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

February 28, 2020

Langdale and Riverview Hydroelectric Projects (FERC No. 2341-033 & 2350-025)
License Surrender Filings:
Progress Report
Draft Potential Effects of Dam Removal on Shoal Bass Study Report
Draft Water Quality Report

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Room 1-A- Dockets Room
Washington, D.C. 20426

Dear Secretary Bose:

On behalf of Georgia Power Company (Georgia Power), Southern Company is filing this letter with the Federal Energy Regulatory Commission (FERC) to provide an update on Final Study Plan progress for the Langdale and Riverview Projects' license surrender. On July 24, 2019, Georgia Power filed the Final Study Plan, which included plans for Hydraulic and Hydrologic Modeling, Water Quality, Shoal Bass, Mussel Survey and Cultural Resources studies. On August 15, 2019, FERC responded to Georgia Power's May 24, 2019 Proposed Study Plan and July 24, 2019 Final Study Plan filings. FERC noted that the Dam Decommissioning Plan should be filed after all studies were complete and that Georgia Power should file the results of any studies completed to date.

Attachment A of this filing is a Progress Report, which provides a summary of the FERC surrender process to date and a list of major activities relative to the decommissioning studies and decommissioning plan. According to FERC's recommendation and other circumstances discussed further in the Progress Report, the Final Study Plan and Decommissioning Plan schedule has been revised from the schedule proposed in the July 24, 2019 Final Study Plan. The revised schedule is included in Table 1-1 of the Progress Report.

Two studies have been completed; the Draft Potential Effects of Dam Removal on Shoal Bass Study Report is included in Attachment B and the Draft Water Quality Report is included in Attachment C.

Georgia Power will host public meetings on April 1, 2020 to present information on the decommissioning of the Langdale and Riverview Projects, including results of Hydraulics and Hydrology, Shoal Bass and Water Quality studies, and updates on the Cultural Resources Study and the Mussel Survey Study. Stakeholders may file comments with FERC on or before May 1, 2020, regarding the information presented at the public meeting and draft study reports.

The public meeting scheduled for April 1, 2020 will be held at the Valley Community Center located at 130 Sportsplex Dr, Valley, AL 36854. Meetings will be held from 2:00 P.M. through 4:00 P.M. EDT and from 6:00 P.M. through 8:00 P.M. EDT. The same information will be provided in each of the public meetings.

If you require further information, please contact me at 404.506.7219.

Sincerely,

Courtenay R. O'Mara

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

ATTACHMENT A – Progress Report

PROGRESS REPORT

LANGDALE (FERC NO. 2341)
AND
RIVERVIEW (FERC NO. 2350)
HYDROELECTRIC PROJECTS

Prepared by:

SOUTHERN COMPANY GENERATION HYDRO SERVICES &
GEORGIA POWER NATURAL RESOURCES

and

Kleinschmidt

FEBRUARY 2020

GEORGIA POWER COMPANY
ATLANTA, GEORGIA

LANGDALE (FERC NO. 2341) AND RIVERVIEW (FERC NO. 2350)
HYDROELECTRIC PROJECTS

PROGRESS REPORT

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ACRONYMS AND ABBREVIATIONS

ADCNR	Alabama Department of Conservation and Natural Resources
ADEM	Alabama Department of Environmental Management
AHC	Alabama Historical Commission
AIR	additional information request
AL	State of Alabama
C.F.R.	Code of Federal Regulations
cfs	cubic feet per second
CWA	Clean Water Act
FERC	Federal Energy Regulatory Commission
FPS	Final Study Plan
GA	State of Georgia
GDNR	Georgia Department of Natural Resources
GEPD	Georgia Environmental Protection Division
GHPD	Georgia Historic Preservation Division
Georgia Power	Georgia Power Company
GPS	Global Positioning System
HAER	Historic American Engineering Record
HEC-RAS	Hydrologic Engineering Center River Analysis System
H&H	Hydraulic and Hydrologic
kW	kilowatt
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
PSP	Proposed Study Plan or Study Plan
RM	river mile
SB	Shoal Bass
USACE	U.S. Army Corps of Engineers
USGS	United States Geological Survey
WQ	Water Quality

GEORGIA POWER COMPANY
ATLANTA, GEORGIA

LANGDALE (FERC NO. 2341) AND RIVERVIEW (FERC NO. 2350)
HYDROELECTRIC PROJECTS

PROGRESS REPORT

1.0 INTRODUCTION

Georgia Power Company (Georgia Power) is filing with the Federal Energy Regulatory Commission (FERC) this Progress Report in support of Georgia Power's applications for the license surrender and decommissioning of the Langdale Project (FERC No. 2341) and the Riverview Project (FERC No. 2350) (the Projects). This Progress Report provides information on the Langdale and Riverview Projects and a summary of the FERC surrender process to date and lists the major activities relative to the decommissioning studies and decommissioning plan.

1.1 LANGDALE PROJECT

The Langdale Project is located on the Chattahoochee River, adjacent to the City of Valley, Alabama, along the border of Georgia and Alabama (Figure 1-1). The Langdale Project is located at River Mile (RM) 191.9, approximately 9.5 river miles 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.

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.

1.2 RIVERVIEW PROJECT

The Riverview Project is located approximately at river mile (RM) 191.0 (Crow Hop Diversion Dam) and RM 190.6 (Riverview Dam) on the Chattahoochee River, downstream of the City of 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.

The Project consists of two separate dams, Riverview Dam and Crow Hop Diversion Dam (Crow Hop Dam), and a powerhouse with generating equipment located on the western abutment of Riverview Dam. The Project operated as a run of river hydroelectric plant. Crow Hop Dam is the upstream dam and is situated across the main 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 1-2). The Project was constructed in several phases. The smaller downstream 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. Georgia Power stopped operating the units in 2009.

1.2.1 THE FERC SURRENDER PROCESS

Georgia Power filed License Surrender applications with FERC for the Projects on December 18, 2018, in accordance with FERC's regulations at 18 C.F.R. § 6.1 and 6.2. The Projects' licenses expire on December 31, 2023.

On April 11, 2019, FERC issued a request for additional information (AIR) regarding Georgia Power's applications. Georgia Power prepared and filed a Proposed Study Plan (PSP) on May 24, 2019. Based on comments on the PSP, Georgia Power revised the PSP and filed it as a Final Study Plan (FSP) with FERC on July 24, 2019.

On August 15, 2019, FERC responded to Georgia Power's May 24 and July 24, 2019, filings. FERC noted that Georgia Power's Decommissioning Plan should be filed after all studies are complete. FERC also recommended that Georgia Power file the results of any cultural resource studies, aquatic studies, or other studies completed to date as well as documentation of consultation. FERC requested that Georgia Power file with the Decommissioning Plan a draft Memorandum of Agreement (MOA) that memorializes the mitigation of any adverse effect to historic properties that would result from Georgia Power's final decommissioning proposal.

The following sections provide an update on the progress for each decommissioning study. Stakeholder consultation is ongoing; therefore, documentation of consultation will be filed with the Final Decommissioning Plan. For the Shoal Bass and Water Quality studies, Georgia Power is filing draft Study Reports, concurrent with the filing of this Progress Report, for stakeholder review and comment. All comments on the draft Study Reports are due to FERC and Georgia Power on or before May 1, 2020. An updated schedule is also provided in Table 1-1 for each study and the Dam Decommissioning Plan.

TABLE 1-1 PROPOSED STUDY IMPLEMENTATION MASTER SCHEDULE FOR THE PROJECTS

ACTIVITY	START DATE	COMPLETION DATE OR DEADLINE	PUBLIC REVIEW AND COMMENTS DUE
Hydraulic & Hydrologic (H&H) Modeling	May 2019	March 2020	May 1, 2020
Water Quality (WQ)	May 2019	February 2020	May 1, 2020
Shoal Bass (SB)	May 2019	February 2020	May 1, 2020
Mussel Survey	May 2020 (dependent on river conditions and temperatures)	Fall 2020	30 days following filing of the Draft Mussel Survey report
Cultural Resources *	November 2019	April 2020	30 days following filing of the Draft Cultural Resources Survey report
Public Meeting		April 1, 2020	May 1, 2020
File Final Decommissioning Plan	NA	Fall 2020	

*The Cultural Resources Study Report will be filed at FERC as privileged information; therefore, some or all of the report may not be available for public review.

1.2.2 U.S. FISH AND WILDLIFE SERVICE AGREEMENT

Georgia Power and the U.S. Fish and Wildlife Service (USFWS) are working collaboratively on the removal of the Projects. In a letter dated May 31, 2019, the USFWS stated that it is working with Georgia Power to develop a MOA on the dam removal (Attachment 1). As indicated in the letter [and in ongoing consultation with Georgia Power], the USFWS supports the license surrender and any activities to decommission and remove the Projects' structures. Along with Georgia Power, USFWS is also coordinating with federal and state agencies and other organizations. The USFWS supports the removal to restore this portion of the Middle Chattahoochee River and to provide continuity and connectively to the river and its habitat. The USFWS also notes that removal of the Projects will restore a more natural river channel, including shoal habitats that will benefit many aquatic, wetland and terrestrial species such as the blue-striped shiner, Shoal Bass, southern elktoe, Delicate spike and Rayed creekshell mussels. In addition, the USFWS supports the removal to enhance recreation such as kayaking, bird watching, and fishing.

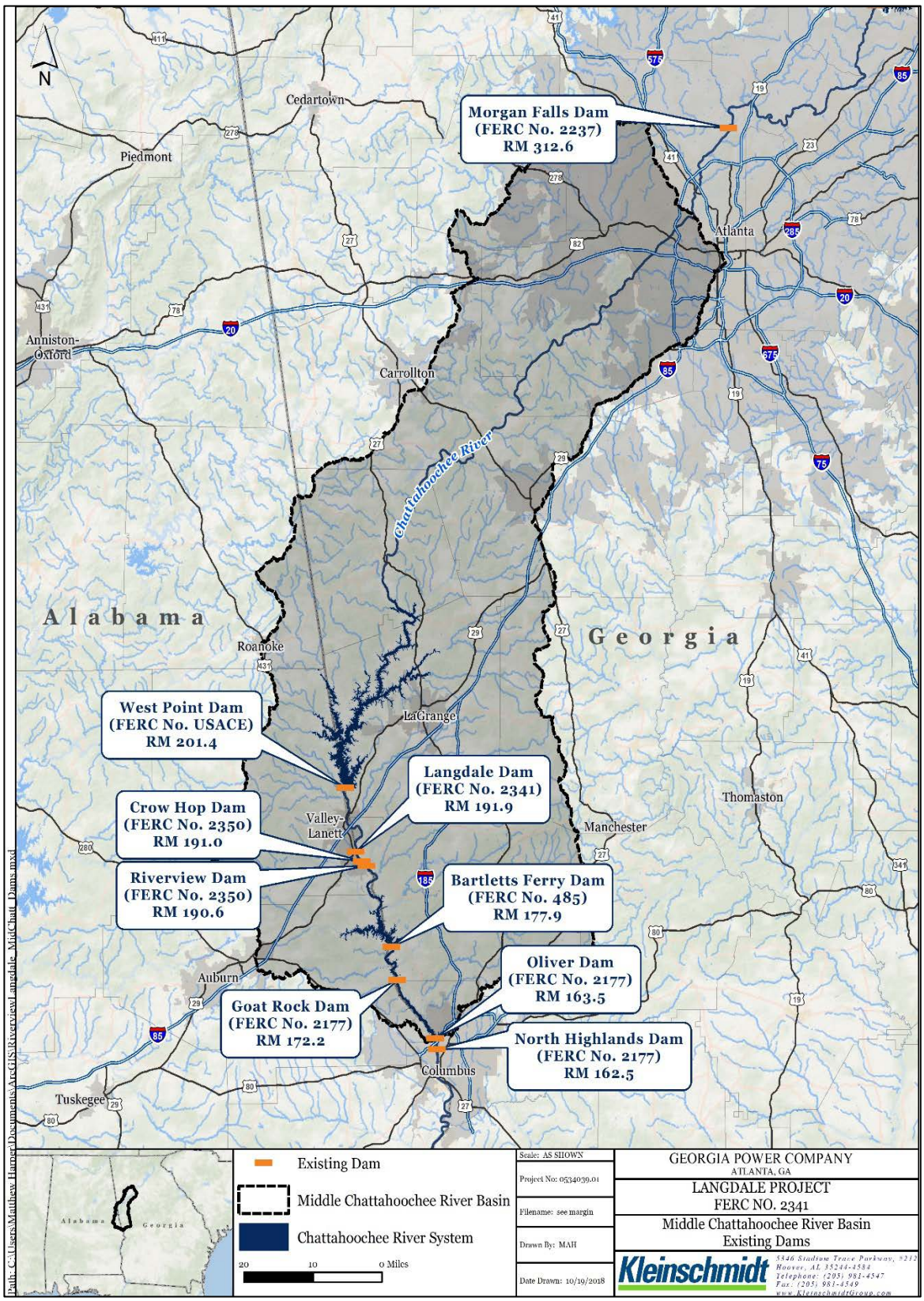

FIGURE 1-1 MIDDLE CHATTAHOOCHEE RIVER BASIN EXISTING DAMS

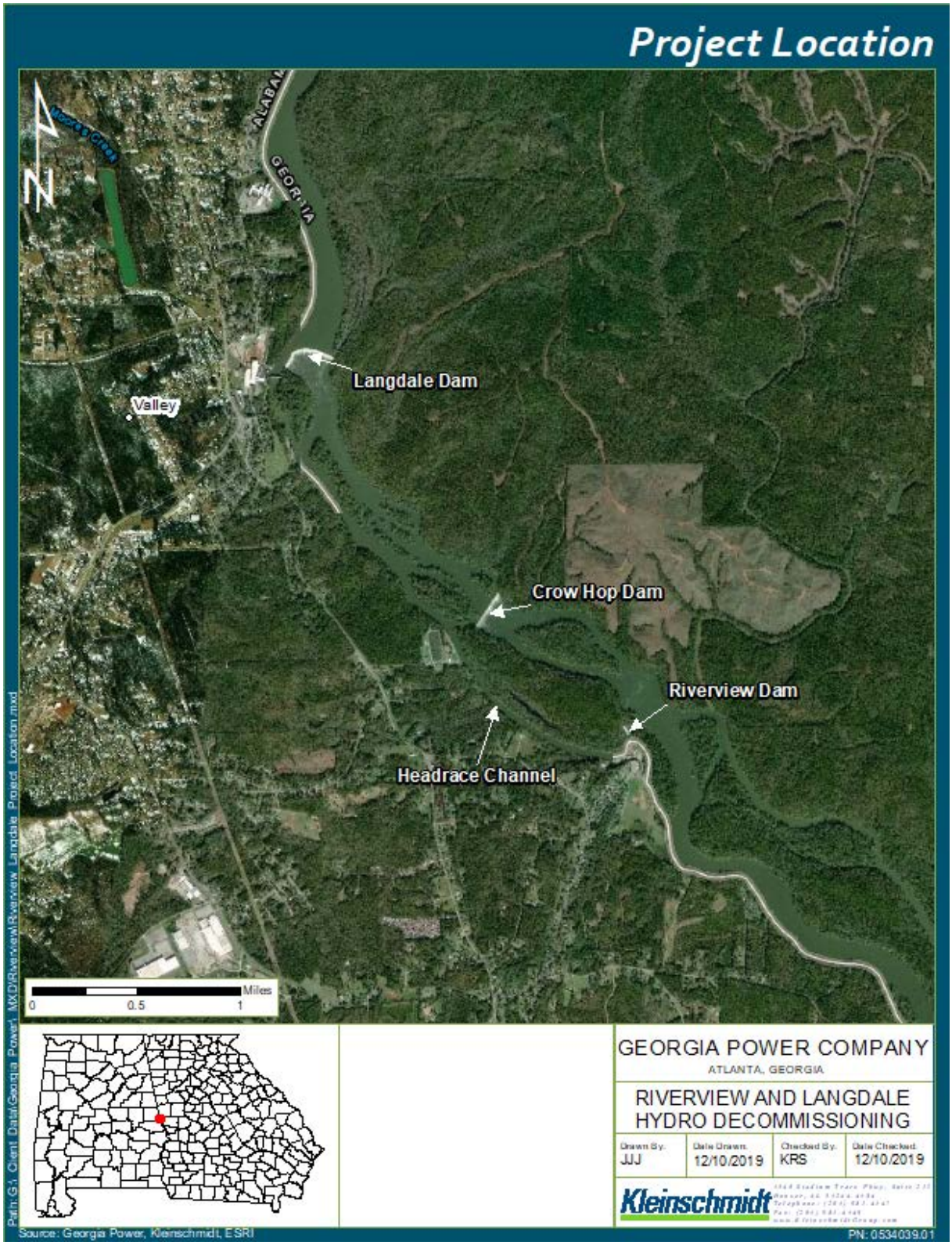

FIGURE 1-2 LANGDALE AND RIVERVIEW PROJECT LOCATIONS

2.0 HYDRAULICS AND HYDROLOGY (H&H) STUDY

2.1 INTRODUCTION

Georgia Power developed a steady-state Hydrologic Engineering Center River Analysis System (HEC-RAS) model of the Chattahoochee River from West Point Dam downstream to the headwaters of the Bartletts Ferry reservoir, Lake Harding. A principal element of the H&H study was to evaluate the lateral extent of the Chattahoochee River affected under various dam breach alternatives to determine a preferred dam removal proposal for the Decommissioning Plan. Georgia Power studied how the Chattahoochee River (elevations, widths and flow velocity) changes with removal of all three dams, leaving a portion of the Langdale Dam on the Georgia side of the river, as well as 10-foot abutments on the Georgia side of the river at Crow Hop and Riverview dams. The model focused on base flow conditions (675 cubic feet per second (cfs)) released from the upstream USACE's West Point Dam, base flow plus one unit generating, and base flow plus two units generating.

2.2 STUDY PROGRESS

- Georgia Power developed a HEC-RAS model and presented initial results to the resource agencies on July 16, 2019 and November 7, 2019.
- In addition, Georgia Power and the USFWS conducted a site visit on August 13, 2019 to explore options to enhance water availability in the Langdale tailrace at the request of the City of Valley and to discuss removal sequencing and construction activities.
- Georgia Power met with the City of Valley and East Alabama Water, Sewer, and Fire Protection District (EAWSFPD) on December 16, 2019 to present initial modeling of the Langdale tailrace.
- Georgia Power held a meeting on January 23, 2020, to present initial modeling results to property owners potentially affected by the proposed dam removal.
- Georgia Power is developing a draft H&H Study Report, including all model run results for Langdale, Crow Hop and Riverview. This report will also include agency and stakeholder consultation. Once filed, stakeholders may provide comments on this draft report on or before May 1, 2020.

2.3 VARIANCE FROM STUDY PLAN AND SCHEDULE

- In response to agency and property owner comments on initial modeling results, Georgia Power compiled existing modeling information and developed photo renderings, visual aids, and parcel maps. These additional tasks resulted in a change in the schedule for the Draft H&H report. Georgia Power anticipates filing the Draft H&H report with FERC in March 2020.

2.4 REMAINING ACTIVITIES

- Georgia Power will finalize the draft H&H Study Report and distribute to FERC and stakeholders for review and comment. Georgia Power will address comments and incorporate them, as applicable, into the Final H&H Study Report, which will be included in the Decommissioning Plan.
- Georgia Power will host a public meeting on April 1, 2020 from 2-4 PM and 6-8 PM (Eastern time) at the Valley Community Center (Crowder Room), 130 Sportsplex Drive, Valley, Al 36854 to present information on the decommissioning of the Langdale and Riverview Projects, including the Draft H&H report. Stakeholders may provide comments to Georgia Power and/or FERC on or before May 1, 2020, regarding the information presented at the April 1, 2020 public meeting and the draft study report. Georgia Power will review comments and incorporate them into the Final H&H Report and Decommissioning Plan, as appropriate. For any comments not included in the Final H&H Report and/or Decommissioning Plan, Georgia Power will provide an explanation of why these comments were not included.

3.0 SHOAL BASS STUDY

3.1 INTRODUCTION

Shoal Bass are recognized as a high priority, rare species by both Alabama Department of Conservation and Natural Resources (ADCNR) and the Georgia Department of Natural Resources (GDNR) in their State Wildlife Action Plans due to multiple factors including limited range and habitat fragmentation by dams. Shoal Bass (*Micropterus cataractae*) is also a popular target for Chattahoochee River anglers in the vicinity of the Projects. As such, the protection or enhancement of Shoal Bass populations through actions that increase their range and habitat connectivity are of particular interest to resource managers. The goal of the study is to provide a literature review of Shoal Bass and to discuss the potential effects of dam removal on Shoal Bass and their aquatic habitats in the study area.

3.2 STUDY PROGRESS

- The Draft Potential Effects of Dam Removal on Shoal Bass Study Report (Shoal Bass Study Report) is being filed with FERC concurrent with this Progress Report. Stakeholders have until May 1, 2020 to review and comment on this report.

3.3 VARIANCE FROM STUDY PLAN AND SCHEDULE

- Several stakeholders in the FERC surrender proceedings commented that removing the Projects would be detrimental to the Shoal Bass population in this reach of the Chattahoochee River. Therefore, Georgia Power expanded the original literature review to include an analysis of the effects of dam removal on Shoal Bass.
- There was a slight variance from Georgia Power's schedule in the FSP filed on July 24, 2019; instead of filing in December 2019, Georgia Power filed this study report in February 2020.

3.4 REMAINING ACTIVITIES

- Georgia Power will host a public meeting on April 1, 2020 from 2-4 PM and 6-8 PM (Eastern time) at the Valley Community Center (Crowder Room), 130 Sportsplex Drive, Valley, Al 36854 to present information on the decommissioning of the Langdale and Riverview Projects, including the Draft Shoal Bass Study Report. Stakeholders will have until May 1, 2020 to provide comments to Georgia Power and/or FERC. Georgia Power will review comments and incorporate them into the Final Shoal Bass Study Report and Decommissioning Plan, as appropriate. For any comments not included in the Final Shoal Bass Study Report and/or Decommissioning Plan, Georgia Power will provide an explanation of why these comments were not included.

4.0 WATER QUALITY STUDY

4.1 INTRODUCTION

The goal of the water quality study is to provide baseline water quality for the study area. The objective is to characterize study area water quality based on a summary of available relevant water quality data, including information presented in the application supplemented by available information from 2018-2019. In addition, Georgia Power will use this information in consulting with the USACE, Georgia Department of Natural Resources Environmental Protection Division (GEPD), and the Alabama Department of Environmental Management (ADEM) regarding a Clean Water Act (CWA) Section 404 permit and CWA Section 401 water quality certifications.

4.2 STUDY PROGRESS

- The Draft Water Quality Study Report is being filed with FERC concurrent with this Progress Report. Stakeholders have until May 1, 2020 to review and comment on this report.

4.3 VARIANCE FROM THE STUDY PLAN AND SCHEDULE

- In addition to providing baseline water quality for the study area, Georgia Power also evaluated potential effects on the EAWSFPD's discharge within the Langdale Project boundary. As part of that effort, Georgia Power worked with the Alabama Department of Environmental Management (ADEM) to evaluate the effects on EAWSFPD's existing National Pollutant Discharge Elimination System (NPDES) permit; the results are included in the Draft Water Quality Report.
- There was a slight variance from Georgia Power's schedule in the FSP filed on July 24, 2019; instead of filing in December 2019, Georgia Power filed this study report in February 2020.

4.4 REMAINING ACTIVITIES

- Georgia Power will host a public meeting on April 1, 2020 from 2-4 PM and 6-8 PM (Eastern time) at the Valley Community Center (Crowder Room), 130 Sportsplex Drive, Valley, Al 36854 to present information on the decommissioning of the Langdale and Riverview Projects, including the effects of the project decommissioning on water quality. Stakeholders may provide comments to Georgia Power and/or FERC on or before May 1, 2020, regarding the information presented at the April 1, 2020 public meeting and draft study report. Georgia Power will review comments and incorporate them into the Final Water Quality Study Report and Decommissioning Plan, as appropriate. For any comments not included in the Final Water Quality Study Report and/or Decommissioning Plan, Georgia Power will provide an explanation of why these comments were not included.

5.0 MUSSEL SURVEY STUDY

5.1 INTRODUCTION

Georgia Power will conduct a mussel survey on the Chattahoochee River in the immediate areas downstream of Langdale, Riverview and Crow Hop Dams where localized construction activity is proposed to effectuate dam removal. The purpose of the mussel study is to characterize the existing mussel community in the immediate downstream vicinity of the dams using field surveys and to examine areas of disturbance likely to occur with dam removal. Ecological Solutions was retained to assess the quality of mussel habitat in the areas immediately surrounding the Langdale, Riverview and Crow Hop Dams, where actual deconstruction of the dam facilities will take place. The survey extents were reviewed and approved by USFWS and Georgia DNR/WRD on October 15-17, 2019.

Ecological Solutions will provide:

- Mussel surveys (utilizing hand grubbing, snorkeling, and Self Contained Underwater Breathing Apparatus);
- Photographic documentation of surveyed aquatic resources;
- Threatened and endangered species research and findings;
- Global positioning system (GPS) recording of protected species locations; and
- Report summarizing all findings.

5.2 STUDY PROGRESS

- Georgia Power has retained Ecological Solutions to perform the mussel survey. However, the Fall mussel survey was unavoidably delayed due to a combination of excessive rain, unexpected high releases from the USACE's West Point Project, and extreme low temperatures which created unsuitable and unsafe survey conditions.
- Georgia Power is working with Ecological Solutions to schedule the mussel survey during safe working conditions.

5.3 VARIANCE FROM THE STUDY PLAN AND SCHEDULE

- The mussel survey scope has expanded to include additional areas of potential disturbance.
- Due to unsuitable and unsafe survey conditions described in Section 5.2, the mussel survey has been postponed until safe and suitable survey conditions exist (likely to be late spring/summer 2020).

- Consistent with FERC's request to have all studies completed prior to and included with the Dam Decommissioning Plan filing, Georgia Power advanced the mussel survey fieldwork to occur before dam removal. We anticipate completing this field study in late Spring/summer 2020, rather than just prior to dam construction as originally proposed.

5.4 REMAINING ACTIVITIES

- Conduct mussel survey once survey conditions are suitable and safe.
- Georgia Power will host a public meeting on April 1, 2020 from 2-4 PM and 6-8 PM (Eastern time) at the Valley Community Center (Crowder Room), 130 Sportsplex Drive, Valley, Al 36854 to present information on the decommissioning of the Langdale and Riverview Projects, including the intent to characterize, through the mussel survey, the effects of the project decommissioning on mussels. Stakeholders may provide comments to Georgia Power and/or FERC on or before May 1, 2020, regarding the information presented at the April 1, 2020 public meeting. Once the mussel survey is complete and a report is distributed, stakeholders will have 30 days to review and comment on the Draft Mussel Report. Georgia Power will review comments and incorporate them into the Final Mussel Study Report and Decommissioning Plan, as appropriate. For any comments not included in the Final Mussel Study Report and/or Decommissioning Plan, Georgia Power will provide an explanation of why these comments were not included.

6.0 CULTURAL RESOURCES STUDY

6.1 INTRODUCTION

Georgia Power is consulting with the Georgia Historic Preservation Division (GHPD), the Alabama Historic Commission (AHC), and potentially affected federally-recognized Tribes (together, Consulting Parties) on ways to avoid, minimize, and/or mitigate adverse effects to historic properties. To help achieve these goals, Georgia Power will conduct a cultural resources study. Specific objectives of this study are to:

- Determine need for additional information/documentation on known and unknown resources.
- Work with Consulting Parties to develop a plan to avoid, minimize, and mitigate adverse effects to Langdale and Riverview plants and site 9HS30; and
- Work with Consulting Parties to determine need for any continued management of resources retained by Georgia Power.

Georgia Power surveyed the riverine reaches between Langdale and Crow Hop, as well as those between Crow Hop and Riverview, by boat and/or on foot during low flow to identify any rock weirs, fish traps, or similar features. Researchers also surveyed the island below the Langdale Dam and adjacent to the powerhouse as that area is in the area of potential effect.

Currently, Georgia Power is working with the Consulting Parties to determine the level of Historic American Engineering Record (HAER) documentation and evaluation that may be needed at the Langdale and Riverview plants. Results of this study will be used to develop a Memorandum of Understanding (MOU).

6.2 STUDY PROGRESS

- Georgia Power has retained Southern Research to conduct cultural resource surveys and historic property documentation.
- Southern Research performed the surveys in November 2019. Georgia Power anticipates that a draft study report will be available to the Consulting Parties in February 2020.

6.3 VARIANCE FROM THE STUDY PLAN AND SCHEDULE

- Consistent with FERC's request to have all studies completed prior to and included with the Dam Decommissioning Plan filing, Georgia Power advanced the cultural resources survey to occur before dam removal. Southern Research began surveying in November 2019 and Georgia Power anticipates completing this field study in late Spring 2020, rather than just prior to dam construction as originally proposed.

6.4 REMAINING ACTIVITIES

- Complete Draft Cultural Resource Study Report based on existing information and Fall 2019 field work and send to Consulting Parties for review and comment. Due to the sensitive nature of this report, review will be limited to FERC, AHC, GHPD and consulting Tribes.
- Georgia Power will host a public meeting on April 1, 2020 from 2-4 PM and 6-8 PM (Eastern time) at the Valley Community Center (Crowder Room), 130 Sportsplex Drive, Valley, Al 36854 to present information on the decommissioning of the Langdale and Riverview Projects, including an update on the cultural resources study. Stakeholders may provide comments to Georgia Power and/or FERC on or before May 1, 2020, regarding the information presented at the April 1, 2020 public meeting.

ATTACHMENT 1

U.S. FISH AND WILDLIFE SERVICE LETTER OF SUPPORT

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

October 24, 2019

Langdale and Riverview Projects (FERC Nos. 2341-033 and 2350-025)
Letter of Support for Surrenders and Dam Removals

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Room 1-A – Dockets Room
Washington, DC 20427

Dear Secretary Bose:

On behalf of Georgia Power Company, Southern Company is filing with the Federal Energy Regulatory Commission (FERC) the enclosed U.S. Fish and Wildlife Service (USFWS) letter of support for Georgia Power's proposal to surrender the project licenses for the Langdale and Riverview Projects (FERC Project Nos. 2341-033 and 2350-025). The letter of support, signed by representatives from USFWS and Georgia Power, acknowledges an ongoing effort to develop a Memorandum of Agreement for the removal of project dams on the Chattahoochee River.

If you have questions or comments, please feel free to contact me at 404.506.7219 or at cromara@southernco.com

Sincerely,

Courtenay R. O'Mara

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

Enclosure

cc: Mark S. Berry - Environmental and Natural Resources Vice President, Georgia Power
Leopoldo Miranda – Regional Director, U.S. Fish and Wildlife Service
Herbie N. Johnson - Hydro General Manager, Southern Company Generation
Hallie M. Meushaw, Troutman Sanders
Kelly Schaeffer, Kleinschmidt
Wayne King, FERC ARO

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345

In Reply Refer To:
FWS/R4/FAC

May 31, 2019

Georgia Power and the US Fish and Wildlife Service (Service) have expressed a mutual interest in the removal of the Langdale and Riverview dams. These structures are located on the Chattahoochee River, which forms the border between Alabama and Georgia. The current licenses for these minor power-generating projects are set to expire in 2023 although neither has been operational since 2009.

The Service has participated in collaborative communications with Georgia Power and other resource managers in advance of the FERC application filing. The Fish and Wildlife Service supports Georgia Power's request to the Georgia Public Service Commission regarding decertification of the Langdale and Riverview dams. The Fish and Wildlife Service supports surrendering of the operation of these facilities and any subsequent activities needed to decommission and remove these structures. The Service has been coordinating with Georgia Power, state agencies, and other organizations on the proposed action. The Service fully supports the request for approval to restore stream continuity and connectivity as well as natural flows and habitats that are beneficial to overall ecosystem function as well as at-risk aquatic, wetland, and terrestrial species associated with the middle Chattahoochee River. While larger barriers will remain on the Chattahoochee River both up- and downstream of these areas, the resulting unimpeded reach will restore a more natural river channel, including shoal habitats, that will benefit fish and wildlife resources. Key species that will benefit from removals are the blue-striped shiner and the shoal bass as well as listed species such as the Southern elktoe, Delicate spike and the Rayed creekshell mussels. In addition to conservation benefits, the proposed action will also enhance recreational opportunities (kayaking, fishing, bird watching, etc.) for local and visiting communities.

There is currently a Memorandum of Agreement (MOA) being developed by the necessary agencies that will, upon approval by regulatory agencies, culminate in the removal of these dams and help restore natural conditions to this section of the Chattahoochee River.

This letter will serve as my approval for continuing discussions among the agencies and for developing proposals for the removal of these dams and obtain the associated conservation benefits that will come with these removals.

Leopoldo Miranda, Regional Director
Fish and Wildlife Service

Dr. Mark Berry, Vice President
Environmental and Natural Resources
Department Georgia Power Company

ATTACHMENT B – Draft Potential Effects of Dam Removal on Shoal Bass Study Report

POTENTIAL EFFECTS OF DAM REMOVAL ON SHOAL BASS

DRAFT

LANGDALE (FERC NO. 2341)
AND
RIVERVIEW (FERC NO. 2350)
HYDROELECTRIC PROJECTS

Prepared by:

Southern Company Generation Hydro Services
& Georgia Power Natural Resources

and

Kleinschmidt

FEBRUARY 2020

POTENTIAL EFFECTS OF DAM REMOVAL ON SHOAL BASS
LANGDALE (FERC NO. 2341) AND RIVERVIEW (FERC NO. 2350) HYDROELECTRIC PROJECTS
DRAFT

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ACRONYMS AND ABBREVIATIONS

ACF	Apalachicola-Chattahoochee-Flint
ADCNR	Alabama Department of Conservation and Natural Resources
AIR	additional information request
AL	State of Alabama
C.F.R.	Code of Federal Regulations
cfs	cubic feet per second
FERC	Federal Energy Regulatory Commission
FL	State of Florida
fps	feet per second
FPS	Final Study Plan
GA	State of Georgia
GDNR	Georgia Department of Natural Resources
Georgia Power	Georgia Power Company
GPS	Global Positioning System
HEC-RAS	Hydrologic Engineering Center River Analysis System
kW	kilowatt
PSP	Proposed Study Plan or Study Plan
RM	river mile
USACE	U.S. Army Corps of Engineers
YOY	young-of-year

1.0 PROJECT OVERVIEW

Georgia Power Company (Georgia Power) is filing with the Federal Energy Regulatory Commission (FERC) this report in support of Georgia Power's applications for license surrender and decommissioning of the Langdale Project (FERC No. 2341) and the Riverview Project (FERC No. 2350) (the Projects).

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 river miles 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.

Riverview Project

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

The Riverview Project consists of two separate dams, Riverview Dam and Crow Hop Diversion Dam (Crow Hop Dam), and a powerhouse with generating equipment located on the western abutment of Riverview Dam. The Project operated as a run of river hydroelectric plant. Crow Hop Dam is the upstream dam and is situated across the main 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 1-2**). The Project was constructed in several phases. The smaller downstream 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. Georgia Power stopped operating the units in 2009.

Georgia Power filed applications to surrender the FERC licenses for the Projects on December 18, 2018, in accordance with FERC's regulations at 18 C.F.R. § 6.1 and 6.2. The Projects' licenses expire on December 31, 2023.

On April 11, 2019, FERC issued a request for additional information (AIR) regarding Georgia Power's applications. Georgia Power prepared and filed a Proposed Study Plan (PSP) on May 24, 2019. Based on comments on the PSP, the PSP was revised and filed as the Final Study Plan (FSP) on July 24, 2019. As part of implementing the FSP, Georgia Power prepared this report to provide a literature review on Shoal Bass and describe the potential effects of dam removal on Shoal Bass and their aquatic habitats in the study area.

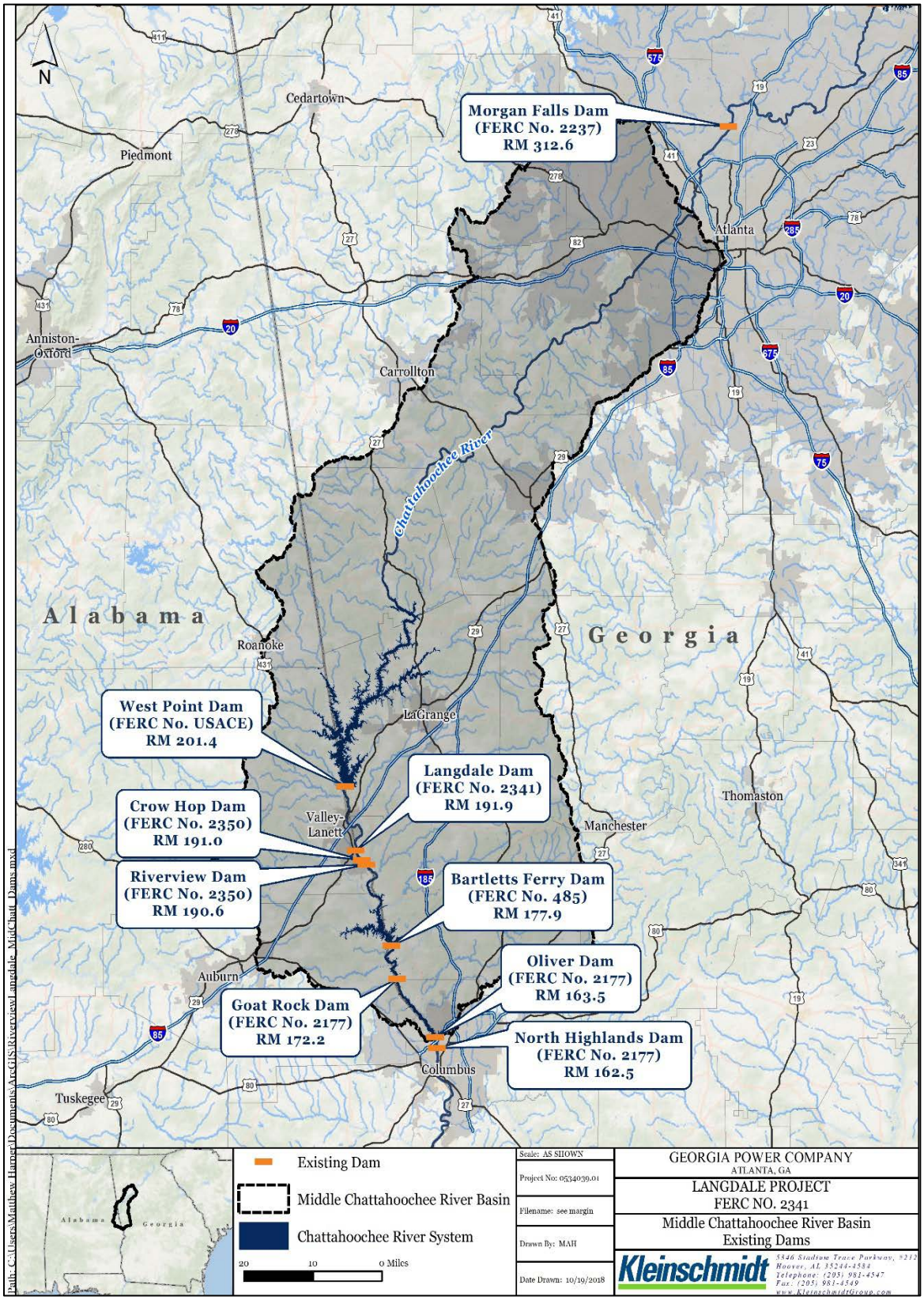

FIGURE 1-1 MIDDLE CHATTAHOOCHEE RIVER BASIN EXISTING DAMS

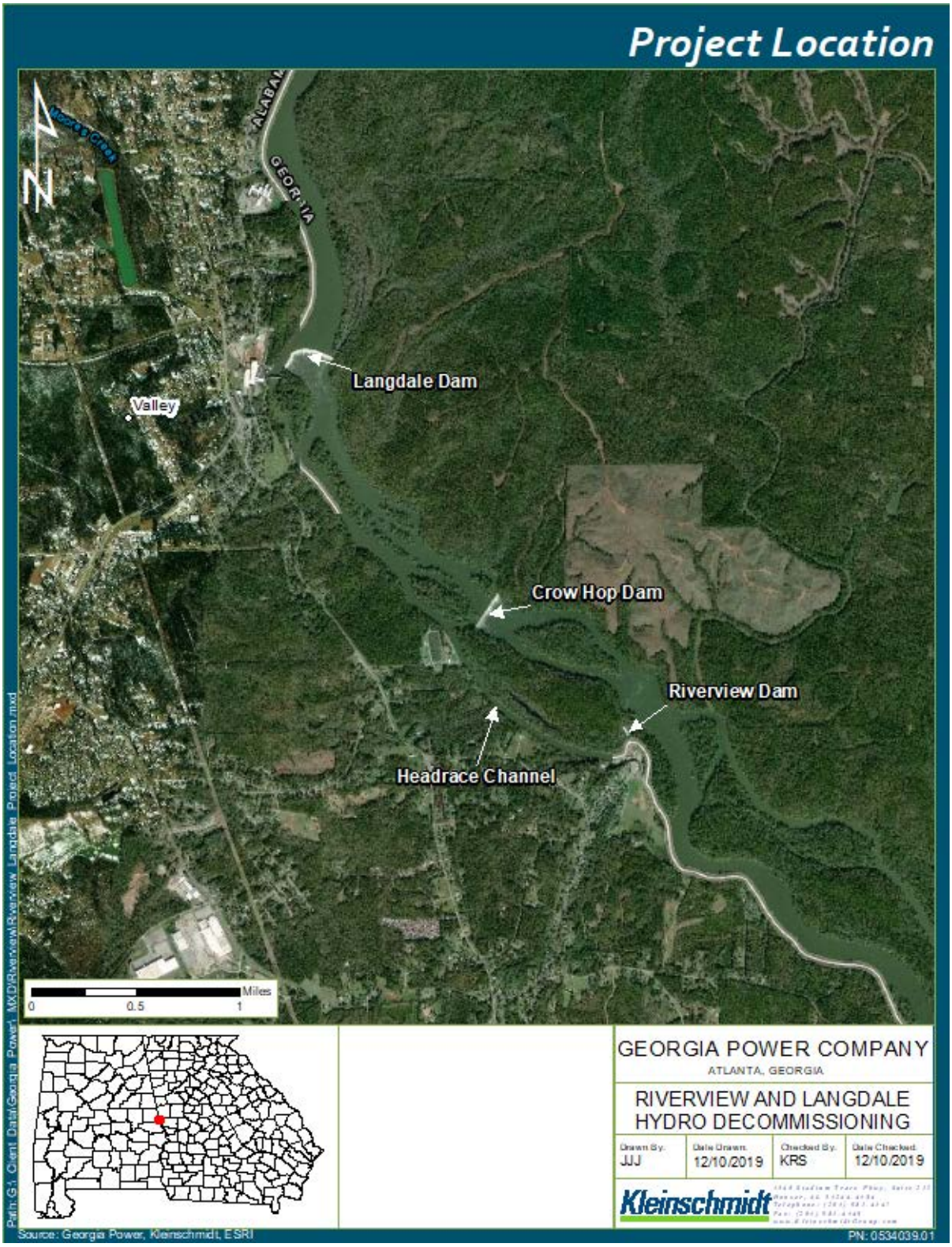

FIGURE 1-2 LANGDALE AND RIVERVIEW PROJECT LOCATIONS

2.0 EFFECTS OF DAM REMOVAL ON SHOAL BASS

2.1 INTRODUCTION

Shoal Bass are recognized as a high priority, rare species by both Alabama Department of Conservation and Natural Resources (ADCNR) and the Georgia Department of Natural Resources (GDNR) in their State Wildlife Action Plans due to multiple factors including limited range and habitat fragmentation by dams. As such, the protection or enhancement of Shoal Bass populations through actions that increase their range and habitat connectivity are of particular interest to resource managers.

Shoal Bass (*Micropterus cataractae*) is also a popular species for Chattahoochee River anglers in the vicinity of the Projects. Several stakeholders in the FERC surrender proceedings have commented that removing the Projects would be detrimental to the Shoal Bass population in this reach of the Chattahoochee River.

2.2 GOALS AND OBJECTIVES

The goal of this study is to provide a literature review of Shoal Bass and describe the potential effects of dam removal on Shoal Bass and their aquatic habitats in the study area.

2.3 STUDY AREA

The study area includes the Chattahoochee River from West Point Dam downstream through the Langdale and Riverview Projects to the headwaters of Lake Harding (Bartletts Ferry Hydroelectric Project (FERC No. 485) reservoir).

2.4 METHODOLOGY

Literature consulted for this review consisted of peer-reviewed published journals. The studies referenced pertain to the biology and life history of Shoal Bass, the general effects of dam removal on fish species (occurring locally and non-locally), and the possible effects of dam removal on Shoal Bass. Georgia Power also considered the stakeholder comments filed in the FERC surrender proceedings for the Projects in developing this report. Additionally, Georgia Power prepared a brief entitled “Expected Outcomes of Barrier Removal on Shoal Bass

Micropterus cataractae Within their Native Range", which is included in Appendix A of this report.

2.5 SHOAL BASS LIFE HISTORY

SHOAL BASS (GEORGIAWILDLIFE.COM)

The Shoal Bass is a riverine, freshwater fish species endemic to the Apalachicola-Chattahoochee-Flint (ACF) river basin in Georgia, Alabama, and Florida (Williams and Burgess 1999). This species is typically found in mainstem rivers and their larger tributaries (Ramsey 1975). Across their entire range, Shoal Bass typically begin spawning in early April through mid or late June (Wright 1967; Hurst et al. 1975). They spawn in refuges from high water velocities such as boulders, rocks, or vegetation in the lower ends of pools and their eggs adhere to rocks and pebbles (Boschung and Mayden 2004; Johnston and Kennon 2007; Bitz et al. 2015). Johnston and Kennon (2007) observed two different size classes in Little Uchee Creek (AL) in June, suggesting that there may be more than one spawning bout, although it is unclear if the same individual fish can spawn more than once per season. Larval Shoal Bass hatch in water temperatures of 15 °C to 22 °C (Sammons et al. 2015) and inhabit deep areas with no water velocity (Johnston and Kennon 2007). Juveniles tend to inhabit more shallow areas of low velocity (Johnston and Kennon 2007) and higher-than-average percentages of rocky substrate in both shoals and pools (Wheeler and Allen 2003) and feed on insects such as mayflies, odonates and hellgrammites (Wheeler and Allen 2003; Sammons et al. 2015).

As adults, Shoal Bass have been found to inhabit rocky areas of moderate to high velocity and feed on fish and crayfish (Boschung and Mayden 2004; Goclowski et al. 2013; Wheeler and Allen 2003). Shoal Bass typically grow more rapidly after their second year and reach sexual maturity at 3 years. The mean sizes for fish ages 1 to 7 from the Chipola (FL) and Flint (GA) rivers and Halawakee Creek (AL) were 82, 179, 261, 326, 375, 424, and 468 mm, respectively. The life expectancy for Shoal Bass is approximately 8 years (Boschung and Mayden 2004; Parsons and Crittenden 1959).

2.6 GENERAL EFFECTS OF DAM REMOVAL

Dams can alter the flow, water temperature, water chemistry, nutrient transport, community structure, and fish movement in rivers (Kerr et al. 2010); therefore, potentially affecting aquatic species in a variety of ways. Dams may affect fish in particular by altering habitat and limiting mobility. The goal of dam removal is often to restore historic habitat and allow fish passage, which may increase fish diversity by allowing fish to migrate (Burroughs et al. 2010; Cooper et al. 2017). In some species, migration between freshwater and marine habitat is necessary for spawning. Anadromous fish species spawn in freshwater habitats and migrate to marine habitats to grow and mature, while catadromous species spawn in marine habitats and migrate to freshwater to grow and mature. Potamodromous species migrate solely within freshwater systems to forage, breed, or seek refuge. Examples of potamodromous fish in the southeastern U.S.A. include Shoal Bass, Lake Sturgeon, and Flathead Catfish.

In some cases, reducing barriers to fish passage can be complex and may have unexpected results on fish species. For example, increasing fish passage on the Connecticut River (1975-1981) allowed American Shad to migrate more than 100 stream miles into historic upper watershed habitat and disperse throughout the upper reaches (Leggett et al. 2004). However, fish passage construction did not affect the shad population, presumably because the small population of adults may have been too dispersed during spawning season, and the reduction of barriers caused an increased migration distance and therefore increased bioenergetic cost of spawning, causing mortality (Leggett et al. 2004). The authors attributed the delayed restoration of the shad population to migration barriers being removed too rapidly for such a large watershed and small remnant population (Leggett et al. 2004).

Macroinvertebrate species may also be impacted by dams and benefit from their removal. For example, sessile species of mussels require host fish to disperse their larvae. Habitat connectivity and the unimpeded ability of fish to migrate throughout river systems is therefore an important factor influencing the distribution and abundance of mussels (Watters 1996). The removal of a barrier can have a variety of effects. In one case, community density, generic richness, and Shannon-Wiener diversity initially decreased for several months after the removal of a dam before consistently increasing thereafter, depending on location of the reach (Mažeika et al. 2017). Another study found no influence of a barrier on assemblage composition and structure,

likely due to dispersal mechanisms not being entirely dependent on water (Milesi and Melo 2017).

2.7 POTENTIAL EFFECTS ON SHOAL BASS

In the state of Georgia, Shoal Bass are considered to be a High Priority Species and a Species of Concern (Georgia Department of Natural Resources 2015). The factors that threaten Shoal Bass populations include habitat fragmentation (Dakin et al. 2015; Sammons and Early 2015; Taylor et al. 2018a), hybridization with other *Micropterus* species (Dakin et al. 2015; Taylor et al. 2018b), and forms of habitat degradation such as sedimentation (Walser and Bart 1999), temperature alteration (Porta 2011), and flow manipulation (Stormer and Maceina 2009). In response to the proposed surrender of the Langdale and Riverview Projects, some stakeholders have commented that removing the dams would result in: 1) Shoal Bass migrating out of the area; 2) Striped Bass moving upstream and reducing the Shoal Bass population; and 3) decreased suitable habitat for Shoal Bass.

Although it is likely that Shoal Bass would migrate after dam removal, migration can be a natural part of the Shoal Bass life cycle. Prior to the construction of dams, Shoal Bass were able to move freely within the free-flowing ACF basin. In the unregulated portion of the Flint River, Shoal Bass have been recorded migrating as far as 197 km to spawn (Sammons 2015), but spawning migrations are often impeded or shortened in sections with dams or reservoirs (Stormer and Maceina 2009; Sammons and Early 2015; Cottrell 2018). Restoring connectivity within the river system may also reduce inbreeding and random genetic drift, which can lower the fitness of individuals in segments of stream with little effective reach (Dakin et al. 2015; Taylor et al. 2018c).

The other threat to Shoal Bass populations is habitat degradation. Dams and other habitat-altering barriers may pose a threat to Shoal Bass because they are habitat specialists and are more selective in their habitat than other species, such as Spotted Bass (Goclowski et al. 2013; Williams and Burgess 1999). Shoal Bass require different types of habitat at different life stages: deep areas with no velocity as larvae (Johnston and Kennon 2007), more shallow and rocky areas of low velocity as juveniles to avoid predation (Johnston and Kennon 2007), and rocky areas of moderate to high velocity as adults (Boschung and Mayden 2004; Goclowski et al. 2013; Wheeler and Allen 2003). Alterations to these habitats could affect the life cycle of this species.

Furthermore, Shoal Bass avoid lentic habitats such as reservoirs and backwaters. Sammons and Early (2015) reported that Shoal Bass from Flat Shoals Creek entered the Chattahoochee River mainstem and settled just below Crowhop Dam rather than moving into Bartlett's Ferry reservoir (Lake Harding) downstream.

Removing the Langdale and Riverview Dams has the potential to restore aquatic habitats to a free-flowing condition and have a long-term positive effect on Shoal Bass. Dam removal will allow better migration of Shoal Bass to spawning habitats and reduce inbreeding. It may also reduce the homogeneity of habitat and restore the variety of habitats used by Shoal Bass during different life stages. Shoal Bass inhabiting this currently fragmented section of the Chattahoochee River would have unimpeded access to tributaries in the reach, including Flat Shoals Creek, which has an abundant population and a fairly large spawning shoal.

In order to compare the effects of removing the dams on physical habitat, habitat suitability criteria from an instream flow study conducted on the Ocmulgee River (GA) was examined. In that study, optimal habitat conditions for adult and young-of-year (YOY) Shoal Bass were determined. For adult Shoal Bass, optimal depths ranged from 3.08 to 4.62 feet and optimal water velocities ranged from 0.51 to 0.77 feet per second (fps). For YOY Shoal Bass, optimal depths ranged from 1.09 to 1.45 feet, and optimal velocities ranged from 0 to 0.14 fps.

Results from Georgia Power's Hydrologic Engineering Center - River Analysis System (HEC-RAS) modeling (Kleinschmidt 2019) were used to analyze the effects of dam removal on the amount of optimal habitat available for adult and YOY Shoal Bass in the study area. Existing and post-removal water depths and velocities under base flow conditions (minimum flow of 675 cubic feet per second (cfs) out of West Point) were output from the HEC-RAS model and analyzed using GIS to determine the total area meeting the optimal criteria for each scenario.

Based on this analysis, the amount of habitat with optimal depth and velocity conditions for adult Shoal Bass are predicted to increase after dam removal. The amount of habitat with optimal depth conditions for YOY is predicted to increase, although amount of habitat with optimal velocity conditions for YOY is predicted to decrease after dam removal (**FIGURE 2-1**). However, the amount of ideal habitat to be gained from dam removal exceeds the amount lost, suggesting Shoal Bass could benefit from the habitat changes caused by dam removal, in addition to the benefits afforded by increased habitat connectivity.

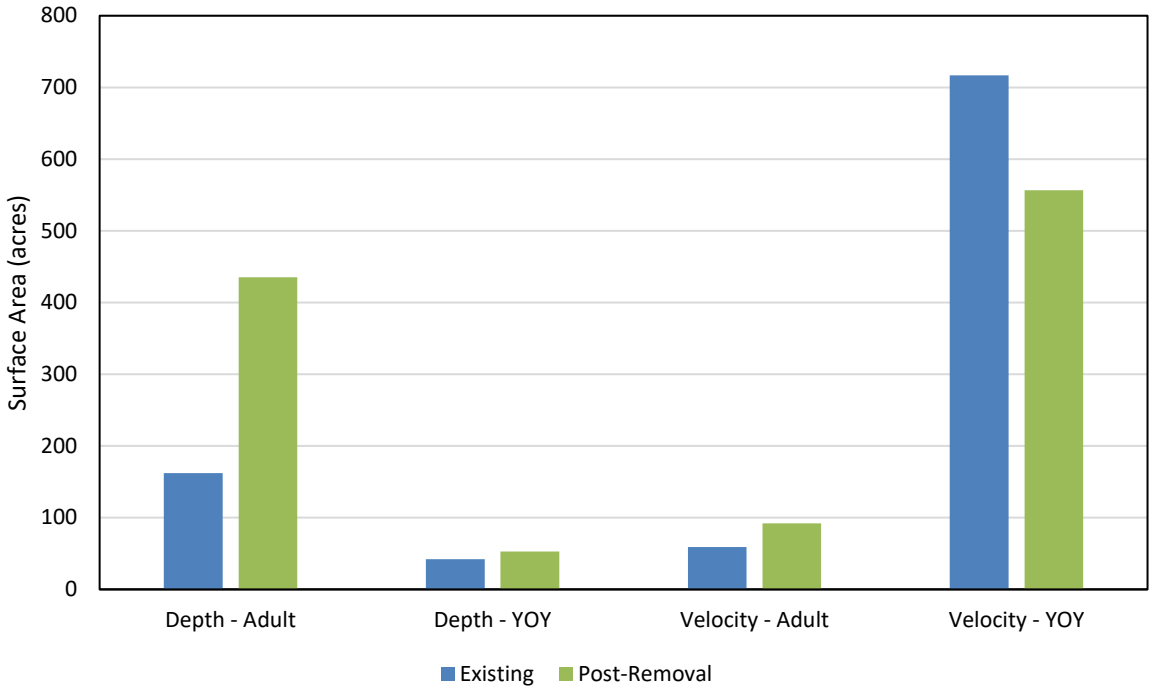

FIGURE 2-1 EXISTING AND POST-REMOVAL AMOUNT OF OPTIMAL HABITAT FOR SHOAL BASS

3.0 CONCLUSIONS

Based on the results of this literature review and analysis of changes to physical habitat predicted by the hydraulic model, the following conclusions are evident:

- Adult Shoal Bass prefer lotic (flowing water) environments with rocky bottoms and moderate to swift currents, and do not prefer impoundments;
- Removal of the Projects' dams will restore aquatic habitats to a free-flowing condition, provide greater connectivity among habitat types, and increase genetic diversity of Shoal Bass and other riverine species inhabiting the reach; and
- Removal of the Projects' dams will result in a net increase in suitable habitat for Shoal Bass.

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APPENDIX A

GEORGIA POWER BRIEF:
EXPECTED OUTCOMES OF BARRIER REMOVAL ON SHOAL BASS MICROPTERUS CATARACTAE WITHIN THEIR NATIVE RANGE

Expected Outcomes of Barrier Removal on Shoal Bass *Micropterus cataractae* Within their Native Range

The removal of barriers to migration is one of the actions that resource managers have commonly focused on to further Shoal Bass *Micropterus cataractae* conservation. This briefing is intended to summarize existing research and literature to approximate expected outcomes from removals of dams, culverts, and other barriers to fish passage on Shoal Bass populations. While research needs remain regarding the natural history and habitat needs of the species, recent research helps shine light on the potential for future barrier removal projects.

Background

The Shoal Bass is a riverine, freshwater fish species endemic to the Apalachicola-Chattahoochee-Flint (ACF) river basin in Georgia, Alabama, and Florida (Williams and Burgess 1999). This fish is typically found in mainstem rivers and their larger tributaries (Ramsey 1975). True to its name, the Shoal Bass typically prefers swift, rocky habitat when available (Williams and Burgess 1999; Wheeler and Allen 2003; Stormer and Maceina 2009; Gocklowski et al. 2013; Sammons et al. 2015). Seasonal habitat use varies, with adult Shoal Bass often congregating in large shoal complexes to spawn in spring (Gocklowski et al. 2013; Bitz et al. 2015; Sammons 2015; Cottrell 2018), then dispersing to diverse habitats, including coastal plain river segments with little, if any, shoal habitat (Sammons 2015).

The Shoal Bass is a popular sportfish across its range (Taylor and Peterson 2014; Sammons et al. 2015), but threats from multiple factors include habitat fragmentation (Dakin et al. 2015; Sammons and Early 2015; Taylor et al. 2018a) and degradation (e.g. sediment, Walser and Bart 1999; temperature, Porta 2011; and flow, Stormer and Maceina 2009) as well as hybridization with other *Micropterus* species (Dakin et al. 2015; Alvarez et al. 2015; Taylor et al. 2018b). Because of these factors, the Shoal Bass is considered a species of conservation concern by multiple groups. The State of Georgia considers the Shoal Bass both a High Priority Species and a Species of Concern (Georgia Department of Natural Resources 2015). Stormer and Maceina (2008) found declining abundance in three of four known populations in Alabama from 2005-2007. The state of Alabama now ranks Shoal Bass as a Level 1 Species of Greatest Conservation Need, with only one known population remaining (Alabama Department of Conservation and Natural Resources 2015). However, recent sampling efforts suggest that this population may now also be extirpated in Uchee Creek (AL) (S. Sammons, personal communication). The International Union for Conservation of Nature Red List considers them “Near Threatened”, while the Endangered Species Committee of the American Fisheries Society considers it a species of special concern (Jelks et al. 2008). However, the shoal bass currently is not listed or petitioned for federal protection under the Endangered Species Act (ESA). Projects which enhance connectivity such as dam removals could help prevent a future ESA listing.

Prior to European settlement, the ACF basin was a free-flowing, interconnected system. The presence of Shoal Bass from mountainous reaches of the Upper Chattahoochee through the Piedmont, across the fall line, and into the Coastal Plain suggests a high degree of connectivity,

though there do appear to be some natural genetic differences among populations across the range (Taylor et al. 2018c). Shoal Bass spawning migrations as far as 197 km (122 mi) have been recorded in the unregulated section of the Flint River (Sammons 2015), though these can be much shorter in sections of the basin with reduced effective distance due to dams or reservoirs (Stormer and Maceina 2009; Sammons and Early 2015; Cottrell 2018). A species distribution modeling exercise suggested that the distance of available free-flowing, interconnected stream length (comprised of third-order streams and larger) was important in explaining the current distribution of Shoal Bass, and that interconnected reaches (i.e. cumulative miles of all connected tributaries) of less than approximately 100 km rapidly lost their suitability for Shoal Bass presence (Taylor et al. 2018a). Fragmented tributary streams showed the greatest loss in Shoal Bass suitability, likely because longer free-flowing fragments connected to mainstem rivers confer access to critical habitats that are unevenly distributed within stream systems (e.g., spawning shoals or drought refugia; Taylor et al. 2018a). In stream segments with little effective reach, inbreeding depression and random genetic drift can result (Dakin et al. 2015; Taylor et al. 2018c), perhaps lowering fitness of remaining individuals. Where barriers to fish passage block smaller tributary populations from access to mainstem refugia, increased variability in year class strength (Taylor 2017) and high mortality during drought (Stormer and Maceina 2009) have also been documented. It is important to note, however, that Taylor et al. (2018a) did not differentiate between stream sizes in their analysis, and it is likely that connectivity to large, mainstem rivers with higher discharge could reduce the effective reach threshold at which shoal bass populations would reach sustainability/stability.

Shoal bass are a fluvial specialist, requiring swift water and rocky outcrops throughout their life cycles (Williams and Burgess 2019; Taylor and Peterson 2013). Shoal Bass do not appear to prefer to utilize lentic habitats (e.g. reservoirs and backwaters). Sammons and Early (2015) found that fish from a large tributary of the Chattahoochee River entered the mainstem but remained immediately below a dam where flow was present rather than entering a downstream reservoir. When Shoal Bass are released into reservoirs (e.g. following fishing tournaments), they typically return to lotic environments upstream of the reservoir (Taylor and Peterson 2015), and Ingram et al. (2013) found that survival of translocated shoal bass was 92% after 90 days, with most fish returning upstream to flowing portions of the headwaters river. Shoal Bass populations exist within some small impoundments on the Middle Chattahoochee River, though each of these systems typically receives some flow due to their high inflow to storage ratios (J. Slaughter, personal communication) in comparison with larger impoundments. In contrast, populations of Shoal Bass are abundant and concentrated during spawning in the unregulated Upper Flint River (Sammons and Goclowski 2012) and populations in unregulated reaches above Lake Lanier on the Chattahoochee and Chestatee Rivers appear stable (Taylor 2017). In the Upper Flint and Upper Chattahoochee Rivers, professional guides offer Shoal Bass trips, supporting the presence of healthy fisheries.

Discussion

Removal of barriers should generally benefit shoal bass populations for multiple reasons. Providing fish passage allows the effective reach available to a population to increase, which can open up access to quality habitat and resolve genetic diversity concerns across currently isolated populations. Therefore, the removal of barriers that open up the highest amount of quality habitat should be prioritized. In areas where non-native congener species (e.g. Alabama Bass *Micropterus henshalli*) exist below a barrier but not above it, however, managers should consider the potential impacts of hybridization and/or interspecific competition on shoal bass as a factor. Removal of barriers can also make populations more resilient in the face of environmental stressors by offering refugia during periods of drought or due to habitat degradation in a localized area as a result of land use impacts, particularly if access to mainstem rivers that are not as susceptible to critical reductions in flow is made available. This may include the restoration of impounded reaches to more suitable, flowing habitat that shoal bass are more likely to utilize.

It is critical that barrier removal projects do not impede passage of fish due to excessive velocities at newly-established points of connectivity. While no published literature exists on the critical swim velocities of Shoal Bass, several studies have looked at similar criteria for Smallmouth Bass *Micropterus dolomieu*. Published U_{crit} values for various sizes of Smallmouth Bass range from 63 to 117 cm/s (Bunt et al. 1999; Cooke and Bunt 2001; Peake 2004). Peake (2004) also studied the ability of Smallmouth Bass to pass through culvert-style raceways and found that a high proportion of individuals (82-95%) were able to make complete ascents at velocities ranging from 40-120 cm/s. Smallmouth Bass are known to use riverine habitats throughout their range, and therefore should stand as a suitable, conservative proxy for Shoal Bass critical swim velocities.

Restoration of impounded reaches can also increase access to historic habitat. While removal of larger dams that create these impoundments is not always a feasible option, where possible, it could potentially increase the biological carrying capacity of a basin. If the impoundment covers historic spawning habitat, benefits can be two-fold in that spawning shoals are restored with appropriate flows while access is then provided to isolated, adjacent populations downstream of a dam. For instance, removal of a low-head dam on the Milwaukee River resulted in increased abundance of native smallmouth bass and decreased abundance of invasive common carp, not only within the footprint of the former reservoir, but also in adjacent study reaches (Kanehl et al. 1997). Even in cases where population equilibrium does not increase, population stability over multiple generations is likely to increase.

Barrier removal projects should always consider the biological needs of the species in concern and be based in sound science. If removals can ameliorate known threats to Shoal Bass populations (e.g. isolation, impoundment, habitat degradation, genetic isolation or hydridization) without creating a larger problem due to one of these threats, these projects should be pursued in a cost-effective approach that prioritizes species recovery both across the range and within priority sub-basins.

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ATTACHMENT C – Draft Water Quality Report

WATER QUALITY STUDY REPORT

DRAFT

LANGDALE (FERC NO. 2341)
AND
RIVERVIEW (FERC NO. 2350)
HYDROELECTRIC PROJECTS

Prepared by:

Southern Company Generation Hydro Services
& Georgia Power Natural Resources

and

Kleinschmidt

FEBRUARY 2020

WATER QUALITY STUDY REPORT
LANGDALE (FERC NO. 2341) AND RIVERVIEW (FERC NO. 2350) HYDROELECTRIC PROJECTS
DRAFT

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ACRONYMS AND ABBREVIATIONS

ADEM	Alabama Department of Environmental Management
AIR	additional information request
AL	State of Alabama
C.F.R.	Code of Federal Regulations
cfs	cubic feet per second
FERC	Federal Energy Regulatory Commission
FL	State of Florida
fps	feet per second
FPS	Final Study Plan
GA	State of Georgia
GDNR	Georgia Department of Natural Resources
Georgia Power	Georgia Power Company
GPS	Global Positioning System
HEC-RAS	Hydrologic Engineering Center River Analysis System
kW	kilowatt
PSP	Proposed Study Plan or Study Plan
RM	river mile
USACE	U.S. Army Corps of Engineers
USGS	United States Geological Survey

1.0 INTRODUCTION

Georgia Power Company (Georgia Power) is filing with the Federal Energy Regulatory Commission (FERC) this report in support of Georgia Power's applications for the license surrender and decommissioning of the Langdale Project (FERC No. 2341) and the Riverview Project (FERC No. 2350) (the Projects).

1.1 LANGDALE PROJECT

The Langdale Project is located on the Chattahoochee River in Harris County, Georgia and adjacent to the City of Valley, Alabama (Figure 1-1). The Langdale Project is located at River Mile (RM) 191.9, approximately 9.5 river miles 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.

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, 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.

1.2 RIVERVIEW PROJECT

The Riverview Project is located approximately at river mile (RM) 191.0 (Crow Hop Diversion Dam) and RM 190.6 (Riverview Dam) on the Chattahoochee River, downstream of the City of 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.

The Project consists of two separate dams, Riverview Dam and Crow Hop Diversion Dam (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 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 1-2**). The Project was constructed in several phases. The smaller downstream 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. Georgia Power stopped operating the units in 2009.

Georgia Power filed License Surrender applications with FERC for the Projects on December 18, 2018, in accordance with the Commission's regulations at 18 C.F.R. § 6.1 and 6.2. The Projects' licenses expire on December 31, 2023.

On April 11, 2019, FERC issued a request for additional information (AIR) regarding decommissioning studies proposed by Georgia Power. Georgia Power prepared and filed a Proposed Study Plan (PSP) on May 24, 2019, to address a majority of the items requested by FERC in the AIR. Based on comments received, Georgia Power revised the PSP and filed a Final Study Plan (FSP) with FERC on July 24, 2019. In accordance with the FSP, Georgia Power prepared this report to evaluate baseline water quality data at the Projects.

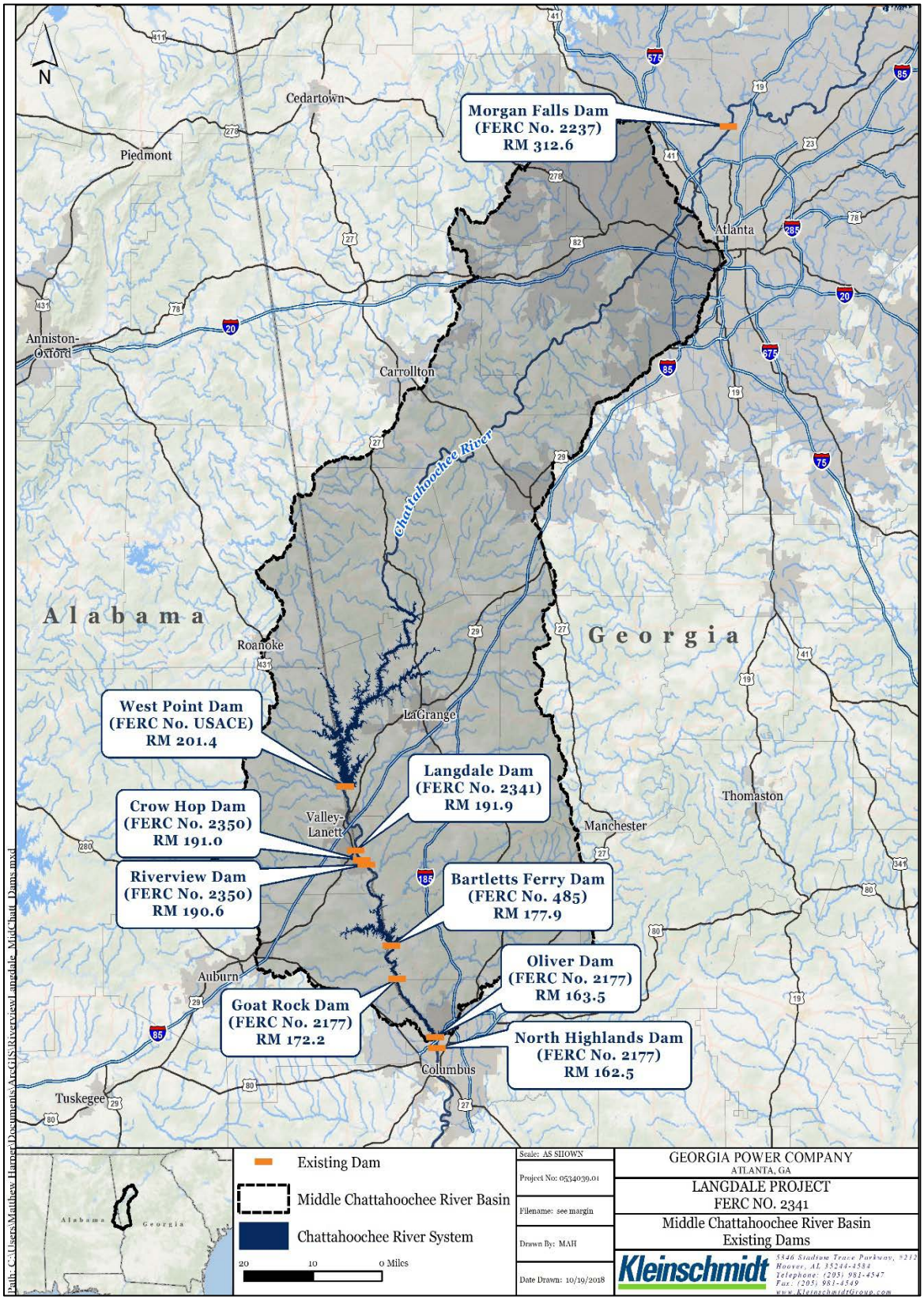

FIGURE 1-1 MIDDLE CHATTAHOOCHEE RIVER BASIN EXISTING DAMS

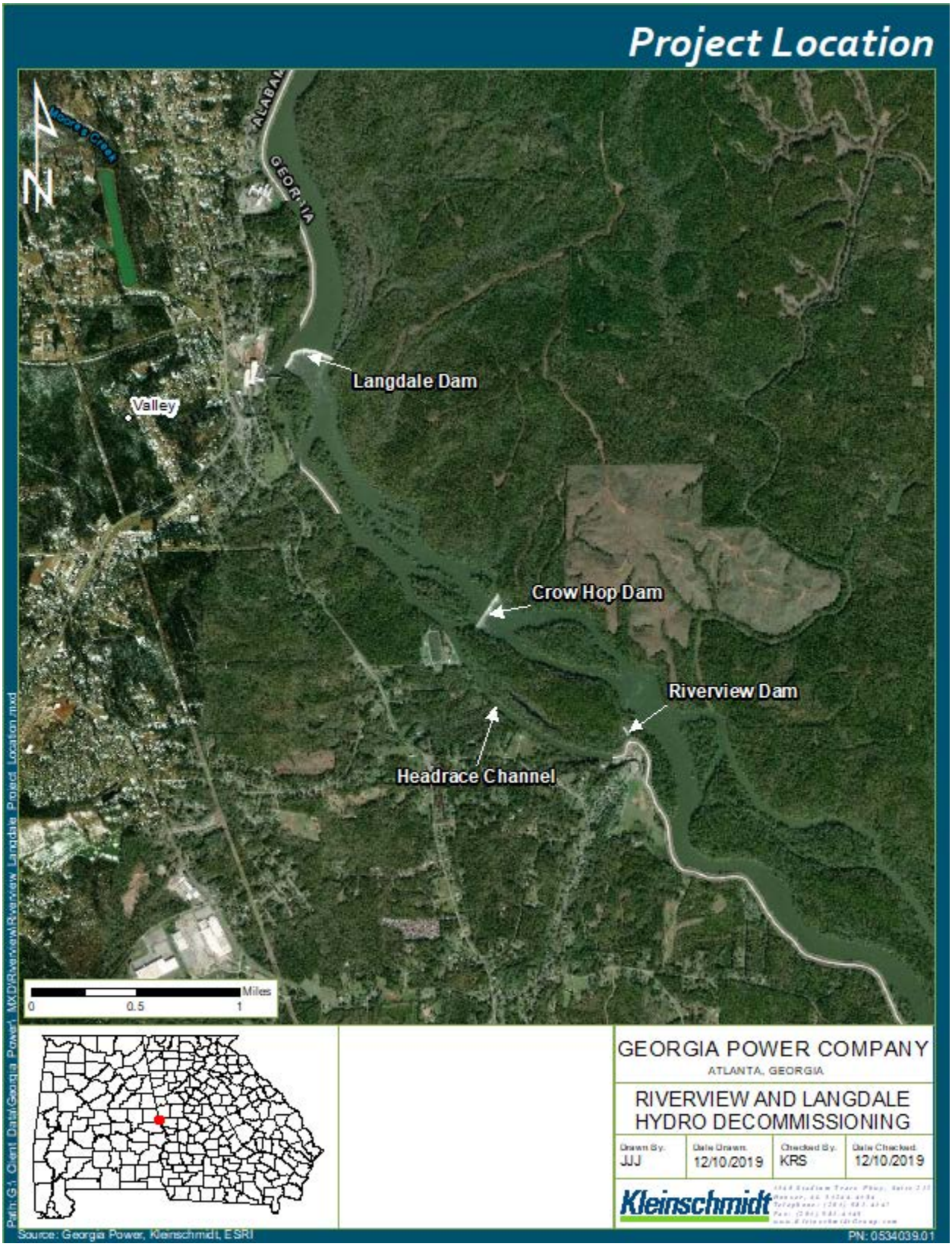

FIGURE 1-2 LANGDALE AND RIVERVIEW PROJECT LOCATIONS

2.0 METHODS

Georgia Power performed searches for available water quality data within the study area, which includes the Chattahoochee River within the FERC Project Boundary for the Langdale and Riverview Projects, as well as West Point Lake (upstream of the Projects) and Lake Harding (downstream of the Projects). Sources included United States Geological Survey (USGS), Georgia Environmental Protection Division (GEPD), Alabama Department of Environmental Management (ADEM), and Georgia Power Company (Georgia Power). GEPD and Georgia Power were sources of relevant contemporary (within the last 10 years) data, which were summarized and included in this report. Searches for relevant contemporary USGS and ADEM data were not found.

3.0 DESCRIPTION OF STUDY AREA

The Chattahoochee River is used extensively and has been actively managed since the late 1800s. Historic and current uses of the river include flood control, hydroelectric power, recreation, and wastewater assimilation. The river's water quality has been impacted by municipal and industrial discharges and agriculture. The Chattahoochee River Basin, including the river, its tributaries, headwater streams, and underlying groundwater, is utilized for numerous purposes. Its waters are withdrawn to supply water for cities and counties, industry, and agriculture.

The Projects lie within the Middle Chattahoochee River Basin (HUC 03130002). Langdale has a drainage area of 3,640 square miles (USGS 2018). The surface area of the water impounded by the Langdale Dam is approximately 152 acres (USACE 2016). Tributaries to the Langdale Project reservoir include Oseligee Creek (AL) and Long Cane Creek (GA). Riverview has a drainage area of 3,661 square miles (USACE 2016). The surface area of the water impounded by the Crow Hop and Riverview Dams is 75 acres. Moores Creek is the only significant tributary that drains into the Riverview Project reservoir. The Riverview Project releases water into the Chattahoochee River, also considered the headwaters of the Lake Harding, a reservoir created by the Bartletts Ferry Hydroelectric Project (FERC No. 485), located approximately 12 RM downstream of the Riverview Dam.

The Projects historically operated as run-of-river. Discharges from West Point Dam comprise 98 percent of the inflows to the Projects, with the remaining 2 percent contributed by local runoff from the intervening watershed. West Point Dam has a minimum continuous flow requirement of 670 cubic feet per second (cfs), also referred to as the “base flow”. West Point Dam is a peaking power plant and provides flood control for this region. Because most inflows into the Projects are comprised of releases from West Point, the operation of the upstream West Point Dam regulates the flow regime through the Projects ‘area.

Georgia’s use classification for the Chattahoochee River in the Project Area is “Drinking Water” (GEPD 2016). The state of Alabama use classifications for the Chattahoochee River in the Project Area are “Public Water Supply” (PWS) and “Fish and Wildlife” (F&W) (ADEM 2017). The specific criteria applicable to these use classifications are presented in Table 3-1. The most

recent 305(b) reports for Georgia and Alabama indicate that the Chattahoochee River in the Project Area is fully supporting its designated uses (GEPD 2016a and ADEM 2016).

TABLE 3-1 GEORGIA AND ALABAMA WATER QUALITY CRITERIA FOR APPLICABLE CLASSIFICATIONS IN THE STUDY AREA

PARAMETER	DRINKING WATER (GA)	PUBLIC WATER SUPPLY AND FISH AND WILDLIFE (AL)
Bacteria	May through October: < 200/100 milliliter (mL) November through April: < 1,000/100 ml	*E. coli*: Geometric mean < 548 colonies/100 mL; ≤ 2,507 colonies/100 ml in any sample
Dissolved Oxygen	≥ 5.0 mg/L daily average, and > 4 mg/L at all times	≥ 5.0 mg/L at all times
pH	6.0 – 8.5	6.0 – 8.5
Water Temperature	≤ 90° F	≤ 90° F

Source: GEPD 2015, ADEM 2017

4.0 RESULTS

The GEPD conducted forebay monitoring in West Point Lake since 1994 (Monitoring Location ID LK_12_4060). Vertical profiles of water temperature and dissolved oxygen collected at approximately 1-meter intervals indicate West Point Lake becomes stratified in spring and remains so through early fall (**Figure 4-1, Figure 4-2**). During this time, dissolved oxygen levels at depths greater than 10 meters are extremely low.

The GEPD also conducted monthly monitoring in the Chattahoochee River approximately 0.5 miles downstream of West Point Dam since January 2019 (Monitoring Location ID RV_12_4063). Data from that monitoring effort indicates low dissolved oxygen levels in the West Point tailrace in July and August (Table 4-1). This is due to the release of hypolimnetic water from the West Point Dam.

The GEPD conducted monthly monitoring in the Chattahoochee River at Highway 29, approximately 3 miles downstream of West Point Dam and 6.3 miles upstream of Langdale Dam, from 2010 to 2012 (Monitoring Location ID RV_12_4067). Mean monthly values for select parameters were calculated and are presented in Table 4-2. Similar to the data from the West Point tailrace, these data show dissolved oxygen levels are lowest during the summer months. The data also indicates relatively low levels of nutrients (nitrogen and phosphorus).

A Georgia Power study performed in 2009 and 2010 documented water quality in the Chattahoochee River approximately 1 mile downstream of the Riverview powerhouse. Monthly vertical profile samples at this location indicated dissolved oxygen levels exceed applicable criteria (Table 4-3). The 2009-2010 study also involved the collection of monthly discrete water chemistry samples. Analysis of these samples for 24 different parameters are summarized in Table 4-4.

4.1 EFFECTS OF DECOMMISSIONING ON WATER QUALITY

Based on a review of available data, the water quality at the Projects generally meets or exceeds applicable water quality criteria. Nutrient levels at the Projects are generally low, as the upstream West Point Lake serves as an effective “trap” for nitrogen and phosphorus inputs from its drainage area. Releases from the USACE’s West Point Dam exhibit low dissolved oxygen levels during the summer months. The duration and magnitude of these low dissolved oxygen releases

likely varies from year to year based on hydrologic and climatic conditions, which can affect lake stratification processes.

Under existing conditions, dissolved oxygen levels recover as the releases from West Point Dam flow downstream, especially as they pass over the Projects' dams, which provide physical aeration. 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 alternate means of physical aeration as the water passes through exposed shoals.

4.2 EFFECTS OF DECOMMISSIONING ON WATER QUANTITY

The East Alabama Lower Valley Wastewater Treatment Plant (Valley WWTP) discharges treated effluent to the Chattahoochee River at the upstream end of the Riverview Headrace Channel. ADEM has indicated that the National Pollution Discharge Elimination System (NPDES) permit for the Valley WWTP is based on the 7Q10 flow of 136 cfs. Based on modeling results, the decommissioning and removal of Crow Hop and Riverview Dams will result in a minimum flow of at least 193 cfs in the Headrace Channel (Kleinschmidt 2019, see River Reach 8) under the minimum flow discharge from the upstream West Point Dam. When West Point Dam's large turbine units are added during peaking there is significantly more flow than 193 cfs present in the Headrace Channel. These flows ensure that decommissioning and removal do not impact the permitted effluent from Valley WWTP and meet applicable water quality criteria. Georgia Power discussed these issues with ADEM in its consultations which occurred on September 5, 2019, November 7, 2019 and via a follow-up phone conference on November 13, 2019. Additionally, this item was the subject of discussion with the East Alabama Water and Sewer Authority on July 22, 2019 and December 16, 2019. All consultation documentation will be provided in the Final Decommissioning Plan filing

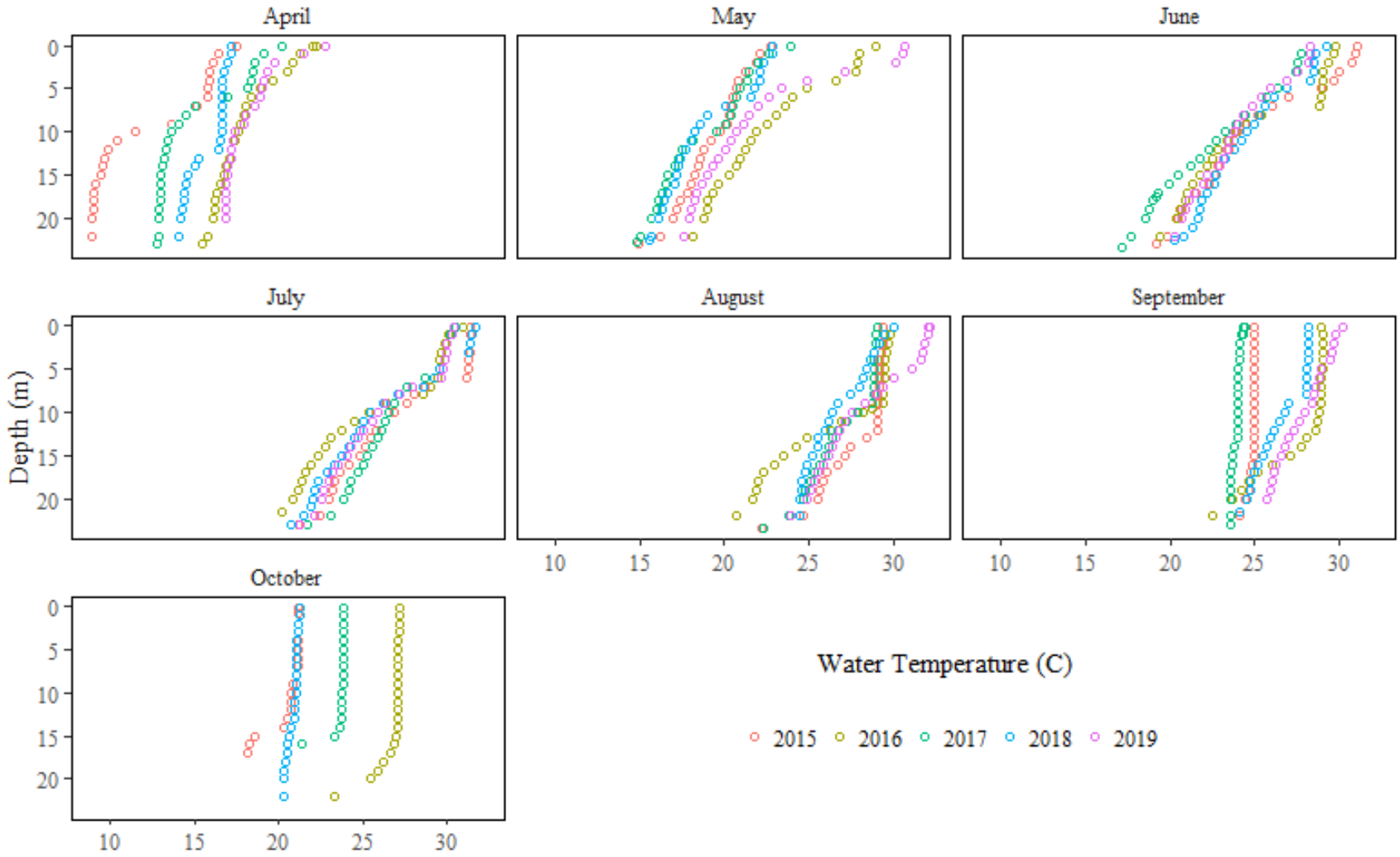

FIGURE 4-1 WEST POINT LAKE FOREBAY WATER TEMPERATURE PROFILES

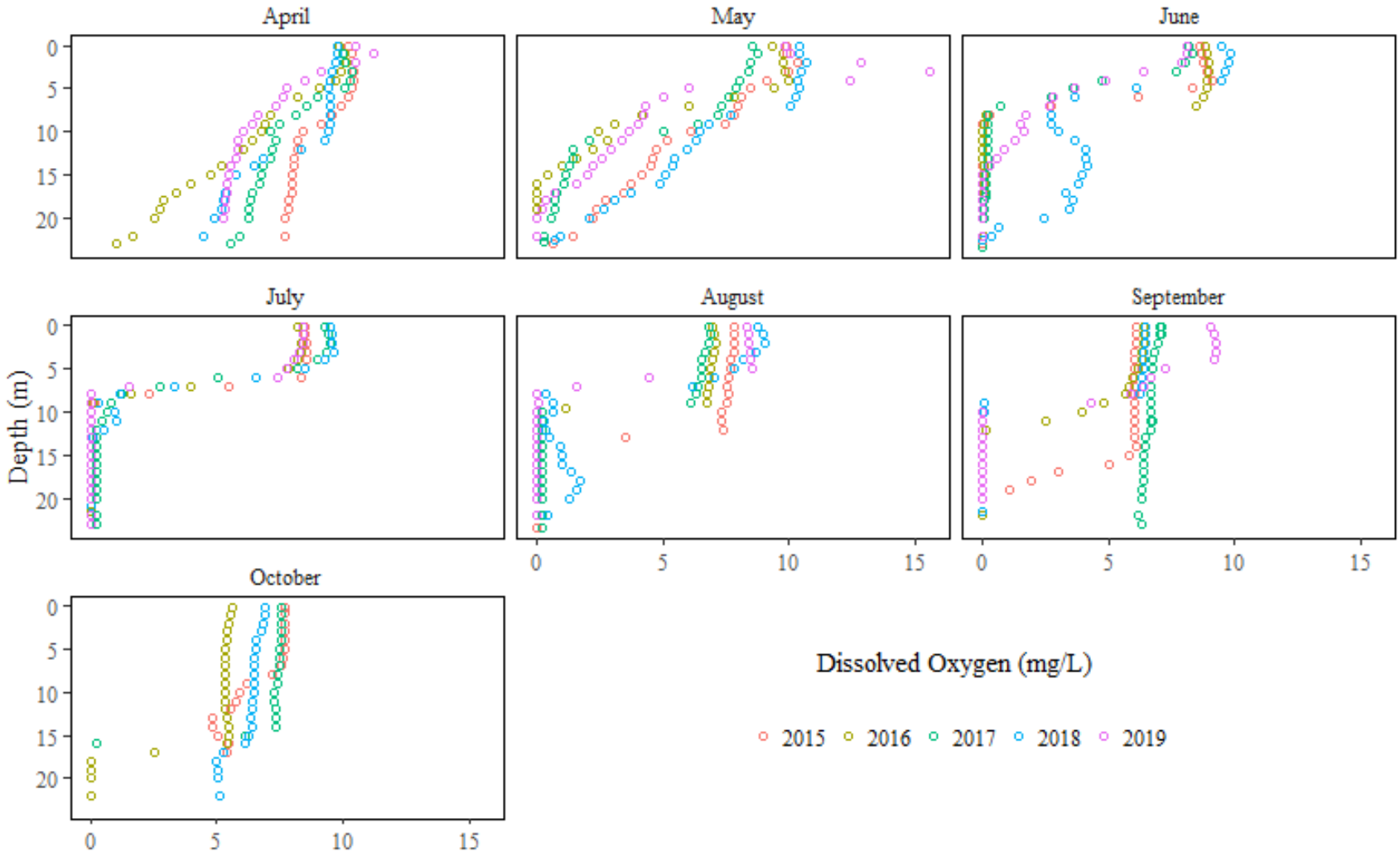

FIGURE 4-2 WEST POINT LAKE FOREBAY DISSOLVED OXYGEN PROFILES

TABLE 4-1 SUMMARY OF 2019 WATER QUALITY DATA FROM CHATTAHOOCHEE RIVER BELOW WEST POINT DAM

Month	Water Temp (C)	Conductivity (us/cm)	Dissolved Oxygen (mg/L)	pH	Turbidity (NTU)	NO^2-NO^3 (mg/L)	NH3 (mg/L)	TKN (mg/L)	Total Phosphorus (mg/L)
Jan	9.76	70.4	10.00	7.20	12.0	0.63	0.06	0.31	0.04
Feb	9.58	65.3	10.33	6.90	8.5	0.71	0	0.27	0.03
Mar	12.88	67.1	9.92	7.00	12.0	0.64	0	0.29	0.03
Apr	14.67	64.4	-	7.00	3.9	0.63	0	0.29	0.03
May	19.02	56.6	7.50	7.30	9.8	0.49	0.04	0.38	0.03
Jun	25.36	78.4	5.37	6.80	3.3	0.57	0.05	0.31	0
Jul	26.92	87.8	4.52	6.83	2.9	0.54	0.08	0.34	0
Aug	29.08	102.0	3.74	6.21	2.7	0.45	0.23	0.56	0.02
Sep	24.90	-	5.15	6.59	7.0	-	-	-	-

TABLE 4-2 SUMMARY OF WATER QUALITY PARAMETER MEANS FROM CHATTAHOOCHEE RIVER AT HWY 29 (2010 – 2012)

Month	Water Temp (C)	Conductivity (us/cm)	Dissolved Oxygen (mg/L)	pH	Turbidity (NTU)	NO^2-NO^3 (mg/L)	NH3 (mg/L)	TKN (mg/L)	Total Phosphorus (mg/L)
Jan	8.16	106.0	10.79	6.67	7.8	0.99	0.04	0.27	0.05
Feb	9.70	102.7	11.44	6.74	10.7	1.05	0.06	0.31	0.03
Mar	12.32	93.0	10.39	6.51	7.8	0.91	0.05	0.30	0.04
Apr	17.06	75.7	9.40	6.33	5.1	0.74	0.06	0.30	0.03
May	21.06	116.3	7.96	6.33	8.7	0.72	0.04	0.25	0.03
Jun	26.17	93.3	6.44	6.51	1.9	0.67	0.04	0.26	-
Jul	28.14	102.7	5.63	6.39	2.3	0.44	0.10	0.35	0.02
Aug	27.97	112.3	4.29	6.41	2.3	0.43	0.22	0.46	0.02
Sep	27.33	127.3	4.35	6.42	2.4	0.53	0.27	0.49	-
Oct	22.32	132.3	6.85	6.82	1.3	0.88	0.07	0.28	-
Nov	16.21	139.3	7.45	6.52	2.5	1.31	0.05	0.20	0.02
Dec	13.21	133.0	9.93	6.54	1.8	1.30	0.04	0.25	0.02

TABLE 4-3 RESULTS OF 2009-2010 WATER QUALITY MONITORING BELOW RIVERVIEW POWERHOUSE

PARAMETER	MINIMUM	MEAN	MAXIMUM
Dissolved Oxygen (mg/L)	7.54	9.57	11.90
Water Temperature (°C)	7.94	18.87	29.68
Specific Conductance (µs/cm)	57.70	92.10	128.70
pH (standard units)	6.61	7.26	7.70
Turbidity (NTU)	0.0	79.9	3000.0
Secchi Depth (ft)	2.00	4.51	8.50

Source: GPC 2011

TABLE 4-4 RESULTS OF 2009-2010 WATER SAMPLES COLLECTED BELOW RIVERVIEW POWERHOUSE

ANALYTE	NUMBER OF SAMPLES	NUMBER OF DETECTIONS	MINIMUM	MEAN	MAXIMUM
Alkalinity (mg/L)	19	19	15	22	31
Ammonia (mg/L)	16	12	0	0.13	0.4
Arsenic (mg/L)	24	24	0	0	0.01
BOD (mg/L)	17	16	0	1	3
COD (mg/L)	17	15	0	5	15
Cadmium (mg/L)	24	24	0	0	0.001
Calcium (mg/L)	24	24	2.6	6.3	8.8
Chlorophyll a (µg/L)	24	24	0.4	1	2.4
Copper (mg/L)	24	24	0	0	0.01
Fecal Coliform (col./100 mL)	23	21	2	14	>336
Hardness (mg/L as CaCO3)	24	24	13	23	30
Iron (mg/L)	24	24	0.06	0.64	2.2
Lead (mg/L)	24	24	0	0	0.02
Magnesium (mg/L)	24	24	1.4	1.75	2.2
Manganese (mg/L)	24	24	0.034	0.12	0.42
Mercury (mg/L)	23	23	0	0.0001	0.0002
Nickel (mg/L)	24	24	0	0.001	0.005
Nitrate (mg/L)	24	24	0.262	0.665	1.12
Nitrite (mg/L)	24	24	0	0.014	0.13
Selenium (mg/L)	24	24	0	0	0.02
TSI Chlorophyll a	24	24	21.6	29.8	39.2
TSI Total Phosphorus	24	24	27.36	52.81	90.55
Total Phosphorus (mg/L)	24	24	0.01	0.05	0.4
Turbidity (NTU)	19	19	1	8	24

Source: GPC 2011

5.0 CONCLUSIONS

Based on the results of this study and the post-removal physical conditions predicted by the hydraulic model, the following conclusions are evident:

- Water quality at the Projects currently meets applicable standards and supports existing designated uses;
- Water quality at the Projects should continue to meet applicable standards and support existing designated uses after decommissioning and removal; and
- Decommissioning and removal of the Projects will not impact the Valley WWTP permitted effluent discharge.

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