US Army Corps
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Savannah District

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SAVANNAH RIVER BELOW AUGUSTA TRAINING WALL DRAFT INTEGRATED DISPOSITION STUDY AND ENVIRONMENTAL ASSESSMENT AND DRAFT FONSI AUGUSTA, GA AND NORTH AUGUSTA, SC

Draft Integrated Disposition Study and Environmental Assessment and Draft FONSI

View from South Carolina of the Training Wall Centerline of the Savannah River

EXECUTIVE SUMMARY

The Savannah River Below Augusta (SRBA) training wall disposition study reports the findings and conclusions used to determine if Federal interest exists to keep or dispose of the training wall and its associated navigation features.

Constructed in the early 1900s for steamboat navigation, the training wall, only a portion of the SRBA Federal project, no longer serves its original authorized purpose. Located along the Savannah River between River Miles 198 and 200, the training wall stretches approximately 1.5 miles along the northern bank and centerline of the Savannah River between Augusta-Richmond County, Georgia and Aiken County, South Carolina. The training wall has been fully submerged since construction of the New Savannah Bluff Lock and Dam in 1937.

The study evaluates three alternatives: (Alternative 1) Future Without Project Condition (FWOP)/No Action Alternative (NAA); (Alternative 2) Removal of the Training Wall; and (Alternative 3) Removal of the Training Wall and Sediment at Gardner's Bar on the South Carolina downstream bank. Alternatives 1 and 2 are efficient alternatives that contribute to the Federal objective, while the exponentially higher cost of Alternative 3 relative to Alternative 2 makes it inefficient. The stakeholders' problems and opportunities related to regional economic development are met within the objective of the action Alternatives 2 and 3, but not within Alternative 1, the FWOP/NAA.

The FWOP/NAA would require no disposal of the training wall. The approved Recommended Plan and Finding of No Significant Impact (FONSI) for the Savannah Harbor Expansion Project, Georgia and South Carolina: Fish Passage at New Savannah Bluff Lock and Dam (NSBLD) Integrated Post Authorization Analysis Report and Supplemental Environmental Assessment represents the FWOP/NAA. In the FWOP/NAA, several locations of the training wall would be submerged around two feet below the water surface when flows are less than 5,000 cfs, which occurs approximately 24 percent of the time of the year. During those flows, due to its prominent location in the centerline of the waterway, the training wall would obstruct recreational boaters and special events. Special events like the Ironman 70.3 and Head of the South (HOTS) Regatta would not be adversely impacted during normal flow conditions. However, during flow conditions below 5,000 cfs, the HOTS course would need to be restricted to using only the Georgia side of the river. That would limit the number of races, participants, and spectators. Hence, Alternative 1 would have negative regional economic development impacts on the local communities. The present value of those losses to that economy are estimated at $6.7 million.

By removing the training wall and its associated navigation features (Alternative 2), associated risks to recreationists and their watercraft and special events would be eliminated. New recreational opportunities would be made available with the full width of the river unobstructed. Access to boating docks would be improved. HOTS Regatta would occur unrestricted allowing the local communities to maximize economic gains. However, the cultural resource, the training wall, would be completely removed. The total project cost of removing the entire training wall and it associated navigation features is estimated at approximately $5.42 million.

Removal of the entire training wall and its associated navigation features along with sediment at Gardner's Bar on the South Carolina downstream bank (Alternative 3) is estimated to cost $29.1 million. Since this alternative achieves contributions to the objective at a much higher price than Alternative 2, it is inefficient. In addition, there is evidence that sediment existed prior to the construction of the training wall. Hence, Alternative 3 is not recommended as the Tentatively Selected Plan (TSP).

The Corps recommends Alternative 2, Removal of the Training Wall, for the TSP. Removal of the training wall would eliminate all risks, limitations, and economic losses associated with it being an obstruction to recreational navigation and special events. Also, the re-established, unobstructed natural river would provide new opportunities for recreational navigation that otherwise would not exist with the training wall. Unlike the NAA alternative, the public fully accepts Alternative 2.

SAVANNAH RIVER BELOW AUGUSTA
TRAINING WALL DISPOSITION STUDY
AUGUSTA, GA AND NORTH AUGUSTA, SC

Draft Integrated Disposition Study and Environmental Assessment and Draft FONSI
This report is a combined Disposition Study and Environmental Assessment, complying with requirements of the USACE and the Council of Environmental Quality (CEQ), and is intended to reduce duplication and paperwork. An **asterisk (*)** in the table of contents and headings notes paragraphs that are required for National Environmental Policy Act (NEPA) compliance.

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1.0 STUDY AUTHORITY AND PURPOSE*

1.1 Study Authority

This study is being conducted with full Federal funding under the authority of Section 216 of the Flood Control Act of 1970 Public Law 91-611). Section 216 specifically states:

"The Secretary of the Army, acting through the Chief of Engineers, is authorized to review the operation of projects the construction of which has been completed and which were constructed by the Corps of Engineers in the interest of navigation, flood control, water supply, and related purposes, when found advisable due to the significantly changed physical or economic conditions, and to report thereon to Congress with recommendations on the advisability of modifying the structures or their operation, and for improving the quality of the environment in the overall public interest."

1.2 Study Purpose

The purpose of this study is to determine whether Federal interest exists to retain or dispose of the training wall.

2.0 PROJECT AUTHORIZATION AND HISTORY

2.1 Project Authorization*

Through the Rivers and Harbors Act of 1882 (46 Cong. Ch. 136, March 3, 1881, 21 Stat. 468), Congress first appropriated money "for the construction, completion, repair, and preservation of certain works on rivers and harbors, and for other purposes" for hundreds of U.S. locations. Included was the initial appropriation of $15,000 ($376,680 in 2019 dollars) for "Improving Savannah River, Georgia. The 1902 Chief of Engineers Annual Report provides documentation of additional appropriations in 1882, 1884, 1886, 1888, 1890, 1892, 1894, 1896, 1899, 1900, 1901, and 1902. The Corps entered into the contract to build the training wall at Gardner's Bar from November 9, 1900 through August 7, 1901. In the 1902 Report of the Chief of Engineers, Gardner's Bar is shown directly across from the City of Augusta.

Appendix J6 of the 1881 Report of the Chief of Engineers "contains locations, a description of the work that should be conducted, and costs for 16 areas between Augusta and Savannah to make year round steamer navigation possible." Appendix J6 also identifies the obstructions caused by Gardner's Bar to be the "worst" of all of them,

and provides proof of the urgency to establish a structure, such as a training dike, to correct the impediments to water travel and clean up the timber causing obstructions. Of the sixteen offending shoals and bars, Gardner's was rated as "the most important obstruction." (p. 1095 of the Report)

Two amendments to the Rivers and Harbors Act of 1899 (55 Cong. Ch. 425, Mar. 3, 1899, ch. 425, 30 Stat. 1121) provided the authorization and money for the Corps to award the contracts mentioned in Appendix O of the 1902 Report of the Chief of Engineers. (https://usace.contentdm.oclc.org/digital/collection/p16021coll6/id/905)

Section N2 states the following:

> The Appropriations Acts of June 6, 1900 (56 Cong. Ch. 791, June 6, 1900, 31 Stat. 588); and March 3, 1901 (56 Cong. Ch. 853, March 3, 1901, 31 Stat. 1133) each make appropriations of $64,000 (nearly $2 million in 2019 dollars) for FY 1901; and $100,000 (nearly $3 million in 2019 dollars) for FY 1902, respectively. Each appropriation was for "Improving Savannah River, Georgia: For continuing Improvement between Augusta and Savannah." There are no more details in the statute that would pinpoint the training wall at issue as a qualifying "improvement," but the narrative in Appendix O2 shows it is likely that the money from these Appropriations Acts went toward the building of the training wall. The project is included under this heading in the 1902 Report of the Chief of Engineers in Appendix O2, beneath the heading “Operations During the Fiscal Year Ending June 30, 1902.” Other improvements noted include additional training walls and dikes at Twiggs bar, Blue House bar, Kirks bar, San Bar Ferry, and Rifle cut, as well as the construction of a house boat for river maintenance.

2.2 **History**

The project history is documented in a book published by the Corps, “History of Savannah District 1829-1989” (https://www.amazon.com/History-Savannah-District-Engineers-1829-1989/dp/B001925H6A). This book contains the following information regarding the training wall and other navigation improvements along the river. The use of the word “project” throughout this report refers to the Savannah River Below Augusta Project.

> “Section 2 of the Rivers and Harbors Act of 1880 provided that an examination and partial survey be made of the Savannah River from Savannah to Augusta to determine a preliminary plan of improvement and estimate of costs. Colonel Quincy A. Gillmore directed Sewall L. Fremont, Assistant Engineer in Savannah, to conduct this examination. Fremont’s report was transmitted by Gillmore on 22 December 1880 and became the basis for the project of improvement. The object of this initial project was to provide a low-water navigable depth in the river of at least 5 feet.” (Barber, et. al., p. 108).

> “The number of steamboats operating on the river had increased from two in 1880 to five in 1886.” (Barber, et. al., p. 110)

> "In 1910 Congress approved a modified project for the entire length of the Savannah River between Augusta and Savannah and targeted the 30 miles below Augusta for special attention. The Corps of Engineers met the congressional mandate to complete the project in four years, having attained the five (5) foot steamboat channel at ordinary summer low water in 1915." (Barber, et. al., p. 112-113)

This training wall system was constructed in the early 1900s as part of the Federally authorized Savannah River Below Augusta (SRBA) Navigation Project to maintain a 5 foot channel for steamboat navigation. Chief of Engineers reports from the late 1880s to mid-1930s reference numerous wing dams, training walls, pile dikes, and other features the U.S. Army Corps of Engineers (the Corps) constructed to aid with navigation through the shallow areas of the Savannah River in the Augusta, Georgia area. See Figure 1.

A completed pile dike used for channel contraction Augusta. Note the inner core of brush fascines topped by a layer of rip rap stone, 21 September 1935. (Savannah District, Corps of Engineers)

Figure 1. Picture of Pile Dike along the Savannah River near Augusta

With the construction of the New Savannah Bluff Lock and Dam (NSBLD) in 1937, authorized under the 1930 and 1935 Rivers and Harbors Acts, commercial navigation at the upper limits of the Savannah River was improved to a 9 foot depth of channel and the entire training wall and Gardner's Bar was inundated.

By 1980, commercial navigation on the river had virtually ceased, and channel maintenance was discontinued. The last maintenance dredging was completed in October 1979. A decision was made in May 1981 to curtail dredging. The Federal

purpose of commercial navigation, for which the project (the Savannah River Below Augusta) was originally constructed, no longer exists and the current use of the river is primarily for recreation.

3.0 STUDY AREA DETAILED PROJECT DESCRIPTION

The training wall is a navigation feature of the SRBA Federal project along the Savannah River located between River Mile 198 and River Mile 200 as shown in Figure 2and Figure 3. The structure is approximately 1.5 miles in length and is situated along the northern bank of the Savannah River between Augusta-Richmond County, GA and Aiken County, SC. In addition to the training wall, there are up to nine associated navigation features, referred to in previous reports and historical maps as either “pile dikes” or “wing dams”, which run perpendicular to the training wall from the South Carolina bank of the river.

The training wall and associated navigation features are located downstream of three large reservoirs, and as such experience lower peak flows, velocities, and debris loads than in an unregulated and unimpounded river system.

The training wall contains treated wood pilings, wire cribbing containing layers of corded wood and rock. There are no documents noting inspections of the structure to determine its current condition nor have there been efforts to maintain the wall. Based on recent hydrographic surveys, the structure appears to have remained largely intact with the exception of the crest of the structure which is not uniform and ranges in elevation from approximately 103 to 110.5 ft NAVD88. The highest portions of the structure (higher than approximately 109.5 ft NAVD88) are located at five reaches between stations 00+000 to 00+100, 00+500 to 10+200, 10+800 to 20+100, 40+600 to 40+900, and 70+800 to 70+900 (see Figure 3 for stationing). The non-uniform crest of the structure could be an indication of deterioration due to age, high river currents, or damage from vessels or debris. The structure is expected to continue to deteriorate over time because of its age; however, the wood portions of the wall are almost always submerged which drastically reduces the rate of decay. Saturated wood keeps oxygen from infiltrating and reduces fungal growth that actually “rots” the wood. Therefore, this will likely slow that deterioration. For these reasons, it is anticipated that the training wall would continue to remain relatively stable throughout the period of analysis from 2022-2071.

The local municipalities perceive the training wall to be a navigational hazard for recreational boaters and, in the future without project condition would impact their revenues from special events. Until 2014, the Coast Guard maintained buoys and marked the section of the wall between the 5th Street Bridge and the Railroad Bridge wall. With the closure of the lock chamber, the area above the NSBLD was removed from their buoy maintenance program. Since then, no one has had an official responsibility to mark the wall or replace the buoys if they are lost or damaged. The few remaining buoys on the wall are reset by local volunteers when they are moved off station. The 1971 and the 2017 Savannah River – Brier Creek to Augusta NOAA Chart

(635SC) (11515) (https://www.charts.noaa.gov/InteractiveCatalog/nrnc.shtml) show 3 buoys and all of them are downstream of the Gordon Highway Bridge (US Hwy 78). The training wall is labeled as “subm jetty”, a submerged jetty.

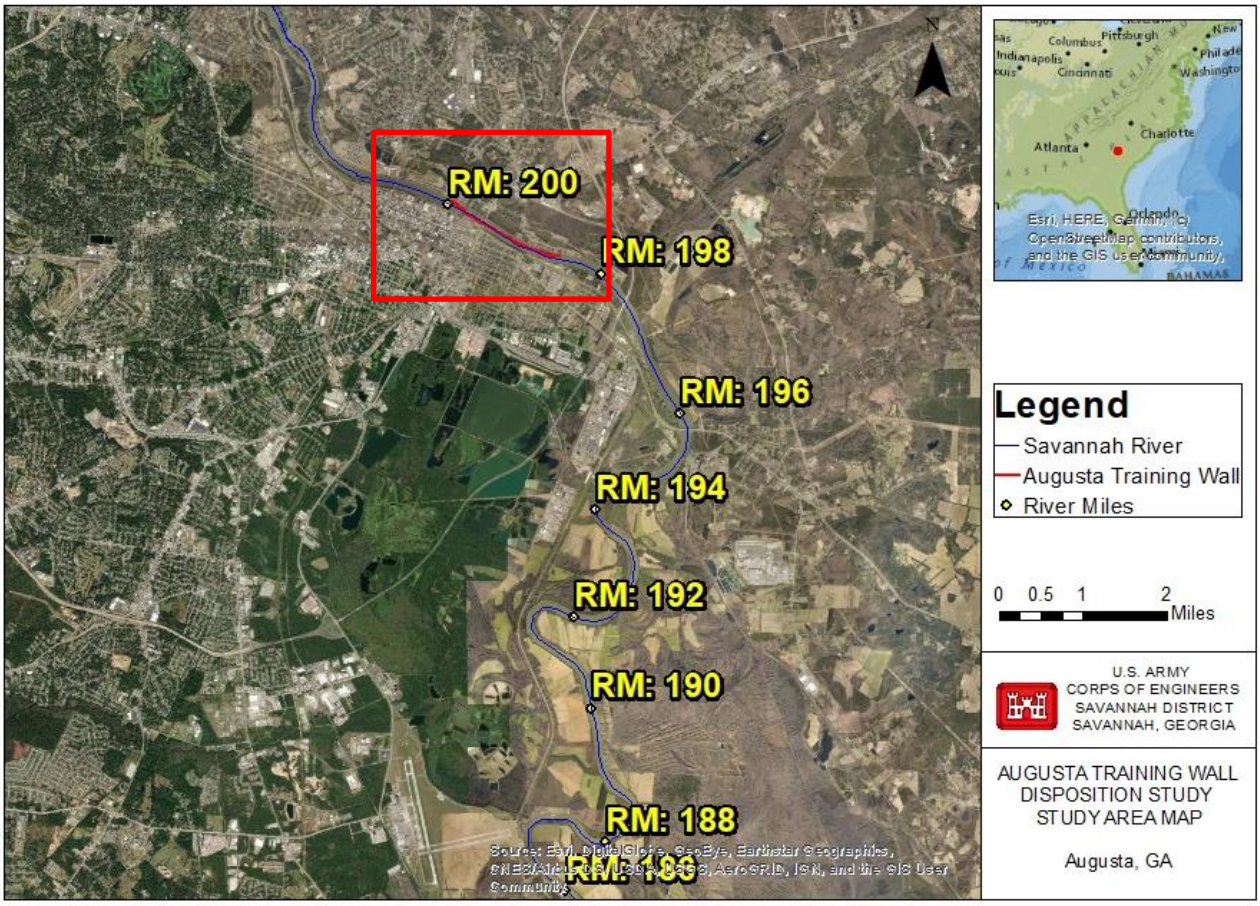

Figure 2. Disposition Study Area Map

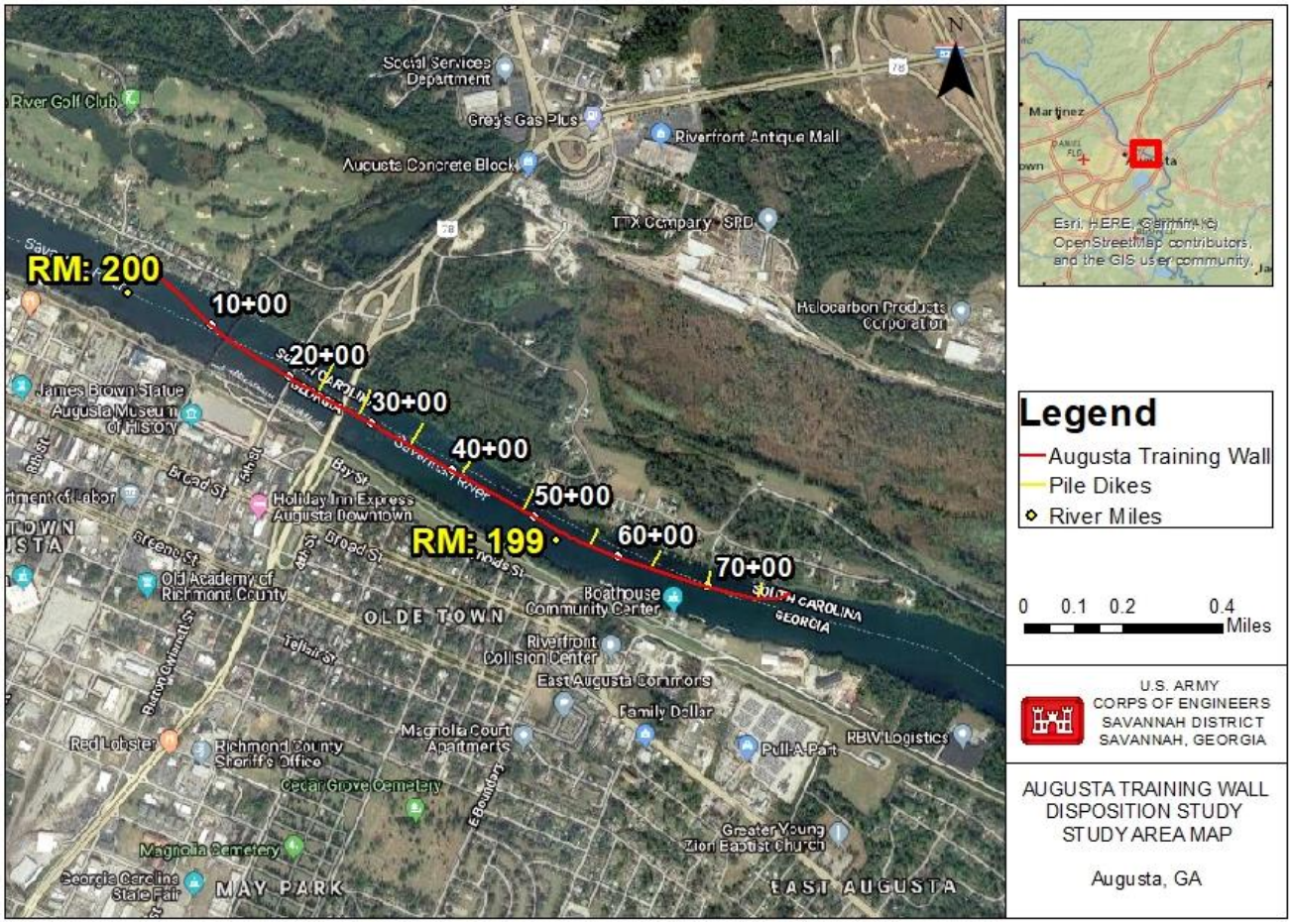

Figure 3. Disposition Study Area Map (zoomed-in)

4.0 HISTORIC AND EXISTING CONDITIONS

4.1 History of Performance

The original project was a plan for commercial navigation improvement by narrowing the river using low wing dams of treated timber, brush, and stone. At points where excessive widths produce shoals (generally anywhere the river exceeded 600 feet in width was considered excessive), contraction works were built to reduce the width to 400 feet which would generate a river depth of five (5) feet and a navigable current. (1915 Chief's Annual Report, p. 1813).

From a sampling of other Chief's reports, there is no evidence that the training wall did not perform as intended by improving the depth of the navigation channel, although some dredging was still required.

Table 1 was extracted from the 1932 Chief's annual report, showing a sampling of tonnages moved on the river prior to the construction of the NSBLD.

Table 1. Tonnages on Savannah River Prior to NSBLD

Calendar Year	Vessel Traffic		Rafted		Total	
1927	Tons	Value $	Tons	Value $	Tons	Value $
1927	95,964	1,834,218	38,548	148,439	134,512	1,982,657
1928	130,587	2,434,174	12,672	41,025	143,259	2,475,199
1929	133,727	2,126,703	20,597	28,249	154,324	2,154,952
1930	86,004	1,847,070	1,466	4,223	87,470	1,851,293
1931	32,582	1,121,520	14,861	37.596	47,443	1,159,118

There is no supplemental detail on how much tonnage was used by the Augusta port; however, due to Augusta being the only developed port on the river, and only a few other natural landings in use, it is assumed most tonnage originated or terminated in Augusta. It is not possible to estimate how much of these terminated at the area impacted by the training wall.

4.2 Operation and Maintenance History

There is minimal written documentation of Operation and Maintenance (O&M) activity specifically for this area. Some construction and O&M costs are noted in the 1915 Chief's annual report, among other annual reports; however, those costs are not separated by specific features (contraction works) and are only presented as a lump sum. Maintenance would have ceased once the pool was impounded and the training wall inundated after the construction of NSBLD (constructed between 1934 and 1937).

4.3 Existing Safety Evaluation

The current normal operating range of the water surface elevation is between 113.9 and 115.3 feet NAVD88 at a USGS gage at 5th Street Bridge when flows are between 3,600 and 8,000 cfs. The highest known elevation of the training wall is documented at 110.5 feet, upstream from the 5th Street Bridge, approximately 3 feet below the water surface at normal low flows. News reports and anecdotal evidence suggest that recreational boats have been damaged by striking the training wall within the current normal operating range, and local interest groups have expressed "safety" concerns for recreational boating related to the training wall. Since 2010, the Operations Project Manager for the Savannah River Below Augusta Project has received several incident reports of boats damaged by striking the training wall and suggestions for either marking the training wall to better inform boaters or removing it.

4.4 Summary of Asset Holding

There are no real estate records within the Corps files documenting this project. Additional information can be found in the Real Estate Findings of Fact attached as Appendix C.

5.0 INVENTORY OF EXISTING CONDITIONS*

5.1 General

5.1.1 Existing Environmental Setting

The headwaters of the Savannah River Basin originate in the Blue Ridge Province of Georgia, North Carolina, and South Carolina. The Savannah River Basin then passes through the Piedmont, Fall Line, and Coastal Plain Provinces, paralleling the Georgia and South Carolina border, before reaching the Atlantic Ocean. Approximately 175 square miles of the estimated 10,577 square-mile basin are located in North Carolina, 4,581 square miles in South Carolina, and 5,821 square miles in Georgia.

In the Upper Savannah River, the Chattooga and Tallulah Rivers join in the headwaters of Georgia to form the Tugaloo River. In South Carolina, the Keowee River and Twelve Mile Creek are the major water bodies that join to form the Tugaloo River. The Savannah River forms at the junction of the Seneca River and the Tugaloo River, which flows southeasterly for approximately 300 river miles to the Atlantic Ocean.

The study area is focused on an approximately 1.5 mile long training wall and its associated navigation features located in the Savannah River at Augusta, Georgia, and North Augusta, South Carolina, between River Mile 198 and River Mile 200. The training wall is located just downstream of the Augusta Shoals and at the lower extent of the Fall Line in the Sandhills Region of the Savannah River Watershed, a unique geologic feature that is the transitional zone between the Piedmont and Upper Coastal Plain Physiographic Provinces of the southeast. It is expressed at the surface by underlying metamorphic rocks, getting its name from the relatively steep gradient the river assumes as it moves through this transitional zone. Unaltered rivers and streams traversing this physiographic feature are characterized by extensive areas of metamorphic rock outcroppings and are dominated by rapids, short pools, and occasional waterfalls.

The Sand Hills Region is a belt of deep sandy soils on gently sloping to strongly sloping uplands. Soils in this area were derived from marine sands, loams, and clays that were deposited on acid crystalline and metamorphic rocks. Elevation ranges from 350 to 500 feet mean sea level (Smith and Hallbick 1979, Perkins and Shaffer, 1977). The Piedmont Province consists of gently rolling to hilly slopes. This area is underlain by acidic crystalline and metamorphic rock of Pre-Cambrian origin. Elevations range from 600 to 1200 feet M.S.L. (Smith and Hallbick 1979, Perkins and Schaffer, 1977). As the river transitions from the Sandhills to the Piedmont, substrate and structure changes from sandy to bedrock and cobble/gravel shoals.

The climate within the study area has short mild winters with rare snowfall and brief frost and freeze events, and hot humid summers with a wide diurnal temperature variation throughout the year. According to the U.S. Climate Data website, the average high temperatures for the study area ranges between 76.8° F and 77.3° F. Average low temperatures range between 50.9° F and 51.1° F. Overall average temperatures for the

study area range between 63.9 ° F and 64.2° F. Average annual precipitation (rainfall) ranges between 43.58 inches and 52.44 inches. Maximum rainfall generally occurs during the month of June.

5.1.2 Existing Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) set forth requirements for the National Marine Fisheries Service (NMFS), regional Fishery Management Councils (FMC), and other Federal agencies to identify and protect important marine and anadromous fish habitat. Anadromous fish are those fish species that are born in fresh water, then, early in its life, it moves to saltwater, where it spends most of its life. It then returns to fresh water to spawn. These amendments established procedures for the identification of Essential Fish Habitat (EFH) and a requirement for interagency coordination to further the conservation of Federally-managed fisheries. There is no EFH in the study area.

5.1.3 Existing Hydrology of the Watershed

The Savannah River is a major interstate river with a drainage basin of over 10,000 square miles and forms the border between the States of Georgia and South Carolina. The upper natural river system has been fragmented by a series of reservoirs, including three large Federal reservoirs (Hartwell Lake, Richard B. Russell Lake, and J. Strom Thurmond Lake). These reservoirs provide hydropower, fish and wildlife habitat, water supply, water quality, recreational facilities, and flood control. J. Strom Thurmond Dam is responsible for most of the flow regulation that affects the Savannah River at Augusta. Stevens Creek Dam, which began generating electricity in 1914 and is located between Thurmond Dam and Augusta, Georgia, impounds a minor run-of-the-river reservoir compared to the three large multi-purpose reservoirs. Stevens Creek Dam and other dams upstream of Hartwell Lake have little impact on flood discharges at Augusta, Georgia.

The NSBLD project is the lowest dam on the Savannah River at River Mile 187.3, approximately 13 river miles downstream from the city of Augusta in Richmond County, Georgia, and the city of North Augusta in Aiken County, South Carolina. River flows at Augusta, Georgia, and NSBLD are regulated by J. Strom Thurmond Dam and to a lesser extent by Stevens Creek Dam. During normal operating conditions flows range from 3,600 cfs to around 8,000 cfs, though there is daily and even hourly variability in flow due in large part to hydropower generation at Thurmond. A statistical analysis of the period-of-record flow data was used to develop a plot of the non-exceedance probability of the mean daily flow at NSBLD and can be seen in Figure 4. This figure represents the flow exceedance for the Savannah River upstream of the NSBLD to include the vicinity of the training wall structure. Together with J. Strom Thurmond Dam, the NSBLD currently regulates the water surface elevation and the flow of the Savannah River. Mean daily flows are between 3,600 cfs and 8,000 cfs approximately 66 percent of the time.

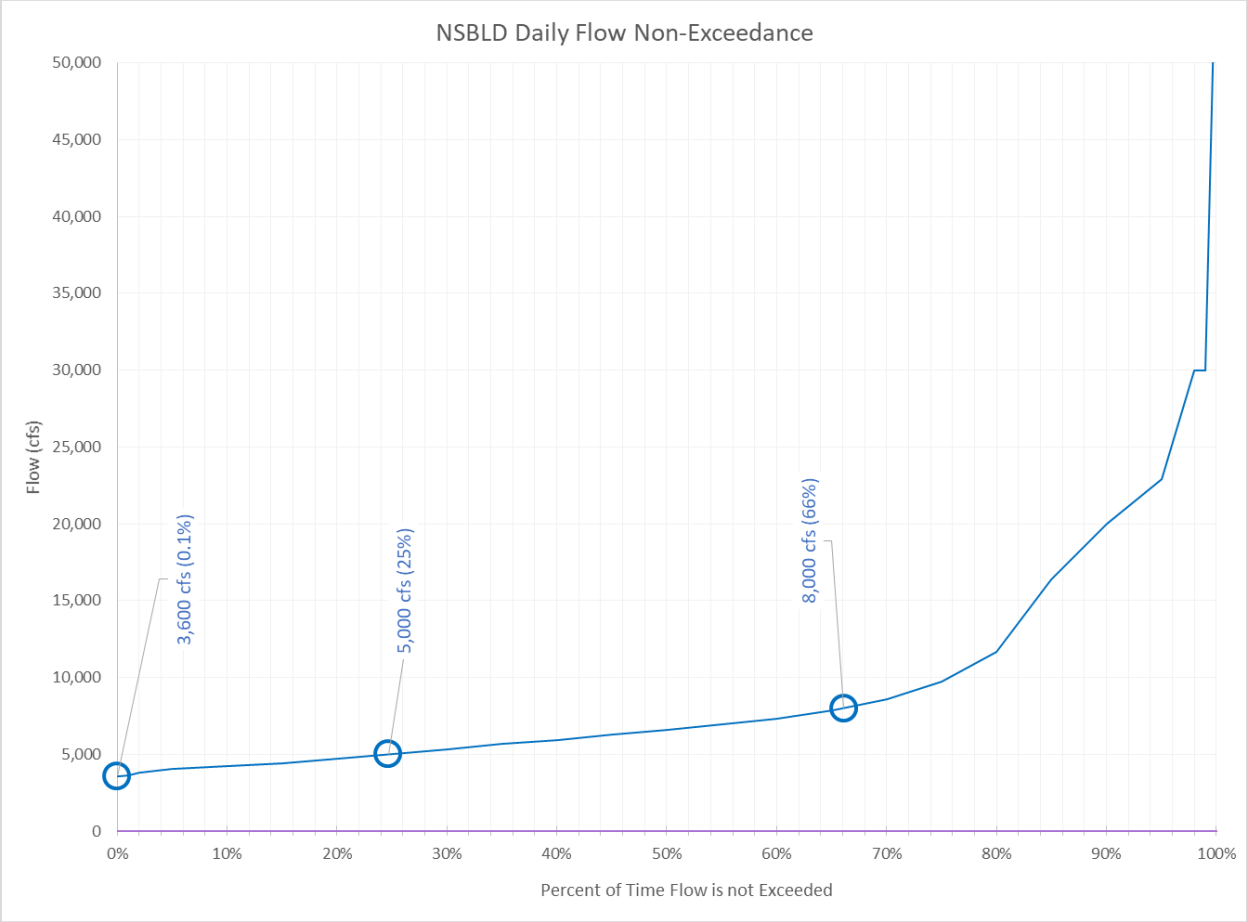

Figure 4. NSBLD Daily Flow Non-Exceedance

Under existing conditions, the gates of the NSBLD are operated remotely from the J. Strom Thurmond Dam to help maintain a pool elevation between 113.9-115.3 feet NAVD88 at the 5th Street Bridge which is approximately 10 river miles upstream of the NSBLD.

The regulated pool is used to support activities described in the subsequent sections of this report during normal flow conditions. As inflow increases, operational gates are opened to keep a steady pool within the target range; gates are closed as flow decreases. The gates are opened fully as flows approach 25,000 cfs and water is allowed to flow unobstructed through the NSBLD. For flow levels above the channel capacity of 30,000 cfs, water begins to leave the channel and flows around the dam on the South Carolina abutment. At stream-flow levels above 35,000 cfs, all NSBLD gates are lifted out of the water, and the river begins to flow around the structure on the "Georgia" abutment. The 0.5 percent Annual Chance Exceedance (ACE) (2-year return interval) flow is approximately 33,000 cfs and serves as a good proxy for the channel capacity flow.

The Augusta Levee System is located on the southern bank of the Savannah River between River Mile 187 and 203 in Richmond County, and in the city of Augusta. The

levee is between the river and the city of Augusta with considerable industry and residential areas adjacent the levee. The levee has a total design length of 61,125 linear feet and was designed and constructed to provide protection against a discharge of approximately 500,000 cubic feet per second (cfs).

Large storms are common in the region and can produce severe flooding in the Augusta-Richmond County area. These storms are usually of the frontal type, lasting two to four days and covering large areas. The summer storms generally consist of thunderstorms, which have high rainfall intensities and are scattered over small areas. In addition, the study area is vulnerable to hurricane and tropical storm activities. These storms usually occur August through October and have produced some of the most severe floods in the area.

Numerous damaging floods have previously occurred in Augusta-Richmond County. However, the September-October 1929 flood is the most severe flood on record. It was caused by two successive storms. The first storm, which began in Alabama, spread eastward covering all of Georgia, northern Florida and South Carolina. Approximately eight inches of rain fell on September 26 and 27. The second storm was caused by a tropical cyclone, which passed around the Florida peninsula, turned northwestward, and moved inland near Pensacola, Florida on September 30. It moved northeastward across northern Florida and southeastern Georgia and then up the Atlantic Coast. This second storm caused approximately seven inches of additional rain to fall over the city of Augusta.

The September-October 1929 flood registered a reading of 45.6 feet NAVD88 on the Savannah Fifth Street gage. This reading represented a peak flow of 350,000 cubic feet per second (cfs). This value corresponds to a regulated peak flow, including the impacts of the Hartwell, J. Strom Thurmond (formerly Clarks Hill), and Richard B. Russell Reservoirs, of 252,000 cfs. With the reservoirs in-place, the 1 percent ACE flood regulated peak flow is computed to be 138,000 cfs at the Butler Creek gage, which corresponds to the 1 percent ACE unregulated peak flow of 277,000 cfs.

Executive Order (EO) 11988 has an objective to avoid, to the extent possible, long, and short-term adverse impacts associated with occupancy and modification of the base floodplain. Further objectives are the avoidance of direct and indirect support of development in the base floodplain wherever there is a practicable alternative and protection and restoration of natural floodplain functions. The Corps regulation for implementing EO 11988 (ER 1165-2-26) defines the base floodplain as the 1 percent ACE floodplain.

5.1.4 **Existing Water Quality**

The portion of the Savannah River near the training wall is classified by the South Carolina Department of Health and Environmental Control (SCDHEC) (SCDHEC 2012) as “Freshwater.” This designation is defined as “freshwaters suitable for primary and secondary contact recreation and as a source of drinking water supply after conventional treatment in accordance with the requirements of the Department. Suitable

for fishing and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. Suitable also for industrial and agricultural uses." (SCDHEC 2014).

Georgia Environmental Protection Division's (GAEPD) database indicates that the mainstem Savannah River near the training wall currently supports its designated use of fishing.

Several areas on the mainstem Savannah River in Aiken County, near the existing project, are included on the South Carolina's 2016 303d of the Clean Water Act list of Impaired Waters. These areas are impaired for fish consumption due to mercury levels, an impairment that appears to be fairly common in other reaches of the mainstem Savannah River (SCDHEC 2016).

5.1.5 **Existing Air Quality**

Richmond County, Georgia and Aiken County, South Carolina are currently in attainment for the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants. Therefore, the project area is under no Federal or state restrictions for the purpose of improving air quality to meet any air quality standards.

5.1.6 **Existing Socio-Economic Resources**

According to a 2018 U.S. Census estimate, 604,167 people live in the Augusta-Richmond County metro area. Local-born residents make up 52 percent of the population. Augusta-Richmond County residents born in the United States make up 96 percent of the population. Nearly one quarter (23 percent) of the county's residents are under 18, over half (56 percent) are between the ages of 19-65, and 21 percent are over 65. Age distribution is similar to nationwide averages, and the median age for the county is 38 years old. Veterans comprise 11 percent of the metro's residents and 12 percent are disabled, similar to national averages. Of the working population, 88 percent finished high school, 30 percent attended some college, 26 percent hold bachelor's degrees, and 10 percent have graduate or professional degrees.

Table 2. 2010 U.S. Census Data for Communities in the Vicinity of the Savannah River Training Wall in Augusta

	2000 Population	2018 Population	Growth	Racial Composition	Median Age
United States	281,421,906	327,167,434	16.3%	White-72% Black- 13% Other-15%	38.2
South Carolina	4,012,012	5,084,156	26.7%	White-64% Black-27% Other-9%	38.8
Georgia	8,186,453	10,511,131	28.4%	White-60% Black-31% Other-9%	37.7
Augusta-Richmond County Metro	508,041	604,167	18.9%	White-55% Black-35% Other-10%	37.9

Per the Federal Reserve Bank of St. Louis, in the years between 2010 and 2018, the unemployment rate in the Augusta-Richmond County metro has decreased by roughly 56.7 percent, from 9.7 to 4.2 percent. The unemployment rate in Georgia decreased by 62 percent during the same period, and 68.5 percent in South Carolina.

About 65 percent of households are double-income households, matching the national average, with median household income of $40,168 which is lower than the Georgia and South Carolina averages, $55,821 and $57,444 respectively.

Results from the US Bureau of Labor Statistics 2018 Employment Census are provided in Table 3 and Figure 5. As shown in Figure 5 the majority (62 percent) of industry employment is in five sectors: Office and Administration, Sales and Support, Food Preparation, Healthcare, Manufacturing and Production, and Transportation.

As part of the aggregated median household wage totals depicted in Table 5, the per capita employment in the Augusta-Richmond MSA, wages ranged from a low of $21,060 in Food Preparation and Serving to a high of $103,960 in Management. The 2018 annual per capita average wage for all industry was $44,980, which is lower than the regional (Southeastern) total of $47,337.

Table 3. 2018 U.S. Census Data for the Augusta-Richmond County Metro: Unemployment Rate and Median Income

	2010 Unemployment Rate	2018 Unemployment Rate	2018 Median Household Income	Population Below The Poverty Line
South Carolina	11.2	3.4	$57,444	15.30%
Georgia	10.5	3.9	$55,821	14.30%
Augusta-Richmond County Metro	9.7	4.2	$40,168	24.40%

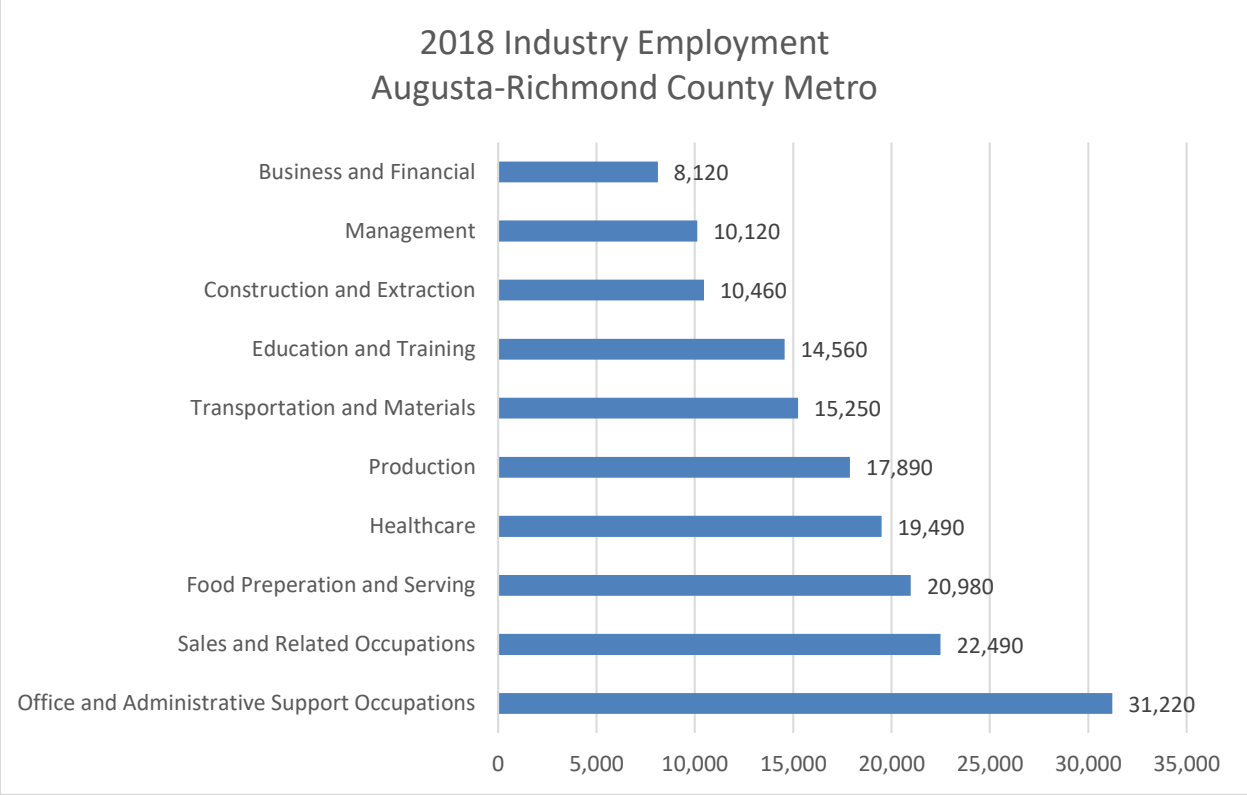

Figure 5. Employment in Augusta-Richmond Co Metro by Industry (Source: https://www.bls.gov/oes/current/oes_12260.htms)

5.1.7 **Existing Recreational Resources**

The Savannah River near Augusta serves as an important source of recreation, including fishing, boating, and wildlife viewing. The river is highly accessible at a number of public access sites, which adds to the general sense that this is a shared resource with multiple benefits. Beyond the local recreation contributions of the river,

there are several Regional and National events which utilize the riverine environment and produce valuable revenue to the study area. The most significant events are listed below.

5.1.7.1 **Ironman 70.3**

The Ironman 70.3 is a one-day triathlon event that usually occurs in September and includes swimming in the Savannah River. The swimming course is a point-to-point course that starts at 6th Street at the Riverfront Marina. Athletes enter the water and swim with the current for 1.2 miles along the shoreline until they exit the swim course at the Augusta Rowing Complex public boat ramp.

In 2017, the Ironman 70.3 totaled $4,716,616 in estimated economic impact on the Augusta economy (https://www.augustasportscouncil.org/economic-impact). Total Estimated Economic Impact (EEI), the sum of all the direct, indirect and induced spending estimates, is calculated based on research commissioned by both the Georgia Department of Economic Development (GDEcD) and Destination Marketing Association International (DMAI) in conjunction with globally recognized research vendors, the U.S. Travel Association and Tourism Economics.

5.1.7.2 **Head of the South (HOTS) Regatta**

Hosted by the Augusta Rowing Club, the Head of the South (HOTS) Regatta is one of the largest head races in the Southeast Region and the fifth largest in the nation. Every year since 1997 rowers have competed on the Savannah River in Augusta, Georgia. In November 2017, approximately 2,500 out-of-town rowers and coaches and 1,500 visiting spectators from multiple states came to the Regatta.

The HOTS Regatta course starts just upstream of 13th Street Bridge near the Hammonds Ferry development in North Augusta, goes past the River Walk Amphitheater, and finishes just downstream of the Augusta Rowing Club Boathouse. All those areas allow for spectators to view the event. Along the course, there are danger and course buoys. The danger buoys indicate shallow areas. The course crosses over the upstream end of the training wall at the Railroad Bridge just upstream of the 5th Street Bridge and before the finish line near the Augusta Rowing Club Boathouse.

In 2017, the HOTS totaled $1,650,120 in EEI on the Augusta economy (https://www.augustasportscouncil.org/economic-impact).

5.1.8 **Existing Environmental Justice**

Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority and Low-Income Populations; February 11, 1994) provides minority and low-income populations an opportunity to comment on the development and design of Federal activities and on the consequences of proposed Federal actions. This Executive Order requires that Federal agencies shall make achieving environmental justice part of their missions by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities

on minority and low-income populations. The Council on Environmental Quality (CEQ), identifies minority groups as Asian, American Indian or Alaskan Native, Pacific Islander, Black not of Hispanic origin, and Latino (CEQ 1997). It defines a minority population as any group of minorities that exceed 50 percent of the existing population within the market area or where a minority group comprises a meaningfully greater percentage of the local population than in the general population. Additionally, CEQ identifies low income using 2010 census data for "individuals living below the poverty level." For the purposes of this study, a low income population will be defined similarly as a local or market area population with more than 50 percent of people living below the poverty level.

The existing socioeconomic environment does not trigger any aspect of EO 12898 related to environmental justice.

5.1.9 **Existing Sediments**

This section characterizes the sediments found within the Savannah River, North of Augusta, Georgia. Particle size analysis was conducted to evaluate physical soil properties for potential disposition. Particle size results from the September 2019 (Phase I) sampling event indicate the top 0.7 – 1.8 ft. of sediment is characterized as silty sand (SM) and sandy silt (ML). Particle size results from the October 2019 (Phase II) sampling event reveal the sediments behind the training wall are primarily composed of highly erodible poorly graded sand (SP). The sediment ranges between 5 feet thick at the upstream portion of the wall to 16 feet thick at the downstream end of the training wall. The natural river bottom sediment is composed of lean clays (CL), also known as saprolite, highly resistant to erosion. Sand is defined as grain size between 0.07 and 5.0 mm in diameter and silt and clay measures less than 0.07 mm in diameter. A cross sectional view of the site (Figure 6 and Figure 7) shows the distribution of SP and CL with depth behind the SRBA Training Wall. Figure 6 and Figure 7) shows the distribution of SP and CL with depth behind the SRBA Training Wall.

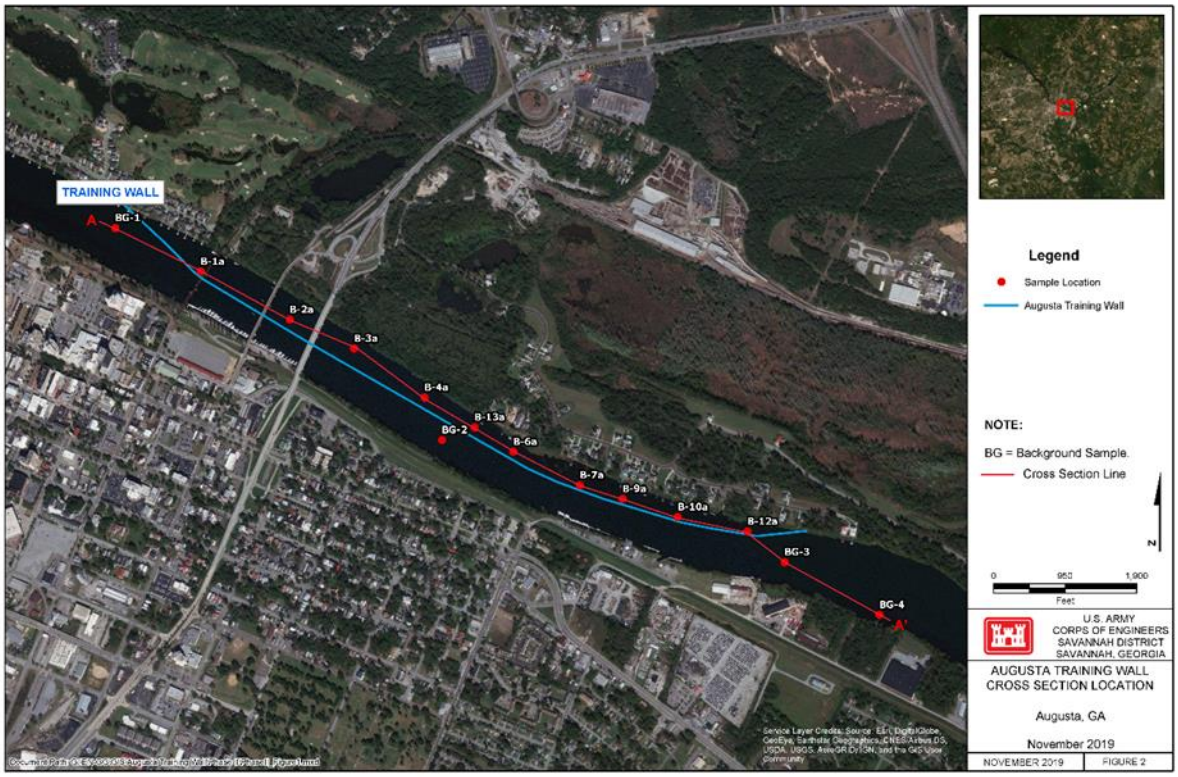

Figure 6. SRBA Training Wall sediment sample locations

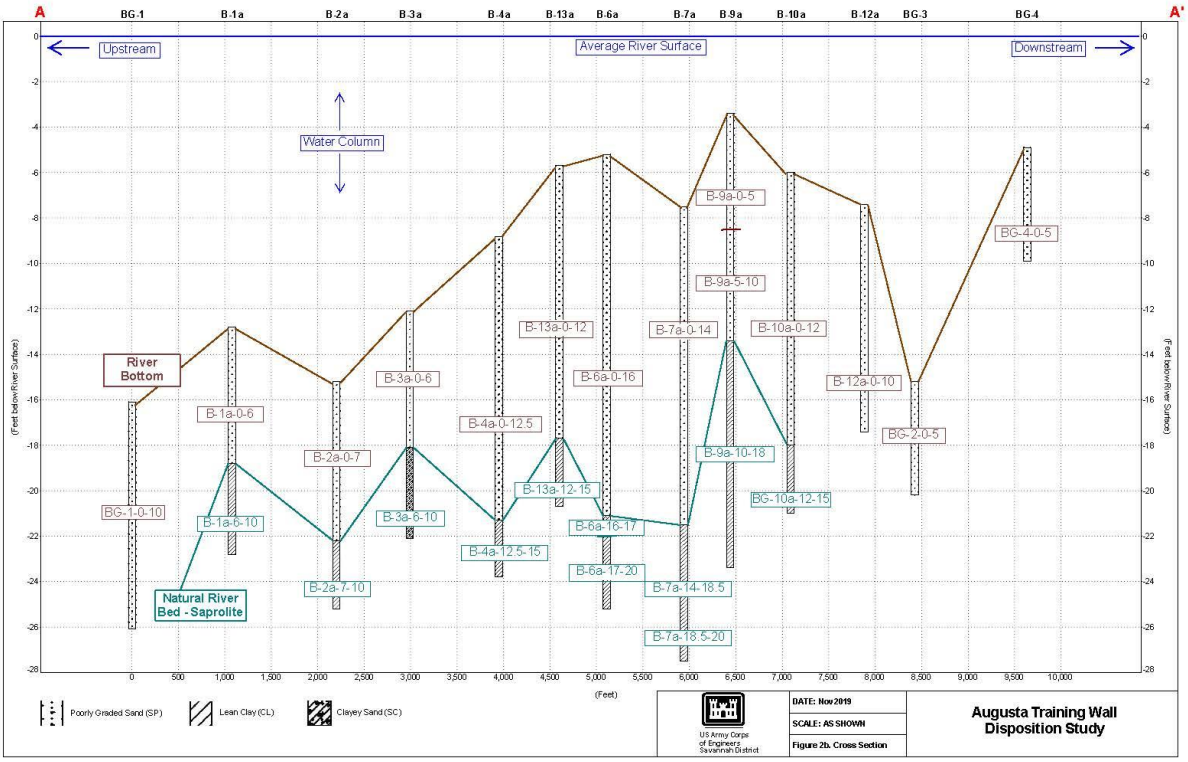

Figure 7. Cross Section A-A' Location (top). Cross Section A-A' (bottom) Showing Sample Distribution and Sediment Depths

5.1.10 **Existing Noise**

For purposes of regulation, noise is measured in A-weighted decibels (dBA). This unit uses a logarithmic scale to weigh sound frequencies. Table 4 shows typical noise levels and corresponding impressions. The project area within the Augusta, Georgia area within the Savannah River Basin is a populated area with one vehicle bridge and one railroad present, along with a marina, an amphitheater, and residential and commercial developments. Watershed noises associated with vehicle and railroad traffic along with noises associated with downtown activities and residential and commercial developments are the predominant sources of noise in the project area. Naturally occurring noises (buzzing of insects, bird calls, etc.) are also common within the project area. As stated on the Federal Highway Administration Research and Technology website, from a July/August 2003 article entitled "Living with Noise", levels of highway traffic noise can typically range from 70 to 80 dBA 15 meters (50 feet) from the highway. An April 8, 1977 article from the Journal of Sound and Vibration, explained that locomotive noise is largely confined to the range of 75 to 95 dBA at 30 m (100 ft.) for all speeds. According to a May 2017 article on the Alpine Hearing Protection website, average noise volumes at a concert or festival that might be held at the local amphitheater is around 100 decibels and a June 2016 article published in the Journal of Urban Health, urban residential noise levels generally range from 45 to 55 dB depending on the time of day and location of measurement.

Table 4. Typical Noise Levels and Impressions

Source	Decibel Level	Subjective Impression
Normal breathing	10	Threshold of hearing
Soft whisper	30	---
Library	40	Quiet
Normal conversation	60	---
Television audio	70	Moderately loud
Ringing telephone	80	---
Snowmobile	100	Very loud
Shouting in ear	110	---
Thunder	120	Pain threshold

5.1.11 **Existing Aesthetics (Visual Resources)**

The continually changing channel of the Savannah River across its flood plain has built a diverse landscape of bluff, levees, swamps, lakes, and creeks. Ecosystems within the basin include agricultural systems, upland forests, bottomland hardwoods, pine plantations, free flowing streams, water impoundments (dams), swamps, and freshwater and marine marshes. Equally diverse is the array of plants and animals living in the habitats created by the river. The Savannah River Basin is home to more than 50 species of rare, threatened, and endangered plants and animals, including the swallow-tailed kite, the rocky shoals spider lily, and the smooth coneflower. Much of the water in the upper basin is retained by several large dams, including those forming the three upstream reservoirs, which provide a wide range of recreation opportunities including fishing, boating, and swimming.

The lower part of the basin is characterized by a meandering course with few tributaries and slow currents. The natural beauty of the Lower Savannah River has been preserved by a number of factors. Among these are: (1) the floodplain forests are generally intact, (they have not been exploited extensively for timber, except for the economically valuable cypress); (2) the pattern of large landholdings extensively used for forestry and recreation has resulted in a low population level in the region, thereby leaving no motive for intensive development; and (3) the major uses of the area, that of recreation (hunting, fishing, and boating), have had little permanent effect on the natural environment.

5.1.12 **Existing Aquatic Resources/Fisheries**

The study area, within the lower Savannah River supports an abundant diversified migratory fish community. Common fish species include American shad, redbreast sunfish, channel catfish, largemouth bass, black crappie, yellow perch, bluegill, striped mullet, and redear sunfish. Other species found within the study area include diadromous fish (those fish that spend portions of their life cycles partially in fresh water and partially in salt water): such as striped bass, blueback herring and shortnose and Atlantic sturgeon. The catadromous (fish that migrate down river to the sea to spawn) American eel has also been documented within the study area.

Other aquatic species that could be in the study area are several freshwater invertebrates. There are three Georgia listed invertebrate species for state conservation status that could be within the proposed study area including the Carolina slabshell (*Elliptio congaraea*), the Tidewater mucket (*Leptodea ochracea*), and the Roanoke slabshell (*Elliptio roanokensis*). In addition to those three species there is one state listed invertebrate species, the Atlantic Pigtoe (*Fusconaia masoni*), which is listed as endangered for the state of Georgia. There are also four South Carolina invertebrate species listed for state conservation that have the potential to be within the study area. These include the Atlantic spike (*Elliptio product*), Eastern elliptio (*Elliptio complanata*), variable spike (*Elliptio icterina*), and the Florida pondhorn (*Uniomerus caroliniana*). These four species listed for South Carolina have various conservation ranks but are not state listed for protected status.

There are a number of exotic aquatic weeds that are present in the vicinity of the training wall. Brazilian elodea (*Egeria densa*) and hydrilla (*Hydrilla verticillata*) both grow in the river, and water hyacinth is a nuisance at certain times of the year. Phragmites is also present. Most years the city of Augusta sprays the submergent weeds in early summer to control population growth.

5.1.13 **Existing Wetlands**

Palustrine forested wetlands dominate the extensive alluvial plain of the Savannah River. Palustrine wetlands include any inland wetland that lacks flowing water, mostly fresh water, and is non-tidal. The wettest parts of the flood plain, such as swales, sloughs, and back swamps are dominated by bald cypress, water tupelo, and swamp tupelo. Slightly higher areas, which are usually flooded for much of the growing season, are often dominated by overcup oak and water hickory. Most of the Savannah River floodplain consists of low relief flats or terraces. These areas are flooded during most of the winter and early spring and one or two months during the growing season. Laurel oak is the dominant species on these flats and green ash, American elm, sweetgum, spruce pine, sugarberry, and swamp palm are often present. Swamp chestnut oak, cherrybark oak, spruce pine, and loblolly pine are found on the highest elevations of the flood plain, which are only flooded infrequently during the growing season. The wetlands associated with natural oxbows and man-made cutoff bends begin to dry out even during non-drought conditions. A recent National Wetland Inventory (NWI) Map for the project area accessed in October 2019 identified Freshwater Forested/Shrub wetlands within the study area (Figure 8). There are approximately 17 acres of Freshwater Forested/Shrub wetlands along the edge of the City of Augusta and the Savannah River. There are no wetlands in the proposed holding area site based on the NWI for the area.

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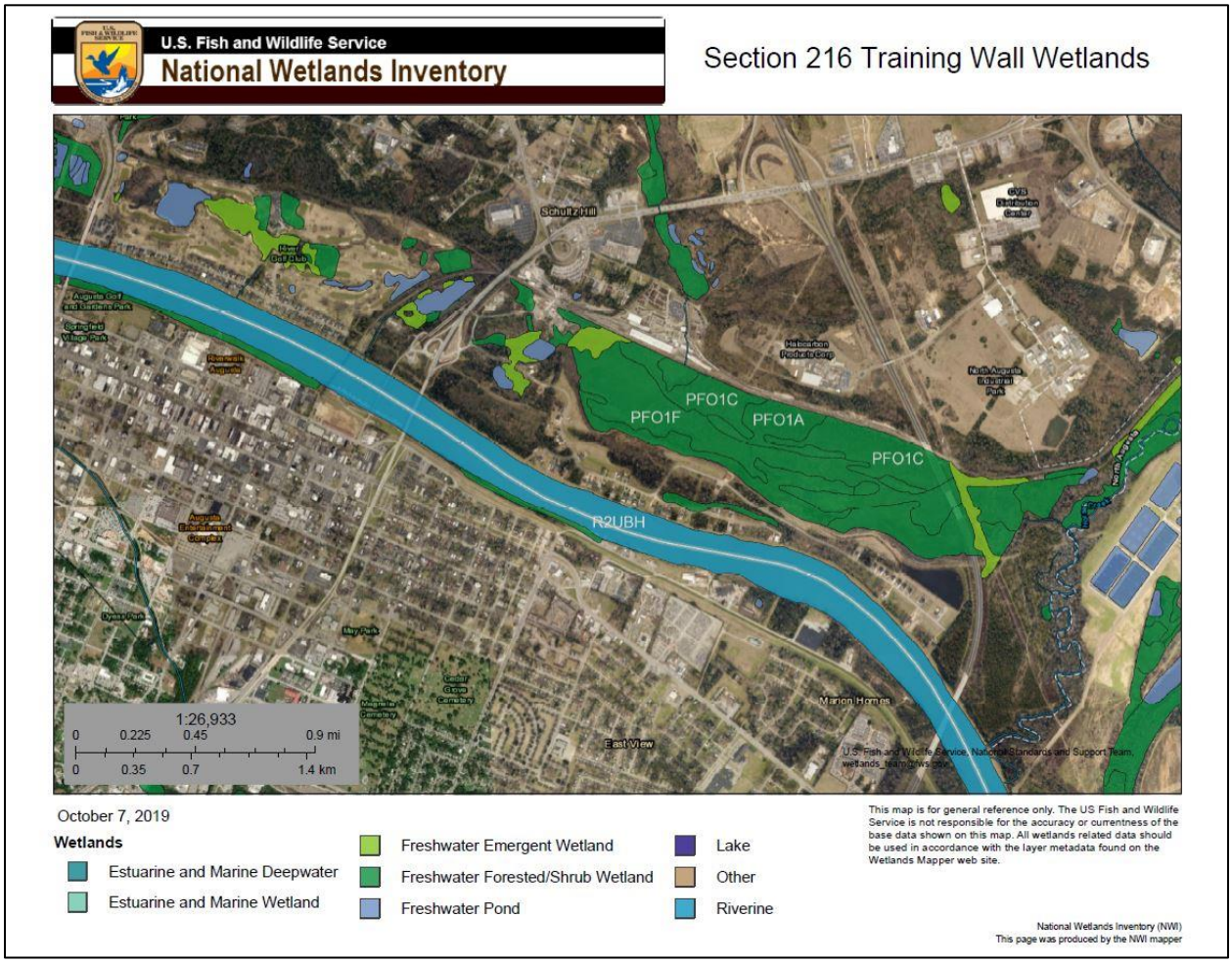

Figure 8. National Wetland Inventory Map for Section 216 Training Wall

5.1.14 **Existing Terrestrial Resources**

Wildlife associated with forested wetlands within the study area are numerous and diverse. The furbearers are an important component of these wetlands and include beaver, muskrat, mink, otter, bobcat, gray fox, raccoon, and opossum. Deer, turkey, and even black bear in the more isolated areas, use the bottomlands. Palustrine emergent wetlands also provide excellent habitat for furbearers including the mink, beaver, and river otter. Terrestrial species from surrounding areas often utilize the fresh marsh edge for shelter, food, and water. These include raccoon, opossum, rabbit, and bobcat.

The study area is part of the Atlantic Flyway. Forested wetlands provide important wintering habitat for many waterfowl species and nesting habitat for wood ducks. Many species of woodpeckers, hawks, and owls use the bottomlands and swamps.

The primary game birds are the bobwhite quail, eastern wild turkey, and the mourning dove. The most common bird species found in the mature forests include the pine warbler, cardinal, summer tanager, Carolina wren, ruby-throated hummingbird, blue jay, hooded warbler, eastern towhee, and tufted titmouse. The red-cockaded woodpecker, a Federally-listed endangered species, is found in mature longleaf pine habitats.

The study area also provides excellent habitat for a large number of reptiles and amphibians. Wetland habitats support many kinds of frogs including the bullfrog, bronze frog, southern leopard frog, several species of tree frogs, cricket frogs, and chorus frogs. Turtles found in the wetlands include the river cooter, Florida cooter, pond slider, eastern chicken turtle, snapping turtle, mud turtle, and stinkpot. Snakes found in the wetlands include the red-bellied water snake, banded water snake, brown water snake, eastern mud snake, rainbow snake, and eastern cottonmouth. The American alligator can be observed in streams and ponds of the Coastal Plain.

5.1.15 Existing Threatened and Endangered Species

The Endangered Species Act (ESA) of 1973 (16 USC 1531-1543) regulates activities affecting plants and animals classified as endangered or threatened, as well as the designated critical habitat of such species.

The USFWS's Information, Planning, and Conservation System (IPAC) website (http://ecos.fws.gov/ipac/) indicated several Federally listed species potentially within the study area. These included a total of four Federally listed endangered species, one Federally listed threatened species, and one Federally listed candidate species as well as over ten species of birds that are protected by the Migratory Bird Treaty Act. The American bald eagle, which is within the study area, is not only protected by the Migratory Bird Treaty Act, but the Bald and Golden Eagle Protection Act, and is also listed in the states of Georgia and South Carolina as threatened. Table 5 identifies the species that have been listed by the USFWS as occurring or possibly occurring within the study area and at the holding area site.

Table 5. Federally Endangered, Threatened and Candidate Species Likely to Occur in the Training Wall Study Area

Category	**Common Name**	**Scientific Name**	**Federal Status**	**Critical Habitat Designated Y/N**
Birds	Red-cockaded Woodpecker	*Picoides borealis*	Endangered	N
Birds	Wood Stork	*Mycteria americana*	Threatened	N
Flowering Plants	Harperella	*Ptilimnium nodosum*	Endangered	N
Flowering Plants	Relict Trillium	*Trillium reliquum*	Endangered	N
Flowering Plants	Smooth Coneflower	*Echinacea laevigata*	Endangered	N
Reptiles	Gopher Tortoise	*Gopherus polyphemus*	Candidate	N

The Savannah River was identified as a spawning river for Atlantic sturgeon based on capture location and tracking locations of adults and the collection of larvae. Based on the August 17, 2017, Federal Register publication of the final rule of the Savannah River as critical habitat for Atlantic sturgeon (Figure 9), (https://www.federalregister.gov/documents/2017/08/17/2017-17207/endangered-and-threatened-species-designation-of-critical-habitat-for-the-endangered-new-york-bight), it was concluded by National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) that because sturgeon cannot currently pass above the NSBLD, they believe that dam is the farthest upstream extent of spawning habitat accessible to Atlantic sturgeon in the occupied reaches of the Savannah River. As a result, the critical habitat for Atlantic sturgeon does not go past the base of the NSBLD and the area where the training wall is located is not considered to be critical habitat for the Atlantic sturgeon.

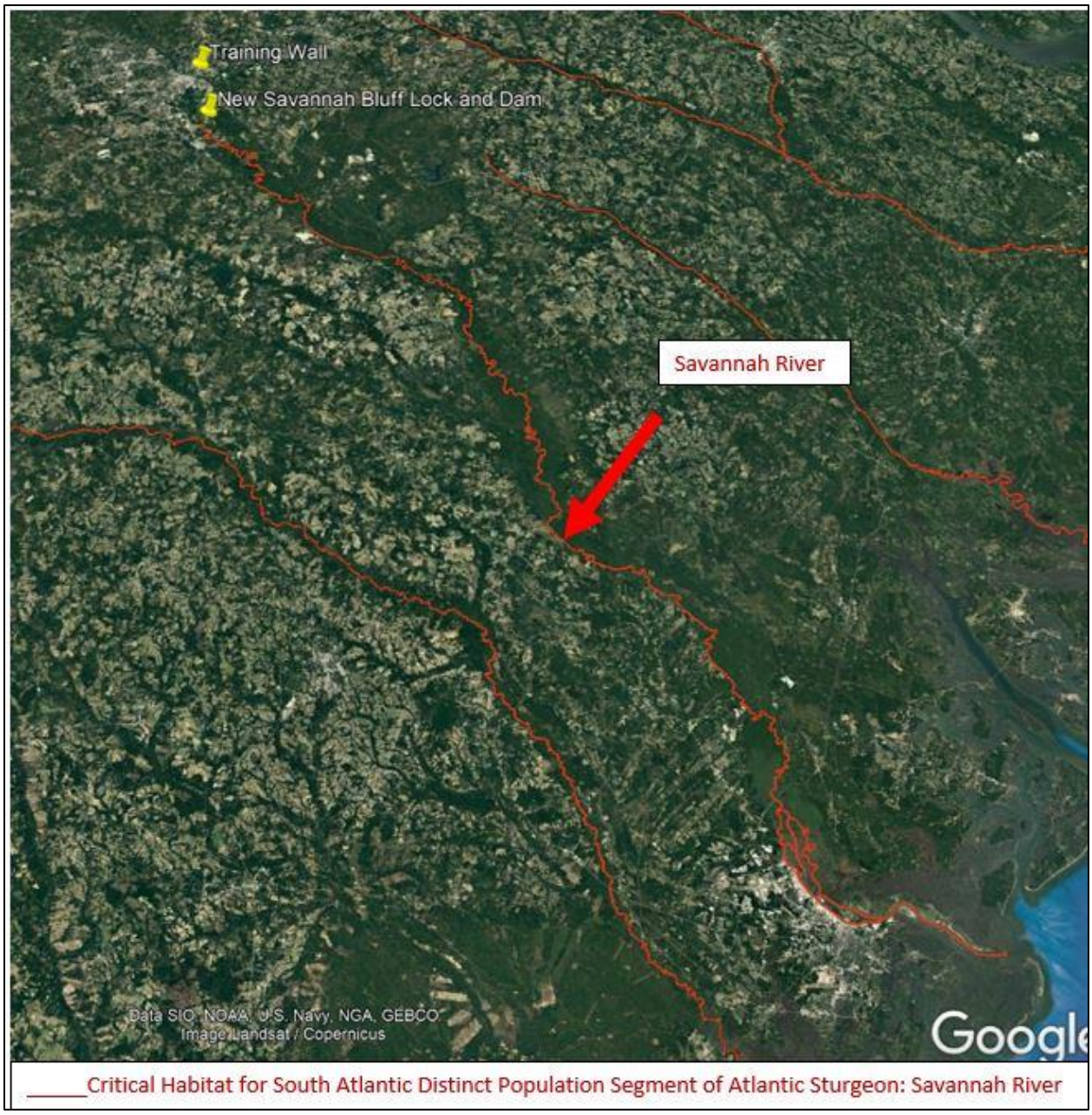

Figure 9. Atlantic Sturgeon Critical Habitat

In addition to Federally-listed species, between the states of South Carolina and Georgia, there is one endangered species identified within the study for the state of Georgia, the Atlantic pigtoe (*Fusconaia masoni*). There are also a total of 18 species for state conservation status listed for both the states of South Carolina and Georgia (Table 6 and Table 7).

Table 6. South Carolina Species of State Conservation

County/ State	Species Type	Scientific Name	Common Name	Sate Conservation Rank	Habitat Requirements	Habitat has the Potential to Exist in Immediate Training Wall Project Area
Aiken, South Carolina	Vascular Plant	*Elliottia racemosa*	Georgia Plume	SX	Sand ridges, evergreen hammocks, outcrops of ultamafic or serpentine rock, and Atlamaha Grit	No
Aiken, South Carolina	Vascular Plant	*Delphinium carolinianum*	Carolina Larkspur	S1	The species is generally found on outcrops and in rocky, oak dominated woods, flowering from March-May, followed by fruits, which may persist through early summer	No
Aiken, South Carolina	Reptile	*Ambystoma tigrinum*	Tiger Salamander	S2S3	Isolated wetlands for breeding; variety of open, upland habitats; CP- sandhills, oldfields, dry pine savanna	No
Aiken, South Carolina	Vascular Plant	*Trillium discolor*	Faded Trillium	S4	It is native to areas of the Savannah River drainage system of Georgia, North Carolina and South Carolina. It is locally common in rich woods within its restricted range, as at Steven's Creek Heritage Preserve and Lake Keowee.	No
Aiken, South Carolina	Vascular Plant	*Euonymus atropurpureus*	Wahoo	S1	Is primarily found in the Midwestern United States, but its range extends from southern Ontario south to northern Florida and Texas. It grows in low meadows, open slopes, open woodland, stream banks and prairies, in moist soils, especially thickets, valleys, and forest edges	No
Aiken, South Carolina	Vascular Plant	*Trillium reliquum*	Relict Trillium (Federally listed)	S1	Mature hardwood forest in rich ravines and on stream terraces; over calcium-rich bedrock such as amphibolite or limestone	No
Aiken, South Carolina	Invertebrate	*Elliptio producta*	Atlantic Spike	S2	This species is wide spread in South Carolina ranging from the Savannah River Basin north to the Pee Dee, including the Waccamaw River Basin.	Yes
Aiken, South Carolina	Invertebrate	*Elliptio complanata*	Eastern Elliptio	S5	This species is widespread in the Atlantic Slope rivers in South Carolina from the Savannah River Basin north to the Pee Dee River Basin	Yes
Aiken, South Carolina	Invertebrate	*Elliptio icterina*	Variable Spike	S4	This species is wide spread in South Carolina ranging from the Savannah River Basin north to the Pee Dee, including the Waccamaw River Basin.	Yes
Aiken, South Carolina	Invertebrate	*Uniomerus caroliniana*	Florida Pondhorn	S3	This species occurs in mainstems, tributaries of most sizes, swamps, and some lakes	No

State Rank Definitions: **SX:** Presumed nonexistent with the state **S1:** Critically Imperiled **S2:** Imperiled **S3:** Vulnerable **S4:** Apparently Secure **S5:** Secure

Table 7. Georgia Species of State Conservation

County/ State	Species Type	Scientific Name	Common Name	Sate Conservation Rank	Habitat Requirements	Habitat has the Potential to Exist in Immediate Training Wall Project Area
Richmond County, Georgia	Birds	*Passerina ciris*	Painted Bunting	S2S3	Thickets, woodland borders, marsh edges, and brushy areas	No
Richmond County, Georgia	Invertebrates	*Callophrys irus*	Frosted Elfin	S2S4	Georgia habitat information not available	No
Richmond County, Georgia	Invertebrates	*Elliptio roanokensis*	Roanoke Slabshell	S2	Near-shore trough habitats in sand and gravel substrates	Yes
Richmond County, Georgia	Invertebrates	*Fusconaia masoni*	Atlantic Pigtoe (State Listed as Endangered)	S1	Medium sized streams to large rivers from the Ogeechee River northward; coarse sand and gravel at downstream edge of riffles; fast flowing and well oxygenated water	No, this habitat is located upstream of project area
Richmond County, Georgia	Invertebrates	*Elliptio congaraea*	Carolina Slabshell	S3	Large to medium rivers	Yes
Richmond County, Georgia	Invertebrates	Leptodea ochracea	Tidewater Mucket	S3	Large to small rivers in Atlantic Coastal Plain	Yes
Richmond County, Georgia	Vascular Plants	*Crataegus dispar*	Aiken Hawthorn	S1?	Georgia habitat information not available	No
State Rank Definitions: **SX:** Presumed nonexistent with the state; **S1:** Critically Imperiled; **S2:** Imperiled; **S3:** Vulnerable; **S4:** Apparently Secure; **S5:** Secure; **?:** Inexact or Uncertain						

5.1.16 **Existing Hazardous Toxic and Radioactive Waste (HTRW)**

The area in the Augusta, Georgia and North Augusta, South Carolina near where the training wall is located was evaluated for hazardous, toxic and radioactive wastes (HTRW) using the Environmental Protection Agencies Toxic Release Information System (TRI) via the Environmental Protection Agency's EnviroFacts database (https://www.epa.gov/enviro/topic-searches#land) in 2019. A search of the Cleanups in My Community (CIMC) database found 17 sites listed in Richmond County, GA (Figure 10) and 12 in Aiken County, SC. The CIMC database lists sites that have the following characteristics: "Accidents, spills, leaks, and past improper disposal and handling of hazardous materials and wastes… that have contaminated our land, water (groundwater and surface water), and air (indoor and outdoor). These contaminated sites can threaten human health as well as the environment". In Richmond County there are three listed superfund sites and five Brownfield properties. Brownfields are real properties, for which the redevelopment or reuse may be complicated by the presence

or potential presence of hazardous substance, pollutants or contaminants. There are ten listings that involved Resource Conservation and Recovery Act (RCRA) corrective or other response actions that were described as controlled and/or cleanup complete in the Corrective Action Profile, with the exception of one that was listed as Not Controlled from an assessment dated August 1996. Of the 12 sites listed for Aiken County, only three - two Brownfields properties and one superfund site – are within five miles of the project area. All others are considerably further away.

Figure 10 shows those industries and businesses within a one-mile radius of the project that annually report to EPA on toxic chemical releases and waste management activities as part of the EPA's EJSCREEN, Environmental Justice Screening and Mapping Tool (https://www.epa.gov/ejscreen). The information captured in Figure 11 shows the sites within the study area that report to EPA including superfund sites, brownfields sites, and toxic releases.

No significant spills have been reported in recent history. Personal communication with representatives with the City of Augusta indicate that no recent spills have occurred that have adversely impacted the Savannah River in the project area.

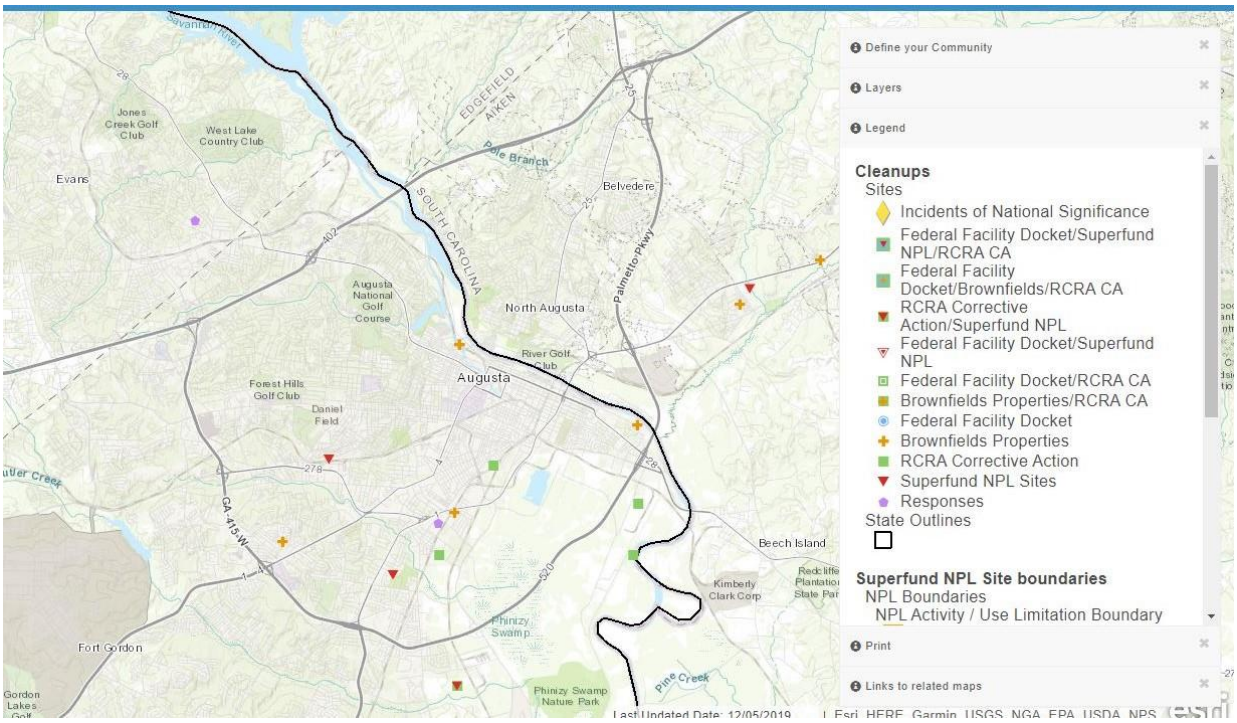

Figure 10. SRBA Training Wall Project EPA EnviroFacts Snapshot

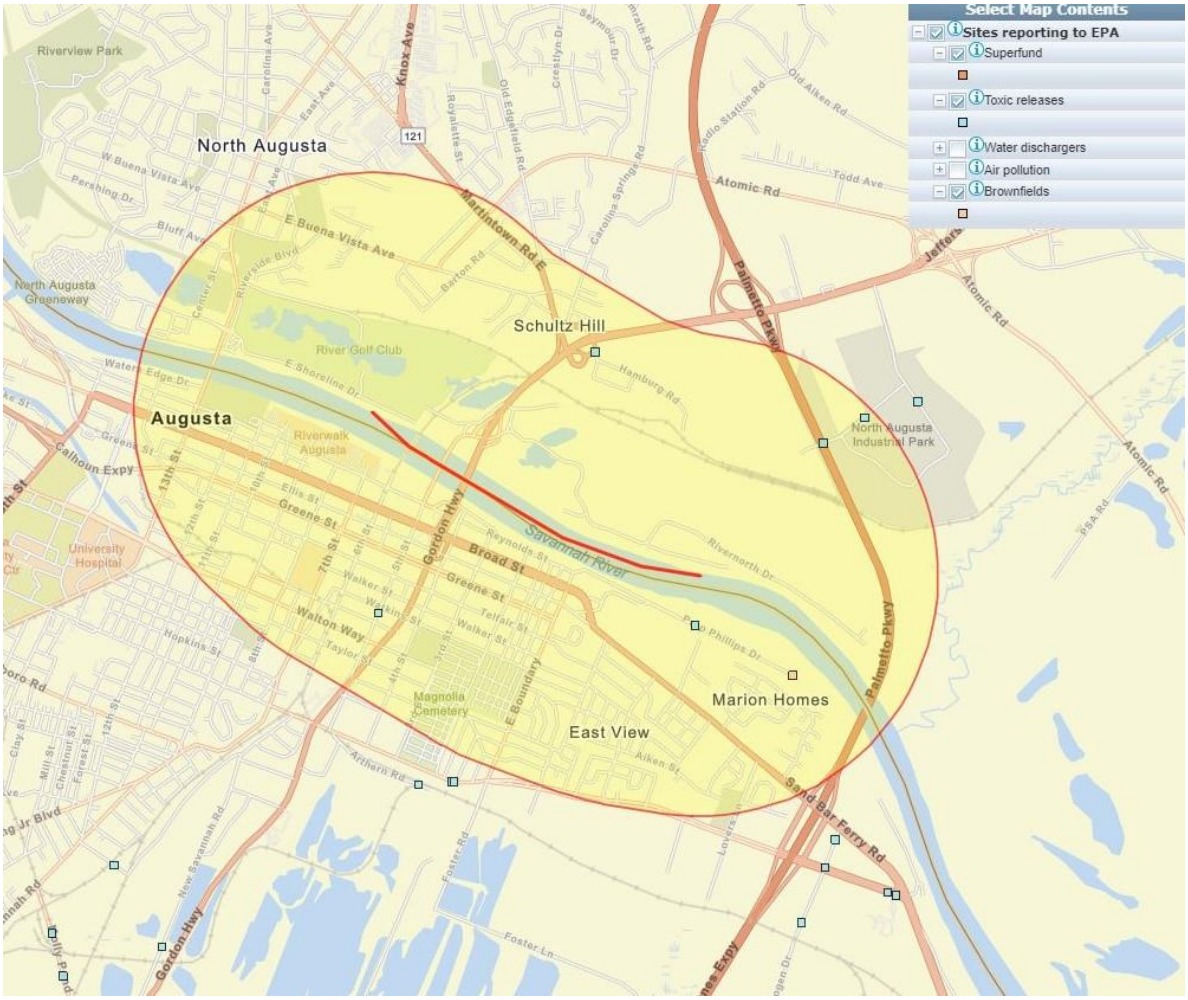

Figure 11. SRBA Training Wall HTRW Report from EPA

5.1.17 **Existing Cultural Resources**

Cultural resources are prehistoric and historic sites, structures, districts, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or any other reason. Several Federal laws and regulations protect these resources, including the National Historic Preservation Act (54 U.S.C. §300101 et. seq.) (NHPA), the Archaeological and Historic Preservation Act of 1974 (54 U.S.C. §§312501- 312508), and the Archaeological Resources Protection Act of 1979 (16 U.S.C. §§470aa-470mm). These Federal laws, specifically Section 106 of the NHPA (54 U.S.C. §306108), require Federal agencies to consider the effects of their actions on cultural resources and historic properties, including districts, sites, buildings, structures, and objects included or eligible for inclusion in the National Register of Historic Places (NRHP). The CEQ's regulations implementing National Environmental Policy Act (NEPA) also requires that Federal agencies consider the "unique characteristics of the geographic area such as proximity to historic or cultural resources, and the degree to which the proposed action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for

listing in the NRHP (40 CFR §1508.27(b) (3)). In addition to Section 106, the NEPA requires a broader consideration of cultural resources beyond those eligible for inclusions in the NRHP.

Section 106 of the NHPA and its implementing regulations (36 CFR 800) requires an assessment of the potential impact of an undertaking on historic properties that are within the proposed project's Area of Potential Effects (APE). The APE is defined as the geographic area(s) "within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR 800.16(d)). The APE for Section 106 and NEPA consultation, research, and analysis has been identified by the Corps for this study as the training wall with a 50 meter buffer, the pile dikes, and the riverbed between the pile dikes. This APE is the area where the alternatives under consideration will have direct impacts. As part of the analysis, a wider area is included for other effects such as changes to the viewsheds of adjacent historic properties, cumulative effects to a broader area, and possible indirect effects that may affect result from the proposed project features.

The effort to determine if any of the cultural resources are within the APE for this project is ongoing.

5.1.18 Existing Historic Context and Previously Recorded Resources

The training wall is located in an archaeologically and historically sensitive area. There is a deep and rich history of habitation in this region prior to European settlement, and the town of Augusta dates to before the founding of the United States. The following information focuses on the area directly around the training wall in the Savannah River at Gardner's Bar, and presents the current status of knowledge regarding cultural resources in the vicinity. The information below is based on previous surveys, site files for Georgia and South Carolina, entries into the National Register of Historic Places, and consultation. The information will be updated following an ongoing cultural resources assessment survey.

The training wall is a cultural resource as a structure constructed over 50 years ago. Low training walls like this one helped prevent formation of sandbars, and wing dams and pile dikes, and were constructed of brush fascines and loaded with gravel and stone, to prevent erosion along the riverbanks. Appendix O2 of the Annual Report of the Chief of Engineers for 1902 states the training dike at Gardner's Bar, measuring 9,534 feet long, was completed during the fiscal year. The construction of the training wall was part of a larger Corps effort to manage the Savannah River in Augusta, with funded projects dating to the 1880s. Information contained in the Annual Report of the Chief of Engineers for 1886 describes work that was conducted between 1882 and 1885. During the three year period numerous wing dams and bank revetments were constructed at Gardner's Bar, Course's Bar, the shallow crossing at Sand Bar-Ferry Bar, and at Blue-House bar 6 miles below Augusta, Georgia.

Specific construction details for the training wall at Gardner's Bar are limited. There are the Corps' records containing drawings and photographs of features that were

constructed during the 1930s in the Savannah River. It is assumed that a similar design was used for the training wall and features at Gardner's Bar. The wall was constructed to improve channel depth in the river to allow commercial navigation from Augusta to Savannah and was part of a system of navigation features. The design of the wall intended to keep sediments from accumulating in the main channel, which kept the channel at a navigable depth. The portions of the wall were exposed until the completion of the New Savannah Lock and Dam in 1937.

Archaeological sites have been documented at the western end of the training wall. Divers recorded archaeological sites 38AK0644 and 38AK0645 as submerged artifact scatter with material dating from the Early Colonial Period to the present, in addition to historic docks and other features submerged features. As mapped in South Carolina's ArchSITE database, 380644 is entirely within the APE and only the eastern quarter of 38AK0645 overlaps the APE. The sites are mapped in ArchSITE as larger than the descriptions in the site files, along the northern edge of the riverbed extending out approximately 70 meters. Both of these sites were recorded by Darryl Boyd in 1994.

The archaeological site 38AK0644 is divided into three areas: B1, B2, and B3. From these areas 159 artifacts were collected. The site file form contains several pages of identified artifacts, including two cannon balls, a brass plate with "Augusta" inscribed on it, and button with 16 stars and an eagle through twentieth century glass and industrial ceramics. The reported date range includes the eighteenth, nineteenth, and twentieth centuries, with "possible" written next to seventeenth century. The site is estimated to be 33-x-500 meters in size. The documentation of 38AK0644 includes a note that this is well-known to local divers and that it "is a potential historic site."

Archaeological site 38AK0645 is separated by a small distance from 38AK0644 and is beneath two bridges. On the site file form, it is divided into two areas, B4 and B5. The site reportedly includes dock structures, two barges, and a wooden boat. A total of 34 artifacts were recovered from the site. The identified artifacts consist entirely of glass and ceramics. The reported date range includes the eighteenth, nineteenth, and twentieth centuries. On the site file form, the site is estimated to be 33-x-300 meters in size. The site file form also reports the area was reported as having been damaged after the survey; it is unclear how the construction of two bridge over the top of this site may have disturbed intact deposits, if any existed.

The mix of historic and modern materials may be due to the training wall trapping material in the Savannah River or eroding out of the riverbank. The archaeological site 38AK0644 contains piers for the training wall and the pilings for two bridges that may trap material. It is unclear from the site file forms if features like the sunken barges and boat are within the APE and would be affected by the removal of the training wall and associated sediment.

There are three bridges located above the training wall. Starting from the west, the training wall is beneath the 6th Street Railroad Bridge, a resource the South Carolina SHPO determined is eligible for listing in the NRHP as site number 0297. The bridge

was first constructed in 1899, and updated with a lift span in 1910-1911. The bridge is a 5 span steel bridge on stone and concrete piers. There is a bascule on the bridge to allow large boats to pass, but it reportedly no longer operates. This resources has not been recorded in the Georgia Site Files, but is included in the Augusta Downtown Historic District NRHP nomination.

The next bridge to the west is recorded as Historic Structure 0295, the 5th Street over Savannah River or Jefferson Davis Memorial Bridge. This structure is listed as ineligible for listing on the NRHP in South Carolina's ArchSITE database. It is also listed as eligible for listing on the NRHP in the National Bridge Inventory, under entry 24500940. This steel stringer bridge was built in 1931 and is listed as a contributing resource to the Augusta Downtown Historic District NRHP nomination.

The easternmost bridge is the US 1 bridge over the Savannah River. This structure has not been recorded as a cultural resource in Georgia or South Carolina. This bridge was constructed in 1960 and is entry 000000024500210 in the National Bridge Inventory. The bridge is constructed of cast-in-place concrete and was reconstructed or repaired in 2006.

There are two historic districts near the APE, both on the Georgia side of the Savannah River. The Augusta Downtown Historic District is listed on the NRHP under reference number 04000515. Though this historic district's northern boundary is noted as the Savannah River, the nomination form explicitly includes the bridges noted above. A levee constructed by the Corps is also part of this district. The historic district follows the layout of Augusta in 1736, and is the historic center of the commercial, governmental, religious, and residential activities of Augusta. The period of significance is recorded as 1736 through 1967.

The Pinched Gut Historic District is located east of the Augusta Downtown Historic District. This area is mainly residential, with the structures primarily constructed from the early nineteenth century through the 1930s. As recorded in the National Register of Historic Places (reference number 12001082), the boundaries do not extend into the river.

5.1.19 **Existing Navigation**

The most recent authorization for the Savannah River Below Augusta project provided a (9) nine foot deep navigation channel from Georgia Highway 30 in Savannah to the 13th Street Bridge in Augusta. Dredging maintenance of the Savannah River for commercial navigation ceased in 1979, snagging ceased in 1980 and the project was placed into caretaker status. There have been no known instances of commercial navigation in the vicinity of the training wall since this time. The training wall is indicated on NOAA navigation charts for the area. Marina facilities have been developed directly across from the wall, and since 2005 several subdivisions have been constructed behind and around the training wall and the associated private boat docks have increased boating in the area.

5.1.20 **Existing Real Estate**

An exhaustive search of real estate records has been conducted and no documentation of real estate acquisition associated with the training wall can be located. A search for real property asset records has also been completed and no records could be located that would indicate this structure (the training wall) exists. Based on this, there will be no disposal deeds required, no value assigned to the training wall, and no administrative fees that would normally be associated with a disposal of project lands and improvements.

5.1.21 **Existing Risk & Uncertainty**

The training wall contains wood pilings and wire cribbing containing layers of corded wood and rock. The training wall has not received any maintenance for decades and there are no existing inspection records or assessments to determine whether the underwater portions are deteriorating. The special circumstances are that the wood portions of the wall are almost always submerged which drastically reduces the rate of decay. Saturated wood keeps oxygen from infiltrating and reduces fungal growth that actually "rots" the wood. Based on professional judgment, it is anticipated that the wooden structural components of the wall would remain stable for decades. Currently, no portion of the training wall is less than 2 feet below the water surface when flows are at 3,600 cfs.

6.0 DESCRIPTION OF FEDERAL INTEREST IN DISPOSITION

6.1 **Screening and Selection Criteria**

Initial screening revealed which management measures did or did not meet the planning objective and/or avoid the planning constraints. The Water Resources Council's 1983 Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G) four evaluation criteria (completeness, effectiveness, efficiency and acceptability) were the primary evaluation criteria used for evaluating the final array of alternatives. The final array of alternatives were also evaluated using the P&G System of Accounts of National Economic Development (NED), Environmental Quality (EQ), Regional Economic Development (RED), and Other Social Effects (OSE) to display their effects and impact, costs, and risk and uncertainty analysis to select the Tentatively Selected Plan (TSP).

6.2 **Eligibility for Disposition**

The training wall and associated navigation features are excess separable elements of the Savannah River Below Augusta project. With the construction of the New Savannah Bluff Lock and Dam (NSBLD) in 1937, the training wall SRBA project no longer served a navigation function to meet the intended authorized purpose and was no longer needed. The authorized navigation purpose of the entire SRBA project no longer exists. Therefore, existing authority can be used to remove the separable elements of the project. Even though deauthorization is not required, an analysis has been prepared for the disposition study process.

7.0 PLAN FORMULATION AND EVALUATION

The planning process used for this study and detailed in this section was conducted in accordance with detailed guidance contained in the Planning Guidance Notebook (Engineer Regulation 1105-2-100). This guidance is based on the Water Resources Council's 1983 Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies that were developed pursuant to Section 103 of the Water Resources Planning Act (P.L. 89-80) and Executive Order 11747, which was approved by the U.S. Water Resources Council in 1982, and by the President in 1983. A defined six-step process is used to identify and respond to problems and opportunities associated with the Federal objective, and specific state and local concerns.

The six steps defined in the process are as follows:
Step 1: Identify Problems and Opportunities
Step 2: Inventory and Forecast Conditions
Step 3: Formulate Alternative Plans
Step 4: Evaluate Alternative Plans
Step 5: Compare Alternative Plans
Step 6: Select Recommended Plan

The process involves an orderly and systematic approach to making evaluations and decisions at each step so the public and the decision makers can be informed of basic assumptions made, the data and information analyzed, risk and uncertainty, the reasons and rationale used, and the significant implications of each alternative plan. Alternatives were formulated and then screened, evaluated, and compared in an iterative process with increasing levels of detail at each sequence to finally identify the Recommended Plan. Although various analysis parameters may change at each sequence, within each sequence, the parameters used to compare alternatives are kept identical. The process concludes with the selection of a Recommended Plan. The period of analysis for this study is 50 years, so assumptions made for all alternatives consider conditions up to and including 50 years from the date of this document. Specific applications of the process are described in following sections of this document. The goal of this study is to determine the Federal interest on disposition of the training wall and its associated navigation features and make a recommendation of disposition for the SRBA training wall and its associated navigation features.

7.1 Problems, Opportunities, Objectives, and Constraints*

7.1.1 Problems

The Savannah River Below Augusta training wall and its associated navigation features no longer serve their authorized purpose of commercial navigation. Federal funds expended on the training wall and its associated navigation features to maintain and protect them for a purpose that no longer exists are an inefficient use of funds. In addition, local interests have expressed "safety" concerns for recreational boating related to the training wall being an obstruction to recreational navigation and special events, leading the Corps to consider disposal of the training wall.

7.1.2 Opportunities
There are opportunities to restore the channel to a more natural state.

7.1.3 Objectives
The objective of this study is to identify the best action plan, if any, for the Federal government to divest itself from a project that no longer has a Federal interest, in a manner that also causes the fewest impacts to stakeholders and the environment, over a 50-year period of analysis from 2022 to 2071.

7.1.4 Constraints
Study specific constraints over the period of analysis include:

- Avoid negative environmental effects that cannot be mitigated;
- Avoid actions that increase obstruction to navigation; and
- Avoid decreases in recreation opportunities along the river.

7.2 Future Without Project Condition
On October 29, 2019, the final report and implementation of the Recommended Plan and Finding of No Significant Impact for the Savannah Harbor Expansion Project, Georgia and South Carolina: Fish Passage at New Savannah Bluff Lock and Dam (NSBLD) Integrated Post Authorization Analysis Report and Supplemental Environmental Assessment was approved.

The Recommended Plan will be implemented beginning no later than January 2021 and completing construction within three (3) years. The approved Recommended Plan constitutes the Future Without Project (FWOP) condition, also referred to as the No Action Alternative (NAA), for this training wall disposition study.

The FWOP condition water surface elevation at the 5th Street Bridge, which is about the midpoint of the study area along the Savannah River, is estimated to range from 111.4 to 114.2 feet NAVD88 with mean daily flows between 3,600 cfs and 8,000 cfs, respectively. Those flows would be estimated to exist approximately 66 percent of the time in any given year. It would be below 3,600 cfs less than one percent of the time. Because the highest point along the training wall is at 110.5 feet NAVD88, it would likely not be exposed above the surface of the water. However, it is estimated that several areas along the training wall would obstruct recreational navigation during parts of the the year. Those areas would be less than two feet below the water surface elevation when flows are between 3,600 cfs and 5,000 cfs at approximately 24 percent of the time at any time of the year during any given year. Since most boats that traverse this area of the Savannah River draft around two feet, areas along the training wall with less than two feet of water above it would be considered an obstruction. There would be 5 lengths of the training wall that would fit that category.

Buoys and signs are assumed to be placed along the training wall in the future without project condition to ameliorate the concerns of obstruction to recreational navigation.

This will reduce direct impacts to the training wall, which is a cultural resource. The obstruction to navigation and its associated risks would not be eliminated.

7.3 Alternatives Description

This section describes the formulation of alternatives. Management measures, initial array of alternatives, screening of the initial array of alternatives, and the final array of alternatives are discussed in depth.

7.3.1 Management Measures

A management measure is a feature or an activity that can be implemented at a specific geographic site to address one or more planning objectives.. Management measures are the building blocks of which alternative plans are made and are structural or nonstructural. An alternative can be one management measure, or several put together.

The management measures were developed based on potential effectiveness of achieving the study objective and avoiding the study constraints. The management measures considered are as follows:

1. Remove all or part of the training wall and associated navigation features.

2. Remove sediment behind the training wall near the shoreline.

3. Revise the Savannah River Water Control Manual/Drought Contingency Plans for Upstream Projects.

Table 8 displays the management measures and identifies whether they meet the planning objective and avoid the planning constraints.

Table 8. Management Measures

Management Measure #	Management Measures	Objective Met	Constraints Avoided
1	Removal of training wall	**Yes** – This management measure would assist in divesting of the training wall and its associated navigation features.	**Yes** – Avoids negative environmental effects that cannot be mitigated **Yes** – Avoids actions that increase obstruction to navigation **Yes** – Avoids decrease in recreation along the river.
2	Removal of sediment	**Yes** – This management measure alone would not aid in divesting of the training wall and its associated navigation features, but it could complement the objective.	**Yes** – Avoids negative environmental effects that cannot be mitigated **Yes** – Avoids actions that increase obstruction to navigation **Yes** – Avoids decrease in recreation along the river.
3	Revise Water Control Manual/Drought Contingency Plans for Upstream Projects	No – This management measure would not aid in divesting the training wall and its associated navigation features.	**Yes** – Avoids negative environmental effects that cannot be mitigated **Yes** – Avoids actions that increase obstruction to navigation **Yes** – Avoids decrease in recreation along the river.

7.3.2 **Description of Initial Array of Alternatives**

Those management measures that met or complemented the objective and constraints were used to formulate the initial array of alternatives. Revising the water control manual and drought contingency plan for multipurpose projects upstream were screened out and were not considered for further evaluation. For all alternatives, it is assumed that the fish passage has replaced the NSLBD.

Alternative 1 is the FWOP condition/NAA. The FWOP condition/NAA describes the project area's future if there is Federal interest to retain the training wall. NEPA regulations require that the NAA always be considered as a baseline to compare action alternatives. Alternative 1, FWOP condition/NAA, assumes that the training wall is marked with buoys and signs.

Alternative 2 consists of the removal of the training wall and its associated navigation features. The associated navigation features include nine pile dikes oriented perpendicular to the training wall between the training wall and the South Carolina bank. All usable rock is planned to be transported to a J. Strom Thurmond holding area that is approximately 24 miles away requiring approximately 500 truckloads. All other debris would be disposed of at the Augusta Landfill.

Alternative 3 consists of the removal of the training wall, its associated navigation features, and partial removal of sediment at Gardner's Bar on the South Carolina downstream bank side of the training wall.

7.4 **Evaluation of Alternatives**

Table 9 displays the initial screening of the initial array of alternatives and the reasons why they were removed or selected for the final array of alternatives. Alternatives 1, 2, and 3 were selected for the final array of alternatives.

Table 10 shows the selected final array of alternatives applied to the four screening criteria suggested in the Principals and Guidelines (P&G). The P&G suggests the use of four evaluation criteria for the screening of alternative plans, which are completeness, effectiveness, efficiency, and acceptability.

Completeness is the extent to which the alternative plans provide and account for all necessary investments or other actions to ensure the realization of the planning objectives, including actions by other Federal and non-Federal entities.

Effectiveness is the extent to which the alternative plans contribute to achieve the planning objectives.

Efficiency is the extent to which an alternative plan is the most cost-effective means of achieving the objectives.

Acceptability is the extent to which the alternative plans are acceptable in terms of applicable laws, regulations, and public policies. Appropriate mitigation of adverse effects shall be an integral component of each alternative plan. Acceptability in terms of compliance with existing laws and regulations will be determined. Public acceptability pays attention to the people's problem and opportunities and lends credibility to an alternative.

As seen in Table 10, the alternatives were further screened to determine if they were complete, efficient, effective, and acceptable. Planning Manual Part II: Risk-Informed Planning, page 125 states "If a combination of measures fails to meet any one of these criteria, it is not yet a plan. An incomplete plan will not work." Based on this statement, the NAA would be considered incomplete plans. Only Alternative 2 meets all of the four P&G screening criteria. Table 10 shows the final array of alternatives studied.

Table 9. Initial Screening of Initial Array of Alternatives

Initial Array of Alternatives	Reason Alternative Removed or Kept for Further Consideration	Alternative Moves Forward Through Formulation
Alternative 1 - NAA/FWOP: No Federal action. The training wall and associated navigation structures remain in-place with buoys and signage.	Kept for further consideration since it meets the study objective.	Yes
Alternative 2 – Remove training wall and its associated navigation features	Kept for further consideration since it meets the study objective.	Yes
Alternative 3 – Remove training wall, its associated navigation features, and sediment at Gardner's Bar.	Kept for further consideration since it meets the study objective.	Yes

7.4.1 **Final Array of Alternatives**

The final array of alternatives (Table 10) was also further evaluated using the P&G screening criteria. In addition, each alternative was evaluated to determine the impacts, both positive and negative, using the P&G System of Accounts for display (Tables 11-14) and in terms of obstruction to recreational navigation, environmental and cultural resources, costs, and safety.

Table 10. Final Array of Alternatives with P&G Screening Criteria

Alternatives	Complete	Efficient	Effective	Acceptable
Alternative 1 - NAA/FWOP: No Federal action. The training wall and associated navigation structures remain in-place with buoys and signage.	**Meets Criterion** The plan is complete relative to the determination of whether Federal Interest exists to retain or dispose of the training wall.	**Meets Criterion** If the Corps determines it is in the Federal Interest to retain the training wall, then Alternative 1 would be the most cost effective alternative. However, the obstruction to navigation would still exist.	**Meets Criterion** This alternative effectively achieves the study objective.	**Not Acceptable** Does not meet stakeholders' problems and opportunities in terms of regional economic development. Plan is acceptable in response to all laws, regulations, and policies, however, the local municipalities and public at large strongly support removing it.
Alternative 2 – Remove training wall and associated navigation features	**Meets Criterion** The plan is complete relative to the determination of whether Federal Interest exists to retain or dispose of the training wall.	**Meets Criterion** If the Corps determines it is in the Federal Interest to dispose of the training wall, then Alternative 2 would be the most cost effective alternative. It would completely remove the obstruction to navigation. Recreational activity would increase in that area, access to boat docks would be open, and risks would be eliminated with 100 percent certainty.	**Meets Criterion** This alternative effectively achieves the study objective.	**Fully Acceptable** Meets stakeholders' problems and opportunities in terms of regional economic development. Plan is acceptable in response to all laws, regulations, and policies, and is an acceptable alternative for the local municipalities and public at large.
Alternative 3 – Remove training wall, associated structures, and sediment at Gardner's Bar.	**Meets Criterion** The plan is complete relative to the determination of whether Federal Interest exists to retain or dispose of the training wall.	**Meets Criterion** If the Corps determines to remove the training wall and sediment along the SC side, then Alternative 3 would be the most cost effective alternative.	**Meets Criterion** This alternative effectively achieves the study objective.	**Fully Acceptable** Meets stakeholders' problems and opportunities in terms of regional economic development. Plan is acceptable in response to all laws, regulations, and policies, is an acceptable alternative for the local municipalities and public at large.

Table 11. System of Accounts - National Economic Development

National Economic Development Account	Alternative 1: NAA/FWOP	Alternative 2: Remove training wall and associated navigation features	Alternative 3: Remove training wall, associated navigation features, and sediment at Gardner's Bar.
Average Annual Damages Prevented	N/A	N/A	N/A
Emergency Costs Avoided	There would be emergency costs. Additional safety boats would be required during special events.	Removal of the training structure would reduce future emergency costs as a result of removing the obstruction to navigation.	Removal of the training structure would reduce future emergency costs as a result of removing the obstruction to navigation.
Recreation	Potential for increased interaction between boats and training wall could negatively impact recreation and special events in the area.	There is the potential that removal of the training structure could attract additional recreationists. An increase in unobstructed channel width would make the area more boater (and associated activities) friendly for times when they were obstructed by the training wall.	There is the potential that removal of the training structure could attract additional recreationists. An increase in unobstructed channel width would make the area more boater (and associated activities) friendly for times when they were obstructed by the training wall.
Total Beneficial Impacts	Unknown.	Unknown.	Unknown.
Initial Project Cost, Including Real Estate	$0	$5.24 million	$29.1 million.

National Economic Development Account (continued)	Alternative 1: NAA/FWOP	Alternative 2: Remove training wall and associated navigation features	Alternative 3: Remove training wall, associated navigation features, and sediment at Gardner's Bar.
Interest During Construction	N/A	$49,000	$92,000
Economic Costs for BCR	N/A	N/A	N/A
Average Annual First Cost	N/A	N/A	N/A
Annual O&M	$3,600	$0	$0
Total Avg. Annual Costs	$3,600$	N/A	N/A
Benefit-Cost Ratio	N/A	N/A	N/A
Average Annual Net Benefits	N/A	N/A	N/A
Effects on Commercial Navigation	No future commercial navigation is likely.	No future commercial navigation is likely.	No future commercial navigation is likely.
Effects on Small Boat Navigation	Would allow for continued small boats during normal flow condition, but risks of hitting training wall would increase when flows are less than 5,000 cfs.	Would allow for unobstructed passage for smaller boats and would allow for larger craft due to removal of the navigation obstruction.	Would allow for unobstructed passage for smaller boats, and would allow for larger craft due to removal of the navigation obstruction.

Table 12. System of Accounts – Regional Economic Development

Regional Economic Development	Alternative 1: NAA/FWOP	Alternative 2: Remove training wall and associated navigation features	Alternative 3: Remove training wall, associated navigation features, and sediment at Gardner's Bar.
Impact on Sales Volume	Augusta economy negatively impacted by limits on HOTS Regatta during low flow periods.	Local businesses offering equipment, food, or conveniences near the study areas may be positively impacted in the short term, as construction activities typically result in increased localized consumer activity from laborers. Additional sales revenue may be realized through an increase of recreationalists to the study area.	Local businesses offering equipment, food, or conveniences near the study areas may be positively impacted in the short term, as construction activities typically result in increased localized consumer activity from laborers. Additional sales revenue may be realized through an increase of recreationalists to the study area
Impact on Income	Augusta economy negatively impacted by limits on HOTS Regatta during low flow periods.	Local businesses that realize an increase in construction related traffic will most likely see a positive, short term impact. Additionally, an increase in recreation activities can result in increased income for local merchants.	Local businesses that realize an increase in construction related traffic will most likely see a positive, short term impact. Additionally, an increase in recreation activities can result in increased income for local merchants.
Impact on Employment	No effect.	No direct effect; however, an increase in indirect labor requirements is possible as local merchants realize increased sales due to increased recreation related activity.	No direct effect; however, an increase in indirect labor requirements is possible as local merchants realize increased sales due to increased recreation related activity.
Tax Changes	Augusta economy negatively impacted by limits on HOTS Regatta during low flow periods.	An increase in the attractive nature of personal boating and dock access on the South Carolina side of the project has the potential of increasing home values, resulting in an increase of the local tax base. Additionally, an increase in recreation activities could result in increased tax revenues.	An increase in the attractive nature of personal boating and dock access on the South Carolina side of the project has the potential of increasing home values, resulting in an increase of the local tax base. Additionally, an increase in recreation activities could result in increased tax revenues.

Table 13. System of Accounts – Other Social Effects Account

Other Social Effects Account	Alternative 1: NAA/FWOP	Alternative 2: Remove training wall and associated navigation features	Alternative 3: Remove training wall, associated navigation features, and sediment at Gardner's Bar.
Security of Life, Health, and Safety	No direct effect; However, as area populations increase, any risk of accident increases, resulting in potential negative impacts such as infrastructure failure, or the creation of unsafe conditions for the recreating public	Drowning and other potential life-safety risks would be reduced	Drowning and other potential life-safety risks would be reduced
Preserves Historic Importance	No effect.	Unknown; however, if the training structure were to realize eligibility for listing on the National Register of Historic Places, removal would be an adverse effect.	Unknown; however, if the training structure were to realize eligibility for listing on the National Register of Historic Places, removal would be an adverse effect.
Maintains Social Bonds/Connections	N/A	N/A	N/A
Community Cohesion	Alternative could be anticipated to have negative effects.	Alternative could have positive effects.	Alternative could have positive effects.
Minimizes Risks to Life and Safety	N/A	Removal would eliminate risks associated with training wall.	Removal would eliminate risks associated with training wall and sediment.
Reduces Vulnerability of Population	N/A	N/A	N/A

Table 14. System of Accounts – Environmental Quality

Environmental Quality	Alternative 1: NAA/FWOP	Alternative 2: Remove training wall and associated navigation features	Alternative 3: Remove training wall, associated navigation features, and sediment at Gardner's Bar.
Physical Environment			
Sediment and Erosion	No effect	Short duration increase in turbidity downstream and sediment releases and quickly settles out. No effect post construction.	No effect
Flooding	N/A	N/A	N/A
Water Quality	No effect	Minor, temporary impacts during removal.	Minor, temporary impacts during removal.
Noise Levels	No effect.	Minor, temporary impacts during removal.	Minor, temporary impacts during removal.
Water Supply	No effect	No effect	No effect
Groundwater	No effect	No effect	No effect
Hazardous, Toxic, and Radioactive Wastes (HTRW)	No effect. No HTRW are known to exist in the project area.	No effect. No HTRW are known to exist in the project area.	No effect. No HTRW are known to exist in the project area.
Effects on Water Wells	No effect	No effect	No effect
Biological Environment			
Aquatic Habitat	No effect	Minor, temporary impacts during removal.	Minor, temporary impacts during removal.
Riparian Habitat	No effect	No effect unless construction access needed.	No effect unless construction access needed.
Wetlands	No effect	No effect. Although unanticipated, it is possible that the natural wetlands that have formed on the SC side	No effect. Although unanticipated, it is possible that the natural wetlands that have formed on the SC side might move once the training wall is removed and the sediment

		might move once the training wall is removed and the sediment moves but there is the potential for new wetlands to form downstream as the sediment settles.	moves but there is the potential for new wetlands to form downstream as the sediment settles.
Threatened and Endangered Species	No effect	No effect	No effect
Effects on Anadromous Fish	No effect	Minor, temporary impacts during removal.	Minor, temporary impacts during removal.
Prime and Unique Farmland	N/A	N/A	N/A
Cultural Environment			
Aesthetic Views	No effect	More aesthetically pleasing view of the river channel for some. Construction equipment in and around the study area would provide perceived short-term adverse impacts.	More aesthetically pleasing view of the river channel for some. Construction equipment in and around the study area would provide perceived short-term adverse impacts.
Cultural Resources and Tribal Interests	A beneficial effect because protecting the 2 archeological sites by using buoys.	The removal of the training wall, a cultural resource, would be impacted. This would be negative, but issues are unknown. The site has not been confirmed to be a historic property At this time, mitigation is unknown.	The removal of the training wall, a cultural resource, would be impacted. This would be negative, but issues are unknown. The site has not been confirmed to be a historic property At this time, mitigation is unknown.

7.4.2 Obstruction to Recreational Navigation

7.4.2.1 Alternative 1 (FWOP/NAA)

The FWOP/NAA would require no Federal action. The training wall and associated commercial navigation structures would remain in-place with 75 buoys and signage that protects that cultural resource. However, the training wall would still be an obstruction to recreational navigation. Within the FWOP condition, the water surface elevations at the 5th Street Bridge range between 111.4 and 114.2 feet in NAVD88 with flows between 3,600 cfs and 8,000 cfs, respectively. Mean daily flows are between 3,600 cfs and 8,000 cfs approximately 66 percent of the time. When there are low flow conditions (<5,000 cfs), there would only be around two feet of clearance over the training wall in several areas. Typical boat drafts are about 2 feet, so even if the boat is idling, there would still be a potential for the propeller to hit the training wall. Even experienced boaters find it difficult to avoid hitting the training wall because the 5th Street Marina and training wall creates a narrow passage that makes avoiding hitting the training wall more challenging. Due to its prominent location in the centerline of the waterway, the structure would continue to pose risks to recreational boaters. Several incidents have been reported since 2010 indicating severe damage to the boats, motors, and the propellers of recreational boats that hit the training wall. By leaving the training wall in-place, those incidents could still happen especially during hours of dark and when there are high populations of recreationists.

Special events like the Ironman 70.3 and Head of the South (HOTS) Regatta would not be adversely impacted during normal flow conditions. However, during low flow conditions, the HOTS course would need to be restricted to using only the Georgia side of the river instead the full extent of it. The events would be limited to racing 500 instead of 750 sculls. That would result in around a one-third reduction in participants and spectators. Hence, the training wall would have negative economic impacts on the local communities. It is estimated that the $1.65 million economic impact of the HOTS Regatta for Augusta would be reduced to $1.1 million during years when there are low flow conditions. It is estimated based on historical flow condition that flows would be below 5,000 cfs about 20 years of the 50-year period of analysis. The present value of those losses to that economy are estimated at $6.7 million.

Due to its prominent location in the centerline of the waterway, the training wall would continue to pose risks to recreational boaters and economic losses to the community. This alternative is estimated to be medium risk with low uncertainty.

7.4.2.2 Alternative 2 – Removal of Training Wall Only

Alternative 2 involves removing the training wall. By removing the training wall and associated navigation features, the obstruction to recreational navigation would be eliminated along with its associated risks to recreationists and their watercraft. New recreational opportunities would be made available with the full width of the river unobstructed with the exception of Gardner's Bar. Access to boating docks would be improved. HOTS Regatta would occur unrestricted allowing the local communities to maximize economic gains. However, the cultural resource would be completely

removed. All usable rock is planned to be transported to a J. Strom Thurmond holding area that is approximately 24 miles away requiring approximately 500 truckloads. All other debris would be disposed of at the Augusta Landfill. The total project cost is estimated at approximately $5.42 million.

Removing the training wall would eliminate all risks associated with the training wall with 100 percent certainty.

7.4.2.3 **Alternative 3 – Removal of Training Wall and Sediment Removal to EL. 108**

This alternative involves removing the training wall and sediment at Gardner's Bar on the South Carolina downstream bank side of the training wall down to elevation 108 feet. It would eliminate the obstructions to navigation and associated risks to recreationist and their watercraft and improve access to boating docks.

An image from the 1883 Annual Report shows that sediment existed at Gardner's Bar prior to the construction of the training wall. As a result, there is no evidence that the training wall caused that sediment to accumulate.

Removal of the training wall along with sediment at Gardner's Bar on the South Carolina downstream bank (Alternative 3) is estimated to cost $29.1 million. Since there is evidence that sediment existed prior to the construction of the training wall, this alternative is not recommended as the Tentatively Selected Plan (TSP).

7.4.3 **Environmental and Cultural Resources**

7.4.3.1 **Alternative 1 (NAA)**

This alternative would have no negative impacts on the environment, but the risk of watercraft damaging the cultural resource would still exist. This is a low risk alternative with low uncertainty.

7.4.3.2 **Alternative 2 – Removal of Training Wall Only**

This alternative would have a minor, temporary impact during removal to the water quality, air quality, noise, wetlands, riparian habitat, terrestrial resources and potential T&E mussel species. It would have permanent adverse impacts to a cultural resource because the training wall, a cultural resource, would be removed.

This is a low risk alternative with medium uncertainty. Medium risk would be present if mussels are found within the project area. Knowledge uncertainty exists with the lack of mussel surveys in the study area.

7.4.3.3 **Alternative 3 – Removal of Training Wall and Sediment Removal to EL. 108**

This alternative would have an initial minor and temporary impact to the water quality, air quality, noise, wetlands, riparian habitat, terrestrial resources and potential T&E mussel species. Removal of the training wall would have permanent impacts to a cultural resource: the training wall. Removal of sediments would present no adverse effects to cultural resources because they are located more than 1/3 of a mile from the

archaeological sites and none are located at the site where the sediment would be removed.

This is a low risk alternative with medium uncertainty. Medium risk would be present if mussels are within the project area. Knowledge uncertainty exists with the lack of mussel surveys in the study area.

7.4.4 **Costs**

7.4.4.1 **Alternative 1 (NAA)**
This FWOP condition alternative involves leaving the training wall in-place and installing buoys to protect it every 100 feet of channel, for an approximate total of 75 buoys. It is assumed these would be standard no wake hazard buoys.

7.4.4.2 **Alternative 2 – Removal of Training Wall Only**
This alternative involves removing the training wall and associated navigation features. All usable rock is planned to be transported to a J. Strom Thurmond holding area that is Approximately 24 miles away requiring approximately 500 truckloads. All other debris would be disposed of at the Augusta Landfill. The total estimated cost for removing the entire training wall is $5.42 million.

7.4.4.3 **Alternative 3 – Removal of Training Wall and Sediment Removal to EL. 108**
This alternative involves removing the entire training wall (same quantity as Alternative 2) and removal of sediment on the downstream side of the training wall on the South Carolina bank to elevation 108 feet for a total cost of $29.1 million.

7.4.5 **Safety Evaluation**

7.4.5.1 **Alternative 1 (NAA)**
Several portions of the training wall will be within two (2) feet of the water surface in the future when flows are at or below 5,000 cfs. Damage to watercraft and loss of life could be possible if recreational boaters are not aware it could be an obstruction to recreational navigation. It is assumed that buoys and signs will be placed in the vicinity of the training wall to ameliorate these concerns. The buoys and signs would reduce direct impacts to the training wall, which is a cultural resource. The obstruction to navigation and its associated risks would not be eliminated.

The NAA water surface elevation at 5th Street Bridge is estimated to range from 111.4 to 114.2 feet NAVD88 with mean daily flows between 3,600 cfs and 8,000 cfs, respectively. Those flows would be estimated to exist approximately 66 percent of the time in any given year. It would be below 3,600 cfs less than one percent of the time. Because the highest point along the training wall is at 110.5 feet NAVD88, it would likely not be exposed above the surface of the water. However, it is estimated that several areas along the training wall would obstruct recreational navigation. Those areas would be less than two feet below the water surface elevation when flows are between 3,600

cfs and 5,000 cfs at approximately 24 percent of the time during the year at any given time of the year.

7.4.5.2 **Alternative 2 – Removal of Training Wall Only**
The training wall would no longer be an obstruction to recreational navigation.

7.4.5.3 **Alternative 3 – Removal of Training Wall and Sediment Removal to EL. 108**
The training wall and sediment would no longer be an obstruction to recreational navigation.

7.5 **Comparison of Alternatives**
The action alternatives are compared to the NAA to determine the changes from the NAA to the action alternative.

7.5.1 **Obstruction to Recreational Navigation**
For obstruction to recreational navigation, the NAA would have a medium risk (low probability of occurrence with high consequences) with low uncertainty while Alternatives 2 and 3 would have no risks with no uncertainty. Removing the training wall and associated navigation features would eliminate all risks with no uncertainty. Alternative 2 or 3 would provide new opportunities for recreationists compared to the NAA.

7.5.2 **Environmental and Cultural Resources**
For environmental and cultural resources, Alternative 1 (the NAA) would have low risks (low probability of the training wall being struck by watercraft with low consequences to that cultural resource) with low uncertainty while Alternative 2 and 3 would have high risks (100 percent probability of effect to the cultural resource with disposal of the training wall with low consequences) with low uncertainty.

7.5.3 **Costs**
There are minor O&M cost of $3,600 for Alternative 1, the NAA. Alternative 2 is estimated to cost $5.42 million to remove the entire training wall and associated structures. Alternative 3 is estimated to cost $29.1 million to remove the entire training wall, associated structures, and sediment in Gardner's Bar. Disposition of the training wall costs the Federal government and the taxpayers more money than compared to no action. However, the NAA costs the cities and counties surrounding the training wall loses in economic gains due to special events not occurring during years when flows are between 3,600 and 5,000 cfs. Those costs are estimated at $6.7 million over the period of analysis.

7.5.4 **Safety**
From a safety perspective, in the NAA, several portions of the training wall are within two (2) feet of the water surface when flows are approximately at or below 5,000 cfs. Damage to watercraft and the training wall and loss of life could be possible. Alternative 2 would eliminate all obstructions to navigation by removing the training wall and associated navigation features. Removal of sediment in Alternative 3 would also

eliminate that obstruction to navigation.

8.0 FUTURE CONDITIONS ENVIRONMENTAL EFFECTS*

8.1 Hydrology and Hydraulics

8.1.1 Future Conditions with No Action

Alternative 1 is the no action alternative in which the training wall and associated structures would remain in-place. This includes the FWOP condition in which the NSBLD is removed and replaced with a fixed-crest weir fish passage structure. A hydraulic model (HEC-RAS) of the Savannah River incorporating the geometry configuration of this alternative was used to compute water surface elevations, depths, and velocities for the with-project condition. A range of flows for normal conditions (5,000 to 8,000cfs) and the channel capacity condition at the training wall's location (25,000 cfs) were evaluated using the hydraulic model. The model results of this alternative were used as a baseline for comparison to determine whether there were hydrodynamic impacts associated with Alternatives 2 and 3.

8.1.2 Future Conditions with Alternative 2

A hydraulic model (HEC-RAS) of the Savannah River incorporating the geometry configuration of this alternative was used to compute water surface elevations, depths, velocities, and flooding extents for the with-project condition. A range of flows for normal conditions (5,000 to 8,000cfs) and the channel capacity condition at the training wall's location (25,000 cfs) were evaluated using the hydraulic model. The results of the model indicate this alternative would not have direct impacts on water surface elevation and channel velocity. As result, this alternative is unlikely to have adverse hydrodynamic impacts at the site of the training wall structure during any flow condition.

The hydraulic analysis considered potential impacts of the structure's removal with respect to sediment movement. Sediment movement is driven primarily by higher velocities. The hydraulic model computed velocities within the channel associated with the Alternative during the aforementioned flow volumes. Using Erodibility Charts, erosion rates were computed for each flow condition. The estimated erosion rates were relatively low. Based on these results and engineering judgment, the recommended alternative is unlikely to have adverse impacts.

The analysis also identified existing locations downstream of the structure currently accumulating sediment. In general, sediment accumulates inside channel bends. Currently, sediment has accumulated inside the five channel bends downstream of the training wall structure. Any sediment movement resulting from the alternative would likely contribute to these areas. More detail regarding the analysis is located within the Engineering Appendix A.

8.1.3 Future Conditions with Alternative 3

This alternative was not specifically evaluated within the hydraulic model. Using engineering judgment, any hydrodynamic impacts of removing a portion of the sediment

would be less than not removing any sediment (Alternative 2). The results of the model indicate that Alternative 2 would not have direct impact on water surface elevation and channel velocity at the training wall structure during any flow condition. Using engineering judgment, it was determined that Alternative 3 would not likely have adverse hydrodynamic impacts at the site of the training wall structure.

8.2 Water Quality

8.2.1 Future Conditions with No Action

Implementation of the No Action Alternative would not impact water quality within or near the project area where the training wall is located.

8.2.2 Future Conditions with Alternative 2

With implementation of Alternative 2, short term water quality effects would result from the removal of the training wall and all of its associated features. The demolition phase of the removal would temporarily increase sedimentation and turbidity in the areas downstream from the study area. The effects of the training wall removal would only be present until the removal operation is complete. In order to minimize impacts to water quality during construction, the Corps will follow sediment and erosion control best management practices in its designs to minimize turbidity plumes from leaving the construction area.

Sediment that has accumulated behind the training wall will not be mechanically removed as part of Alternative 2, but would be released back into the system naturally over time. This sediment was tested and the results indicated that there is there is no presence of metals, PCBs, and SVOCs above the Environmental Protection Agency's Regional Screening Level residential soil standard. In addition, the background location sample results did not differ from the samples taken behind the training wall. Therefore, the Corps does not expect any long term Section 401 issues other than the temporary turbidity impacts.

8.2.3 Future Conditions with Alternative 3

With implementation of Alternative 3, water quality impacts would be very similar to Alternative 2. With implementation of Alternative 3; however, a portion of the sediment that has accumulated behind the training wall over the years will be mechanically removed to an elevation of 108 feet NAVD88 and taken to a local landfill leaving less sediment to go back into the riverine system. During the sediment removal process, there will be some localized, temporary turbidity that will occur where the mechanical dredge makes contact with the sediment while moving through the water column. The same sediment and erosion control best management practices will be used minimize turbidity plumes during the removal process but it is expected with less sediment going into the system, there will be less temporary turbidity impacts as a result.

8.3 Air Quality

8.3.1 Future Conditions with No Action

With implementation of the No Action Alternative, there would not be any effects on air quality as there would not be any construction that would be required. Operation and maintenance associated with maintaining the signage around the training wall is not expected to result in any adverse air quality impacts.

8.3.2 Future Conditions with Alternative 2 or 3

With implementation of Alternatives 2 or Alternatives 3, there would be minor temporary dust generation from vehicles driving over unpaved areas during construction and there would also be minimal temporary impacts from vehicle emissions during the construction activities especially with the dump trucks hauling the training wall and sediment from the study area to the local landfill. However, these are no more than temporary and minor impacts anticipated from these activities. Construction activities of the proposed action would follow all Federal, state, local regulations, and applicable policies. There would not be any new point sources of air pollution created and no additional non-point sources would be expected during the construction of the proposed alternative. Since Richmond County is currently in attainment for the NAAQS for all criteria pollutants, the construction of the proposed alternatives would not be expected to contribute to a change in this designation.

8.4 Socio-Economics

By 2030 the US population is projected to increase by 15 percent over the 2010 totals, to over 355,000,000 persons. South Carolina is expected to have similar growth to that of the US, at 28 percent, while Georgia (fueled by growth in Atlanta and adjacent suburbs) is anticipated to grow by roughly 52 percent to 14.7 Million persons. However, the population of the Richmond-Augusta metropolitan statistical area is only projected to increase by 16 percent, falling behind the growth rate of the Region. See Table 15.

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Table 15. Population and Projections

Year	US	SC	GA	Augusta-Richmond MSA
2000	282,200,000	3,924,000	7,943,000	499,684
2010	309,300,000	4,012,000	9,688,000	565,000
2018	327,200,000	4,597,000	10,520,000	605,903
2030	355,101,000	5,149,000	14,700,000	654,000
Percent Growth (2000-2010)	10 %	2 %	22 %	13 %
Percent Growth (2010-2030)	15 %	28 %	52 %	16 %

Along with normal to robust population growth in the Region and study area, the business economy is expected to maintain a positive upward trajectory within the study area. This, as explained by University of Georgia economists, will be fueled by an increase in the U.S. defense budget by $85 billion, which will benefit Fort Gordon and bolster the economy of the Richmond-Augusta MSA. Along with the Regional multiplier benefit of capital increases into local military entities, both South Carolina and Georgia traditionally rank high in business friendly States, stemming from current and historic business friendly tax and labor policies.

8.4.1 Future Conditions with No Action

The FWOP condition of the training wall would not be impacted by or impact any anticipated demographic or economic changes.

8.4.2 Future Conditions with Alternative 2 or 3

Removal of the training wall would not be impacted by any anticipated demographic or economic changes, and neither National nor Regional Economic Development is expected to be impacted. However, there may be an increase in recreational boating with removal of the training wall obstruction because it has anecdotally been regarded as a potential “safety hazard” by local officials and recreationalists.

8.5 Recreation

8.5.1 Future Conditions with No Action

Recreational activities are expected to continue within the study area. However, the training wall would continue to be an obstruction to recreational navigation limiting the width of the recreational navigation channel for a distance of 1.5 miles.

Even though buoys and signs would be installed, several areas of the training wall would be susceptible to being struck by propellers and/or ship hulls. Special events like the Ironman 70.3 and Head of the South (HOTS) Regatta would not be adversely impacted during normal flow conditions. However, during low flow conditions, the HOTS course would need to be restricted to using only the Georgia side of the river instead the full extent of it. The events would be limited to racing 500 instead of 750 sculls. That would result in around a one-third reduction in participants and spectators. Hence, the training wall would have negative economic impacts on the local communities. It is estimated that the $1.65 million economic impact of the HOTS Regatta for Augusta would be reduced to $1.1 million during years when there are low flow conditions. It is estimated based on historical flow condition that flows would be below 5,000 cfs about 20 years of the 50-year period of analysis. The present value of those losses to that economy are estimated at $6.7 million.

8.5.2 Future Conditions with Alternative 2

Future recreational activities would be improved due to the removal of the training wall and associated structures. The potential of an unobstructed waterway could increase the number and enhancement of activities beyond the Future Conditions with No Action.

8.5.3 Future Conditions with Alternative 3

Future recreational activities would be improved due to the removal of the structure and sediment. The potential of an unobstructed waterway could increase the number and enhancement of activities beyond the Future Conditions with No Action.

8.6 Environmental Justice

As the Augusta-Richmond County Metropolitan Statistical Area increases in population (as seen in section 5.5), and the economy expands, it is assumed that existing vulnerable populations defined by Executive Order 12898 will remain. However, the existing vulnerable populations are not expected to increase in the short term.

The selection of Alternatives 1, 2, or 3 would not impact future conditions of vulnerable populations and would not adversely affect the existing environmental justice determination status of the study area. Hence there would be no environmental justice issues.

8.7 Geology and Sediments

8.7.1 Future Conditions with No Action

With implementation of the no action Alternative, there would not be any anticipated impacts to soils within the study area.

8.7.2 Future Conditions with Alternative 2 or 3

During the October 2019 site investigation, 22 samples were collected from the sediment behind the SRBA Training Wall and the natural bottom material (saprolite) of the Savannah River. Additionally, four background sediment samples were collected from the Savannah River bottom outside of the SRBA Training Wall to characterize existing conditions. Particle size results reveal that the sediments behind the Training Wall are primarily composed of highly erodible poorly graded sand. The sediment ranges between 5 feet thick at the upstream portion of the wall to 16 feet thick at the downstream end of the training wall. The natural river bottom sediment is composed of lean clays, highly resistant to erosion.

Analytical testing results were compared to the EPA residential RSL as a conservative screening tool to determine if further evaluation is necessary. Testing results from the loose sandy sediments behind the training wall show that no metals, PCBs or SVOCs are present at concentrations exceeding the EPA RSL. Analytical results from the natural river bottom (saprolite) sediments show that no PCBs or SVOCs are present above the EPA RSL. Arsenic was detected in several samples at concentrations slightly above the residential RSL in the saprolite material. These low-level detections are consistent with naturally occurring levels in the region (USGS, 1984) and do not appear to be the result of anthropogenic activities. These sediments are not anticipated to be impacted by the removal of the training wall.

The analytical results were also compared to the four background samples collected. The background samples were collected from the sediments of the existing river bottom upstream (BG-1), adjacent to the training wall (BG-2) and downstream in likely shoaling areas (BG-3 and BG4). The results show that there is no variability between the background sediments and the sediments behind the training wall and therefore there will be no impacts to the surrounding areas as a result of implementation of Alternative 2 or 3.

8.8 Noise

8.8.1 Future Conditions with No Action

With implementation of the No Action Alternative, there would not be any effects on the noise within the study area as there would not be any construction that would be required. Operation and maintenance associated with maintaining the signage around the training wall is not expected to result in any impacts to existing noise levels.

8.8.2 Future Conditions with Alternative 2 or 3

With implementation of Alternative 2 or 3, the associated construction would generate a minimal short-term noise increase within the study area. This would cause a temporary increase in noise that may affect people in the vicinity of the project sites during the construction effort.

8.9 Aesthetics

8.9.1 Future Conditions with No Action

With implementation of the No Action Alternative, aesthetics will remain as they are with the training wall still in-place.

8.9.2 Future Conditions with Alternative 2 or 3

Removing a mile and a half man-made training wall structure and restoring the river to a more natural appearance could be a more aesthetically pleasing view of the river channel for some. With construction equipment in and around the study area, short term adverse impacts may be perceived by some but these would subside upon completion of the project.

8.10 Aquatic Resources

8.10.1 Future Conditions with No Action

The structure is located entirely within the main channel of the Savannah River, and its presence will not cause any future beneficial or adverse effects to aquatic resources in the study area.

8.10.2 Future Conditions with Alternative 2 or 3

Adverse environmental impacts to aquatic resources from Alternatives 2 or 3 are expected to be limited to short term impacts during construction as a result of temporary turbidity impacts as the sediment is released back into the system after the training wall is removed. Removal of the wall with or without sediment removal will have a positive impact on aquatic resources, as it serves to partially restore the channel to its free flowing state without shifts in circulation and sediment deposition caused by the wall.

The study area will continue to provide valuable foraging habitat for a variety of aquatic fish species, however with implementation of Alternative 2 or 3, the training wall that once provided a thermal refuge for the aquatic species would no longer be available. In addition, the removal of the training wall will reduce the diversity of foraging habitat for various aquatic resources within the study area, making the area more uniform.

Consultation with GADNR indicated that there may be potential impacts to mussel species during the removal of the structure as sediments are mobilized downstream. Surveys in the downstream reach between the training wall and the NSBLD conducted in 2006 returned records of several species in the genus *Elliptio* which are generally a common and tolerant species in the Savannah River. Therefore, it is anticipated that the removal of the training wall and the release of the sediment behind the training wall

back into the system should not cause any major or long-term impacts to those species. Still, GADNR indicated that based on the positioning of the training wall, which is located on a generally straight section of the river, and the results of the sediment analysis, they believe that removing the sediment prior to removal of the structure is likely the least damaging course of action in regards to freshwater mussel populations in the impact area. (Personal communication January 16, 2019).

8.11 Wetlands

8.11.1 Future Conditions with No Action

The No Action Alternative would not have any effects on existing wetlands within the study area because the training wall is located entirely within the main channel of the river and does not influence the soils, vegetation, or hydrology of adjacent wetlands.

8.11.2 Future Conditions with Alternative 2 or 3

The majority of the study area is dominated by riverine wetlands and there are approximately 17 acres of Freshwater Forested/Shrub wetlands located right along the edge of the City of August and the Savannah River. However, the implementation of Alternative 2 or 3 will not influence the soils, vegetation, or hydrology of adjacent wetlands. There may be the potential that once the training wall is removed and the sediment that has accumulated behind the wall is naturally released back in the system and makes it way downstream, it could accumulate in the inside of the channel bends resulting in the creation of additional wetland habitat.

On the Georgia side of the river, it is planned to use an existing boat ramp for a staging area where riparian and wetland habitat will not be impacted by the construction effort. Figure 12 shows a Google Earth image of the locations of the two potential staging area as well as approximate riparian impacts associated with the staging area on the South Carolina side which would impact approximately two to three acres. It is expected that this habitat that will be impacted is not unique to the study area and there are other areas within the study area that have the same functions and provide similar habitat values during the construction effort. It is also expected that once the construction effort is completed that the cleared area will eventually fill back in overtime.

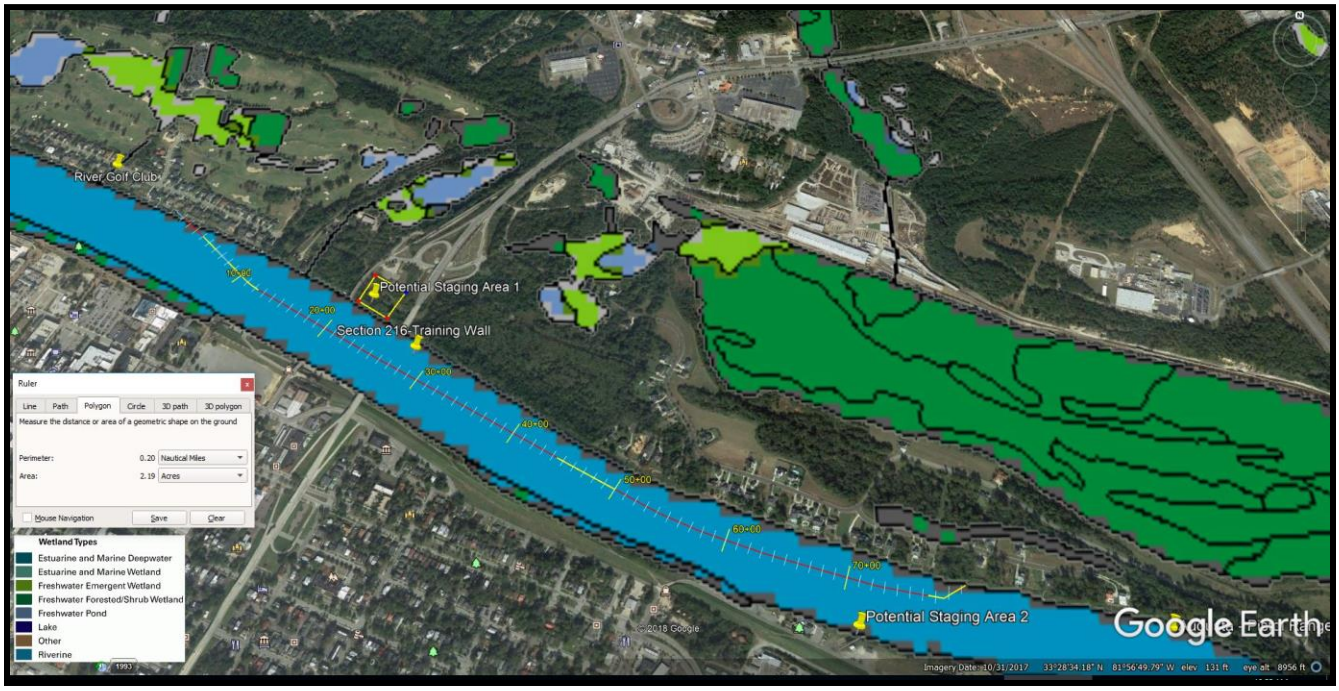

Figure 12. Google Earth image of the two potential construction staging areas

8.12 **Terrestrial Resources and Wildlife**

8.12.1 **Future Conditions with No Action**

There would be no effect to terrestrial resources and wildlife within the study area under the no action alternative as there would not be any construction that would change or alter the habitat within the study area

8.12.2 **Future Conditions with Alternative 2 or 3**

With implementation of Alternative 2 or Alternative 3, there would be minor and short term effects on terrestrial and wildlife resources within the study area with approximately two to three acres of upland/riparian habitat that would be removed to create an access road to move heavy equipment from the land to the water for the training wall and sediment removal. It is expected that this habitat that will be impacted is not unique to the study area and there are other areas within the study area that has the same functions and provide similar habitat values during the construction effort. Therefore, it is expected, that with implementation Alternatives 2 or 3 may have minor indirect impacts on the terrestrial resources and wildlife that might have used that riparian habitat that now will need to find an alternate location. These areas would be stabilized and rehabilitated after project construction.

8.13 Federal and State Threatened and Endangered Species

8.13.1 Future Conditions with No Action

With implementation of the No Action Alternative, there should not be any impacts to Federally or state listed species within the study area since no work will be completed in the river or adjacent areas.

8.13.2 Future Conditions with Alternative 2 or 3

Based on information obtained from the USWFS IPAC website site there are six Federally listed species that have the potential to be within the project area.

After coordination with staff from the USFWS South Carolina field office, there are no known populations of red-cockaded woodpeckers in that area (personal communication, December 12, 2019). In addition, the potential staging area and JST rock stockpile area that would be cleared for construction access is not preferred habitat for relict trillium (*Trillium reliquum*) or the smooth coneflower (*Echinacea laevigata*). However, before construction begins, a site visit to confirm absence would be conducted. If the species are found, additional consultation with USFWS would be initiated. Coordination with staff from the USFWS South Carolina field office who have knowledge of the study area and habitat preferences of Harperella (*Ptilimnium nodosum*), that this species would not be located within the project area and therefore should not be impacted by the training wall and sediment removal (personal communication, December 13, 2019).

The staff from the USFWS South Carolina field office also relayed to the Corps information on a species that they were petitioned to list in the project area, the Ocmulgee skullcap (*Scutellaria Ocmulgee*) (personal communication, December 13, 2019). While it is unlikely that that species is within the proposed staging area, when surveys are conducted to identify if the relict trillium is present, surveys to identify the Ocmulgee skullcap will also be conducted.

The Federally listed wood stork (*Mycteria Americana*) should not be impacted by the removal of the training wall or the partial removal of the sediment that has accumulated behind the training wall. Their preferred feeding sites which are primarily found in depressions in marshes or swamps where fish become concentrated during periods of falling water levels are not in the study area.

The gopher tortoise (*Gopherus Polyphemus*), which is a candidate Federally listed species is not expected to be impacted by the removal of the training wall or the partial removal of the sediment that has accumulated behind the training wall. The gopher tortoise most often lives on well-drained sandy soils in transitional (forest and grassy) areas. It is commonly associated with a pine overstory and an open understory with a grass and forb (non-woody) groundcover and sunny areas for nesting. The area where the training wall will be removed is mostly submerged underwater and does not provide the preferred habitat preference of the gopher tortoise but there are plenty of areas along the shoreline of South Carolina that will not be impacted by the removal of the training wall that does and will continue to be available for gopher tortoise to use.

Federally listed Atlantic and shortnose sturgeon as well as the Georgia state listed robust redhorse are not expected to be impacted from the removal of the training wall or the partial removal of sediment that has accumulated behind the training wall. Removal of the training wall from the study area provides the sturgeon and the robust redhorse more width of the river to use for foraging habitat as they make their way up and back from the shoals. It is not expected that sediment that will be released back into the river system during the removal effort will impact important spawning habitat at the gravel bed just downstream of the fish passage structure at the NSBLD. With the average flow velocities within the study area, it is expected that the majority of the sediment will settle out along the inside of the approximately five channel bends downstream of the training wall before reaching either the fish passage structure or the gravel bar located just downstream of the fish passage structure. Time of year restrictions may be implemented during the training wall removal construction effort to avoid impacts to those state and Federally listed anadromous fish species during important spawning migrations. These timeframes will be coordinated through ongoing consultation with NOAA NMFS and USFWS.

Based on the analysis above, the Corps has made a not likely to adversely affect (NLAA) determination for all Federally listed Threatened and Endangered species in the project area, regardless of the selected alternative.

With regards to the state listed species within the project area, the Atlantic pigtoe (*Fusconaia masoni*) is listed as endangered for the state of Georgia. This invertebrate species prefers habitats that prefer medium sized streams to large rivers with coarse sand and gravel at downstream edge of riffles with fast flowing and well oxygenated water. This habitat type is not located within the immediate vicinity of the training wall or downstream towards the fish passage structure at the NSBLD. This habitat is located upstream of the training wall location by the shoals. It is anticipated therefore that the removal of the training wall or the partial removal of the sediment that has accumulated behind the training wall will not impact this state listed species. Consultation with GADNR has verified that this species has not been recorded in the vicinity of the training wall, nor in the Savannah River, within the last 20 years (Personal communication January 16, 2019), and therefore it is anticipated to be no impact to this species in regards of the selected alternative.

With regards to the mussel species below the fish passage structure at the New Savannah Bluff Lock and Dam that have designated levels of concerns either Federally, or in South Carolina and/or in Georgia, including the Savannah Lilliput (*Toxolasma pullus*), Altamaha arcmussel (*Alasmidonta arcula*), and Atlantic Pigtoe, it is not expected that release of the sediments as part of the training wall removal will reach that portion of the Savannah River Basin where these species occur as most of the sediment will settle out along the inside of the river bends.

8.14 Hazardous Toxic and Radioactive Waste (HTRW)

8.14.1 Future Conditions with No Action

With implementation of the No Action Alternative, there would be no anticipated impacts to HTRW within the study area.

8.14.2 Future Conditions with Alternative 2 or 3

With implementation of Alternative 2 or Alternative 3, the probability of encountering new HTRW contamination during the removal of the training wall and release of the sediment that has accumulated behind the training wall back into the Savannah River Basin system is extremely low. In October/November 2019, the sediment that has accumulated behind the training wall was tested and the results indicated that there is no presence of metals, PCBs, and SVOCs above the Environmental Protection Agency's Regional Screening Level residential soil standard. In addition, the background location sample results did not differ from the samples taken behind the training wall so the Corps does not expect any concerns with contamination issues once the sediment is released back into the river system. Construction of the training wall removal is not expected to result in any associated increase of hazardous waste generation at the site. Any HTRW materials identified during the construction process will be reviewed for appropriate disposal measures.

8.15 Cultural Resources

The Federal Action Alternatives have the potential to impact cultural resources. The Corps has not completed all identification measures of the areas of potential effects for the alternatives; the following is based on the existing data from the site files for Georgia and South Carolina, entries into the National Register of Historic Places, and consultation. Efforts to identify historic properties are ongoing. A survey will map the extents of all cultural resources within the APE of the proposed alternatives and provide the Corps of Engineers with information to determine if the cultural resources are historic properties (cultural resources eligible for listing on the NRHP) and assess any adverse impacts. Prior to completion of the final report, the Corps will execute a Section 106 agreement (Programmatic Agreement or Memorandum of Agreement) or make a determination of no adverse effects to historic properties. Should historic properties exist within the APE, possible mitigation measures may include avoiding dredging in the location of historic properties, documenting the properties prior to removal, or creating interpretative signage to educate the public about the cultural resources impacted by the project.

8.15.1 Future Conditions with No Action

The no action alternative includes the installation of markers to prevent vessels from striking the wall or shoaling in the shallower waters behind the training wall. The effects of the no action alternative would not be adverse. Due to the age of the wall and shoaling, the material has likely reached an equilibrium that would limit future deposition. There may be continued accumulation of material from the shore, but this would not adversely impact the archaeological sites. The installation of buoys to

prevent vessels from striking the wall would protect this cultural resource. The bridges and historic districts would not be affected by the no action alternative.

8.15.2 Future Conditions with Alternative 2

The alternative to remove the wall and leave the sediment would adversely affect the training wall by direct removal. The increased water flow and lack of retaining structures would allow sediment to be removed from the archaeological sites but are unlikely to move archaeological deposits. The bathymetry for the western half of the training wall, where the known archaeological sites are located, shows the riverbed to the north as generally ten feet lower than the wall, at the same depth as the river channel. The depth and location of the recorded archaeological sites are not in the areas with high potential for erosion. The archaeological sites are located in deeper areas, not in the highly shoaled eastern portion of the area of potential effects. The archaeological sites are generally at an elevation of 104 feet NAVD88 or deeper and located near the northern shoreline of the river. The hydrologic subject matter expert for the project has indicated the removal of the wall will create the conditions for scouring, but the modeled increased velocity will remove material primarily from along the edge of the channel and from where there is significant shallow shoaling; the areas with the archaeological sites are already at or near the same depth as the river channel and near the riverbank. If the archaeological sites are determined to be historic properties, additional hydrologic modeling may be necessary to determine if Alternative 2 presents an adverse effect.

The removal of the training wall and pile dikes from within the boundaries of 38AK0644 and 38AK0645 may disturb these archaeological sites. The extent of the impact would be dependent on the footprint and method of training wall removal. If the ongoing efforts to identify and evaluate historic properties determine these archaeological sites or training wall are eligible for listing in the NRHP, additional measures will be necessary to determine how to avoid, minimize, or mitigate adverse effects of this alternative.

The training wall has not been identified as a part of the neighboring historic districts and has not been visible under normal conditions. The visual effect of removing the training wall will not be adverse to the historic districts or bridges. The removal of the wall may lead to increased traffic on the river, which will allow the public to appreciate the historic districts and bridges over the Savannah River.

8.15.3 Future Conditions with Alternative 3

The alternative to remove the wall and the sediment to 108 feet NAVD88 would adversely affect the training wall. As noted above, this is shallower than the recorded archaeological sites. The dredging of sediment would not be within one-third of a mile of the archaeological sites and would present no adverse effects to these cultural resources. However, the removal of the wall and pile dikes would cross the boundaries of 38AK0644 and 38AK0645. The extent of the impact would be dependent on the footprint and method of training wall removal. If the ongoing efforts to identify and evaluate historic properties determine these archaeological sites or training wall are

eligible for listing in the NRHP, additional measures will be necessary to determine how to avoid, minimize, or mitigate adverse effects of this alternative.

The training wall has not been identified as a part of the neighboring historic districts and has not been visible under normal conditions. The visual effect of removing the training wall and sediment will not be adverse to the historic districts or bridges. The removal of the wall may lead to increased traffic on the river, which will allow the public to appreciate the historic districts and bridges over the Savannah River.

8.16 Navigation

Commercial navigation does not exist on the Savannah River Below Augusta. This is not expected to change with any alternative selection. Therefore, there are no expected impacts to commercial navigation. However, there are many opportunities for recreational navigation within the boundaries of the study area. Those opportunities include recreational boating and special events such as Head of the South Regatta.

8.16.1 Future Conditions with No Action

The NAA includes approximately 75 no wake hazard buoys and signage that can be seen during the daylight hours. However, the training wall would still be an obstruction to recreational navigation. Within the FWOP condition, the water surface elevations at the 5th Street Bridge range between 111.4 and 114.2 feet in NAVD88 with flows between 3,600 cfs and 8,000 cfs, respectively. There would be approximately less than 2 feet of clearance over the training wall in several areas. Typical boat drafts are about 2 feet, so even if the boat is idling, there would still be a potential for the propeller to hit the training wall. Even experienced boaters find it difficult to avoid hitting the training wall because the 5th Street Marina creates a narrow passage that makes avoiding hitting the training wall more challenging. Several incidents have been reported since 2010 showing severe damage to the watercraft, motors, and the propellers of recreational boats that hit the training wall. By leaving the training wall in-place, those incidents could still happen especially during hours of dark and when there are high populations of recreationists.

The training wall would continue to be an obstruction to recreational navigation and present risks to recreationists. Due to its prominent location in the centerline of the waterway, the structure would continue to pose risks to recreational boaters and economic losses to the community. This alternative is estimated to be medium risk with low uncertainty.

8.16.2 Future Conditions with Alternative 2

Alternative 2 involves removing the training wall. By removing the training wall and associated navigation features, the obstruction to recreational navigation would be eliminated along with its associated risks to recreationists and their watercraft. Access to boating docks would also be improved. Removing the training wall would eliminate all risks with no uncertainty.

8.16.3 Future Conditions with Alternative 3

This alternative involves removing the training wall and sediment at Gardner's Bar on the South Carolina downstream bank side of the training wall down to elevation 108 feet. It would eliminate the obstruction to recreational navigation and associated risks to recreationist and their watercraft and improve access to boating docks. By removing the training wall, associated navigation features, and sediment, these obstructions to recreational navigation would be eliminated along with their associated risks.

8.17 Real Estate

An exhaustive search of real estate records has been conducted and no documentation of real estate acquisition associated with the training wall can be located. A search for real property asset records has also been completed and no records could be located that would indicate this structure (the training wall) exists. Based on this, there will be no disposal deeds required, no value assigned to the training wall and no administrative fees that would normally be associated with a disposal of project lands and improvements. Therefore, there are no impacts regardless of the selected alternative.

8.18 Risk and Uncertainty

8.18.1 Future Conditions with No Action

In the Future Without Project Condition, there would be no negative impacts on the environment, but the residual risk of watercraft damaging the cultural resource, the training wall, would still exist even with buoys and signage. This alternative exhibits medium risk with low uncertainty.

8.18.2 Future Conditions with Alternative 2

This alternative would have a minor, temporary impact during removal to the water quality, air quality, noise, wetlands, riparian habitat, terrestrial resources and potential T&E mussel species. It would have permanent impacts to a cultural resource because the training wall, a cultural resource, would be removed. This alternative would exhibit low risk with medium uncertainty. Medium risk would be present if mussels are found within the project area. Knowledge uncertainty exists with the lack of mussel surveys in the study area.

8.18.3 Future Conditions with Alternative 3

This alternative would have a minor, temporary impact during removal to the water quality, air quality, noise, wetlands, riparian habitat, terrestrial resources and potential T&E mussel species. Removal of the training wall would have permanent impacts to the cultural resource, the training wall. Removal of sediments would present no adverse effects to cultural resources because they are located more than 1/3 of a mile from the archaeological sites and none are located at the site where the sediment would be removed. This alternative would exhibit low risk with medium uncertainty. Medium risk would be present if mussels are within the project area. Knowledge uncertainty exists with the lack of mussel surveys in the study area.

8.19 **Cumulative Impacts**

The Council on Environmental Quality regulations (40 CFR 150.7) require an analysis of the cumulative impacts resulting from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of who undertakes these other actions. Cumulative impacts can result from individually minor, but collectively significant, actions. This section addresses the cumulative effects arising from the alternatives being evaluated when combined with other ongoing or proposed actions within in the Savannah River Basin near the study area.

Several other studies and projects will be evaluated or completed within the Savannah River Basin near the study area over the next several years.

One of the biggest projects that will be completed within the Savannah River Basin near the study area is the Fish Passage mitigation feature of the Savannah Harbor Expansion Project. The goal of the Fish Passage feature is to reconnect river flows in such as a way to allow for the upstream migration of a variety of migratory fish species including Federally listed shortnose and Atlantic sturgeon, American shad, Hickory shad, blueback herring, striped bass, and American eel. The structure will allow for fish such as Atlantic and shortnose sturgeon to return downstream once they have spawned in their historic spawning grounds further upriver at the Augusta shoals. Long term beneficial impacts could occur to aquatic species from the potential local increased dissolved oxygen from creation of turbulence at the rock weir. The rock weir would also improve habitat in general for fish and wildlife species by improving habitat diversity. The Fish Passage mitigation feature of the Savannah Harbor Expansion Project is unlikely to cause any negative impacts to the overall water quality within the Savannah River Basin especially with regard to temperature and dissolved oxygen and will help increase the fish diversity within the Savannah River watershed. There should be no adverse cumulative effects on the evaluated environmental resources such as aquatic resources, wetlands, or water quality as a result of the Fish Passage mitigation feature and there are positive cumulative impacts on threatened and endangered species including the Atlantic and shortnose sturgeon as well as other migratory fish species. With the Fish Passage mitigation feature in-place, it is not expected that any of the alternatives being evaluated will have any combined adverse cumulative impacts within the study area.

In addition to the completion of the Fish Passage mitigation feature of the Savannah Harbor Expansion Project, the Corps is also evaluating other projects within the Savannah River Basin system.

The Savannah River does not function as it did in the early-1900s when commercial navigation was occurring between Savannah Harbor and the city of Augusta. In many areas within the Savannah River Basin, the bends were cut off to facilitate navigation in the mid-1950s. Some meandering oxbows were cutoff in an effort to aid river navigation the Corps studying the restoration of those bends along the Savannah River between Augusta and the mouth of the Savannah Harbor to improve fish and wildlife habitat as part of the SRBA Ecosystem Restoration study (SRBA). The SRBA study in

conjunction with the alternatives being evaluated as part of this study are not expected to have any adverse cumulative impacts within the study area.

Another effort that the Corps is working on is updating the Drought Contingency Plan for the Savannah River Basin which will improve water resource management for the multipurpose dam and reservoir projects on the Savannah River in all authorized project purposes during prolonged low inflows. The Savannah River is viewed by some located in other river basins as a ready source of clean water for their needs. If the regulating government agencies agree additional inter-basin transfers can occur, stresses on existing uses along the entire length of the Savannah River Basin would increase. The Savannah River has been substantially modified over time; however, the basin still provides a multitude of opportunities for the use and enjoyment of this valuable resource. The number of people desiring to use or benefit from this resource continues to increase. The uses vary seasonally, with lower demands placed on the aquatic ecosystem during the cooler fall/winter months. As a drought intensifies or continues in duration, the stress on both the natural ecosystem and human uses of the resources increases. The proposed changes to the Drought Contingency Plan in conjunction with the alternatives being evaluated as part of this study area are not expected to have any adverse cumulative impacts within the study area.

8.19.1 Future Conditions with No Action

With implementation of the no action Alternative, which would leave the training wall in-place with the addition of buoys and signs installed, it is expected that there would not be any cumulative adverse effects to the study area. It is expected that this portion of the Savannah River Basin would still provide adequate recreational opportunities for water related activities with the training wall still in-place and there would be enough clearance for boats to traverse over the training wall during normal flow events. With implementation of the no action Alternative, the training wall could continue to be a potential obstruction to recreational navigation in the study area, especially at lower pool elevations and for those who are not familiar with that portion of the Savannah River Basin.

With implementation of the no action Alternative, there would not be any anticipated adverse cumulative impacts to historical/archeological structures, terrestrial and wildlife resources, and threatened and endangered species located within the study area. There would also not be any adverse cumulative impacts to air quality, water quality, or HTRW with implementation of the no action alternative.

8.19.2 Future Conditions with Alternative 2

With implementation of Alternative 2, there would minor and temporary impacts to air quality, water quality, noise, aquatic resources, riparian habitat, terrestrial resources and wildlife, and potentially threatened and endangered mussel species within the immediate study as a result of the removal of the training wall construction efforts. It is expected that with implementation of time of year restrictions on when the construction would occur as well as the use of best management practices during construction, that the river system within the study area would recover within one to two years after

completion. Implementation of Alternative 2 would also remove the potential risk to recreational navigation associated with having the training wall present within the project area of the Savannah River Basin.

No other significant cumulative impacts associated with the proposed action and other past, present, and foreseeable actions have been identified during this assessment. Coordination with the appropriate state and Federal resource agencies will continue to ensure future actions do not result in direct or indirect impacts to natural resources in the vicinity of the project area where the training wall is located.

8.19.3 Future Conditions with Alternative 3

With implementation of Alternative 3, there would minor and temporary impacts to air quality, water quality, noise, aquatic resources, riparian habitat, terrestrial resources and wildlife, and potentially threatened and endangered mussel species within the immediate study as a result of the removal of the training wall construction efforts. It is expected that with implantation of time of year restrictions on when the construction would occur as well as the use of best management practices during construction, that the river system within the study area would recover within one to two years after completion. Implementation of Alternative 3 would also remove the potential risk to recreational navigation associated with having the training wall and sediment present within the project area of the Savannah River Basin. However, sediment existed prior to the training wall being constructed. As a result, there is no evidence that the training wall has caused the sediment.

No other significant cumulative impacts associated with the proposed action and other past, present, and foreseeable actions have been identified during this assessment. Coordination with the appropriate state and Federal resource agencies will continue to ensure future actions do not result in direct or indirect impacts to natural resources in the vicinity of the project area where the training wall is located.

9.0 RECOMMENDED PLAN:

The Corps recommends disposing of the training wall and associated navigation features. Disposing of it effectively achieves the planning objective. It eliminates all risks to recreationist and their boats associated with the obstruction to recreational navigation. Re-establishing an unobstructed natural river would provide new recreational opportunities that would not have otherwise been available with the training wall. Access to boating docks would be improved. HOTS Regatta would occur unrestricted allowing the local communities to maximize economic gains and maintain community cohesion.

9.1 Description of Plan

Based on the comparison of action alternatives to the NAA, the Tentatively Selected Plan (TSP) is Alternative 2. Alternative 2 would include the removal of the training wall. Removal of the entire training wall and pile dikes approximately costs an estimated $5.42 million. Additional cost savings could be realized for different scales of removal.

For example, removing half of the height of the training wall (five feet) would cost approximately $5.02 million. However, once interest during construction costs are added, those cost savings are completely negated because the construction time to remove half of the training wall is almost double that of removing the entire training wall.

9.2 Environmental Effects

With implementation of Alternative 2, it is not expected that there would be significant environmental impacts to water quality, existing wetlands, riparian/upland habitat, terrestrial resources and habitat, aquatic resources and habitat and protected resources within the study area. In order to minimize impacts to water quality during construction, Corps will follow sediment and erosion control best management practices in its designs. Turbidity curtains will be installed while the training wall is being removed as well as during the partial removal of the accumulated sediment to minimize turbidity plumes from leaving the construction area. The sediment behind the training wall was tested and the results indicated that there is there is no presence of metals, PCBs, and SVOCs above the Environmental Protection Agency's Regional Screening Level residential soil standard. In addition, the background location sample results did not differ from the samples taken behind the training wall so the Corps does not expect any Section 401 issues.

The clearing of the staging area 1 has the potential to have the Federally listed relict trillium and smooth coneflower as well as the potentially Federally listed Ocmulgee skullcap. A confirmation field survey will be conducted in the spring of 2020 to ensure the project will not impact these species during construction. Time of year restriction may be implemented during the training wall and partial sedimentation removal construction effort avoid impacts to state and Federally listed anadromous fish species including the robust redhorse and shortnose and Atlantic sturgeon during important spawning migrations. These timeframes will be coordinated through ongoing consultation with the Services. The clearing of the staging area 1 would also result in the loss of approximately two to three acres of riparian habitat along the South Carolina side of the river. It is expected that this habitat that will be impacted is not unique to the study area and there are other areas within the study area that has the same functions and provide similar habitat values during the construction effort. The terrestrial resources and wildlife that would use that habitat would still have other similar habitat areas within the study area and therefore would not be significantly impacted as a result of the construction efforts. In addition, the potential staging area and JST rock stockpile area, as seen in Figure13, that would be cleared for construction access is not preferred habitat for relict trillium (*Trillium reliquum*) or the smooth coneflower (*Echinacea laevigata*).

Figure 13. 1.5 Acre Stockpile Location at J. Strom Thurmond Dam.

Environmental impacts to aquatic resources from the Alternatives 2 are expected to be limited to short term impacts during construction as a result of temporary turbidity impacts as the sediment is released back into the system after the training wall is removed. The study area will continue to provide valuable foraging habitat for a variety of aquatic fish species with the training wall removed, however the training wall that once provided a thermal refuge for the aquatic species would not be removed. In addition, the removal of the training wall will reduce the diversity of foraging habitat for varies aquatic resources within the study area, making the area more uniform.

9.3 **Economic Effects**

The U.S. Army Corps of Engineers Interim Guidance on the Conduct of Disposition Studies, dated 22 August 2016, states that any economic analysis will support the documentation of the impacts of alternatives, including disposition, to the extent the impacts are known and able to be quantified and monetized. The analysis must consider both benefits and costs that result from the alternatives. In general, economic benefits and costs will be calculated using established methodologies and procedures as defined in the Planning Guidance Notebook ER 1105-2-100. To the extent practicable, the economic analysis will evaluate alternative plans based on quantitative metrics, but qualitative presentation is acceptable where warranted. Benefits and costs will be based on current price levels and shown as annualized values discounted over the period of analysis using the current fiscal year (FY) Federal discount rate.

Given the lack of readily available data on recreation use days and the loss of navigable commerce (the authorized purpose), a traditional NED analysis which utilizes life cycle costs and benefits cannot be performed. Instead, a qualitative analysis was prepared.

9.4 Other Social Effects

Special events on the river in the community would be unimpeded by the training wall during normal flow conditions. Some special events would be negatively impacted during low flow conditions. As a result, the community would be negatively affected.

9.5 Safety Effects

By removing the training wall and associated structures, risks to recreationist and their watercraft would be eliminated. There would also be no potential risks of injury or loss of life associated without the training wall. All restrictions related to the training wall on recreational boaters and special events would no longer be necessary.

9.6 Cultural Resources

Efforts to determine the effects of the Recommended Plan are ongoing. The Corps will determine eligibility for listing in the National Register of Historic Places of the training wall and previously-recorded archaeological sites at the completion of a survey and evaluation effort, following the process as outlined in 36 CFR 800. If the training wall or portions of the archaeological sites impacted by the Recommended Plan are determined to be a historic property, the removal of the wall would be an adverse effect and the Corps will consider additional measures to avoid, minimize, or mitigate the adverse effects. Should avoidance of adverse effects to historic properties not be possible, the Corps will notify the Advisory Council on Historic Preservation, Georgia State Historic Preservation Officer, South Carolina State Historic Preservation Officer, the Certified Local Governments of Augusta-Richmond County, Georgia and North Augusta, South Carolina, and other interested parties. If necessary, the Corps will develop a Memorandum of Agreement to resolve the adverse effects through mitigation measures.

10.0 COMPLIANCE WITH ENVIRONMENTAL LAWS, STATUTES, AND EXECTIVE ORDERS*

Table 16 summarizes compliance of the proposed action with applicable Federal/State laws.

Table 16. Relationship of Project to Environmental Requirements

Federal Statutes	Level of Compliance
Clean Air Act	Full
Clean Water Act	Full

Coastal Barrier Resources Act	N/A
Coastal Zone Management Act	N/A
Comprehensive Environmental Response, Compensation and Liability Act	Full
Endangered Species Act	Partial
Estuary Protection Act	N/A
Farmland Protection Policy Act	N/A
Federal Water Project Recreation Act	N/A
Fish and Wildlife Coordination Act	Partial
Flood Control Act of 1944	Full
Land and Water Conservation Fund Act	N/A
Magnuson Fishery Conservation and Management Act	N/A
Marine Mammal Protection Act	N/A
National Environmental Policy Act	Partial
National Historic Preservation Act	Partial
North American Wetlands Conservation Act	N/A
Resource Conservation and Recovery Act	N/A
Rivers and Harbors Act	N/A
Water Resources Development Acts of 1976, 1986, 1990, and 1992	Full
Water Resources Planning Act	Full
Watershed Protection and Flood Prevention Act	Full
Wild and Scenic Rivers Act	N/A
Executive Orders (EO), Memoranda, etc.	
Migratory Bird (E.O. 13186)	N/A
Protection and Enhancement of Environmental Quality (E.O. 11514)	Partial
Federal Statutes	Level of Compliance*
Protection and Enhancement of Cultural Environment (E.O. 11593)	Partial
Exotic Organisms (E.O. 11987)	Full

Floodplain Management (E.O. 11988)	Full
Protection of Wetlands (E.O. 11990)	Full
Relating to Protection and Enhancement of Environmental Quality (E.O. 11991)	Partial
Environmental Justice in Minority and Low-Income Populations (E.O. 12898)	Full
Invasive Species (E.O. 13112)	Full
Protection of Children from Health Risks and Safety Risks (E.O. 13045)	N/A
Prime and Unique Farmlands (CEQ Memorandum, 11 August 1980)	N/A

*Level of Compliance:
Full Compliance (Full): Having met all requirements of the statute, E.O., or other environmental requirements.
Partial Compliance (Partial): Not having met some of the requirements at current stage of planning. Compliance with these requirements is ongoing (e.g. Coordination of this document with the public, and relevant resource agencies, including resolution of adverse effects to historic properties in accordance with stipulations in the PA and the MOA and notifying and filing with the ACHP will result in full compliance.)
Non-Compliance (NC): Violation of a requirement of the statute, E.O., or other environmental requirement.
Not Applicable (NA): No requirements for the statute, E.O, or other environmental requirement for the current stage of planning.

10.1 **Compliance with State Statutes**

No sediment disposal in waters of the U.S. activities are included in the proposed plan. The material that have accumulated behind the training wall is already in the system and will be allowed to naturally distribute within the river system over time. During the removal of the training wall there will be some disturbance of the sediment. In order to minimize impacts to water quality during construction, the Corps will follow sediment and erosion control best management practices in its designs to minimize turbidity plumes from leaving the construction area. Therefore, a Section 404(b)(1) evaluation is not required.

Section 401 Water Quality Certifications from the States of Georgia and South Carolina are not needed for the proposed action because no discharge of effluent or materials would be deposed of into waters of the U.S. as a result of the recommended plan.

Since the site of the proposed action is not within the coastal zone and does not have indirect impact on the coastal zone, we do not expect impacts to coastal resources from this project. Therefore, we believe this project is fully consistent with the enforceable policies of the South Carolina Coastal Management Plan as well as the policies of the Georgia Coastal Zone Management (CZM) program.

Environmental compliance for the proposed action would be achieved upon completion of the following:

- Coordination of this EA and draft Finding of No Significant Impact (FONSI) with appropriate agencies, organizations, and individuals for their review and comments.

- U.S. Fish and Wildlife Service (USFWS) and NOAA NMFS confirmation that the proposed action would not likely adversely affect any endangered or threatened species.

- Continued consultation with Georgia and South Carolina SHPO on training wall eligibility for listing in the National Register of Historic Places.

- Receipt and acceptance or resolution of all USFWS Fish and Wildlife Coordination Act evaluation recommendations.

- Receipt and acceptance or resolution of all EPA's comments on the NEPA and air quality impact analysis documented in the EA.

The draft FONSI will not be finalized and signed until the proposed action achieves environmental compliance with applicable laws and regulations, as described above.

10.2 Compliance with Executive Order 11988

Executive Order 11988 requires Federal agencies to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of flood plans and to avoid direct and indirect support of flood plain development. Since the training wall structure is within the channel of the Savannah River, all study alternatives, including the proposed action, will not adversely impact the floodplain.

10.3 Coordination and Regulatory Compliance

Preparation of this EA and draft Finding of No Significant Impact (FONSI) is being coordinated with appropriate congressional, Federal, state, and local interests, as well as environmental groups and other interested parties. A list of the Federal and state agencies that will be contacted during the evaluation or that will receive a copy of the EA for review follows:

U.S. Department of Interior, Fish and Wildlife Service
U.S. Environmental Protection Agency
U.S. Department of Commerce, National Marine Fisheries Service
Natural Resources Conservation Service, State Conservationist
S.C. Department of Health and Environmental Control
S.C. Department of Natural Resources
S.C. Department of Archives and History
GA Department of Natural Resources

The Corps initiated consultation for the project with the state and Federal resource agencies on 9 August 2019. Coordination with the resource agencies since then has been ongoing and the Corps has held several phone calls and webinar discussions including one on October 3, 2019 and one on December 3, 2019 to provide the resource agencies a status update on the project as well as give the resource agencies a chance to provide comments during the alternatives evaluation process.

On November 4, 2019 the Corps received a draft Fish and Wildlife Service Coordination Act Report evaluation for the project (See Appendix B) which had the following recommendations of things to keep in mind as the District moves ahead in the alternatives analysis effort:

10.4 **USFWS Recommendation 1**

It will be important to have access to the hydrologic modeling results to understand what impacts the sediments may have over how large an area (length, width, and thickness), how far downstream, and for what period of time, time of year and/or under what conditions the sediments would be expected to move.

10.4.1 **The Corps Response**

While the Corps was not able to complete a sediment transport model for the study, based on the low erosion rates determined by the hydraulic and hydrology model and sediment characteristic analysis we do not anticipate adverse impacts with respect to environment and infrastructure as a result of the release of the sediment behind the training wall. Based on the analysis, the top 16 feet of sediment is characterized by poorly graded sand (SP) in the high erodibility zone. From hydrodynamic model, the peak velocity is 1.9 fps at 25,000 cfs. Using the erodibility chart, this results in approximate erosion rate between 1 and 2 fps. Erosion rate is instantaneous and would decrease as material is eroded until equilibrium is reached with a new channel geometry. In general, deposition occurs inside channel bends; degradation occurs at outside of channel bends. As a result, it is expected that the sediment behind the training wall, once it goes back into the system will accumulate in the inside of the five or so channel bends between the area of the training wall down to the location of the New Savannah Bluff Lock and Dam structure/fish passage structure.

10.5 **USFWS Recommendation 2**

If significant quantities (to be determined) of sediments are expected to reach the NSBLD, their impact at that location should be considered.

10.5.1 **The Corps Response**

Based on the average flow rates within the study area, along with the sediment characteristics, and knowledge that in general deposition of sediment occurs inside the channels bends, and that there are approximately five of them between the location of the training wall and the New Savannah Bluff Lock and Dam Fish Passage structure, it is not expected that the sediment will reach or go below that area.

10.6 **USFWS Recommendation 3**

A known sensitive area is the gravel bar used by species of concern immediately below the NSBLD. This is approximately 10.5 river miles downstream and on the other side of the lock and dam from the training wall project. Impacts to this breeding habit should be avoided.

10.6.1 **The Corps Response**

It is not expected that the sediment that has accumulated behind the training wall, once it has been introduced back into the system would reach the location of the fish passage structure at New Savannah Bluff Lock and Dam below. With the average flow velocities within the study area, it is expected that the majority of the sediment will settle out along the inside of the approximately five channel bends between the location of the training wall and will settle out before reaching either the fish passage structure or the gravel bar located just downstream of the fish passage structure.

10.7 **USFWS Recommendation 4**

If the NSBLD fishway begins passing fish before the training wall is removed, timing restrictions on construction activities may be appropriate to avoid conflicts with spawning migrations.

10.7.1 **The Corps Response**

It is expected that the removal of training wall would occur before the construction of the fish passage structure would be started which would avoid potential conflicts with spawning migrations of anadromous fish species.

11.0 DESCRIPTION OF INTERESTED PARTY

The Corps has requested if any entity was interested in taking over ownership of the training wall. No positive responses were received.

12.0 REQUIREMENTS FOR IMPLEMENTATION OF RECOMMENDATION

12.1 **Cost**

The estimated total project cost for the selected Alternative is $5.42 million:

Feature	Estimated Cost
Planning, Engineering & Design	$ 610,000
Construction	$ 4,204,000
Construction Management	$ 610,000
Total	**$ 5,424,000**

A detailed cost estimate is presented in Section 5 of Appendix A.

12.2 **Schedule**

A preliminary schedule was developed with the assumption that appropriations are received at the start of FY22:

Task Name	Start	Finish	Duration (Days)
Design Contract Preparation	11/1/2021	1/30/2022	90
Design Contract Award	1/31/2022	2/1/2022	1
Project Design	2/2/2022	7/2/2022	150
Final Plans and Specifications	7/3/2022	7/4/2022	1
Construction Contract Preparation	7/5/2022	10/3/2022	90
Construction Contract Award	10/4/2022	10/5/2022	1
Notice to Proceed	10/6/2022	10/13/2022	7
Generate KTR Submittals	10/14/2022	11/13/2022	30
Approve Submittals	11/14/2022	12/14/2022	30
Mobilization	12/15/2022	12/25/2022	10
Remove Training Wall	12/26/2022	3/26/2023	90
Cleanup/Restoration	3/27/2023	4/3/2023	7
Demobilization	4/4/2023	4/11/2023	7
Construction Complete	4/12/2023	4/13/2023	1
Project Closeout	4/14/2023	5/14/2023	30
Project Complete	5/15/2023	5/16/2023	1

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A History of Savannah District 1929 – 1989,
Henry E. Barber and Allen R. Gann, 1989

DRAFT FINDING OF NO SIGNIFICANT IMPACT
Section 216 Study
Savannah River Below Augusta Training Wall
Draft Integrated Disposition Study and Environmental Assessment
Augusta, GA and North Augusta, SC

The U.S. Army Corps of Engineers, Savannah District (Savannah District) has conducted an environmental analysis in accordance with the National Environmental Policy Act of 1969, as amended. The final Integrated Disposition Study and Environmental Assessment (IDS/EA) dated March x, 2020 for the Section 216 Study, Savannah River Below Augusta (SRBA), Training Wall Disposition, Augusta, Georgia and North Augusta, South Carolina addresses whether federal interest exists to retain or dispose of the training wall in Augusta, Georgia and North Augusta, South Carolina. The final recommendation is contained in the report of the Chief of Engineers, dated XXXXXX.

The IDS/EA, incorporated herein by reference, includes evaluated various alternatives that would determine whether federal interests exists to retain the training wall or if the federal interest is to dispose of the structure and its associated features in the study area. The recommended plan, Alterative 2, would completely remove the full length of the training wall and pile dikes to the natural channel bottom of approximately 100 feet NAVD88. Once the training wall is removed, the sediment that has accumulated over time behind the training wall would be allowed to migrate into the system naturally over time.

In addition to the “no action” alternative, which would leave the training wall and associated navigation features in-place but would be marked with safety buoys and signs, two “action” alternatives were evaluated. The alternatives included Alternative 2 (draft recommended plan) and Alternative 3. Alternative 3 would completely remove the full length of the training wall and pile dikes to the natural channel bottom of approximately 100 feet NAVD88 but would also include mechanically removing a partial amount of sediment that has accumulated behind the training wall down to the approximate elevation of 108 feet NAVD88 and transported to a local landfill. The final array of alternatives are described and compared in Section 7.3 and 8.0 of the IDS/EA.

SUMMARY OF POTENTIAL EFFECTS:

For all alternatives, the potential effects were evaluated, as appropriate. A summary assessment of the potential effects of the recommended plan are listed in Table 1:

Table 1: Summary of Potential Effects of the Draft Recommended Plan

	Insignificant effects	Insignificant effects as a result of mitigation*	Resource unaffected by action
Aesthetics	☒	☐	☐
Air quality	☒	☐	☐
Aquatic resources/wetlands	☒	☐	☐
Invasive species	☒	☐	☐
Fish and wildlife habitat	☒	☐	☐
Threatened/Endangered species/critical habitat	☒	☐	☐
Historic properties	☐	☐	☐
Other cultural resources	☐	☐	☐
Floodplains	☒	☐	☐
Hazardous, toxic & radioactive waste	☒	☐	☒
Hydrology	☒	☐	☐
Land use	☐	☐	☒
Navigation	☒	☐	☐
Noise levels	☒	☐	☐
Public infrastructure	☐	☐	☒
Socio-economics	☐	☐	☒
Environmental justice	☐	☐	☒
Soils	☒	☐	☐
Tribal trust resources	☐	☐	☒
Water quality	☒	☐	☐
Climate change	☐	☐	☒

All practicable and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the recommended plan. Best management practices (BMPs) as detailed in the IDS/EA will be implemented, if appropriate, to minimize impacts.

No compensatory mitigation is required as part of the recommended plan.

Pursuant to section 7 of the Endangered Species Act of 1973, as amended, the United States Fish and Wildlife Service provided a draft Fish and Wildlife Coordination Act Evaluation Report on November 04, 2019 for the project that has been incorporated into draft IDS/EA report and environmental assessment. The Savannah District will concur with, and/or resolve all USFWS Coordination Act Report recommendations and it is expected that with implementation of the draft recommended plan, there will not be impacts to federally-listed threatened and endangered species within the project area.

Pursuant to section 106 of the National Historic Preservation Act of 1966, as amended, the U.S. Army Corps of Engineers is determining if historic properties may be adversely affected by the recommended plan. Efforts to determine the effects of the Recommended Plan are ongoing. The Corps will determine eligibility for listing in the National Register of Historic Places of the training wall and previously-recorded archaeological sites at the completion of a survey and evaluation effort, following the process as outlined in 36 CFR 800. If the training wall or portions of the archaeological sites impacted by the Recommended Plan are determined to be a historic property, the removal of the wall would be an adverse effect and the Savannah District will consider additional measures to avoid, minimize, or mitigate the adverse effects. Should avoidance of adverse effects to historic properties not be possible, the Savannah District will notify the Advisory Council on Historic Preservation, Georgia State Historic Preservation Officer, South Carolina State Historic Preservation Officer, the Certified Local Government of Augusta-Richmond County, and other interested parties. If necessary, the Savannah District will develop a Memorandum of Agreement to resolve the adverse effects through mitigation measures. The Corps and the Georgia State Historic Preservation Officer, South Carolina State Historic Preservation Officer could entered into a Memorandum of Agreement (MOA), dated **DATE OF AGREEMENT.** All terms and conditions resulting from the agreement shall be implemented in order to minimize adverse impacts to historic properties.[1]

No sediment disposal in waters of the U.S. activities are included in the proposed plan. The sediment that has accumulated behind the training wall is already in the system and will be allowed to naturally distribute within the river the system over time. This sediment was tested and the results indicated that there is there is no presence of metals, PCBs, and SVOCs above the Environmental Protection Agency's Regional Screening Level residential soil standard. In addition, the background location sample results did not differ from the samples taken behind the training wall. Therefore, a Section 404(b)(1) evaluation is not required.

Section 401 Water Quality Certifications from the States of Georgia and South Carolina are not needed for the proposed action because no discharge of effluent or sediment would be deposed of into waters of the U.S. as a result of the draft recommended plan.

Since the site of the proposed action is not within the coastal zone and does not have indirect impact on the coastal zone, Corps does not expect impacts to coastal resources from this project. Therefore, the Savannah District concludes this project is fully consistent with the enforceable policies of the South Carolina Coastal Management Plan as well as the policies of the Georgia Coastal Zone Management (CZM) program.

All applicable environmental laws have been considered and coordination with appropriate agencies and officials has been completed.

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[1] Required by 36 CFR 800.6(c)(3) meeting the terms and conditions of the MOA

FINDING:
Technical, environmental, and cost effectiveness criteria used in the formulation of alternative plans were those specified in the Water Resources Council's 1983 Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies. All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives. Based on this report, the reviews by other Federal, State and local agencies, Tribes, input of the public, and the review by my staff, it is my determination that the recommended plan would not cause significant adverse effects on the quality of the human environment; therefore, preparation of an Environmental Impact Statement is not required.

_____ _____

Date

Daniel H. Hibner, PMP
Colonel, U.S. Army
Commanding