the next little bit after that.

Patrick

Patrick O'Rouke
Fisheries Biologist
Georgia Power

pmorouke@southernco.com
241 Ralph McGill Blvd.
Atlanta, GA 30308
(404) 506-5025 (Office)
(470) 426-5322 (Cell)

GEORGIA DEPARTMENT OF NATURAL RESOURCES
HISTORIC PRESERVATION DIVISION

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HPD Consultation (Filed with FERC on April 24, 2020)

Georgia Power

241 Ralph McGill Blvd., NE
BIN 10151
Atlanta, GA 30308
404 506 2337 tel
404 506 4132 fax
404 782 8796 cell
jcharles@southernco.com

April 24, 2020

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
Mail Code: OEP/DHAC, PJ-12-1
888 First Street, NE, Room 1-A
Washington, DC 20426

RE: System upgrades at the Terrora powerhouse – North Georgia Project (#2354)

Dear Madam Secretary:

Georgia Power is proposing upgrades to the Terrora powerhouse, within the North Georgia Hydroelectric Project (FERC # 2354) located in Rabun County. Specifically, these upgrades involve the replacement of existing control panels with new industry standard panels. Installation and maintenance of the new panels will require some alterations to the control room. As part of agency consultation, a cultural resources assessment was conducted by Georgia Power cultural resources staff and provided to the Georgia State Historic Preservation Officer (SHPO) for review and comment (see attachments). SHPO concurred with our recommendation that the proposed construction would constitute an adverse effect on historic properties. As such, Georgia Power consulted with SHPO in the development of a draft Memorandum of Agreement (MOA) to mitigate adverse effects. Specific mitigation measures include preparing a Permanent (photographic) Archival Record (PAR) pursuant to the SHPO's *Guidelines for Establishing a Photographic Permanent Archival Record.*

Please find attached a brief narrative of the proposed upgrades as well as a draft Memorandum of Agreement (MOA) for the mitigation of adverse effects for your review and comment. If you have any questions or require additional information, please contact me at 404-506-2337 or jcharles@southernco.com.

Sincerely,



Joseph Charles
Hydro Compliance Coordinator

attachments

cc: Jennifer Polardino, FERC-DHAC

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HPD Consultation (Filed with FERC on April 24, 2020)

Georgia Power

241 Ralph McGill Blvd., NE
BIN 10151
Atlanta, GA 30308
404 506 2337 tel
404 506 4132 fax
404 782 8796 cell
jcharles@southernco.com

February 18, 2020

Ms. Jennifer Dixon
DNR Historic Preservation Division
Jewett Center for Historic Preservation
2610 GA Hwy 155, SW
Stockbridge, GA 30281

RE: System upgrades at the Terrora powerhouse – North Georgia Project (#2354)

Dear Ms. Dixon:

Georgia Power is proposing upgrades to the Terrora powerhouse, within the North Georgia Hydroelectric Project (FERC # 2354) located in Rabun County. Specifically, these upgrades involve the replacement of existing control panels with new industry standard panels. Installation and maintenance of the new panels will require some alterations to the control room that will likely constitute an adverse effect on this NRHP-eligible resource, and, as such, require consultation with your office under the terms of the Cultural Resources Management Plan (CRMP). Please find attached a brief narrative of the proposed upgrades as well as a draft Memorandum of Agreement (MOA) for the mitigation of adverse effects for your review and comment. If you have any questions or require additional information, please contact me at 404-506-2337 or jcharles@southernco.com.

Sincerely,

Joseph Charles
Hydro Compliance Coordinator, Natural Resources

Charles, Joseph D.

From: Rooks, Whitney <Whitney.Rooks@dnr.ga.gov>
Sent: Tuesday, March 17, 2020 2:02 PM
To: Charles, Joseph D.
Subject: Rabun HP-200218-007
Attachments: Template Two-Party MOA.doc

EXTERNAL MAIL: Caution Opening Links or Files

Ok Joey

We are concurring with GP that the proposed project constitutes an adverse effect. When I initially looked at the project I didn't consider the role the control room played in the subject power house. The proposed project is a significant change to an important feature. I just sent you our official response and the draft MOA with our comments. Also, attached is our 2-party MOA template. It will help with organizing the MOA for this project. If you need any help please let me know. Once you have gone through the draft MOA, please send me back a clean copy, so I know what you are ok with.

Thanks!

-Whitney Rooks

From: Charles, Joseph D. <JCHARLES@southernco.com>
Sent: Tuesday, March 17, 2020 11:46 AM
To: Rooks, Whitney <Whitney.Rooks@dnr.ga.gov>
Subject: RE: Terrora

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There's not much to it, but here's what I came up with so far. I figured if it came down to it, we would have some comments back and forth before a final version, so this was more or less a starting point.

> **From:** Rooks, Whitney <Whitney.Rooks@dnr.ga.gov>
> **Sent:** Tuesday, March 17, 2020 11:42 AM
> **To:** Charles, Joseph D. <JCHARLES@southernco.com>
> **Subject:** FW: Terrora
>
> EXTERNAL MAIL: Caution Opening Links or Files
>
> Good Morning Joey
>
> Just in case others in my office think this project is an adverse effect, can you send me the draft MOA?

Thanks!

-Whitney Rooks

From: Rooks, Whitney
Sent: Tuesday, March 17, 2020 9:23 AM
To: Charles, Joseph D. <JCHARLES@southernco.com>
Subject: RE: Terrora

Ok. Thanks!

-Whitney Rooks

From: Charles, Joseph D. <JCHARLES@southernco.com>
Sent: Tuesday, March 17, 2020 9:22 AM
To: Rooks, Whitney <Whitney.Rooks@dnr.ga.gov>
Subject: Terrora

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Whitney,

I think my connectivity issue maybe a larger network issue (too many people logging in remotely?). At any rate, I can't access my files at the moment. I'll get you something as soon as I can.

Joey

Get Outlook for iOS [gcc01.safelinks.protection.outlook.com]

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HPD Consultation (Filed with FERC on April 24, 2020)

Cultural Resources Assessment of Proposed Upgrades at the Terrora Powerhouse of Georgia Power's North Georgia Hydroelectric Project (#2354)

The Terrora powerhouse, completed in 1925, is located in Rabun County, Georgia, at the headwaters of Tallulah Falls Lake (Figures 1-2). Connected to Lake Rabun by a one-mile tunnel through solid rock, it was constructed to take advantage of 190ft drop between two locations. The Terrora powerhouse is a rectangular building constructed of brick curtain walls around a steel frame, with reinforced concrete floors, and a hipped roof covered with concrete roof tiles (Figures 3-4). According to the Cultural Resource Management Plan (CRMP) for the North Georgia Hydroelectric Project (#2354), the Terrora powerhouse is considered a contributing element of the North Georgia Hydroelectric Project, which was determined eligible for the National Register of Historic places (NRHP) under Criterion A and Criterion C.

The control room is located at the east end of the building, situated over the switch room. The front façade of the control is characterized by a long, horizontal, multi-light window, separated by steel partitions and framed by steel panels across the bottom (Figures 5-6). Within this unit is a steel door. A steel staircase and deck provide access to the control room. The control room houses the control panels for operating the powerhouse (Figure 7).

Proposed upgrades to the powerhouse would replace these panels with modern, industry standard control panels that, due to their size and spacing requirements, would take up a larger footprint than the current configuration. This will require reorienting the control panel bank so that it spans the front wall of the control room, which will, in turn, require the replacement of the previously described front façade with a solid panel wall (Figure 8). This wall will be constructed of acoustical panels (Appendix A). New switch gear and breakers in metal cabinets will be placed on the roof of the control room, which is currently accessed via a metal ladder attached to the wall. To facilitate the safe installation and access to the roof, Georgia Power is proposing to replace the ladder and existing staircase with a two-level staircase across the front façade of the control room (Figure 9).

Georgia Power believes that these alterations will have an adverse, but unavoidable effect on this historic property. For the powerhouse to continue to operate safely and efficiently, these upgrades must be completed. Since the upgrades are on the interior of the powerhouse and will not alter character-defining features of the building's exterior, we believe that any adverse effects are minimal. We propose to mitigate these effects by establishing a permanent archival record (PAR) of the resource per the standards set forth in the Historic Preservation Division's *Guidelines for Establishing a Photographic Permanent Archival Record*. To that end, I have attached a draft Memorandum of Agreement (MOA) for review and comment (Appendix B).

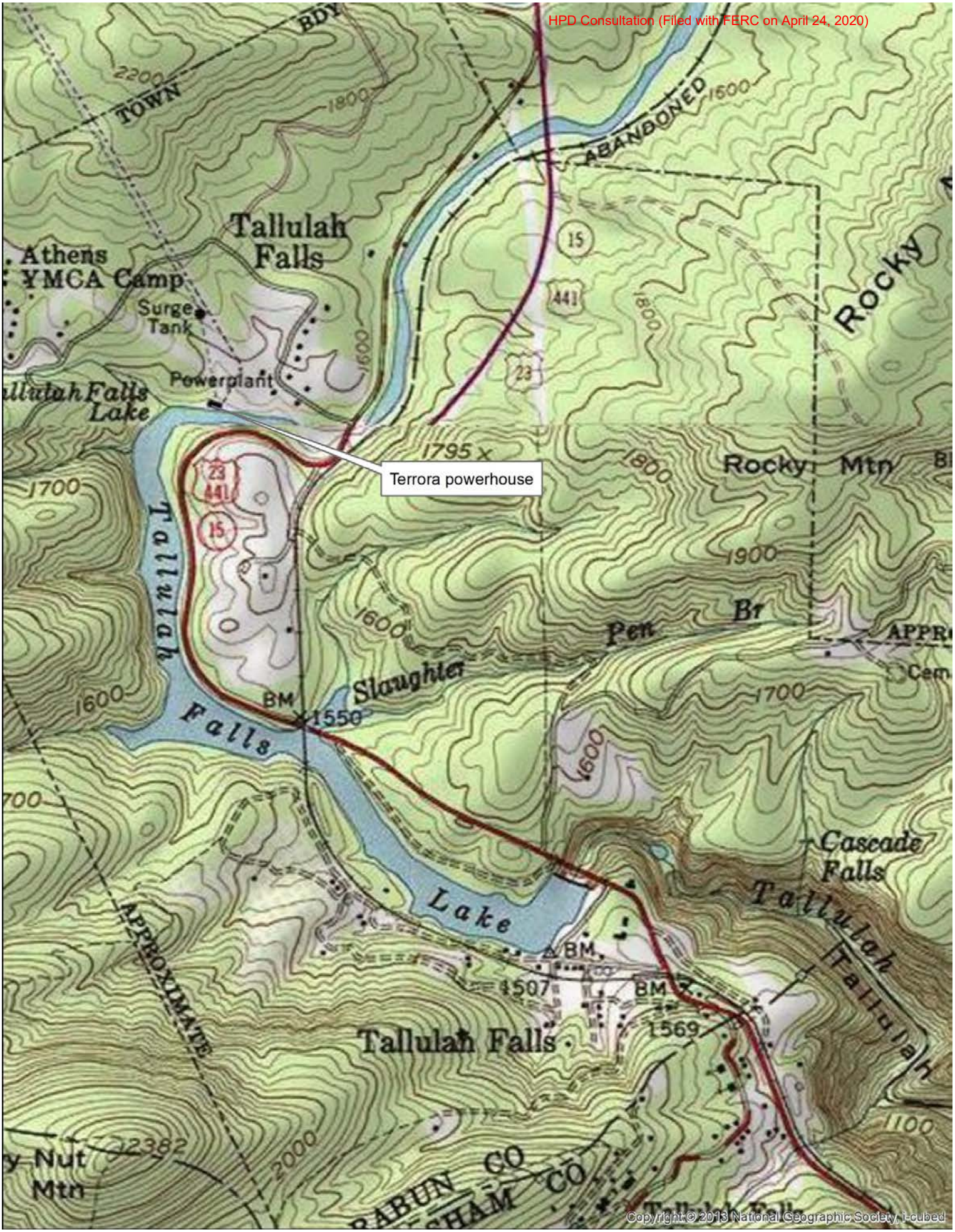


Figure 1. Map showing the location of Terrora powerhouse.

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HPB Consultation (Filed with FERC on April 24, 2020)

Figure 2. Aerial photograph of Terrora powerhouse.

HPD Consultation (Filed with FERC on April 24, 2020)

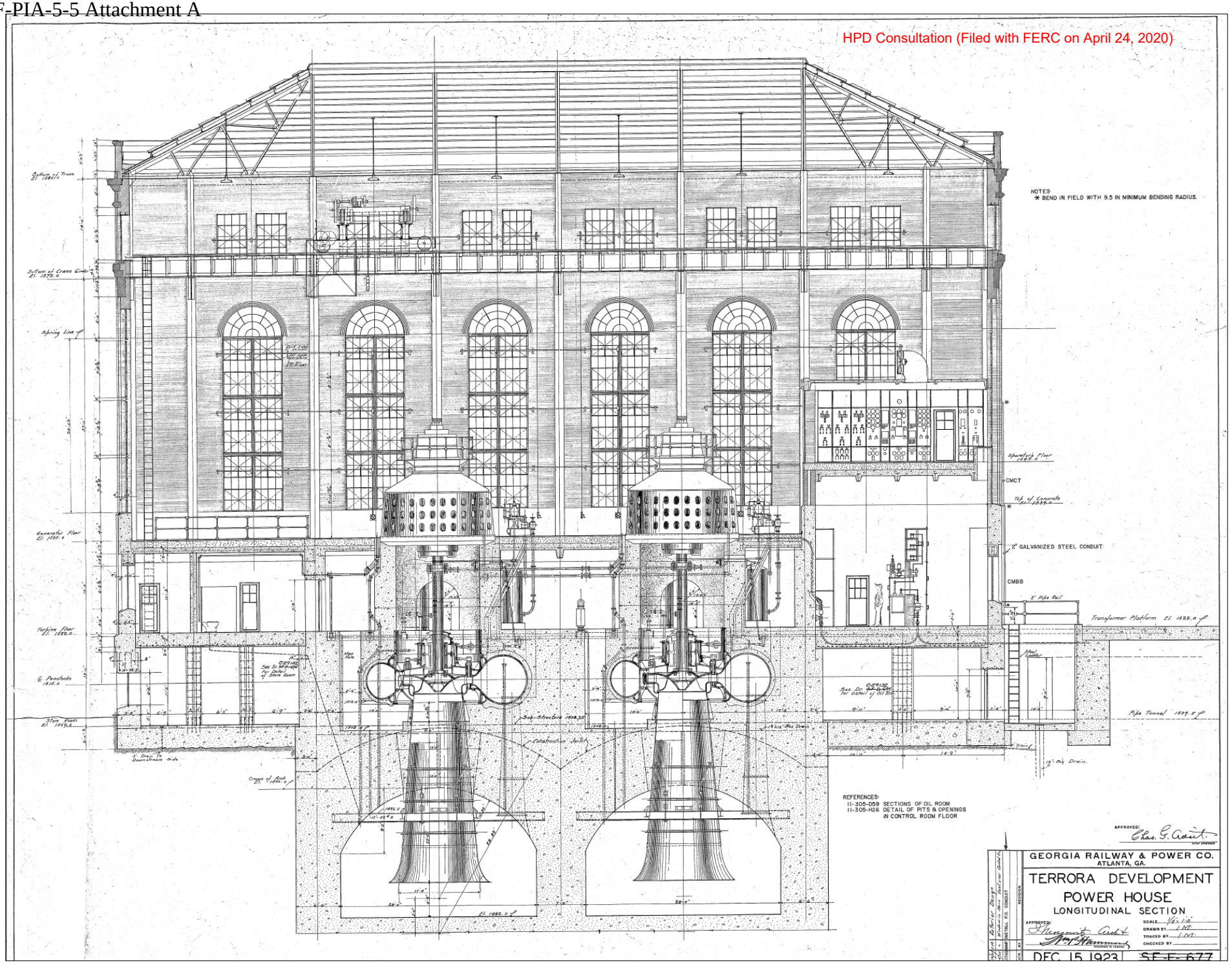


Figure 3. Terrora powerhouse, view to the north/northeast.



Figure 4. Terrora powerhouse, view to the north/northwest.



Figure 5. View of control room from the main floor.



Figure 6. View of front façade from inside the control room.



Figure 7. View of existing control panels inside the control room.



Figure 8. Rendering showing proposed alterations to the front façade of the control room (note: the proposed staircase to the roof has been omitted to provide unobstructed view).

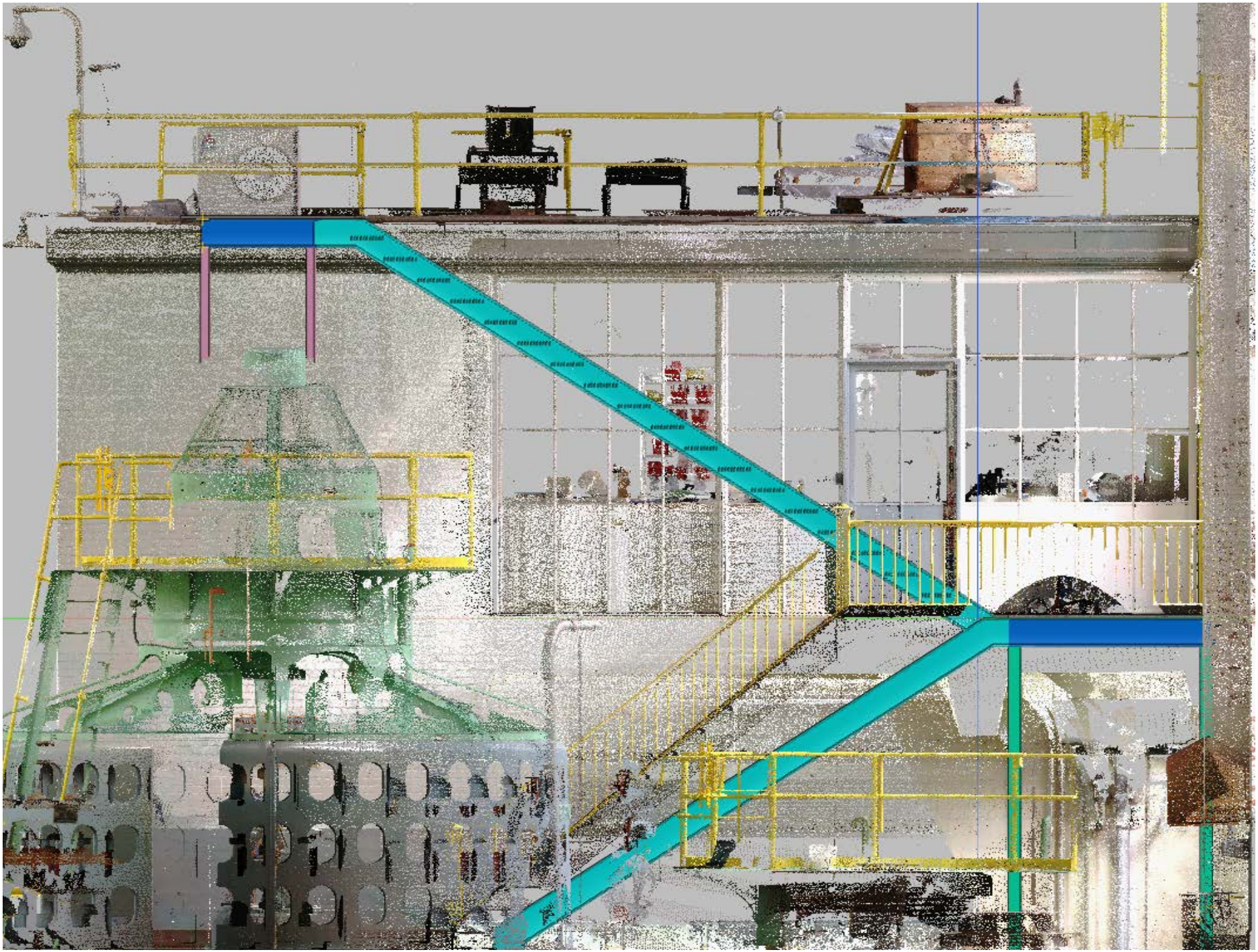
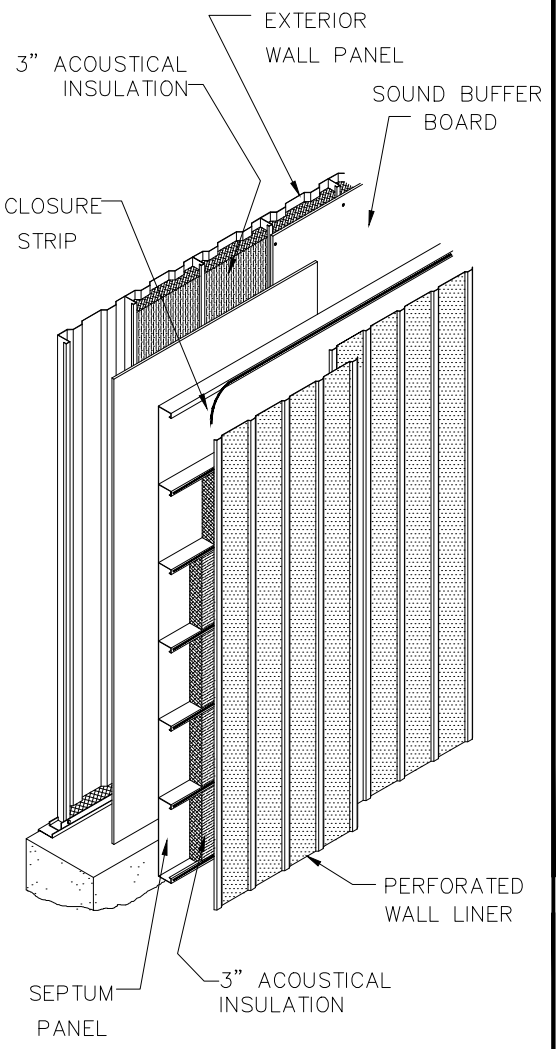


Figure 9. Rendering showing proposed alterations to the staircase at the control room.

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APPENDIX A: REPLACEMENT WALL SPECIFICATIONS



A49 ACOUSTICAL WALL

PRODUCT DESCRIPTION

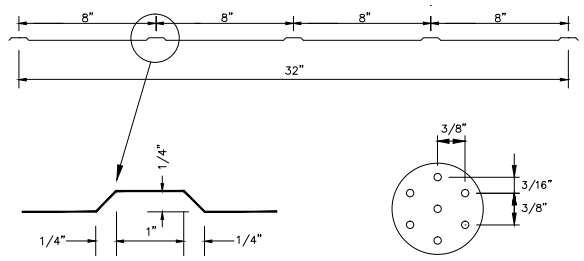
A49 Acoustical Wall System

A49 Acoustical Wall System consists of a nominal 24 ga. fluted exterior panel with a minimum 3" thick, 16" wide, 4# density fibrous acoustical insulation in panel void. A ½" thick sound buffer board shall separate the exterior wall system and a nominal 26 ga. flush metal septum panel. The septum panels shall be installed perpendicular to the exterior wall panels with void filled with 3" thick, 16" wide, 4# density fibrous acoustical insulation. A vibration retardant tape will be installed between the septum panel ribs and a perforated formed liner panel. The system shall have NRC of 1.00 and STC of 49. Wall accessories may effect overall performance.

The Acoustical Wall Systems have been tested in explicit conformity with the requirements of the ASTM Designations E90-87 and E413-87.

Exterior Cavity Insulation	R11
Continuous Insulation	R0.45
Interior Cavity Insulation	R11

Calculated system "U" value 0.07 (ASHRAE zone method)



PANEL PROFILE PERFORATION DETAIL

PRODUCT NAME

A49 Acoustical Wall System

MANUFACTURER

Parkline, Inc.
P.O. Box 65
Winfield, West Virginia 25213
Phone: (304) 586-2113 in WV
(800) 786-4855 outside WV
(304) 586-3842 FAX
web: http://www.parkline.com
E-mail: parkline @parkline.com

PARKLINE, INC.
13122A49
RAP 08–10–11

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APPENDIX B: DRAFT MEMORANDUM OF AGREEMENT

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HPD Consultation (Filed with FERC on April 24, 2020)

MEMORANDUM OF AGREEMENT
AMONG
THE FEDERAL ENERGY REGULATORY COMMISSION,
THE GEORGIA POWER COMPANY,
AND
THE GEORGIA STATE HISTORIC PRESERVATION OFFICER
REGARDING
ALTERATIONS TO THE TERRORA POWERHOUSE OF THE
NORTH GEORGIA HYDROELECTRIC PROJECT
BY GEORGIA POWER COMPANY IN
RABUN COUNTY, GEORGIA
HP-200218-007

WHEREAS, as part of the Federal Energy Regulatory Commission ("Commission") relicensing of Georgia Power Company's ("Licensee") North Georgia Hydroelectric Project (FERC Project No. 2354) ("Project"), a historic context study and inventory of the Project dam and supporting structures was conducted in 1990; and

WHEREAS, the Project works were determined eligible for listing in the National Register of Historic Places ("NRHP"); and

WHEREAS, Licensee has developed and implemented a Cultural Resources Management Plan ("CRMP") for the Project pursuant to Article 417 of the Project's license issued by the Commission; and

WHEREAS, Licensee has proposed alterations to the control room of the Terrora powerhouse to facilitate necessary system upgrades ("Undertaking"); and

WHEREAS, the Commission has determined that the Undertaking will have an adverse effect on the Terrora powerhouse, which is contributing to the NRHP-eligible Project works; and

WHEREAS, the Licensee and Commission have consulted with the Georgia State Historic Preservation Officer ("Georgia SHPO") pursuant to regulations implementing Section 106 of the National Historic Preservation Act (16 USC 470f), 36 CFR Part 800, and have notified the Advisory Council on Historic Preservation ("Council") of the adverse effect finding pursuant to 36 CFR §800.6(a)(1) and afforded the Council an opportunity to comment; and

WHEREAS, the Commission, Licensee, and the Georgia SHPO agree that there is no practicable alternative to avoid or minimize the adverse effect to the powerhouse; and

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HPD Consultation (Filed with FERC on April 24, 2020)

WHEREAS, the Licensee participated in the consultation for the Undertaking described above, will implement the treatment measures in the stipulations below, and has been invited to sign this Memorandum of Agreement ("Agreement") as an invited signatory;

NOW THEREFORE, the Commission, the Licensee, and the Georgia SHPO agree that the Undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the Undertaking on historic properties:

STIPULATIONS

The Commission will condition any approval issued in connection with the Undertaking to require the satisfaction of the following stipulations and will ensure that the following stipulations are carried out by a professional meeting the applicable Secretary of the Interior's Professional Qualifications Standards:

I. MITIGATION MEASURES

A. Archival Photographs Recordation/Permanent Archival Record (PAR)
   i. Prior to upgrade activities, the Licensee will have digital photographs of the Powerhouse within the Project works taken, including views of the exterior and interior, structural or decorative detailings, and the interior and exterior setting of the Powerhouse, focusing on the control room and its generator area. Digital photographs showing the overall complex and its setting will also be included.
   ii. The photographer shall comply with the minimum level standards necessary for document retention at Georgia SHPO pursuant to the *Guidelines for Establishing a Photographic Permanent Archival Record* (Appendix A). A draft copy of the PAR will be provided to Georgia SHPO for a 30-day review and comment period. The Licensee will respond to SHPO comments regarding the draft PAR within 30-days of receipt. After the draft has been reviewed, a final archival copy of the PAR will be provided to SHPO and to the Rabun County Historical Society.

B. UNANTICIPATED DISCOVERIES

C. If the Licensee determines after removal has commenced that the Undertaking will affect a previously unidentified property that may be eligible for inclusion in the NRHP or will impact known resources in a greater capacity, the Licensee will address the discovery in accordance with the HPMP.

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II. PUBLIC DOMAIN OF AGENCY RECORDS

A. All rights, title, and interest in all documents, data, studies, surveys, drawings, maps, models, photographs, and reports prepared pursuant to this MOA, including without limitation any copyright, title, trademark, and intellectual property rights in and to the project materials, shall remain with the **Licensee** reserves unto itself all rights of every kind and nature except those expressly granted to Georgia SHPO herein. **The Licensee** hereby grants to Georgia SHPO a worldwide, perpetual, nonexclusive, nontransferable, unconditional, royalty free, irrevocable license to use, reproduce, exhibit, transmit, distribute, maintain, and modify the project materials, in whole or in part, and to incorporate the project materials, in whole or in part, into other works, including but not limited to any and all markets, media, and advertising.

B. The Licensee hereby waives the right to inspect or approve any copy that is used in connection with the works in any existing or subsequently developed medium, and agree to release and discharge Georgia SHPO from any and all claims arising out of such use for the purposes described above

III. ADMINISTRATIVE PROVISIONS

A. DURATION

This MOA will expire if its terms are not carried out within five (5) years from the date of its execution. Prior to such time, the Commission may consult with the other signatories to reconsider the terms of the MOA and amend it in accordance with Stipulation III.D below

B. MONITORING AND REPORTING

Each six (6) month period following the execution of this MOA until it expires or is terminated, the Licensee shall provide all parties to this MOA a summary report detailing work undertaken pursuant to its terms. Such report shall include any scheduling changes proposed, any problems encountered, and any disputes and objections received in the Licensee's efforts to carry out the terms of this MOA.

C. DISPUTE RESOLUTION

Should any signatory to this MOA object at any time to any actions proposed or the manner in which the terms of this MOA are implemented, the Commission shall

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consult with such party to resolve the objection. If the Commission determines that such objection cannot be resolved, the Commission will:

1. Forward all documentation relevant to the dispute, including the the Commission's proposed resolution, to the ACHP. The ACHP shall provide the Commission with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the Commission shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, signatories and concurring parties, and provide them with a copy of this written response. the Commission will then proceed according to its final decision.

2. If the ACHP does not provide its advice regarding the dispute within the thirty (30) day time period, the Commission may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, the Commission shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories and concurring parties to the MOA, and provide them and the ACHP with a copy of such written response.

3. The Commission 's responsibility to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged.

D. AMENDMENTS

This MOA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the ACHP.

E. TERMINATION

If any signatory to this MOA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other parties to attempt to develop an amendment per Stipulation III.D, above. If within thirty (30) days (or another time period agreed to by all signatories) an amendment cannot be reached, any signatory may terminate the MOA upon written notification to the other signatories.

Once the MOA is terminated, and prior to work continuing on the undertaking, the Commission must either (a) execute an MOA pursuant to 36 CFR § 800.6 or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR

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§ 800.7. The Commission shall notify the signatories as to the course of action it will pursue.

F. EFFECTIVE DATE

This Agreement will take effect on the date that it has been fully executed by both the Commission and the Georgia SHPO and incorporated into the license for the Project.

Execution of this MOA by the **Commission, the Licensee** and **the Georgia SHPO**, its submission to the ACHP in accordance with 36 CFR 800.6(b)(1)(iv), and implementation of its terms evidence that **the Commission** has taken into account the effects of this undertaking on historic properties and afforded the ACHP an opportunity to comment.

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FEDERAL ENERGY REGULATORY COMMISSION

By:_____ Date:_____

Carlisa Linton-Peters
Acting Director, Division of Hydropower
Administration and Compliance

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HPD Consultation (Filed with FERC on April 24, 2020)

GEORGIA STATE HISTORIC PRESERVATION OFFICER

By:_____ Date:_____

Dr. David C. Crass
Deputy Georgia State Historic
Preservation Officer

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HPD Consultation (Filed with FERC on April 24, 2020)

CONCUR: GEORGIA POWER COMPANY

By:_____ Date:_____

Jennifer Winn
General Manager, Natural Resources
Georgia Power Company

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GEORGIA
DEPARTMENT OF NATURAL RESOURCES
HISTORIC PRESERVATION DIVISION

MARK WILLIAMS
COMMISSIONER

DR. DAVID CRASS
DIVISION DIRECTOR

Guidelines for Establishing a Photographic Permanent Archival Record (PAR)

Introduction

Section 106 of the National Historic Preservation Act of 1966, as amended requires that any undertaking that is federally funded, licensed or permitted take into account the effect it will have on resources listed or eligible for listing on the National Regis**ter of Historic Places (NRHP).** If any undertaking has an adverse effect on a listed or eligible resource, alternatives that avoid or minimize the effect are considered and if these are not feasible, mitigation to resolve that effect is proposed. The following guidelines should be used for completion of mitigation stipulations, specifically photographic mitigation, as set forth in a Memorandum of Agreement (MOA) between the federal agency and the Georgia Historic Preservation Division (HPD)/State Historic Preservation Office (SHPO).

The aspects of the project that should be photo documented for mitigation for a given undertaking is determined through consultation with the parties involved and under the guidance of the SHPO. There are several types of photo documentation including 35 mm, medium format, large format photography and Historic American Building Survey (HABS) and Historic American Engineering Record (HAER). HABS/HAER documentation is the national historical architectural and engineering documentation program of the National Park Service. The documentation is retained by the Library of Congress and consists of measured drawings, photographs, and written information. This level of documentation is the national standard.

In 2001, the National Park Service requested that only National Historic Landmarks, properties eligible for the NRHP at the national level of significance, and individually eligible properties significant at the State and Local levels could be carried out to HABS/HAER standards. In response to this request, the SHPO has decided that most resources of the State or Local level of significance will be documented to the standards outlined in the following guidelines rather than to HABS/HAER standards unless a particular resource merits a higher level of documentation. Eligible bridges are one exception to this rule and shall be documented to HAER standards. For projects where HABS/HAER is not required or warranted, the SHPO has determined that digital photography is the preferred medium for photo documentation; therefore, the following guidelines describe the minimum extent and level of documentation required for a Permanent Archival Record (PAR) retained by the State of Georgia.

Purpose and Value

Photographic mitigation shall provide a visual record of a resource determined eligible for the NRHP that will be physically impacted by project implementation (i.e. taking of a resource, taking of part of a resource, or altering the setting of a resource). Photo documentation of eligible resources is the "last resort" mitigation measure.

Extent and Level

The extent of documentation refers to the content considerations determined necessary by the circumstances of a given project; the level of documentation refers to the technical considerations determined necessary by the circumstances of a given project. The extent and level of documentation are almost always dependent upon th**e circumstances of a project.**

To determine the extent and level of documentation necessary for a particular project, the following two factors must be taken into account: the features which contribute to the eligibility of a resource and then of those features, which ones will be impacted by the proposed project. For example, if a resource will be demolished during implementation of the project, interior photographs of the resource will be required as well as exterior photographs; on the other hand, if only a small portion of the front yard of a resource will be impacted by the proposed project and if no other contributing features are located within that area, then the level of documentation may be limited to exterior elevation and setting photographs of the resource.

Content

The following represents the minimum level of supporting documentation that must accompany the digital photographs in the mitigation of a historic resource. This documentation is necessary for establishing a complete PAR of the resource:

- An introductory page providing the appropriate project number, and HP number. This page should also include a brief description (no more than 3 or 4 sentences) of the resource (Ex: circa 1910 Hall-and-parlor house type) along with an explanation of why it is significant.
- Another page providing information on the geographic location of the resource. This information will consist of the name of the property (Ex: Smith House), street address, city, county, and UTM coordinates. Geographic information should be separated out from text paragraphs and more general location information such as cross road references should be included.
- A map documenting the resource's location in relation to its surrounding area. County maps should be used to provide this information. A thumbnail map showing general location on a state map and a more detailed county or city map pinpointing the location is recommended.
- A sketch map/site plan illustrating the resource(s) and its immediate surroundings. Plat books, insurance maps, bird's eye views, district highway maps, or hand-drawn maps are acceptable. Sketch maps need not be drawn to a precise scale. A number and vantage point of each accompanying photograph should also be labeled on the sketch map.

- A photo log providing the following information:
    1. Name of resource
    2. Street address where property is located
    3. City and County where property is located
    4. Name of photographer
    5. Date of photographs (date photographs were taken, not processed)
    6. Location of digital image files (this will always be the SHPO)
    7. Photograph Number
    8. Description of view indicating the direction of the camera (Ex: View of façade, facing west)

- In cases where a resource has been shown to be exceptionally significant based on its historical importance or for possessing a high degree of architectural integrity, supplementary information may be required. This information should convey the significance of the resource through a detailed architectural description and/or a short summary of its historical importance.
- Photograph proof sheets of all digital photographs with six (6) photographs per page.
- All of the documentation must be printed on archival-stable paper. This includes all attachments, appendices, plans, photocopies, and other supplemental material.
- Provide a .pdf that includes all information mentioned above (narrative, photo log, and photo proof sheets, etc.).

Technical Considerations

For digital photographic documentation, the minimum required is as follows:

- Use of a modern digital SLR camera
- Use of perspective controlled (pc) lens is recommended
- Take at least three (3) exposures of each view or angle and pick the best exposure.
- In order to capture details and allow for greater enlargement of the images, the photographs should be submitted in 3 formats:
    1. RAW Format
    2. TIF format (minimum 360 ppi, 8 bit files – 16 bit files NOT accepted)
    3. JPEG format (minimum 1024x1024 and 360 ppi)

- Images should be saved to a media that is designed for long-term (over 100 years) storage of sensitive data, video or music files. The media should be archivally labeled (using felt type and solvent free pen and no adhesive details).
- Proof sheets containing six (6) images per page that includes the name of the property and view should be submitted on archivally stable paper along with the media.

Product/Presentation

The following represents the minimum level of standards necessary for document retention at the SHPO:

- All paper and media included should be archivally stable. Reports should use headings to separate topics, include an index if applicable, and when and who prepared the report.
- All documentation shall be stored loose in an archivally stable folder. The folder should have sides and a flap over the top to keep the documentation secure. Each resource recorded should be presented in its own separate folder with all supporting documentation.
- Ideally, all documentation should be the size of an 8 1/2 x 11 sheet of paper. If large plan sheets must be inserted in the document, consider photographing the plans either with a copy stand or by tacking the plans to a wall and photographing them using a tripod.
- No pins, paper clips, staples, rubber bands, or stick-on labels shall be attached to the document.
- No ballpoint pen ink or felt-tip pens should ever be used on photographs, negatives, or paper.

Miscellaneous

- When mitigating larger historic resources such as agricultural properties, aerial photography of the landscape should be included as part of the PAR – provided that an aerial view of the resource is available.
- When mitigating certain types of structures, such as bridges, HPD may request that the engineering drawings or blueprints for the structure accompany the required photo documentation. Generally, this type of information will not be necessary unless the structure has been determined to possess an exceptional degree of architectural integrity or historic significance at the local or state level.
- In most cases, at least two sets of final documents must be prepared – one for deposit in the archives of HPD and a second in a publicly accessible archive near the historic site recorded. The MOA will specify the second local repository for the documentation, usually a regional or branch library or historical society in the county of the proposed undertaking. Local repositories should be sent a copy of everything in the PAR.

STF-PIA-5-5 Attachment A
Document Content(s)

HPD Consultation (Filed with FERC on April 24, 2020)

Terrora submittal.PDF.....1-29

ATTACHMENT C

REVISED EXHIBIT A – PROJECT DESCRIPTION

GEORGIA POWER COMPANY

NORTH GEORGIA PROJECT

FERC PROJECT NO. 2354

EXHIBIT A – PROJECT DESCRIPTION

AMENDED JUNE 2020

4.51.b Exhibit A is a description of the project. If the project includes more than one dam with associated facilities, each dam and the associated component parts must be described together as a discrete development. The statement contains subsections that follow this introduction. Each of these subsections is keyed to the appropriate corresponding requirements of 18 CFR 4.51.

The North Georgia Project consists of six separate developments: Burton, Nacoochee, Mathis-Terrora, and Tallulah Falls on the Tallulah River; and Tugalo and Yonah on the Tugaloo River. Each development is described separately below. The Mathis-Terrora description was updated to reflect the project description in the June 2020 Non-Capacity Related License Amendment.

BURTON DEVELOPMENT

4.51.b.1 Physical Description

The Burton Development is located farthest upstream of the six developments in the North Georgia Project, at Mile 368 on the Tallulah River. This development impounds most of the storage volume for the project, and its discharge is used by each of the other developments in turn to generate power. The development consists of a dam with non-overflow, low-level sluiceway, intake, and gated spillway sections, a tailrace, a powerhouse with two generating units, and a transformer and switchgear in a small substation adjacent to the powerhouse.

The dam is a concrete gravity type, built using cyclopean concrete construction. From left to right, the dam consists of: a left non-overflow section 296.5 feet long (including a 56.3-foot long core wall), a gated spillway section 197 feet long, a sluiceway section 69.5 feet long, an intake section 64 feet long, and a right non-overflow section 360.5 feet long. The total length of the dam is 987.5 feet and the maximum height is about 128 feet. The crest elevation of the non-overflow section is 1873.0 feet above mean sea level; there is a bridge over the spillway with this same crest elevation. The spillway crest elevation is 1860.0 feet. The spillway has eight motor-operated, bottom-hinged gates 22 feet wide and 7.5 feet high.
The steel penstocks, seven feet in diameter and 120 feet long, are built into the intake section of the dam. The penstocks and two low-level sluices in the sluiceway section are joined to a common header in the dam which connects to the two turbines and to an 84-inch free discharge gate valve.

The powerhouse sits at the toe of the dam. It is a steel, reinforced concrete, and masonry structure 88 feet long, 47 feet 8 inches wide, and about 81.5 feet tall at the downstream face. The powerhouse contains two generating units, a control room, and a machine shop.

The tailrace is about 50 feet wide and merges with the main river channel about 150 feet downstream of the powerhouse. Concrete walls contain the tailrace downstream of the powerhouse for about 120 feet on the right side and about 65 feet on the left side.

The generating units supply power at 6600 volts to a small substation adjacent to the powerhouse. A transformer in the substation steps up the power to 46 KV. Two 46-KV transmission lines leave the substation: one connects with the Habersham Electric Municipal Cooperative (EMC), and the other connects with the Nacoochee Development downstream. These transmission lines are primarily used to distribute power to Habersham EMC and are not part of the Burton Development.

4.51.b.2 Areas, Elevations, Storage Capacity

The full-pool level of the Burton Development Impoundment (Lake Burton) is 1866.6 feet above mean sea level. At that elevation, the surface area of the lake is 2775 acres. The gross storage capacity at full-pool is 108,000 acre-feet and the usable storage capacity is 90,000 acre-feet.

4.51.b.3 Turbine and Generator Descriptions

Burton has two generating units. Each unit has a vertical Francis-type turbine rated at 7300 horsepower at 110 feet of head, and a vertical, direct-coupled alternating current generator rated 4500 KVA, 4050 KW at 225 rpm.

4.51.b.4 Transmission Line Description

Only the short stub lines from the powerhouse to the substation are included in the project. The 46-KV transmission lines leaving the substation are primarily used to distribute power to Habersham EMC and are not part of the Burton Development.

4.51.b.5 Additional Equipment Description

Mechanical

Turbines:

2 – Vertical shaft, Francis type, S. Morgan Smith, 7300 hp at 110 feet of head, 225 rpm

Turbines are complete with steel penstocks, 84” motor operated penstock valves, steel pressure cases, Woodward governors, conical steel draft tubes, and other minor auxiliary equipment.

Gates:

8 – Crest gates: tilting type, steel with steel frame, 7.5 feet X 22 feet, with individual motor operated hoists.

2 – Head gates: steel, vertical lift, screw type, with motor operated hoists for 7 feet X 7 feet penstock opening.

1 – Sluice gate valve: 84-inch diameter, steel, vertical lift, screw type, motor operated (sluice gates are not operated).

Miscellaneous:

1 – Powerhouse crane: Shaw, 25 ton, bridge type, with 42’9” span and 31’ lift.

Other miscellaneous mechanical equipment includes trash racks, oil pumps, an air compressor, storage tanks, piping, and fire protection equipment.

Electrical

Generators:

2 – Vertical shaft, General Electric, 4500 KVA, 0.9 p.f., 4050 KW, 225 rpm, 3 phase, 60 cycle, 6600 volts.

Generators are open frame with direct connected 37-KW main exciters.

Circuit Breakers:

3 – Industrial Electric Manufacturing vacuum circuit breakers, 13.8 KV.

Switchboard:

1 – Complete nine panel switchboard for: remote control of units; local control of generators, exciters, voltage regulators, station service, motor generator, and outgoing transmission lines; and all necessary instruments, controls, indicating devices and protective relays.

Miscellaneous electrical equipment includes current and potential transformers, 65 KW motor generator, switchgear, station batteries, and lighting and telephone systems.

Transmission

Transformer:

1 – Wagner, 7500 KVA, 46,000 GRD Y/23, 100-6600 volts, three phase, 60 cycle, oil insulated, forced air cooled, outdoor type.

Circuit Breaker:

1 – Allis Chalmers power circuit breaker, 46 IV, 600 ampere.

Transmission Lines:

Only the short stub lines from the powerhouse to the substation are included in the project. The 46-KV transmission lines leaving the substation are primarily used to distribute power to Habersham EMC and are not part of the Burton Development.

The transmission substation is located at the west end of the powerhouse and consists of steel frames, buses, disconnecting switches and cable necessary to control the station from the switchboard.

4.51.b.6 Description of Lands of the United States

No lands of the United States are enclosed within the project boundary.

NACOOCHEE DEVELOPMENT

4.51.b.1 Physical Description

The Nacoochee Development is located approximately 4.8 miles downstream from Burton Dam. The development consists of a concrete gravity dam with nonoverflow, intake, low-level sluiceway, and free-crested spillway sections, a powerhouse with two generating units, a tailrace, and a transformer and switchgear in a small substation adjacent to the powerhouse.

The dam was built using cyclopean concrete construction. From left to right, the dam consists of : a 190-foot left nonoverflow section, a 54-foot long intake section, a 38-foot long sluiceway section, a 140-foot long free-crested spillway section, and a 78-foot long right nonoverflow section. The total length of the dam is 500 feet and the maximum height is about 73 feet. The crest elevation of the non-overflow sections is 1765.0 feet above mean sea level. The spillway crest elevation is 1752.5 feet.

Two steel penstocks nine feet in diameter and about 80 feet long are built into the intake section of the dam. The dam has a 7-foot by 7-foot sluiceway with a steel slide gate. The sluice gate is not operated.

The powerhouse sits at the toe of the dam. It is a steel, reinforced concrete, and masonry structure 85’4” long, 40’4” wide, and about 76.5 feet high at the downstream face. The powerhouse contains two generating units, a control room, and a machine shop.

The tailrace is about 50 feet wide and merges with the main river channel about 200 feet downstream of the powerhouse. Concrete walls contain the tailrace downstream of the powerhouse for about 50 feet on the right side and for about 200 feet on the left side.

A small substation adjacent to the powerhouse steps up the power generated from 6600 volts to 46,000 volts. The substation also serves as the connecting point for the 46-KV distribution line from the Burton Development, and two six-mile long 46-KV transmission lines to the Mathis-Terrora Development. These transmission lines are used primarily as distribution lines and are not part of the Nacoochee Development.

4.51.b.2 Areas, Elevations, Storage Capacity

The full-pool level for the Nacoochee Development impoundment (Seed Lake) is 1752.5 feet above mean sea level. At that level, the surface area of the lake is 260 acres. The gross storage capacity is 8250 acre-feet and the usable storage capacity is 5350 acre-feet.

4.51.b.3 Turbine and Generator Descriptions

Nacoochee has two generating units. Each unit has a vertical shaft, propeller-type turbine rated 4000 horsepower at 58 feet of head, and a

directly connecting alternating current generator rated 3000 KVA, 2400 KW at 400 rpm.

4.51.b.4 Transmission Line Description

Only the short stub lines from the Nacoochee powerhouse to the substation transformer are included in the Nacoochee Development. The 46-KV line to Burton and the two 46-KV lines to the Terrora substation are not part of the Nacoochee Development.

4.51.b.5 Additional Equipment Description

Mechanical

Turbines:

2 – Vertical shaft, propeller type (Bell), S. Morgan Smith, 4000 hp at 58 feet of head, 400 rpm.

Turbines are complete with steel penstocks, steel pressure cases, Woodward governors, concrete elbow type draft tubes, and other minor auxiliary equipment.

Gates:

2 – Headgates; steel, vertical lift, screw type, with motor operated hoist for 10 ft. X 15 ft. opening.

1 – Sluice gate; steel, vertical lift, screw type, with motor operated hoist for 7 ft. X 7 ft. sluiceway.

Miscellaneous:

1 – Powerhouse crane; Shaw, 20 ton, bridge type, with 34’5” span and 30 foot lift.

Other miscellaneous mechanical equipment includes trash racks, oil pumps, an air compressor, storage tanks, piping, sump pumps, and fire protection equipment.

Electrical

Generators:

2 – Vertical shaft, General Electric, 3000 KVA, 0.8 p.f., 2400 KW, 400 rpm, 3-phase, 60 cycle, 6600 volts.

Generators are open frame with direct connected 48-KW main exciters.

Circuit Breakers:

3 – Industrial Electric Manufacturing vacuum breaker, 13.8 KV.

Switchboard:

1 – Complete nine panel switchboard for: remote control of units;

control of generators, exciters, voltage regulators, station service, motor generator, and outgoing transmission lines; and all necessary instruments, controls, indicating devices and protective relays.

Miscellaneous electrical equipment includes current and potential transformers, 65 KW motor generator, switchgear, station batteries, and lighting and telephone equipment.

Transmission

Transformer:

1 – General Electric, 5000 KVA, 43,800 GRV/25290-6600 volts, three phase, 60 cycle, oil insulated, forced air cooled, outdoor type.

Circuit Breaker:

1 – McGraw Edison power circuit breaker, 46 KV, 1200 ampere.

Transmission Lines:

Only the short stub lines from the powerhouse to the substation transformer are included in the Nacoochee Development.

The transmission substation is located just below the powerhouse and consists of steel frames, buses, disconnecting switches and cable necessary to control station from switchboard.

4.51.b.6 Description of Lands of the United States

No lands of the United States are enclosed within the project boundary.

MATHIS-TERRORA DEVELOPMENT

4.51.b.1 Physical Description

The Mathis-Terrora Development consists of a main dam, called Mathis Dam, a saddle dike, an intake and power tunnel, a surge tank, two penstocks, a powerhouse with two generating units, and transformers and switchgear in a substation. Mathis Dam is located at mile 354 on the Tallulah River, about nine miles downstream of the Nacoochee Development. The Terrora powerhouse is located 5.6 miles downstream of Mathis Dam at the head of the impoundment of the Tallulah Falls Development. The mile-long power tunnel cuts through a mountain to connect the impoundment (Lake Rabun) and the Terrora penstocks.

Mathis Dam is a concrete slab and buttress dam with the main concrete dam structure at 617 feet long and a maximum height of 115 feet. Several walls have been added on both sides of the dam since original construction. With the added walls, the dam consists of the following sections, from left to right: 1) a 20-foot concrete wall, a 19.75-foot concrete wall, a 48.5-foot concrete panel wall, a 47.33-foot timber wall, a 275-foot left non-overflow section with a timber wall on top, a 290-foot long spillway section, a 50-foot right non-overflow section with a timber wall on top, and a 21.5-foot timber wall. These structures together create a crest elevation of 1703 feet for the impounding structure. The timber walls, on both the non-overflow sections and the abutments, and the concrete walls on the left abutment were added to raise the elevation of the structures to at least 1,702 feet, which corresponds to the probable maximum flood (PMF) elevation. A one-foot high steel splash plate was added to the timber walls, the concrete panel wall, and the 19.8-foot long concrete wall to increase the top elevation to at least 1703, or about one foot above PMF. The 20-foot long concrete wall was constructed to at least elevation 1,703 as well. The original crest elevation of the main concrete, non-overflow sections is 1695.0 feet above mean sea level, and the spillway crest elevation is 1683.1 feet. A spillway bridge at elevation 1704.0 feet extends over the length of the spillway.

The spillway is equipped with 16 Obermeyer gates with bay openings varying from about 15.5 to 16 feet wide. The skin plates for the Obermeyer gates are about 7.8 feet tall with a curved face. The new spillway gates were installed in 2014-2015 to replace the original bottom-hinged gates. The gates are operated from a control room under the dam in the old powerhouse location. Backup power to the gate control system is provided by a natural gas generator that was installed during spillway gate replacement. As a safety mechanism, the spillway gates have a mechanical device that will deflate the bladders and lower the gates automatically if about one foot of water is passing over the gates.

A saddle dike closes a low saddle in the reservoir rim about 2300 feet north of Mathis Dam. It is a homogeneous earth embankment 370 feet long and about 65 feet high at its centerline. The dike has a 20-foot wide crest, slopes of 2.5 horizontal to 1 vertical, a downstream rock toe with a 2.75:1 slope, and a combination open cut and grouted cutoff extending into the hard micro

schist foundation rock. This saddle dike was constructed in 1956 to replace the original concrete slab and buttress saddle dike, which is located just upstream of the new dike and has been breached.

The intake to the power tunnel is a separate reinforced concrete structure located on the right abutment about 500 feet upstream of the dam. The power tunnel is excavated through rock. The power tunnel is lined where it enters and exits the mountain. Between the entrance and exit, the tunnel is unlined. The power tunnel has a lower rectangular cross section that is topped by a semi-circular cross section. The width of the lower rectangular section varies from 11 to 13 feet while the semi-circular top portion varies in radius from 5'6" to 6'6. The entire power tunnel has a length of 5334 feet. The power tunnel discharges into a reinforced concrete surge tank. Two steel riveted penstocks, nine feet in diameter and about 850 feet long, connect the surge tank and the Terrora powerhouse.

The Terrora powerhouse is a steel, reinforced concrete, and masonry structure 127'4" long, 57'4" wide and about 100 feet tall at the downstream face. It houses two generating units, a control room, and a machine shop. The generating units discharge water out of the powerhouse directly into the impoundment for the Tallulah Falls Development; there is no tailrace.

The generating units supply power at 6600 volts. This is stepped up to 115,000 volts by transformers in the substation east of the powerhouse. The substation is a connecting point for the two 46-KV transmission lines from Nacoochee, and for two 110-KV lines from the Tallulah Lodge substation. The Terrora Development includes only step-up and switching facilities in the substation up to the point of junction with the 110-KV Terrora-Tallulah Lodge distribution line. Neither the transmission lines between Terrora and Nacoochee nor the lines between Terrora and the Tallulah Lodge substation are part of the development.

4.51.b.2 Areas, Elevation, Storage Capacity

The full pool elevation of Lake Rabun, the impoundment of Mathis Dam, is 1689.6 feet above mean sea level. At that elevation, Lake Rabun has a surface area of 780 acres, a gross storage of 31,100 acre-feet, and a usable volume of 21,900 acre-feet.

4.51.b.3 Turbine and Generator Descriptions

There are two generating units in the Terrora powerhouse. Each unit has a vertical Francis-type turbine rated 15,499 horsepower at 176 feet of head, directly connected to a vertical alternating current generator rated 14,375 KVA, 11,500 KW at 200 rpm.

4.51.b.4 Transmission Line Description

This development includes only the stub lines from the Terrora powerhouse to the Terrora substation up to the point of junction with the Terrora-Tallulah Lodge transmission line.

4.51.b.5 Additional Equipment Description

Mechanical

Turbines:

2 – Vertical shaft, Francis type, American Hydro Corporation, 15,499 hp at 176 feet of head, 200 rpm.

Turbines are complete with steel penstocks, 84” hydraulically operated penstock valves, steel pressure cases, Woodward governors, conical steel draft tubes, and other minor auxiliary equipment.

Gates:

16 – Crest gates; Obermeyer,with a 7.75-foot curved steel skin plate.
2 – Head gates; steel, vertical lift, screw type, with motor operated hoist for 30 ft. X 20 ft. tunnel opening.
2 – Penstock emergency gates; tilting type, steel, with motor operated hoist for 9 ft. diameter penstock opening.

Miscellaneous:

1 – Powerhouse crane, Whiting, 50 ton, bridge type, with 50 ft. span.
3 – Gate valves; 48”, for sluiceways.
2 – Relief valves; 22”, water pressure operated.
1 – Surge tank; reinforced concrete.

Other miscellaneous equipment includes trash racks, oil pumps, an air compressor, storage tanks, piping, and fire protection equipment.

Electrical

Generators:
2 – Vertical shaft, Westinghouse (Rewound by NEC), 14,375 KVA, 0.8 P.F., 11,500 KW, 200 rpm, 3 phase, 60 cycle, 6600 volts.

Generators are direct connected with 160-KW exciters.

Circuit Breakers:
2 - 2000 amp Powell frame breakers, 6600 V, with a short circuit rating of 50kA.

Computerized Control System:
1 - digital distributed control system for remote control of units; control of generators, exciters, voltage regulators, station service, motor generator, and outgoing transmission lines; and all necessary instruments, controls, indicating devices and protective relays.

Miscellaneous equipment includes current and potential transformers, 160 KW motor generator, 480V metal clad switchgear, station batteries, and telephone and lighting equipment.

Transmission

Transformers:
3 - Westinghouse, 6667 KVA, 110 KV/63.52 KV/6.6 KV, single phase, 60 cycle, oil insulated, water cooled, outdoor type.
1 - Westinghouse, 12,000 KVA, 115KV/46KV, three phase, 60 cycle, oil insulated, forced air cooled, outdoor type.

Circuit Breakers:
1 - General Electric, oil-blast circuit breaker, 115 KV, 800 ampere.
1 - Westinghouse, 46 KV, 1200 ampere.
1 - Westinghouse, 46 KV, 600 ampere.
1 - McGraw-Edison, 121 KV, 1200 ampere.

Transmission Lines:
The development includes only the short stub lines from the powerhouse to the point of junction with the Terrora-Tallulah Lodge 115 KV transmission line in the Terrora substation.

The transmission substation is located at the east end of the powerhouse and consists of steel frames, buses, disconnecting switches and cable necessary to control the station from the switchboard.

4.51.b.6 Description of Lands of the United States

No lands of the United States are enclosed within the project boundary.

TALLULAH FALLS DEVELOPMENT

4.51.B.1 Physical Description

The Tallulah Falls Development consists of a dam, an intake and power tunnel, a surge tank, six penstocks, an incline railway, a powerhouse with six generating units, other plant buildings, a tailrace, transformers and switchgear, and one transmission line. The Tallulah Falls Dam is located at mile 347 on the Tallulah River, and the powerhouse is located 1.8 miles downstream at the head of the impoundment of the Tugalo Development.

The Tallulah Falls Dam is a concrete gravity dam constructed with a curved alignment. From left to right, the dam consists of: a left abutment, a gated spillway section, and a right abutment. The total length of the dam is 426 feet, and the maximum height is about 130 feet. The crest elevation of the abutments is 1514.0 feet above mean sea level, and the spillway crest elevation is 1493.0 feet. A bridge with 3-foot high parapet walls spans the dam. The spillway has 10 spillway bays, each 28 feet wide. The four left bays have wooden flashboards with aluminum pipe supports that are 7 feet high. The six right bays are bottom-hinged steel gate structures with wood facing with motor-operated hoists. The gates are 8 feet high. There are also two five-foot square sluiceways through the spillway at elevation 1425.0 feet. The sluiceways close with steel slide gates on the upstream face of the dam. The sluice gates are not operated.

The intake to the power tunnel is a separate reinforced-concrete structure on the right bank about 75 feet up stream of the dam. The power tunnel is cut through rock and is concrete lined. It is horseshoe-shaped in cross section, about 11 feet wide and 14.5 feet high, and 6665 feet long.

The tunnel discharges into a box-type surge tank partially excavated into rock. The tank is constructed of reinforced concrete. It is 93’ high, 71’ long, and 30’ wide. Six steel penstocks connect the surge tank to the powerhouse, which is located down in the Tallulah Gorge. The penstocks are five feet in diameter and average 1250 feet in length. Upper penstock sections are riveted together on all six penstocks, while the lower sections are welded together for Penstocks 1-5 (from left to right). Penstock 6, which was American-made, is riveted for its full length. The penstocks rest on concrete piers spaced 32 feet apart.

An incline railway provides access to the powerhouse in the gorge. The railway is about 1200 feet long and rises in that distance about 650 feet. The maximum grade of the railway is 98 percent. A brick and steel house covers the hoist arrangement at the head on the incline.

The power plant buildings located in the gorge are steel, reinforced concrete and masonry structures. The generator building houses the six generating units. It is 191’ 9 ½” long, 47’6” wide and approximately 115’ tall at the downstream face. The switching house contains transformers and switchgear. It is 248’ 5 ½” long, 49’ 6 ¾” wide, and about 120’ at its

downstream face high. These two buildings are connected by a small building, 28'10" long and 28' wide, which houses the plant control room.

The tailrace was constructed almost at a right angle to the powerhouse, in the original river channel. It is tapered, being only 10 feet wide at the first unit upstream and widening to 50 feet at its lower end. The tailrace is about 250 feet long. It is bounded on its right side by the powerhouse and a concrete wall that extends downstream from the powerhouse about 50 feet. On its left side, it is bounded by a concrete wall extending downstream 250 feet.

Power is delivered from the generators at 6600 volts. This is stepped up to 110,000 volts by transformers in the switching house and delivered by one 0.3-mile long, 110 KV transmission line to the Tallulah Lodge substation at the crest of the gorge. The Tallulah Lodge substation is not a part of the Tallulah Falls Development.

4.51.b.2 Areas, Elevations, Storage Capacity

The full pool elevation of the Tallulah Falls Development impoundment (Tallulah Falls Lake) is 1500 feet above mean sea level. At that elevation the surface area of the impoundment is 63 acres. The gross storage capacity at full pool is 2450 acre-feet and the usable storage capacity is 1490 acre-feet.

4.51.b.3 Turbine and Generator Descriptions

The Tallulah Falls Development has six generating units. Each unit has a vertical Francis-type turbine rated 19,300 horsepower at 580 feet of head. The generators are direct-connected, vertical, alternating current generators rated 12,000 KVA, 12,000 KW at 514 rpm.

4.51.b.5 Additional Equipment Description

Mechanical

Turbines:

6 – Vertical shaft, Francis type, S. Morgan Smith, 19,300 hp at 580 feet of head, 514 rpm.

Turbines are complete with steel penstocks, 60” motor operated penstock valves and 45” water pressure operated valves, cast-iron pressure cases except one with cast steel pressure case, Woodward governors, elbow type steel draft tubes, and other minor auxiliary equipment.

1 - Horizontal shaft, Pelton wheel, 67 hp at 608.5 feet of head, 750 rpm, for auxiliary exciter.

Gates:

4 - Stationary flashboards, 7 ft. X 28 ft., wood with aluminum pipe supports.

6 Spillway gates,- 8 ft. X 28 ft., wood-faced with steel frame, electric motor operated.

2 - Sluice gates; vertical lift, screw type, with manual operated hoist for 5’ diameter opening. The sluice gates are not operated.

5 - Intake gates; steel, vertical lift, with manual hoist for 8 ft. X 10 ft. opening.

6 - Emergency gates; steel, flap type, manually operated for steel penstocks.

Miscellaneous:

1 – Powerhouse crane, Shaw, 60 ton, bridge type.

1 – 15 ton crane for switching building.

1 – Surge tank; reinforced concrete.

1 - Passenger incline car; Intamin, Inc.

1 – Freight incline car.

Other miscellaneous equipment includes trash racks, oil pumps, air compressors, storage tanks, piping, automatic release valves, by-pass valves, meters and fire protection equipment.

Electrical

Generators:

6 – Vertical shaft, General Electric, 12,000 KVA, 1.0 p.f., 12,000 KW, 514 rpm, 3 phase, 60 cycle, 6600 volts.

Generators are direct connected with 100 KW exciters.

1 - Horizontal shaft, 50 KW, 250 volt, 750 rpm auxiliary exciter.

Circuit Breakers:

6 - Industrial Electric Manufacturing, MCVB-1523-20 vacuum breakers, 13.8 KV, 2000 amps.

Switchboard:

1 - Complete fourteen panel switchboard for: remote control of units; control of generators, exciters, voltage regulators, station service, and outgoing transmission lines; and all necessary instruments, controls, indicating devices and protective relays.

Miscellaneous electrical equipment includes current and potential transformers, switchgear, station batteries, and lighting and telephone equipment.

Transmission

Transformers:

4 - General Electric, 3333 KVA, 63,500/110,000/6600 volt, single phase, 60 cycle, oil insulated, water cooled.
1 - Westinghouse, 12/16/20 MVA, 115,000/6900 volt, 3 phase, 60 cycle, oil insulated, water cooled.
8 - General Electric, 4167 KVA, 66,400/115,000/6900 volt, single phase, 60 cycle, oil insulated, water cooled.
1 - Kuhlman, 12/16 MVA, 115 KV/6.6 KV, oil insulated.
1 – General Electric, 8000 KVA, 63,500/100,000/6600 volt, water cooled, oil insulated.

Circuit Breakers:

1 - Westinghouse oil circuit breaker, 115 KV, 1200 ampere.
1 - General Electric oil circuit breaker, 15 KV, 300 ampere.

Transmission Line:

1 – 0.3 mile, 110-KV line from the plant to the Tallulah Lodge substation at the crest of the gorge.

The transmission substation is located in the switching house which is adjacent to the powerhouse and consists of buses, disconnecting switches and cable necessary to control the station from the switchboard.

4.51.b.6 Description of Lands of the United States

No lands of the United States are enclosed within the project boundary.

TUGALO DEVELOPMENT

4.51.b.1 Physical Description

The Tugalo Development is located just downstream of the confluence of the Tallulah and Chattooga Rivers into the Tugaloo River, at river mile 343. The development consists of: a concrete gravity dam with non-overflow, intake, and gated spillway sections, a powerhouse with four generating units, a tailrace, and a substation with transformers and switchgear.

The dam was built with cyclopean concrete construction. From left to right, the dam consists of: a left non-overflow section 73 feet long, a gated spillway section 357 feet long, a center non-overflow section 20 feet long, an intake section 165 feet long, and a right non-overflow section 225 feet long. The total dam length if 840 feet and the maximum dam height is about 160 feet. The crest elevation of the non-overflow sections is 905.0 feet above mean sea level; there is a bridge over the spillway at this same elevation. The spillway crest elevation is 885.0 feet. The spillway has 14 motor-operated, bottom-hinged steel gates 22 feet long and 7.5 feet high. Two seven-foot square sluiceways with centerline at elevation 820.0 feet are located in the spillway section. The sluice gates are not operated.
Four steel penstocks, each about 308 feet long and 13 feet in diameter, carry water from the intake section through the dam, then under a substation located between the dam and powerhouse, and finally into the generating units. The penstocks are encased in concrete.

The powerhouse sits about 130 feet downstream of the toe of the dam; a substation is situated in the space between. The powerhouse is a steel, reinforced concrete, and masonry building 204’4” long and 64’4” wide, with a 40’ by 37’10” control room extending out from the upstream side. The powerhouse is 109.5 feet high at its downstream face. It contains four generating units, a control room, and a machine shop.

The tailrace is about 150 feet wide and joins the main river channel about 200 feet downstream of the powerhouse. The tailrace is separated from the main channel on its left by a concrete wall about 70 feet long. On the right side a concrete wall extends about 200 feet downstream.

The plant substation is located between the powerhouse and the toe of the dam. Transformers step up power from 6600 volts to 115,000 volts for transmission. Interconnection to the 115-KV Tallulah Lodge – Tugalo – Commerce transmission line of the distribution system is done in the substation. Only the short stub lines from the powerhouse to the substation transformers are part of the Tugalo Development. The 115-KV Tallulah Lodge – Tugalo – Commerce transmission line is primarily for distribution and so is not part of the Tugalo Development.

4.51.b.2 Areas, Elevations, Storage Capacity

The full-pool level for the Tugalo impoundment (Tugalo Lake) is 891.5 feet above mean sea level. At full pool the reservoir surface area is 597 acres,

the gross storage capacity is 43,000 acre-feet and the usable storage is 14,000 acre-feet.

4.51.b.3 Turbine and Generator Descriptions

Tugalo has four generating units. Each unit has a vertical Francis-type turbine rated 21,200 horsepower at 143 feet of head, and a vertical, alternating current generator rated 12,500 KVA, 11,250 KW at 171.4 rpm.

4.51.b.4 Transmission Line Description

Only the stub lines connecting the Tugalo powerhouse and the substation transformers are part of the Tugalo Development. The 115 KV Tallulah Lodge – Tugalo – Commerce distribution line is not part of the Tugalo Development.

4.51.b.5 Additional Equipment Description

Mechanical

Turbines:

4 – Vertical shaft, Francis type, S. Morgan Smith, 21,200 hp at 143 feet of head, 171.4 rpm.

Turbines are complete with steel penstocks, steel pressure cases, Woodward governors, elbow type draft tubes, and other minor auxiliary equipment.

1 - Vertical shaft, Francis type, S. Morgan Smith, 135 hp at 150 feet of head, 1000 rpm, for auxiliary exciter.

Turbine is complete with steel penstock, 15” gate valve, steel pressure case, governor, conical steel draft tube, and auxiliary equipment.

Gates:

14 - Crest gates; tilting type, steel, 7’6” X 22’, with individual motor operated hoists. 2 - Sluice gates; steel, vertical lift, motor operated for 7 ft. X 7 ft. sluiceway. The sluice gates are not operated.

8 - Intake gates; cast iron, vertical lift, screw type, with motor operated hoist for 13 foot diameter penstock.

1 - Intake gate; cast iron, vertical lift, screw type, with motor operated hoist for 3 ft. diameter penstock.

Miscellaneous:

1 – Powerhouse crane, Northern, 50 ton, bridge type.

Other miscellaneous equipment includes trash racks, oil pumps, air compressors, storage tanks, piping, and fire protection equipment.

Electrical

Generators:

4 – Vertical shaft, General Electric, 12,500 KVA, 0.9 p.f., 11,250 KW, 171.4 rpm, 3 phase, 60 cycle, 6600 volts.

Generators are equipped with direct connected with 100 KW exciters.

1 - Vertical shaft, General Electric, 100 KW, 250 volt, auxiliary exciter.

Circuit Breakers:

4 - ITE, air circuit breakers, 7200 V, 1200 ampere.

Switchboard:

1 - Complete sixteen panel switchboard and benchboard for: remote control of units; control of generators, exciters, voltage regulators, station service, auxiliary exciter, and outgoing transmission lines; and all necessary instruments, controls, indicating devices and protective relays.

Other electrical equipment, includes current and potential transformers, switchgear, station batteries, and lighting and telephone systems.

Transmission

Transformers:

2 - Westinghouse, 26720 KVA, 115,000 GRDY/6400 volts, 3 phase, 60 cycle, oil insulated, forced air cooled.

Circuit Breakers:

1 - General Electric, 115 KV, 1200 ampere.
1 - General Electric, 115 KV, 600 ampere.

Transmission Lines:
Only the short stub lines connecting the powerhouse with the substation transformers are part of the Tugalo Development.

The transmission substation is located between the powerhouse and the dam and consists of buses, disconnecting switches, and cable necessary to control the station from the switchboard.

4.51.b.6 Description of Lands of the United States

No lands of the United States are enclosed within the project boundary.

YONAH DEVELOPMENT

4.51.b.1 Physical Description

The Yonah Development is the farthest downstream development in the North Georgia Project. Yonah is located at mile 340 on the Tugaloo River, 3.1 miles downstream of Tugalo Dam. The development consists of: a concrete gravity dam with non-overflow, intake, low-level sluiceways, spillway sections, a powerhouse with three generating units, a tailrace, and a substation with transformers and switchgear.

The dam is a concrete gravity dam of cyclopean concrete construction. From left to right, the dam consists of: a left non-overflow section 112 feet long, a 450-foot long spillway section with 2-foot high flashboards, a sluiceway section 49’4” long, an intake section 131’6” long, and a 204’2” long right non-overflow section. The total length of the dam is 947 feet and the maximum height is about 95 feet. The crest of the non-overflow sections is 757.0 feet above mean sea level and the spillway crest elevation is 742.25 feet. Two-foot high flashboards make the spillway crest elevation 744.25 feet during normal operation.

Three penstocks approximately 15 feet in diameter are built into the dam. Two 7-foot square sluiceways were constructed at an invert elevation of 676.50 feet.

The powerhouse is located at the toe of the intake. It is a steel, reinforced concrete, and masonry structure 184’8” long, 58’8” wide, and about 120 feet tall at its downstream face. The powerhouse contains three generating units, a control room, and a machine shop.

The tailrace is about 120 feet wide and merges with the main river channel about 300 feet downstream of the powerhouse. The tailrace is separated from the main river channel on the left by a concrete wall about 240 feet long. Another concrete wall extends out from the powerhouse about 200 feet on the right side of the tailrace.

Generation from the Yonah units is at 6600 volts. Power is transmitted from the powerhouse to the adjacent substation with short stub lines. In the substation, the power is stepped up to 115 KV and connected to the 115-KV Tallulah Lodge – Yonah – Commerce transmission line. The Tallulah Lodge – Yonah – Commerce transmission line is part of the power distribution system and is not included in the Yonah Development.

4.51.b.2 Areas, Elevations, Storage Capacity

The full-pool elevation of the Yonah impoundment (Yonah Lake) is 744.25 feet above mean sea level. At that elevation, the surface area of the lake is about 293 acres, the gross storage capacity is 10,200 acre-feet, and the usable storage is estimated to be 6000 acre-feet.

4.51.b.3 Turbine and Generator Descriptions

Yonah has three generating units. Each unit has a vertical Francis-type turbine rated at 13,700 horsepower at 68 feet of head, and a directly connected alternating current generator rated 8333 KVA, 7500 KW, at 128.6 rpm. Power from the units is at 6600 volts and is stepped up to 115 KV in the substation adjacent to the powerhouse.

4.51.b.4 Transmission Line Description

Only the short stub lines connecting the Yonah powerhouse and the substation transformers are part of the Yonah Development. The 115 KV Tallulah Lodge – Yonah – Commerce transmission line is primarily for distribution purposes and is not part of the Yonah Development.

4.51.b.5 Additional Equipment Description

<u>Mechanical</u>

Turbines:

3 – Vertical shaft, Francis type, S. Morgan Smith, 13,700 hp at 68 feet of head, 128.6 rpm.

Turbines are complete with steel penstocks, cast-iron pressure cases, Woodward governors, elbow type draft tubes, and other minor auxiliary equipment.

Gates:

30 - Crest gates; timber flashboards, 15 ft. X 2.25 ft. supported by steel pipe. These are operated in three sections, with each section having a different trip elevation.

2 - Sluice gates; steel, vertical lift, screw type, with motor operated hoist for 7 ft X 7 ft. sluiceway. The sluice gates are not operated.

6 - Head gates; steel, vertical lift, screw type, with motor hoist for 15 ft. diameter penstock.

Miscellaneous:

1 – Powerhouse crane, Northern, 60 ton, bridge type.

Other mechanical equipment includes trash racks, oil pumps, air compressors, storage tanks, piping, and fire protection equipment.

Electrical

Generators:

3 – Vertical shaft, General Electric, 8333 KVA, .9 p.f., 7500 KW, 128.6 rpm, 3 phase, 60 cycle, 6600 volts.

Generators are complete with direct connected with 175 KW exciters.

Circuit Breakers:

1 - General Electric oil circuit breaker, 7500 volt, 500 ampere.
3 - Industrial Electric Manufacture's vacuum breakers, 13.8 KV.

Switchboard:

1 - Complete 23- panel switchboard for: remote control of units; control of governors, exciters, voltage regulators, station service, motor generator, and outgoing transmission lines; and all necessary instruments, controls, indicating devices and protective relays.

Miscellaneous electrical equipment including current and potential transformers, 125-KW motor generator, switchgear, station batteries, and lighting and telephone systems.

Transmission

Transformers:

4 - General Electric, 8333 KVA, 63.7/110/6.6 KV, single phase, 60 cycle, oil insulated, water cooled.
1 - Kuhlman, 7500 KVA, oil insulated, air cooled.

Circuit Breakers:

1 - General Electric, pneumatic air circuit breaker, 115000 v, 1200 ampere.
1 - Allis Chalmers, 14.4 KV, 1200 ampere, solenoid operated.

Transmission Lines:
Only the stub lines between the powerhouse and the substation transformers are part of the Yonah Development.

The transmission substation is located at the southwest corner of the powerhouse and consists of steel frames, buses, disconnecting switches, and cable necessary to control the station from the switchboard.

4.51.b.6 Description of Lands of the United States

No lands of the United States are enclosed within the project boundary.

ATTACHMENT D

DOCUMENTATION OF AGENCY CONSULTATION ON THE DRAFT NON-CAPACITY RELATED AMENDMENT APPLICATION

Crabbe, Melissa C.

From: O'Mara, Courtenay R.
Sent: Thursday, June 4, 2020 3:32 PM
To: Glassmeyer, Scott T; Zapata, Martha J; donald_imm@fws.gov; Rabern, Anthony; Litts, Thom; Fenwick, Whitney; audra.dickson@dnr.ga.gov; Wiedl, Stephen; Smith, Bradley; Zeng, Wei; Liang, Hailian; Booth, Elizabeth; Rooks, Whitney
Cc: O'Rouke, Patrick Michael; Dodd, Anthony Ray; Charles, Joseph D.; Crabbe, Melissa C.; Crew, James F.
Subject: Georgia Power FERC License Amendment Application for Mathis-Terrora Hydro Plant
Attachments: 2020-06-04 DRAFT Amendment Application for Agency Review_compiled.pdf

Good afternoon-
I wanted to let you know that we are close to submitting the license amendment application to FERC for the Mathis-Terrora Hydro Plant, which is 1 of 6 plants that Georgia Power operates as its North Georgia Project (FERC Project Number 2354). We appreciate all of the feedback and consultation that has been ongoing since January 2020 with you. As you may recall, our proposal is for a non-capacity upgrade of two generating units in the Mathis-Terrora powerhouse, and includes replacing the turbine runners, rewinding the generators and replacing the balance of plant equipment and intake trash racks.

Before we submit the license amendment application to the FERC we wanted to provide you some time to take a look at our Draft License Amendment application so that you could provide any comment, if needed. Your comments are sufficient via reply email. I will take your comments and also provide them to the FERC when we make the application. FERC in turn will also provide an additional opportunity for comment after they receive our application, but we thought your early review would help resolve any outstanding issues.

The draft application consists of the following attachments:
Attachment A – Initial Statement and Application for a Non-Capacity License Amendment (8 pages)
Attachment B - Documentation of our Consultation with Agencies (72 pages, but you will be familiar with the documentation of your own agency consultation with us)
Attachment C – Marked up version of the existing Exhibit A, showing changes that would be required to this part of our existing FERC license by the proposal (Redlines on pages 3, and 15-17 only)

If possible, we would like your review by next Friday, June 12, 2020 because we intend to submit the application to FERC on Monday, June 15, 2020.

Thanks so much.

Courtenay R. O'Mara, P.E.
Hydro Licensing and Compliance Supervisor
Southern Company
241 Ralph McGill Blvd. – Bin 10193
Atlanta, Georgia 30308
Tel 404.506.7219
Mobile 404.797.9432
southerncompany.com



Crabbe, Melissa C.

From: Booth, Elizabeth <Elizabeth.Booth@dnr.ga.gov>
Sent: Friday, June 5, 2020 9:30 AM
To: O'Mara, Courtenay R.
Subject: RE: Georgia Power FERC License Amendment Application for Mathis-Terrora Hydro Plant

EXTERNAL MAIL: Caution Opening Links or Files

Courtenay,

I have looked over the Georgia Power FERC license amendment application reviewed the comments I made and I have no additional comments.

Thanks
Liz

Elizabeth A. Booth, Ph.D., P.E.
Georgia Environmental Protection Division
Watershed Protection Branch
Watershed Planning and Monitoring Program
2 Martin Luther King Jr. Drive, Suite 1152
Atlanta, Georgia 30334
404 463-4929
elizabeth.booth@dnr.ga.gov

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

From: O'Mara, Courtenay R. <CROMARA@SOUTHERNCO.COM>
Sent: Thursday, June 4, 2020 3:32 PM
To: Glassmeyer, Scott T <scott_glassmeyer@fws.gov>; Zapata, Martha J <martha_zapata@fws.gov>; donald_imm@fws.gov; Rabern, Anthony <Anthony.Rabern@dnr.ga.gov>; Litts, Thom <Thom.Litts@dnr.ga.gov>; Fenwick, Whitney <whitney.fenwick@dnr.ga.gov>; Dickson, Audra <Audra.Dickson@dnr.ga.gov>; Wiedl, Stephen <Stephen.Wiedl@dnr.ga.gov>; Smith, Bradley <Bradley.Smith@dnr.ga.gov>; Zeng, Wei <Wei.Zeng@dnr.ga.gov>; Liang, Hailian <Hailian.Liang@dnr.ga.gov>; Booth, Elizabeth <Elizabeth.Booth@dnr.ga.gov>; Rooks, Whitney <Whitney.Rooks@dnr.ga.gov>
Cc: O'Rouke, Patrick Michael <PMOROUKE@southernco.com>; Dodd, Anthony Ray <ARDODD@southernco.com>; Charles, Joseph D. <JCHARLES@southernco.com>; Crabbe, Melissa C. <MCCRABBE@SOUTHERNCO.COM>; Crew, James F. <JFCREW@southernco.com>
Subject: Georgia Power FERC License Amendment Application for Mathis-Terrora Hydro Plant

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Thanks so much.

Courtenay R. O'Mara, P.E.
Hydro Licensing and Compliance Supervisor
Southern Company
241 Ralph McGill Blvd. – Bin 10193
Atlanta, Georgia 30308
Tel 404.506.7219
Mobile 404.797.9432
southerncompany.com [gcc01.safelinks.protection.outlook.com]



Georgia HPD Response

From: O"Mara, Courtenay R.
To: Rooks, Whitney
Cc: Charles, Joseph D.
Subject: RE: Georgia Power FERC License Amendment Application for Mathis-Terrora Hydro Plant
Date: Friday, June 12, 2020 11:05:02 AM

Great. Thanks for the clarification Whitney. We appreciate your review!

Courtenay O'Mara

Courtenay R. O'Mara, P.E.
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241 Ralph McGill Blvd. – Bin 10193
Atlanta, Georgia 30308
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Southern Company

From: Rooks, Whitney <Whitney.Rooks@dnr.ga.gov>
Sent: Friday, June 12, 2020 10:50 AM
To: O'Mara, Courtenay R. <CROMARA@SOUTHERNCO.COM>
Subject: RE: Georgia Power FERC License Amendment Application for Mathis-Terrora Hydro Plant

EXTERNAL MAIL: Caution Opening Links or Files

Good Morning Courtney

I hope all is well. Please disregard my previous email. When I emailed you I forgot Section 106 documentation for this project had been submitted to our office. The project was determined an adverse effect so we are working with Joseph Charles at Georgia Power to develop a MOA. HPD is still fine with this draft application. But it should be noted that S106 consultation has started and GP/FERC is working on a MOA with GA SHPO.

Please let me know if you need anything else.

Thanks!

-Whitney Rooks

Georgia HPD Response

From: O'Mara, Courtenay R. <CROMARA@SOUTHERNCO.COM>
Sent: Thursday, June 4, 2020 3:32 PM
To: Glassmeyer, Scott T <scott_glassmeyer@fws.gov>; Zapata, Martha J <martha_zapata@fws.gov>; donald_imm@fws.gov; Rabern, Anthony <Anthony.Rabern@dnr.ga.gov>; Litts, Thom <Thom.Litts@dnr.ga.gov>; Fenwick, Whitney <whitney.fenwick@dnr.ga.gov>; Dickson, Audra <Audra.Dickson@dnr.ga.gov>; Wiedl, Stephen <Stephen.Wiedl@dnr.ga.gov>; Smith, Bradley <Bradley.Smith@dnr.ga.gov>; Zeng, Wei <Wei.Zeng@dnr.ga.gov>; Liang, Hailian <Hailian.Liang@dnr.ga.gov>; Booth, Elizabeth <Elizabeth.Booth@dnr.ga.gov>; Rooks, Whitney <Whitney.Rooks@dnr.ga.gov>
Cc: O'Rouke, Patrick Michael <PMOROUKE@southernco.com>; Dodd, Anthony Ray <ARDODD@southernco.com>; Charles, Joseph D. <JCHARLES@southernco.com>; Crabbe, Melissa C. <MCCRABBE@SOUTHERNCO.COM>; Crew, James F. <JFCREW@southernco.com>
Subject: Georgia Power FERC License Amendment Application for Mathis-Terrora Hydro Plant

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Good afternoon-
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Before we submit the license amendment application to the FERC we wanted to provide you some time to take a look at our Draft License Amendment application so that you could provide any comment, if needed. Your comments are sufficient via reply email. I will take your comments and also provide them to the FERC when we make the application. FERC in turn will also provide an additional opportunity for comment after they receive our application, but we thought your early review would help resolve any outstanding issues.

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Georgia WRD Response

Crabbe, Melissa C.

From: Rabern, Anthony <Anthony.Rabern@dnr.ga.gov>
Sent: Friday, June 5, 2020 11:06 AM
To: O'Mara, Courtenay R.; Glassmeyer, Scott T; Zapata, Martha J; donald_imm@fws.gov; Litts, Thom; Fenwick, Whitney; Dickson, Audra; Wiedl, Stephen; Smith, Bradley; Zeng, Wei; Liang, Hailian; Booth, Elizabeth; Rooks, Whitney
Cc: O'Rouke, Patrick Michael; Dodd, Anthony Ray; Charles, Joseph D.; Crabbe, Melissa C.; Crew, James F.
Subject: RE: Georgia Power FERC License Amendment Application for Mathis-Terrora Hydro Plant

EXTERNAL MAIL: Caution Opening Links or Files

Courtenay,

I reviewed Georgia Power's application to upgrade the Mathis-Terrora Hydro Plant and intake structure. My primary focus was to identify negative impacts associated with the upgrades to water quality, flow and current patterns, potential entrainment, lake level fluctuations, and water-based recreation in the impoundment (Lake Rabun) and its receiving waters. Based on the information provided in the application, the changes in velocity both into and out of the intake structure will be slight and most likely will not entrain sunfish and blueback herring, which commonly occur near the intake structure. In addition, there will be no changes in water quality or lake level operations. I agree, therefore, with Georgia Power's conclusion on page 7 (3) that facility upgrades are not expected to have an impact on the current flow, lake levels, aquatic life, or recreation. I would add to that statement that no adverse impacts are expected in the impoundment (Lake Rabun) or in downstream waters. Thank you for the opportunity for input.

Anthony Rabern
Fisheries Management

Wildlife Resources Division [georgiawildlife.com]
(770) 535-5498 | M: (404) 695-7816

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Buy a hunting or fishing license today! [georgiawildlife.com]

A division of the
GEORGIA DEPARTMENT OF NATURAL RESOURCES

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Sent: Thursday, June 4, 2020 3:32 PM
To: Glassmeyer, Scott T <scott_glassmeyer@fws.gov>; Zapata, Martha J <martha_zapata@fws.gov>; donald_imm@fws.gov; Rabern, Anthony <Anthony.Rabern@dnr.ga.gov>; Litts, Thom <Thom.Litts@dnr.ga.gov>; Fenwick, Whitney <whitney.fenwick@dnr.ga.gov>; Dickson, Audra <Audra.Dickson@dnr.ga.gov>; Wiedl, Stephen <Stephen.Wiedl@dnr.ga.gov>; Smith, Bradley <Bradley.Smith@dnr.ga.gov>; Zeng, Wei <Wei.Zeng@dnr.ga.gov>; Liang, Hailian <Hailian.Liang@dnr.ga.gov>; Booth, Elizabeth <Elizabeth.Booth@dnr.ga.gov>; Rooks, Whitney <Whitney.Rooks@dnr.ga.gov>
Cc: O'Rouke, Patrick Michael <PMOROUKE@southernco.com>; Dodd, Anthony Ray <ARDODD@southernco.com>; Charles, Joseph D. <JCHARLES@southernco.com>; Crabbe, Melissa C. <MCCRABBE@SOUTHERNCO.COM>; Crew, James F. <JFCREW@southernco.com>
Subject: Georgia Power FERC License Amendment Application for Mathis-Terrora Hydro Plant

Georgia WRD Response

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Thanks so much.

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