Final Sediment Transport Assessment Study Report

LANGDALE PROJECT (FERC No. 2341)
AND
RIVERVIEW PROJECT (FERC No. 2350)

Prepared for:
Georgia Power Company

Prepared by:
Kleinschmidt Associates

October 2023

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1.0 OVERVIEW

Georgia Power Company (Georgia Power) is the Federal Energy Regulatory Commission (FERC) licensee for the Langdale Hydroelectric Project FERC No. 2341 (Langdale Project) and the Riverview Hydroelectric Project FERC No. 2350 (Riverview Project) (collectively, the "Project"). On December 18, 2018[1], Georgia Power filed with FERC applications for license surrender and dam removal for the Project in accordance with FERC regulations at 18 Code of Federal Regulation (C.F.R.) § 6.1 and 6.2. The licenses for the Project expire on December 31, 2023.

1.1 Project Background

1.1.1 Langdale Project

The Langdale Project is located on the Chattahoochee River, adjacent to the city of Valley, Alabama and in Harris County, Georgia at river mile (RM) 191.9. The Langdale Project is located approximately 9.5 RMs downstream of the U.S. Army Corps of Engineers (USACE) West Point Dam (RM 201.4), which began operation in 1976 and regulates the flow through the Middle Chattahoochee River region (Figure 1-1).

The Langdale Project was constructed between 1904 and 1908 and purchased by Georgia Power from West Point Manufacturing Company in 1930. The Project operated as a run of river hydroelectric plant. Over time, the four horizontal generating units developed maintenance problems, and eventually were no longer operable. Generation records suggest that Georgia Power stopped operating the horizontal units in approximately 1954. The horizontal units were officially retired in 1960, leaving only the two 520 kilowatt (kW) vertical units operating at the Langdale Project; these two units remain in place in the powerhouse but have not operated since 2009.

1.1.2 Riverview Project

The Riverview Project (Crow Hop Diversion Dam [Crow Hop Dam]) is located at approximately RM 191.0 and the Riverview Dam is located at approximately RM 190.6) on the Chattahoochee River, downstream of the Valley, Alabama and in Harris County, Georgia (Figure 1-1). The Riverview Project is located approximately 10.5 RM downstream of the USACE West Point Project and 0.9 RM downstream of the Langdale Project.

[1] Accession Number 20181218-5451 and 20181218-5452

The Riverview Project consists of two separate dams, Riverview Dam and Crow Hop Dam, and a powerhouse with generating equipment located on the western abutment of Riverview Dam. Crow Hop Dam is the upstream dam and is situated across the main stem of the river, diverting flow into a headrace channel between an island and the western bank. The headrace channel is approximately 1-mile-long. Riverview Dam and the powerhouse are located at the lower end of this headrace channel (Figure 1-1). The Project was constructed in several phases. The shorter-length downstream dam (Riverview Dam) was constructed in 1906 for West Point Manufacturing Company. Originally, the dam diverted water into the adjacent mill building to provide power for mill operation. The existing powerhouse was built in 1918 and houses two 240 kW generating units. Crow Hop Dam was constructed in 1920. Georgia Power purchased the Riverview Project from West Point Manufacturing Company in 1930 and began operating the two generating units. Over time, the units developed maintenance problems, and eventually were no longer operable or repairable. Georgia Power stopped operating the units in 2009. The Riverview Project previously operated as a run of river project.

On April 11, 2019, FERC issued an additional information request[2] regarding decommissioning studies proposed by Georgia Power. As part of its response, Georgia Power filed the Proposed Study Plan on May 24, 2019[3] to provide additional information on the proposed studies to support its surrender application for the Project. Georgia Power filed the Final Study Plan on July 24, 2019[4] and filed the Draft Study reports on September 21, 2020[5]. On October 5, 2020, Georgia Power held a Public Meeting to present the study results to stakeholders. The meeting consisted of an afternoon and evening session held virtually due to concerns with Coronavirus Disease 2019. Georgia Power requested that stakeholders submit comments on all draft study reports by November 5, 2020. Georgia Power received seven comment letters on the draft study reports.

By letter dated November 18, 2020, FERC requested information on the sediment quantity, post-removal sediment transport, and post-removal sediment impacts of the proposed decommissioning and removal of the Project. Georgia Power developed a Sediment Transport Study Plan and filed that study plan with FERC for review and comment on October 19, 2021. Documentation of consultation is provided in Appendix A. In August

[2] Accession Number 20190411-3007
[3] Accession Number 20190524-5217
[4] Accession Number 20190724-5110
[5] Accession Number 20200921-5036

2022, Georgia Power filed a *Draft Sediment Transport Assessment Study Report* with FERC to address the post-removal sediment transport and potential impacts of dam decommissioning. No comments were filed on the draft report; therefore, this *Final Sediment Transport Assessment Study Report* is being filed with FERC.

In 2023, engineering refinements in the Riverview headrace channel required re-running the hydraulic model to reflect the post-construction condition. The Final H&H Report includes both an Estimated Sediment Extent [ESE] bathymetry and an adjusted bathymetry, with the adjusted bathymetry having sediment elevations between the existing bathymetry (current river bottom elevations) and the ESE bathymetry (river bottom if all sediment flushed from the system. The 2023 hydraulic model anticipates some of the sediment in the Riverview headrace channel remains in place, as described in the "adjusted bathymetry" model results in the Final H&H report. Section 3.1 of this *Final Sediment Transport Assessment Study Report* reflects the Estimated Sediment Extent [ESE] bathymetry, as described in the final H&H report (see Section 6.0 of that report). For purposes of presenting the volume estimate and transport assessment herein, the most conservative (worst-case) scenario assumed all the sediment above the sediment probe refusal depths would mobilize, as characterized by the ESE bathymetry.

Figure 1-1 Langdale and Riverview Project Locations

1.2 Study Background

Langdale Dam, Crow Hop Dam, and Riverview Dam were constructed over 100 years ago, and each impoundment contains stored sediments that have accumulated over the years. Removal of these three dams will enable the restoration of natural sediment transport processes in the river, including the mobilization of some of the sediment stored behind each dam. These sediments will eventually be transported downstream to Lake Harding, (the reservoir for the Bartletts Ferry Project, FERC No. 485, the next downstream reservoir below the Projects). The United States Department of Agriculture (USDA) report (Eakin 1936; Eakin and Brown 1939) stated that the Langdale and Riverview reservoirs were determined to be "filled to the point of practically complete elimination of storage as a factor of power production" in 1936; this is within 30 years of the construction of the first Langdale and Riverview dams. Based on that finding, the reservoirs likely have effectively passed the incoming sediment load since at least 1936 as there are no observed recent substantial deposition areas within these reservoirs. The time scale for the process of sediment mobilization during and after dam removal will be important for assessing impacts to aquatic habitat.

Previous sampling of the river bottom in 2019 indicated that the dominant sediment load is composed of a tan-brown, silty, fine to coarse sand with a grain size distribution D_{50} equal to approximately 1 millimeter (mm). The river appears to mobilize this sediment readily and transport it through the Project reach without extensive deposition. This inference is based on a review of the river reach longitudinal elevation profile, which shows a highly irregular thalweg elevation interspersed with exposed bedrock controls upstream of each dam and intervening deep pools (Figure 1-2). Examples of bedrock controls include the high points in river bathymetry near Stations 8,500 feet and 14,500 feet in Figure 1-2. Finer grain size distributions were located in quieter areas affected by backwater and in floodplain deposits, including in samples collected at locations immediately upstream of each dam. The weight of the evidence from the profile and grain size distributions is that locations with greatest potential to accumulate sediments are found between the dam and the first bedrock control upstream.

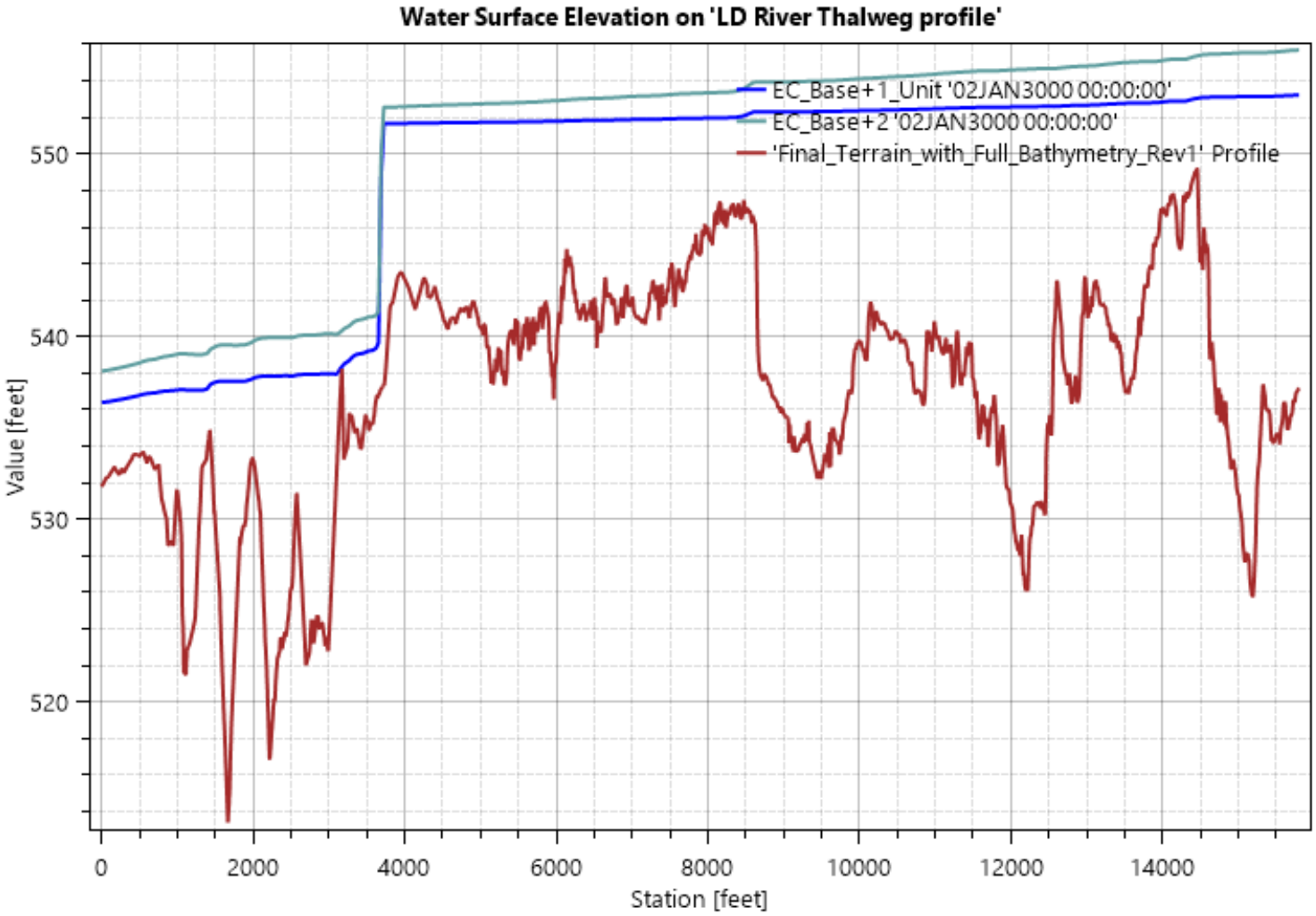

Figure 1-2 Stream Profile above Langdale Dam Showing Variability in Existing Terrain. Base plus one unit (blue line) represents a total flow release of 8,275 cfs from West Point Reservoir. Similarly, base plus two units (green line) represents a total flow release of 15,875 cfs.

2.0 SEDIMENT TRANSPORT ASSESSMENT GOALS AND OBJECTIVES

2.1 Goals and Objectives

The study goals are as follows:

- Update the sediment volume estimate based on additional sediment probes collected in the field in 2021.
- Estimate the length of time required for stored sediment behind Langdale, Crow Hop, and Riverview dams to be transported downstream to Lake Harding.
- Summarize the anticipated post-removal sediment impacts as they relate to stream bank erosion, scouring, incision, accretion stemming from the initial and prolonged changes in flow dynamics during and following dam removal (including analysis of these impacts on aquatic organisms).

2.2 Study Area

The study area consists of the mainstem Chattahoochee River at the Project from the impoundment behind Langdale Dam downstream to the upstream portion of Lake Harding (approximately RM 199.5 to RM 190.0) (Figure 2-1). This extent correlates with the extents of the hydraulic model developed for this Project.

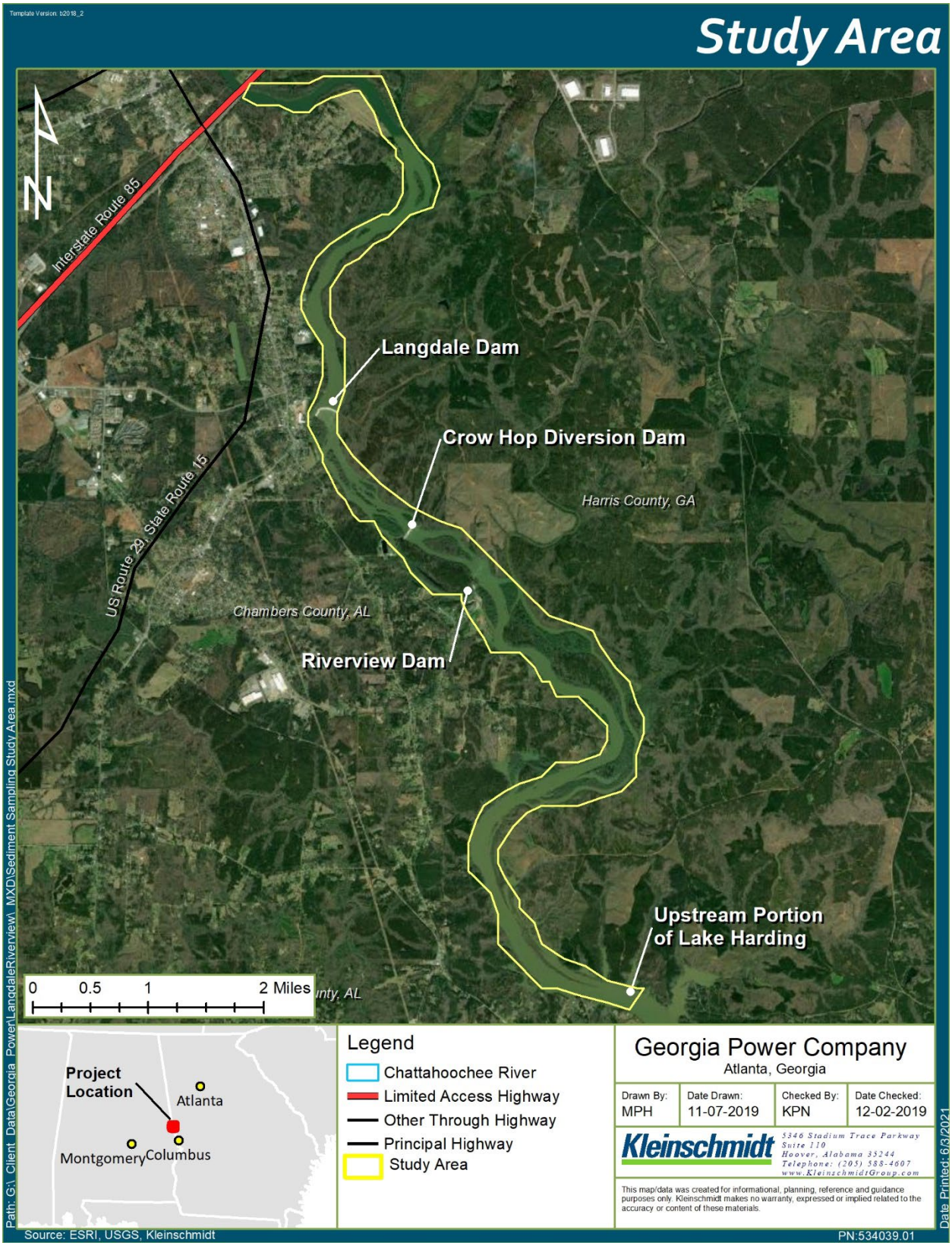

Figure 2-1 Study Area

3.0 METHODS

3.1 Sediment Volume Assessment

To estimate the volume of sediment behind the Langdale and Riverview dams, a series of depth probes were completed in areas with anticipated sediment deposition as inferred from the longitudinal profiles of the existing bathymetry (Figure 3-1). Based on 2019 sediment sampling completed by Geotechnical & Environmental Consultants (GEC), minimal sediment volume (relative to the annual sediment loading in the river) is anticipated behind Crow Hop Dam. The sediment depth was recorded by driving a steel rod or implement to refusal at selected locations in the Langdale and Riverview impoundments. Driving was completed using a Vibrocore, pneumatic hammer, or other consistent method to drive a 1-inch rod (or similar) probe to refusal depth.

An existing conditions two-dimensional hydraulic model (2D model) was developed as part of the *Final Hydraulic and Hydrologic (H&H) Study Report* for this decommissioning Kleinschmidt 2023a). The hydraulic model utilizes a surface that was developed using bathymetric data collected in the river over the model extent. Sediment depth measurements were used to generate a new "estimated sediment extent" (ESE) bathymetry of potential post-removal conditions by lowering the existing bathymetry by the depth of the sediment found in the 2019 and 2021 probes in that area. The ESE bathymetry sought to keep the elevation near the current water's edge the same but taper from that location down to the elevation of refusal. This ESE bathymetry surface was created by using the existing bathymetry, the depth of the sediment at the probe locations, a zero-change in elevation at the water's edge, and limited intermediate points between sediment probes (manually added to make transitions more realistic) to subtract the estimated depth of sediment (down to refusal elevation) from the existing bathymetry. This method preserved some of the natural variability in the riverbed, incorporated the variability in depths of sediment found during the 2019 and 2021 studies, and assumed less adjustment near shore, where the historical stream banks would have been prior to construction of the dams.

This is likely a conservative estimate of the amount of sediment that may move, as it assumes all the sediment above the refusal depth would mobilize, when in implementation, it is likely that some areas of sediment will remain in place post-dam removal. This potential post-removal surface was then compared to the existing bathymetry to estimate a potential volume of sediment that could mobilize post-dam

removal. Sediment depth probes were collected at 20 stations in the Project reach. The ten stations at Langdale extend approximately 5,500 feet upstream (Figure 3-1) until the bedrock control, above which the bathymetry is non-uniform. The ten stations at Riverview extend approximately 7,000 feet upstream (Figure 3-2) until a natural bedrock control where the bathymetric profile resumes natural variability. A subset of these samples (as noted on the figures) included grain size analysis to inform the particle size distribution of sediment at the Project.

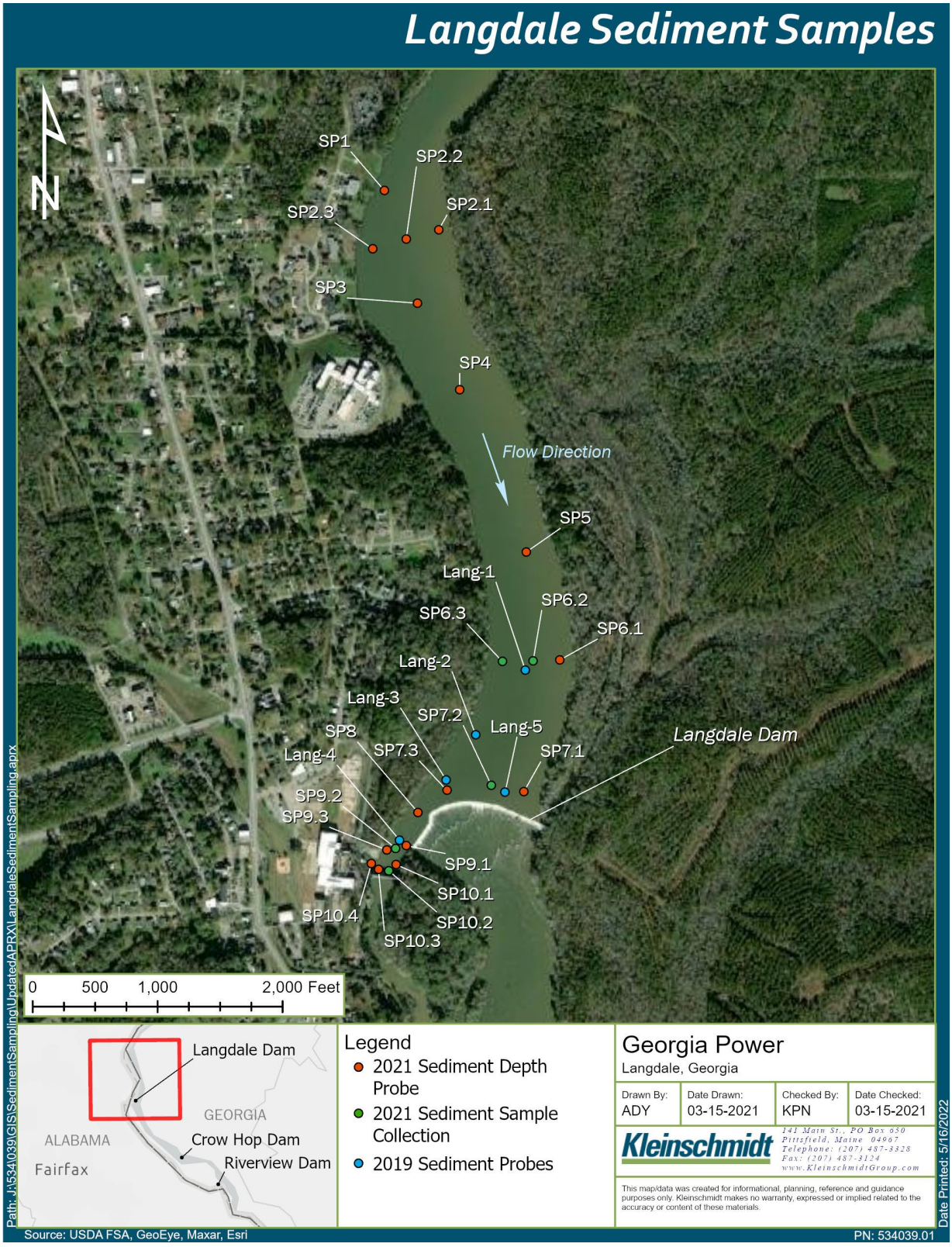

Figure 3-1 Langdale Sediment Probe Locations

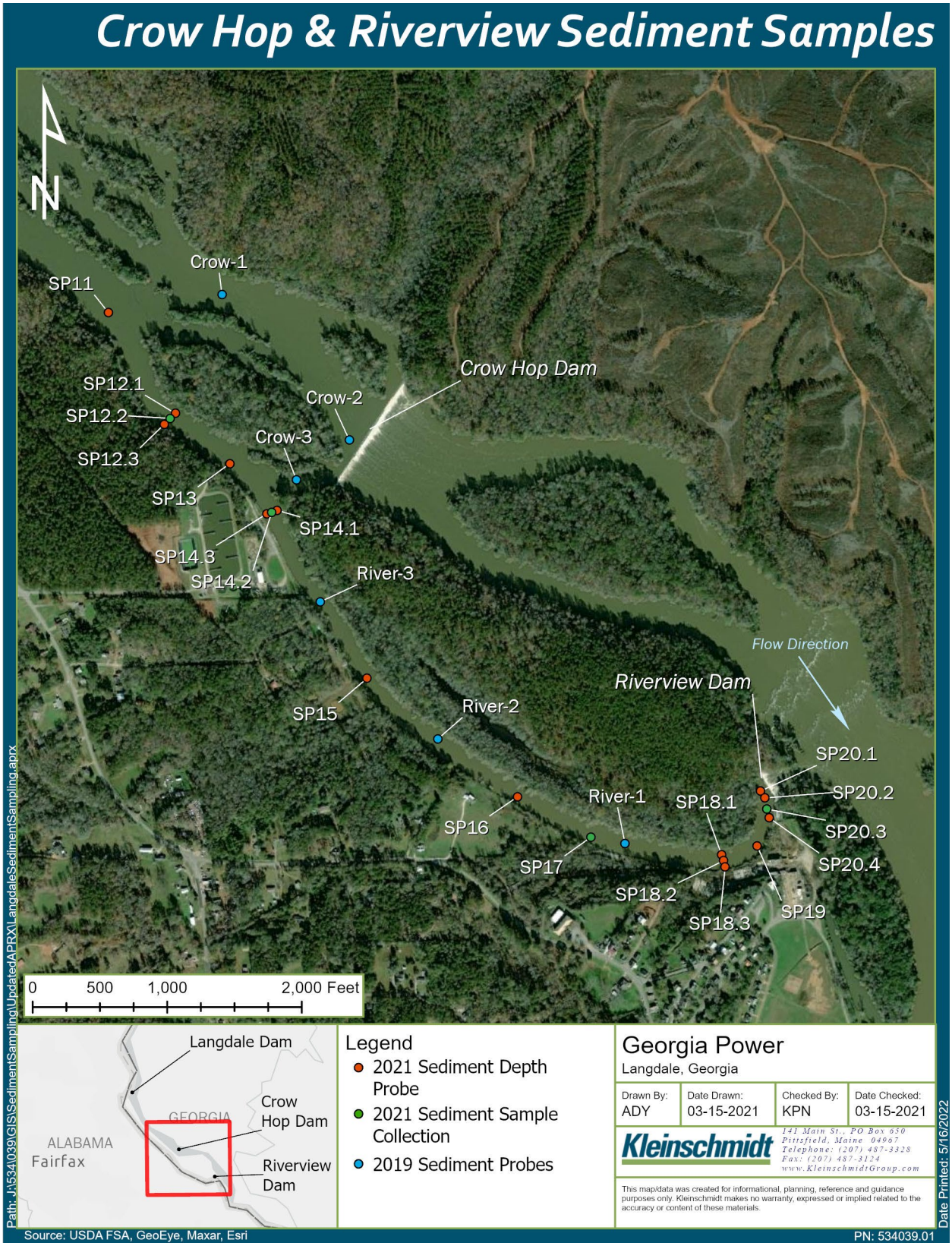

Figure 3-2 Crow Hop and Riverview Sediment Probe Locations

3.2 Sediment Transport Assessment

A sediment transport assessment was performed to estimate the volume of sediment expected to be transported downstream (e.g., estimate of sediment transport capacity at key locations for particular flow range) and the time scale needed to transport the stored sediments downstream to Lake Harding. A sediment transport rating curve was developed at a critical cross-section within each of the following three reaches (Figure 3-3):

- Langdale Dam to Crow Hop Dam
- Crow Hop Dam to Riverview Dam
- Riverview Dam to Lake Harding

The existing 2D hydraulic model was used to select proposed locations for critical cross-sections where sediment transport rating curves were developed. The model was used to generate water surface profiles along multiple pathways through each reach. Critical cross-sections were selected at locations with low water surface gradients. These locations have low velocities, low shear stresses, and low capacity to transport sediment, making them likely locations of sediment deposition post-dam removal and therefore the most critical to sediment transport or deposition in this reach. When the sediment is shown to move through these low-sediment transport capacity areas, it is likely transported out of the Project area (into Lake Harding) just as sediments from all other portions of the Project that generally have higher sediment transport capacity are transported out of the Project.

Locations for critical cross-sections are shown in Figure 3-3. Critical Cross-Section 1 is located about one mile downstream from Langdale Dam (but upstream of Crow Hop Dam) at a location where multiple flow pathways come together with a common water surface elevation. Critical Cross-Section No. 2 is located about ¾ mile downstream from Crow Hop Dam. This cross-section spans three flow pathways separated by two islands. The hydraulic effects of Lake Harding extend upstream to Riverview Dam. Critical Cross-Section 3 was selected on the Chattahoochee River just downstream from Riverview Dam where the river has a relatively wide breadth (and corresponding lower velocities).

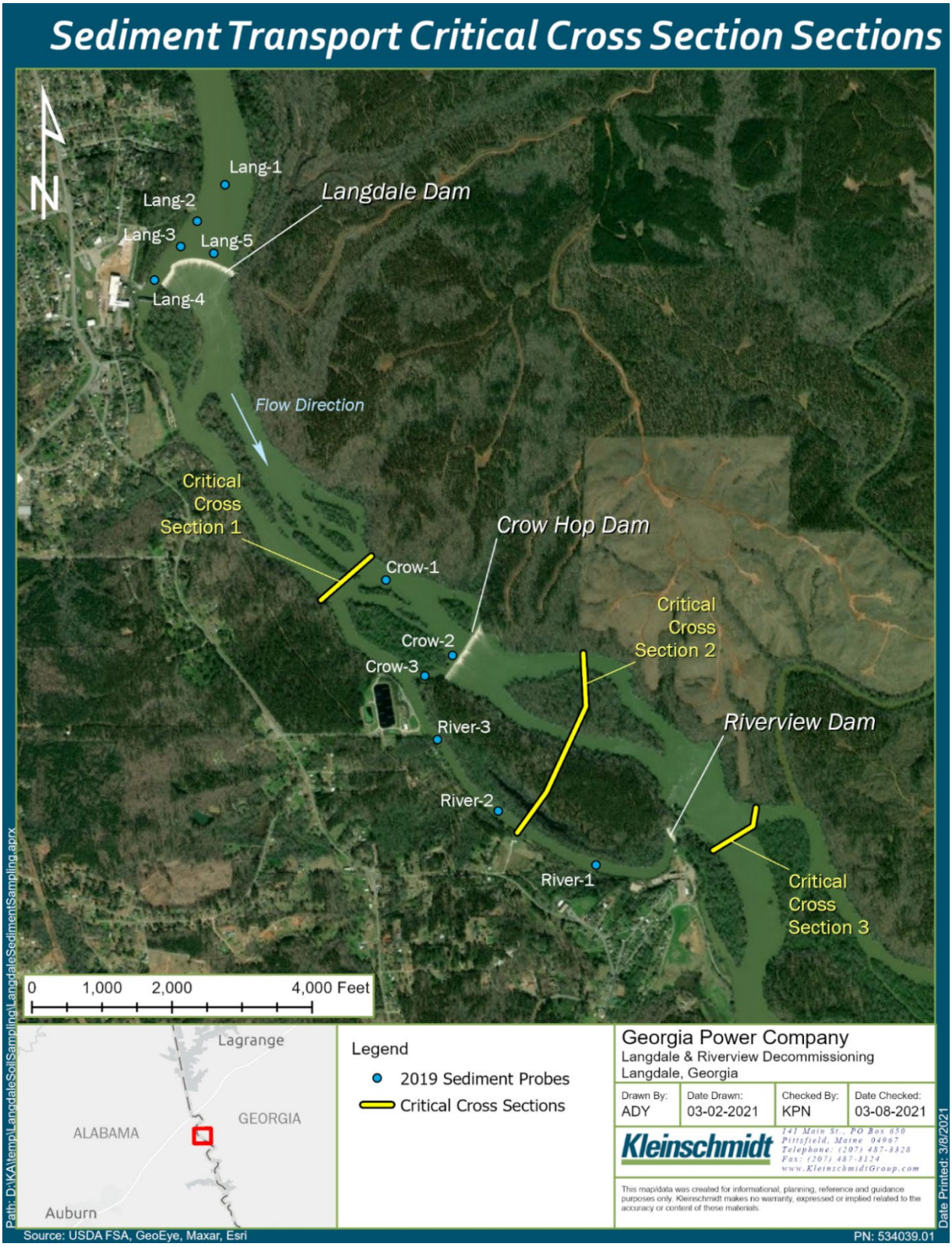

Figure 3-3 Locations of Critical Cross-Sections on the Chattahoochee River where Sediment Transport Rating Curves Were Developed

A sediment transport rating curve is a relationship between water discharge (cubic feet per second (cfs)) and sediment transport rate (acre-feet per day) for a given particle size distribution (further described below). At each critical cross-section, the existing 2D model was used to determine hydraulic conditions, such as shear stress, velocity, and depth, for a range of flows. Hydraulic conditions at each critical cross-section were used to calculate sediment transport rate for different flows, and the 2D model was used to infer what, if any, impact the release of the trapped sediments have on the receiving water body (at that cross section). Discharge in the study reach is regulated by operations at the upstream USACE's West Point Project. Discharge releases from the West Point Project include three different discharge levels through up to three generator units: 675 cfs (base flow through a small capacity generating unit); 8,275 cfs (base flow plus one generator unit); and 15,875 cfs (base flow plus two generator units). As part of the H&H Study (Kleinschmidt, 2022), the 2D model was run for these three discharge levels. In addition, the model was used for the 100-year flood condition (79,000 cfs). To provide more robust sediment transport rating curves, the model was run for two additional discharges: the 2-year flood and the 20-year flood to provide a more detailed rating curve.

A time series hydrograph of discharge in the Chattahoochee River was applied to the sediment transport rating curve developed at each critical cross-section to develop a cumulative potential volume of sediment transported (acre-feet) past each critical cross-section for that hydrograph time period. This analysis was performed for dry, average, and wet year hydrographs. The cumulative volume of sediment transported during each of the hydrograph time periods was compared to the estimated volume of sediment in the reservoirs to evaluate the potential impact on the river and determine a "relative probability of sediment impact" (USBR 2017; Section 4b).

West Point Dam is located on the Chattahoochee River 9.6 miles upstream of Langdale Dam. Since the construction of West Point Dam in 1975, much of the sediment transported by the Chattahoochee River from upstream has been trapped in West Point Lake. This study is focused on the sediment currently stored in the reservoirs upstream from Langdale, Crow Hop, and Riverview Dams. These sediments will become available for transport following removal of the dams.

This analysis assumes that there is a readily available supply of sediment arriving at these cross sections of the given grain size, when in practice, that sediment will need to be eroded from upstream locations first and enter into the flowing water column to be transported past these cross sections. The timing of sediment erosion from above the

dams is not an input in these calculations, as this study assumes the upstream sediment is mobilized in adequate capacity to allow sediment transport at the rates identified in the rating curves developed for this study. As discussed in Section 4, , this assumption is reasonable. There is a decreasing trend of sediment transport capacity as Lake Harding is approached because of the backwater effect from Lake Harding.

If the erosion of the sediment from its pre-dam removal location does not occur, the erosion occurs more slowly, or the eroded sediment volume is less than the conservative assumption of all sediment above the refusal depth mobilizes, the system may stabilize quicker than anticipated in this study.

The time series analyses relied on daily flows in the Chattahoochee. This is referred to as a quasi-unsteady modeling approach in the 1D HEC-RAS model. This approach is appropriate given the relatively short travel time through the study reach.

Another important piece of information needed to calculate sediment transport rating curves and volume of sediment mobilized for a given flow is the grain size distribution of the sediment. The sediment deposits were characterized as fine to coarse silty sand with some fine gravel in 2019 sediment sampling by GEC. To further inform sediment particle sizes within the Project, additional core samples of the sediment deposits were collected and analyzed to determine grain size distribution as part of the Sediment Volume Assessment (Section 3.1). The average of at least three representative sediment sample grain size distributions from upstream of each critical cross section were used to develop a representative grain size distribution for developing the sediment transport rating curve. The representative distributions were used to represent the potential sources of sediment passing that cross section; therefore, the lowest cross section has samples from both the Langdale and Riverview impoundments.

Sediment transport analyses were based on total load methods, which involved the characterization of sediment load by the sum of bedload and suspended load of bed material. The analyses did not account for wash load, which are very-fine sediments that travel in suspension and wash through the river system.

A comprehensive review of total load methods was performed by Yang (1996) and by Garcia (2008). Based on this information, the following four methods were used to calculate total load:

- Engelund and Hansen (1967)

- Yang (1973)
- Ackers and White (1973)
- Brownlie (1981)

It is common to use multiple methods to calculate sediment transport capacity; the median results of these four methods were used to develop a sediment transport rating curve for each critical cross-section. As discussed, historical hydrology was applied to the sediment transport rating curves to estimate the time scale needed to transport the stored sediment downstream to Lake Harding. The preliminary estimates of the total volume of stored sediments as presented in the 2019 H&H study, were further refined as part of this study because more sediment depth probes were collected in the 2021 field effort (Section 3.1).

3.3 Post-Removal Sediment Impacts

Sediment stored upstream from Langdale, Crow Hop, and Riverview dams is expected to be transported downstream to Lake Harding following removal of the three dams. Section 3.2 focused on estimating how long it may take for that process to occur given the assumption that the full amount of sediment would mobilize.

The 2D hydraulic models used to perform the sediment transport assessment and the sediment volume assessment were used to qualitatively assess the following potential post-removal sediment impacts as they relate to initial and prolonged changes in flow and riverine conditions during and following dam removal:

- stream bank erosion – the stream banks just upstream from the removed dams may become vulnerable to erosion until a healthy riparian vegetative community becomes established;
- scouring – the stored sediments are expected to be scoured following removal of the dams. The streambed under the stored sediments is expected to have a relatively stable structure of coarser sediments and bedrock;
- incision – some head cutting is expected to occur in the stored sediments as they erode and are transported downstream;
- accretion – the stored sediments are expected to temporarily accumulate in downstream areas of low shear stress and low velocity. These sediments are expected to be transported to Lake Harding. Some sorting of the sediments transported to Lake Harding is expected to occur. Coarser sediment particles are

expected to deposit near the upstream end of Lake Harding, while finer sediment particles are expected to deposit further downstream within the lake; and

- impacts to aquatic organisms – there may be some temporary impacts to aquatic organisms (fish and macroinvertebrates).

Each of these initial and prolonged impacts was assessed through interpretation by a professional civil engineer specialized in sediment transport and a biologist specialized in freshwater aquatic species. The 2D hydraulic models, observations from site visits, and historical drawings inform interpretations. Spatial patterns of shear stress and velocity were also reviewed to develop anticipated conditions described below for these parameters.

4.0 RESULTS AND DISCUSSION

4.1 Sediment Volume Assessment

Sediment samples were collected from sediments stored behind the Project dams and near the project powerhouses in the Chattahoochee River in 2019 and 2021. These samples were analyzed to estimate the volume of stored sediment, the chemistry of the sediment[6], and the grain size distributions of the stored sediment. Results of the volume and grain size distributions are included in this section. A general summary of borehole data from samples collected in 2019 and 2021 is provided in Table 4-1.

Table 4-1 General Characteristics of Borehole Samples Collected from The Chattahoochee River in 2019 and 2021.

Name	Water Depth (ft)	Sediment Depth (ft)	Sampling Year	Existing Bathymetry Elevation	Comments	ESE Bathymetry Elevation
Q1 - Upstream	4.5	1.5	2021	547.9	Large rocks within sample	546.4
Q2 - Lang A	10	1	2021	539.2		538.2
Q3 - Lang B	9	2.6	2021	541.8		539.2
Q4 - Lang C	3	8	2021	546.6		538.6
Q5 - Lang D	2	8.3	2021	533.9		525.6
Q6 - Riverview	11	2	2021	526.7		524.7
Q7 - Downstream	7	4.8	2021	Not avail.	Downstream of bathymetry points extent	
SP6.2	10	1	2021	539.3	Same as Q2	538.3
SP6.3	7	7	2021	543.3		536.3
SP7.2	9	2.6	2021	541.8	Same as Q3	539.2
SP9.2	3	8	2021	546.6	Same as Q4	538.6
SP10.2	9.2	3.6	2021	541.3		537.7
SP10.7 - Lang. tailrace	2.25	8.3	2021	531.5		523.2
SP12.2	7	4.8	2021	526.9		522.1
SP14.2	4	4.6	2021	530.2		525.6
SP17	6	5.25	2021	528.8		523.5
SP20.3	11	2	2021	526.7	Same as Q6	524.7

[6] The sediment chemistry is provided in the *Final Sediment Quality Study Report* (Kleinschmidt 2023b) and filed with FERC.

Name	Water Depth (ft)	Sediment Depth (ft)	Sampling Year	Existing Bathymetry Elevation	Comments	ESE Bathymetry Elevation
SP1	9.8	0.6	2021	539.6		539.0
SP2.1	6	0.5	2021	544.7		544.2
SP2.2	5	1.75	2021	545.7	Microcore slid down a rock face to refusal	543.9
SP2.3	5	0.25	2021	546.7	Rocks observed in the area	546.5
SP3	5.6	3.3	2021	542.6		539.3
SP4	6.3	4.75	2021	542.4		537.7
SP5	7.6	1.6	2021	542		540.4
SP6.1	8.6	2	2021	539.1		537.1
SP7.1	14	1	2021	537.9		536.9
SP7.3	4	9	2021	542		533.0
SP8	10	1	2021	545.8		544.8
SP9.1	3	13	2021	543.9		530.9
SP9.3	4.5	3.6	2021	544.5		540.9
SP10.1	6	6.25	2021	543.5		537.3
SP10.3	7	5.5	2021	541.9		536.4
SP10.4	5.7	3	2021	545.2		542.2
SP10.5 - Lang. tailrace	6	3.6	2021	528.3		524.7
SP10.6 - Lang. tailrace	7	1.3	2021	527.4		526.1
SP11	7	1.5	2021	526.4	Vibrocore slid down a rock face to refusal	524.9
SP12.1	4.2	8	2021	528.7		520.7
SP12.3	10	2	2021	524.9	Vibrocore slid down a rock face to refusal	522.9
SP13	4.6	4.3	2021	528.7		524.4
SP14.1	5	4.3	2021	530.6		526.3
SP14.3	3.3	5.5	2021	532.2		526.7
SP15	5.5	6.75	2021	530		523.2
SP16	5	5.8	2021	529.6		523.8
SP18.1	5.25	8	2021	529.4		521.4
SP18.2	4.6	2	2021	529.6		527.6

Name	Water Depth (ft)	Sediment Depth (ft)	Sampling Year	Existing Bathymetry Elevation	Comments	ESE Bathymetry Elevation
SP18.3	7	5.5	2021	529.5		524.0
SP19	8.75	0.5	2021	528.2	On rock, with rock in the area	527.7
SP20.1	--		2021		Conditions not safe to access	
SP20.2	5.6	5.5	2021	529.2		523.7
SP20.4	11.25	1	2021	524.6		523.6
PB1 -Lang US	4.5	1.5	2021	547.9	Same as Q1	
PB2 - Lang Mid	2.6	12	2021	547.4		535.4
PB3 - Lang DS	3.2	10	2021	547.6		537.6
Lang-1	9	2.5	2019	540.4		537.9
Lang-2	5	8	2019	545.1		537.1
Lang-3	5	7	2019	544.2		537.2
Lang-4	4.3	5.5	2019	545.9		540.4
Lang-5	9	2.3	2019	540.1		537.8
Crow-1	7	3.7	2019	521.2		517.5
Crow-2	7	3	2019	527.5		524.5
Crow-3	2	6	2019	530.9		524.9
River-1	5	9	2019	529.6		520.6
River-2	4	8	2019	528.4		520.4
River-3	3	8.5	2019	529.1		520.6

The volume of stored sediments in the Chattahoochee River was estimated upstream from Langdale Dam, between Crow Hop Dam and Langdale Dam, and between Riverview Dam and Crow Hop Dam. The estimated volumes in these three reaches based on the volume difference between the existing bathymetry and ESE bathymetry (conservatively assumed all sediment mobilized down to refusal depth in main channel) are as follows:

- Upstream from Langdale Dam – 495,000 cubic yards (306.8 acre-feet)
- Between Crow Hop Dam and Langdale Dam – 108,000 cubic yards (66.9 acre-feet)
- Between Riverview Dam and Crow Hop Dam – 266,000 cubic yards (164.9 acre-feet)

The total volume of stored sediment is estimated to be 869,000 cubic yards (538.6 acre-feet).[7]

The collected sediment samples from 2019 and 2021 at select sites (Figure 3-1 and Figure 3-2) were processed in geotechnical laboratories to characterize sediment grain size distributions. The capacity of the Chattahoochee River to transport sediments stored behind the dams will depend on the grain size distributions of the sediment. Results of the geotechnical laboratory procedures are illustrated in Figure 4-1.

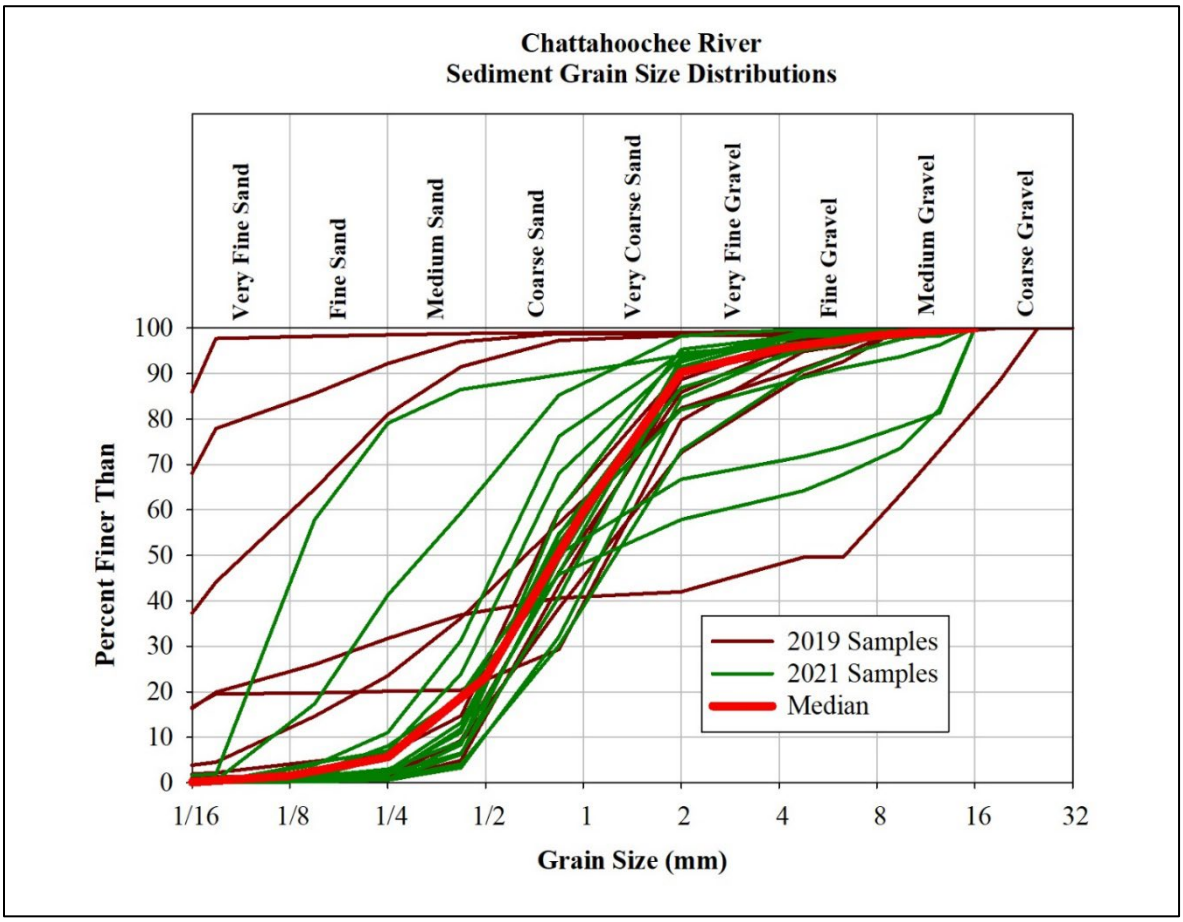

Figure 4-1 Grain Size Distributions of Sediment Stored in the Chattahoochee River from Samples Collected in 2019 and 2021, and a Median Distribution of all of the Samples

[7] This estimate of total sediment volume is based on the difference between the existing and ESE surfaces. Not all of this sediment is anticipated to mobilize, but it is an estimate of the sediment volume present in the Project's impoundments; only a portion of this sediment is anticipated to migrate downstream post-dam removal. Grade stabilization to the Riverview headrace channel is expected to result in the majority of the sediment within the Riverview channel being retained in place post-removal.

There is some variability in the grain size distributions of the sediment samples (Figure 4-1), which is commonly observed in reservoir sediment deposits. While some samples had more silt (these were generally in areas that will not mobilize sediment post-removal) and some more gravel, the central tendency was clear; a median grain size distribution was delineated for use in the sediment transport analyses (thick red line in Figure 4-1).

The percent composition of the median grain size distribution is shown in Figure 4-2. The dominant grain size is coarse sand with a median size (D_{50}) of 0.83 mm.

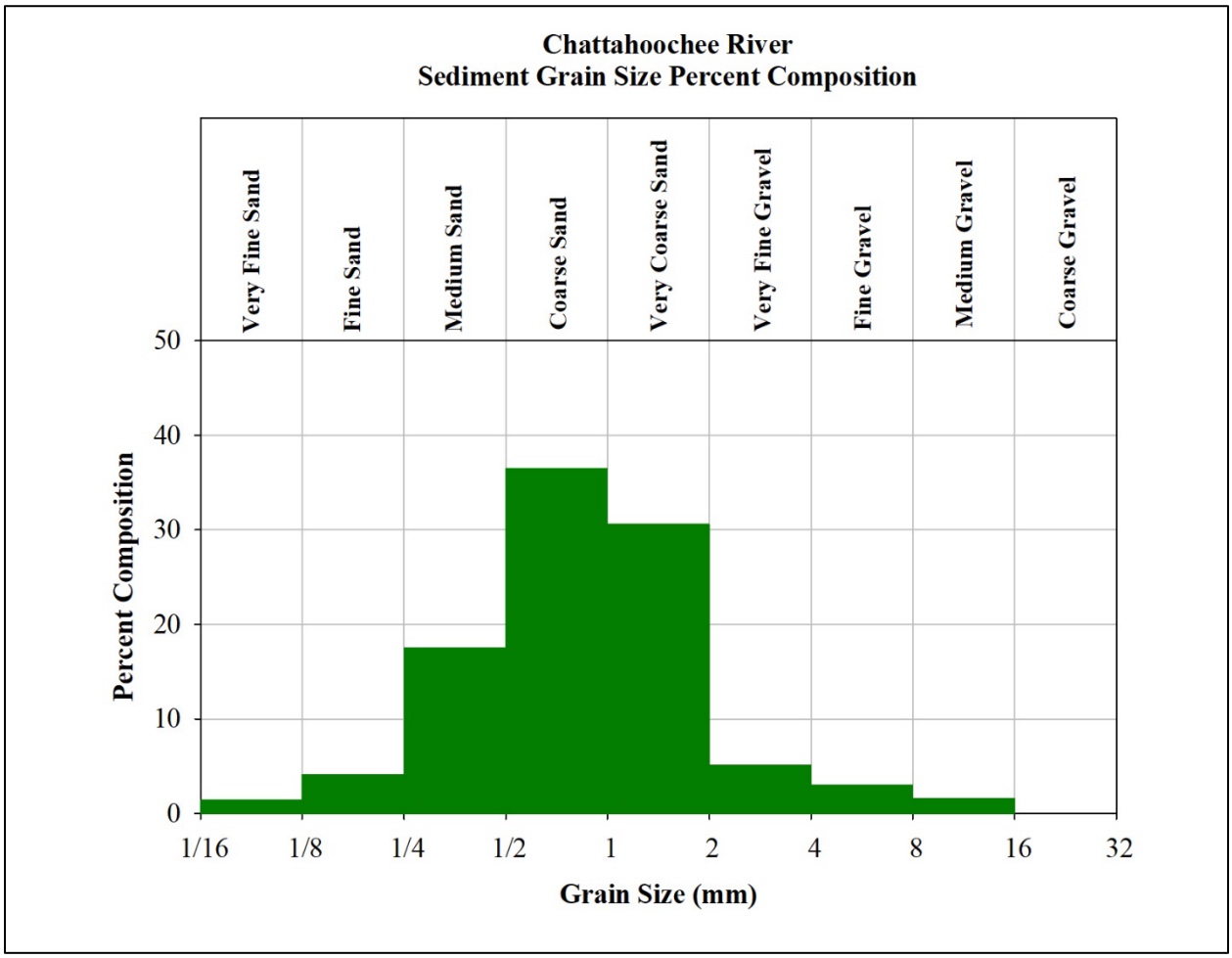

Figure 4-2 Median Composition of Grain Size of Stored Sediments in the Chattahoochee River

4.2 Sediment Transport Assessment

There are two critical thresholds for transport of sediment. The first threshold occurs when the shear stress is sufficient to start moving the sediment as bedload (sediment bouncing or rolling along the bottom of the river). The second threshold occurs when the shear stress is sufficient to start moving the sediment as suspended load (sediment suspended

in the water column). Both of these thresholds depend on the grain size. The shear stress needed to move larger sediment particles is greater than the shear stress needed to move smaller sediment particles.

Brownlie (1981) provides a method to estimate the shear stress sufficient to initiate sediment motion as bedload. Brownlie's method is based on the well-known Shields Diagram. To initiate suspended load, the shear velocity must exceed the particle fall velocity.

A summary of the critical shear stresses needed to initiate bedload and suspended load is listed in Table 4-2 for sediment particles ranging in size from very-fine sand to medium gravel. For example, the shear stress needed to initiate bedload for coarse sand is 0.00763 pounds per square foot while the shear stress needed to initiate suspended load for coarse sand is 0.1862 pounds per square foot or over twenty times greater.

Table 4-2 Critical Shear Stresses Needed to Initiate Bedload and Suspended Load for Sediment Particles Ranging in Size from Very Fine Sand to Medium Gravel

Grain Size Classification	Geometric Mean Grain Size		Critical Shear Stress (pounds per square foot)	
	(ft)	(mm)	Bedload	Suspended Load
Very Fine Sand	0.00029	0.088	0.0037	0.0037
Fine Sand	0.00058	0.177	0.0040	0.0072
Medium Sand	0.00116	0.35	0.0047	0.044
Coarse Sand	0.0023	0.71	0.0076	0.186
Very Coarse Sand	0.0046	1.41	0.0173	0.52
Very Fine Gravel	0.0093	2.8	0.042	1.24
Fine Gravel	0.0186	5.7	0.096	2.6
Medium Gravel	0.037	11.3	0.21	5.3

In addition to grain size distribution, the capacity of the Chattahoochee River to transport stored sediments depends on hydraulic characteristics such as velocity, shear stress, depth (hydraulic radius), and wetted width of the river. These hydraulic characteristics were derived from the 2D hydraulic model at the three critical cross sections shown in Figure 3-3. A total of six different flow conditions were used to derive these data:

- 675 cfs Base flow
- 8,275 cfs Base flow plus one generating unit

- 15,875 cfs Base flow plus two generating units
- 27,300 cfs 2-year flood
- 57,625 cfs 20-year flood
- 75,100 cfs 100-year flood

Average hydraulic characteristics at Critical Cross Sections 1, 2, and 3 are listed in Table 4-3. The assessment focused on the hydraulic characteristics of the channel portion of each cross section. Under high flow conditions the river will inundate the adjacent floodplain. Sediment transport will occur in the channel portion of the river but not be significant in the floodplain. The floodplain portions of a river are often regarded as sediment depositional zones.

Table 4-3 Average Hydraulic Characteristics in Chattahoochee River at Critical Cross Sections 1, 2, and 3 for Discharges Ranging from 675 to 75,100 cfs

Location	Discharge (cfs)	Hydraulic Characteristic			
		Velocity (fps)	Shear Stress (psf)	Depth (ft)	Wetted Width (ft)
Critical Cross Section 1	675	0.69	0.036	2.6	689
	8,275	2.35	0.183	4.6	917
	15,875	3.22	0.302	6.1	943
	28,370	4.01	0.405	8.3	944
	57,625	4.70	0.490	12.7	955
	75,100	5.14	0.540	14.7	955
Critical Cross Section 2	675	0.28	0.008	7.0	589
	8,275	1.37	0.051	9.3	602
	15,875	2.04	0.112	10.8	629
	28,370	2.87	0.214	13.0	659
	57,625	4.13	0.401	18.0	659
	75,100	4.40	0.439	20.1	659
	675	0.22	0.003	4.8	880

Location	Discharge (cfs)	Hydraulic Characteristic			
		Velocity (fps)	Shear Stress (psf)	Depth (ft)	Wetted Width (ft)
Critical Cross Section 3	8,275	1.24	0.042	8.2	899
	15,875	1.67	0.064	10.9	912
	28,370	2.24	0.100	14.3	912
	57,625	3.08	0.179	19.5	912
	75,100	3.43	0.215	21.8	912

The average velocities at Critical Cross Sections 1, 2, and 3 of the Chattahoochee River are shown in Figure 4-3 for discharges ranging from 675 to 75,100 cfs. The highest velocities are at Critical Cross Section 1 and the lowest velocities are at Critical Cross Section 3. This is indicative of the backwater effect from Lake Harding at Cross Section 3 (most downstream). Velocity is one of the more important indicators of the capacity of the river to transport sediment. The decreasing trend of velocity towards Lake Harding suggests a decreasing trend of sediment transport capacity.

Similarly, the average shear stresses at Critical Cross Sections 1, 2, and 3 of the Chattahoochee River are shown in Figure 4-4. The highest shear stresses are at Critical Cross Section 1 and the lowest shear stresses are at Critical Cross Section 3. Again, this is indicative of the backwater effect from Lake Harding lower in the study reach. Shear stress is another important indicator of the capacity of the river to transport sediment. The decreasing trend of shear stress as Lake Harding is approached suggests a decreasing trend of sediment transport capacity.

The average depths at Critical Cross Sections 1, 2, and 3 of the Chattahoochee River are shown in Figure 4-5 for discharges ranging from 675 to 75,100 cfs. The river is generally deeper at Critical Cross Sections 2 and 3, and shallower at Critical Cross Section 1.

The wetted widths at Critical Cross Sections 1, 2, and 3 of the Chattahoochee River are shown in Figure 4-6. The river is generally wider at Critical Cross Sections 2 and 3, and narrower at Critical Cross Section 1.

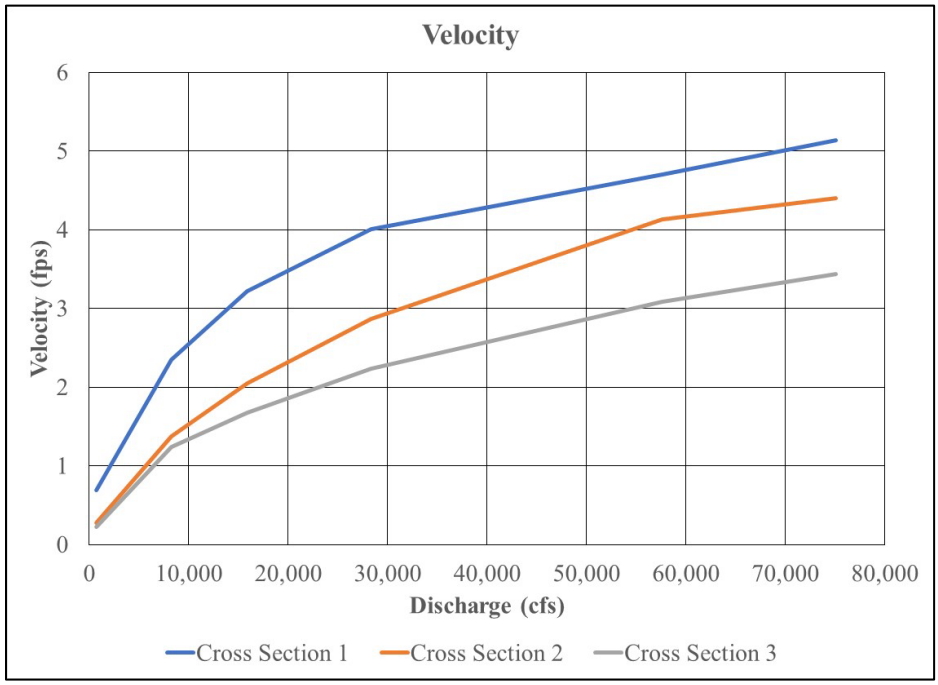

Figure 4-3 Average Velocity at Critical Cross Sections 1, 2, and 3 of the Chattahoochee River

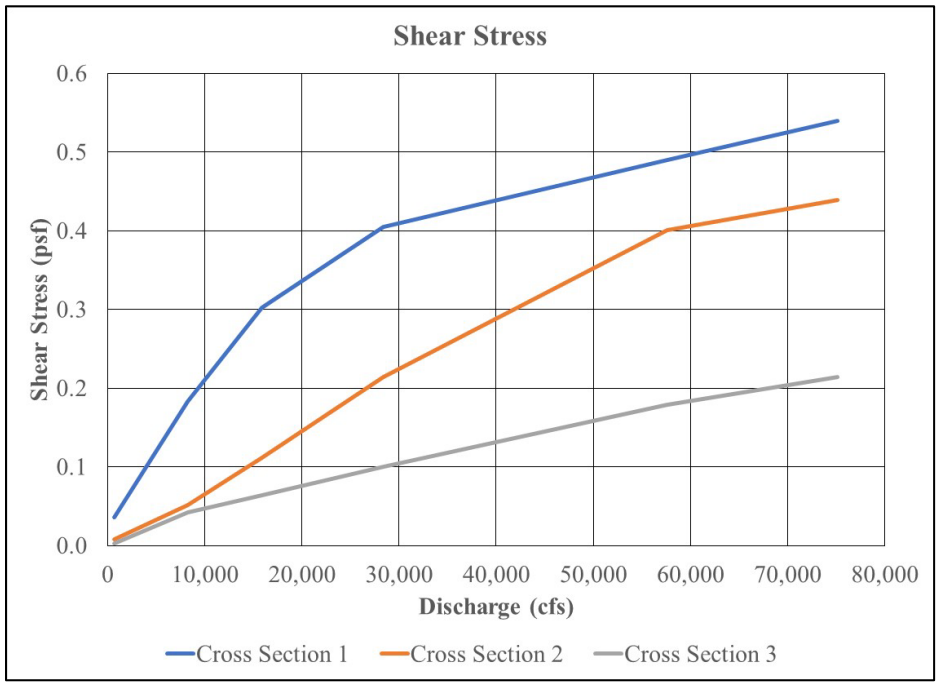

Figure 4-4 Average Shear Stress at Critical Cross Sections 1, 2, and 3 of the Chattahoochee River

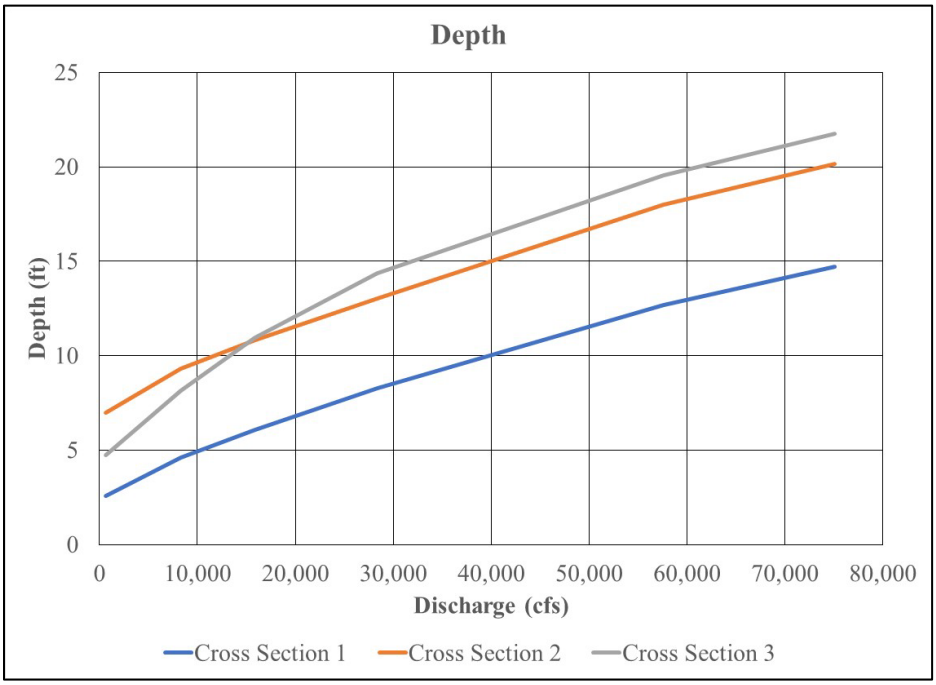

Figure 4-5 Average Depth at Critical Cross Sections 1, 2, and 3 of the Chattahoochee River

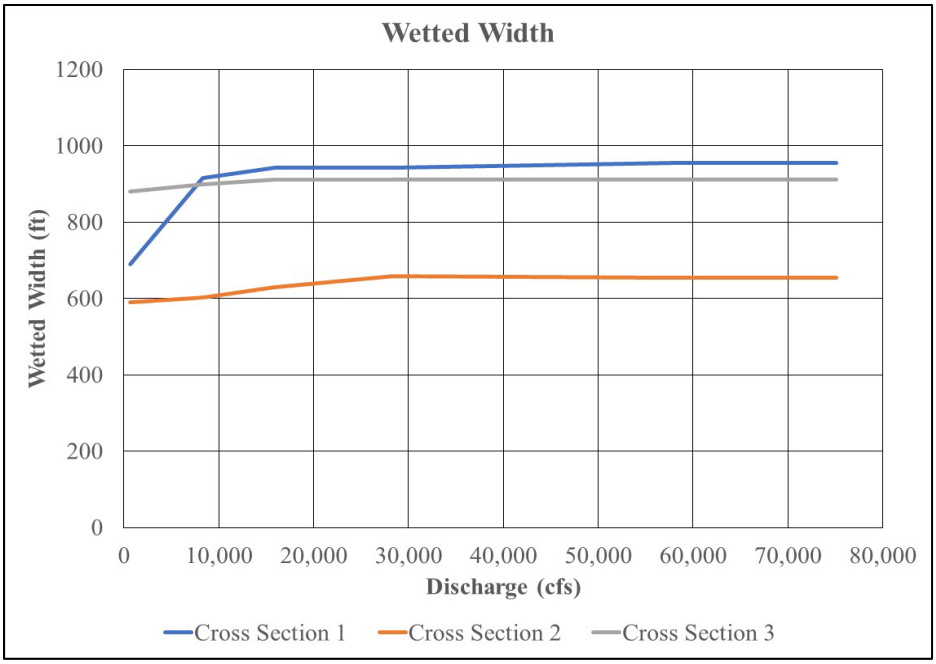

Figure 4-6 Wetted Width at Critical Cross Sections 1, 2, and 3 of the Chattahoochee River

From the sediment grain size and hydraulic characteristics of the Chattahoochee River, sediment transport rating curves were developed for Critical Cross Sections 1, 2, and 3. Rating curves were based on the Engelund Hansen (1967), Yang (1973), Ackers White

(1974), and Brownlie (1981) methods. A median sediment transport rating curve was derived from the four methods and the median curve was used for time series analyses.

To develop the sediment transport rating curves, the following assumptions were made:

- D_{16} = 0.00124 ft (0.38 mm)
- D_{50} = 0.00273 ft (0.83 mm)
- D_{84} = 0.00569 ft (1.73 mm)
- Unit weight of water = 62.4 lb/ft^3
- Unit weight of sediment = 165 lb/ft^3 (samples ranged from 164.3 -167.4 lb/ft^3)
- Gravitational acceleration = 32.2 ft/s^2
- Kinematic viscosity of water = 1.41*10^{-5} ft^2/s
- Fall velocity = 0.31 ft/s
- Hydraulic radius = average depth
- Friction slope = $\frac{\tau}{\gamma R}$
- Dry bulk density of sediment = 100 lb/ft^3

Results of the sediment transport rating curve analyses are summarized in Table 4-4. Results are also illustrated graphically in Figure 4-7, Figure 4-8, and Figure 4-9 for Cross Sections 1, 2, and 3, respectively. Median rating curves are shown in Figure 4-10 for the three cross sections.

From the rating curves shown in Figure 4-10, the sediment transport capacity is relatively high at Cross Section 1 and relatively low at Cross Section 3. This is expected as Cross Section 3 is located in the upper extent of Lake Harding. The effects from Lake Harding are more apparent at Cross Section 3, and they attenuate further upstream.

Table 4-4 Sediment Transport Rates Based on Engelund Hansen (1967), Yang (1973), Ackers White (1973), and Brownlie (1981), and a Median Transport Rate Derived from the Four Methods

Location	Discharge (cfs)	Sediment Transport (cubic yards per day)				
		Engelund Hansen (1967)	Yang (1973)	Ackers White (1973)	Brownlie (1981)	Median
Critical Cross Section 1	670	29	0	0	0	0
	8,275	5,080	3,250	1,128	1,811	2,530
	15,875	20,800	13,190	4,480	8,680	10,940
	28,370	49,900	31,300	10,120	23,500	27,400
	57,625	92,600	61,600	18,690	51,100	56,300
	75,100	128,100	85,400	25,400	75,100	80,200
Critical Cross Section 2	670	0	0	0	0	0
	8,275	166	84	0	28	56
	15,875	1,255	1,054	316	567	811
	28,370	6,880	5,980	2,020	3,870	4,920
	57,625	36,200	29,600	8,740	22,600	26,100
	75,100	47,200	41,200	11,860	32,500	36,900
Critical Cross Section 3	670	0	0	0	0	0
	8,275	151	53	0	13	33
	15,875	528	334	53	155	245
	28,370	1,850	1,362	517	891	1,126
	57,625	8,390	6,880	2,840	5,340	6,110
	75,100	13,700	11,660	4,680	9,480	10,570

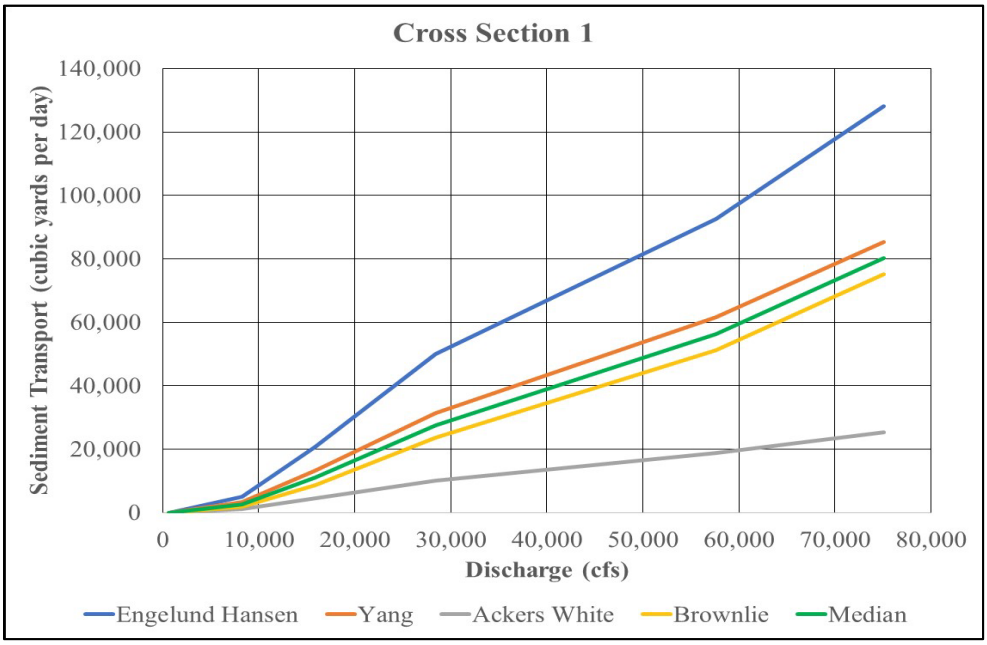

Figure 4-7 Sediment Transport Rates at Critical Cross Section 1 on the Chattahoochee River Based on Engelund Hansen (1967), Yang (1973), Ackers White (1973), and Brownlie (1981), and a Median Transport Rate Derived from the Four Methods

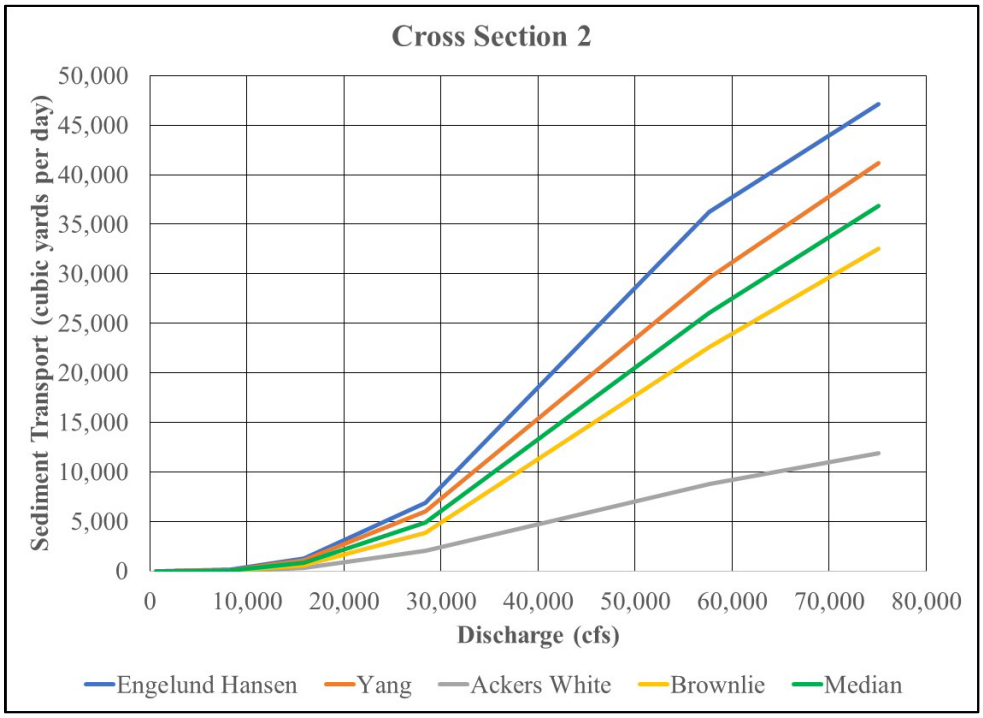

Figure 4-8 Sediment Transport Rates at Critical Cross Section 2 on the Chattahoochee River Based on Engelund Hansen (1967), Yang (1973), Ackers White (1973), and Brownlie (1981), and a Median Transport Rate Derived from the Four Methods

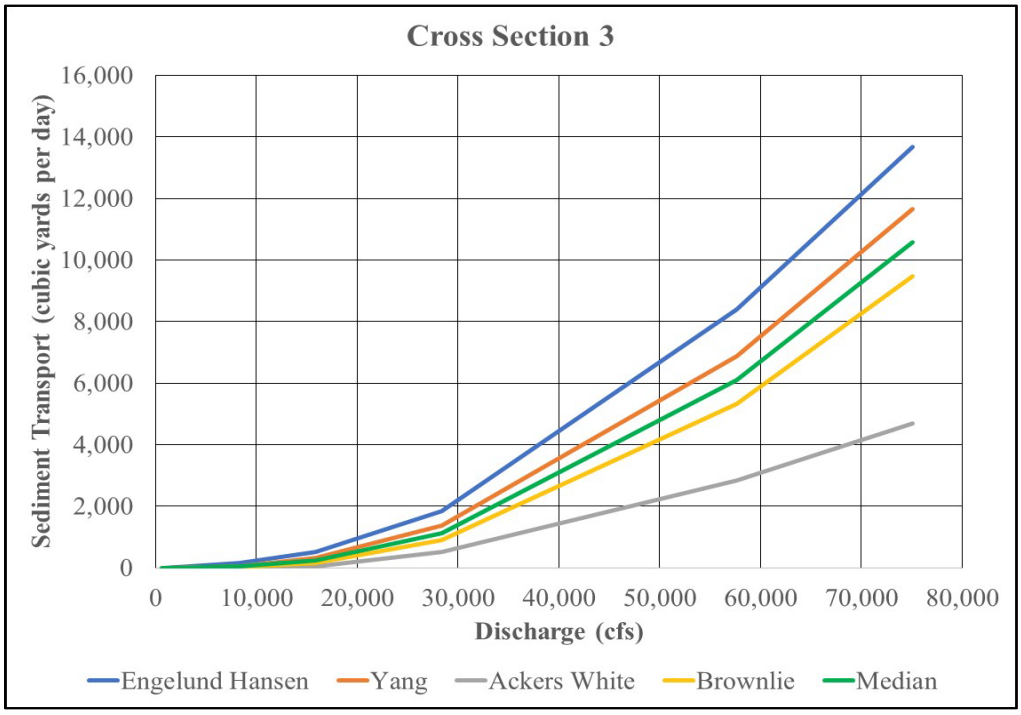

Figure 4-9 Sediment Transport Rates at Critical Cross Section 3 on the Chattahoochee River Based on Engelund Hansen (1967), Yang (1973), Ackers White (1973), and Brownlie (1981), and a Median Transport Rate Derived from the Four Methods

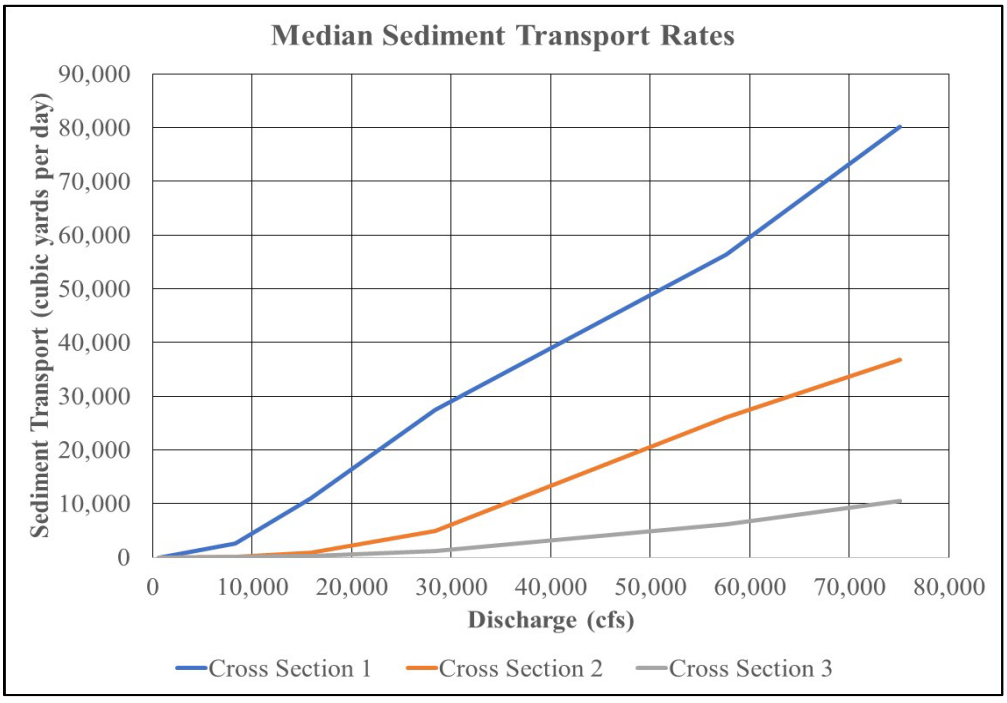

Figure 4-10 Median Sediment Transport Rates at Critical Cross Sections 1, 2, and 3 on the Chattahoochee River

The sediment transport rating curves shown in Figure 4-10 were used to estimate the timeline for transport of stored sediment to Lake Harding. For this analysis, historical flows from U.S. Geological Survey (USGS) Gage 02339500 (Chattahoochee River at West Point) were used. A 46-year period following construction of West Point Dam was the basis of this analysis. This period extended from Water Year 1976 to Water Year 2021.

To characterize the range of hydrologic conditions, the average annual flow was calculated from the daily flows from the USGS Gage in the Chattahoochee River at West Point. These average annual flows were ranked from lowest to highest. The lowest average flow occurred in Water Year 2008 (2,090 cfs) and the highest average flow occurred in 1990 (8,500 cfs). These years were selected for a dry year and a wet year, respectively. A median year (1994) was also selected. This process is often used in FERC relicensing projects.

The selected wet (1990), median (1994), and dry (2008) years were used to illustrate transport of sediment on a daily basis. Results of these analyses are shown in Figure 4-11, Figure 4-12, and Figure 4-13 for Cross Sections 1, 2, and 3, respectively. Most of the time, transport rates are relatively low, and high rates of transport can occur over a small portion of the year for wet and median years. Low rates of transport occur for the entire year during the dry year.

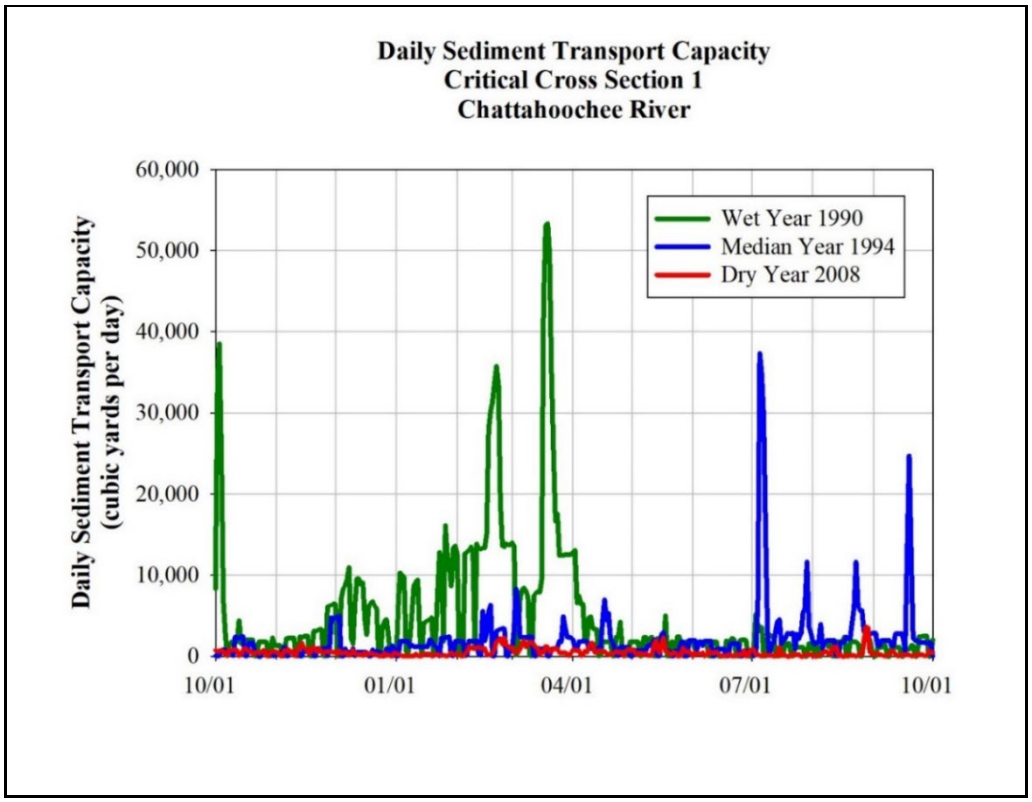

Figure 4-11 Daily Sediment Transport Capacity at Cross Section 1 During Wet (1990), Median (1994), and Dry (2008) Years

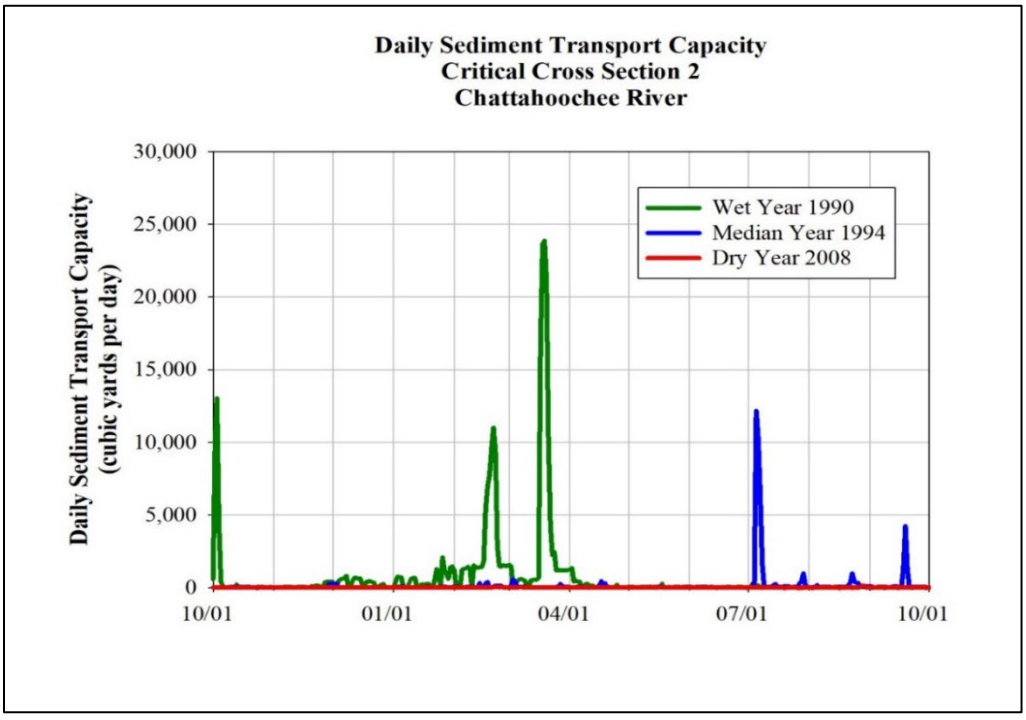

Figure 4-12 Daily Sediment Transport Capacity at Cross Section 2 During Wet (1990), Median (1994), and Dry (2008) Years

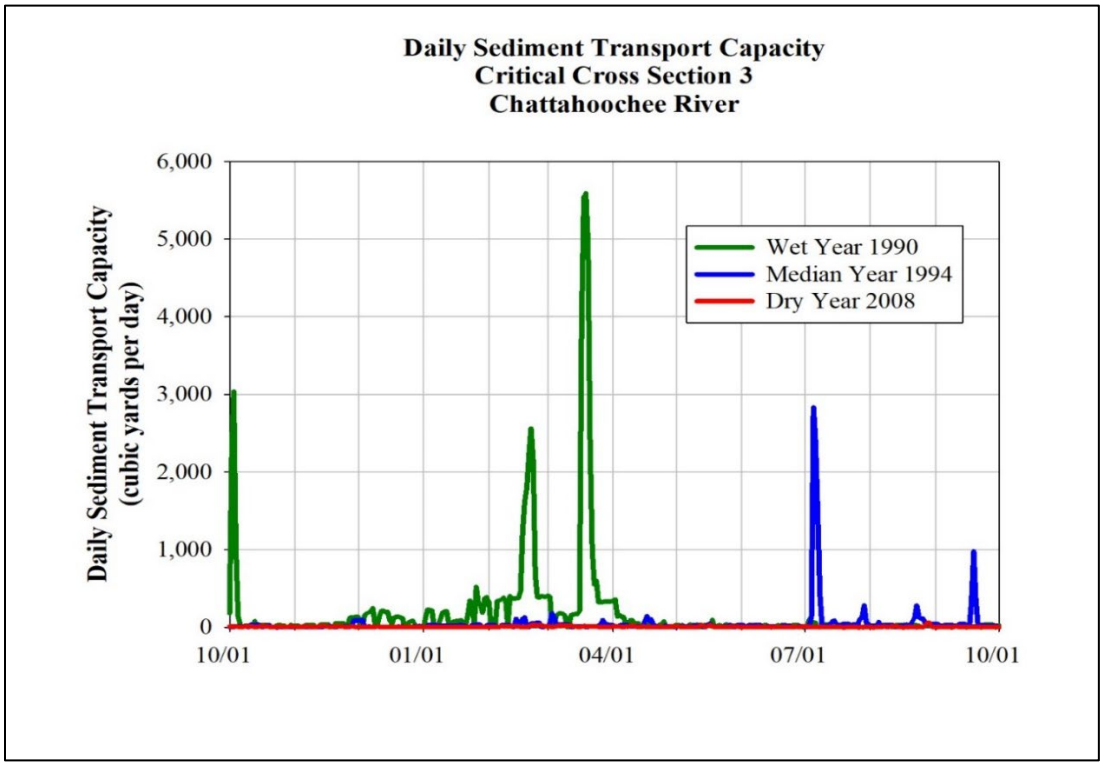

Figure 4-13 Daily Sediment Transport Capacity at Cross Section 3 During Wet (1990), Median (1994), and Dry (2008) Years

Annual sediment transport capacity is shown in Figure 4-14, Figure 4-15, and Figure 4-16 for Cross Sections 1, 2, and 3, respectively. The results shown in these graphics were used to estimate the timeline for transport of stored sediment above Langdale Dam downstream to Lake Harding.

The total volume of sediment stored in the Chattahoochee River upstream from Langdale Dam is conservatively estimated at 495,000 cubic yards (assuming the full estimated volume of sediment mobilizes). In 31 of the 46 years, the flow would be sufficient to transport at least 495,000 cubic yards in one year. During a low flow period from Water Year 2006 to Water Year 2008, it would take three years to transport 495,000 cubic yards. Therefore, it would take approximately 1 to 3 years to transport this volume through Critical Cross Section 1.

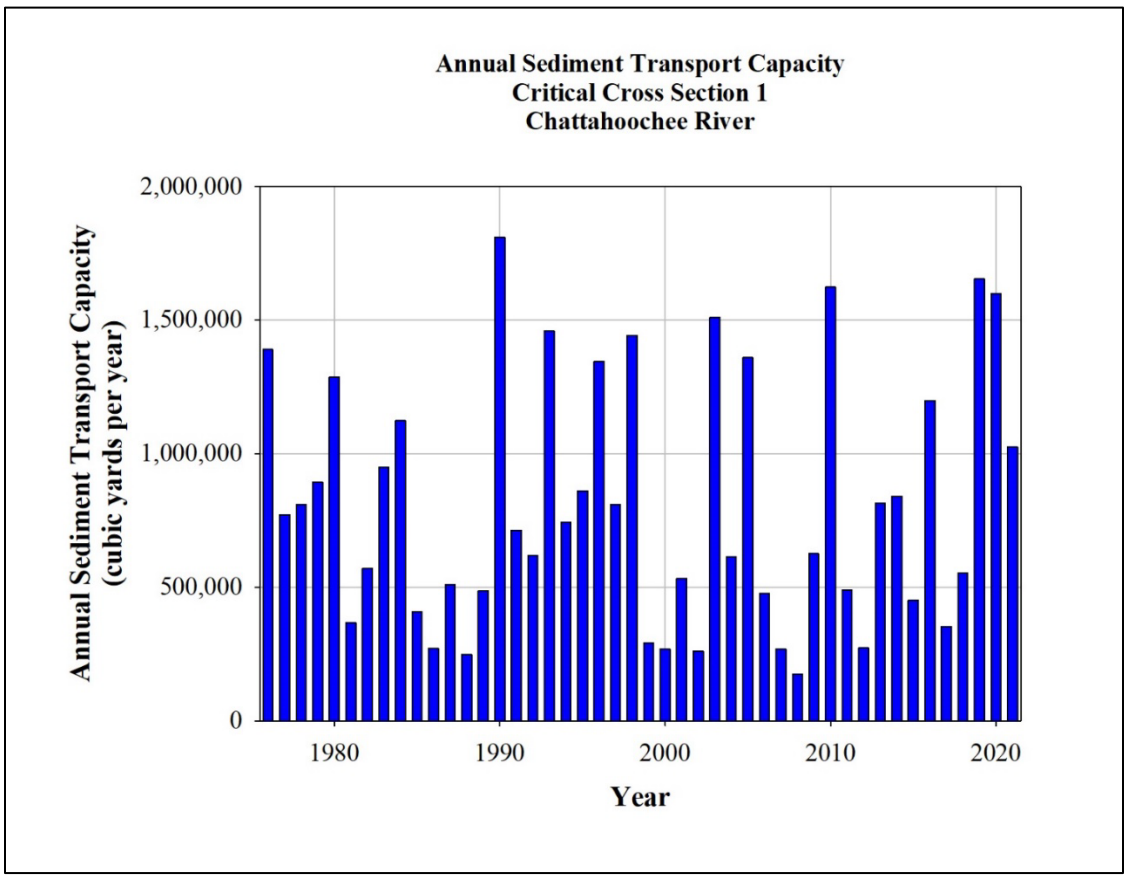

Figure 4-14 Annual Sediment Transport Capacity at Cross Section 1 of the Chattahoochee River, Water Years 1976 Through 2021

The total volume of sediment stored in the Chattahoochee River upstream from Crow Hop Dam/Critical Cross Section 2 is conservatively estimated at 603,000 cubic yards (assuming the full estimated volume of sediment behind Langdale and Crow Hop dams mobilizes). During a high flow period from Water Year 1990 to Water Year 1996, it would take 7 years to transport 603,000 cubic yards. During a low flow period from Water Year 2004 to Water Year 2018, it would take 15 years to transport 603,000 cubic yards. Therefore, it is estimated it would take approximately 7 to 15 years to transport the sediment through Critical Cross Section 2. Some of the sediment stored upstream from Langdale Dam would be transported downstream and would be temporarily stored in the reach between Crow Hop Dam and Langdale Dam before being transported further downstream.

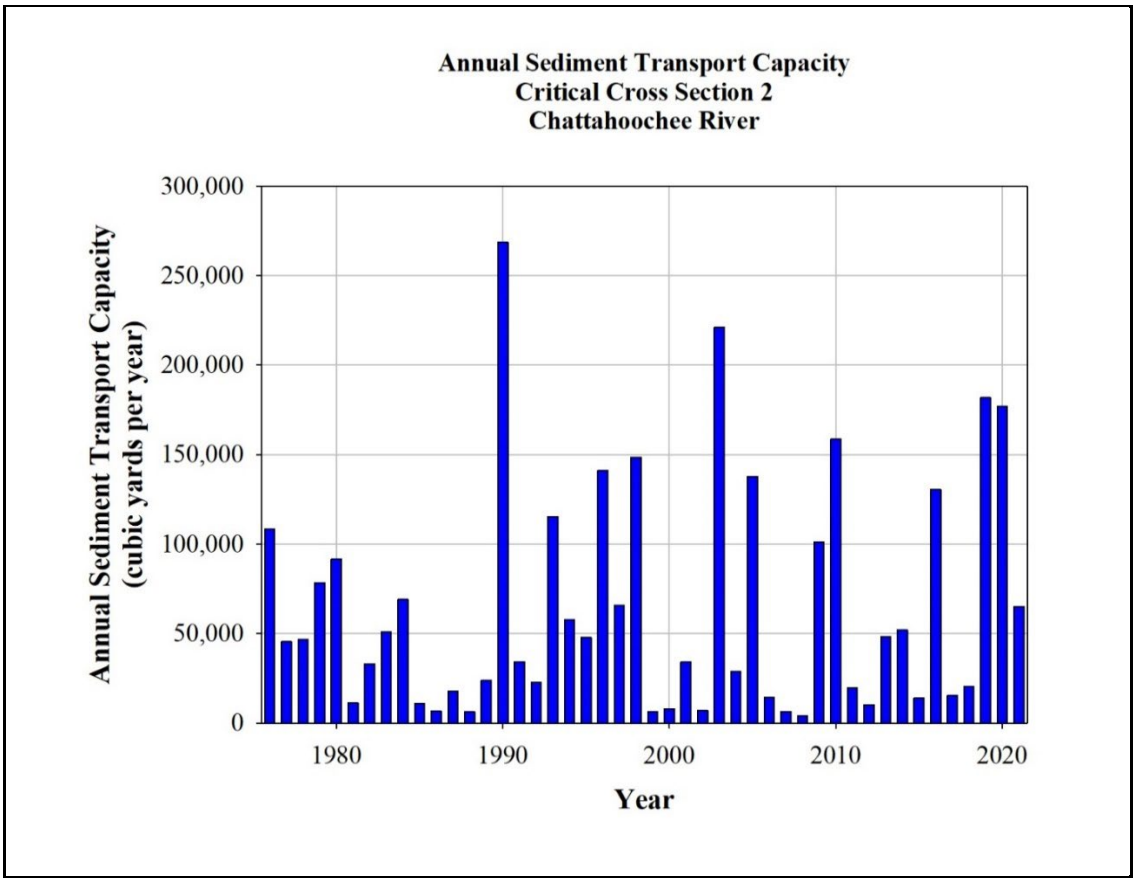

Figure 4-15 Annual Sediment Transport Capacity at Cross Section 2 of the Chattahoochee River, Water Years 1976 Through 2021

The total volume of sediment stored in the Chattahoochee River upstream from Critical Cross Section 3 is conservatively estimated at 869,000 cubic yards (assuming the full estimated volume of sediment behind the three dams mobilizes). From the information shown in Figure 4-16, it is estimated it would take the entire 46 years to transport the sediment through Critical Cross Section 3. Some of the sediment stored upstream from Crow Hop Dam would be transported downstream and would be temporarily stored in the reach between Riverview Dam and Crow Hop Dam before being transported further downstream.

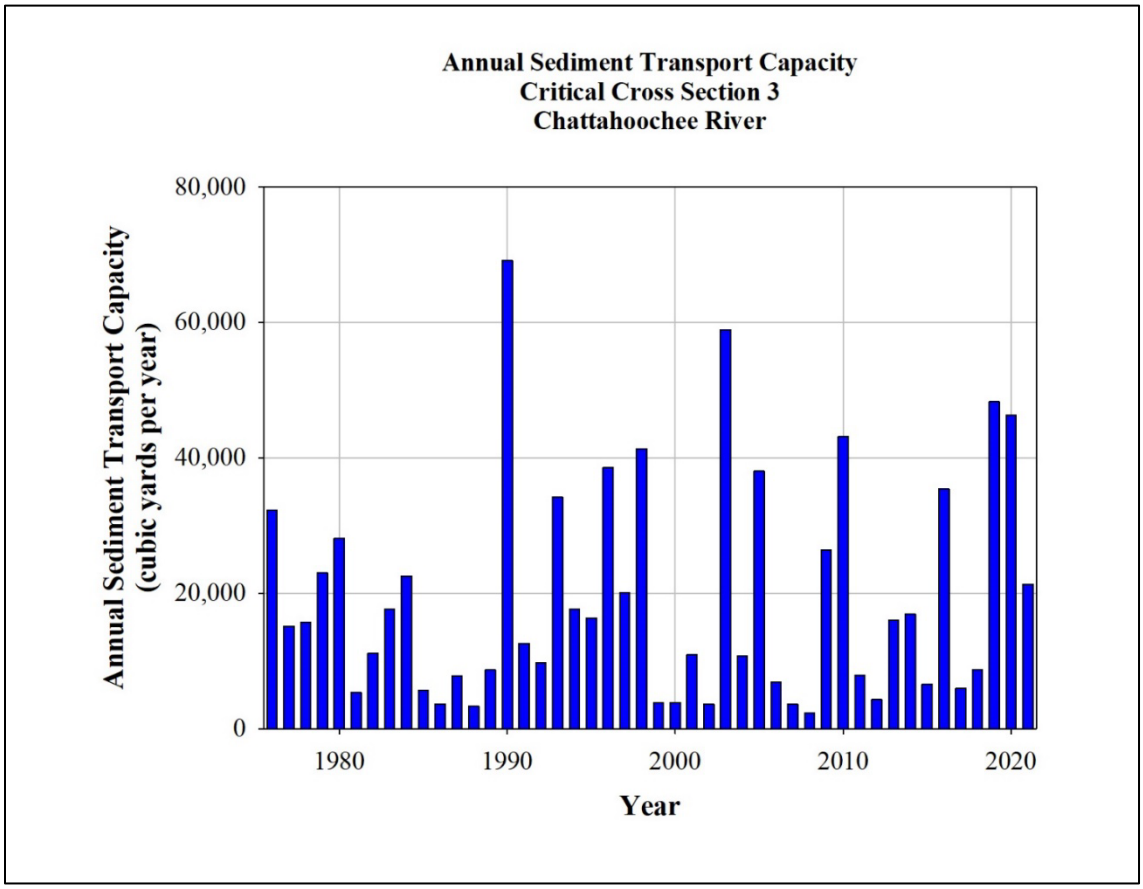

Figure 4-16 Annual Sediment Transport Capacity at Cross Section 3 of the Chattahoochee River, Water Years 1976 Through 2021

Results of these analyses indicate that the capacity of the river to transport stored sediments downstream decreases as Lake Harding is approached. The timelines for downstream transport of stored sediment are summarized as follows:

- Critical Cross Section 1 – it would take approximately 1 to 3 years to transport the upstream stored sediments (for the given cross section geometry)
- Critical Cross Section 2 – it would take approximately 7 to 15 years to transport the upstream store sediments (for the given cross section geometry)
- Critical Cross Section 3 – it would take approximately 46 years to transport the upstream stored sediments (for the given cross section geometry)

The timeline for downstream transport of stored sediments could be accelerated if Lake Harding is drawn down during high flow events, which may increase the velocity and shear stress at the Critical Cross Section 3, speeding up that timeline.

These analyses were based on 46 years of daily flows (averaging out known daily peaking flows at West Point) in the Chattahoochee River downstream from USACE West Point Dam and do not account for the effects of hourly peaking operations at West Point. The timeline for downstream transport of sediment would be accelerated with hourly peaking operations and the sediment transport processes would occur more rapidly than the estimates provided herein. The West Point Project is known to peak for between two and four hours per day during peak demand periods, with either one or two units turning on, resulting in periods of higher flow each day that exceed the daily average flow during this peaking operation.

Further, this sediment transport assessment utilized the same cross section (and corresponding depth, velocity, shear stress) to evaluate sediment transport across all flow ranges and does not account for any natural changes to that cross section. In an unregulated river system, the channel cross section changes in response to hydraulic and sediment inputs, so it is likely that the cross sections used in this assessment will adapt to the changes in hydraulics and sediment supply after the dam removal. These changes will occur so that the system can handle the hydraulic and sediment supply being input to the reach. Thus, in this case, it is feasible, for example, that Critical Cross Section 3 may adapt (potentially by aggrading some sediment on the east channel area and deepening flow in the main channel; resulting in higher velocities and sediment transport capacity) to become more efficient at transporting sediment. This natural evolution of channel geometry occurs on all streams in geologic time and is more evident in shorter periods of time during substantial changes in either the hydrology (e.g., major storm event) or sediment supply (e.g., dam removal, fire in the watershed resulting in increased erosion). It is anticipated there will be a period of adjustment after the initial dam removal as the river adjusts to the new terrain, distribution of flow, and sediment supply, but it is expected that with the daily peaking flows and natural evolution of the cross sections, the period for the system to pass the sediment and stabilize will be shorter than the time periods identified, particularly at the two lower cross sections studied in this report.

Sediment stored upstream from Langdale, Crow Hop, and Riverview dams is expected to be transported downstream to Lake Harding following removal of the three dams. Given that the 1936 (Eakin) report identified that the impoundments were essentially full over 80 years ago, the system has been managing natural annual inputs of sediment without substantial storage in the impoundments over the past approximately 80 years (although sediment inputs likely were reduced after the construction of West Point Project).

4.3 Post-Removal Sediment Impacts

4.3.1 General Impacts

At the upstream end of Lake Harding (near Riverview Dam), the riverbed is multi-threaded. This morphological type is typically observed when rivers flow into lakes or reservoirs and can be symptomatic of an oversupply of sediment.

The 2D hydraulic models used to perform the sediment transport assessment and the sediment volume assessment was used to qualitatively assess the following potential post-removal sediment impacts as they relate to initial and prolonged changes in flow and riverine conditions during and following dam removal:

- stream bank erosion – the stream banks just upstream from the removed dams may become vulnerable to erosion until a healthy riparian vegetative community becomes established. However, in Kleinschmidt's experience, the natural seed bed in the impoundment sediment is ready to start growing as soon as it is exposed, and natural revegetation is expected to establish good vegetative cover (thereby reducing bank erosion) within 6 months to 2 years post-removal in most areas of sediment that are exposed post-removal. In general, the existing water line will move towards the middle of the river post-removal, so unless there was some unnatural dredging or excavation near shore (resulting in steep banks), the river is expected to return towards its historical streambeds, leaving portions of the existing bank as more upland-like post-dam removal.
- scouring – the stored sediments are expected to be scoured following removal of the dams due to the change from lower to higher velocity areas in the impoundment. The streambed under the stored sediments is expected to have a relatively stable structure of coarser sediments and bedrock, as the channel used to flow on its historical streambed pre-dam construction. This historic stream bed is evidenced by bedrock outcroppings in the impoundment and the refusal elevations in the sediment boring locations.
- incision – some head cutting is expected to occur in the stored sediments as they erode and are transported downstream. Historical tributaries to the Chattahoochee River will regain a non-impounded connection to the river; however, if the tributaries' flow regimes have changed since the dam was constructed, it may be that the water velocity in that tributary has increased, which may result in some incision at the tributary. This is understood to be an effect of changes within that tributary's watershed/runoff that has been "hidden" by the impoundment when the dams are in place. Based on a review of tributaries contributing to the impoundments behind these dams, most tributaries are in forested watersheds or are relatively small, thereby limiting the likelihood of substantial incision post-dam

removal, given the bedrock controls that set the river bottom elevations in the Chattahoochee River.

- accretion – the stored sediments are expected to temporarily accumulate in downstream areas of low shear stress and low velocity (e.g., near shore, in side channels, or on floodplains) until remobilized by higher flows of suitable depth, velocity, and/or shear stress. These sediments are ultimately expected to be transported into Lake Harding, as has happened with the annual sediment load since the reservoirs were deemed to be "full" in the 1930's (Eakin, 1936). The volume of sediment released into Lake Harding from the dam removals will be orders of magnitude less than the volume of Lake Harding. Some sorting of the sediments transported to Lake Harding is expected to occur. Coarser sediment particles are expected to deposit near the upstream end of Lake Harding, while finer sediment particles are expected to deposit further downstream within the lake. Further discussion on these aspects of accretion is provided in this section.
- impacts to aquatic organisms – there may be some short-term impacts to aquatic organisms (fish and macroinvertebrates) (Bednarek 2001). The transport of stored sediment may temporarily accumulate at downstream locations before reaching Lake Harding. This could result in temporary impacts to preferred fish spawning grounds such as gravel beds. Sediments transported through the affected reach could scour periphyton (i.e., attached algae) and macroinvertebrates resulting in short-term effects to some fish species that utilize these as food sources (Wood and Armitage 1997).

4.3.2 Interpretation of Sediment Transport Results

Cross Sections 1, 2, and 3 are located 0.97, 1.70, and 2.26 miles downstream from Langdale Dam, respectively. Shear stresses at these three locations are plotted longitudinally in Figure 4-17 with respect to thresholds for bedload transport. At the base flow (675 cfs), the river would be able to transport fine sand at Cross Sections 1 and 2, but not at Cross Section 3. With the base flow combined with one unit running (8,275 cfs), the river would be able to transport fine sand at all three locations.

At the base flow (675 cfs), the river would be able to transport coarse sand at Cross Section 1, but not at Cross Sections 2 and 3. With the base flow combined with one unit running (8,275 cfs), the river would be able to transport coarse sand at all three locations.

The base flow (675 cfs) would not be sufficient to transport very-fine gravel at all three cross sections. With the base flow combined with one unit running (8,275 cfs), the river would be able to transport very-fine gravel at Cross Sections 1 and 2 but not at Cross

Section 3. With the base flow combined with two units running (15,875 cfs), the river would be able to transport very fine gravel at all three cross sections.

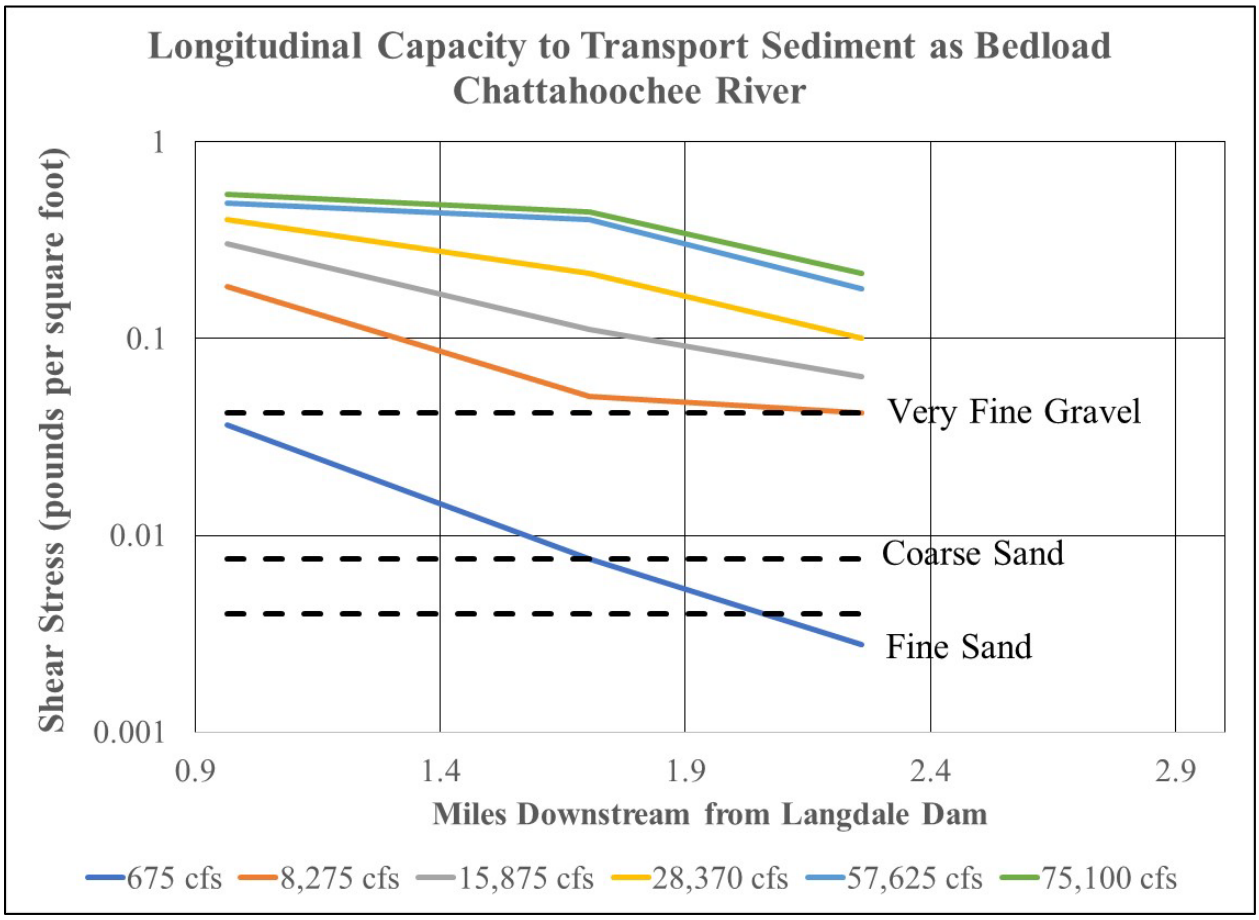

Figure 4-17 Longitudinal Profiles of Shear Stress in the Chattahoochee River Downstream from Langdale Dam with Respect to Thresholds for Bedload Movement

Shear stresses at Cross Sections 1, 2, and 3 are plotted longitudinally in Figure 4-18 with respect to thresholds for suspended load transport. At the base flow (675 cfs), the river would be able to transport fine sand in suspension at Cross Section 1, but not at Cross Sections 2 and 3. With the base flow combined with one unit running (8,275 cfs), the river would be able to transport fine sand in suspension at all three locations.

With the base flow combined with one unit running (8,275 cfs), the river would not be able to transport coarse sand in suspension at all three cross sections. During the 100-year flood (75,100 cfs), the river could transport coarse sand in suspension at all three cross sections.

During the 100-year flood (75,100 cfs) the river would not have the capacity to transport very-fine gravel in suspension.

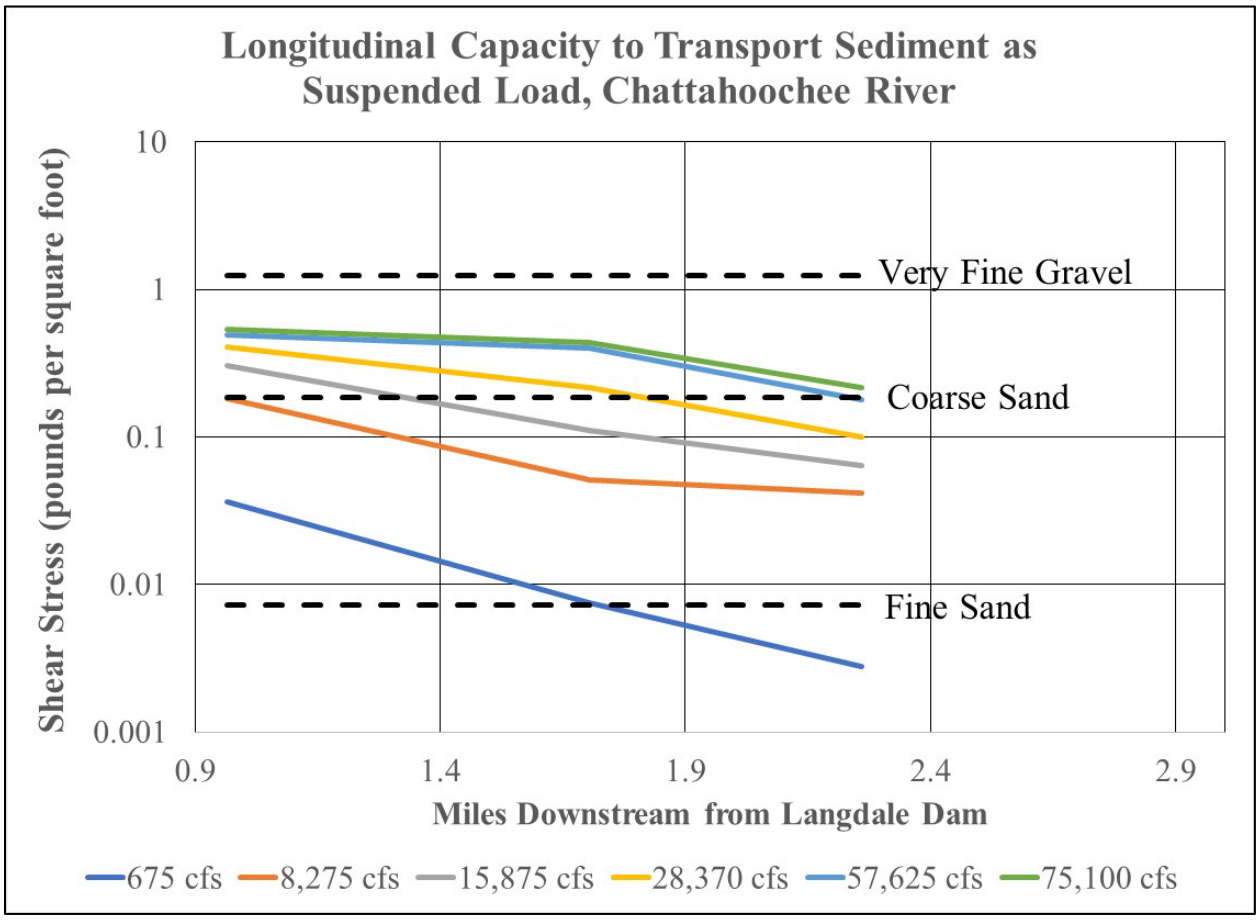

Figure 4-18 Longitudinal Profiles of Shear Stress in the Chattahoochee River Downstream from Langdale Dam with Respect to Thresholds for Suspended Load Movement

5.0 REFERENCES

Ackers, P., and W.R. White. 1973. Sediment Transport: New Approach and Analysis, Journal of Hydraulic Engineering, ASCE, 99(11), 2041-2060.

Bednarek, A. T. (2001). Undamming rivers: a review of the ecological impacts of dam removal. Environmental management, 27(6), 803-814.

Brownlie, W.R. 1981. Prediction of Flow Depth and Sediment Discharge in Open Channels, Report No. KH-R-43A, Keck Laboratory of Hydraulics and Water Resources, California Institute of Technology, Pasadena, California.

Eakin, Henry M. 1936. Silting of Reservoirs. Technical Bulletin No. 524. Division of Research, Soil Conservation Service, United States Department of Agriculture. July 1936.

Eakin, Henry M. and Carl B. Brown. 1939. U.S. Department of Agriculture. Silting of Reservoirs. Technical Bulleting No. 524. Revised and Issued November 1939. United States Department of Agriculture Washington, D.C.

Engelund, F. and E. Hansen. 1967. A Monograph of Sediment Transport in Alluvial Streams, Teknisk Vorlag, Copenhagen, Denmark.

Garcia, Marcelo M. 2008. Sedimentation Engineering, Processes, Measurements, Modeling, and Practice, Chapter 2, Sediment Transport and Morphodynamics, ASCE Manuals and Reports on Engineering Practice No. 110.

Kleinschmidt Associates. 2023a. Langdale and Riverview Project Decommissioning, Final Hydraulic and Hydrologic Modeling Report, prepared for Georgia Power Company, October 2023.

Kleinschmidt Associates. 2023b. Langdale and Riverview Project Decommissioning, Final Sediment Quality Study Report, prepared for Georgia Power Company, October 2023.

US Bureau of Reclamation (USBR). 2017. Dam Removal Analysis Guidelines for Sediment. December 2017.

Wood, P. J., and P. D. Armitage. 1997. Biological effects of fine sediment in the lotic environment. Environmental Management 21(2):203–217.

Yang, C.T. 1973. Incipient Motion and Sediment Transport, Journal of Hydraulic Engineering, ASCE 99(10), 1679-1704.

Yang, Chih Ted. 1996. Sediment Transport Theory and Practice, McGraw-Hill.

APPENDIX A

DOCUMENTATION OF CONSULTATION

Langdale and Riverview Projects - Public Comment Matrix	
Comment by Lanny Bledsoe (Landowner) Accession No. 20201104-0020	**Georgia Power's Response**
I have a personal interest in this matter as I am the largest landowner directly affected by the destruction of the three dams at Langdale, Crow Hop, and River View. I own all of the islands in the river between Langdale and River View and they will be adversely affected if the dams are gone, as will all the shoreline. •The destruction will be caused by the overwhelming flood of water turned loose each day when West Point dam generates. The water in the Langdale/River View area rises several feet quickly with great force and through the years we have seen the effect it has, even with the dams in place. It is my opinion that the dams now act as a protecting buffer and keep the water hitting the islands with full force. However, two islands have already been washed away and are gone. •Some years back, the water force had washed to bank away in the bend above the River View dam and a portion of Riverdale Mill was in danger of falling into the river. I was manager of the mill at that time and a meeting was held with Corp of Engineers to review the situation. Alabama Sector Howard Heflin was in the meeting and after reviewing the evidence, Senator Heflin directed the Corp to line the bank with riprap to protect it. According to tests Georgia Power has done, they are concerned about this same area with the dams down and plan to protect it. •Based on the latest Georgia Power studies just released, at minimum flow level, when West Point is not generating, only canoes and kayaks can travel on the river. These dams have been in place for a hundred years, the ponds behind the dams is a great place to boat, fish, and have recreation. The city of Valley should be greatly concerned about this, they're going to lose an asset. •I've heard a lot of talk about concern for Shoal Bass as a reason to take the dams down. The state of Georgia showed little concern for any fish when they put striped bass in the river. Years ago, we could catch crappie and shad by the thousands at River View dam. Not they are gone, wiped out by the striped bass. Striped bass are not a problem above the dams now, but they will be with the dams gone. •The River View powerhouse was built across an arm of the river. One side of the building was on the Alabama bank and the other side on Hodge Island. The tail race from the powerhouse flowed as it had before the powerhouse was built. Georgia Power's plans are to take the powerhouse down and block the flow of the river. Hodge Island, which I own, will not be an island but will be joined by land to the Alabama side. This will change the original flow of the river and they should not have the power to do this. They used the powerhouse for a hundred years and now want to block the river. •I grew up in River View 84 years ago. The river has been a wonderful place for everyone to enjoy. It has been an asset here for all of my life. Now it will change. Georgia Power used these dams all these years for their business and the generation of electricity. They no longer have any use for the dam, and their plan would change what has been in place, for all of these years. This should not happen.	Georgia Power will evaluate potential erosion on the privately owned islands as part of removal process and post removal monitoring and would, if needed, propose to provide some protection potentially using rock from the dam removal. The Decommissioning Plan (Section 4) specifically addresses bank stabilization in the Riverview headrace channel. The Applicant Prepared Environmental Assessment describes the change in river navigability of various vessels in Section 11. To address public access to the river, Georgia Power is proposing to extend three existing public boat ramps into the river to at least two feet of water depth at the new water surface elevation (measured at West Point minimum flow) following dam removal and river stabilization (see Section 11 of the APEA). Additionally, as discussed in the Recreation Section 11, there are nearby access points at Lake Harding and West Point that provide powered boat recreational access. Regarding effects on Shoal Bass, Georgia Power implemented a Pre-Removal Shoal Bass Abundance and Tracking Study to provide baseline information on Shoal Bass. In addition, Georgia Power is proposing to implement a Post Removal Shoal Bass Abundance and Tracking Study to assess effects of the removal on Shoal Bass in the Project area. Section 8 of the APEA discusses effects of dam removal on Shoal Bass and other aquatic organisms. Georgia Power performed studies to address effects of the decommissioning including: river hydraulics and hydrology (H&H) and potential impacts to aquatic organisms (including shoal bass). Study reports applicable to these comments include: • Final H&H Report • Final Water Quality Report •Draft Sediment Quality Study Report •Draft Sediment Transport Study Report •Final Potential Effects on Dam Removal on Shoal Bass •Pre-Dam Removal Shoal Bass Abundance and Tracking Study Report •Freshwater Mussel Survey Report
Comment by GADNR - WRD Accession No. 20201104-5105	**Georgia Power's Response**
GA Power has completed a series of studies addressing potential changes to existing resources associated with the dam removals. These studies included modeling changes to river hydraulics and hydrology, sediment characterization, and potential impacts to aquatic wildlife, water quality, and cultural resources. Comprehensive modeling of flow distribution and velocity, shoal habitat, and potential impacts to aquatic resources such as the endemic Shoal Bass and native mussel community was also presented. •Wildlife Resources Division finds the studies to be adequate, and we support Georgia Power's indication that sediment distribution will be further investigated during the decommissioning process in consultation with FERC and US Fish and Wildlife Service National Fish Passage Program.	Thank you for your comment and continued consultation.

•We request that WRD be informed of related findings. •Georgia Power maintains ongoing consultation with WRD regarding the decommission and removal of these hydropower projects, and we support the proposed actions and associated studies. The removal of these projects is expected to restore connectivity and riverine characteristics in this reach of the Chattahoochee River, which is expected to benefit fish, wildlife, and aquatic resources. The WRD will remain engaged in the decommissioning process.	
Comment by Valley City Council District 5 (Kendall Andrews) Accession No. 20201105-5000	**Georgia Power's Response**
I have made previous comments opposing the removal of the Langdale, Riverview, and Crow Hop dams. These dams provide the City of Valley and its citizens with an invaluable natural resource. I have many concerns about their removal that I will list below: •The H&H model presented by Georgia Power predicts that both boat ramps located in the City of Valley will be dewatered post removal. Even if the boat ramps are extended, the amount navigable water with a powerboat will be so little that they will be useless. The City of Valley has a large number of older citizens that use the river on a daily basis with powerboats. Many of these people will not be able to drag a canoe or paddle a kayak through the shoals that will be present. Also, many people with disabilities will face the same barriers. Their access to the river will be gone •The restoration of suitable shoal bass habitat has been mentioned as a possible benefit to the removal of the dams. I disagree with this. The only example of dam removal where shoal bass were present in the surrounding waters was in Columbus, GA with the removal of the City Mills and Eagle Phenix dams. Removal of these dams had an extremely negative effect on the shoal bass in this area. There has been no research done on the shoal bass population located in the reservoir below Langdale Dam. It is common knowledge that this is where the best population of shoal bass exists in this area. I believe that there should be some data obtained from this area, if for nothing else, to create a baseline for comparison post removal of the dams. •The virtual format of the public meeting made participation very difficult for much of the community. The list of attendees submitted shows that there were few participants that were not associated with an agency or group. This is one of the only chances for members of the community to have their questions answered and to voice their opinions. The removal of these dams has the potential to devastate the local community. The public meeting should not be rushed to meet a deadline. •I would like to respectively request that the Federal Energy Regulatory Commission require Georgia Power to hold an in-person public meeting once the nation pandemic ends. This will give everyone the opportunity to participate before any decisions are finalized.	The Applicant Prepared Environmental Assessment describes the change in river navigability of various vessels in Section 11. To address public access to the river, Georgia Power is proposing to extend three existing public boat ramps into the river to at least two feet of water depth at the new water surface elevation (measured at West Point minimum flow) following dam removal and river stabilization (see Section 11 of the APEA). Additionally, as discussed in the Recreation Section 11, there are nearby access points at Lake Harding and West Point that provide powered boat recreational access. Regarding effects on Shoal Bass, Georgia Power implemented a Pre-Removal Shoal Bass Abundance and Tracking Study to provide baseline information on Shoal Bass. In addition, Georgia Power is proposing to implement a Post Removal Shoal Bass Abundance and Tracking Study to assess effects of the removal on Shoal Bass in the Project area. Section 8 of the APEA discusses effects of dam removal on Shoal Bass and other aquatic organisms.
Comment by Chattahoochee Riverkeeper (Chris Manganiello) Accession No. 20201105-5077	**Georgia Power's Response**
… Our comments will focus on 3 topics: recreational access; construction process; and aquatic resources. •Recreational Access: -CRK supports safe, continued and enhanced access to the River in the middle of the Project area's middle (Cemetery Road) and the bottom (Lake Harding). This type of access will enable paddlers of varying skill to enter and exit the project area at multiple points. Some existing access points will require extensions and improvement when dam removal reduces pool elevations and river flows. -CRK also supports a new public recreational access point to the river above the Projects. For example, a new proposed park above Langdale on river right would provide safe access above the exposed Langdale shoals.	The new Langdale Park is described in Section 11 of the Applicant Prepared Environmental Assessment and is also referenced in the Decommissioning Plan and 90 percent drawings for the Langdale Project (Appendix D). In addition, the Decommissioning Plan provides details on the construction process, schedule, and post removal monitoring. Regarding effects on Shoal Bass, Georgia Power implemented a Pre-Removal Shoal Bass Abundance and Tracking Study to provide baseline information on Shoal Bass. In addition, Georgia Power is proposing to implement a Post Removal Shoal Bass Abundance and Tracking Study to assess effects of the removal on Shoal Bass in the Project area. Section 8 of the APEA discusses effects of dam removal on Shoal Bass and other aquatic organisms.

For example, see slide 55 from the October 5, 2020 Public Meeting. CRK understands that the City of Valley, Alabama may assume local control and responsibility for recreational assets in the Project area. Foot access to the islands and the river is something that might be considered. CRK understands the managed nature of West Point Dam releases and river flows adds significant risk for people who choose to recreate in the Project area. If a single access point from Langdale to the large adjacent island was available, anglers might appreciate foot access from the west bank to the shoals. •Construction Process: -CRK understands that Georgia Power is developing the details of the construction plan. CRK anticipates those details in the next round of public engagement and document release. CRK is very interested to learn about Georgia Power's plans for egress and river access to conduct physical construction and removal activities. -Additionally, we look forward to reviewing the dam removal schedule, that is, which dam will be removed first and by what methods, and what will Georgia Power intend to do with the dams' debris. -Finally, CRK would also like to know if Georgia Power has any additional plans for pre-construction and post-construction monitoring during the construction process, and specifically for sediment movement as well as quantity and quality. •Aquatic Resources: -CRK is optimistic that removal of the dams in the Project area will enhance aquatic habitat and connectivity for species, including shoal bass. While CRK understands that Georgia Power cannot stock any aquatic species without coordinating with Georgia's Department of Natural Resources Wildlife Resources Division, it would be helpful to understand Georgia Power's plans for pre-construction and post-construction monitoring of aquatic species. -For example, is there a base-line for the shoal bass population, and if post-construction monitoring revealed poor conditions, what might Georgia Power do to improve conditions? It is our understanding that post-construction monitoring in Columbus after the removal of Eagle & Phenix and City Mills dams has been extremely limited. •In closing, CRK remains supportive and hopeful about the prospect of barrier removal in the Middle Chattahoochee River region. Given the unprecedented size, scale and scope of this proposed project, pre- and post-construction monitoring of multiple natural and aquatic resources would greatly aid in the general understanding of the impacts and consequences of barrier removal in large, regulated southeastern river systems.	Georgia Power performed studies to address effects of the decommissioning, as described in the following study reports: • Final H&H Report • Final Water Quality Report •Draft Sediment Quality Study Report •Draft Sediment Transport Study Report •Final Potential Effects on Dam Removal on Shoal Bass •Pre-Dam Removal Shoal Bass Abundance and Tracking Study Report •Freshwater Mussel Survey Report •Archaeological Testing of Two Sites On The Chattahoochee River, 9HS30 AND 9HS31, Harris County, Georgia •Archaeological Survey of 20 Acre Island in the Chattahoochee River, Harris County, GA •Archaeological Reconnaissance Survey of the Chattahoochee River, Harris County, GA •Langdale Dam Marine Remote Sensing in the Chattahoochee River, Harris County, GA •Assessment of Effects for Archaeological Sites 9HS30, 9HS525, 9HS526, 9HS527, 9HS528, 9HS529, 9HS530, 9HS531, 9HS532, and 9HS533.
Based on our review of the study report, we have the following comments: • On Page 5 of the draft study report, GPC stated "searches for relevant contemporary USGS and ADEM data were not found." ADEM sampled Moores Creek, which is one of the main tributaries to the Riverview Project Reservoir, in 2014 and 2016. This data can be found using the Water Quality Data Portal. • We request Georgia Power to continue informing the ADEM of water quality and sediment distribution findings during the decommissioning process.	These comments are addressed in the Final Water Quality Study Report.
Comment by American Rivers Accession No. 20201106-5010	**Georgia Power's Response**
American Rivers fully supports and encourages the removal of these projects for the reasons outline below: •Public safety improvements: On 4/1/2019, one drowning and three injuries occurred at Crow Hop diversion dam as a result of a kayaking accident. Eliminating the low head dams will significantly improve public safety in this reach of river, especially for water recreation activities.	Georgia Power performed studies to address effects of the decommissioning including: river hydraulics and hydrology (H&H), sediment characterization (quality and quantity), potential impacts to aquatic organisms, water quality, and cultural resources. Georgia Power is filing an Applicant Prepared Environmental Assessment (which incorporates study results and analyzes effects on environmental, recreational, and cultural resources), Dam Decommissioning Plan, and the following study reports:

•Sediment release: Based on data provided by GPC, impounded sediment volumes behind the low head dams are negligible compared to overall sediment volume in the system below West Point dam, which has become a sediment sink since its construction. Release of impounded sediments at the removed Riverview & Langdale Dams will renourish sediment-starved downstream habitat for the benefit of aquatic species. •River flow: By definition, low head dams do not store water, therefore removal of the dams will not cause significant changes in flow volume or timing, as the flow of the Chattahoochee River is controlled by US Army Corps of Engineers (USACE) operations at West Point Dam. USACE may elect to hold back flow in West Point Lake during dam removal construction to provide optimal conditions for instream activities. Presence of naturally occurring bedrock shoals will act as grade control for the river once dam removal construction is completed. •Flood risk: According to GPC studies, removing the dams will not increase flood risk, and in fact reduces flood risk at the 1% return, particularly upstream of the Langdale Dam. American Rivers concurs with this finding. •Boat access: due to water elevation changes associated with dam removal, some areas of the river may not be navigable during low flow conditions, even for low draft paddling boats such as canoes and kayaks. However, the public safety benefits of dam removal are critical given the recent fatality and injuries at the Crow Hop dam. It may be possible to negotiate short term flow augmentation from West Point Lake to support schedule water recreation events. It is important to point out that more than adequate access to flat water boating for canoes, kayaks, jon boats, and deeper draft motorized boats exists at West Point Lake and Lake Harding in proximity to the project area. •Aquatic habitat connectivity and species impacted: GA Wildlife Resources Division finds that dam removal will support aquatic habitat connectivity and access for shoal bass, a high-value, rare species identified as a priority species in the GA State Wildlife Action Plan. Chattahoochee Riverkeeper finds the potential reconnection of up to 11 miles of shoal bass habitat and encourages habitat enhancements be included in the project. American Rivers concurs with these positions and supports dam removal for aquatic habitat connectivity to benefit shoal bass. •Infrastructure: American Rivers finds that GPC plan for dam removal incorporates structural adjustments to accommodate continued treated effluent discharges to the Chattahoochee River. •Public engagement: Based on materials provide by GPC, American Rivers finds that public engagement was sufficient to provide critical information about the project to surrounding property owners, river interest groups, cognizant agencies, and stakeholders. •Water quality: American Rivers has documented the impacts of low head dams on water quality including decreased dissolved oxygen and increased thermal profile at numerous locations around the country. We concur with GPC's finding that dam removal will not negatively impact the water quality of the Chattahoochee River.	• Final H&H Report • Final Water Quality Report •Draft Sediment Quality Study Report •Draft Sediment Transport Study Report •Final Potential Effects on Dam Removal on Shoal Bass •Pre-Dam Removal Shoal Bass Abundance and Tracking Study Report •Freshwater Mussel Survey Report •Archaeological Testing of Two Sites On The Chattahoochee River, 9HS30 AND 9HS31, Harris County, Georgia •Archaeological Survey of 20 Acre Island in the Chattahoochee River, Harris County, GA •Archaeological Reconnaissance Survey of the Chattahoochee River, Harris County, GA •Langdale Dam Marine Remote Sensing in the Chattahoochee River, Harris County, GA •Assessment of Effects for Archaeological Sites 9HS30, 9HS525, 9HS526, 9HS527, 9HS528, 9HS529, 9HS530, 9HS531, 9HS532, and 9HS533.
Comment by American Rivers Accession No. 20201106-5011 - Duplicate of above comments	**Georgia Power's Response - see above**
Comment by Chattahoochee Riverkeeper (Chris Manganiello) Accession No. 20201106-5011 - Duplicate of above comments	**Georgia Power's Response - see above**
Comments by Federal Energy Regulatory Commission Accession No. 20201118-3015	**Georgia Power's Response**
H&H	
As noted in our August 15, 2019 letter, several stakeholders raised concerns regarding the composition of the sediment and the possible presence of contaminants within it. The H&H study fails to characterize the sediments found within the projects' reservoirs and instead speaks mostly to sediments elsewhere in the river	Georgia Power conducted a standalone Sediment Quality Study and is filing a Draft Sediment Quality Study Report concurrent with the Dam Decommissioning Plan and Applicant Prepared Environmental Assessment to address specific comments on sediment. The Final H&H Study Report incorporates by reference the Draft Sediment Quality Study Report.

Langdale and Riverview Projects - Public Comment Matrix	
basin. Additionally, Appendix C only includes data for the borings within the proposed constructed channel through the island between Langdale Dam and Powerhouse. •You must revise the H&H study report to characterize the sediments within the project reservoirs and include the associated data.	
The H&H study fails to explain why you did not perform a chemical analysis of the sediment and does not speak to the concerns related to possible contaminants in any meaningful way. You must explain the appropriateness of the comparisons in the H&H study to other sampling completed within the river basin due to the following conditions: 1) West Point Dam was more recently constructed and some of the sampling was performed in the riverine section just below the dam; and 2) the City Mills and Eagle Phenix Dams were located downstream of Lake Harding and had smaller impoundments with characteristics that made them less likely to trap sediment. •You must revise the H&H study report to reassess the need for chemical analysis based on project specific circumstances.	Georgia Power conducted a standalone Sediment Quality Study and is filing a Draft Sediment Quality Study Report concurrent with the Dam Decommissioning Plan and Applicant Prepared Environmental Assessment. The Draft Sediment Quality Study Report provides a chemical analysis of the sediment and documentation of consultation. As applicable, the Final H&H Study Report incorporates by reference the Draft Sediment Quality Study Report.
The H&H study fails to explain how the number and locations of the sediment borings were determined, or explain their adequacy of lack thereof (e.g., see pages 31 and 52 – "borings did not provide enough information for interpolation"). •You must revise the H&H study report to include an explanation of the appropriateness and adequacy of the locations and number of borings completed.	Georgia Power conducted a standalone Sediment Transport Study and is filing a Draft Sediment Transport Study Report with the Dam Decommissioning Plan and Applicant Prepared Environmental Assessment. The Final H&H Study Report incorporates by reference the Draft Sediment Transport Study Report.
The H&H study fails to address sediment quantity (estimated to be 516-acre-feet or approximately 832,500 cubic yards), post removal sediment transport, and associated impacts in any meaningful way. •Either the Decommissioning Plan or the revised H&H study report must include a thorough analysis of the post removal sediment impacts, considering specific metrics such as erosion, scouring, incision, accretion, etc., stemming from the initial and prolonged changes in flow dynamics during and following dam removals. •You must also include specific analyses of these impacts to aquatic organisms, as described below.	Georgia Power has addressed the sediment quantity in the Draft Sediment Transport Study Report along with responses to each of the specific metrics described by FERC. Potential effects on aquatic organisms are described in the Applicant Prepared Environmental Assessment and in the Draft Sediment Transport Study Report.
•Either the Decommissioning Plan or the revised H&H study report must include a discussion of post-removal streambank erosion.	The Decommissioning Plan discusses post removal streambank erosion.
The H&H study indicates two boat launches will be dewatered as well as the loss of motorboat access to most of the study reach but fails to discuss the impacts or possible mitigation measures. •Either the Decommissioning Plan or the revised H&H study report must include a discussion of impacts and possible mitigation measures.	The Decommissioning Plan and the Applicant Prepared Environmental Assessment discuss Georgia Power's proposed protection, mitigation, and enhancement measures to address access to existing public boat ramps.
The H&H study contains the following error message in several locations (e.g., pages 25, 52, 53, and 74): "Error! Reference source not found." Please correct these reference errors.	Error corrected in the Final H&H Study Report.
Shoal Bass & Water Quality	
In the shoal bass literature review, you included a histogram displaying predicted acres of existing and post-removal optimal habitat for shoal bass. You state that the data were generated from output from the Hydrologic Engineer Center – River Analyses System (HEC-RAS) modeling and analyzed with GIS, however, you did not provide supporting evidence (methods, data, maps, etc.) to substantiate those conclusions. •Either the Decommissioning Plan or a revised shoal bass literature review must include such evidence to adequately support your conclusions.	Georgia Power conducted a standalone Pre-Dam Removal Shoal Bass Abundance and Tracking study that includes methods, data, maps, and conclusions.

Langdale and Riverview Projects - Public Comment Matrix	
Similarly, you state in the water quality study report that conclusions were made based on modeling results; however, the methods you used were not described in the report, nor were any pertinent supporting materials to substantiate the statements that: -The decommissioning and removal of Crop Hop and Riverview Dams will result in a minimum flow of at least 193 cubic feet per second in the Headrace Channel [thereby not impacting the Valley Wastewater Treatment Plan permitted effluent discharge]; -and If the projects' dams are removed, the resulting lower water levels and higher water velocities in the affected reach of the Chattahoochee River would provide an alternative means of physical aeration as the water passes through exposed shoals. •Because there are gaps in your conclusions, you must address the items above in either the Decommissioning Plan or a revised water quality study report by providing such evidence to adequately support your results. Regarding minimum flows in the headrace channel, please also include documentation of correspondence with Valley Wastewater Treatment Plant for our review.	These comments are addressed in the Final Water Quality Study Report. Note that the consultation for the Valley Wastewater Treatment Plant was conducted with the East Alabama Water, Sewer, and Fire Protection District.
Aquatic Resources	
The H&H study does not address the specific methods that will be used in the removal of each individual dam, nor does it address the rate of drawdowns that each pond would experience as a result of each removal. •The Decommissioning Plan must include the specific means by which the dams would be removed, including the anticipated rate of drawdown (to natural river channel) that would occur under each scenario.	Specific information on the removal of each dam and the Riverview Powerhouse is provided in the Decommissioning Plan, along with the construction sequence, schedule, and drawdown information.
As noted above, the H&H study does not provide an adequate analysis of sediment transport during and following dam removals. Further, there is no analysis of potential effects to mussel beds or other aquatic organisms in the shoal bass or mussel studies. •The Decommissioning Plan must include an analysis of the potential impacts of sediment transport to aquatic organisms (i.e., sedimentation of mussel beds, habitat loss/creation, etc.), based on the revised H&H study report as directed above.	These issues are addressed in the Applicant Prepared Environmental Assessment.
Regarding aquatic organisms that may become stranded in dewatered areas during and following dam removals, there is no mention of a plan for surveys and/or rescue efforts in either the mussel or shoal bass studies. •The Decommissioning Plan must include a plan to survey for stranded aquatic organisms during each dam removal, including methods for rescue/relocation if stranded organisms are found. This plan must be based on your previous bathymetry models, as well as your pending analysis of anticipated rates of reservoir drawdown as directed above.	The Draft Aquatic Organism Recovery Survey and Relocation Plan is discussed in the Decommissioning Plan and the Applicant Prepared Environmental Assessment. In addition, the draft Aquatic Organism Recovery Survey and Relocation Plan is provided as an appendix to the Decommissioning Plan.
Cultural Resources	
On September 21, 2020, you filed archaeological surveys completed for the Langdale and Riverview Projects with the Commission. However, you did not include consultation from the Georgia and Alabama State Historic Preservation Officers (Georgia and Alabama SHPOs) regarding the review of archaeological surveys in your filing. •In our review of the archaeological surveys, we expect your Decommissioning Plan filing to include a draft Memorandum of Understanding (MOA) that memorializes the mitigation of any adverse effect to historic properties that would result from your proposals. •Additionally, you should include documentation of your consultation with the Georgia and Alabama SHPOs and how you addressed any of their comments in the MOA.	Consultation with the SHPOs has been ongoing during the study phase and this documentation is provided in the Consultation Summary as appendices to the concurrently filed Privileged cultural resource reports. After the study report review concluded, Georgia Power drafted an MOA that went out on July 1, 2022 to Alabama and Georgia SHPOs as well as Alabama-Coushatta Tribe of Texas, Alabama-Quassarte Tribal Town, Coushatta Tribe of Louisiana, and the Muscogee (Creek) Nation. Georgia Power did receive comments from the SHPOs and is currently addressing those comments in the MOA; a 2nd draft MOA will be sent back out to the same July 1st groups by middle to late August 2022. Georgia Power anticipates receiving any further comments and addressing them by about early October. Georgia Power will submit documentation of the MOA drafts and MOA consultation in a separate submittal to FERC in October 2022.

Langdale and Riverview Projects - Public Comment Matrix	
Other Issues	
Several comments were filed in response to the October 5, 2020 virtual study result meetings. •You are expected to respond to those comments either as part of the study report revisions requested above or in the Decommissioning Plan to be filed with the Commission.	Comments are addressed in the Draft and Final Study Reports, Decommissioning Plan, and/or Applicant Prepared Environmental Assessment.
We remind you that our analysis of the surrender and decommissioning is based only on information filed on the record for these proceedings. •To help prevent the need for additional future studies and information requests, we again recommend that you document the detailed methods, consultation process, development, and implementation of these studies. Additionally, each study report should include each party's concurrence and/or comments, and explanations of how you addressed the comments.	The Study Reports include the associated documentation of consultation.

U.S. Fish and Wildlife Service

From: Bauer, Eric F <eric_bauer@fws.gov>
Sent: Wednesday, September 8, 2021 2:46 PM
To: Dodd, Anthony Ray <ARDODD@southernco.com>
Cc: Maholland, Peter D <peter_maholland@fws.gov>; Doresky, John <John_Doresky@fws.gov>
Subject: Re: [EXTERNAL] Langdale/Riverview Dam Decommissioning Sediment Testing Study Plan

---

Tony,

Thanks, no need for the appendices. Both the sediment transport assessment and draft sediment testing study plans look good to me and seem well-reasoned for this stage (screening level assessment). I look forward to seeing/reviewing the study reports that result from these studies. As we discussed in our meeting the other day, the proposed sampling protocol should be able to identify any contaminants issues and if any are identified it may be necessary to further map the extent of deposited contaminants and for finer scale analyses regarding depths at which they're deposited. But there's no need to explore that path unless or until contaminants are identified. Thanks for the opportunity to review this study plan. Please let me know if you need my comments in the form of a more official letter; I think GPC has included email correspondence in their FERC filings before, but it's no problem to provide a letter if you need it.

-Eric

Eric F. Bauer, PhD
(he/him/his)
Fish and Wildlife Biologist
Georgia Ecological Services
US Fish and Wildlife Service
RG Stephens, Jr. Federal Building
355 East Hancock Avenue, Room 320, Box 7
Athens, GA 30601
Office #: 706-613-9493

From: Dodd, Anthony Ray <ARDODD@southernco.com>
Sent: Friday, September 3, 2021 12:39 PM
To: Bauer, Eric F <eric_bauer@fws.gov>
Subject: RE: [EXTERNAL] Langdale/Riverview Dam Decommissioning Sediment Testing Study Plan

Hi Eric,

Thanks for the call earlier.

Here's a copy of the sediment transport study plan. I didn't attached the Appendix A - sediment boring logs. Let me know if you want those as well and I'll send.

Tony

From: Dodd, Anthony Ray <ARDODD@southernco.com>
Sent: Friday, September 3, 2021 11:56 AM
To: Bauer, Eric F <eric_bauer@fws.gov>
Subject: Re: [EXTERNAL] Langdale/Riverview Dam Decommissioning Sediment Testing Study Plan

Hi Eric
I'm free from now til about 1:10.
Would be happy to discuss now or next week.
Tony

Get Outlook for iOS [gcc02.safelinks.protection.outlook.com]

From: Bauer, Eric F <eric_bauer@fws.gov>
Sent: Friday, September 3, 2021 11:34:45 AM
To: Dodd, Anthony Ray <ARDODD@southernco.com>
Subject: Re: [EXTERNAL] Langdale/Riverview Dam Decommissioning Sediment Testing Study Plan

---

Hey Tony,

Would you have time to discuss this Sediment Testing Study Plan? I feel like it might be easier to talk over the plan and ask questions first and then I can provide feedback in writing, if it's warranted, based on that discussion. I'm free until 2Pm today and most of next week outside of 1-3PM on Tuesday.

-Eric

Eric F. Bauer, PhD
(he/him/his)
Fish and Wildlife Biologist
Georgia Ecological Services
US Fish and Wildlife Service
RG Stephens, Jr. Federal Building
355 East Hancock Avenue, Room 320, Box 7

Athens, GA 30601
Office #: 706-613-9493

From: Doresky, John <John_Doresky@fws.gov>
Sent: Friday, September 3, 2021 10:12 AM
To: Bauer, Eric F <eric_bauer@fws.gov>
Cc: Maholland, Peter D <peter_maholland@fws.gov>
Subject: Fw: [EXTERNAL] Langdale/Riverview Dam Decommissioning

Can you look to make sure there's no red flags? Thanks in Advance. jd

BTW -- See their September 10 return request. jd

John Doresky

Georgia Ecological Services

US Fish and Wildlife Service

Highway 27 @ 1st Division Road

Building 5889

Fort Benning, GA 31905

706-544-6030

706-202-2467 (c)
Email: john_doresky@fws.gov

From: Dodd, Anthony Ray <ARDODD@southernco.com>
Sent: Friday, September 3, 2021 9:53 AM
To: Imm, Donald <donald_imm@fws.gov>
Cc: Doresky, John <John_Doresky@fws.gov>
Subject: RE: [EXTERNAL] Langdale/Riverview Dam Decommissioning

Re: Langdale_ Riverview Dam Decommissioning

Don,

I hope all is well with you. I had hoped to circle back to you sooner. We are finally at the point now, following consultations with GA EPD and document refinement, ready to share the Draft Langdale_Riverview Sediment Testing Study Plan (attached as *.pdf) for your review. So that you know, we are also sharing this study plan with ADEM and WRD. If you still have the opportunity at this stage of your recent shift in duties, we hope that you'll be able to review and turn around comments/acknowledgements by 10 September. I've copied John Doresky here. We are hopeful that this stage of the study planning will enable GPC to sample this Fall.

Please let me know if you have any questions.

Best Regards,

Tony

Tony Dodd
Natural Resources Specialist
Georgia Power Company
241 Ralph McGill Blvd, NE
Atlanta, GA 30308
Cell: 404-434-9412
Desk: 404-506-5026
Email: ardodd@southernco.com

Georgia Power

From: Imm, Donald <donald_imm@fws.gov>
Sent: Wednesday, May 26, 2021 7:25 AM
To: Dodd, Anthony Ray <ARDODD@southernco.com>
Cc: Doresky, John <John_Doresky@fws.gov>
Subject: Re: [EXTERNAL] Langdale/Riverview Dam Decommissioning

Yes, please forward, I'll review ASAP, and if possible try to get a signature on our response. John Doresky will be acting once I've left, he is the supervisor in the Ft. Benning office, so he is already aware of the proposed dam removal and the documents shared over the past few years, etc.

From: Dodd, Anthony Ray <ARDODD@southernco.com>
Sent: Tuesday, May 25, 2021 3:38 PM
To: Imm, Donald <donald_imm@fws.gov>
Subject: [EXTERNAL] Langdale/Riverview Dam Decommissioning

Hey Don,

I didn't know that I'd bouncing back your way so soon after our recent email.

This note is about making a request of USFWS for the Langdale/Riverview Dam Decommissioning. The project is still moving along. In response to FERC's request for sediment quality characterization, we have developed a study plan for screening level analysis of study area sediment quality in addition to a sediment transport study plan. We believe those will be ready by end of this week. Owing to our schedule intent to sample in July, we think it's time now to seek USFWS' review or, at least, acknowledgement of the proposed study plans. We will be reaching out to EPD and WRD at the same time.

Can I send those to you … assuming that you might review directly or designate?

Tony Dodd
Natural Resources Specialist
Georgia Power Company
241 Ralph McGill Blvd, NE
Atlanta, GA 30308
Cell: 404-434-9412
Desk: 404-506-5026
Email: ardodd@southernco.com

Georgia Power

Georgia Department of Natural Resources

Environmental Protection Division

From: Dodd, Anthony Ray
To: Wiedl, Stephen
Cc: Zeng, Wei; Booth, Elizabeth
Subject: Langdale Riverview - Slide Presentation
Date: Monday, June 14, 2021 5:06:25 PM
Attachments: 2020-10-01 FINAL Slides Combined_Reduced.pdf

Attached are supporting report presentations produced prior to GPC's development of draft study plans for sediment transport and sediment testing.
Thank you for tee-ing up discussion with your risk assessment group to hear their thoughts on our proposed sediment testing approach and perhaps ideas on how best to meet EPD's information needs for a 401 certification determination. Also, if after looking through the presentation slides, if you feel that you'd rather see the actual reports, please let me know and I'll send those along.
Please let us know if you have any questions.

Tony Dodd
Natural Resources Specialist
Georgia Power Company
241 Ralph McGill Blvd, NE
Atlanta, GA 30308
Cell: 404-434-9412
Desk: 404-506-5026
Email: ardodd@southernco.com

From: Dodd, Anthony Ray
Sent: Monday, June 14, 2021 5:47 PM
To: Wiedl, Stephen <Stephen.Wiedl@dnr.ga.gov>
Cc: Zeng Wei (wei.zeng@dnr.ga.gov) <wei.zeng@dnr.ga.gov>; Booth, Elizabeth <Elizabeth.Booth@dnr.ga.gov>
Subject: Langdale Riverview

Thanks again for your time earlier today in the discussion on Langdale Riverview Dams decommissioning project.
Per our call action items, please find copies of GPC's draft study plans for Sediment Transport and Sediment Testing (Quality)
I will send a follow-up email to this message with attachments for the previous study reports for water quality, freshwater mussels plus the Hydrology and Hydraulics modeling study.

Tony Dodd
Natural Resources Specialist
Georgia Power Company
241 Ralph McGill Blvd, NE
Atlanta, GA 30308
Cell: 404-434-9412
Desk: 404-506-5026
Email: ardodd@southernco.com

Georgia Power

From: Clark, Jill <Jill.Clark@dnr.ga.gov>
Sent: Monday, June 21, 2021 10:26 AM
To: Wiedl, Stephen
Cc: Potter, Amy; Mahbub, Amin
Subject: FW: Solicit Review/Input per Langdale Riverview Dam Decommissioning Sediment Testing Plan
Attachments: 2021-06-04 Draft Sediment Testing Study Plan.pdf; Langdale Riverview - Sediment Transport & Testing Study Plans; Langdale Riverview - Slide Presentation

Hi Stephan,

The analytes selected to be analyzed in Section 3.3 of the Draft Sediment Testing Study Plan are appropriate. It may be beneficial to analyze for dioxins due to papermills being in the area. Additionally, if surface water samples will be collected in future sampling events, it is recommended to collect hardness data (in mg/L CaCO3) for each sediment sample since hardness-dependent metals are being analyzed.

Please let us know if you would like to discuss further.

Jill Clark
Senior Risk Assessor
Risk Assessment Program
Zoom Phone 470-524-0314 (NEW)
jill.clark@dnr.ga.gov

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

From: Potter, Amy <Amy.Potter@dnr.ga.gov>
Sent: Wednesday, June 16, 2021 8:58 AM
To: Clark, Jill <Jill.Clark@dnr.ga.gov>; Mahbub, Amin <amin.mahbub@dnr.ga.gov>
Subject: FW: Solicit Review/Input per Langdale Riverview Dam Decommissioning Sediment Testing Plan

FYI

Amy M. Potter
Manager

Risk Assessment Program
Land Protection Branch
Zoom phone 470-524-0565 (NEW)

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

From: Wiedl, Stephen <Stephen.Wiedl@dnr.ga.gov>
Sent: Tuesday, June 15, 2021 7:26 PM
To: Potter, Amy <Amy.Potter@dnr.ga.gov>
Cc: Zeng, Wei <Wei.Zeng@dnr.ga.gov>; Booth, Elizabeth <Elizabeth.Booth@dnr.ga.gov>; Driggers, Nathan <nathan.driggers@dnr.ga.gov>; Dodd, Anthony Ray <ardodd@southernco.com>; Thiery, Devin <devin.thiery@dnr.ga.gov>
Subject: Solicit Review/Input per Langdale Riverview Dam Decommissioning Sediment Testing Plan

Amy,

I wanted to reach out to you in EPD's Risk Assessment Unit to solicit your help to review a draft sediment testing plan which Georgia Power/Kleinschmidt have prepared regarding the planned decommissioning and removal of a series of three low-head dams on the Chattahoochee River above Columbus. Yesterday I, Wei Zeng and Liz Booth had an E-meeting with several folks from Georgia Power/Southern Company on this topic and they (Tony Dodd) have supplied several documents relating to the overall project. Much of the attached material really doesn't pertain to your risk assessment/contaminant review in that it focuses on issues such as bulk river sediment transport, non-contaminant water quality, biological assessments, etc. I believe the area for your focus would be limited to Section 3.3 Sample Testing for Potential (Contaminant (my insertion here)) Constituents within the attached Draft Sediment Testing Study Plan.

If you would be able to review and comment on the sampling target contaminants contained at Section 3.3 it would be appreciated. One issue that we discussed yesterday regarding the draft sediment plan as it stands is that the plan currently would focus on contaminant levels in bulk river bottom sediments. I raised the issue that such an approach may not really get at our 401 WQC concerns about materials as released into the river water column, i.e. that assessment and reporting of this list of analytes may need to include elutriate testing, not simply bulk sediment testing. Of course there are many complex issues about mobilization/release of constituents that may require certain analysis or modeling approaches that have not yet been decided upon. But your input on the issue of elutriate-phase assessment for such contaminants would be helpful.

Thank you very much for your input on this.

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: Wiedl, Stephen <Stephen.Wiedl@dnr.ga.gov>
Sent: Monday, August 16, 2021 5:09 PM
To: Dodd, Anthony Ray <ARDODD@southernco.com>; Zeng, Wei <Wei.Zeng@dnr.ga.gov>; Potter, Amy <Amy.Potter@dnr.ga.gov>
Cc: Smith, Bradley <Bradley.Smith@dnr.ga.gov>
Subject: RE: Langdale Riverview

Tony,

I have reviewed the issues which you describe in your message below and have consulted with my manager Wei Zeng on these topics. What we at EPD Wetlands/401 Unit are able to respond to you at this time is this: Through our consultation and coordination these past weeks we have facilitated EPD's Risk Assessment Unit providing you at Georgia Power/Southern Company with information which will hopefully be informative and worthwhile regarding your development of a sediment assessment study plan. We have also shared to you our thoughts regarding potential elutriate phase assessment of sediments and/or modeling of sediment effects to the Chattahoochee River system as they may be important for our eventual review and potential issuance of a 401 water quality certification at some point in the future. However, in our authorized role focused on 401 WQC administration, we are not in a position to provide any formal agreement with your intent to move forward with the proposed sediment assessment study plan.

We do look forward to working with you in the future as you move into the phase of this project wherein a formal application and review for 401 water quality certification may play out.

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: Dodd, Anthony Ray <ARDODD@southernco.com>
Sent: Friday, August 6, 2021 12:01 PM
To: Zeng, Wei <Wei.Zeng@dnr.ga.gov>; Wiedl, Stephen <Stephen.Wiedl@dnr.ga.gov>; Potter, Amy <Amy.Potter@dnr.ga.gov>
Cc: Smith, Bradley <Bradley.Smith@dnr.ga.gov>
Subject: RE: Langdale Riverview

Wei,

Thanks to you and Steve for responding to our recent question seeking clarification as to whether elutriate sampling is required by EPD as an aspect of GPC's proposed sediment assessment study for the Langdale Riverview Dams decommissioning project. We understand from you at this point that elutriate sampling is not required by EPD as part of the proposed sediment assessment study but may offer a means to help EPD address 401 water quality certification (WQC) for the decommissioning project.

To recap, our inquiries of EPD have been seeking study plan approval by means of a singular sediment-based sampling-strategy that attempts to:

1) address FERC's recent request for GPC to conduct a sediment assessment (which is ecologically focused), and
2) additionally address WQC as required as part of FERC's decommissioning process.

Our consultations with EPD have highlighted the need for GPC to separate the proposed sediment assessment from the 401 WQC process. At this time, we wish to move forward with the ecologically-oriented sediment assessment which would include the targeted list of potential constituents (including dioxins) recently reviewed by EPD's risk assessment unit. Separating current project task needs (sediment assessment) now from the eventual WQC process will allow us to focus on the sediment study that was principally designed to address FERC's inquiry into project sediment quality - rather than water quality. Results of the sediment assessment will satisfy initial investigatory needs surrounding potential concerns to aquatic biota due to dam demolition. Those results may also provide insight toward the eventual 401 certification process.

In addition, as we discussed in recent correspondence, needs for project progression will eventually be subject to USACE Section 404 permitting which itself may inform the 401 WQC process. We are looking forward to the reauthorization/release of applicable permits, and until that happens, uncertainty exists about the timeliness of release date as well as whether a region-specific Nation-wide Permit (NWP), tailored to low-head dam removal, will be available. The sediment sampling proposed to meet FERC's comments will inform additional, future discussion on WQC that may include USACE, ADEM, and others in addition to EPD and GPC.

We are seeking your agreement with our intent to move forward with the proposed sediment assessment study plan as we look forward to engaging the 401 process with EPD at a later time step.

Tony

Tony Dodd
Natural Resources Specialist
Georgia Power Company
241 Ralph McGill Blvd, NE
Atlanta, GA 30308
Cell: 404-434-9412
Desk: 404-506-5026

Email: ardodd@southernco.com

Georgia Power

Georgia Department of Natural Resources
Wildlife Resources Division

From: Rowe, Matthew <matthew.rowe@dnr.ga.gov>
Sent: Monday, September 20, 2021 12:20 PM
To: Dodd, Anthony Ray <ARDODD@southernco.com>
Subject: RE: Langdale Riverview Dam decommissioning

Tony,

I'm sorry for the slow turnaround on this. I've been scrambling to get in as much field work as I can ahead of the weather and before I loose my technician next week. I'm not any kind of expert in sediment analysis, but I read the proposal and it looks to have sensible testing locations and include the contaminants that would be of the most concern so I have no objections to the proposal as it's written. Let me know if you need anything more concrete and I'll take care of it today.

Matthew Rowe
Aquatic Biologist - Freshwater Invertebrates, Wildlife Conservation

Wildlife Resources Division [gcc01.safelinks.protection.outlook.com]
(706) 557-3217 | M: (678) 836-6132

Facebook [gcc01.safelinks.protection.outlook.com] • Twitter [gcc01.safelinks.protection.outlook.com] • Instagram [gcc01.safelinks.protection.outlook.com]
Buy a hunting or fishing license today! [gcc01.safelinks.protection.outlook.com]

A division of the
GEORGIA DEPARTMENT OF NATURAL RESOURCES

From: Dodd, Anthony Ray <ARDODD@southernco.com>
Sent: Monday, September 20, 2021 11:56 AM
To: Rowe, Matthew <matthew.rowe@dnr.ga.gov>
Subject: RE: Langdale Riverview Dam decommissioning

Hi Matt
I hope all is well with you. I'm circling back to learn if you found time to look at the proposed sediment testing study plan for Langdale Riverview Dam Decommissioning Project. Please let me know if you have any questions or comments.
Thanks!
Tony

From: Dodd, Anthony Ray
Sent: Wednesday, September 8, 2021 4:21 PM

To: Rowe, Matthew <matthew.rowe@dnr.ga.gov>
Subject: RE: Langdale Riverview Dam decommissioning

Hi Matt,

I hope all is well with you. It's taken the process a while, but we're final at the point now, following consultations with GA EPD, ready to share the Draft Langdale_Riverview Sediment Testing Study Plan (attached as *.pdf) for your review. Also, in that it will accompany the sediment testing study and its results will provide expanded context, I have attached a copy of the Sediment Transport Assessment Study Plan as well. So that you know, we are also sharing this study plan with ADEM and USFWS. We hope that you'll be able to review and turn around comments/acknowledgements to us by 15 September. We are hopeful that this stage of the study planning will enable GPC to sample this Fall.

Thank you and please let me know if you have any questions.

Kindest Regards,

Tony

From: Rowe, Matthew <matthew.rowe@dnr.ga.gov>
Sent: Friday, June 18, 2021 9:46 AM
To: Dodd, Anthony Ray <ARDODD@southernco.com>
Subject: RE: Langdale Riverview Dam decommissioning

EXTERNAL MAIL: Caution Opening Links or Files

Thanks for the update, Tony. I'd love to see the results of the sediment study!

The weather outlook for the weekend… does not look good for Altamaha River sampling…

From: Dodd, Anthony Ray <ARDODD@southernco.com>
Sent: Thursday, June 17, 2021 5:15 PM
To: Rowe, Matthew <matthew.rowe@dnr.ga.gov>
Subject: Langdale Riverview Dam decommissioning

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.

Matt
Wanting to keep you up-to-date on the Langdale Riverview dam removal project. Our team has been working steadily to complete study plans for sediment transport as well as sediment quality studies at the request of the FERC.

We consulted with EPD last week on the sediment quality study plan and as soon as we work through any revisions there, we hope to then send the study plans to you /WRD and USFWS for your review/comments. I don't have an exact date yet but will keep you posted. Our summer schedule will be tight as it seems to be every year… We hope to be in the river collecting sediment samples in July if the schedule / review process allows.
Thanks!
Tony

Alabama Department of Environmental Management

From: Haslbauer, Jennifer <jhaslbauer@adem.alabama.gov>
Sent: Monday, September 20, 2021 11:38 AM
To: O'Mara, Courtenay R. <CROMARA@SOUTHERNCO.COM>
Cc: Dodd, Anthony Ray <ARDODD@southernco.com>; Moore, David <djmoore@adem.alabama.gov>; Crabbe, Melissa C. <MCCRABBE@SOUTHERNCO.COM>
Subject: RE: Sediment Testing and Transport Plans for Langdale/Riverview Dam FERC Surrenders

---

Hi Courtenay,

The only feedback we have regarding the draft plans is to update the footnote numbers to superscript throughout page 1-2 of the Draft Sediment Transport Assessment Study Plan.

Thanks,

Jennifer Haslbauer, P.E.
Chief, Standards and Planning Section
Water Quality Branch – Water Division
Alabama Department of Environmental Management
P.O. Box 301463
Montgomery, Alabama 36130-1463
(334) 274-4250
adem.alabama.gov

Mission: Assure for all citizens of the state a safe, healthful, and productive environment

From: O'Mara, Courtenay R. <CROMARA@SOUTHERNCO.COM>
Sent: Friday, September 3, 2021 1:31 PM
To: Haslbauer, Jennifer <jhaslbauer@adem.alabama.gov>
Cc: Dodd, Anthony Ray <ARDODD@southernco.com>; Moore, David <djmoore@adem.alabama.gov>; Crabbe, Melissa C. <MCCRABBE@SOUTHERNCO.COM>
Subject: Sediment Testing and Transport Plans for Langdale/Riverview Dam FERC Surrenders

Jennifer-
Thanks for your patience. As I mentioned in my last email we were in the middle of reviewing with GA DNR-EPD the sediment testing and transport plans that were requested from FERC. We have just finished and as a result have updated the draft sediment testing plan by adding dioxin to our list of analytes for the sediment samples. We are now circulating the draft plans out to y'all and Georgia DNR-Wildlife Resources Division and U.S. Fish and Wildlife Service for input before submitting to FERC. Our goal remains to get out in the field in the next month or so to collect these samples and hopefully wrap

up the results of these final studies and complete the Decommissioning Plan by the end of the year. Depending on when I can contract the field work our final submittal to FERC could shift into the 1st quarter of 2022.

If you would like to provide feedback on the draft plans would you have time to do so in the next 2 weeks?

Thanks so much and enjoy the long weekend!

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