Attachment E
Dam Removal Feasibility Study – Wallace PUBLIC DISCLOSURE

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PUBLIC DISCLOSURE

WALLACE DAM: DAM REMOVAL FEASIBILITY STUDY

January 10, 2025

Prepared for:
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Project Number: 175578493

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Acronyms / Abbreviations

CFR	Code of Federal Regulations
CFS	Cubic feet per second
CLOMR	Conditional Letter of Map Revision
CWA	Clean Water Act
DEM	Digital elevation model
DNR	Division of Natural Resources
DOA	Department of the Army
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPD	Environmental Protection Division
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FIRM	Flood Insurance Rate Map
Ft	Feet
GA	Georgia
GIS	Geographic Information System
GPC	Georgia Power Company
HPD	Historic Preservation Division
HPMP	Historic Properties Management Plan
IPaC	Information for Planning and Consultation
I-20	US Interstate 20
LF	Lakefront
LOMR	Letter of Map Revision
LV	Lakeview
M	Million
Mi^2	Square miles
MLS	Multiple Listing Service
MW	Megawatts
MWh	Megawatt hour
NAVD	North American Vertical Datum
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NWP	Nationwide Permit
O&M	Operation & Maintenance
OPCC	Opinion of probable construction costs
PD	Plant Datum, PD= Mean Sea Level -0.20 feet (+/- 0.01 feet) (GPC, 2018).
RM	River Mile
ROW	Right Of Way
USACE	U.S. Army Corps of Engineers

USEPA	United States Environmental Protection Agency
USFS	United State Forest Service
USFWS	United State Fish and Wildlife Service
USGS	United States Geological Survey
WQC	Water Quality Certification

1 Introduction

Stantec Consulting Services Inc. (Stantec) was contracted by Troutman Pepper Hamilton Sanders LLP (Troutman Pepper LLP) to conduct a feasibility study to assess the potential implications and cost drivers for removing Wallace Dam. Wallace Dam is operated by Georgia Power Company (GPC) and is licensed for operation under the Federal Energy Regulatory Commission (FERC) Project No. 2413.

1.1 Dam Background

Wallace Dam is located on the main stem of the Oconee River in the Piedmont physiographic province in east-central Georgia. Wallace Dam is situated in the upper Oconee River basin of the greater Altamaha River basin and is located at river mile (RM) 172.7. The Dam was constructed between 1970 and 1979 with Lake Oconee reaching a full pool elevation of 435 ft Plant Datum (PD) (PD=mean sea level -0.20 feet (+/- 0.01 feet)). in May of 1980. Lake Oconee has approximately 374 miles of shoreline and a surface area of approximately 19,050 acres at the normal full pool elevation of 435 ft PD. Wallace Dam is located 29.7 miles upstream of GPC's Sinclair Dam (RM 143) and immediately upstream of Lake Sinclair. Wallace Dam flows directly into Lake Sinclair, and there is no intervening free flowing or bypassed reach of river (GPC, 2018). On May 31, 2018, GPC filed an application to relicense the 321.3 megawatt (MW) Wallace Dam Pumped Storage Project. On June 18, 2020, FERC issued a new 40-year term license for the Project.

GPC operates Wallace Dam in a pumped storage mode for the purpose of peaking power generation. Generation releases occur during peak power demand hours to meet the electrical system demand with renewable, low-emission power that generates no wastes for disposal. Some of this water subsequently passes downstream for hydropower generation at the Sinclair project to meet both electrical system demand and river flow requirements in the Oconee River downstream of Sinclair Dam. The remaining volume of water from Wallace Dam remains in Lake Sinclair for a few hours before being pumped back up and into Lake Oconee by the reversible units for reuse in the next day's generation cycle. Pump back operations occur during off-peak demand hours when electrical system demand is low. (GPC, 2018).

1.2 Study Scope

Stantec assessed concepts for the removal of Wallace Dam by completing data review and analyses focused on various hydrologic, hydraulic, and community impact parameters. Key considerations in the analysis included financial and logistical factors associated with sediment quantity, , and potential effects on recreational resources. Stantec assessed sediment quantity in the reservoir by conducting a limited bathymetric survey and estimating the amount of sedimentation accumulation since Wallace Dam's construction in 1979. Additionally, Stantec assessed the potential property and recreational impacts associated with removal of Wallace Dam.

A field reconnaissance to identify and verify notable shoreline development (including residential homes, public access points, parks and marinas) was performed by Stantec. Additionally, field personnel collected measurements of the lakebed at strategically selected locations. Topographic mapping, surveying, and hydraulic modeling were not part of the scope.

The results of these analyses and data reviews informed assessment of construction feasibility, costs, and potential impacts for the removal of the Wallace Dam facilities. A planning level, Class 4 Opinion of Probable Construction Cost (OPCC) was developed for the removal of Wallace Dam.. Permits and agency coordination that could affect implementation of dam removal were reviewed and conceptual figures were created for dam removal.

1.2.1 SHORELINE DEVELOPMENTS AND RECREATIONAL IMPACT

The potential impacts on shoreline developments and recreational opportunities at Lake Oconee were a primary consideration when considering the potential removal of Wallace Dam.. Lake Oconee is used for recreational boating, fishing, and swimming and developments along the shoreline include marinas, residential homes, parks, and hotels. Additionally, Lake Oconee is used as a drinking water supply. Desktop investigations and field reconnaissance were conducted to review existing developments around the lake.

1.2.2 COST AND IMPACTS

In addition to the impact on shoreline developments around the lake as discussed in Section 1.2.1, construction costs were considered as another factor of feasibility. Construction costs were estimated for the removal of Wallace Dam, and a relative cost of maintenance was developed. Based on bathymetric survey results from survey's completed in 2023, sedimentation of the dam would likely increase the cost of dam removal over time, including significant construction costs associated with dredging, stabilization, or removal of this additional sediment. Actual requirements related to ongoing monitoring, shoreline stabilization, and other restorative work would be determined through the FERC license surrender process.

The economic impact of foregone electrical generation should be considered and will be evaluated by GPC and therefore are not included in this study. Additionally, legal costs, public outreach costs, and additional impacts to third parties such as losses in local drinking water supplies were beyond the scope of this study and were not included.

Natural capitalization was considered but was not included in the cost estimate as it was considered limited in relative benefits compared to the construction costs .

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2 Existing Site Conditions

2.1 Project Setting

Wallace Dam is located on the Oconee River near the City of Greensboro and the City of Madison. The reservoir at Wallace Dam forms Lake Oconee which covers 19,050 acres and has 374 miles of shoreline (GPC, 2018). Lake Oconee is surrounded by four counties including Greene, Morgan, Putnam, and Hancock Counties. The shoreline of Lake Oconee has been developed with over 4,400 residential parcels and offers recreational opportunities at marinas, hotels, and restaurants. The northern section of the reservoir above Interstate 20 (I-20) is surrounded by a 130 square mile unit of the Oconee-Chattahoochee National Forest.

The normal full pool elevation of Lake Oconee is 435 ft PD. Under daily normal operation, the water level of Lake Oconee is controlled by discharges through the powerhouse, and water levels fluctuate 1.5 ft throughout the day and overnight The Wallace Dam Project (FERC No. 2413) is a pumped storage project consisting of Wallace Dam, a powerhouse, and a reservoir (Lake Oconee). Per Wallace Dam 2018 GPC FERC License Application Exhibit E, the powerhouse consists of six turbines (two conventional turbines and four turbines that can reserve direction and become pumps), as shown in Figure 1.

The water discharge rate of the 6 units in the Wallace Dam powerhouse totals approximately 48,000 cfs, thus the Wallace spillway gates will rarely be operated, except for testing and maintenance (Kleinschmidt, 2020). Releases from Wallace Dam flow directly into Lake Sinclair, a 15,330-acre reservoir formed by Sinclair Dam, shown in Figure 2 (GPC, 2018). Sinclair Dam is owned and operated by GPC under a separate FERC license.

The watershed of the dam site is approximately 1,830 square miles. The Oconee River accounts for more than 50 percent of the watershed. Additionally, the following major tributaries contribute to the Wallace Dam watershed (GPC, 2018):

- *Apalachee River – originates in Gwinnett, Barrow, Walton, and Oconee Counties, flows southeast through Morgan and Greene Counties, and enters the Apalachee River embayment of Lake Oconee; watershed area of about 233 sq mi.*
- *Hard Labor Creek – originates in Walton County, flows east through Morgan County, and enters the Apalachee River embayment; watershed area of about 86 sq mi.*
- *Richland Creek – drains portions of Greene County north and west of Greensboro, flows south, and enters the Richland Creek embayment south of I-20; watershed area of about 53 sq mi.*
- *Sugar Creek – drains portions of southeastern Morgan County and enters the western side of Lake Oconee south of I-20; watershed area of about 49 sq mi.*
- *Fishing Creek – originates in southwestern Oglethorpe County, drains portions of Greene County, flows west, and enters the eastern upstream end of the Oconee River embayment; watershed area of about 39 sq mi.*

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Figure 1. Downstream Elevation of Wallace Dam (GPC, 2020)

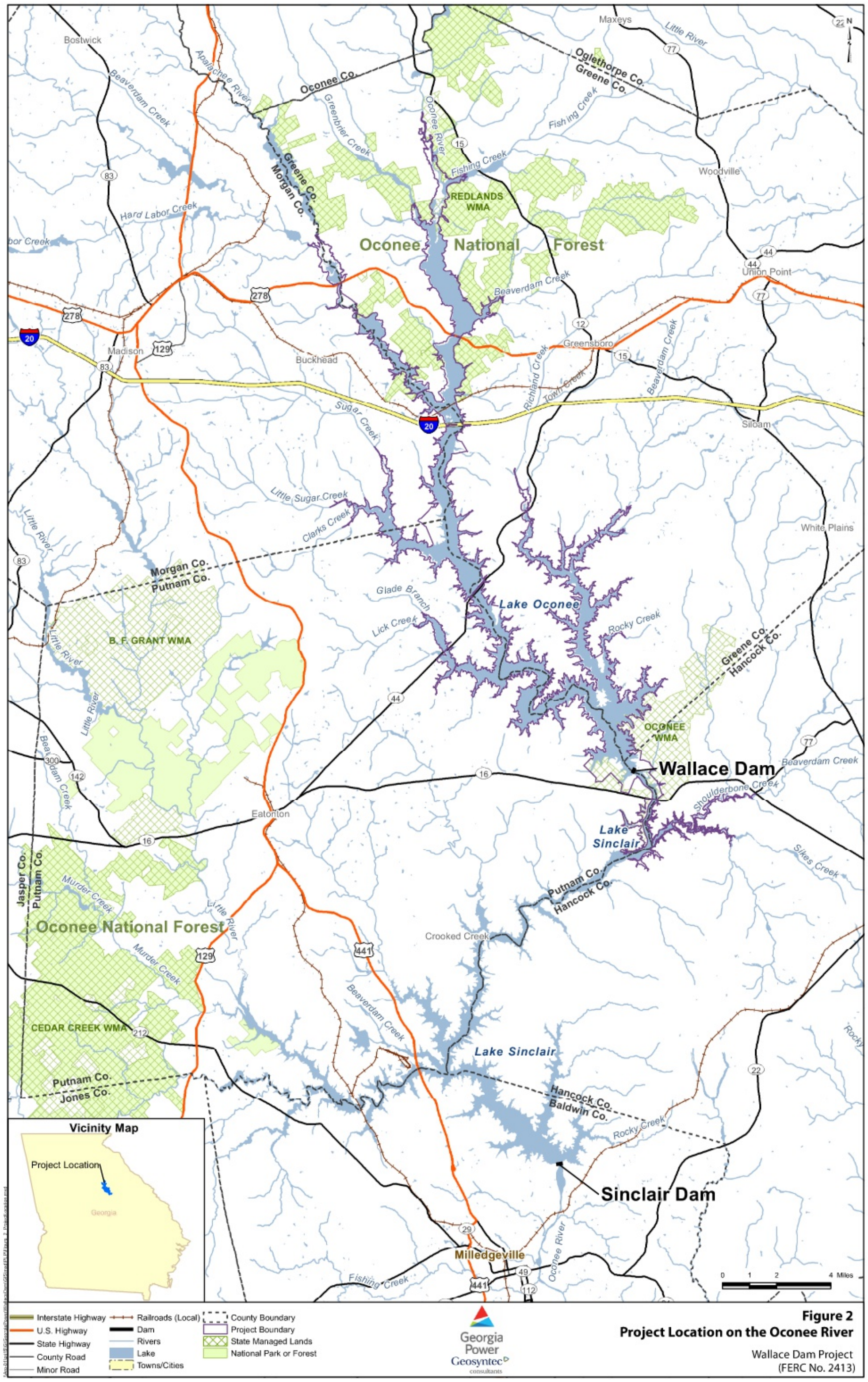

Figure 2. Lake Oconee and Lake Sinclair Overview Map (GPC, 2018)

2.2 Basin Characteristics

The drainage area contributing to Lake Oconee and Wallace Dam is approximately 1,830 square miles The United States Geological Survey (USGS) StreamStats web-based geographic information systems (GIS) application was used to delineate the full contributing watershed and is shown in Figure 3. Basin characteristics in Table 1 below are from the Wallace Dam 2018 GPC FERC License Application Exhibit E.

Table 1. Overview of Basin Characteristics of the Wallace Dam Watershed

Basin Characteristic	Characteristic Description *(GPC, 2018)*	Exhibit E Section Reference (GPC, 2018)
Physiographic Province	*The Wallace Dam Project is located on the main stem of the Oconee River in the Piedmont physiographic province in east-central Georgia.*	*Executive Summary- Project Setting*
Topography	*The topography is gently rolling and descends from around 700-ft elevation near its northern limits to about 500-ft elevation at its southern margin. Streams occupy broad, shallow valleys separated by broad, rounded divides, with local relief of 50 to 100 ft (Clark and Zisa, 1976).*	*Section 3.3.1.1 Geology and Soils- Affected Environment*
Ecoregion	*The Project is located in the Southern Outer Piedmont ecoregion. This ecoregion has low hills, major forest types of loblolly-shortleaf pine, underlying rocks of gneiss, schist and granite, fine sandy loam soils, and a deep, red clayey subsoil (Griffith et al., 2001; Edwards et al., 2013).*	*Section 3.3.1.1 Geology and Soils- Affected Environment*
Land Uses	*The predominant land uses in northern counties upstream of the Project include a suburban or rural residential mix of low-intensity urban, forested lands, and row crop and pasture lands. With the exception of urban lands around the cities of Eatonton and Greensboro, most of the lands around the Project contain forest, row crop/pasture, or clearcut/sparse vegetation. Lake Oconee is also known for its private residential and resort developments, including many golf courses and marinas*	*Section 3.1.2 Major Land Uses*
Climate	*The Oconee River basin is characterized by a moist and temperate climate. Summers are long and hot, and winters are mild and short. Average annual air temperature ranges from 60 to 65°F* *(GEPD, 1998). Average daily temperatures vary from 40 to 45°F in January to 75 to 80°F in July. Winter low temperatures fall below freezing for only short periods. Average annual precipitation ranges from 47 inches in the lower basin to 56 inches in the upper basin. The wettest month is usually March, and the driest months are usually September and October (U.S. Geological Survey [USGS], 2017).*	*Section 3.1.5 Climate*

Fourteen counties and over 40 cities and towns are located upstream of the Wallace Dam Project in the upper Oconee River basin (GPC, 2018). The largest upstream population is in the consolidated government of Athens-Clarke County with an estimated 128,561 residents in 2022 (U.S. Census Bureau, 2022) The 2022 populations of counties surrounding Lake Oconee were 22,933 residents (Putnam), 21,024 residents (Morgan), 20,111 residents (Greene), 8,417 residents (Hancock). (U.S. Census Bureau, 2022).

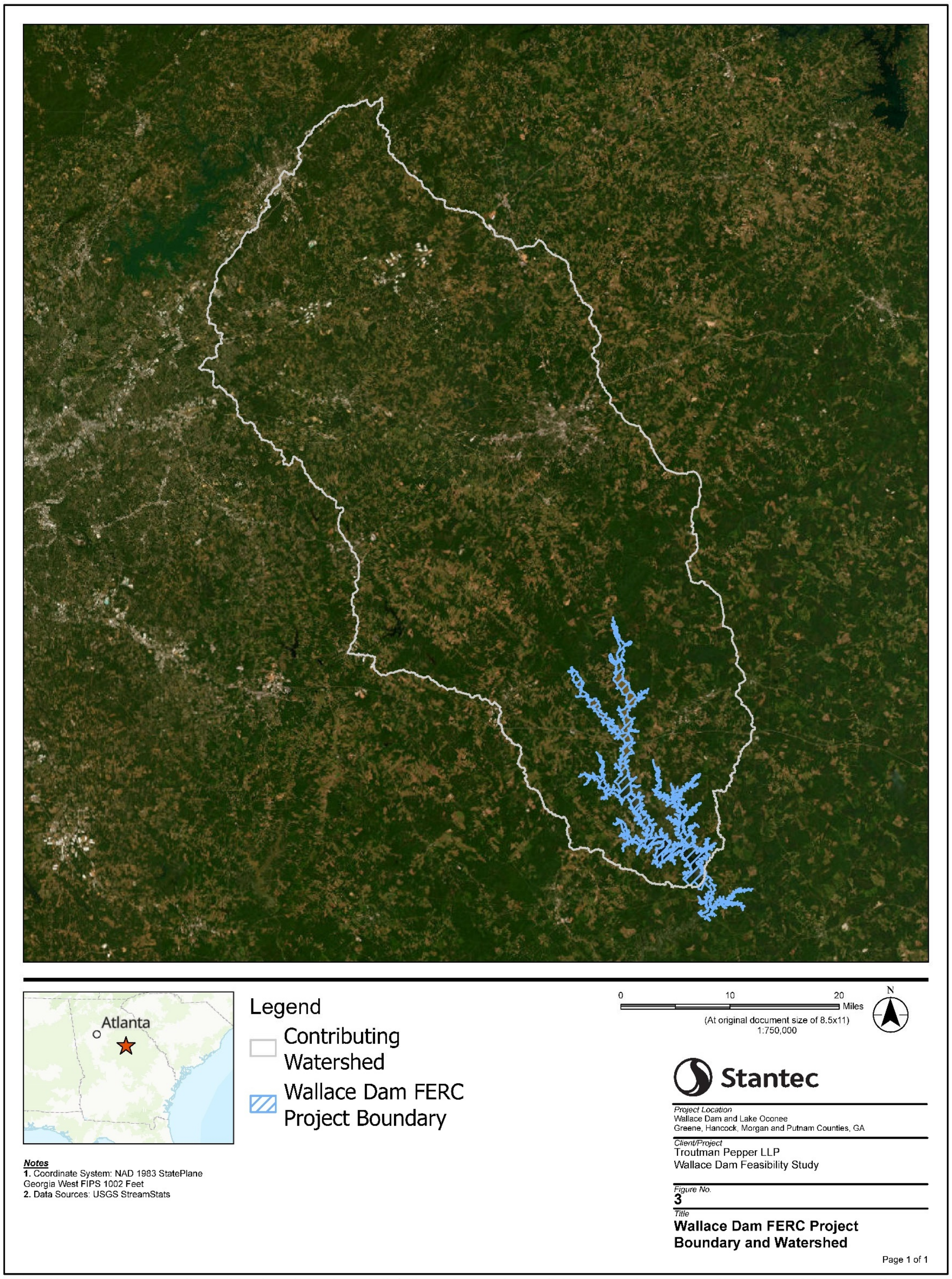

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Figure 3.Wallace Dam Catchment and Project Area

2.3 Shoreline Development, Recreation Resources, and Water Withdrawals

Lake Oconee supports extensive recreational, residential, and commercial shoreline development including recreational areas, hotels, marinas, campgrounds, restaurants, and golf courses. Lake Oconee is accessible for boating by privately owned marinas, U.S. Forest Service (USFS) managed boat ramps, and GPC managed boat launches. Lake Oconee is used frequently for fishing tournaments. Tournament fishing occurs between March and November. Participation ranges from approximately 10 to 25 boats for monthly events, to approximately 150 boats for large, annual events.

It is estimated there are over 4,400 residential parcels along the extensive shorelines of Lake Oconee. In 2015, GPC estimated Lake Oconee has 605,000 annual visitors (GPC, 2018). GPC manages shoreline use and development under a 2020 FERC-approved Shoreline Management Plan.

Stantec personnel conducted a field reconnaissance of major shoreline developments on March 28 and 29, 2024. Facilities included in the field reconnaissance included commercial marinas, private recreation facilities, public recreation areas managed by GPC and USFS, hotels, and residential areas around Lake Oconee. Major shoreline developments are summarized in Table 2.

Table 2. Major Recreational Shoreline Developments at Lake Oconee

Facility Name	Facility Type	Reservoir Access
Facilities Managed By GPC		
Lawrence Shoals Recreational Area	Camping	Public Boat Launch
Rock Hawk Effigy & Hiking Trails[1]	Day Use	No Boat Launch
Long Shoals Boat Ramp	Camping	Public Boat Launch
Jerry's Highway 44 Bank Fishing Access	Day Use	No Boat Launch
Sugar Creek Boat Ramp	Day Use	Public Boat Launch
Parks Ferry Campground	Camping	Public Boat Launch
Area C-5 Bank Fishing Access	Day Use	No Boat Launch
Old Salem Park	Camping	Public Boat Launch
Armors Bridge Boat Ramp	Day Use	Public Boat Launch
Marinas		
Great Water Marina	Day use	Private Boat Launch
Freedom Boat Club	Day use	Private Boat Launch
Fish Tale Marina	Day Use	Private Boat Launch
Anchors Marina	Day Use	Private Boat Launch
Sugar Creek Marina	Day Use	Private Boat Launch
Blue Spring Marina	Day Use	Private Boat Launch
The Landing Marina	Day Use	Private Boat Launch
Harbor Club Golf Course and Marina	Day Use	Private Boat Launch
Linger Longer Marina	Day Use	Private Boat Launch
Lake Club Marina at Reynold Lake Oconee	Day Use	Private Boat Launch

Facility Name	Facility Type	Reservoir Access
Richland Pointe Marina	Day Use	Private Boat Launch
Facilities Managed By USFS		
Swords Recreation Area	Day Use	Public Boat Launch
Redlands Recreation Area	Day Use	Public Boat Launch
Dyar Pasture Recreation Area	Day Use	Public Boat Launch
Hotels		
The Ritz-Carlton Lake Oconee	-	No Boat Launch
The Lodge at Lake Oconee	-	No Boat Launch

[1] The Rock Hawk Effigy Hiking Trails and campground are managed by GPC in partnership with the Historic Piedmont Scenic Byway Corp Putnum County, Georgia DNR and more. The hiking trails are open for day use and connect with the Lawrence Shoals Recreation Area.

As provided in GPC 2018 license application, the estimated annual recreation use was approximately 605,000 total visits to Lake Oconee in 2015, of which 471,900 were for day use and 133,100 were for night (including overnight) use. An estimated 169,247 of these visits (28 percent) occurred at the seven project recreation facilities

Additionally, Lake Oconee serves as a municipal surface water source for the City of Greensboro, City of Madison, private customers of Piedmont Water Company, and numerous golf courses. The three entities permitted by the Georgia Environmental Protection Division (GA EPD) to withdraw surface water from Lake Oconee and are summarized in the Table 3. Permitted maximum daily withdrawal and the permitted monthly average withdrawal are presented in million gallons per day (MGD).

Table 3. Water Withdrawals at Lake Oconee

Entity	County	Permitted Maximum Daily Withdrawal (MGD) [1]	Permitted Monthly Average Withdrawal (MGD) [2]	Withdrawal Location on Reservoir
City of Greensboro	Greene	3.31	3.00	Location Not Publicly Available
City of Madison	Morgan	2.00	2.00	Apalachee River at Lake Oconee [3]
Piedmont Water Company	Greene	2.00	2.00	Richland Creek branch at Lake Oconee [4]

1. Source: GPC ,2018
2. Source: GPC ,2018
3. Source: City of Madison, 2023
4. Source: Piedmont Water Resources 2023

Figure 4. Parks Ferry Boat Launch managed by GPC (Stantec March 2024).

Figure 5. Beach at Old Salem Park managed by GPC (Stantec, March 2024).

Figure 6. Boat Launch available at Redlands Recreation Area managed by USFS (Stantec, March 2024)

Figure 7. Aerial Imagery of the Ritz-Carlton Lake Oconee (Google Earth, 2024).

Figure 8. Boat launch available at Fish Tale Marina (Stantec, March 2024)

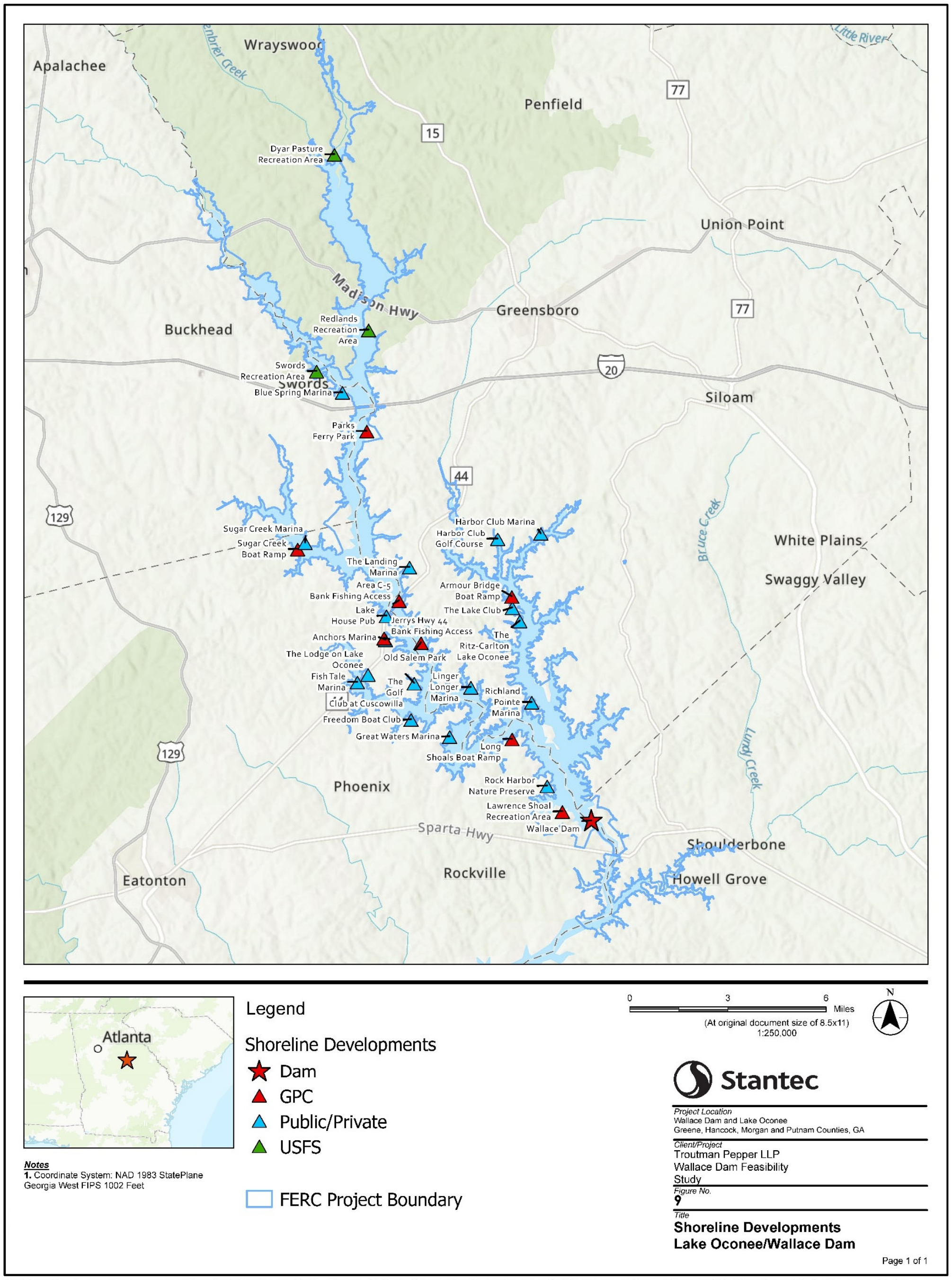

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Figure 9. Major Shoreline Developments at Lake Oconee

2.4 Existing Conditions of Dam

Wallace Dam is a concrete gravity dam with a crest elevation of 445 ft PD, a crest length of 2,395 feet, and a height above streambed of 120 ft. The accompanying features (and their lengths) to Wallace Dam are the West Earth Embankment (347 ft), the west concrete non-overflow section (300 ft), the concrete spillway (266 ft), the powerhouse intake (531 ft – 4 inches), the east concrete non-overflow section (226 ft), and the east earth embankment (725 ft). The west and east earth embankments are homogenous earth sections with chimney drains. The embankments are constructed of compacted structural fill comprised of residual soils developed by weathering of the gneiss and granites of the site area. The earth embankments slope upstream at a ratio of 3 horizontal to 1 vertical (3H:1V) and downstream at a ratio of 2.5H:1V. Riprap (3 ft thick over 12 inches of bedding) extends from elevation 425 ft PD on the upstream side to the crest of the dam and protects the upstream slopes against wave action. The east and west non-overflow sections are concrete structures with crest elevations of 445 ft PD. The concrete spillway has a crest elevation of 390 ft PD and contains five Tainter gates (48 ft high by 42 ft wide), with a discharge capacity of 35,000 cubic feet per second (CFS) per gate at the normal pool elevation of 435 ft PD. The powerhouse is located immediately downstream of the dam intake section on the east side of the river (GPC, 2018)

2.5 Hydrology and Hydraulics

To inform the development of conceptual design for dam removal, stream flow patterns for the project area were assessed. GPC calculated a daily inflow record at Wallace Dam using the nearest USGS gages upstream of the Project, Oconee River Near Penfield, Ga (USGS Gage 02218300) and Apalachee River Near Bostwick, Ga (USGS Gage 02219000) (GPC, 2015). The drainage areas to the Oconee River and Apalachee River Gages are 940 mi^2 and 176 mi^2, respectively. To determine daily flows available for generation at Wallace Dam, flows recorded at these gages were added together and multiplied by a factor of 1.613 to account for the additional drainage area into Lake Oconee. Evaporation was subtracted from the calculated inflows, but water withdrawals by local users were not subtracted. Monthly minimum, mean, and maximum inflows calculated by GPC for the Wallace Dam Project are presented in Figure 10.

Mean calculated inflows were comparable across all months, ranging from 911 cfs in August to 3,523 cfs in March. The maximum inflows were more variable by month. The highest maximum monthly flows occurred in February and March and lowest in June and August (Figure 10). The "Probable Maximum Flood (PMF) Study" completed in 1990 defines the PMF reservoir outflow as 307,000 cfs and peak PMF inflow as 345,300 cfs (GPC, 2018). The average annual discharge at Wallace Dam is approximately 2,037 cfs (GPC, 2015).

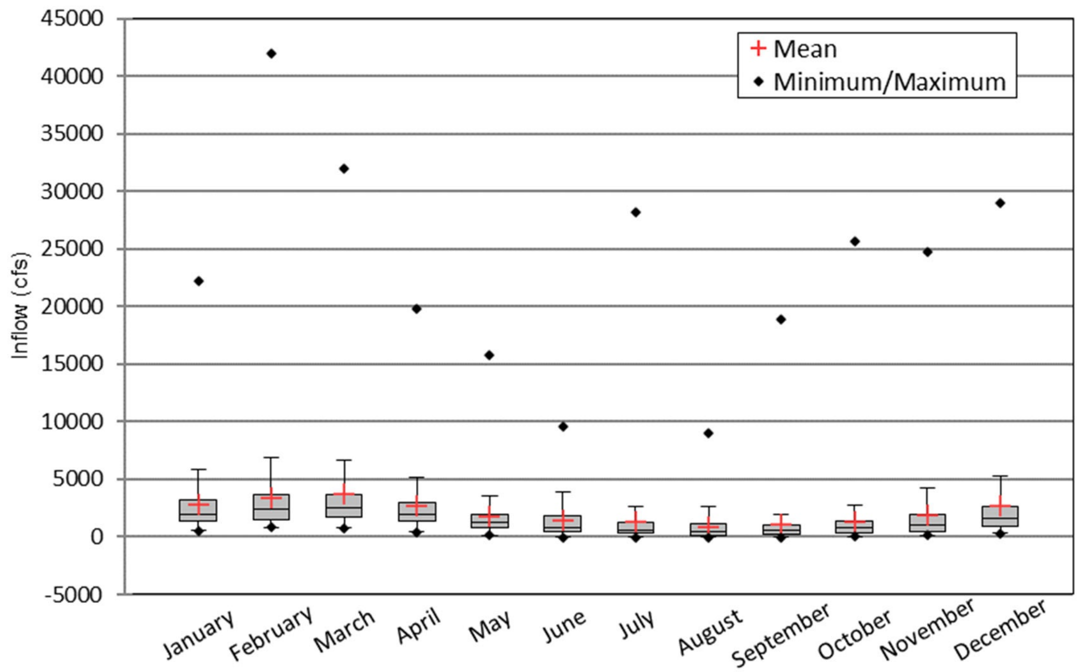

Figure 10. Mean daily inflow summarized by month at the Wallace Dam Project for the period of January 1, 1997 to December 31, 2016. Boxes represent the 25th, 50th, and 75th percentile flows.

Calculated inflow data were used to construct a flow duration curve to examine how the basin provides flows of various magnitudes (GPC, 2015; Figure 11).

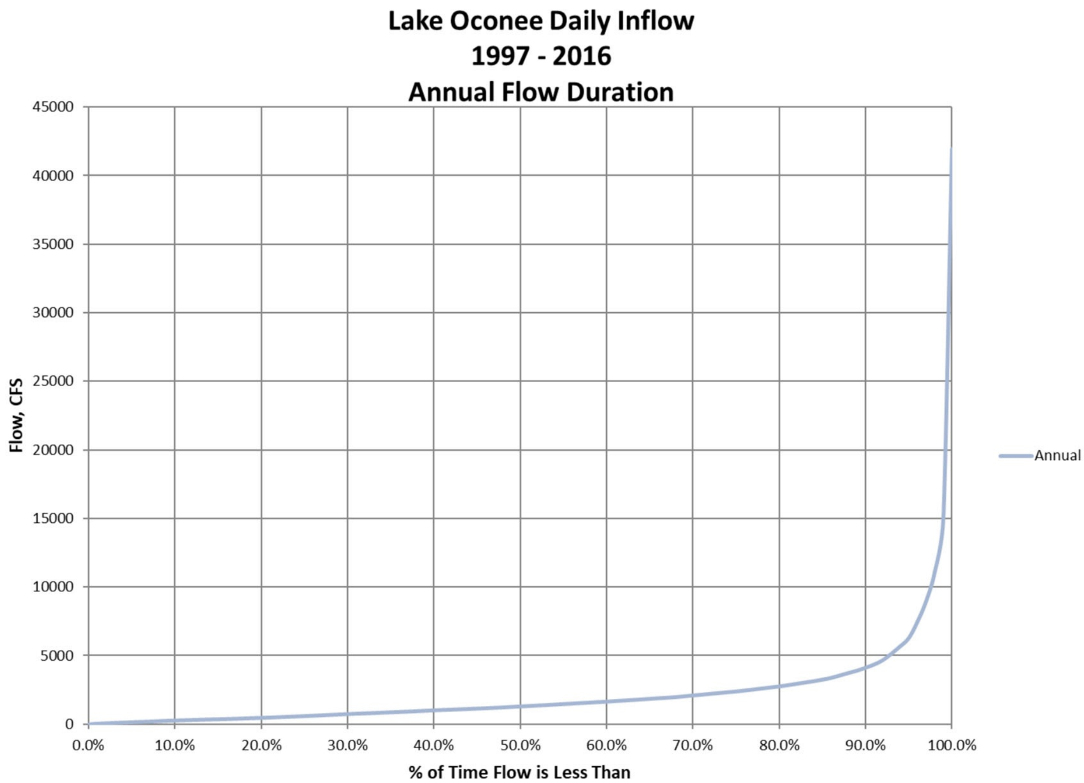

Figure 11. Wallace Dam Flow Duration Curve (Geogia Power, 2015)

2.6 Sediment Assessment

To estimate the extent of sediment storage in Lake Oconee, bathymetric data was collected by Stantec in 2023 and compared to data collected by Metro Engineering in 2011. The 2023 survey consisted of two cross-sections, near the upstream and downstream extents of the reservoir, and are shown in Figure 12. The 2023 cross-section locations were intended to replicate the location of cross-sectional data collected in the 2011 survey. The purpose of the 2023 data collection was to confirm the 2011 data and assess the need for more granular data collection efforts in the future.

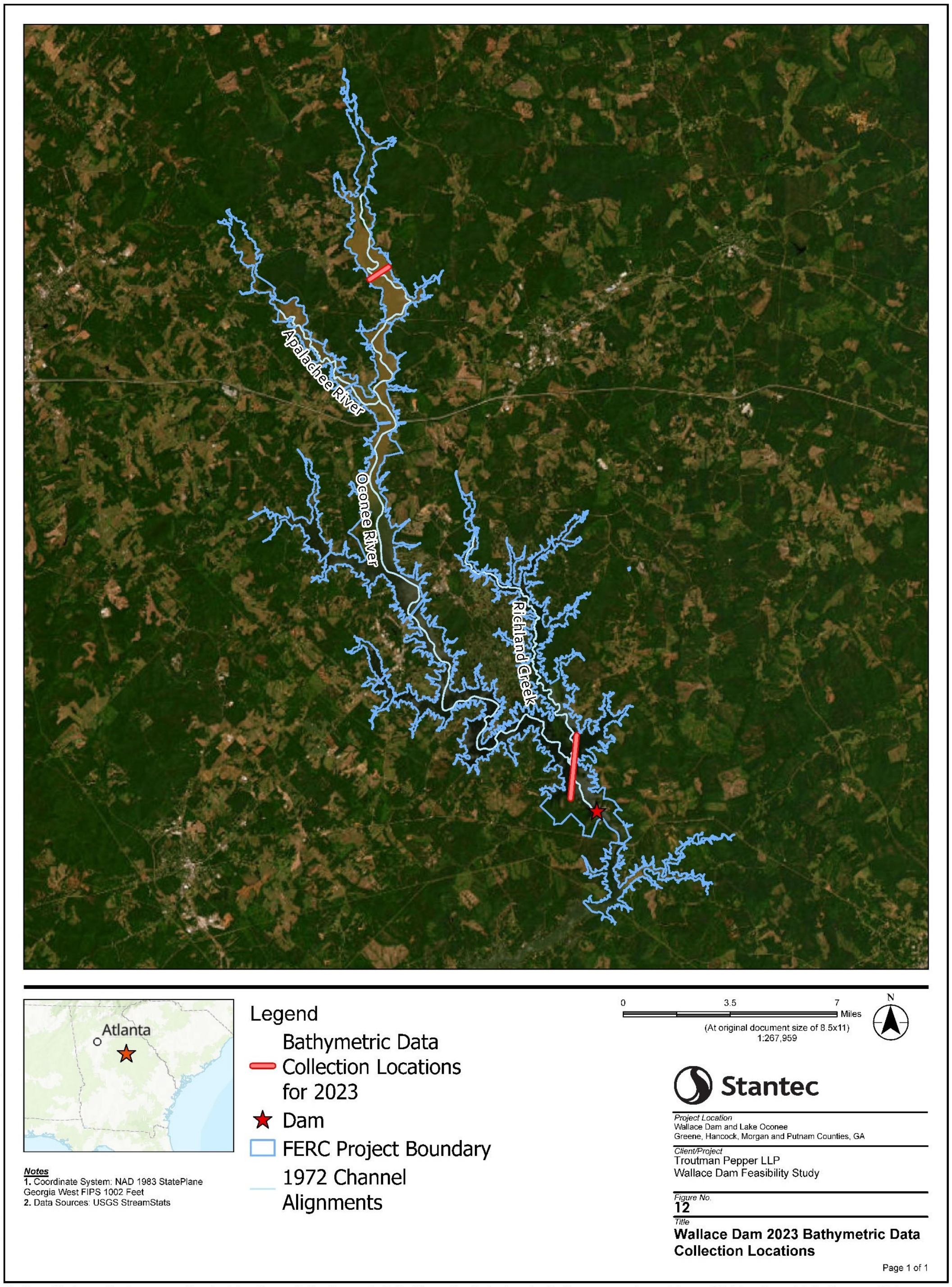

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Figure 12. Bathymetric Data Collection Locations for 2023

Figure 13 and Figure 14 show a comparison of the two cross-sections from the 2011 and 2023 datasets. Cross-section locations in 2023 were collected in the same general vicinity as 2011, but alignments did not match up exactly. At the downstream cross-section, no change in lakebed elevation was observed between 2011 and 2023 (Figure 13). The agreement in bed elevation measurements between the two studies suggests that significant sediment accumulation did not occur in this location. Horizontal changes in the thalweg at the downstream location could be a result of the normal ebb and flow of sediments on the bottom of the lake or this may be due to inconsistencies in data collection and processing methods between the two datasets. The upstream cross-section showed a small increase in elevation, likely due to sediment accumulation between 2011 and 2023. An average accumulation thickness of approximately 0.54 feet was observed across the transect (Figure 14). A more in-depth analysis of sedimentation rates and spatial distribution of stored sediment would require an extensive hydrographic survey of the lakebed that was beyond the scope of this study.

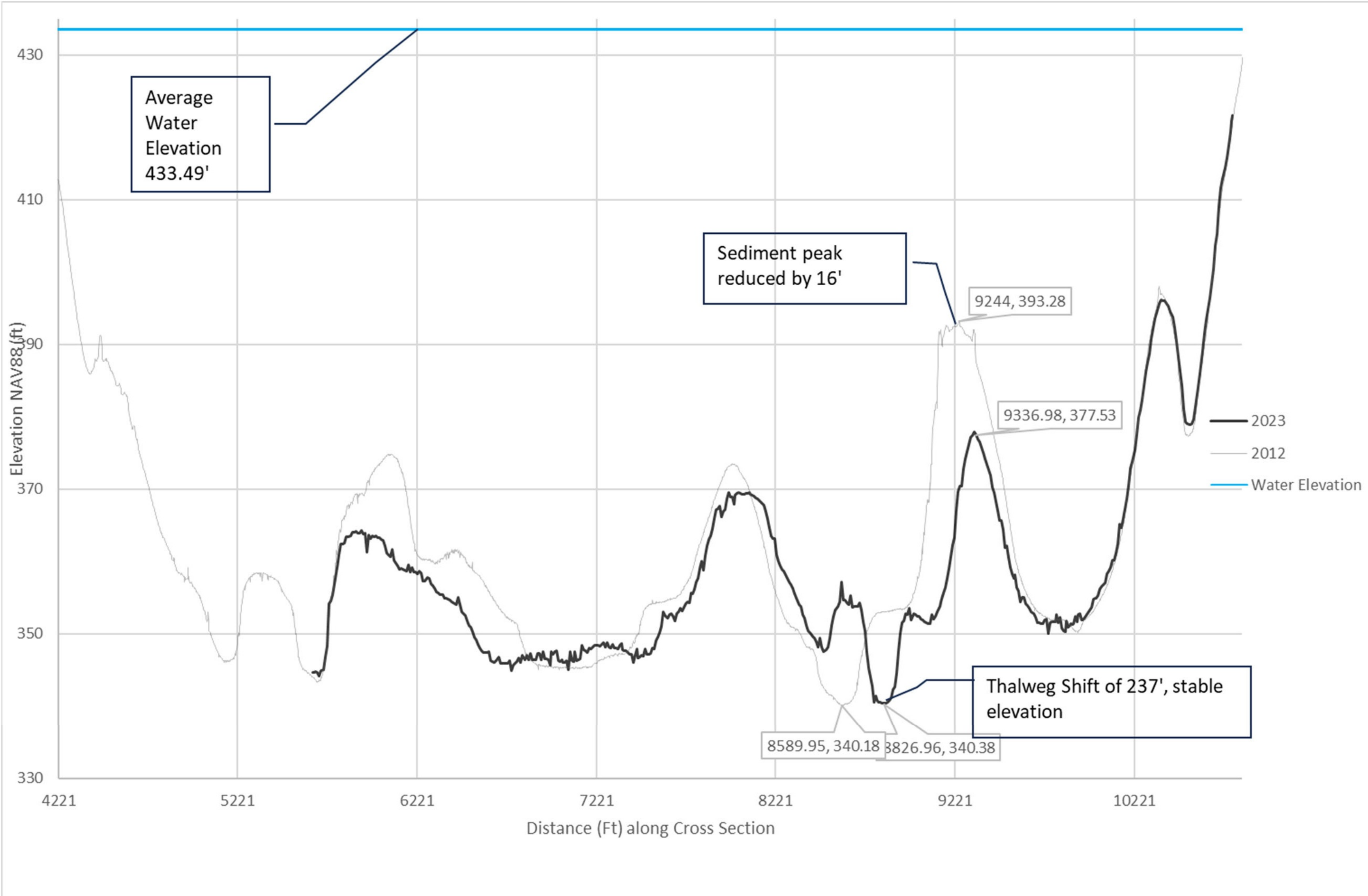

Figure 13. Downstream Cross-Section Comparison of Bathymetric Data

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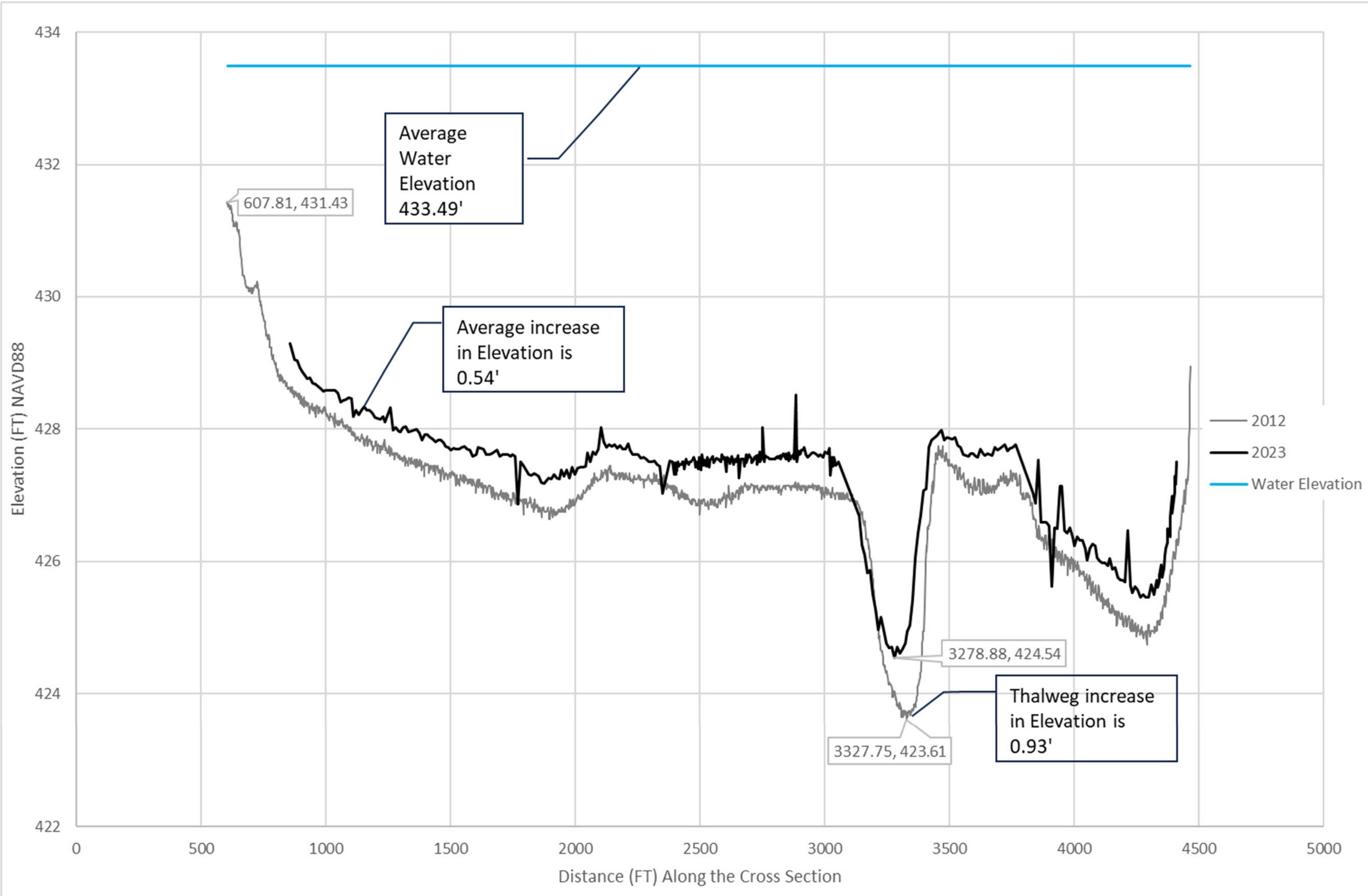

Figure 14. Upstream Cross Section Comparison of Bathymetric Data

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The total volume of sediment storage in Lake Oconee was estimated by comparing the bottom elevation of the dam shown in historical drawings and measurements of the lakebed elevation at the dam in 2023. Of the two cross sections, one was noted to have an average increase in bed elevation of 0.54' over a 12-year period, and the other remained unchanged. To estimate a total sediment storage volume within the reservoir, it was conservatively assumed that average sediment accumulation rate was an average of the accumulation of the two cross sections 0.27 ft per 12 years. To estimate a total sediment storage volume within the reservoir, it was conservatively assumed that average sediment accumulation rate was an average of the accumulation of the two cross sections or 0.27 ft per 12 years. This resulted in an estimated rate of 0.0225 ft of sediment accumulation per year. This average value was applied across the entire footprint of the cross section. This means although accumulation is different between the historic valley walls and valley floodplain, the current rate accounts for the average accumulation across the entire lake bottom. The assumed sediment rate (0.0225 ft/yr) was multiplied by the lake footprint (19,071 acres) and the life of the dam (52 years) to estimate the sedimentation rate of Lake Oconee as approximately 692,500 cubic yards per year, or a total accumulation for the life of the dam of 36 million cubic yards (22,314 acre-feet (ac-ft)), which is a small volume compared to the useable storage volume of the reservoir (351,140 ac-ft). The estimate of total sediment volumes within the reservoir are considered cursory. For a more detailed estimate of sediment storage volume, a more comprehensive bathymetric survey of the entire reservoir would need to be completed.

While the reviewed bathymetric datasets suggest that changes in lakebed elevation are limited between 2011 and 2023, sediment storage is still occurring in Lake Oconee from upstream sediment loading and shoreline erosion. GPC (2016) conducted a shoreline survey of Lake Oconee to characterize existing shoreline conditions and potential sources of erosion and sedimentation to the Lake. The survey found that most banks are stable or moderately stable with high degree of bank protection (i.e., vegetation, seawalls, riprap, etc.) and low potential for erosion. The upper reaches of the reservoir have a more widespread natural vegetative buffer zone while a landscaped riparian area is more common in the lower extent due to the intensity of residential development here. In these residential areas, the shoreline is more exposed to wave action and recreational boating activity is common. Besides residential development, cattle and dairy farming is also common in the watershed and is likely contributing to sediment loading to streams. Other sources of potential sediment to Lake Oconee include stormwater runoff, recreational/boat access, reservoir fluctuations, sediment transport from tributary inflows, and roads and bridges.

Most of the sediment entering the system is falling out of suspension at the upstream end of the dam pool. More coarse sediments (e.g., cobble and gravel) are generally deposited at the upstream limits of the impoundment whereas finer substrates (e.g., silt and sand) are deposited further downstream behind the dam and along channel margins. While sediment management can be a costly part of dam removals, management of sediment in Lake Oconee may be limited to control of reservoir drawdown rates during dam removal and seeding of exposed reservoir sediments. If more significant removal of sediment is deemed necessary by FERC, U.S. Army Corps of Engineers (USACE),, or other regulatory agencies following more extensive surveys of the reservoir, costs associated with dredging and hauling of lake sediment would be significant. Beyond the construction work related to dredging required on-site, developing, permitting, and operating a receiving site could have a significant negative impact to the project cost, schedule, and the public.

2.7 Cultural Resources

Based on the 2020 Historic Properties Management Plan (HPMP) completed by TRC Environmental Corporation (TRC), there are six archaeological sites are monitored by GPC under the current license. Additional archeological sites in the Project area have likely been inundated by construction of the reservoir and are now located under the lake. Additionally, the hydroelectric facilities including dam, powerhouse, control building, administration building, and a maintenance building are eligible for inclusion in the National Register of Historic Places as historically significant resources. Under the current FERC License, the Wallace Dam has a Programmatic Agreement in place since 2020 that guides management of cultural resources and specifies how to plan and conduct ground-disturbing activities or other actions that may affect any historic properties within the project's area of potential effect.

2.8 FERC Licensing and Compliance

The Wallace Dam Hydroelectric Project is operated by GPC and licensed for operation under Federal Energy Regulatory Commission (FERC) Project No. 2413. The current 40-year license for Wallace was issued on July 18th, 2020, and will expire May 31st, 2060 (FERC, 2024) and the relicensing process would need to commence in 2055.

3 Dam Removal Study

Dam removal would eliminate the entire dam structure from the project site and would eliminate the need for active flow control, create sufficient floodplain area for the river, and create comparable floodplain and riverine function downstream to Sinclair Dam.

Construction would begin with the slow removal of the headworks and a controlled drawdown of the lake elevation over time. This method would reduce sediment loading to the downstream reservoir and help the tributaries within the current lake footprint to stabilize passively. Dredging any material beyond the immediate dam footprint was avoided to reduce construction cost.

Limited large-scale stabilization and small-scale channel stabilization measures in the remaining normal pool footprint would most likely be required. Seeding and plantings of trees and shrubs was accounted for across the entire dam footprint. As designed, planting in the normal pool footprint would be a large part of the long-term stability. In the short term, management of the sediment during the dam removal, and allowing natural attenuation of instability points would help avoid large-scale restoration. The result may not be streams with high ecological function, but stability can be achieved over time without significant intervention. An adaptive management plan was included to address invasive species control and localized instability, usually a 10-year period post construction. The associated requirements would be determined by the FERC surrender order, 404 permit special conditions, and if any civil infrastructure is threatened. Limited intervention into stability outside the immediate dam footprint is expected.

The channel design through the dam footprint relies on defining the bankfull discharge. The bankfull discharge is the channel forming flow that maintains channel dimensions. A regional curve was used to obtain typical bankfull cross section geometry for the restored stream following dam removal. Regional curves relate bankfull stream channel dimensions (i.e., width, depth, and area) and discharge to the stream's drainage area. These relationships are empirically derived from longitudinal and cross-section data and are developed for streams in the same physiographic region with similar rainfall/runoff relationships. The North Carolina Rural Piedmont and Mountain regional curves were used to calculate the bankfull dimensions of the restored channel using the linear regression shown in Figure 15 (Harman et al., 2000).

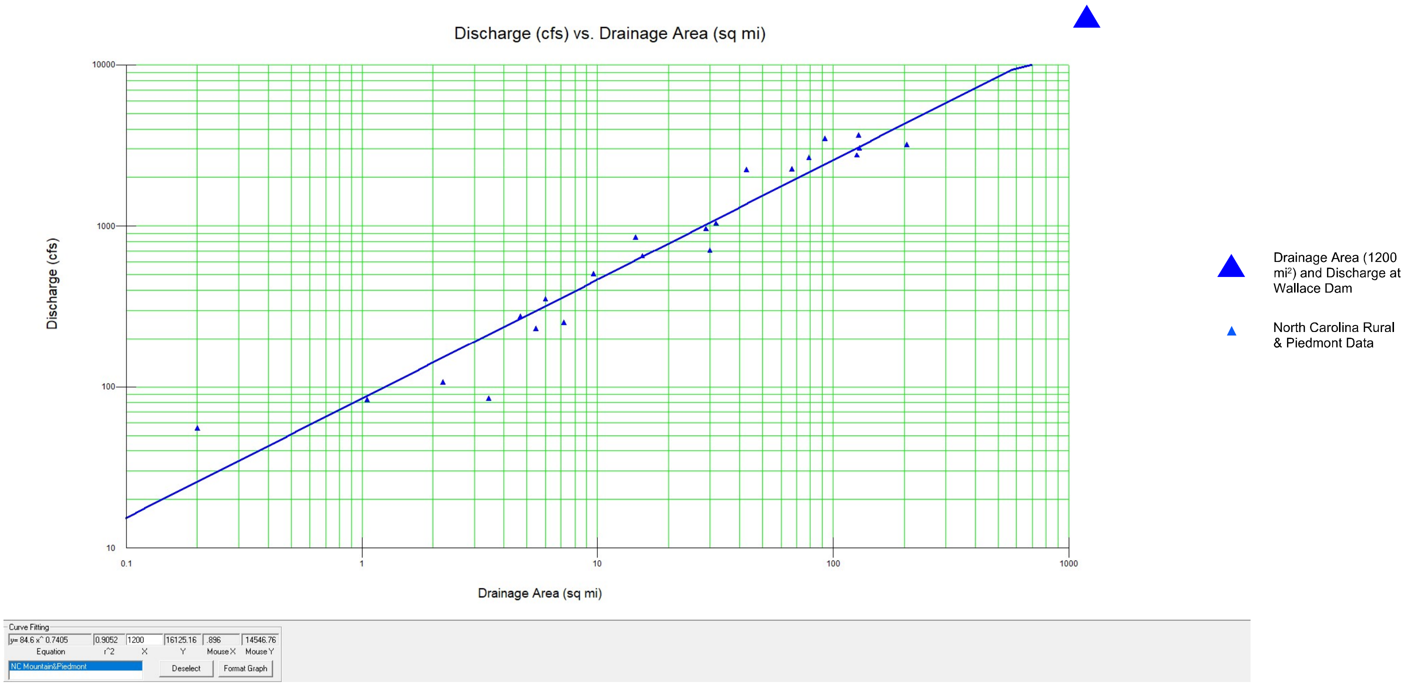

Figure 15. North Carolina Rural and Piedmont Regional Curve and Wallace Dam Drainage Area to Bankfull Discharge

Based on the historic valley width estimated from the bathymetry, A total "valley" width of approximately 1100-2500 feet is observed. The historical valley width at Wallace Dam is 1100 feet. The goal of allowing efficient flood flows through the former dam footprint requires an entrenchment ratio that would not cause an excessive constriction. The railroad bridge upstream of the dam has a span of 730 ft, Interstate 20 bridge has two spans totaling 630 ft, and the Madison Hwy has a span of 490 ft. The entrenchment ratio is defined as the ratio of the valley width over the bankfull width (266 ft).

$$Entrenchment\ Ratio\ (ER) = \frac{Valley\ Width}{Bankfull\ Width\ (266\ ft)}$$

$$\begin{gathered} ER < 1.4; Entrenched \\ 1.4 < ER < \ 2.2; Moderately\ Entrenched \\ ER > 2.2; Slightly\ Entrenched \end{gathered}$$

Achieving an entrenchment ratio greater than 2.0, which is defined as "moderately entrenched", would require a valley width of 532 ft. The ultimate design valley width is 546 ft. This valley width would allow overbank flooding above the bankfull discharge to reduce the potential for scour or sediment deposition caused by flow constriction. It also agrees with the existing bridge spans within the Oconee Lake footprint. Riffles and pools, designed with the goal of stability and aquatic habitat, would be constructed within this valley. Riffles were estimated to require imported material, this is a conservative estimation as in-situ material may be available for use. Some of the material removed would be recovered in order to perform the channel restoration, to be used as bed or bank material based on gradation and cohesiveness. Grade Control structures were considered as part of the stabilization efforts, but because of the size and discharge of the Oconee River, grade control structures were not proposed. The lack of sedimentation at the downstream end of the river means that the historical grade control features like bedrock formations of the Oconee River are most likely still present and are able to provide support to the river post-dam removal. Also because of the low sediment storage near the dam, the Oconee River can be expected to return to its former alignment. The resultant design recognizes this and would utilize the historical alignment for the new channel. That means the historical slope of the Oconee River (0.04%) and the bed and banks would be utilized during restoration activities. Extensive bank stabilization is proposed because of the absence of vegetation on the exposed mud flats. Toe wood structures would establish a stable bank toe, and live brush layering and soil lifts would be installed to ensure short-term and long-term stability (Figure 16). The historical River dimensions, which agree with the restoration dimensions, include a bankfull width of 265 ft, average depth of 9.5 ft, and a bankfull discharge of 16,125 CFS. The Richland Creek confluence is sufficiently close to the new upstream end of Lake Sinclair, so restoration of the downstream end of Richland Creek is proposed. Design principles used for the Oconee River were applied to Richland Creek.

The process of Dam removal would begin after the draw down of Lake Oconee. Draw down would be achieved with the existing control valves within the Dam. Removal of the headworks and control systems can begin during this phase, removing or bulkheading redundant structures. Once Lake Oconee levels are sufficiently low demolition of the structure can begin. The most practical method of demolition would be to use explosives. This method would also be the most practical when removing the dam below Lake Sinclair water levels. The downstream raceway from Wallace Dam is significantly deep (50 ft). To remove Wallace Dam down to 10 feet below Lake Sinclair water levels, water from Lake Sinclair would need to be managed. Cofferdams were considered but because of the significant depth of water below Wallace Dam, the cost of installing and maintaining a coffer dam of this size is impractical. Therefore, explosives to remove the final portion of the Wallace Dam would be utilized. Unconsolidated riprap and sequencing of the structure removal would be used to control the water through this final removal. That riprap can then be used to complete the hard stabilization measures proposed around the remaining dam structure.

PUBLIC DISCLOSURE

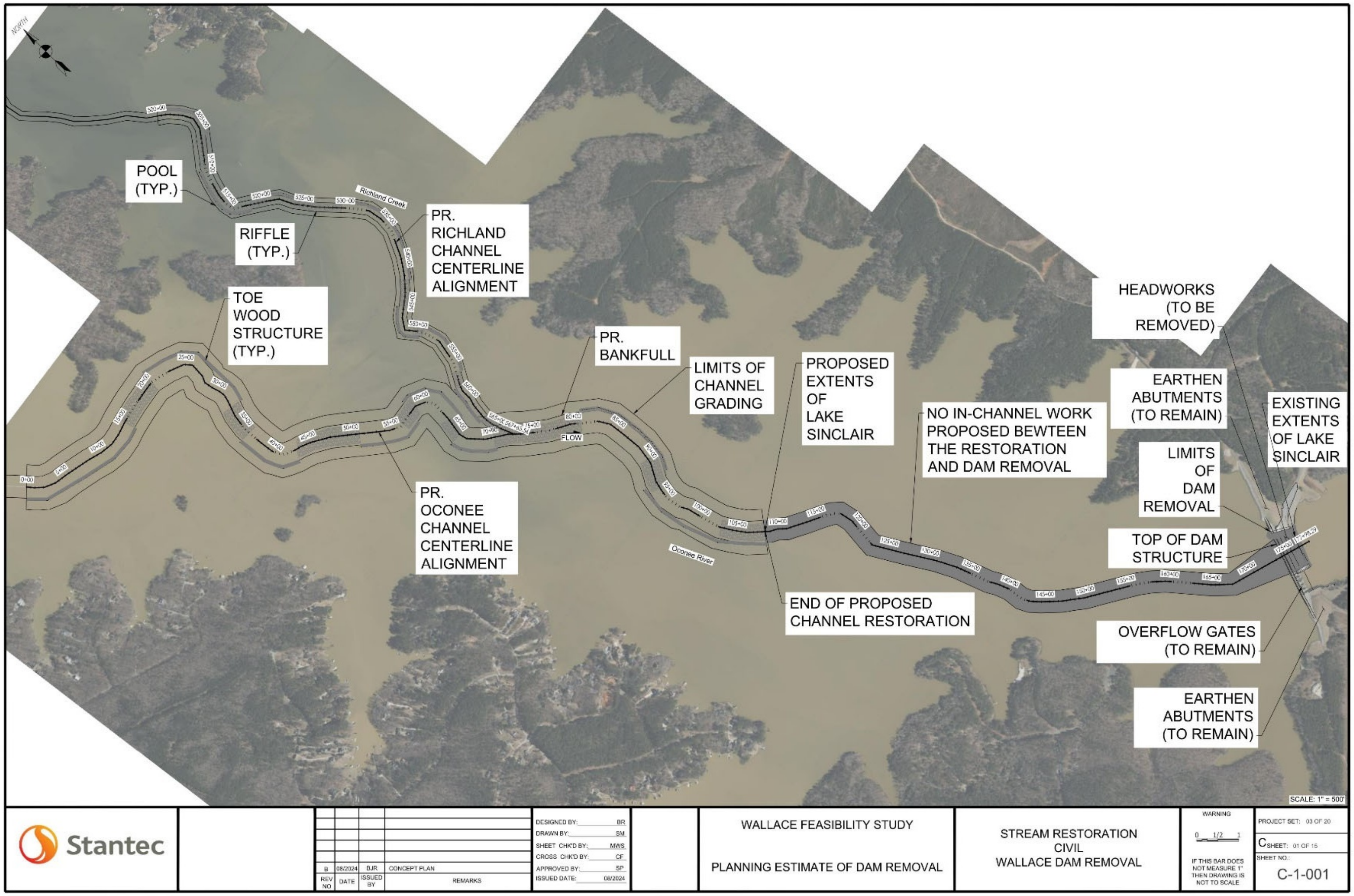

Figure 16. Plan View of Lake Oconee Restoration following Dam Removal

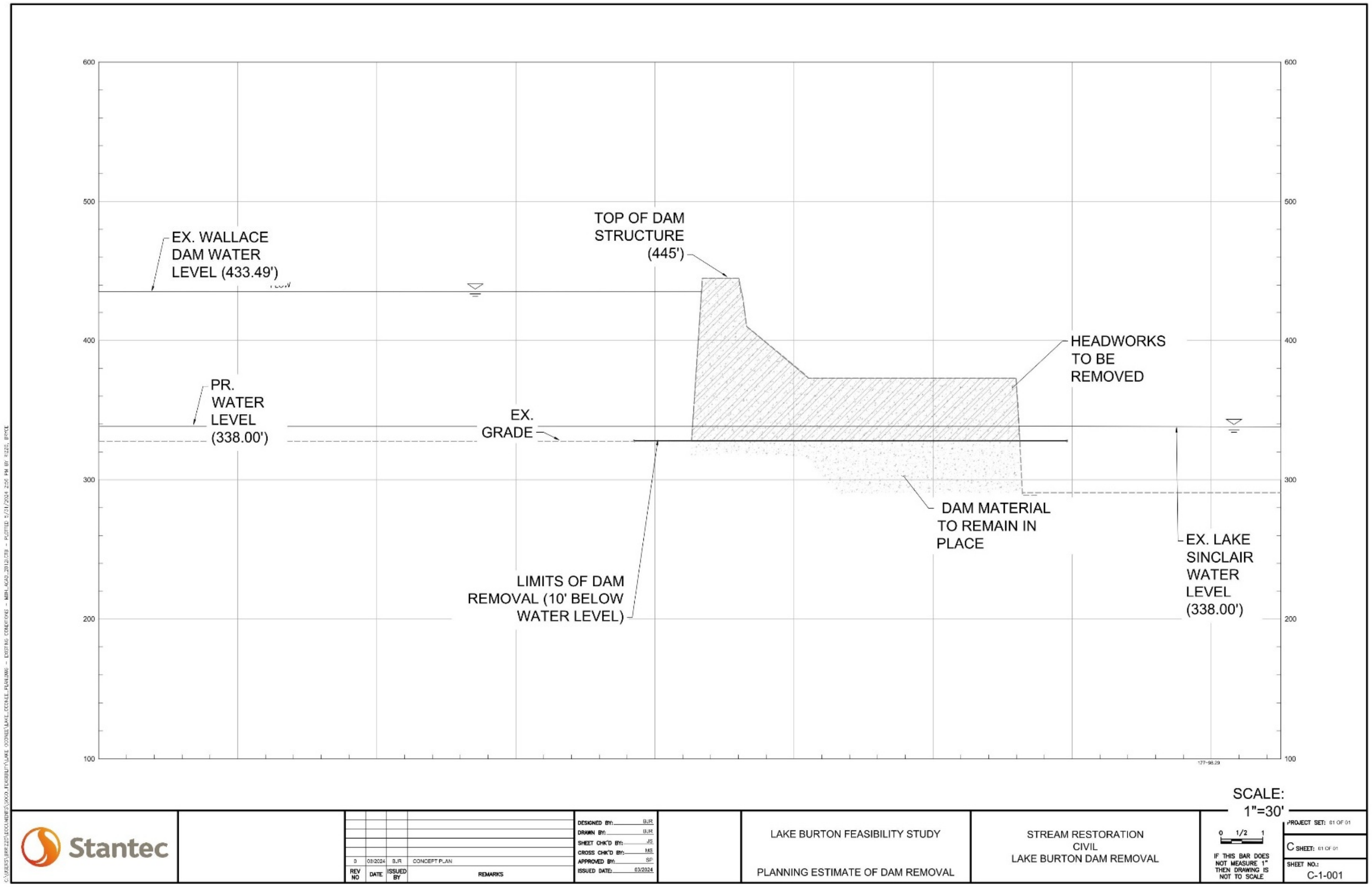

Figure 17. Profile view of Dam Removal

PUBLIC DISCLOSURE

4 Evaluation of Dam Removal Feasibility for Wallace Dam

4.1 Recreation, Residential, Commercial, and Lost Power Generation Impacts

Dam removal and decommissioning and removal of the Wallace power generation station would have significant adverse effects on the economic, recreational, and aesthetic resources of Green, Hancock, Morgan, and Putnam County and surrounding communities.

Lake Oconee is a significant resource for many outdoor recreationists in Georgia and adjoining states. Removal of the dam and draining of the lake would transform a large flatwater recreation and residential resource to a much smaller free-flowing riverine recreation resource. Residential docks and shoreline development would no longer have access to the water's edge. The current recreational commercial infrastructure like marinas, rental properties, and campgrounds would no longer have water access as originally intended. Redevelopment and repurposing of existing infrastructure could be a part of the burden on local stakeholders after dam removal and could potentially be a burden on GPC. The lake supports a popular sport fishery and Georgia DNR regularly stocks the Lake.

Developed public recreation facilities that would experience significant loss of use and/or loss of utility would include Lawrence Shoals Recreational Area, Rock Hawk Effigy & Hiking Trails, Long Shoals Boat Ramp, Jerry's Highway 44 Bank Fishing Access, Sugar Creek Boat Ramp, Parks Ferry Campground, Area C-5 Bank Fishing Access, Old Salem Park, Armors Bridge Boat Ramp, Swords Recreation Area, Redlands Recreation Area, and Dyar Pasture Recreation Area. In 2015, GPC estimated Lake Oconee has 605,000 annual visitors (GPC, 2018). The facilities are managed by GPC and USFS, so impact evaluation would require inclusion of the USFS and any other project stakeholders. Dam removal would drastically change the recreation environment and most of future recreation use would be limited to free-flowing river opportunities with some overnight and day use visitation. This would lead to the displacement of numerous recreationists, who currently frequent Lake Oconee.

This loss in recreation use would result in less spending by recreationists for supplies, gas, lodging, restaurants and other retail purchase in the county and other towns and commercial hubs of the region.

The implications to other economic losses that would arise from the potential removal of Wallace Dam are impacts to nearby property values from dam removal, including anticipated impacts to the two hotel properties on Lake Oconee. Further, the economic impact of foregone electrical generation should be considered and would be evaluated by GPC and therefore are not included in this study.

4.1.1 PROPERTY IMPACTS

Residential properties and hotel properties have been developed along the shoreline of Lake Oconee and both categories of properties could be impacted by the potential removal of Wallace Dam. Estimating property impacts was accomplished by first establishing a categorized list of property types and defining the broad sets of amenities provided by the lake. For example, lakefront properties benefit differently from the lake compared to homes with only lake views.

Based on the major types of amenities offered by the lake to nearby properties, four categories of properties were established. These four types are listed below (with their shorthand notation in parentheses).

1. Lakefront properties with a secondary structure like a dock or a boat house on the shore (LF-Dock)
2. Lakefront properties without a secondary structure like a dock or a boat house on the shore (LF-NoDock)
3. Non-lakefront properties with high quality views of the lake (LV-High)
4. Non-lakefront properties with poor quality or no view of the lake (LV-Low)

Stantec estimated the number of properties in each of the four categories across Lake Oconee using Google Earth as well as a 2018 GPC FERC Relicensing Exhibit E document that estimated the number of properties along Lake Oconee's shore. Only those properties within approximately 1,000 feet of the current shoreline were considered for inclusion. A distance of 1,000 feet from the lake front was assumed to be the approximate limit at which property prices may benefit materially from views of the lake, though property owners beyond this distance are also likely to be impacted by dam removal. This analysis estimates that there are approximately 17,700 properties in the four property categories within approximately 1,000 feet of the lake front (Table 4). Approximately 4,400 of the 17,700 properties are estimated to be lakefront, and 90% of lakefront properties are estimated to have secondary structures geared towards water-based activities.

Further, through satellite imagery and topographic data, we estimate that approximately 50% of the non-lake front homes, or approximately 6,640, have high-quality lake views from their property for at least part of the year.

Table 4. Estimated Number of Properties by Category

Category	Category Description	Number of Properties in Category
LF-Dock	Lakefront properties with a secondary structure like a dock or a boat house on the shore	3,984
LF-NoDock	Lakefront properties without a secondary structure like a dock or a boat house on the shore	443
LV-High	Non-lakefront properties with high quality views of the lake	6,641
LV-Low	Non-lakefront properties with poor quality or no view of the lake	6,641

4.1.2 FOREGONE ELECTRICITY GENERATION

The economic impact of foregone electrical generation should be considered and will be evaluated by GPC and therefore are not included in this study.

4.2 Construction Costs

A planning level opinion of probable construction cost (OPCC) was prepared for dam removal. The cost estimate assumes a long enough schedule to allow for natural attenuation of sediment instability behind the dam and workable access onto the historic floodplain after the draw down. A sediment analysis of the captured fine sediments would be required to understand the stability of these soils. All costs are in 2024 dollars, and escalation is not factored into the costs as no timeline for implementation is suggested by this study. The OPCC includes known major project components, a 15% adaptive management plan, 30% planning level contingency, 15% estimate of survey, design, and permitting professional services,10% construction oversight and owner cost, and a 10% allowance for unknown impact mitigation needs. Detailed cost estimates are presented in Appendix A.

The total project cost for full removal and restoration is estimated to be $988 Million associated with construction cost of the dam removal and site reclamation.

To determine the construction cost of $988 Million, a post restoration grading quantity was estimated, and a grading surface of Wallace Dam was created that represents the post removal condition. This allowed the excavation quantity of the dam removal to be separate from the excavation quantity as a part of the stream restoration. The first phase of construction would be the multi-stage draw down of the embankment and reservoir. Considerations during this stage was the Control of Water, Mobilization and temporary site development, excavation/demolition of the Dam and Facilities, and disposal of material. Assumptions made in this phase were:

- The structure 10 feet below the Lake Sinclair water level is to be removed;
- Some of the material excavated from the embankment can be reused during the restoration;
- A reasonably close disposal site can be secured;
- Control of water of Lake Sinclair would be limited and demolition in the wet is likely to occur.

After the drawn down of the lake and the excavation of sediment upstream of the dam, the restoration can begin. Potential grade control structures, bank stabilization measures, grading, and planting were priced out during the restoration phase of construction. Planting of the restoration site was included as well as the entire footprint of the normal pool. Planting across the former pool ensures the Oconee River and tributaries successfully stabilize without active restoration installations. Ancillary benefits include increased species diversity and faster upland recovery. This design assumes a dynamic equilibrium with the rest of the Oconee River System would be achieved. This means significant long-term maintenance costs are not anticipated at this time. It is assumed the Oconee River would naturally be able to offset the sediment flux out of the project area. If sedimentation stabilization exceeds allowance and includes large portions of the normal pool footprint then additional costs would be extensive. Additionally, costs associated with sediment management (ex: dredging, off-site vs. on-site disposal) could be significantly modified based on additional factors beyond quantity of material removed including sediment quality (geotechnical and environmental characteristics), dredging means and methods (ex: hydraulic vs. excavation), and use of on-site vs. off-site disposal/relocation.

4.3 Regulatory Considerations

If Wallace Dam were to be removed, a number of regulatory requirements would need to be followed to obtain the necessary permits and approvals associated with decommissioning, dam removal, and subsequent restoration actions. The regulatory processes would involve a combination of federal, state, and local regulations. These processes are described in the sections below. Because the Wallace Dam and powerhouse are part of a FERC-licensed project, the current license would have to be surrendered if a removal was pursued. The FERC surrender process would serve as the main process under which compliance with other environmental regulations would fall under. Based on other decommissioning and dam removal planning projects, a surrender process along with gaining other regulatory approvals would take at least 5 to 10 years (and potentially up to 20 years), likely incurring costs of millions of dollars in consulting and legal fees.

4.3.1 LICENSE SURRENDER APPLICATION

In order to relinquish the license for the current hydroelectric project, a surrender application in accordance with FERC regulations at 18 Code of Federal Regulations (C.F.R.) § 6.1 and 6.2 would be required. If the surrender process was initiated just prior to relicensing (i.e., within 5 to 5.5 years prior to expiration of the existing license) a Notice of Intent to not seek a new license would also need to be filed. FERC projects have different requirements for license surrender based on the project components, state and federal regulations in the project location, and what the licensee intends to do with the project after it is surrendered. Both the surrender application and the surrender process are project-specific, with FERC dictating requirements on a case-by-case basis (American Rivers, 2023).

Development of a surrender application is complex and requires extensive consultation and multiple studies with resource agencies and local stakeholders. The surrender application must identify all project features to be removed including the dam, reservoir, power plant, transmission lines and recreation features and how they would be disposed. Major components of a surrender application include:

1. Removal Plan: For a dam removal, the plan would include details on how the dam and associated structures would be removed and a proposed timeline for removal. A proposed timeline and sequencing of removal activities. The plan would also need to cover current and future safety concerns for the project area.
2. Environmental Impact Description: This description outlines the anticipated effects on dam removal on the baseline environmental conditions of the project area. Effects may include sediment, hydraulic, biological, and recreational impacts.

3. Project Description: Includes description of all components of the project, physical structures, hydraulic impacts of the project on the waterbody, and history of the project.

4. Relevant Consultations with Resource Agencies (see Section 4.3.2)

In general, after extensive consultation with stakeholders and development of a removal plan, once filed with FERC the license surrender process would follow these typical steps:

1. License Surrender Application Submitted to FERC

2. After a public comment period, FERC would review comments and decide if a National Environmental Policy Act (NEPA) document (an environmental assessment (EA) or environmental impact statement (EIS) would be required or if additional information or studies are needed.
3. NEPA Document Drafted
4. 30-60 Day Comment Period on Draft NEPA Document
5. Within 60 days of close of comments, resource agencies must file conditions.
6. FERC publishes final NEPA document within 90 days of agencies filing conditions.

7. FERC issues a final decision on the surrender application with required mitigation measures for Wallace development.

8. Agencies and others have opportunities to challenge FERC's final decision.

Once the comment periods have closed on the license surrender application and NEPA document, it may take additional time for FERC to render a final decision on the fate of the license. If FERC approves the surrender application, the licensee must comply with all terms of the license and surrender application before the license is officially surrendered.

4.3.2 AGENCY CONSULTATIONS ASSOCIATED WITH DAM REMOVAL

As described above in the license surrender application process, consultation with relevant federal, state, and local resource agencies is necessary as part of the surrender process. The following sections overview the regulatory drivers leading to important consultations that would be necessary for planning a dam removal. Each of these individual permits or agency consultations will require approvals and mitigation measures.

Clean Water Act 404 Permit

Section 404 of the Clean Water Act (CWA) authorizes the discharge of dredged or fill material to waters of the United States and is administered by the Department of the Army (DOA) through the USACE. DOA permits can be divided into two basic groups; General Permits and Individual Permits. General Permits are issued for small impacts and Individual Permits are issued for projects with greater impacts or those with classes of actions not authorized under NWP. The USACE has developed a Nationwide Permit

(NWP) program that authorizes approximately 54 specific activities. The program has a list of general conditions that must be met by all NWP's. In addition, each NWP has its own list of specific conditions and authorizations. If a proposed activity can be conducted within the constraints of the general and specific NWP conditions, a permit is issued. Dam removal may qualify for NWP 27 only if it would have a limited effect on water quality. A limited (or minimal) effect is defined by as an activity that permanently impacts 0.1 acres or less of Waters of the United States, permanently affects 300 linear feet or less of stream, and does not result in any permanent secondary effects to Water of the United States. It is likely that dam removal would exceed the impact limits set for a general permit and require preparation of an individual 401 WQC.

Clean Water Act 401 Water Quality Certification

Section 401 of the CWA requires state agencies to certify that a federally issued Section 404 CWA permit would not result in a violation of state water quality standards. Each individual state has the option of placing restrictions on usage of the NWP's under its 401 CWA authority. This authority is administered by the Georgia Environmental Protection Division (EPD).

A 401 WQC application requires additional information not involved in a 404 Pre-Construction Notification (PCN). The application includes discussion of avoidance and minimization measures. The applicant is responsible for issuing a public notice of the application after determination by the Georgia EPD that the application is complete. The Individual 401 WQC application review process may require up to 120 days to complete.

Section 7 of the Endangered Species Act

The Federal Endangered Species Act (ESA) [16 U.S.C.1531 et seq.] became law in 1973 and provides for the listing, conservation, and recovery of endangered and threatened species. The USFWS is the agency responsible for protecting and monitoring populations of listed endangered species. Section 7(a)(2) of the ESA states that each Federal agency shall insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species, or result in destruction or adverse modification of designated critical habitat. A federal action includes approval of a permit or license, including Section 404 permits under the CWA.

National Historic Preservation Act

Section 106 National Historic Preservation Act (NHPA) requires Federal agencies to identify historic properties potentially affected by undertakings, and to seek ways to avoid, minimize, or mitigate any adverse effect on these properties. In cases where the project may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized until the requirements of Section 106 of the NHPA have been satisfied. The Georgia Department of Community Affairs' Historic Preservation Division (HPD) is the official historic preservation agency of the state of Georgia.

As described in Section 2.7, there six archaeological sites monitored by GPC under the current FERC license for the Wallace Dam Project.(TRC, 2020). Per the 2020 TRC HPMP, more than 1,000 archaeological sites have been recorded in the Wallace Dam project area, however these additional sites that may be considered historically significant are inundated by Lake Oconee. A complete inventory of the National Register of Historic Places database would need to be conducted for the Project area to identify historic and archaeological resources potentially impacted by the Project. The historical significance of the dam structure would be evaluated when the dam reaches 50 years old. Additionally, a Phase I Cultural Resources Survey may be required since the Project involves public land. A Phase I investigation generally involves a literature review of site records, aerial photographs, maps, and other relevant cultural resources records. If potential impacts to historic features are identified, coordination with HDP would determine what mitigation measures would be required for dam decommissioning and removal.

National Environmental Policy Act

The National Environmental Policy Act (NEPA) process would be undertaken by FERC as the lead agency and other Federal and State Agencies being invited to cooperate. The environmental review under NEPA can involve three different levels of analysis: 1) Categorical Exclusion Determination, 2) Environmental Assessment (EA)/Finding of No Significant Impact, and 3) Environmental Impact Statement (EIS). The purpose of the EA is to determine if the action would cause significant environmental impacts, in which case a more detailed analyses of project environmental effects are conducted through the EIS process. In this case, it is very likely an EIS would be required given the severity of the likely environmental impacts. The EIS is a more rigorous document than the EA and is published for public review and comment for a minimum of 45 days.

Federal Emergency Management Agency (FEMA) Map Revisions

The FEMA process to modify existing floodplain maps would need to be completed to account for the effects of the dam removal. To update a FEMA Flood Insurance Rate Map (FIRM) for a dam removal, existing condition and proposed conditions models would be completed based on detailed hydraulic and hydrologic analyses. The FEMA process would include development of maps based on proposed condition as part of the Conditional Letter of Map Revision (CLOMR) process which would need to be approved by FEMA. During this process, notifications to impacted property owners would be coordinated with local jurisdictions where property owners would have the opportunity to provide comments. Due to the complexity of the removal of Wallace Dam and associated floodplain impacts and coordination with multiple parties, the CLOMR process could take years. After the CLOMR is approved, the project could commence. After completion of the project, a Letter of Map Revision (LOMR) would be completed which is utilized to formally update the maps. The LOMR would be updated map based on constructed conditions (compared to the CLOMR which utilizes proposed conditions).

USFS Coordination

As part of the Lake is within the boundaries of the Oconee-Chattahoochee National Forest, coordination with the USFS would be required. To complete the license surrender process, the USFS may have specific monitoring, mitigation, restoration, or other requirements to restore the lands to a condition satisfactory to USFS.

4.4 Other Considerations

In the process of fulfilling the needs of the individual regulatory authorities including FERC, it is likely that resource protection plans would need to be developed for protection of sediment and soil resources, vegetation and wildlife and fishery resources as well as cultural resources and public safety. In addition, a construction plan that addresses transportation, staging areas, and/or spoil area is needed, and restoration would be likely required. Specific plans that would outline potential impact to Georgia DNR facilities would likely require coordination for public safety and other arrangements that can be implemented to retain or re-purpose those facilities. There may also be additional, unforeseeable mitigation necessary following dam removal. Determining the type and scale of these mitigations is beyond the scope of this work, however the owner should be aware of this uncertainty and potential additional risk. Unforeseeable mitigation may be requests from regulators that go beyond the normal burden for a construction project because of the size and scale of the project. Also, dam removal may expose bridge piers for highways and interstates that may require additional stabilization. A 10% rate of the construction cost was estimated to account for this unforeseeable burden.

Public outreach would need to be a major program for any removal option. Change in residential shoreline use of the reservoir and overall recreational use of the impoundment would significantly impact current and future residents and visitors.

5 Summary and Conclusions

Stantec used available data and studies on existing site conditions, data from a field reconnaissance, and bathymetric survey to consider full dam removal of Wallace Dam. The feasibility study evaluated impacts to recreational and residential developments, and regulatory considerations. Further, the economic impact of foregone electrical generation should be considered and will be evaluated by GPC and therefore are not included in this study. Costs associated with public outreach and coordination, legal services, and impacts to drinking water users were not incorporated into the costs.

Table 5 summarizes the impacts of full dam removal of Wallace Dam.

Table 5. Summary of Project Outcome

Item	Full Dam Removal
Recreational Value	Wadable River, hiking, river fishing. Loss in lake activities such as recreational boating, lake fishing, and value of existing campgrounds adjacent to the Lake.
Water Supply	Loss of water supply source to local communities
Hydrogeneration	Loss of hydrogeneration
Sediment Stability	Sediment stability assumed to be reached over time and would not require any long-term maintenance, however, would likely require dredging and stabilization during construction. Sediment accumulation in Lake Sinclair would increase.
Project Impact Cost	$988 Million for construction and removal. Costs associated with losses in hydrogeneration, recreational value, and additional impacts to other parties (loss of drinking water supply) were not included in the estimate.
Maintenance	Restoration of natural channel properties eliminates maintenance requirements. Portions of the embankment dam or spillway to remain in place would likely require limited maintenance.
Regulatory Process	License surrender application process

The concept presented in Section 3 served as a planning level design and was used to develop the construction cost estimate for dam removal. Cost estimates for construction represent best available data for 2024 prices. Dam removal was estimated to cost approximately $988 Million associated with construction cost of the dam removal and site reclamation. Full removal of Wallace Dam would have a significant economic impact, a decrease in recreational value for flatwater recreationalists, loss of power generation and a considerable construction cost. Costs associated with loss of hydropower generation and recreational values were not included in this estimate. The removal of a dam with such significant property impacts would be unprecedented in the United States based on: (i) a review of the 13 large dam removals with construction costs greater than $20,000,000 construction cost (Duda, et al. 2021); and (ii) national knowledge and experience in dam removals.

Stantec's review of available data and studies, existing site conditions and shoreline developments, economic impact, regulatory considerations, and engineering considerations suggests dam removal is not feasible due to the immense impacts associated. The removal of the dam would reduce the operation and maintenance costs, but the impact to property, recreation, and hydrogeneration outweigh the benefits enumerated. The existing dam operates as originally designed, and the lake behind it is not creating excessive sedimentation or other negative impacts that would change the feasibility of the dam removal.

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Appendix A - Cost Estimate

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Opinion of Probable Construction Cost

Client	Troutman Pepper LLP
Project Name	Feasibility Study - Dam Removal
Location	Wallace Dam, Eatonton, GA
Facility	Wallace Hydroelectric Plant
Date	January 10, 2024
Project No.	175578493

Dam Removal				
Activity	**Units**	**Quantity**	**Unit Cost**	**Total**
Phase 1 Dam Removal				
Mobilization	LS	1	6,000,000	$ 6,000,000
General and Temporary Works	LS	1	3,210,000	$ 3,210,000
Control of Water	WK	150	105,000	$ 15,800,000
Dam Removal	CY	354,812	60	$ 21,290,000
Demolition (Parking, Drive, Etc.)	CY	50,000	45	$ 2,300,000
Turbine Removal & Disposal	LBS	7,688,919	3	$ 26,384,479
Generator Removal & Disposal	LBS	6,377,367	3	$ 21,883,895
Electrical Equipment & Disposal	LS	1	5,546,456	$ 5,546,456
Mechanical System Removal & Disposal	LS	1	4,592,375	$ 4,592,375
Demolition & Recycling and/or Disposal & Hauling of Hydroelectric Infrastructure	LS	750,000	8	$ 6,000,000
C&D Hauling & Disposal	CY	261,812	14	$ 3,665,000
Stabilization Around Existing Dam Structure	CY	101,667	173	$ 17,588,000
Phase 2 Stream Restoration and Lakebed Stabilization				
Riffle	CY	111,000	173	$ 19,200,000
Grade Control Structure	EA	6	630,000	$ 3,780,000
Toe Wood Structure	LF	13,500	1,800	$ 24,300,000
Live Branch Layering	LF	89,000	120	$ 10,680,000
Dredge, Dewater, Haul Sediment (See Note 2)	CY	1,670,000	75	$ 125,250,000
Onsite Fill Material Processing	CY	89,000	60	$ 5,340,000
Channel Restoration Fine Grading	SY	805,000	45	$ 36,230,000
Lakebed Stabilization & Revegetation	AC	19,000	10,000	$ 190,000,000
			Base Construction	$ 549,000,000
			Adaptive Management: Invasive Species, Site stabilization (15%)	$ 82,350,000
			Construction Contingency (30%)	$ 164,700,000
			Design, Studies, and Permitting (Lump Sum) (15%)	$ 82,350,000
			Construction Oversight and Owners Cost (10%)	$ 54,900,000
			Unknown Impact Mitigation Needs (10%)	$ 54,900,000
			Total Project Construction Estimate	$ 988,200,000
Non-Construction Costs				
Loss in Power Generation	Developed separately by GPC			-
Public Outreach and Coordination; Legal Services	Not quantified in this study			-
			Total Project Impact Estimate	$ 988,000,000

General Notes:

1. The estimate is a Class 4 Opinion of Probable Construction Costs based on conceptual design from August 2024. If a dam removal occurs, additional studies, design, permitting, and third-party coordination would be required to refine the estimate.

2. Costs associated with sediment management are preliminary and could be substantially modified based on items such as material quantity, selection of on-site vs. off-site disposal, selection of dredging equipment, and sediment characteristics (geotechnical and environmental). Sediment volumes were based on removal for just a portion of the overall Lakebed sediments along the main section of the River closer to Wallace Dam.

3. Potential third party costs such as potential loss of water supply or shoreline development impacts were not calculated as part of this Study.

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