



**US Army Corps
of Engineers®**
Savannah District

**DRAFT
SUPPLEMENTAL
ENVIRONMENTAL ASSESSMENT**

**SAVANNAH HARBOR EXPANSION PROJECT
Modification of McCoys Cut Feature (McCoys Cut)**

Chatham County, Georgia and Jasper County, South Carolina



May 2017

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Contents

| | |
|--|----|
| 1.0 Introduction | 5 |
| 1.1 Proposed Action. | 5 |
| 1.2 Purpose and Need for the Proposed Action. | 11 |
| 1.2.1 Purpose of the Action | 11 |
| 1.2.2 Need for Action | 11 |
| 1.3 Authority. | 12 |
| 1.4 Prior Reports..... | 12 |
| 2.0 Formulation of Alternatives..... | 12 |
| 2.1 Initial Array of Alternatives | 13 |
| 2.2 Final Array of Alternatives..... | 16 |
| 2.3 No Action Alternative (NAA) (FEIS Approved Plan)..... | 16 |
| 2.4 Alternative 1: Extend Dredging, Beneficial Reuse at Two Sites, with Remainder in Approved DMCA's..... | 17 |
| 2.5 Alternative 2: Extend Dredging, Beneficial Reuse at Two Sites, with Remainder in the Sediment Basin..... | 18 |
| 2.6 Alternative 3: Extend Dredging, Beneficial Reuse at Two Sites, with Remainder in approved DMCA's and/or Sediment Basin. | 19 |
| 3.0 Affected Environment | 19 |
| 3.1 General..... | 19 |
| 3.2 Relevant Resources | 19 |
| 3.2.1 Sediments | 20 |
| 3.2.2 Wetlands | 20 |
| 3.2.3 Aquatic Resources /Fisheries..... | 20 |
| 3.2.4 Essential Fish Habitat | 21 |
| 3.2.5 Terrestrial Resources | 21 |
| 3.2.6 Wildlife | 21 |
| 3.2.7 Threatened and Endangered Species..... | 22 |
| 3.2.8 Cultural Resources..... | 22 |
| 3.2.1 Air Quality..... | 22 |
| 3.2.2 Water Quality | 23 |

| | |
|--|----|
| 3.2.3 Transportation/Traffic | 23 |
| 4.0 ENVIRONMENTAL CONSEQUENCES | 25 |
| 4.1 Sediment | 25 |
| 4.2 Wetlands..... | 25 |
| 4.3 Aquatic Resources/Fisheries | 26 |
| 4.4 Essential Fish Habitat | 27 |
| 4.5 Terrestrial Resources | 29 |
| 4.6 Wildlife | 29 |
| 4.7 Threatened and Endangered Species | 30 |
| 4.8 Cultural Resources | 31 |
| 4.9 Air Quality | 32 |
| 4.10 Water Quality | 33 |
| 4.11 Transportation/Traffic..... | 34 |
| 4.12 Cumulative Impacts | 35 |
| 5.0 COORDINATION | 36 |
| 6.0 MITIGATION | 36 |
| 7.0 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS | 37 |
| 7.1 Existing Approvals Not Requiring Update..... | 37 |
| 7.2 Existing Approvals Requiring Update | 37 |
| 7.3 Environmental Approvals..... | 38 |
| 8.0 CONCLUSION | 39 |
| 9.0 PREPARED BY..... | 40 |
| 10.0 REFERENCES..... | 41 |

Figures

| | |
|--|----|
| Figure 1: Location of Additional Dredging | 7 |
| Figure 2: Proposed Beneficial Use Placement Areas..... | 8 |
| Figure 3: Project Location – Close Up of Proposed Action Beneficial Use Placement Areas..... | 9 |
| Figure 4: Approximate location of access site within Savannah National Wildlife Refuge | 10 |
| Figure 5: Approximate placement location within the Sediment Basin | 19 |
| Figure 6: Location of USGS gages near McCoombs/McCoys and Rifle Cut..... | 28 |
| Figure 7: Location of USGS gage near the Sediment Basin | 29 |

Tables

Table 1: Initial Array of Alternatives..... 14
Table 2: Essential Fish Habitat (EFH) Species for the Project Area..... 21
Table 3: Threatened and Endangered Species..... 24
Table 4: Compliance of the Proposed Action with Executive Orders 38

Appendices

Appendix A: 2016 Wetland Delineation Report for Rifle Cut and McCoys Cut
Appendix B: USFWS IPAC: Federally listed species for the project area
Appendix C: Section 404(b)(1) Evaluation
Appendix D: Value Engineering Proposals Table
Appendix E: Georgia Coastal Zone Consistency Determination
Appendix F: South Carolina Coastal Zone Consistency Determination

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1.0 Introduction

The U.S. Army Corps of Engineers (USACE), Savannah District, prepared this draft Supplemental Environmental Assessment (SEA) to evaluate proposed changes to the McCoys Cut flow re-routing feature of the Savannah Harbor Expansion Project (SHEP). This SEA supplements the July 2012 Final Environmental Impact Statement (FEIS) for the SHEP and Record of Decision (ROD) dated October 26, 2012. The FEIS and ROD are incorporated herein by reference. These 2012 documents and the General Reevaluation Report (GRR) can be found at:

<http://www.sas.usace.army.mil/Missions/Civil-Works/Savannah-Harbor-Expansion>

This SEA covers the increased area needing to be dredged to achieve the required flows down Back River and alternative sediment placement areas. The SEA does not modify the McCoys Cut Diversion structure or plugs in Rifle and McCoombs Cuts, which are covered in the FEIS.

This SEA has been prepared in accordance with the National Environmental Policy Act of 1969, Council on Environmental Quality's Regulations (40 CFR 1500-1508), and USACE Engineering Regulation ER 200-2-2. This SEA provides sufficient information on the potential adverse and beneficial environmental effects to allow the District Commander, USACE, Savannah District, to make an informed decision on the appropriateness of preparing an Environmental Impact Statement (EIS) or signing a Finding of No Significant Impact (FONSI).

1.1 Proposed Action.

There is no change in the method or timing of dredging, the design of the diversion structure or the rock plugs. Construction will still take place from barges to minimize impacts to adjacent lands.

This proposed action (Alternative 3) modifies actions described in the FEIS Section 5.01.2.3, and Appendix C. The proposed action consists of dredging an additional 2,600 feet within Middle River (station 58+00 to 84+00) to -7 feet mean lower low water (MLLW) to provide required flows. Figure 1 shows the location of additional dredging reach in Middle River. Figure 2 shows the additional dredging reach along with locations of the proposed beneficial use placement sites. The green, orange, and blue colors

shown on Figure 1 indicate areas covered by the FEIS (approximately 3.1 miles of dredging and 315,000 cubic yards of dredged material). The area in white shown on Figure 1 indicates new work being proposed (approximately 2,600 feet of additional dredging, about 24,000 cubic yards). In addition dredging an additional 4 feet at the mouth of Union Creek (also shown on Figure 1 and 2) is proposed to account for potential future shoaling. This additional depth remains within the same footprint, but would be four feet deeper for a distance of approximately 1,360 feet.

A large portion of the sediment removed as part of the project would be used beneficially to create wetlands in McCoombs (western arm of McCoys Cut) and Rifle Cuts (Figures 2 and 3), rather than place all of the material in the approved Dredged Material Containment Areas (DMCA) as described in the FEIS. Approximately nine acres of wetlands would be created using the dredged sediments from the project. The material dredged from the Middle and Little Back Rivers it would be placed behind the cut closure structures to an elevation suitable for wetland creation. These new deposition sites are within the boundary of the Savannah National Wildlife Refuge. The quantity of material to be dredged is enough to fill the two cuts to elevation +8 to +8.5 feet MLLW. Once the excavated sediments have been placed in the cuts, the eastern ends of both cuts will be armored with rock to approximately elevation +5 feet MLLW. Above this elevation, protection against erosion will be provided by the placement of hay bales secured with live stakes and several rows of container plantings. This will reduce the risk of erosion while vegetation establishes naturally along most of the length of the cuts. Potential plant species that will be planted on the edge of the newly created wetlands include; River oats (*Chasmanthium latifolium*), Slender spikegrass (*Chasmanthium laxum*), Cane (*Arundinaria gigantea*), Yaupon (*Ilex vomitoria*), Alder (*Alnus serrulata*), buttonbush (*Cephalanthus occidentalis*), Virginia willow (*Itea virginica*), Sweet pepperbush (*Clethra alnifolia*). The rest of the created wetland habitat will mature and fill in by the second full growing season.

The remaining balance of dredged sediment will be placed either in approved DMCA's or in a portion of the Sediment Basin, which is another flow re-routing feature of SHEP. The dredged sediment would be transported either mechanically or hydraulically.

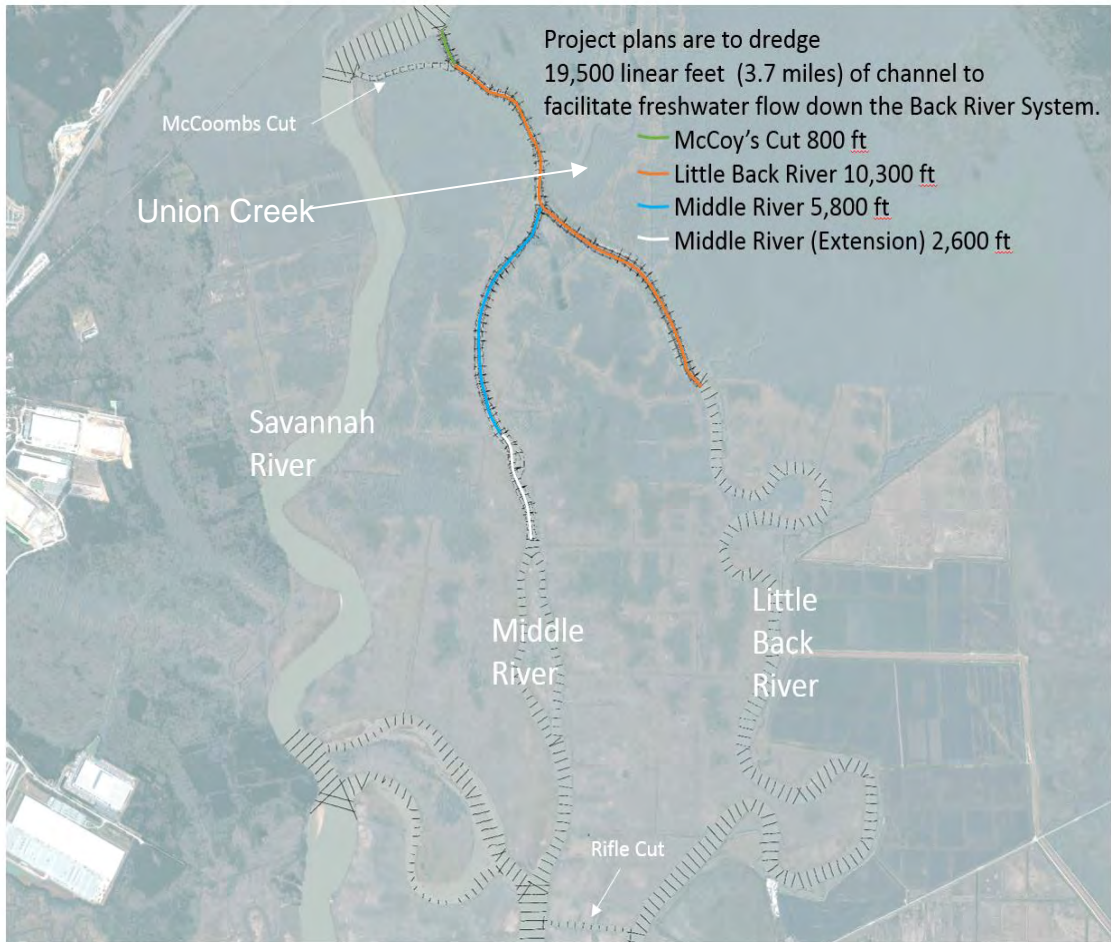


Figure 1: Location of Additional Dredging in Middle River



Figure 2: Proposed Beneficial Use Placement Areas



Figure 3: Project Location – Close Up of Proposed Action Beneficial Use Placement Areas

As a result of logistical concerns of using the Houlihan Bridge during construction, an area will be designated on U.S. Fish and Wildlife (USFWS) lands in the Savannah National Wildlife Refuge as a possible access area for the contractor to move material and supplies to and from the construction site. (Figure 4). A temporary pile supported platform would be installed on the edge of the existing tidal wetland and the Back River,

impacting approximately 0.13 acres of tidal wetlands and 0.10 acres of river. Dike improvements would also be performed leading to the new access site platform, impacting approximately 0.23 acres of managed wetlands on the inside USFWS diked system. This platform is expected to be in place for the duration of the construction timeframe which is estimated to be approximately one year.

If the Houlihan Bridge is to be used to transport materials and supplies to and from the construction site, additional Georgia Department of Transportation (GA DOT) staff may be needed to operate the bridge. In addition, if the contractor wants to use the bridge during nighttime hours, they will required to provide the necessary lighting to safely operate at night.

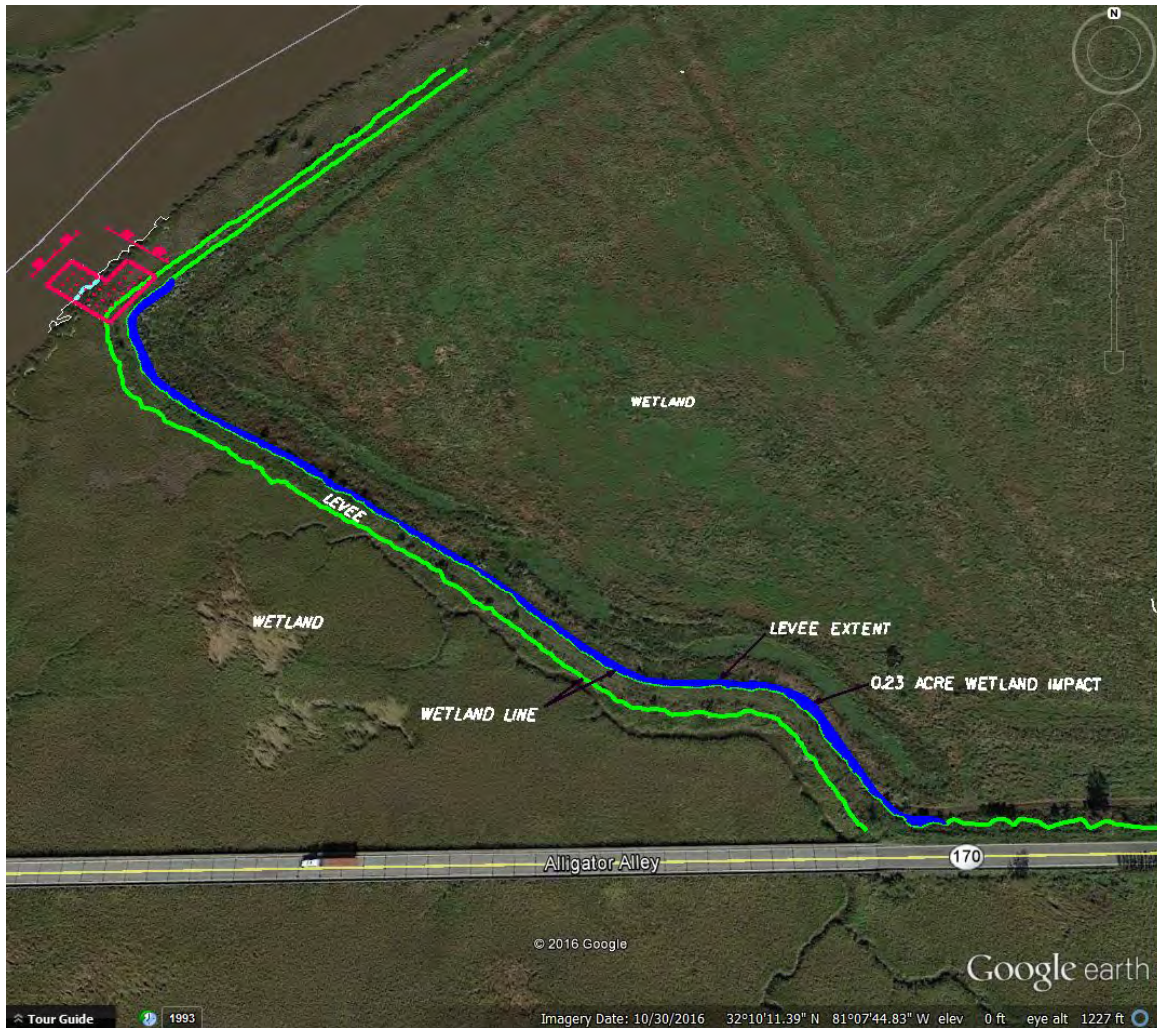


Figure 4: Approximate location of access site within Savannah National Wildlife Refuge

1.2 Purpose and Need for the Proposed Action.

1.2.1 Purpose of the Action

The proposed action would extend the dredging area within Middle River to ensure sufficient freshwater flow to intended areas, as well as save space in the upland DMCA sites by reusing some of the dredged sediments. The reused sediments would create wetland habitat rather than going into approved upland DMCA sites.

1.2.2 Need for Action

USACE believes that an additional 2,600 feet of the Middle River will need to be deepened to achieve the intended flow volume. The original mitigation plan which was designed to increase freshwater flows into the estuary and limit salt water intrusion to reduce salinity impacts from the SHEP navigation project. That plan included dredging Middle River for a distance of approximately 5,800 feet downstream of the confluence with Little Back River. Recent bathymetric data indicates this channel segment would not create a large shoal in Middle River just downstream of the approved dredging template. Approximately 2,600 feet downstream of the original dredging, the river widens and splits around two small islands before narrowing again moving into a more defined channel. By extending the dredging template across this shoal, the deepened channel would connect to the deeper depths downstream of the shoal. This connection would allow the diverted freshwater flow to pass the entire length of Middle River. The additional channel capacity will help ensure wetland mitigation goals are met on Middle River, by mitigating impacts to freshwater and brackish wetlands from upstream salinity movement. Without additional dredging, freshwater flow down Middle River would likely be restricted. While this shoal might have existed for a time, USACE only learned of it through recent bathymetry data when the team entered the design phase for this mitigation feature.

An additional four feet of dredging also appears necessary at the mouth of Union Creek to mitigate future shoaling. This area of additional dredging depth would remain in the same footprint as the previously-approved dredging template, but four feet deeper for a distance of approximately 1,360 feet.

As a result of GA DOT operation limitations at the Houlihan Bridge, an area will be designated on USFWS lands on the Savannah National Wildlife Refuge as a possible access area for the contractor to haul material and supplies to and from the construction site. If during the construction timeframe the Houlihan Bridge becomes inoperable for any reason, this access point would provide the contractor another way to get material and supplies to and from the construction site.

Beneficial use of the excavated sediments would provide environmental enrichment by creating additional wetland habitat. This, in turn, would enhance the fish and wildlife conditions by converting manmade cuts from open water to wetlands. This beneficial use would result in a cost savings to the project and reduce the volume of sediment placed in the approved DMCA's. Reducing sediment placed in DMCA's would extend the useful life of those sites for Operations and Maintenance (O&M) purposes.

1.3 Authority.

A part of the Water Resources Development Act of 1999 (Public Law 106-53, Section 102(b)(9)) authorized the harbor deepening. The wording of the authorization can be found in Section 2.04 of the FEIS.

1.4 Prior Reports

Previous environmental documents, circulated for public and environmental agency review, addressed dredging and sediment placement methods for the Savannah Harbor Expansion Project. Section 1.05 of the FEIS contains a list of these methods. The following reports have been completed since the FEIS was prepared documenting changes or modifications to components of the Savannah Harbor Expansion Project from what was discussed in the FEIS:

USACE, Savannah District. September 2013. Savannah Harbor Expansion Project Environmental Assessment for Modifications to the Raw Water Storage Impoundment (<http://www.sas.usace.army.mil/Portals/61/docs/Planning/Plansandreports/FinalRWSI/RWSI%20Final%20EA%20-%208%20Oct%202013.pdf>). This EA examined the impacts from needed modifications to the location and design of the Raw Water Storage Impoundment. During the detailed design process, USACE considered several alternate sites to identify the location that best met project needs. A parcel near Interstate Highway 95 and the City of Savannah's raw water pipeline was identified as the best location. USACE then performed engineering and environmental studies on that site. Construction is well underway.

Minor Modification Coordination for Diversion Structures, November 2013.

USACE, Savannah District. December 2016. Draft Supplemental Environmental Assessment for the Savannah Harbor Expansion Project, Evaluation and Placement of Cadmium-Laden Sediments. This EA evaluated the potential impacts of placing Cadmium-laden dredged sediments in Dredged Material Containment Areas 14A and 14B in a moist (inundated), but not flooded condition, as part of the SHEP.

2.0 Formulation of Alternatives

USACE examined three types of measures as part of plan formulation for this action:

- 1) Measures that extend the dredging reach down Middle River.
 - a) No change
 - b) Additional 2,600 feet as well as an additional 4 feet of sediment at the mouth of Union Creek
- 2) Sediment Placement Measures
 - a) Use of approved sites (DMCAs)
 - b) Sediment Basin
 - c) Wetland Creation
- 3) Measures to allow contractor access to and from the construction site
 - a) Use of Houlihan Bridge: closing the bridge for multiple weeks at a time
 - b) Access to the construction site from a more northern location

- c) Construct a bulkhead (dredging required) on the edge of the Back River and the Savannah National Wildlife Refuge
- d) Construct a temporary pile supported platform on the edge of the Back River and the Savannah National Wildlife Refuge

2.1 Initial Array of Alternatives

In January 2017, the project team participated in a shortened Value Engineering study to review the McCoys Cut flow re-routing feature and discuss possible alternatives that could reduce project costs or provide additional environmental benefits. The team identified 12 proposals for further evaluation. Appendix D contains a table with the 12 proposals. Table 1 (below) describes the eight alternatives in the initial array as well as the rationale for eliminating or carrying the alternative forward. The alternatives in Table 1 are a combination of the three types of measures discussed in Section 2.0.

Table 1: Initial Array of Alternatives

| Alternative | Includes | Carry Forward | Rationale |
|-----------------------------|---|---------------|--|
| No Action Alternative (NAA) | No Change in dredging or sediment placement | Yes | NEPA requires NAA to be carried forward. |
| 1 | Extend dredging 2,600 feet, partial beneficial reuse of excavated sediments at McCoombs Cut and Rifle Cut, rest in approved DMCAS. An area will be designated on USFWS lands on the Savannah National Wildlife Refuge as a possible access area for the contractor to haul material and supplies to and from the construction site. | Yes | Use the dredged material beneficially to reduce the amount of dredged material placed in the approved DMCAs. This would maintain capacity for O&M and new work sediments and provide ecosystem benefits by creating wetlands. |
| 2 | Extend dredging 2,600 feet, beneficial reuse of excavated sediments at McCoombs Cut and Rifle Cut, maximum amount in both and remainder going to the Sediment Basin. Same access as Alternative 1. | Yes | Take excess dredged material to the Sediment Basin rather to the approved DMCA 2A site. This would save the project money and help to achieve the required fill depth in the Sediment Basin, thereby acting as a salinity block. |
| 3 | Extend dredging 2,600 feet, beneficial reuse of excavated sediments at McCoombs Cut and Rifle Cut, maximum amount in both with the remainder of the sediment placed either in approved DMCAs or in the Sediment Basin. Same access as Alternative 1. | Yes | Potentially reduce costs by allowing the contractor flexibility to place the remaining balance of dredged material at either the approved DMCA site or within the Sediment Basin |
| 4 | Extend dredging 2,600 feet, partial beneficial reuse of excavated sediments at McCoombs Cut site only, rest in DMCAs. Same access as Alternative 1. | No | Using only one site for beneficial use would not achieve as many environmental benefits since it produces less wetlands. The additional sediments going to the DMCAs would take up much |

| | | | |
|---|---|----|---|
| | | | needed capacity for O&M and new work sediments. |
| 5 | Extend dredging 2,600 feet, no change in sediment placement, all excavated sediments to go to approved DMCA's. Same access as Alternative 1. | No | The cost to transport the dredged material from the project area to the approved disposal areas would have the highest cost and would take up needed O&M capacity at the DMCA's. |
| 6 | Extend dredging 2,600 feet, beneficial reuse of excavated sediments at McCoombs Cut and Rifle Cut, maximum amount in both. Same access as Alternative 1. | No | Filling the cuts to a maximum elevation of 9 feet MLLW for wetland habitat would still leave a balance of material that will need to be placed in DMCA 2A as originally planned. |
| 7 | Extend dredging 2,600 feet, beneficial reuse of excavated sediments at McCoombs Cut and Rifle Cut, maximum amount in both, and remainder going to the New Cut Same access as Alternative 1. | No | It would be cost prohibitive to bring the excess dredged material to New Cut for beneficial reuse due to the large amount of rock needed to close New Cut for the limited amount of sediment that would be saved from going to the approved DMCA 2A site. |
| Placement of dredged material to create wetlands or to be placed in approved DMCA's could be accomplished either mechanically or hydraulically. | | | |

2.2 Final Array of Alternatives

Three alternatives to the proposed action (Alternative 3 -Section 1.1) will be considered in detail. Placement of dredged sediments could be accomplished either mechanically or hydraulically.

These alternatives are:

- **No-action Alternative (NAA)** (FEIS PLAN)
- **Alternative 1:** Extend the length of dredging an additional 2,600 feet (24,000 cubic yards) and beneficially use approximately 192,000 cubic yards of excavated sediments at McCoombs Cut and Rifle Cut for intertidal wetland creation, and place the remaining balance of approximately 100,000 cubic yards of excavated sediment in the approved DMCA's. Designate an area on USFWS lands on the Savannah National Wildlife Refuge as a possible access area for the contractor to haul material and supplies to and from the construction site.
- **Alternative 2:** Extend the length of dredging an additional 2,600 feet (24,000 cubic yards) and beneficially use approximately 192,000 cubic yards of excavated sediments at McCoombs Cut and Rifle Cut for intertidal wetland creation, and place the remaining balance of approximately 100,000 cubic yards in the Sediment Basin. Same access as Alternative 1.

2.3 No Action Alternative (NAA) (FEIS Approved Plan).

The NAA is the dredging area and placement plan described in the SHEP GRR and FEIS (FEIS approved plan) in Section 5.01.2.3 of the FEIS, and Appendix C, Section 5.

The plan approved in the FEIS consists of constructing a diversion structure at the upper end of Back River to divert a small portion of freshwater flow on the Savannah River to the upper estuary and down the Middle and Little Back Rivers. The structure itself will be a straight, 280 foot long, steel sheet pile cantilevered wall that extends perpendicular from the south river bank at McCoys Cut into the Savannah River. Stone scour protection would prevent scour along the length of the structure. The south shoreline adjacent to the diversion structure and the north shoreline opposite of the diversion structure would be protected from erosion by cantilever sheet pile shoreline protection walls with toe stone armor for scour protection. The top of the structure would be located at 0 feet MLLW. The tallest portion of the structure would extend approximately 23 feet from the existing river bottom. The structure will be completely submerged at most times. Solar powered lights and signage, constructed upstream and downstream of the structure, would alert river traffic of the potential navigation hazard.

Some environmental dredging would need to occur as discussed in the FEIS. The intent of this mitigation feature is to increase freshwater flow down the Little Back, Back and Middle Rivers and adjacent tidal wetlands. This feature will work in combination with the diversion structure by increasing the flow capacity of the river for the freshwater diverted into the upper estuary. Dredging of these rivers is required to increase their available flow capacity (their ability to transport the freshwater). The dredging in Back River would

extend from the confluence of McCoys Cut and the Savannah River approximately 2.1 river miles down the Little Back River. The dredging in Middle River would begin at the confluence of Middle and Little Back River and extend approximately 1.6 river miles downstream. The dredging template does not include widening and is not expected to impact vegetation adjacent to the channel (wetlands or uplands). Once constructed, a need for future maintenance dredging is not anticipated because increased currents are expected maintain depth.

To prevent the loss of flow diverted into the upper estuary, a plug closure will be constructed on the western end of McCoys Cut (McCoombs Cut) to elevation +11 feet MLLW. A closure will be constructed on the western end of Rifle Cut to elevation +11 feet MLLW in order to prevent movement of saltwater from the Savannah River through Steamboat River and Houston Cut to the Back River. USACE plans to use recycled concrete material (former Highway 17 Bridge) and rock to construct both of these closure structures.

2.4 Alternative 1: Extend Dredging, Beneficial Reuse at Two Sites, with Remainder in Approved DMCA's.

Alternative 1 requires an additional 2,600 feet of dredging within Middle River (stations 58+00 to 84+00) to -7 feet MLLW to provide adequate flows. In addition, the dredging depth would be increased by four feet at the mouth of Union Creek to account for potential future shoaling. The area of additional dredging depth remains within the same footprint as the previously-approved dredging template, but four feet deeper for a distance of approximately 1,360 feet. This alternative includes using the majority of excavated sediments beneficially to create wetlands in both McCoombs Cut (western arm of McCoys Cut) and Rifle Cut to enhance fish and wildlife habitat. The remaining balance of approximately 100,000 cubic yards of course sand from the upper reaches of Middle and Little Back River would be placed in approved DMCA sites.

The sediment would be placed behind the cut closure structures to an elevation suitable for wetland creation. This proposed action, which is conceptually supported by U.S. Fish and Wildlife, would occur within the Savannah National Wildlife Refuge. The volume of sediment to be dredged is sufficient to fill the two cuts to elevation +8 to +8.5 feet MLLW. Topographic surveys conducted for the project indicate that adjacent high ground in both areas are at or above elevation +8 feet MLLW. Before placement of the excavated sediments, a rock, concrete rubble, or similar plug would be constructed across the western ends of both cuts to approximately elevation of +11 feet MLLW. The plug at McCoombs would be 80 feet wide at the base and have 1 foot of dredged material as a cap. The plug at Rifle Cut would be 100 feet wide at the base and have 1 foot of dredged material as a cap. The eastern end will be armored with rock to +5 feet MLLW. Above that elevation, protection against erosion will be provided by hay bales secured with live stakes and several rows of container plantings. The plantings would reduce the risk of erosion immediately after completion of the project until vegetation establishes naturally along the length of the cuts. This action creates approximately nine acres of wetlands.

As a result of logistical concerns of using the Houlihan Bridge during construction, an area will be designated on Savannah National Wildlife Refuge lands as a possible access area for the contractor to haul material and supplies to and from the construction site. (Figure 4). A temporary pile-supported platform would be installed on the edge of the existing tidal wetland and the Back River impacting approximately 0.13 acres of tidal wetlands and 0.10 acres of river. Improvement to the dike leading to the new platform would be completed, impacting approximately 0.23 acres of managed wetlands. This platform is expected to be in place for the duration of the construction timeframe, which is estimated to be approximately one year and would be removed after construction has been completed..

2.5 Alternative 2: Extend Dredging, Beneficial Reuse at Two Sites, with Remainder in the Sediment Basin.

Alternative 2 would require an additional 2,600 feet of dredging within Middle River (stations 58+00 to 84+00) to -7 feet MLLW to provide the required flows. In addition, the dredging depth would be increased by four feet at the mouth of Union Creek to account for potential future shoaling. The area of additional dredging depth is within the same footprint as the previously-approved dredging template, but four feet deeper for a distance of approximately 1,360 feet. This alternative includes using the majority of excavated sediments beneficially to create wetlands in both McCoombs Cut (western arm of McCoys Cut) and Rifle Cut to enhance fish and wildlife habitat. The remaining balance of approximately 100,000 cubic yards of course sand from the upper reaches of Middle and Little Back River would be placed in the Sediment Basin.

As a beneficial use of the sediment dredged from the Middle and Little Back Rivers, the material will be placed behind the cut closure structures to an elevation suitable for wetland creation within the boundary of the Savannah National Wildlife Refuge as described in Alternative 1. As describe in Section 2.4, an area within the Savannah National Wildlife Refuge will be designated as a potential access area to haul material and supplies to and from the construction area impacting approximately 0.36 acres of wetlands (tidal and managed) and approximately 0.10 acres of river habitat.

The remaining excavated material could be transported to an area within the Sediment Basin where Savannah District plans to construct a broad berm as described in the FEIS. Approximately 45 round trips may be needed to transport the excavated sediments to the Sediment Basin and would be coordinated to avoid traffic conflicts with other ships in the project area. Figure 5 shows the area within the Georgia side of the Sediment Basin where the sediments would be placed. The state line between Georgia and South Carolina is not mid channel, but runs along the northern side of the Federal Sediment Basin project. The placement of the excavated sediments would help fill the inactive sediment basin. The area is approximately 30 acres in size, with a bottom elevation of -15 feet MLLW based on an October 2016 hydrosurvey. The placement priority will be at the downstream or eastern end of the box and will be limited to a

placement elevation of -10 feet MLLW (target height for broad berm as described in the FEIS).



Figure 5: Approximate placement location within the Sediment Basin

2.6 Alternative 3: Extend Dredging, Beneficial Reuse at Two Sites, with Remainder in approved DMCAs and/or Sediment Basin.

See Section 1.1, Proposed Alternative for a description of Alternative 3.

3.0 Affected Environment

3.1 General

Section 4.0 of the FEIS describes the affected environment in detail. The method of dredging would not change, but the volume and area would increase.

3.2 Relevant Resources

This section contains a description of relevant resources that could be impacted by the project. The important resources described in this section are those recognized by laws, executive orders, regulations, and other standards of national, state, or regional agencies and organizations, technical or scientific agencies, groups, or individuals, and the general public. USACE Savannah District considered the following resources and believes they would be unaffected by the alternatives under consideration: bottomland

hardwood forest, water bodies, socioeconomic, environmental justice, and recreational resources.

3.2.1 Sediments

Section 4.01.2 and Section 3 of Appendix H of the FEIS describes the sediment characteristics found in the SHEP project area. Sediments excavated from the Savannah Harbor are a mixture of sands, silts, and clays. Sand is defined as grain size between 0.07 and 5.0 mm while silt and clay measures less than 0.07 mm in diameter. Fill material that would be used to construct the various mitigation features of the project include clean sand, rock and riprap.

3.2.2 Wetlands

A wetland delineation report completed in the late summer/early fall of 2016 describes the wetlands found in Little Back River near McCoys Cut/McCoombs Cut and Rifle Cut, where wetland creation activities would occur (Appendix A). The Rifle Cut area is dominated by tidal, emergent wetlands, while the McCoys Cut area contains mostly forested wetlands with small fringe areas of emergent wetlands. No upland areas were observed at Rifle Cut, but a small sandy bluff upland area was observed at McCoys Cut. No upland development presently exists along either project area. Manmade ditches were also observed intersecting with Rifle Cut.

The USFWS National Wetlands Inventory (NWI) maps identified one wetland type surrounding Rifle Cut and two wetland types around Little Back River. In total, the NWI maps identified that wetlands occur in 100 percent of the project area. On both the north and south sides of Rifle Cut, the NWI map depicted a Palustrine emergent wetland. The NWI map for the Little Back River near McCoys Cut shows a Palustrine forested wetland on the north and south sides and a very small portion of a Palustrine emergent wetland in the southwest corner of the project area.

Within the Rifle Cut area, the emergent wetland was almost monotypic in vegetation with *Typha latifolia* covering 96 percent of the area. The Little Back River near McCoys Cut/McCoombs Cut area was dominated by forested and emergent wetlands. There was one small upland area observed in the northeast corner of this area with the rest of the site being wetland or open water.

3.2.3 Aquatic Resources /Fisheries

Section 4.04 of the FEIS describes the aquatic resources found in the SHEP area. Some of the more common fish species found in the Savannah River estuary area include: striped mullet, largemouth bass, bowfin, spotted sucker, common carp, croaker/spot, white catfish, silver perch, spotted seatrout, red drum, striped bass, bluefish, channel catfish, American shad, hickory shad, blueback herring, and American eel. Aquatic resources in the project area also include, oysters, white and brown shrimp and blue crabs.

3.2.4 Essential Fish Habitat

The Magnuson-Stevenson Fishery Conservation and Management Act requires that Essential Fish Habitat (EFH) areas be identified for each fishery management plan and that all federal agencies consult with the National Marine Fisheries Service (NMFS) on federal actions that may adversely affect EFH. Section 4.05 of the FEIS describes the EFH found in the SHEP area. Within the project area, EFH adjacent to McCoys Cut/McCoombs Cut and Rifle Cut are tidal freshwater (palustrine) and tidal palustrine forested areas. In coordination with NMFS, Savannah District determined that the only EFH species that could be impacted by the McCoys Cut project is shrimp, since the construction area is tidal fresh (Table 2).

| Table 2: Essential Fish Habitat (EFH) Species for the Project Area | | | |
|---|---------------------------------|--|--|
| Common Name of Species | Scientific Name of Species | EFH for Life Stages (Estuarine) | Habitat Areas of Particular Concern |
| Brown shrimp | <i>Farfantepenaeus aztecus</i> | Post larvae, juveniles, and adults | Penaeid shrimp HAPC – tidal inlets, state nursery and overwintering habitats |
| White shrimp | <i>Litopenaeus setiferus</i> | Post larvae, juveniles, and sub adults | Penaeid shrimp HAPC – tidal inlets, state nursery and overwintering habitats |
| Pink shrimp | <i>Farfantepenaeus duorarum</i> | Post larvae, juveniles, and sub adults | Penaeid shrimp HAPC – tidal inlets, state nursery and overwintering habitats |

3.2.5 Terrestrial Resources

Section 4.07.1 of the FEIS describes the flora of the Savannah National Wildlife Refuge. The Refuge, located in the upper portion of the harbor, consists of 29,175 acres of freshwater marshes, tidal rivers and creeks, and bottomland hardwoods. It also contains extensive unimpounded wetlands along the Savannah, Middle and Back Rivers. Wetlands located downstream of U.S. Highway 17 are vegetated predominantly by salt marsh and brackish marsh species, while those above that point are predominantly freshwater or brackish species. USFWS also manages 5,700 acres of diked impoundments for waterfowl in the Refuge. Those impoundments include 3,000 acres of freshwater pools.

3.2.6 Wildlife

The Savannah National Wildlife Refuge provides habitat for a wide variety of wildlife species. The Refuge forms an important link in the chain of wildlife refuges along the

Atlantic Flyway and attracts thousands of migratory birds yearly. The Refuge also provides nesting habitat for wood ducks, purple gallinules, bald eagles, anhingas, and swallow-tailed kites. For a complete listing of species found at the Savannah National Wildlife Refuge, see the September 2011 Savannah Coastal National Wildlife Refuges Complex Comprehensive Conservation Plan in Appendix B.

3.2.7 Threatened and Endangered Species

Section 4.09 of the FEIS describes the threatened and endangered (T&E) species that could be found in the SHEP area. An updated species list (Table 3) for the project area was generated using the Information for Planning and Conservation (IPAC) website (<https://ecos.fws.gov/ipac/>) (Appendix B).

3.2.8 Cultural Resources

President Coolidge issued Executive Order No. 4626 on April 6, 1927, establishing the Savannah River Bird Refuge, now known as the Savannah National Wildlife Refuge. The order set aside 2,352 acres and included portions of the Vernezobre, Redeem, Lucknow, Beech Hill, Recess, and Red Knoll Plantations. Through time, the Refuge expanded to 29,175 acres, and it now encompasses Argyle, Hog, Hog Marsh, Isla, and Onslow Islands. Rice plantations and fields flourished in these areas from the late 1700s to the late 1800s.

Numerous archaeological sites associated with the area's rice culture were identified in and along Middle, Little Back and Back Rivers in 2012 (Panamerican Consultants, Inc. 2014). Archaeologists recorded 115 cultural resources sites that represent rice trunks, wharfs, and possible mill sites affiliated with the 18th and 19th century rice plantations during a low water bankline survey. One prehistoric site was recorded. Of the identified sites 111 have potential significance or require further investigation to determine National Register of Historic Places (NRHP) eligibility.

An underwater remote sensing survey of Middle, Little Back and Back Rivers identified 567 magnetic anomalies and 193 side-scan sonar contacts (Panamerican Consultants, Inc. 2014). A total of 11 anomalies and 26 side-scan sonar contacts are considered potentially significant or require further investigation to determine NRHP eligibility.

The 2012 survey included portions of the sediment basin that had been investigated by Tidewater Atlantic Research in 1992 (Watts 1992). No new anomalies or targets were recorded. Archaeological divers investigated seven previously identified targets as part of the 2012 survey. None were determined significant.

3.2.1 Air Quality

Section 4.03 of the FEIS describes the air quality found in the SHEP area. Jasper County and Chatham County remain in compliance with the National Ambient Air Quality Standard. The Georgia Department of Natural Resources, Environmental Protection Division, Air Protection Branch (GA DNR-EPD, APB) and the South Carolina Department of Health and Environmental Control, Bureau of Air Quality, designated both counties as attainment areas.

3.2.2 Water Quality

Section 4.02 of the FEIS describes the water resources found in the SHEP area.

3.2.3 Transportation/Traffic

Within the project area, the Houlihan Bridge in Chatham County, Georgia, is an important node in the transportation network around the port. Based on 2012 data, the Georgia Department of Transportation estimates this busy swing bridge over the Savannah River services approximately 3,570 vehicles daily. Not only do commercial and residential vehicles cross the bridge, but the bridge also opens and closes frequently to allow for vessels to transverse the Savannah River.

Table 3: Threatened and Endangered Species

| Group | Common Name | Scientific Name | Status | Critical Habitat Designated |
|-------------------------|------------------------------|----------------------------------|-----------|-----------------------------|
| Amphibians | Frosted Flatwoods Salamander | <i>Ambystoma cingulatum</i> | T | Y |
| Birds | Kirtland's Warbler | <i>Setophaga kirtlandii</i> | E | N |
| Birds | Piping Plover | <i>Charadrius melodus</i> | T | Y |
| Birds | Red Knot | <i>Calidris Canutus Rufa</i> | T | N |
| Birds | Red-cockaded Woodpecker | <i>Picoides borealis</i> | E | N |
| Birds | Wood Stork | <i>Mycteria American</i> | T | N |
| Fish | Shortnose Sturgeon | <i>Acipenser brevirostrum</i> | E | N |
| Fish | Atlantic Sturgeon | <i>Acipenser Oxyrinchus</i> | E | Proposed |
| Flowering Plants | American Chaffseed | <i>Schwalbea americana</i> | E | N |
| Flowering Plants | Canby's Dropwort | <i>Oxypolis canbyi</i> | E | N |
| Flowering Plants | Pondberry | <i>Lindera melissifolia</i> | E | N |
| Mammals | North Atlantic Whale | <i>Eubalaena Glacialis</i> | E | Y |
| Mammals | West Indian Manatee | <i>Trichechus manatus</i> | E | Y |
| Reptiles | Eastern Indigo Snake | <i>Drymarchon Corais Couperi</i> | T | N |
| Reptiles | Gopher Tortoise | <i>Gopherus Polyphemus</i> | Candidate | N |
| Reptiles | Kemp's Ridley sea turtle | <i>Lepidochelys kempii</i> | E | N |
| Reptiles | Leatherback sea turtle | <i>Dermochelys coriacea</i> | E | Y |
| Reptiles | Loggerhead sea turtle | <i>Caretta</i> | T | Y |

4.0 ENVIRONMENTAL CONSEQUENCES

Section 5.00 of the FEIS describes the environmental consequences of the SHEP.

4.1 Sediment

Future Conditions with No Action (FEIS Plan), Alternative 1, Alternative 2, and Alternative 3 (Proposed Action)

In late November 2016, subsurface investigations were initiated which included portions of McCoys Cut, Little Back River, Middle River and McCoombs Cut. The visual classification of the soil samples collected indicate predominantly medium to coarse sands with little to trace fines and organics. Four out of the nearly 100 samples were comprised of mostly silts/clays, with trace to little sand.

The FEIS included hazardous, toxic and radioactive waste investigations for this project feature. Based on the samples collected analyzed during the most recent subsurface investigation, Savannah District determined that no further investigation of this issue is warranted. Based on the location of the project area, there is a very low risk of contaminants being present. In addition, during the geotechnical analysis process, no unusual colors or odors were noted.

4.2 Wetlands

Future Conditions with No Action (FEIS Plan)

With implementation of the FEIS Plan (NAA), the flow re-routing features would increase freshwater flows into the Back and Middle Rivers. This would limit salinity intrusion and reduce salinity impacts from harbor deepening to tidal freshwater and brackish wetlands. The flow re-routing features benefit tidally-influenced wetlands adjacent to the Middle, Back and Little Back River system which are part of the Savannah River distributary system. To avoid wetland impacts, the project would be constructed from barge-mounted equipment. No land-based access roads or staging areas would be available at the construction sites. Impacts and the required mitigation due to rock closures of the cuts are covered in the FEIS in Section 5.01. As a result of new information USACE recently obtained (discussed in Section 1.2.2), without the proposed additional dredging, the flow re-routing will not perform as originally designed and described in the FEIS.

Future Conditions with Alternative 1, Alternative 2 and Alternative 3 (Proposed Action)

With implementation of Alternative 1, 2 or 3, impacts to wetland habitat as a result of the project would be similar as those discussed for the NAA. However, with implementation of all three alternatives, there would be temporary adverse impacts to existing wetlands where the access area within the Savannah National Wildlife Refuge is proposed. There would be temporary impacts to approximately 0.13 acres of tidal wetlands where the pile supported platform is expected to be placed, as well as approximately 0.10 acre of river that would be impacted due to the shading of the platform. There are also approximately 0.23 acres of managed wetlands that will be impacted by dike

improvement. It is expected that the impacts to the existing wetlands and river as a result of the temporary platform would only last for approximately one year. As part of Alternatives 1, 2, and 3, the sediments excavated for the project would be used to create approximately nine acres of wetland habitat where currently open water exists. Within the project area, there are tidal and non-tidal wetlands surrounding the areas where wetlands would be created. The creation of additional wetlands in the project area will help offset the temporary wetland impacts within the temporary access area within the Savannah National Wildlife Refuge. They would also help improve water quality, provide food and habitat for various fish and wildlife species, and enhance aesthetics and recreation opportunities.

4.3 Aquatic Resources/Fisheries

Future Conditions with No Action (FEIS Plan)

With implementation of the FEIS Plan (NAA), there is a potential risk of direct impact and indirect impacts to aquatic resources using the adjacent wetlands, due to the construction and sediment placement activities. Some aquatic species would be buried while others would be displaced. During construction, short-term increases in turbidity are expected to occur in the project area. The temporary and localized turbidity effects would have only a minor adverse impact on fish species and the aquatic ecosystem. Use of best management practices during construction would minimize turbidity during construction. There are no long-term impacts to fish resources. Impacts associated with the NAA are covered in Section 5.03 of the FEIS.

Future Conditions with Alternative 1

With implementation of Alternative 1, impacts to aquatic resources/fisheries habitat would be similar to those described for the NAA. However, with implementation of this alternative, the sediment dredged for the project would be used to create approximately nine acres of wetland habitat in the project area. This acreage would provide habitat beneficial to species that provide sustenance to resident fish species. In addition, as part of the construction of the access area, approximately 0.10 acres of the Back River will be shaded by the temporary pile supported platform. This newly constructed area may attract fish by providing a shaded area for them during the summer months.

Future Conditions with Alternative 2 and Alternative 3 (Proposed Action)

With implementation of Alternative 2 and Alternative 3, impacts to aquatic resources/fisheries habitat would be similar as those discussed for the NAA and Alternative 1. A silt curtain would be used during construction at the wetland creation sites to minimize those effects. There may also be some temporary turbidity impacts associated with the sediment placement activities at the Sediment Basin. The turbidity effects at the Sediment Basin, expected to be temporary and localized, would have only a minor adverse impact on fish species and the aquatic ecosystem. No long term impacts to fish resources are expected.

4.4 Essential Fish Habitat

Future Conditions with No Action (FEIS Plan)

With implementation of the FEIS Plan (NAA), impacts on Essential Fish Habitat (EFH) would be those covered in Section 5.14 of the FEIS. USACE concluded that with the mitigation and monitoring plans in place, the proposed action would not cause adverse impacts to EFH species, including fish accessibility to habitat. Impacts are expected to be minor on an individual project and cumulative effects basis.

USACE evaluated the overall project impacts on EFH and determined that with the mitigation and monitoring plan, the project would not cause adverse impacts to the EFH species.

Future Conditions with Alternative 1

In coordination with NMFS, Savannah District determined that the only EFH species that could be impacted by the McCoys Cut project would be shrimp, since the project area is dominated by tidal freshwater habitat. The U.S. Fish and Wildlife's Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (South Atlantic) indicate that brown, white, and pink shrimp prefer muddy or peaty bottom substrates. Brown shrimp have been known to frequent other substrates such as sand, silt, or clay, mixed with rock fragments. USACE completed subsurface investigations of the proposed dredging area in late 2016. Visual classification of the soil samples collected indicate the sediments to be excavated consist predominantly of medium to coarse sands, with little to trace fines and organics.

With regards to salinity preference, both white and pink shrimp prefer higher salinity environments. Adult white and pink shrimp spawn where salinities are at least 27 parts per thousand (ppt). While juvenile white and pink shrimp prefer slightly lower salinities these shrimp species can tolerate a wide range of salinities ranging from 18 and 34 ppt. Brown shrimp prefer slightly lower salinities ranging between 8.5 and 17 ppt, but post larvae have been found to survive anywhere between 2 and 40 ppt. Knowing these salinity preferences, USACE evaluated water quality information for the project area by examining USGS gages near the project site. One of the USGS gages is located slightly north of McCoombs Cut/McCoys Cut (https://waterdata.usgs.gov/ga/nwis/uv/?site_no=02198840&PARAMeter_cd=00400,00095,00010) and one is located slightly south west of Rifle Cut (https://waterdata.usgs.gov/ga/nwis/uv/?site_no=02198920&PARAMeter_cd=00400,00095,00010) where the project construction and sediment placement activities would occur (Figure 6).



Figure 6: Location of USGS gages near McCoombs/McCoys and Rifle Cut

Data collected from the USGS gage near McCoombs/McCoys Cut indicate that the average annual salinity is approximately 0.05 ppt, while the average annual salinity near Rifle Cut is approximately 2.67 ppt.

Based on the salinity and sediment preferences for the brown, white, and pink shrimp and the existing conditions of the project area, USACE believes the project will not likely affect these EFH species by the additional dredging and sediment placement activities to create wetlands.

Future Conditions with Alternatives 2 and 3 (Proposed Action)

Impacts associated with Alternative 2 and 3 would be very similar to those described under Alternative 1. However, impacts associated with placement of excavated sediments in the Sediment Basin could have its own impacts to EFH. The sediment composition of the existing bottom at the Sediment Basin is primarily silts. Based on the USGS gage near the Sediment Basin (Figure 7), the average annual salinity in the area is approximately 7 ppt.



Figure 7: Location of USGS gage near the Sediment Basin

Based on the salinity and sediment preferences for the brown, white, and pink shrimp and the existing conditions of the project area, USACE believes the project will not likely affect these EFH species by the additional dredging and sediment placement activities to create wetlands. However, the Sediment Basin has higher salinity levels and is comprised of mostly silty materials. As a result, during sediment placement at the Sediment Basin, there is a possibility that the three species of shrimp could be present.

4.5 Terrestrial Resources

Future Conditions with No Action (FEIS Plan), Alternative 1, Alternative 2, and Alternative 3 (Proposed Action)

There are no expected impacts to terrestrial resources other than what is described in Section 5.08 of the FEIS. The area adjacent the dredging and construction areas are wetlands and the sediments being dredged would be used to create additional wetland habitat.

4.6 Wildlife

Future Conditions with No Action (FEIS Plan), Alternative 1, Alternative 2, and Alternative 3 (Proposed Action)

With implementation of the FEIS Plan (NAA), there are no expected impacts to wildlife resources other than as discussed in Section 5.08 of the FEIS. There are no long-term

impacts expected to the wildlife resources in the area. Short-term, minor impacts are expected from increased turbidity and noise during construction. These may disturb nearby wildlife. Additionally, the project will provide permanent positive impacts to wildlife by increasing freshwater flows in Back and Middle Rivers. This would limit salinity intrusion, reducing salinity impacts from the harbor deepening project to tidal freshwater and brackish wetlands.

4.7 Threatened and Endangered Species

Future Conditions with No Action (FEIS Plan), Alternative 1, Alternative 2 and Alternative 3 (Proposed Action)

The McCoys Cut diversion structure described in the FEIS will not likely adversely affect the protected species identified in Table 3. Potential effects on these listed species are expected to be negligible. The proposed activities would result in minimal disturbance to vegetated areas, because construction equipment will arrive by barge and work from a barge.

Temporary impacts during construction would include construction noise and suspension of sediment in the vicinity of the diversion structure. Appropriate standard precautionary measures would be implemented to minimize impacts during construction.

Sediment control measures would be implemented in the river while the flow diversion structure is being constructed. The flow diversion structure is not expected to have a negative impact on listed species once it is constructed.

To reduce adverse effects to sturgeon during construction of the flow re-routing modifications and during the harbor deepening, special provisions would be implemented to protect sturgeon. The area of the proposed flow re-routing modifications is located in foraging and resting habitat for sturgeon and is used by juvenile shortnose sturgeon during the winter. To minimize project impacts to sturgeon, construction of the diversion and closure structure at McCoys/McCoombs Cut and Rifle Cut would only occur between May 15 and November 1. Most sturgeon are not expected to be in that portion of the estuary during that period, as discussed in the November 4, 2011 final Biological Opinion for SHEP. In addition, dredging would not occur during the spawning season for striped bass, which occurs between April 1 and May 15. As a result of coordination with NMFS in February 2017, additional measures were suggested to minimize potential impacts to sturgeon from the proposed work:

- 1) Monitor water quality (DO, pH, turbidity) downstream of the dredging activity to prevent sediment plumes that could adversely affect the water quality in the deep hole located in the lower Middle River
- 2) Conduct dredging in only one area at a time (either in upper Middle River or the Back River, not both at the same time)

- 3) Regardless of dredging method used, implement precautionary warning techniques before dredging starts each day (e.g., tapping the clamshell bucket on the water surface or some similar method of providing warning)
- 4) Follow similar guidelines as those in NMFS's Sea Turtle and Smalltooth Sawfish Construction Conditions to protect sturgeon observed in or near the dredging area. More specifically, operation of any mechanical construction equipment shall cease immediately if a sturgeon is seen within a 50-foot radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition or a 30-minute waiting period.

The District would implement these measures as part of the proposed action. This document serves as an update to the existing Biological Assessment (Appendix B of the FEIS). This updated assessment concludes that all of the alternatives being evaluated “may affect, but is not likely to adverse effect” Atlantic and shortnose sturgeon or their critical habitat.

4.8 Cultural Resources

Future Conditions with No Action (FEIS Plan)

Savannah District’s 2013 consultation with the Georgia and South Carolina State Historic Preservation Offices (SHPOs) and the USFWS concluded that implementation of the NAA would not adversely impact cultural resources. USACE refined dredging designs for Middle River in 2016, and as a result, one historic rice trunk on the Georgia bank associated with Red Knoll Plantation would be impacted, as an adequate buffer could not be placed around the site. USACE reinitiated consultation with the Georgia SHPO and the USFWS to develop a work plan to conduct detailed archival research, fully delineate the site boundary, and document the site. The work was performed and is sufficient to mitigate the adverse impacts to the site.

Future Conditions with Alternative 1

Extending the length of dredging by an additional 2,600 feet would not affect any cultural resources located along Middle River. Four historic sites, two of which are rice trunk features, and two that are bank reinforcement structures, are located along the expanded area. The sites are located well outside the area of dredging and would not be impacted directly or indirectly by dredging activities.

The construction of plugs in McCoombs Cut and Rifle Cut and the placement of excavated sediment adjacent to those plugs to create wetlands would not impact any cultural resources. No terrestrial or submerged resources are located within the cuts or in areas where sediment material would be placed. The created wetlands will not have a visual impact on the landscape. No cultural resources sites are located at the site of the proposed access platform. Six historic sites are recorded along the shoreline of Back River upstream of the proposed temporary access platform. The project specifications

provided to the contractor will depict the locations of the cultural sites as areas off-limits for mooring to avoid impacts. No sites are located on the dike.

Section 4.10.2 of the FEIS identifies areas within the Area of Potential Effects with extremely low potential for cultural resources. No initial or follow on investigations for historic properties are warranted for those areas. The existing dredged sediment placement sites for Savannah Harbor are included in the list. The original land surfaces in the DMCA that may contain historic properties are buried under 30 or more feet of deposited dredged sediment and would not be impacted by the placement of additional dredged material.

Future Conditions with Alternative 2

No impacts to cultural resources would result with implementation of Alternative 2. Impacts to sites within the extended area of dredging, the areas where dredged sediment would be placed in McCoombs Cut and Rifle Cut, and the associated access area for filling Rifle Cut are the same as described for Alternative 1. Several cultural resources sites associated with maritime history are located along the shoreline within the Sediment Basin. Those sites are outside the limits where dredged material would be placed.

Future Conditions with Alternative 3 or the Proposed Action

Impacts to cultural resources would be same as described in Alternatives 1 and 2.

4.9 Air Quality

Future Conditions with No Action (FEIS Plan)

Although there would be a minimal amount of dust generated during the construction of the diversion and closure structures at McCoys/McCoombs Cut and Rifle Cut, that impact would only occur during the period of construction. Aside from emissions generated by construction equipment and barges hauling the dredged sediment to the various placement sites, no long-term impacts on air quality are expected. Following construction, the structures will be passive and would not generate any additional air pollutants. There would be no permanent impacts to air quality as a result of these alternatives.

Future Conditions with Alternative 1

With implementation of Alternative 1, impacts to air quality would be similar to those described under the NAA. In addition, there would be a minor decrease in greenhouse gasses with implementation of Alternative 1, as a result of the shorter barge movement between the dredging area and the sediment placement sites.

Future Conditions with Alternative 2 and Alternative 3 (Proposed Action)

With implementation of Alternative 2 and Alternative 3, impacts to air quality would be similar to those described under the NAA. With implementation of Alternative 2 and Alternative 3, the barges would have longer distances to haul the dredged material from the excavation area to Sediment Basin than it would take to move the material to the approved DMCA site. However, that impact would still be within the *de minimis level* (minimal threshold for which a conformity determination must be performed for various pollutants in a project area).

4.10 Water Quality

Future Conditions with No Action (FEIS Plan)

With implementation of the FEIS Plan (NAA), short-term water quality impacts will occur from deepening Little Back and Middle River to allow more fresh water to flow into those river systems. There will also be short term water quality impacts during the construction of the diversion structures, resulting from temporary increases in turbidity. More details on impacts to water quality can be found in Section 5.02 in the FEIS.

All the salinity reductions expected in the FEIS would not occur due to the flow restriction that was recently identified in Middle River.

Future Conditions with Alternative 1

With implementation of Alternative 1, the impact to water quality would be the same as those described in the FEIS for the NAA. With implementation of Alternative 1, intertidal wetlands would be created using the sediments dredged from Little Back and Middle Rivers. Once these wetlands mature, they would help improve the water quality within the project area by acting as a natural filtering system, removing excess sediments, nutrients, and pollutants from the water. Wetlands also have the ability to absorb water flows. This can reduce the amount of erosion that occurs and prevent sediment from being transported downstream. The salinity reductions described in the FEIS would occur.

Future Conditions with Alternative 2 and 3 (Proposed Action)

With implementation of Alternatives 2 and 3, the impact to water quality would match those described in the FEIS for the NAA. In addition to the impacts described for Alternative 1, there would be some temporary impacts to water quality as a result of the sediment placement in the Sediment Basin. The composition of the sediment that would be dredged and placed in the Sediment Basin is medium to coarse sand, with little trace of fines and organics. The sandy sediment is expected to drop quickly within the water column, minimizing the amount of turbidity. The excavated sediments would be barged from the dredging area to the Sediment Basin, which means that the fines would have time to settle out before the next round of sediment would be delivered. Based on the

location of the excavation area, there is a very low risk of contaminants being present. As a result, it is anticipated that the proposed action will have only minor and temporary impacts to water quality. The salinity reductions described in the FEIS would occur.

4.11 Transportation/Traffic

Future Conditions with No Action (FEIS Plan)

With implementation of the NAA, all of the dredged sediments from the project are required to go to an approved DMCA placement site. As a result, the number of trips would be greater to take the dredged sediments from the dredging location to the desired placement location. The dredged sediments will either be transported by barge or will be pumped hydraulically using a pipeline, which should not have any adverse impacts to the traffic/transportation in the project area. If the material will be transported by barge, traffic through the Houlihan Bridge will be impacted depending on which DMCA placement site is used. If the material is barged to the DMCA 1N placement site, located above the Houlihan Bridge, traffic should not be impacted other than from trips required to bring materials and equipment for the plugs and diversion structure previously covered in the FEIS. If the material is barged to the DMCA 2A placement site, located below the bridge, traffic would be impacted, causing more frequent bridge openings. In order to ensure safe passage through the bridge during construction hours, and to help with vessel traffic in this portion of the Savannah River, temporary lighting will be installed.

Future Conditions with Alternative 1

With implementation of Alternative 1, approximately 192,000 cubic yards of dredged sediments will be used to create wetlands at both McCoombs Cut and Rifle Cut. The remaining balance of approximately 100,000 cubic yards of dredged sediments will go into an approved DMCA placement site. Impacts associated with Alternative 1 with regards to traffic associated with taking the material to the approved DMCA placement sites will be the same as those described for the NAA, but there would be fewer openings required because of the reduction in the volume of material. If the contractor constructs and uses the pile supported platform on the edge of the Savannah National Wildlife Refuge (Refuge) on the Back River, there will be a temporary increase of marine transportation in this portion of the river during the construction period, which is anticipated to be approximately a year. In addition, there could be an increase of truck traffic along Highway 17 leading away from the DMCA and South Carolina State Road 170.

Future Conditions with Alternative 2

With implementation of Alternative 2, approximately 192,000 cubic yards of dredged sediments will be used to create wetlands at both McCoombs Cut and Rifle Cut. The remaining balance of approximately 100,000 cubic yards of dredged sediments will go into the Sediment Basin. During the construction period, the portion of the sediments

going to the Sediment Basin will require the barges to go through the Houlihan Bridge. These trips to and from the Sediment Basin will cause more frequent openings of the bridge compared to normal circumstances. It will also be in addition to the opening required for the material and equipment needed to construct the plugs and diversion structure previously covered in the FEIS. In order to ensure safe passage through the bridge during construction hours, and to help with vessel traffic in this portion of the Savannah River, temporary lighting will be installed. If the contractor constructs and uses the access at the Refuge the impacts would be the same as those described in Alternative 1.

Future Conditions with Alternative 3 or the Proposed Action

With implementation of Alternative 3, the portion of the excavated sediments dredged as part of the project going to the Sediment Basin will be barged as described in impact description for Alternative 2. The portion of the dredged material going to the approved DMCAs, will be transported by barge, like the material going to the Sediment Basin and therefore will have similar impacts on traffic on the Houlihan Bridge as described under the Alternative 1. If the material is pumped hydraulically using a pipeline there should not be any adverse impacts to the traffic/transportation in the project area. If the contractor constructs and uses the access at the Refuge, the impacts would be the same as those described in Alternative 1.

4.12 Cumulative Impacts

The Council on Environmental Quality's (CEQ) regulations (40 CFR 1500-1508) implementing the procedural provisions of the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 et seq.) define cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR 1508.7)". Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time."

Future Conditions with No Action (FEIS Plan)

With implementation of the NAA, there would be no change in cumulative impacts from those described in the FEIS (Appendix L of FEIS).

Future Conditions with Alternative 1

With implementation of Alternative 1, some temporary impacts will occur as a result of the additional dredging and sediment placement activities associated with the creation of approximately nine acres of wetlands. Adhering to appropriate environmental dredging windows and watching dissolved oxygen levels throughout the process to ensure they do not fall below the 5.0 mg/L threshold will minimize these impacts. The creation of wetlands would have positive benefits over time as the wetlands mature,

providing food and habitat for various fish and wildlife species, improving overall water quality, and minimizing shoreline erosion.

Future Conditions with Alternatives 2 and 3 (Proposed Action)

With implementation of Alternatives 2 and 3, impacts would be similar to those described for Alternative 1. In addition to those impacts, there would be minor and temporary water quality impacts associated with sediment placement activities in the Sediment Basin. These short term impacts would not cause any long term impacts to the water quality.

5.0 COORDINATION

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

Coordination with the state and federal agencies continues and has included discussions at an interagency meeting on October 25, 2016, a meeting with USFWS Refuge staff on January 26, 2016, and an informational email to the various state and federal agencies on February 7, 2017.

Recommendations of the U.S. Fish and Wildlife Service that are received in accordance with the Fish and Wildlife Coordination Act will be considered and addressed in the final EA.

6.0 MITIGATION

The appropriate application of mitigation is to formulate an alternative that first avoids adverse impacts, then minimizes adverse impacts, and lastly, compensates for significant unavoidable impacts. To ensure that dredging and construction activities does not affect manatees, Savannah District has adopted and would implement on this project the "Standard State and Federal Manatee Protection Conditions."

The McCoys Cut project is a mitigation feature of SHEP. This feature is part of a group of features that would re-route flows in the estuary. These features were designed to work in combination to increase freshwater flows in the Back and Middle Rivers. They would limit salinity intrusion to reduce salinity impacts from the harbor deepening project to tidal freshwater and brackish wetlands. These features benefit tidally-influenced wetlands adjacent to the Middle, Back and Little Back River system which are part of the Savannah River distributary system. This system of smaller cuts and rivers joins the navigation channel on the Savannah (or Front) River in several locations.

The additional dredging being proposed is needed for the flow re-routing features to fulfill their purposes described in the FEIS.

Actions associated with the creation of approximately nine acres of wetlands using the excavated sediments should not have any long term negative impacts that would require compensatory mitigation.

If the contractor constructs the access point in the Refuge there would be temporary impacts to approximately 0.13 acres of tidal wetlands and 0.23 acres of managed wetlands. The impacts to the tidal wetlands will be minimized by the subsequent removal of the pile supported platform and replanting of the area. The Refuge provided a list of plants that are acceptable for use in the area. The sum of the impacts to the managed wetlands will be minimized when at the end of construction the 16 foot crest width of the dike is degraded to maintain an approximately 20 foot berm. Disturbed areas of this berm will be replanted. A small portion (approximately half an acre) of the construction of the nine acres of tidal wetlands by the project will compensate for the impacts to the diked managed wetlands.

7.0 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

7.1 Existing Approvals Not Requiring Update

The following environmental compliances would not change from what is in the FEIS due to the proposed action and do not require an update:

Air Quality (Appendix K of the FEIS) – no significant change in equipment used or hours of operation.

7.2 Existing Approvals Requiring Update

The following environmental compliances would require updating as a result of the proposed alternative since additional dredging would be performed and beneficial reuse of the excavated sediment is included to create wetlands:

1. Section 404(b)(1) Evaluation (Appendix H of the FEIS) - fill being placed in the waters of the U.S. to beneficially create wetlands. As a result of the proposed action, an updated 404(b)(1) can be found in Appendix C.

2. Section 401 Certification (Appendix Z of the FEIS) - additional dredging would be performed, and fill would be placed in the waters of the U.S. to beneficially create wetlands
3. Coastal Zone Management (CZM) Act (Existing CZM determinations for the SHEP can be found in Appendix J of 2012 FEIS) - additional dredging would be performed, and fill would be placed in the waters of the U.S. to beneficially create wetlands. As a result of the proposed action, updated CZM determinations for both the States of Georgia and South Carolina can be found in Appendix E and F respectively.

7.3 Environmental Approvals

Environmental compliance for the proposed action would be achieved upon: 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 NMFS confirmation that the proposed action would not be likely to adversely affect any endangered or threatened species or their critical habitat; concurrence by the State Historic Preservation Officers with Savannah District's determination the proposed action will not affect cultural resources; receipt and acceptance or resolution of all USFWS Fish and Wildlife Coordination Act recommendations; receipt and acceptance or resolution of all state comments on the air quality impact analysis documented in the EA; and receipt and acceptance or resolution of all NMFS Essential Fish Habitat recommendations. The FONSI would not be signed until the proposed action complies with applicable environmental laws and regulations, as described above.

| Table 4: Compliance of the Proposed Action with Executive Orders | | |
|---|---------------|--------------------------|
| Executive Orders | Number | Compliance Status |
| Equal Opportunity | 11246 | In Compliance |
| Protection and Enhancement of Environmental Quality | 11514/11991 | In Compliance |
| Protection and Enhancement of the Cultural Environment | 11593 | In Compliance |
| Convict Labor | 11755 | In Compliance |
| Floodplain Management | 11988 | In Compliance |
| Protection of Wetlands | 11990 | In Compliance |

| Table 4: Compliance of the Proposed Action with Executive Orders | | |
|--|---------------|--------------------------|
| Executive Orders | Number | Compliance Status |
| Federal Compliance with Pollution Control Standards | 12088 | In Compliance |
| Environmental Effects Abroad of Major Federal Actions | 12114 | In Compliance |
| Federal Compliance with Right-To-Know Laws and Pollution Prevention | 12856 | In Compliance |
| Federal Actions to Address Environmental Justice and Minority and Low-Income Populations | 12898 | In Compliance |
| Implementation of the North American Free Trade Agreement | 12889 | In Compliance |
| Energy Efficiency and Water Conservation at Federal Facilities | 12902 | In Compliance |
| Federal Acquisition and Community Right-To-Know | 12969 | In Compliance |
| Protection Of Children from Environmental Health Risks and Safety Risks | 13045 | In Compliance |
| Environmental Justice | 12898 | In Compliance |
| National Invasive Species Council | 13112 | In Compliance |
| Responsibilities of Federal Agencies to Protect Migratory Birds | 13186 | In Compliance |

8.0 CONCLUSION

The proposed action consists of (1) dredging an additional 2,600 feet in Middle River to achieve the intended flow needed to fulfill the SHEP's mitigation requirements, and (2) increasing the dredging depth at the mouth of Union Creek by four feet to account for potential future shoaling. The area of additional dredging depth would be within the same footprint as the approved dredging template, but four feet deeper for a distance of approximately 1,360 feet.

The proposed action also consists of using the majority of the excavated sediments to create approximately nine acres of wetlands and placing the remaining 100,000 cubic

yards of sediment in either a portion of the Sediment Basin (another flow re-routing feature of the SHEP) or in an existing upland DMCA.

Savannah District has assessed the environmental impacts expected from the various alternatives and determined that the proposed action (Alternative 3) would have no unacceptable impacts upon cultural resources, wildlife, rare, threatened and endangered species, EFH, terrestrial resources, or air quality. Over time, the proposed action would result in more beneficial effects on wetlands, aquatic resources and water quality than those described for the plan approved in the FEIS.

9.0 PREPARED BY

This SEA and the associated draft FONSI were prepared by Robin Armetta, Biologist, with relevant sections prepared by: Julie Morgan - Archeologist; Taylor Wimberly - Project Manager; Laura Williams – Civil Engineer; and Lee Schuman – Geotechnical Engineer.

The address of the preparers is: Environmental Resources Branch, Savannah District, U.S. Army Corps of Engineers, 100 West Oglethorpe Avenue, Savannah, Georgia 31401-0889

10.0 REFERENCES

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**DRAFT FINDING OF NO SIGNIFICANT IMPACT
(FONSI)**

**SAVANNAH HARBOR EXPANSION PROJECT
Modification of McCoys Cut Feature (McCoys Cut)**

Chatham County, Georgia and Jasper County, South Carolina

1. Description of Proposed Action: The U.S. Army Corps of Engineers (USACE), Savannah District, proposes to modify the McCoys Cut Feature previously discussed in the July 2012 Final Environmental Impact Statement (FEIS) for the Savannah Harbor Expansion Project (SHEP) and Record of Decision dated October 26, 2012.

This proposed action modifies what is described in the FEIS Section 5.01.2.3, and Appendix C. The proposed action consists of (1) dredging an additional 2,600 feet in Middle River (stations 58+00 to 84+00) to -7 feet mean lower low water (MLLW) to provide required flows, (2) dredging an additional 4 feet at the mouth of Union Creek to account for potential future shoaling. This additional depth is within the same footprint, just four feet deeper for a distance of approximately 1,360 feet. A large portion of the sediment removed as part of the project will be used beneficially to create wetlands in McCoombs (western arm of McCoys Cut) and Rifle Cuts, rather than place all of the material in the upland Dredged Material Containment Areas (DMCA) as described in the 2012 FEIS. The remaining quantity of dredged sediment will be placed either in existing DMCAs or in a portion of the Sediment Basin, which is another feature of the flow re-routing effort for SHEP.

2. Factors Considered in Determination: USACE Savannah District assessed the impacts of the proposed action on important resources, including wetlands and aquatic resources/fisheries, terrestrial resources, wildlife, threatened, endangered and protected species, cultural, air quality, and water quality. No significant adverse impacts were identified for any of the important resources. The risk of encountering HTRW is low based on the location of the project area. No impacts were identified that would require compensatory mitigation. The proposed action has the potential to change the impact on the Coastal Zone as additional dredging would be performed and fill would be placed in the waters of the U.S. to beneficially create tidal wetlands. Therefore the District completed an updated Section 404(b)(1) analysis was completed. It is anticipated the proposed action will improve water quality when compared to the No Action Alternative with the creation of tidal wetlands by acting as a natural filtering system, removing excess sediments, nutrients, and pollutants from the water. Wetlands also have the ability to absorb water flows. This can reduce the amount of erosion that occurs and prevent sediment from being transported downstream.

In addition, USACE Savannah District will concur with or resolve all Fish and Wildlife Coordination Act recommendations. With regards to Essential Fish Habitat, based on the salinity and sediment preferences for the brown, white, and pink shrimp and the

existing conditions of the project area. USACE believes the project will not likely affect these EFH species by the additional dredging and sediment placement activities to create wetlands.

3. Environmental Design Commitments. The following commitments are an integral part of the proposed action:

1. If the proposed action is changed significantly or is not implemented within one year, Savannah District will coordinate with the U.S. Fish and Wildlife Service to ensure that the proposed action would not adversely affect any Federally-listed threatened or endangered species, or their habitat.
2. As a result of recent coordination with National Marine Fisheries Service in February 2017, the project includes the following measures to minimize potential impacts to sturgeon:
 - a. Monitor water quality downstream of the dredging activity to prevent sediment plumes that could adversely affect the water quality in the deep hole located in the lower Middle River.
 - b. Conduct dredging in only one site at a time (either in upper Middle River or the Back River, not both at the same time).
 - c. Regardless of which dredging method is used, implement precautionary warning techniques before dredging starts each day (e.g., tapping the clamshell bucket on the water surface or some similar method of providing warning).
 - d. Follow guidelines similar to those in NMFS's Sea Turtle and Smalltooth Sawfish Construction Conditions to protect sturgeon observed in or near the dredging area. More specifically, operation of any mechanical construction equipment shall cease immediately if a sturgeon is seen within a 50-foot radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition or a 30-minute waiting period.

4. Public Involvement. Coordination with the state and federal agencies has been ongoing and has included discussions at an interagency meeting on October 25, 2016, a meeting with USFWS Refuge staff on January 26, 2017, and an informational email to the various state and federal agencies on February 7, 2017. The proposed action will be coordinated with appropriate federal, state, and local agencies and businesses, organizations, and individuals through distribution of a draft Environmental Assessment for their review and comment.

5. Conclusion. USACE Savannah District has assessed the potential environmental impacts of the proposed action. Based on this assessment, a review of the comments

made on the Environmental Assessment, and implementation of the environmental design commitments described in the EA and listed above, USACE Savannah District concludes that the proposed action will not result in a significant impact on the human environment. Therefore, an Environmental Impact Statement will not be prepared.

Draft

Date

Marvin L. Griffin
Colonel, U.S. Army
Commanding

Appendices

- ❖ Appendix A: 2016 Wetland Delineation Report for Rifle Cut and McCoys Cut
- ❖ Appendix B: USFWS IPAC: Federally listed species for the project area
- ❖ Appendix C: Section 404(b)(1) Evaluation
- ❖ Appendix D: Value Engineering Proposals Table
- ❖ Appendix E: Georgia Coastal Zone Consistency Determination
- ❖ Appendix F: South Carolina Coastal Zone Consistency Determination

Appendix A

❖ 2016 Wetland Delineation Report for Rifle Cut and McCoys Cut

Wetland Delineation Report



Prepared For:
Lowe Engineers
United States Army Corps of Engineers, Savannah District

SHEP Wetland Delineation
Rifle Cut and McCoy's Cut, Savannah GA
Task Order on Contract Number W912HN-12-D-0031

AECOM

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AECOM Project Number: 60519402

Table of Contents

| | |
|--|---|
| 1.0 Introduction | 4 |
| 1.1 Purpose of Document..... | 4 |
| 1.2 Wetland Definition | 4 |
| 1.3 Site Location and Description..... | 4 |
| 1.4 Habitat Description | 5 |
| 1.5 National Wetlands Inventory | 5 |
| 1.6 Topography | 5 |
| 1.7 Soils..... | 5 |
| 2.0 Methods | 6 |
| 2.1 Data Collection..... | 6 |
| 2.1 Data Analysis | 7 |
| 2.1.1 Wetland Classification..... | 7 |
| 2.1.2 Mapping | 7 |
| 3.0 Jurisdictional Findings | 7 |
| 3.1 Rifle Cut | 7 |
| 3.2 Little Back River | 8 |
| 4.0 Environmental Permitting | 8 |
| 5.0 Other Regulatory Considerations | 8 |
| 6.0 Literature Cited | 9 |

Tables

Table 1 – Wetlands Intersecting the Project as Indicated by NWI Maps

Table 2 – Soils Intersecting the Project as Indicated by NRCS

Table 3 – Delineation Results Summary

Figures

Figure 1 – Site Vicinity Aerial Map

Figure 2 – Site Vicinity Topo Map

Figure 3a – Delineation Aerial Map Rifle Cut

Figure 3b – Delineation Aerial Map Little Back River

Figure 4a – USGS Topographic Map Rifle Cut

Figure 4b – USGS Topographic Map Little Back River

Figure 5a – National Wetlands Inventory Rifle Cut

Figure 5b – National Wetlands Inventory Little Back River

Figure 6a – USDA-NRCS Soil Map Rifle Cut

Figure 6b – USDA-NRCS Soil Map Little Back River

Appendices

Appendix A – Scope of Work

Appendix B – Wetland Datasheets

Appendix C – Photographic Log

1.0 Introduction

Rifle Cut and the Little Back River near McCoy's Cut are two project areas part of an environmental mitigation project in the Savannah River Basin. The project locations are on lands that are part of the Savannah National Wildlife Refuge, which is owned and operated by the US Fish and Wildlife Service. AECOM was not made aware of proposed project activities thus such considerations have not been included in this report (See Appendix A).

1.1 Purpose of Document

AECOM has prepared this Wetlands Delineation Report on behalf of Lowe Engineers to identify wetlands and Waters of the U.S. present within the study areas. The purpose of this document is to describe the methods used to identify wetlands and other features and present the results of the field delineation.

1.2 Wetland Definition

Wetlands are defined by the U.S. Army Corps of Engineers ([USACE] 33 CFR 328.3, 1986) and the U.S. Environmental Protection Agency ([EPA] 40 CFR 230.3, 1980) as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions". Many wetlands and other water features, including ephemeral, seasonal (formerly intermittent), and perennial streams, are considered waters of the United States by the USACE and these "preliminary jurisdictional" areas are protected under Section 404 of the Clean Water Act (CWA).

1.3 Site Location and Description

The site locations include Rifle Cut and the Little Back River near McCoy's Cut. Rifle Cut is an approximately 2,000-foot long surface water located between the Middle River and the Back River, connecting with the Middle River on its western boundary approximately 800 feet upstream of the GA Hwy 25 (N. Coastal Hwy) bridge crossing Middle River. Little Back River is an approximately 2,300-foot long stream off the Savannah River that flows into McCoy's Cut, located approximately 5 miles upstream of the Houlihan Boat Ramp Park. The wetland delineation covered the length of the two locations, extending no more than 100 feet beyond the top edge of the wetland/surface water interface on both sides of the Cut/River. Both project areas are within the tidal range of the overall Savannah River system. The project locations are on lands that are part of the Savannah National Wildlife Refuge, which is owned and operated by

the U.S. Fish and Wildlife Service (USFWS). While performing the delineation, care was taken to minimize disturbance on the sites as much as possible.

1.4 Habitat Description

The project areas are within the Savannah National Wildlife Refuge, in the Savannah River Basin. Both sites are tidally influenced. The Rifle Cut area is dominated by tidal, emergent wetlands while the McCoy's Cut area contains mostly forested wetlands with small fringe areas of emergent wetlands. No upland areas were observed at Rifle Cut, but a small sandy bluff upland area was observed at McCoy's Cut. No development has occurred along either project area. Man-made ditches were also observed intersecting with Rifle Cut.

1.5 National Wetlands Inventory

The USFWS National Wetlands Inventory (NWI) Maps (USFWS 2015) indicate one wetland type surrounding the Rifle Cut project area and two wetland types around Little Back River project area (Table 1.5). In total, the NWI maps indicate that wetlands occur in 100% of the project areas. On both the north and south sides of Rifle Cut, the NWI map depicted a PEM1Td wetland. The NWI map for the Little Back River near McCoy's Cut shows a PFO1/2T wetland on the north and south sides and a very small portion of a PEMT1 wetland in the southwest corner of the project area.

| Project Area | NWI Code | Wetland Class | Wetland Subclass | Water Regime (Special Modifier) | % of Total Project Area |
|-------------------|----------|---------------------|------------------|---------------------------------------|-------------------------|
| Rifle Cut | PEM1Td | Palustrine Emergent | Persistent | semi-permanently flooded-fresh, tidal | 100 |
| Little Back River | PFO1/2T | Palustrine Forested | Persistent | semi-permanently flooded-fresh, tidal | 98 |
| Little Back River | PEMT1 | Palustrine Emergent | Persistent | semi-permanently flooded-fresh, tidal | <2 |

1.6 Topography

According to the U. S. Geological Survey (USGS) topographic maps for the Project (USGS 2016), elevations are below 1.5 mean sea level (msl) in both project areas. Topographic maps for the project areas are found in Figures 2, 4a, and 4b.

1.7 Soils

Based on a review of the USDA-NRCS online Web Soil Survey (2016), the study area crosses 3 soil types within the Little Back River project area and one soil type within Rifle Cut, which are described in the table below and shown in Figure 2.

| Table 2 Soils Intersecting the Project as Indicated by NRCS | | | |
|--|-----------|---|---------------------|
| Project Area | Soil Code | Soil Name | NRCS Hydric Rating* |
| Rifle Cut | Tmh | Tidal Marsh Fresh | YES |
| Little Back River | AB | Angelina & Bibb soils, frequently flooded | YES |
| | Tmh | Tidal marsh fresh | YES |
| | LE | Levy Soils | YES |

*This rating indicates the percentage of map units that meets the criteria for hydric soils and are separated based on their percentage of hydric components. The National Technical Committee for Hydric Soils definition identifies general soil properties associated with wetness. In order to determine whether a specific soil is hydric or nonhydric, more specific information including depth and duration of the water table is needed. (NRCS 2015)

2.0 Methods

2.1 Data Collection

AECOM wetland scientists evaluated the project areas at Rifle Cut and Little Back River near McCoy's Cut on September 21, 2016. This included the identification and delineation of wetlands and other water features in accordance with the protocol outlined in the 1987 U.S. Army Corps of Engineers Wetlands Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain (Version 2.0).

Each wetland and upland feature in the proposed project area was assigned a unique identification (ID) number. One soil pit was examined for Rifle Cut that represented the entire project area. Two soil pits were examined at Little Back River: a wetland pit and an upland pit. Each pit was examined for the presence of hydric soil indicators and wetland hydrology indicators. Wetland vegetation, soils, and hydrology data were recorded on Wetland Determination Data Forms – Atlantic and Gulf Coastal Plain Region for each wetland pit and the associated upland site (Appendix B). Photographs for each observation point were also taken and can be viewed in Appendix C. It should be noted that there were no upland areas present at Rifle Cut and therefore no upland pit or data form was taken.

The project sites were accessed via boat. The upland/wetland boundaries and surface water boundaries were demarcated using field flagging and a differential Global Positioning System (GPS) device was used to locate the field flags. Due to the presence of deep water and strong tidal action, much of the surface water boundaries were marked and GPS-located from a boat. Observation points for the wetland and upland points were taken by foot.

2.1 Data Analysis

2.1.1 Wetland Classification

During field surveys, wetlands were classified using the Cowardin classification system (Cowardin, et al. 1979). According to this classification system, two types of wetlands were identified: estuarine emergent (EEM) at Rifle Cut and estuarine forested (EFO) at Little Back River near McCoy's Cut. Emergent wetlands are characterized by emergent plants—i.e., erect, rooted, herbaceous hydrophytes, excluding mosses and lichens—are the tallest life form with at least 30% areal coverage. Forested wetlands are characterized by woody vegetation that is 6 meters or taller.

2.1.2 Mapping

After determining the extent of each wetland based on the presence of hydric soils, hydrophytic vegetation, and wetland hydrology, the wetland boundary was mapped on aerial photography using GIS. Acreages for delineated wetlands can be found in the Delineation Results Table 3. The GPS was programmed to only record points with a minimum of five satellites and a Position Dilution of Precision (PDOP) value no greater than 4.0.

3.0 Jurisdictional Findings

Jurisdictional wetlands and surface waters were identified and delineated within both of the project areas. The wetland characteristics for each area are described below and a summary of delineation findings is located in Table 3.

| Project Area | Site Number | Latitude | Longitude | Cowardin Class | Estimated amount of aquatic resource in review area | Class of aquatic resource |
|-------------------|-------------|----------|-----------|----------------|---|--------------------------------|
| Rifle Cut | WA | 32.16801 | -81.13090 | E2EM1 | 10 acres | Wetland, tidal |
| | SA | 32.16796 | -81.13358 | R1SB6 | 2200 lf | Non-wetland, Section 10, tidal |
| Little Back River | WB | 32.22210 | -81.13358 | E2PFO1/4 | 10 acres | Wetland, tidal |
| | SB | 32.22158 | -81.14748 | R1SB6 | 2400 lf | Non-wetland, Section 10, tidal |

3.1 Rifle Cut

This project area contained Rifle Cut, a tidal surface water, and emergent tidal wetlands that surround it. The emergent wetland was almost monotypic in vegetation with *Typha latifolia*

covering 96% of the area. Hydrology was present in the form of saturation and water table to the surface. At the time of the observation point WA1-EEM, there was no surface water present; however a tidal change occurred during the time of delineation, which inundated the entire project area. No upland areas were identified at this project site. Jurisdictional status is assumed for Rifle Cut. Figures showing the location and delineation of Rifle Cut are shown in Figures 3a, 4a, 5a, and 6a.

3.2 Little Back River

This project area contained Little Back River, a tidal surface water, and forested and emergent wetlands that surround it. One small upland area was observed in the northeast corner of this study area with the rest of the site being wetland or open water. At the observation point WB2-EFO, dominant trees included *Nyssa biflora* and *Acer rubrum*. Dominant saplings/shrubs were *Alnus serrulata*, *Persea borbonia*, and *Persea palustris*. *Saururus cernuus*, *Chasmanthium latifolium*, and *Zizania aquatica* dominated the herbaceous stratum. Tidal fluxes influence this area greatly. Inundation occurred throughout the project area save for the small upland area. Jurisdictional status is assumed for Little Back River. Figures showing the location and delineation of Little Back River are shown in Figures 3b, 4b, 5b, and 6b.

4.0 Environmental Permitting

If development activities are proposed at either site that impact jurisdictional features, coordination with the U.S. Army Corps of Engineers Savannah and/or Charleston Districts will be required. Depending on the total amount of impacts proposed, the project could be eligible for coverage under a Nationwide Permit (NWP) – generally less than 0.5 acres of wetland impact and/or 300 linear feet of stream impact (USACE 2012). If proposed impacts exceed the impact thresholds for the relevant NWP, then an Individual Permit will be required.

Additional coordination with State-level environmental regulatory agencies will also be necessary, specifically with Georgia Department of Natural Resources – Coastal Resources Division, and South Carolina Department of Environmental Health and Control.

5.0 Other Regulatory Considerations

Compliance with Section 106 of the National Historic Preservation Act (NHPA) and Section 7 of the Endangered Species Act (ESA) will be required for federal permits (NHPA 2016, ESA 2016). The upland area identified in the project area at Little Back River near McCoy's Cut was observed to be a sandy bluff with a relatively open understory. Such areas located along major river systems can contain cultural resources from prehistoric civilizations. Both project areas are located within the Savannah National Wildlife Refuge which has multiple documented occurrences of threatened and endangered species. Site assessments to document the presence/absence of cultural resources and/or protected species may be required.

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Figures



Service Layer Credits: Source:
 Esri, DigitalGlobe, GeoEye,
 Earthstar Geographics,



0 750 1,500 3,000
 Feet

Drawn By: LLM

- Road
- ▭ Project Limits

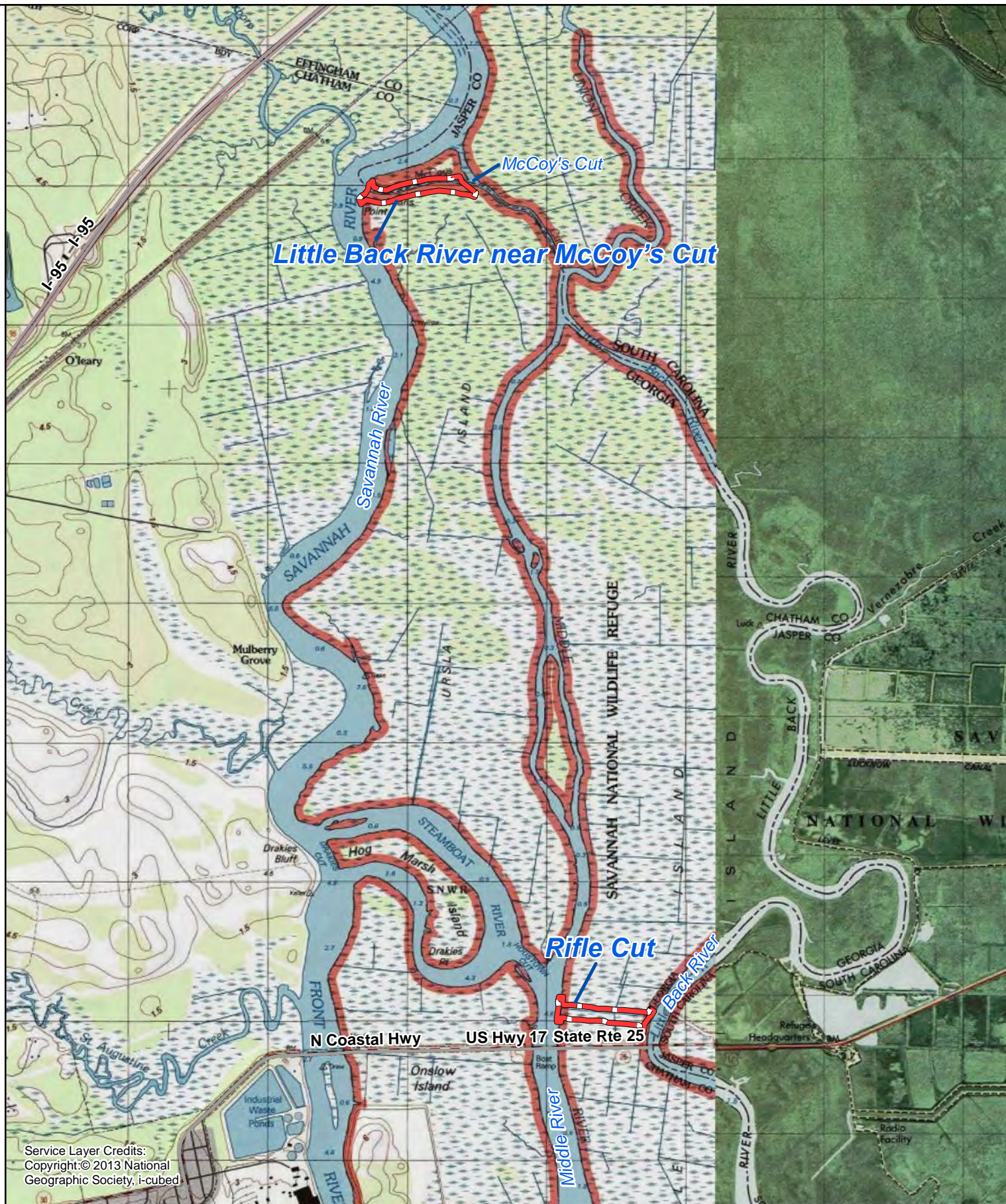
Date Drawn/Revised: (10/14/2016)

Project No. 60519402.1

Figure 1
Site Vicinity Aerial Map



L:\work\GIS\Step Wetland Delineation\map2_Vicinity_Map_topo.mxd



Service Layer Credits:
 Copyright © 2013 National
 Geographic Society, i-cubed



- Road
- ▭ Project Limits

0 750 1,500 3,000
 Feet

Drawn By: LLM

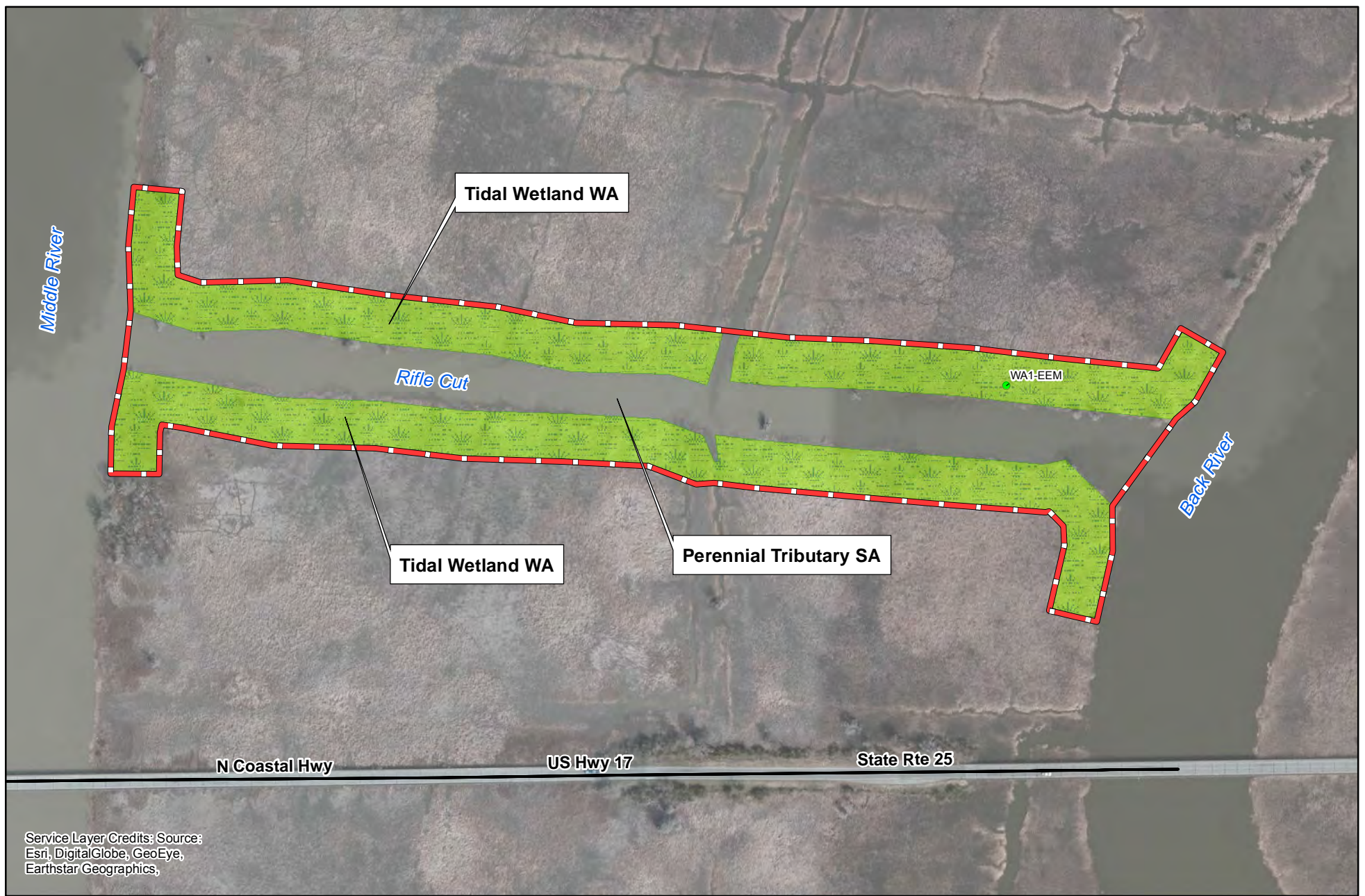
Date Drawn/Revised: (10/14/2016)

Project No. 60519402.1

Figure 2
Site Vicinity Topo Map



L:\work\GIS\Step Wetland Delineation\map3a-Rifle Cut Wetland Delineation.mxd

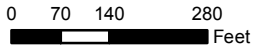


Service Layer Credits: Source:
 Esri, DigitalGlobe, GeoEye,
 Earthstar Geographics,



- Observation Point
- Georgia Wetland
- Road
- Project Limits

Note:
 (1) Horizontal Datum required for this project is NAD 1983 (2011) State Plane Georgia East.
 (2) Vertical Datum required for this project is Mean Lower Low Water (MLLW),
 Epoch 1983-2001 and the North American Vertical Datum of 1988 (NAVD88).
 (3) Units of measure required for this project is US Survey Feet."



Drawn By: LLM

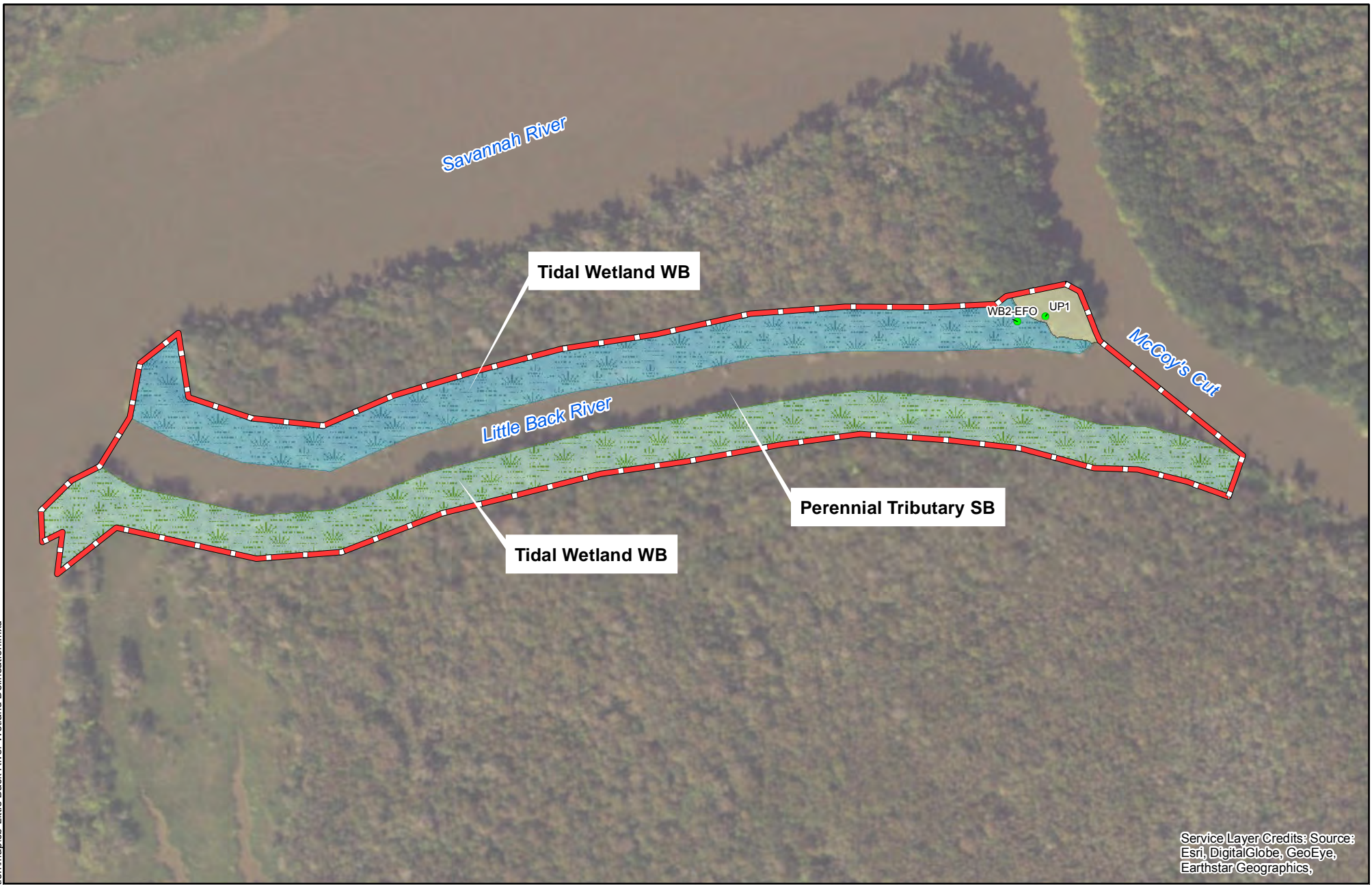
Date Drawn/Revised: (10/14/2016)

Project No. 60519402.1

Figure 3a
Delineation Aerial Map
Rifle Cut



L:\work\GIS\Step Wetland Delineation\map3b-Little Back River Wetland Delineation.mxd



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics,



- Observation Point
- Road
- Project Limits
- Georgia Wetland
- South Carolina Wetland
- Upland

Note:
 (1) Horizontal Datum required for this project is NAD 1983 (2011) State Plane Georgia East.
 (2) Vertical Datum required for this project is Mean Lower Low Water (MLLW), Epoch 1983-2001 and the North American Vertical Datum of 1988 (NAVD88).
 (3) Units of measure required for this project is US Survey Feet."

Figure 3b
Delineation Aerial Map
Little Back River



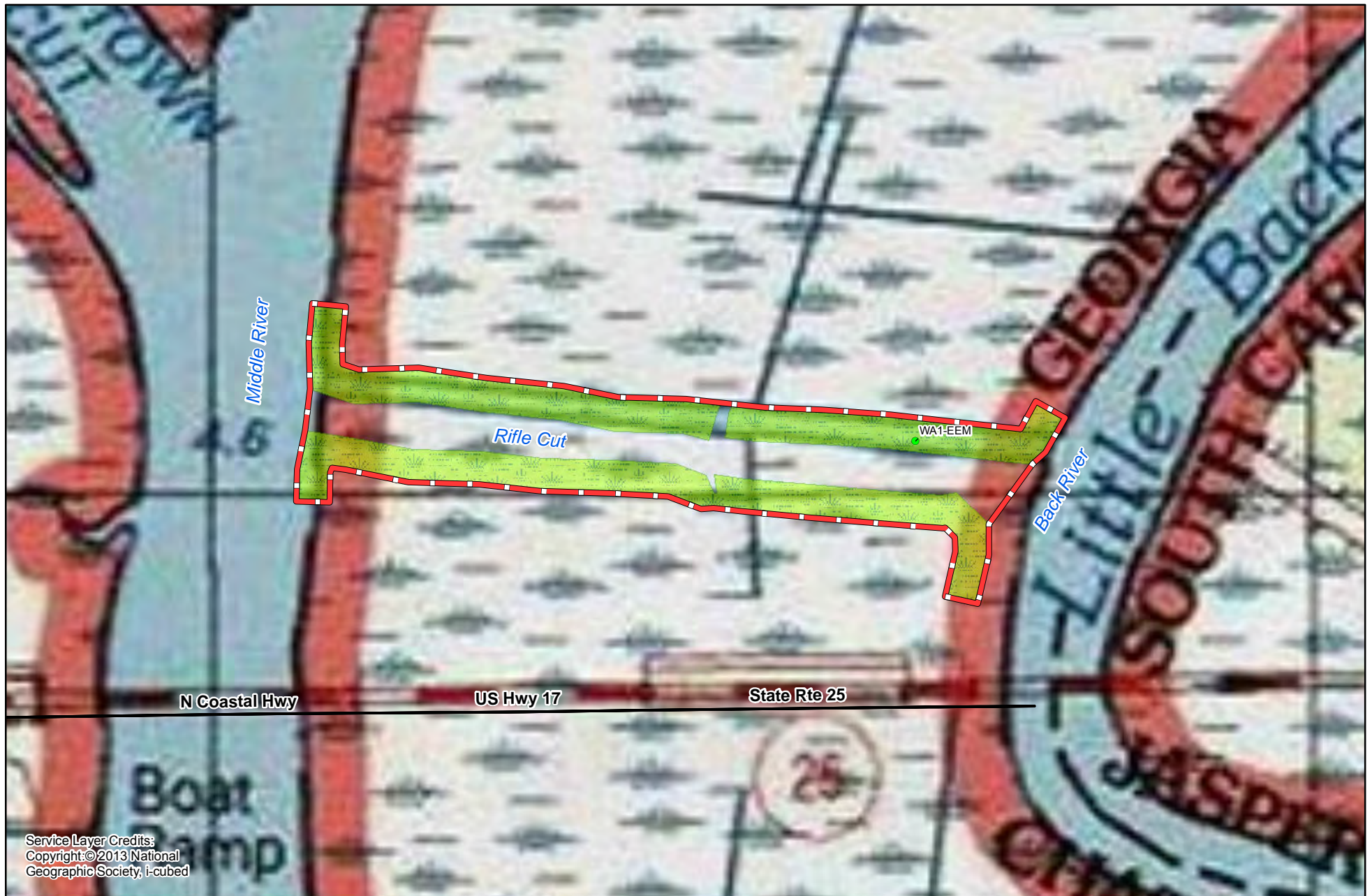
0 75 150 300
Feet

Drawn By: LLM

Date Drawn/Revised: (10/14/2016)

Project No. 60519402.1

L:\work\GIS\Step Wetland Delineation\map4a-Rifle Cut Wetland Delineation-topo.mxd



Service Layer Credits:
 Copyright: ©2013 National
 Geographic Society, i-cubed



0 100 200 400
 Feet

- Observation Point
- Road
- Project Limits
- Georgia Wetland

Note:
 (1) Horizontal Datum required for this project is NAD 1983 (2011) State Plane Georgia East.
 (2) Vertical Datum required for this project is Mean Lower Low Water (MLLW),
 Epoch 1983-2001 and the North American Vertical Datum of 1988 (NAVD88).
 (3) Units of measure required for this project is US Survey Feet."

Drawn By: LLM

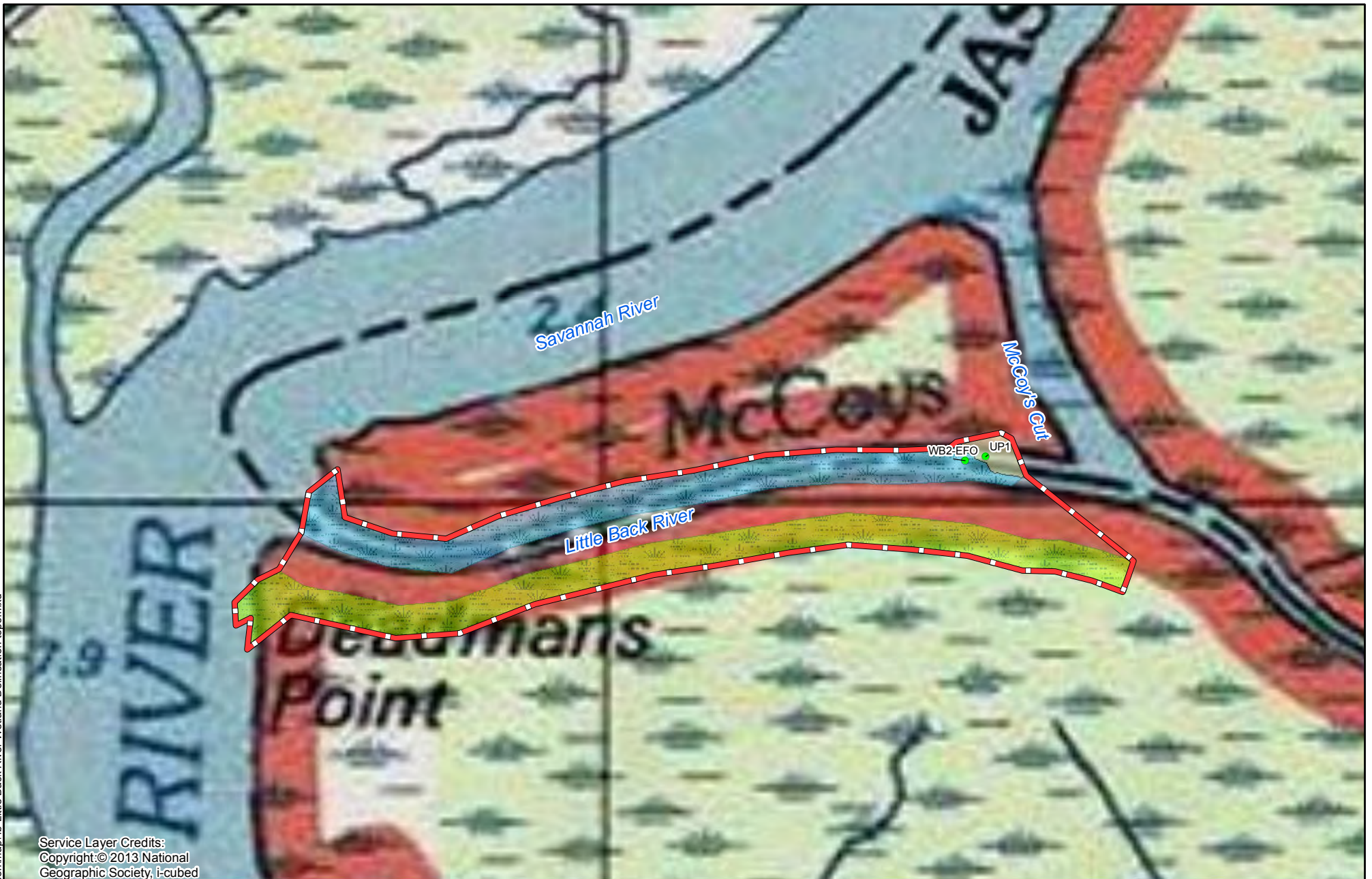
Date Drawn/Revised: (10/14/2016)

Project No. 60519402.1

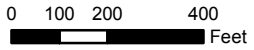
Figure 4a
USGS Topographic Map
Rifle Cut



L:\work\GIS\Shep Wetland Delineation\map4b-Little Back River Wetland Delineation-topo.mxd



Service Layer Credits:
 Copyright: © 2013 National
 Geographic Society, i-cubed



- Observation Point
- Project Limits
- Georgia Wetland
- South Carolina Wetland
- Upland

Note:
 (1) Horizontal Datum required for this project is NAD 1983 (2011) State Plane Georgia East.
 (2) Vertical Datum required for this project is Mean Lower Low Water (MLLW),
 Epoch 1983-2001 and the North American Vertical Datum of 1988 (NAVD88).
 (3) Units of measure required for this project is US Survey Feet."

Figure 4b
USGS Topographic Map
Little Back River

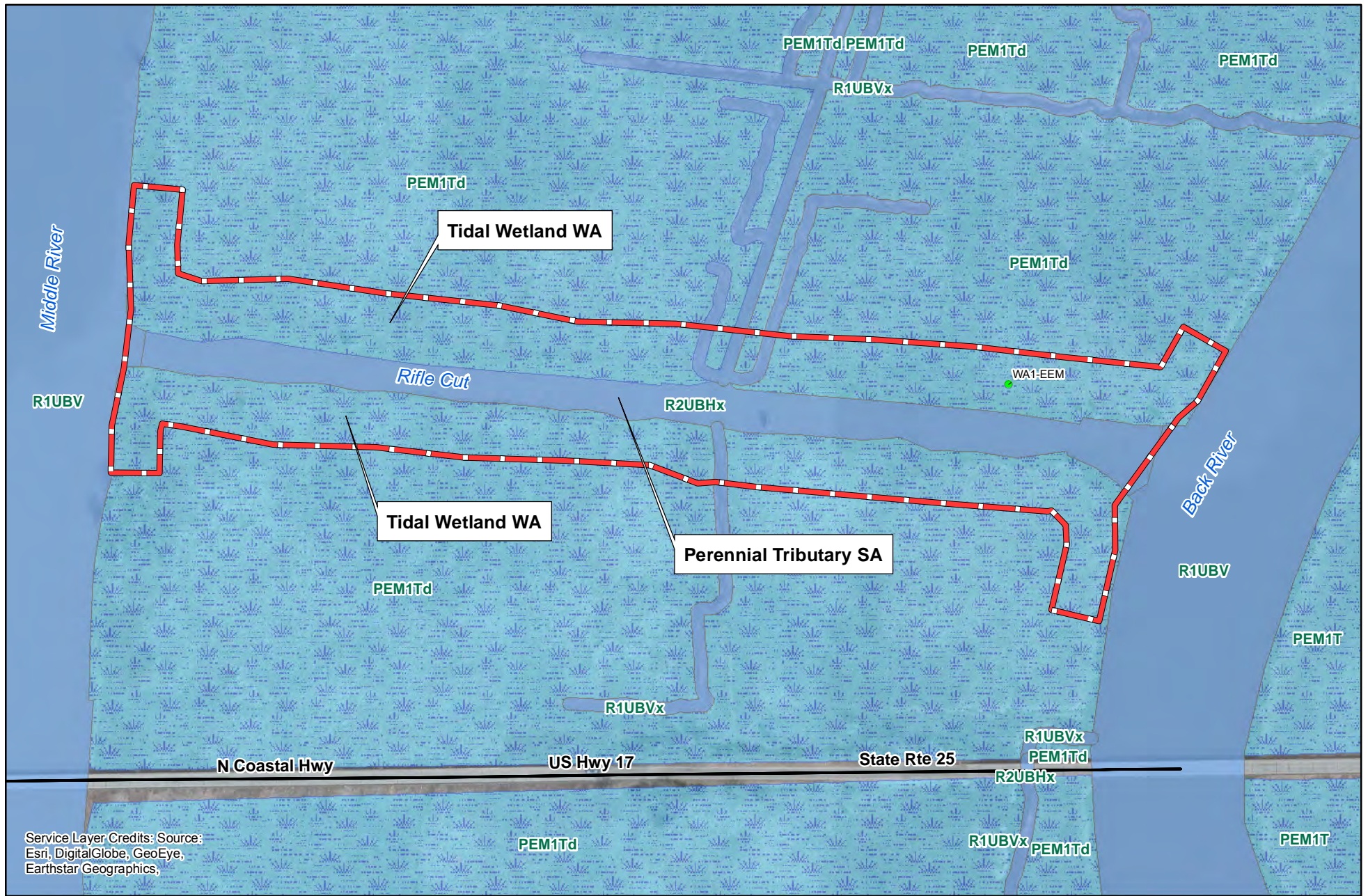


Drawn By: LLM

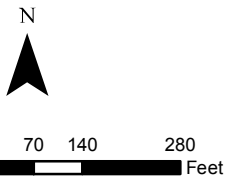
Date Drawn/Revised: (10/14/2016)

Project No. 60519402.1

L:\work\GIS\Step Wetland Delineation\map\Ea-Rifle Cut NWI.mxd



Service Layer Credits: Source:
 Esri, DigitalGlobe, GeoEye,
 Earthstar Geographics,

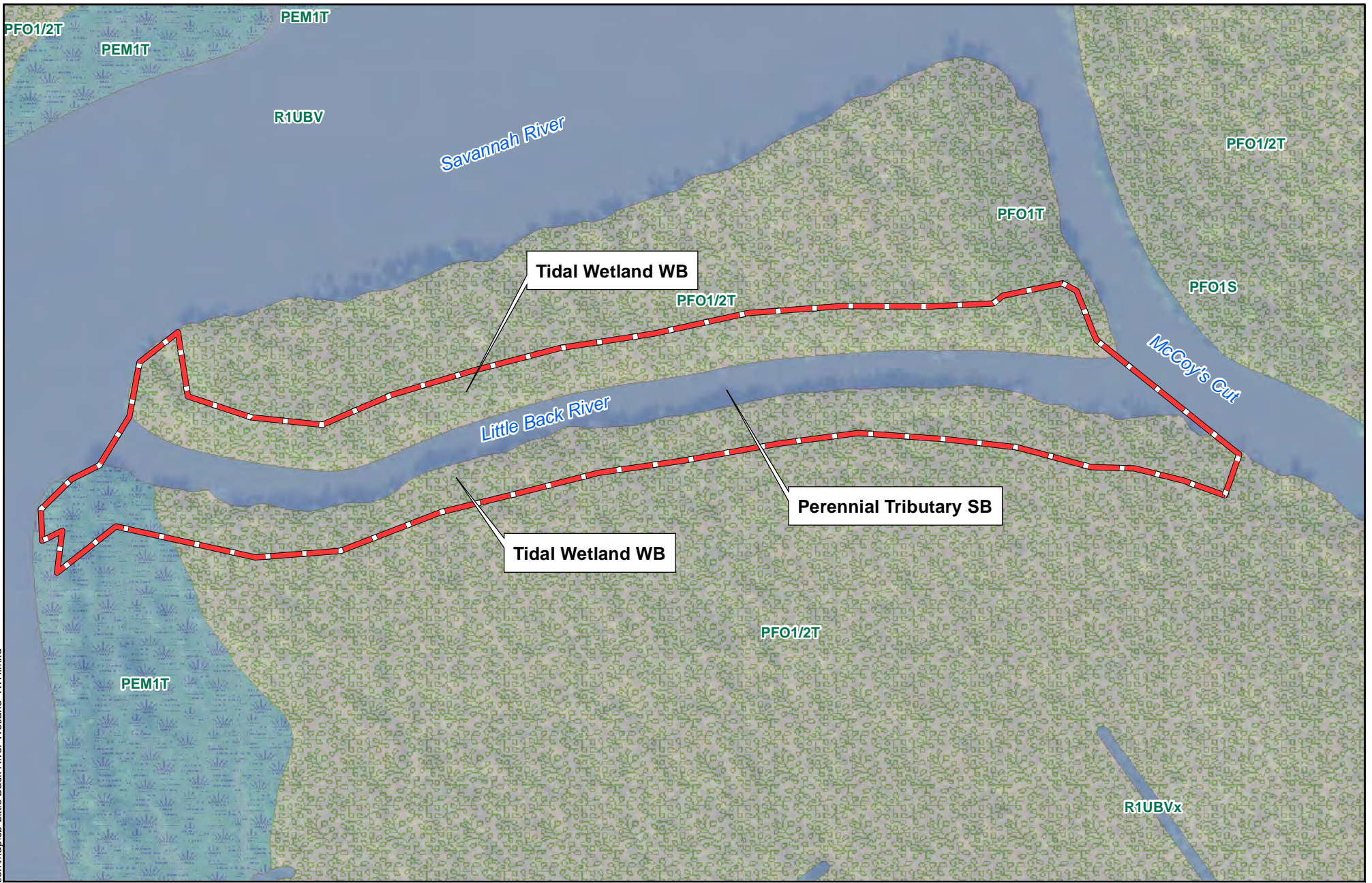


- Observation Point
- Road
- ▬ Project Limits
- Freshwater Emergent Wetland
- Riverine

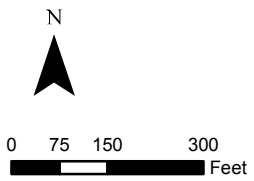
Note:
 (1) Horizontal Datum required for this project is NAD 1983 (2011) State Plane Georgia East.
 (2) Vertical Datum required for this project is Mean Lower Low Water (MLLW),
 Epoch 1983-2001 and the North American Vertical Datum of 1988 (NAVD88).
 (3) Units of measure required for this project is US Survey Feet.*

Figure 5a
National Wetlands Inventory Map
Rifle Cut





L:\work\GIS\Shep Wetland Delineation\map5b-Little Back River Wetland -NW1.mxd



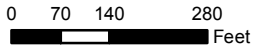
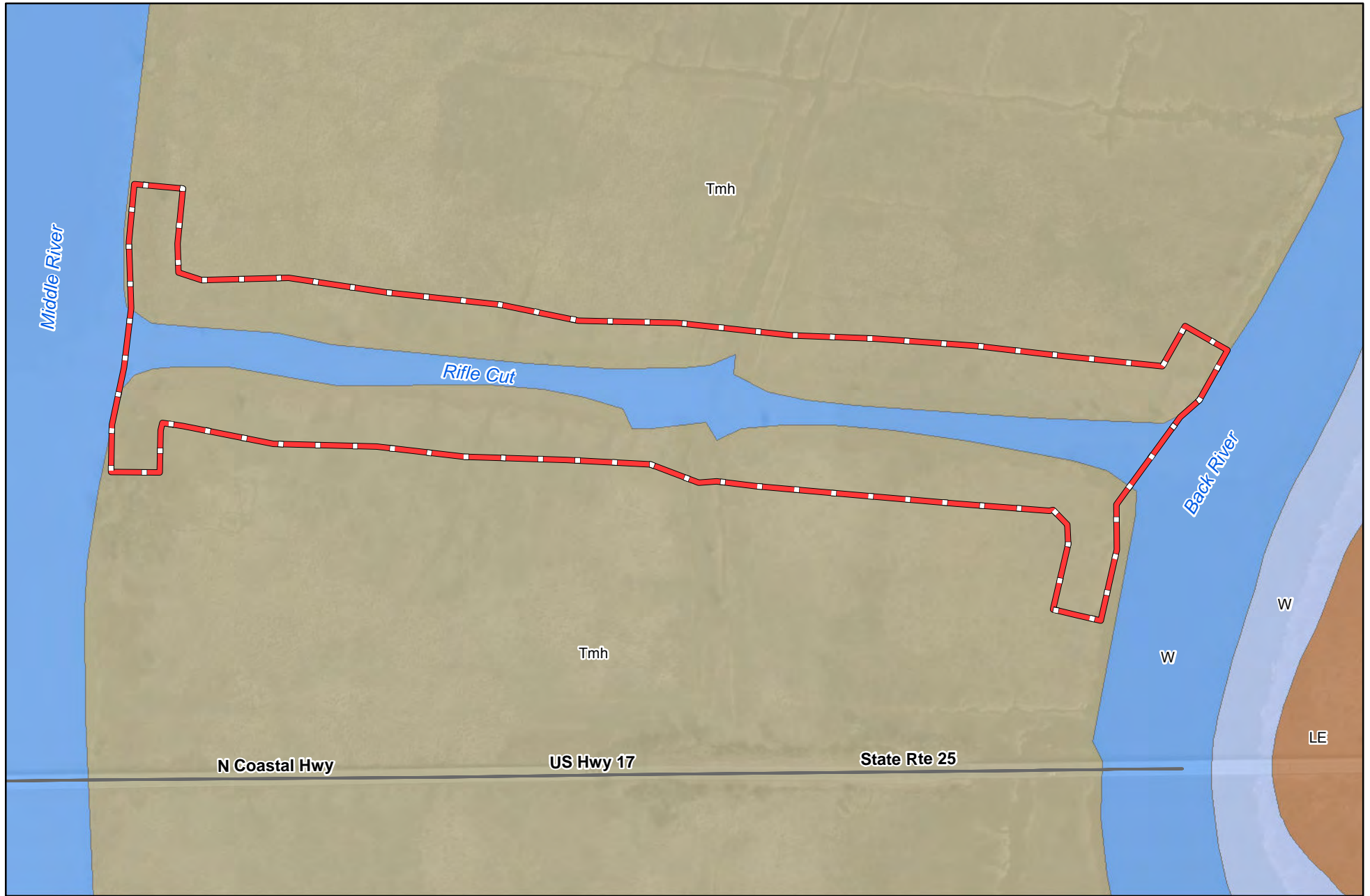
- Project Limits
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Riverine

Note:
 (1) Horizontal Datum required for this project is NAD 1983 (2011) State Plane Georgia East.
 (2) Vertical Datum required for this project is Mean Lower Low Water (MLLW), Epoch 1983-2001 and the North American Vertical Datum of 1988 (NAVD88).
 (3) Units of measure required for this project is US Survey Feet."

Figure 5b
National Wetlands Inventory Map
Little Back River



L:\work\GIS\Step Wetland Delineation\map\6a-Rifle Cut Soils.mxd



- Road
- - - Project Limits
- LE
- South Carolina - W
- Tmh
- Georgia - W

Note:
 (1) Horizontal Datum required for this project is NAD 1983 (2011) State Plane Georgia East.
 (2) Vertical Datum required for this project is Mean Lower Low Water (MLLW), Epoch 1983-2001 and the North American Vertical Datum of 1988 (NAVD88).
 (3) Units of measure required for this project is US Survey Feet."

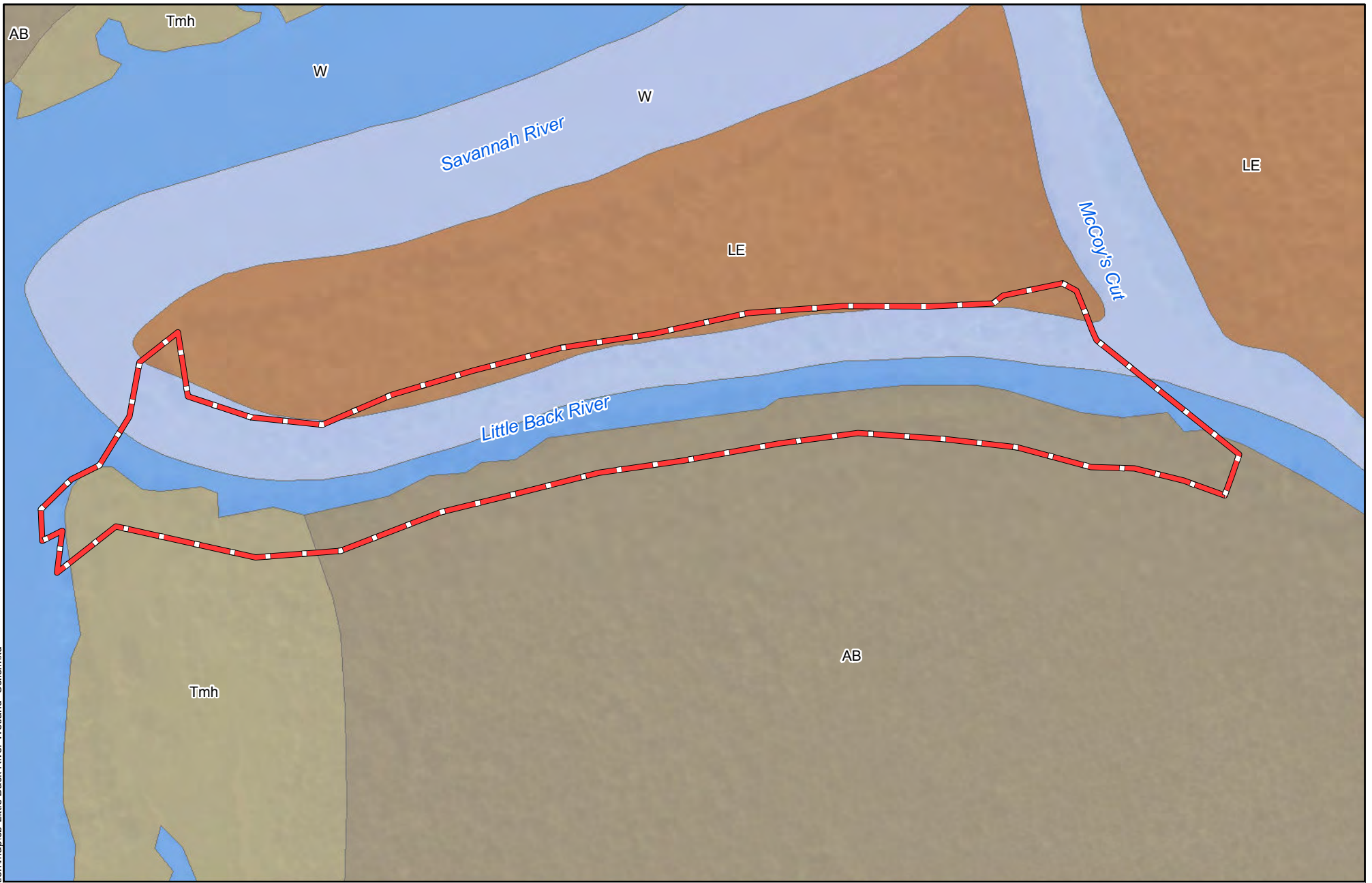
Figure 6a
USDA-NRCS Soil Map
Rifle Cut



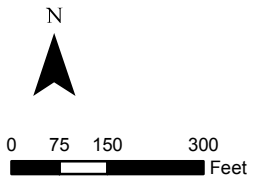
Drawn By: LLM

Date Drawn/Revised: (10/14/2016)

Project No. 60519402.1



L:\work\GIS\Step Wetland Delineation\map6b-Little Back River Wetland -Soils.mxd



- Project Limits
- LE
- South Carolina - W
- AB
- Tmh
- Georgia - W

Note:
 (1) Horizontal Datum required for this project is NAD 1983 (2011) State Plane Georgia East.
 (2) Vertical Datum required for this project is Mean Lower Low Water (MLLW), Epoch 1983-2001 and the North American Vertical Datum of 1988 (NAVD88).
 (3) Units of measure required for this project is US Survey Feet."

Drawn By: LLM

Date Drawn/Revised: (10/14/2016)

Project No. 60519402.1

Figure 6b
USDA-NRCS Soil Map
Little Back River



Appendix A

Scope of Work



REPLY TO
ATTENTION OF:

**DEPARTMENT OF THE ARMY
SAVANNAH DISTRICT, CORPS OF ENGINEERS
100 W. OGLETHORPE AVENUE
SAVANNAH, GEORGIA 31401-3640**

August 15, 2016

Execution Branch
Contracting Division

SUBJECT: Task Order on Contract Number W912HN-12-D-0031, SHEP Topographic Survey and Wetland Delineation

Lowe Engineers
Attn: William Daniel
daniel@loweengineers.com
2000 River Edge Parkway, Suite 400
Atlanta, GA 30328

Dear Mr. Daniel:

A copy of the Specific Instructions for a proposed task order for surveying services is provided.

Please furnish your fee proposal August 26, 2016. The proposal shall be emailed to Jennifer Casey at jennifer.s.casey@usace.army.mil with a copy furnished to the contracting officer at sabrina.bastine@usace.army.mil. These are the only two individuals authorized to receive your proposal. It is inappropriate and further prohibited to furnish your proposal or discuss its contents with other than contracting personnel. The proposal shall include a detailed breakdown of the costs, which includes level of effort by labor category including identifying all subcontractors, any required travel, and special equipment or supplies. It is also requested that you provide the assumptions used in creating the proposal. Preferred software for proposal submission is Word and Excel.

In accordance with FAR Clause 52.222-41 Service Contract Act Wage Determinations may be applicable to this task order. It is a requirement that all service employees providing services on this task order are paid in accordance with the Department of Labor's wage determinations.

Wage Determination WD 15-4471 (Rev.-2) (Fulton County, GA) posted 06/28/2016

Please contact the Contract Specialist, Jennifer Casey at 912-652-5539 if you have any questions regarding submission of your proposal. If you have technical questions please contact Mrs. Casey to schedule a conference with the Technical/Project Manager

SUBJECT: Task Order on Contract Number W912HN-12-D-0031, SHEP Topographic Survey and Wetland Delineation

Please do not proceed with any work or incur any obligation chargeable to the Government. In the event of unsuccessful negotiations, the Government can assume no obligation for payment of any expenses incurred in the preparation of your proposal. Award of the requirement is subject to the availability of funds.

Sincerely,

Sabrina Bastine
Contracting Officer

Enclosure

SUBJECT: Task Order on Contract Number W912HN-12-D-0031, SHEP Topographic Survey and Wetland Delineation

SPECIFIC INSTRUCTIONS

ARCHITECT ENGINEER SERVICES FOR

TOPOGRAPHIC SURVEY & WETLAND DELINEATION LITTLE BACK RIVER NEAR McCOY'S CUT & RIFLE CUT CHATHAM COUNTY, GEORGIA & JASPER COUNTY, SOUTH CAROLINA

1. GENERAL

1.1. The following schedule of A-E Services is required for this delivery order as provided for in paragraph 2, Design Services and Submittal Requirements of Performance Requirements for Architect-Engineer Services Indefinite-Delivery, Indefinite Quantity Contract: W912HN-12-D-0031 to Lowe Engineers, LLC.

| Required | ARCHITECT-ENGINEER SERVICES |
|----------|---|
| | Design Charrette |
| | Code 3 Design with Parametric Estimating with Complete Project Definition Package |
| | Concept/Early Preliminary (35 Percent) Design and Submittal |
| | Preliminary Design (60 Percent) and Submittal |
| | Final Design and Submittal |
| | Construction Contract Documents |
| | Preparation of Design-Build Request for Proposal (Nominal Criteria) |
| | Preparation of Design-Build Request for Proposal (Partial Criteria) |
| | Preparation of Design-Build Request for Proposal (Full Criteria) |
| | Design-Build Evaluation Consultation |
| | Review of Design-Build Submittals |
| | Studies/Reports |
| | Design Conference |
| X | Topographic Survey |
| X | Wetland Delineation |
| | Subsurface Investigation |
| | Asbestos/Lead Based Paint Identification and Removal |
| | Permits |
| | Architectural Renderings |
| | Interior Design |
| | Color Boards |
| X | Photographs |
| | Construction Phase Services |
| X | Other AE Services (see Scope of Work) |

1.2. Project Description: The Contractor shall provide all surveying services, including furnishing of all personnel, transportation, equipment and materials required in connection with the services described in the Scope that follows. In general, work to be performed consists of providing a topographic survey and

SUBJECT: Task Order on Contract Number W912HN-12-D-0031, SHEP Topographic Survey and Wetland Delineation

wetland delineation for two areas that are part of an environmental mitigation project in the Savannah River basin. These services shall be performed in accordance with the technical and special provisions contained herein. Services not specifically described herein are nevertheless required if they can be identified as an item commonly a part of professional grade work of a comparable nature.

1.3. The project site locations are Little Back River, near McCoy's Cut, and Rifle Cut. Site locations are shown on the attached vicinity map. Access to the site locations is by boat only. The Little Back River site is located on the Savannah River approximately 5 miles upstream of the Houlihan Boat Ramp Park. The Rifle Cut site is located on the Middle River approximately 800 feet upstream of the GA Hwy 25 (N. Coastal Hwy) bridge crossing Middle River. Both sites are located on lands that are a part of the Savannah National Wildlife Refuge. Savannah National Wildlife Refuge is owned and operated by the US Fish and Wildlife Service.

- (1) Horizontal Datum required for this project is NAD 1983 (2011) State Plane Georgia East.
- (2) Vertical Datum required for this project is Mean Lower Low Water (MLLW), Epoch 1983-2001 and the North American Vertical Datum of 1988 (NAVD88).
- (3) Units of measure required for this project is US Survey Feet.

2. PERIOD OF PERFORMANCE: The Contractor shall complete the topographic surveys and wetland delineation and furnish the required deliverables to the Contracting Officer within 30 days of the date of the Notice to Proceed.

3. SCOPE

3.1 Topographic Survey: The limits of survey for the sites are shown on the attached maps. The required survey work consists of cross sectioning land adjacent to Little Back River and Rifle Cut. The Contractor shall use Government provided hydrographic surveys and cross section line files, which are spaced at 200' intervals, to establish the location of the required cross sections. The Contractor shall collect cross section points at each end of the required cross section lines beginning at 0.0'MLLW and continuing upland 100' beyond the top edge of bank. The Contractor shall ensure the survey data obtained and submitted accurately describes the ground surface for every cross section. Key points on the cross sections are the toes, top edge of bank, and the 100' beyond top edge of bank point. Intermediate points on cross sections shall be obtained as necessary to describe all variations from a straight line between key points. The vertical accuracy for the cross section points shall be plus or minus 0.2'. The Contractor shall also survey any and all ditches, creeks, or significantly eroded areas along the banks between the required cross section lines to a minimum distance of 100' inland from the top edge of bank.

3.2 Local Project Control: The Contractor will establish a minimum of 3 survey control points at each project site location. The control points for the Little Back River site shall be set near the confluence of the Little Back River with the

SUBJECT: Task Order on Contract Number W912HN-12-D-0031, SHEP Topographic Survey and Wetland Delineation

Savannah River. The control points for the Rifle Cut site shall be set near the confluence of Rifle Cut with Middle River. The Contractor will provide the horizontal coordinates for each control point in NAD 1983 (2011) State Plane Georgia East US Survey Feet and the vertical elevation for each control point in MLLW and NAVD88. The setting of the survey control points shall follow the guidance in EM 1110-1-1002 (Survey Markers and Monumentation). Type C (USACE disk set in existing concrete structure) marks are preferred. Geodetic quality mark stability is not required; thus, Type F and Type G marks (disk attached to rod or rebar) are acceptable as control points. A U-SMART form (source: <http://usmart.usace.army.mil/>) shall be filled out and provided for each control point established. The control points shall be shown in the topographic survey CADD file. The survey control points will be labeled with name designation, northing, easting, and elevation in MLLW.

3.3 Wetland Delineation: Pursuant to Section 404 of the Clean Water Act, the contractor shall conduct a survey to identify and delineate all on-site waters of the United States adjacent to Rifle Cut and Little Back River near McCoy's Cut. The delineation shall be performed in accordance with the 1987 US Army Corps of Engineers Wetlands Delineation Manual, the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region and the ordinary high water mark as described in US Army Corps of Engineers Regulatory Guidance Letter RGL 05-05. Information to be collected will include plant community composition and cover, presence or absence of wetland hydrology and indicators, and hydric soil characteristics. The contractor shall obtain a USACE-approved verification from the applicable US Army Corps of Engineers district Regulatory Division (Savannah District for sites in Georgia, Charleston District for sites in South Carolina). The contractor shall prepare a report to include a narrative of methods employed, findings including site photographs, and map(s) with wetlands and streams and their applicable acreages, along with GPS data plots, delineation flag locations on maps with aerial photo or US Geological Survey topographical basemap using GPS and ArcGIS 10.0 or later to document and report findings. Reports (.pdfs) and maps (ArcGIS 10.0 or later) shall be provided in digital format.

3.4 Special Instructions: The project site locations are on lands that are a part of the Savannah National Wildlife Refuge. Savannah National Wildlife Refuge is owned and operated by the US Fish and Wildlife Service. In order to ensure that the biological integrity, diversity, and environmental health of the refuge lands is maintained the Contractor shall restrict the removal of vegetation necessary to accomplish the required work to the absolute minimum. Underbrush and small limbs (2" diameter or smaller) may be trimmed, using hand tools only, to the extent necessary to allow line of sight between survey points. The felling of trees, excessive clearing, or use of chainsaws is prohibited. The Contractor shall not harass or feed any wildlife that they may encounter on refuge property. The

SUBJECT: Task Order on Contract Number W912HN-12-D-0031, SHEP Topographic Survey and Wetland Delineation

Contractor will not remove anything, including plants, found on refuge property. The Contractor shall ensure that any trash or litter generated by the survey crew is removed from the site at the end of each work day.

US Fish and Wildlife Point of Contact:
Chuck Hayes
U.S. Fish and Wildlife Service
765 Alligator Alley
Hardeeville, SC 29927
843.784.6262 - Office
912.210.7366 - cell
chuck_hayes@fws.gov

4. DELIVERABLES

The Contractor shall provide the topographic survey at a scale of 1" = 50' with 1 foot contours in a Bentley Microstation V8i 3D CADD file. The topographic survey file shall use the Georgia East seed file found by selecting the Topo Seed Files link available from the Savannah District Engineering Criteria web site <http://www.sas.usace.army.mil/About/DivisionsandOffices/EngineeringDivision/EngineeringDesignCriteria.aspx>

The file shall be displayed with North at the top of the sheet. No rotation is acceptable. All drawing elements shall reside on the appropriately named level and conform to the symbology specified for the element in accordance with the 6.0 A/E/C CADD standard. Elevations of all cross section points shall be shown in MLLW and the point in the elevation value shall be located at the x-y coordinate value for that point.

All polygons shall be cleaned and free of duplicate vertexes and self-intersections. Pertinent survey information must be present on the existing topography; datum, correction factor from MLLW to NAVD88, date of survey, survey method, and surveyor name. The Contractor shall also provide a Digital Terrain Model (DTM) for use in Microstation Inroads. The Contractor shall combine the hydrographic survey points provided by the Government with the cross section survey data collected under this task order to create the DTM. The CADD file submitted by the Contractor shall utilize the combined survey data from this DTM.

The Contractor shall provide recovery information for each Local Project Control point. An individual U-SMART description sheet for each monument or bench mark will be created. The contractor shall use the latest USACE Survey Monument Archival and Retrieval Tool (U-SMART) Datasheet form available at <http://usmart.usace.army.mil> to describe all recovered and/or established survey control points including gage reference points. The location map shall show sufficient detail such as street names and significant land marks to adequately

SUBJECT: Task Order on Contract Number W912HN-12-D-0031, SHEP Topographic Survey and Wetland Delineation

display the general location of the mark. The image of the mark if possible should show the stamping and where possible, the horizon/setup image should show the actual setup. The image sizes shall be kept small enough to limit the size of the final document to 3 megabytes. The elevation data will be shown in both MLLW and NAVD88. The Contractor will also provide an overall sketch/map of the Local Project Control Network. The project control information will be delivered in an Adobe PDF format.

The Contractor shall provide a comma delimited ASCII text file of the points surveyed to include the wetland delineation line. The format for the text file shall be in the format: point number, x-coordinate, y-coordinate, z-MLLW, point description.

The Microstation V8i 3D CADD topographic survey file, DTM, U-SMART Datasheets, the comma delimited ASCII text file shall be delivered on a CD or DVD labeled with the project name and date.

The Contractor shall prepare a wetland delineation report to include a narrative of methods employed, findings including site photographs, and map(s) with wetlands and streams and their applicable acreages, along with GPS data plots, delineation flag locations on maps with aerial photo or US Geological Survey topographical basemap using GPS and ArcGIS 10.0 or later to document and report findings. Reports (.pdfs) and maps (ArcGIS 10.0 or later) shall be provided in digital format.

All work shall be delivered to:
U.S. Army Corps of Engineers
Savannah District
Attn: EN-H / Terry Page
100 W. Oglethorpe Ave
Savannah, GA 31402

5. PERMITS

The Government will coordinate a Special Use Permit for this work with US Fish and Wildlife Service. The Contractor is responsible for obtaining all additional permits required in the performance of this task order.

6. USE AND DISTRIBUTION RIGHTS

All deliverable data and documentation shall be free from restrictions regarding use and distribution. Data and documentation provided under this Task Order shall be freely distributable by government agencies.

7. SAFETY

SUBJECT: Task Order on Contract Number W912HN-12-D-0031, SHEP Topographic Survey and Wetland Delineation

The Contractor will comply with all applicable safety requirements specified in the Corps of Engineers Manual, EM 385-1-1, dated 3 November 2003, entitled "Safety and Health Requirements Manual."

Personal Flotation Devices: Personal Flotation Devices, of the type described in paragraph 05.H in the Corps of Engineers Manual, EM 385-1-1, dated 3 November 2003, entitled "Safety and Health Requirements Manual", shall be worn by all persons working on, over, or adjacent to the water.

8. SUBMITTALS

Submit the finished product in the format, quantities and media as specified in paragraph 4. USACE POC for this Task Order is:

Lead Engineer/Technical Manager: Beth Williams
912-652-5268
Laura.E.Williams@usace.army.mil

Technical Point of Contact: Terry Page
912-652-5959
Terry.D.Page@usace.army.mil



AECOM
10 Patewood Drive, Bldg. VI, Suite 500
Greenville, SC 29615

864.234.3000 tel
864.234.3069 fax

August 18, 2016

Lowe Engineers
Attn: William Daniel
daniel@loweengineers.com
2000 River Edge Parkway, Suite 400
Atlanta, GA 30328

Re: Task Order on Contract Number W912HN-12-D-0031, SHEP Topographic Survey and Wetland Delineation

Dear Mr. Daniel:

Per your request, AECOM is submitting this letter proposal to provide Lowe Engineers with a Lump Sum bid to complete Wetland Delineations in support of the SHEP project. The site locations include Rifle Cut (an approximate 2,000 ft cut between the Middle River and the Back River, located on the Middle River approximately 800 feet upstream of the GA Hwy 25 (N. Coastal Hwy) bridge crossing Middle River) and the Little Back River (an approximate 2,300 ft stream off the Savannah River to McCoy's Cut, located approximately 5 miles upstream of the Houlihan Boat Ramp Park). The wetland survey and delineation will cover the length of the two locations, extending no more than 100 feet beyond the top edge of the bank on both sides of the Cut/River.

The wetland delineation will be conducted pursuant to Section 404 of the Clean Water Act. The delineation will be performed in accordance with the 1987 US Army Corps of Engineers Wetlands Delineation Manual, the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region and the ordinary high water mark as described in US Army Corps of Engineers Regulatory Guidance Letter RGL 05-05. Information to be collected will include plant community composition and cover, presence or absence of wetland hydrology and indicators, and hydric soil characteristics. AECOM will obtain a USACE-approved verification from the applicable US Army Corps of Engineers district Regulatory Division (Savannah District for sites in Georgia, Charleston District for sites in South Carolina). AECOM will prepare a report to include a narrative of methods employed, findings including site photographs, and map(s) with wetlands and streams and their applicable acreages, along with GPS data plots, delineation flag locations on maps with aerial photo or US Geological Survey topographical basemap using GPS and ArcGIS 10.0 or later to document and report findings. Reports (.pdfs) and maps (ArcGIS 10.0 or later) shall be provided in digital format.

The two sites are assessable by boat only. Lowe Engineers will provide AECOM staff transportation to and from the site for a minimum of two days with the potential for a third day, depending on site conditions.

ESTIMATED COST

AECOM will provide the scope of work described above on a lump sum basis (\$12,400) per the attached Consulting Services Agreement.

AECOM appreciates the opportunity to provide environmental consulting services to NextEra. If you have any questions regarding this proposal, please do not hesitate to contact Bobbie Hurley at (864) 234-8913

Sincerely,

A handwritten signature in black ink, appearing to read "Roberta Hurley", with a long, sweeping horizontal line extending to the right.

Roberta Hurley

AECOM

Associate Vice President
Design and Consulting Services Group
10 Patewood Drive
Building 6, Suite 500
Greenville, SC 29615
D +1-864-234-8913
M +1-864-918-5836
bobbie.hurley@aecom.com

Appendix B

Wetland Datasheets

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: SHEP - Rifle Cut City/County: Chatham Sampling Date: 09/21/2016
 Applicant/Owner: U.S. Army Corps of Engineers State: GA Sampling Point: WA1-EEM
 Investigator(s): Paul Masten & Miranda Steffler Section, Township, Range: Chatham
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): LRR T Lat: 32.168011 Long: -81.130903 Datum: _____
 Soil Map Unit Name: TmH - Tidal Marsh, fresh NWI classification: PEM1Td

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|---|--|
| Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____ | Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ |
| Remarks: Sampling points 1-43 | |

HYDROLOGY

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|---|---|---|---|--|---|--|---|--|--|---|--|---|---|---|--|--|--|--|--|---|--|--|--|--|--|--|--|--|---|---|
| Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <table style="width:100%; border: none;"> <tr> <td><input type="checkbox"/> Surface Water (A1)</td> <td><input checked="" type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td><input checked="" type="checkbox"/> High Water Table (A2)</td> <td><input type="checkbox"/> Marl Deposits (B15) (LRR U)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Saturation (A3)</td> <td><input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td><input type="checkbox"/> Water Marks (B1)</td> <td><input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)</td> </tr> <tr> <td><input type="checkbox"/> Sediment Deposits (B2)</td> <td><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td><input type="checkbox"/> Drift Deposits (B3)</td> <td><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td><input type="checkbox"/> Iron Deposits (B5)</td> <td><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> </table> | <input type="checkbox"/> Surface Water (A1) | <input checked="" type="checkbox"/> Aquatic Fauna (B13) | <input checked="" type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Marl Deposits (B15) (LRR U) | <input checked="" type="checkbox"/> Saturation (A3) | <input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) | <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | <input type="checkbox"/> Water-Stained Leaves (B9) | | Secondary Indicators (minimum of two required) <table style="width:100%; border: none;"> <tr><td><input type="checkbox"/> Surface Soil Cracks (B6)</td></tr> <tr><td><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td></tr> <tr><td><input type="checkbox"/> Drainage Patterns (B10)</td></tr> <tr><td><input type="checkbox"/> Moss Trim Lines (B16)</td></tr> <tr><td><input type="checkbox"/> Dry-Season Water Table (C2)</td></tr> <tr><td><input type="checkbox"/> Crayfish Burrows (C8)</td></tr> <tr><td><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td></tr> <tr><td><input checked="" type="checkbox"/> Geomorphic Position (D2)</td></tr> <tr><td><input type="checkbox"/> Shallow Aquitard (D3)</td></tr> <tr><td><input checked="" type="checkbox"/> FAC-Neutral Test (D5)</td></tr> <tr><td><input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)</td></tr> </table> | <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Drainage Patterns (B10) | <input type="checkbox"/> Moss Trim Lines (B16) | <input type="checkbox"/> Dry-Season Water Table (C2) | <input type="checkbox"/> Crayfish Burrows (C8) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | <input checked="" type="checkbox"/> Geomorphic Position (D2) | <input type="checkbox"/> Shallow Aquitard (D3) | <input checked="" type="checkbox"/> FAC-Neutral Test (D5) | <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U) |
| <input type="checkbox"/> Surface Water (A1) | <input checked="" type="checkbox"/> Aquatic Fauna (B13) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Marl Deposits (B15) (LRR U) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Saturation (A3) | <input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Presence of Reduced Iron (C4) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Drainage Patterns (B10) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Moss Trim Lines (B16) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Dry-Season Water Table (C2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Crayfish Burrows (C8) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Geomorphic Position (D2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Shallow Aquitard (D3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> FAC-Neutral Test (D5) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | |
|---|---|
| Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0 - to surface</u> Saturation Present? (includes capillary fringe) Yes <u>X</u> No _____ Depth (inches): <u>0 - to surface</u> | Wetland Hydrology Present? Yes <u>X</u> No _____ |
|---|---|

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Surface water was not present at the observation point during the time of evaluation, but was present some hours later after the tide had risen.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WA1-EEM

| | Absolute % Cover | Dominant Species? | Indicator Status | |
|---|---------------------|----------------------|---------------------|--|
| Tree Stratum (Plot size: _____) | | | | Dominance Test worksheet: |
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>1</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 _____ FACW species _____ x 2 _____ FAC species _____ x 3 _____ FACU species _____ x 4 _____ UPL species _____ x 5 _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____ |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Sapling/Shrub Stratum (Plot size: _____) | | | | |
| 1. _____ | _____ | _____ | _____ | Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) |
| 2. _____ | _____ | _____ | _____ | |
| 3. _____ | _____ | _____ | _____ | |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Herb Stratum (Plot size: _____) | | | | |
| 1. <u>Typha latifolia</u> | 96 | Y | OBL | |
| 2. <u>Juncus roemerianus</u> | 3 | N | OBL | |
| 3. <u>Scirpus cyperinus</u> | 2 | N | OBL | |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| 11. _____ | _____ | _____ | _____ | |
| 12. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height. |
| 50% of total cover: <u>50</u> 20% of total cover: <u>20</u> | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| 3. _____ | _____ | _____ | _____ | |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Remarks: (If observed, list morphological adaptations below). | | | | |

SOIL

Sampling Point: WA1-EEM

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|-------------------|---------------|-----|----------------|---|-------------------|------------------|---------|---------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-24 | 10Y 3/1 | 100 | | | | | Muck | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR O, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, S, T, U)

- Polyvalue Below Surface (S8) (LRR S, T, U)
- Thin Dark Surface (S9) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR O)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR U)
- Depleted Ochric (F11) (MLRA 151)
- Iron-Manganese Masses (F12) (LRR O, P, T)
- Umbric Surface (F13) (LRR P, T, U)
- Delta Ochric (F17) (MLRA 151)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils³:

- 1 cm Muck (A9) (LRR O)
- 2 cm Muck (A10) (LRR S)
- Reduced Vertic (F18) (outside MLRA 150A,B)
- Piedmont Floodplain Soils (F19) (LRR P, S, T)
- Anomalous Bright Loamy Soils (F20) (MLRA 153B)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Soils were saturated to the surface and uniform throughout the 24in sample pit with a matrix of 10Y 3/1 and texture of muck. This soil conforms with hydric soil indicator A9.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: SHEP - Little Back River near McCoy's Cut City/County: Chatham and Jasper Sampling Date: 09/21/2016
 Applicant/Owner: US Army Corps of Engineers State: GA & SC Sampling Point: WB2-EFO
 Investigator(s): Paul Masten & Miranda Steffler Section, Township, Range: Chatham, GA & Effingham SC
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): LRR T Lat: 32.222097 Long: -81.144731 Datum: _____
 Soil Map Unit Name: Levy NWI classification: PFO1/2T

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____ | Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ |
| Remarks: The project area north of the Little Back River is located in Effingham, SC while the project area south of the river is located in Effingham, GA. | |

HYDROLOGY

| | | | | | | | | | | | | | | | | | | | | | |
|--|--|--|---|---|---|---|---|--|---|--|--|---|--|---|---|---|--|--|---|--|--|
| Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <table style="width:100%; border: none;"> <tr> <td style="width:50%; border: none;"><input type="checkbox"/> Surface Water (A1)</td> <td style="width:50%; border: none;"><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td style="border: none;"><input checked="" type="checkbox"/> High Water Table (A2)</td> <td style="border: none;"><input type="checkbox"/> Marl Deposits (B15) (LRR U)</td> </tr> <tr> <td style="border: none;"><input checked="" type="checkbox"/> Saturation (A3)</td> <td style="border: none;"><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Water Marks (B1)</td> <td style="border: none;"><input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Sediment Deposits (B2)</td> <td style="border: none;"><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Drift Deposits (B3)</td> <td style="border: none;"><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td style="border: none;"><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Iron Deposits (B5)</td> <td style="border: none;"><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td style="border: none;"><input checked="" type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> </table> | <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Aquatic Fauna (B13) | <input checked="" type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Marl Deposits (B15) (LRR U) | <input checked="" type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) | <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | <input checked="" type="checkbox"/> Water-Stained Leaves (B9) | | Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U) |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Aquatic Fauna (B13) | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Marl Deposits (B15) (LRR U) | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Presence of Reduced Iron (C4) | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Water-Stained Leaves (B9) | | | | | | | | | | | | | | | | | | | | | |
| Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0 - to surface</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0 - to surface</u> (includes capillary fringe) | Wetland Hydrology Present? Yes <u>X</u> No _____ | | | | | | | | | | | | | | | | | | | | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | | | | | | | | | | | | | | | | | | | | | |
| Remarks: | | | | | | | | | | | | | | | | | | | | | |

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WB2-EFO

| | Absolute % Cover | Dominant Species? | Indicator Status | | |
|--|------------------|-------------------|------------------|--|--|
| Tree Stratum (Plot size: _____) | | | | | |
| 1. <u>Nyssa biflora</u> | 45 | Y | OBL | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>7</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B) | |
| 2. <u>Acer rubrum</u> | 15 | Y | FAC | | |
| 3. _____ | | | | | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| 8. _____ | | | | | |
| _____ = Total Cover 50% of total cover: <u>30</u> 20% of total cover: <u>12</u> | | | | Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____ | |
| Sapling/Shrub Stratum (Plot size: _____) | | | | | |
| 1. <u>Alnus serrulata</u> | 40 | Y | FACW | | |
| 2. <u>Persea borbonia</u> | 25 | Y | FACW | | |
| 3. <u>Persea palustris</u> | 10 | N | FACW | | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| 8. _____ | | | | | |
| _____ = Total Cover 50% of total cover: <u>32.5</u> 20% of total cover: <u>13</u> | | | | | |
| Herb Stratum (Plot size: _____) | | | | | |
| 1. <u>Saururus cernuus</u> | 30 | Y | OBL | Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) | |
| 2. <u>Chasmanthium latifolium</u> | 25 | Y | OBL | | |
| 3. <u>Zizania aquatica</u> | 25 | Y | OBL | | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| 8. _____ | | | | | |
| 9. _____ | | | | | |
| 10. _____ | | | | | |
| 11. _____ | | | | | |
| 12. _____ | | | | | |
| _____ = Total Cover 50% of total cover: <u>40</u> 20% of total cover: <u>16</u> | | | | Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height. | |
| Woody Vine Stratum (Plot size: _____) | | | | | |
| 1. _____ | | | | | |
| 2. _____ | | | | | |
| 3. _____ | | | | | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| _____ = Total Cover 50% of total cover: _____ 20% of total cover: _____ | | | | Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ | |
| Remarks: (If observed, list morphological adaptations below). | | | | | |

SOIL

Sampling Point: WB2-EFO

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|----------------|---------------|-----|----------------|----|-------------------|------------------|------------|--------------------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-6 | 10YR 4/2 | 100 | - | - | - | - | Sandy | >70% coated grains |
| 6-24 | 2.5Y 5/1 | 90 | 10YR 5/8 | 10 | C | M | Sandy Loam | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR O, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, S, T, U)
- Polyvalue Below Surface (S8) (LRR S, T, U)
- Thin Dark Surface (S9) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR O)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR U)
- Depleted Ochric (F11) (MLRA 151)
- Iron-Manganese Masses (F12) (LRR O, P, T)
- Umbric Surface (F13) (LRR P, T, U)
- Delta Ochric (F17) (MLRA 151)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils³:

- 1 cm Muck (A9) (LRR O)
- 2 cm Muck (A10) (LRR S)
- Reduced Vertic (F18) (outside MLRA 150A,B)
- Piedmont Floodplain Soils (F19) (LRR P, S, T)
- Anomalous Bright Loamy Soils (F20) (MLRA 153B)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: SHEP - Little Back River near McCoy's Cut City/County: Chatham and Jasper Sampling Date: 09/21/2016
 Applicant/Owner: U.S. Army Corps of Engineers State: GA Sampling Point: WA1-EEM
 Investigator(s): Paul Masten & Miranda Steffler Section, Township, Range: Chatham
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): LRR T Lat: 32.168011 Long: -81.130903 Datum: _____
 Soil Map Unit Name: TmH - Tidal Marsh, fresh NWI classification: PEM1Td

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|---|--|
| Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____ | Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ |
| Remarks: Sampling points 1-43 | |

HYDROLOGY

| | |
|---|---|
| Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) | Secondary Indicators (minimum of two required) |
| <input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) | <input checked="" type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) (LRR U) <input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U) | |

| | |
|---|---|
| Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0 - to surface</u> Saturation Present? (includes capillary fringe) Yes <u>X</u> No _____ Depth (inches): <u>0 - to surface</u> | Wetland Hydrology Present? Yes <u>X</u> No _____ |
|---|---|

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Surface water was not present at the observation point during the time of evaluation, but was present some hours later after the tide had risen.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WA1-EEM

| | Absolute % Cover | Dominant Species? | Indicator Status | |
|--|---------------------|----------------------|---------------------|-------------------------------|
| Tree Stratum (Plot size: _____) | | | | |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| 3. _____ | _____ | _____ | _____ | |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ | | | | 20% of total cover: _____ |
| Sapling/Shrub Stratum (Plot size: _____) | | | | |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| 3. _____ | _____ | _____ | _____ | |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ | | | | 20% of total cover: _____ |
| Herb Stratum (Plot size: _____) | | | | |
| 1. <u>Typha latifolia</u> | 96 | Y | OBL | |
| 2. <u>Juncus roemerianus</u> | 3 | N | OBL | |
| 3. <u>Scirpus cyperinus</u> | 2 | N | OBL | |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| 11. _____ | _____ | _____ | _____ | |
| 12. _____ | _____ | _____ | _____ | |
| 100 = Total Cover | | | | |
| 50% of total cover: <u>50</u> | | | | 20% of total cover: <u>20</u> |
| Woody Vine Stratum (Plot size: _____) | | | | |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| 3. _____ | _____ | _____ | _____ | |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| 50% of total cover: _____ | | | | 20% of total cover: _____ |
| <p>Remarks: (If observed, list morphological adaptations below).</p> | | | | |

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species _____ x 1 _____

FACW species _____ x 2 _____

FAC species _____ x 3 _____

FACU species _____ x 4 _____

UPL species _____ x 5 _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No _____

SOIL

Sampling Point: WA1-EEM

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|-------------------|---------------|-----|----------------|---|-------------------|------------------|---------|---------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-24 | 10Y 3/1 | 100 | | | | | Muck | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR O, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, S, T, U)

- Polyvalue Below Surface (S8) (LRR S, T, U)
- Thin Dark Surface (S9) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR O)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR U)
- Depleted Ochric (F11) (MLRA 151)
- Iron-Manganese Masses (F12) (LRR O, P, T)
- Umbric Surface (F13) (LRR P, T, U)
- Delta Ochric (F17) (MLRA 151)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils³:

- 1 cm Muck (A9) (LRR O)
- 2 cm Muck (A10) (LRR S)
- Reduced Vertic (F18) (outside MLRA 150A,B)
- Piedmont Floodplain Soils (F19) (LRR P, S, T)
- Anomalous Bright Loamy Soils (F20) (MLRA 153B)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Soils were saturated to the surface and uniform throughout the 24in sample pit with a matrix of 10Y 3/1 and texture of muck. This soil conforms with hydric soil indicator A9.

Appendix C

Photographic Log

| | | |
|--|---|--------------------------------|
| Project Name: SHEP – Wetland Delineation | Site Location: Rifle Cut – Savannah, GA Lat 32.16801 Long -81.13090 | Project No. 60519402 |
|--|---|--------------------------------|

| | |
|---|---------------------------|
| Photo No. 1 | Date: 9/21/2016 |
| Direction Photo Taken: Down | |
| Description: Wetland observation point WA1-EEM. View of wetland soil pit. | |



| | |
|---|---------------------------|
| Photo No. 2 | Date: 9/21/2016 |
| Direction Photo Taken: North | |
| Description: Representative view North of the observation point WA1-EEM | |



| | | |
|--|---|--------------------------------|
| Project Name: SHEP – Wetland Delineation | Site Location: Rifle Cut – Savannah, GA Lat 32.16801 Long -81.13090 | Project No. 60519402 |
|--|---|--------------------------------|

| | |
|--|---------------------------|
| Photo No. 3 | Date: 9/21/2016 |
| Direction Photo Taken: East | |
| Description: Representative view East of the observation point WA1-EEM | |



| | |
|---|---------------------------|
| Photo No. 4 | Date: 9/21/2016 |
| Direction Photo Taken: South | |
| Description: Representative view South of the observation point. View of Rifle Cut visible. | |



| | | |
|--|---|--------------------------------|
| Project Name: SHEP – Wetland Delineation | Site Location: Rifle Cut – Savannah, GA Lat 32.16801 Long -81.13090 | Project No. 60519402 |
|--|---|--------------------------------|

| | |
|---|---------------------------|
| Photo No. 5 | Date: 9/21/2016 |
| Direction Photo Taken: West | |
| Description: Representative view West of the observation point WA1-EEM. | |



| | |
|--|---------------------------|
| Photo No. 6 | Date: 9/21/2016 |
| Direction Photo Taken: West | |
| Description: General view of cut near observation point WA1-EEM. | |



| | | |
|--|---|--------------------------------|
| Project Name: SHEP – Wetland Delineation | Site Location: Rifle Cut – Savannah, GA Lat 32.16801 Long -81.13090 | Project No. 60519402 |
|--|---|--------------------------------|

| | |
|--|---------------------------|
| Photo No. 7 | Date: 9/21/2016 |
| Direction Photo Taken: East | |
| Description: General view of cut near observation point WA1-EEM. | |



| | |
|--|---------------------------|
| Photo No. 8 | Date: 9/21/2016 |
| Direction Photo Taken: South | |
| Description: General view of cut near observation point WA1-EEM. | |



| | | |
|--|--|--|
| <p>Project Name: SHEP – Wetland Delineation</p> | <p>Site Location: Little Back River South Side: Chatham, GA North Side: Effingham, SC Lat 32.22210 Long -81.13358</p> | <p>Project No. 60519402</p> |
|--|--|--|

| | |
|--|-----------------------------------|
| <p>Photo No. 1</p> | <p>Date: 9/21/2016</p> |
| <p>Direction Photo Taken: North</p> | |
| <p>Description: General view of north side of WB2-EFO looking towards the upland slope</p> | |



| | |
|---|-----------------------------------|
| <p>Photo No. 2</p> | <p>Date: 9/21/2016</p> |
| <p>Direction Photo Taken: West</p> | |
| <p>Description: General view of west side of WB2-EFO.</p> | |



| | | |
|--|--|--|
| <p>Project Name: SHEP – Wetland Delineation</p> | <p>Site Location: Little Back River South Side: Chatham, GA North Side: Effingham, SC Lat 32.22210 Long -81.13358</p> | <p>Project No. 60519402</p> |
|--|--|--|

| | |
|--|-----------------------------------|
| <p>Photo No. 3</p> | <p>Date: 9/21/2016</p> |
| <p>Direction Photo Taken: East</p> | |
| <p>Description: General view of east side of WB2-EFO. Left side is toward upland boundary.</p> | |



| | |
|--|-----------------------------------|
| <p>Photo No. 4</p> | <p>Date: 9/21/2016</p> |
| <p>Direction Photo Taken: South</p> | |
| <p>Description: General view of south side of WB2-EFO.</p> | |



| | | |
|--|--|--|
| <p>Project Name: SHEP – Wetland Delineation</p> | <p>Site Location: Little Back River South Side: Chatham, GA North Side: Effingham, SC Lat 32.22210 Long -81.13358</p> | <p>Project No. 60519402</p> |
|--|--|--|

| | |
|--|-----------------------------------|
| <p>Photo No. 5</p> | <p>Date: 9/21/2016</p> |
| <p>Direction Photo Taken: Down</p> | |
| <p>Description: View of observation point WB2-EFO pit.</p> | |



| | |
|--|-----------------------------------|
| <p>Photo No. 6</p> | <p>Date: 9/21/2016</p> |
| <p>Direction Photo Taken: East</p> | |
| <p>Description: General view of Little Back River looking east</p> | |



Appendix B

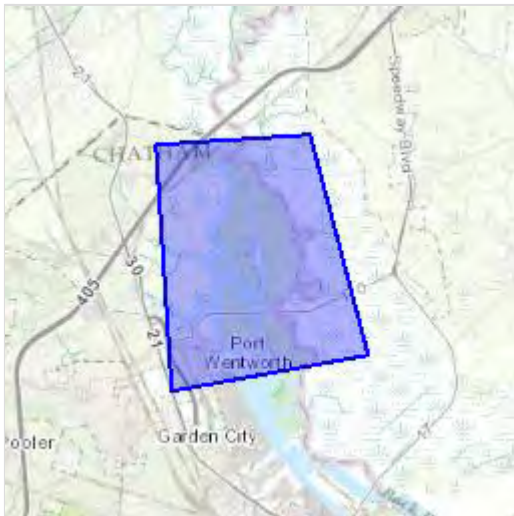
❖ **McCoys Cut USFWS IPAC: Federally Listed Species for the Project Area**

IPaC**U.S. Fish & Wildlife Service**

IPaC resource list

Location

Georgia and South Carolina



Local offices

Georgia Ecological Services Field Office

(706) 613-9493

(706) 613-6059

105 Westpark Drive
Westpark Center Suite D
Athens, GA 30606-3175

South Carolina Ecological Services

(843) 727-4707

(843) 727-4218

176 Croghan Spur Road, Suite 200
Charleston, SC 29407-7558

<http://www.fws.gov/charleston/>

Endangered species

This resource list is for informational purposes only and should not be used for planning or analyzing project level impacts.

[Section 7](#) of the Endangered Species Act **requires** Federal agencies to “request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action” for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list either from the Regulatory Review section in IPaC or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by creating a project and making a request from the Regulatory Review section.

Listed species

¹ are managed by the [Endangered Species Program](#) of the U.S. Fish and Wildlife Service.

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information.

The following species are potentially affected by activities in this location:

Amphibians

| NAME | STATUS |
|---|------------|
| Frosted Flatwoods Salamander <i>Ambystoma cingulatum</i> | Threatened |
| There is a final critical habitat designated for this species. Your location is outside the designated critical habitat. http://ecos.fws.gov/ecp/species/4981 | |

Birds

| NAME | STATUS |
|--|------------|
| Kirtland's Warbler <i>Setophaga kirtlandii</i> (= <i>Dendroica kirtlandii</i>) No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/8078 | Endangered |
| Piping Plover <i>Charadrius melodus</i> No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/6039 | Endangered |
| Piping Plover <i>Charadrius melodus</i> There is a final critical habitat designated for this species. Your location is outside the designated critical habitat. http://ecos.fws.gov/ecp/species/6039 | Threatened |
| Red Knot <i>Calidris canutus rufa</i> No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/1864 | Threatened |
| Red-cockaded Woodpecker <i>Picoides borealis</i> No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/7614 | Endangered |
| Wood Stork <i>Mycteria americana</i> No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/8477 | Threatened |

Fishes

| NAME | STATUS |
|---|------------|
| Atlantic Sturgeon <i>Acipenser oxyrinchus oxyrinchus</i> No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/3252 | Endangered |
| Shortnose Sturgeon <i>Acipenser brevirostrum</i> No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/6635 | Endangered |

Flowering Plants

| NAME | STATUS |
|--|------------|
| American Chaffseed <i>Schwalbea americana</i> No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/1286 | Endangered |
| Canby's Dropwort <i>Oxypolis canbyi</i> No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/7738 | Endangered |
| Pondberry <i>Lindera melissifolia</i> No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/1279 | Endangered |

Mammals

| NAME | STATUS |
|--|------------|
| North Atlantic Right Whale <i>Eubalaena glacialis</i> There is a final critical habitat designated for this species. Your location is outside the designated critical habitat. http://ecos.fws.gov/ecp/species/159 | Endangered |
| West Indian Manatee <i>Trichechus manatus</i> There is a final critical habitat designated for this species. Your location is outside the designated critical habitat. http://ecos.fws.gov/ecp/species/4469 | Endangered |

Reptiles

| NAME | STATUS |
|--|------------|
| Eastern Indigo Snake <i>Drymarchon corais couperi</i> No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/646 | Threatened |
| Gopher Tortoise <i>Gopherus polyphemus</i> No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/6994 | Candidate |

Kemp's Ridley Sea Turtle *Lepidochelys kempii* Endangered
No critical habitat has been designated for this species.
<http://ecos.fws.gov/ecp/species/5523>

Leatherback Sea Turtle *Dermochelys coriacea* Endangered
There is a **final critical habitat** designated for this species.
Your location is outside the designated critical habitat.
<http://ecos.fws.gov/ecp/species/1493>

Loggerhead Sea Turtle *Caretta caretta* Threatened
There is a **final critical habitat** designated for this species.
Your location is outside the designated critical habitat.
<http://ecos.fws.gov/ecp/species/1110>

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Birds are protected under the Migratory Bird Treaty Act

¹ and the Bald and Golden Eagle Protection Act².

Any activity that results in the take (to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct) of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service

³. There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

1. The [Migratory Birds Treaty Act](#) of 1918.

2. The [Bald and Golden Eagle Protection Act](#) of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Conservation measures for birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Year-round bird occurrence data <http://www.birdscanada.org/birdmon/default/datasummaries.jsp>

The migratory birds species listed below are species of particular conservation concern (e.g. [Birds of Conservation Concern](#)) that may be potentially affected by activities in this location, not a list of every bird species you may find in this location. Although it is important to try to avoid and minimize impacts to all birds, special attention should be made to avoid and minimize impacts to birds of priority concern. To view available data on other bird species that may occur in your project area, please visit the [AKN Histogram Tools](#) and [Other Bird Data Resources](#).

| NAME | SEASON(S) |
|---|------------|
| American Bittern <i>Botaurus lentiginosus</i> http://ecos.fws.gov/ecp/species/6582 | Wintering |
| American Kestrel <i>Falco sparverius paulus</i> | Year-round |
| American Oystercatcher <i>Haematopus palliatus</i> http://ecos.fws.gov/ecp/species/8935 | Year-round |
| Bachman's Sparrow <i>Aimophila aestivalis</i> http://ecos.fws.gov/ecp/species/6177 | Year-round |
| Bald Eagle <i>Haliaeetus leucocephalus</i> http://ecos.fws.gov/ecp/species/1626 | Year-round |
| Black Rail <i>Laterallus jamaicensis</i> http://ecos.fws.gov/ecp/species/7717 | Breeding |

| | |
|--|------------|
| Black Skimmer <i>Rynchops niger</i> http://ecos.fws.gov/ecp/species/5234 | Year-round |
| Brown-headed Nuthatch <i>Sitta pusilla</i> | Year-round |
| Chuck-will's-widow <i>Caprimulgus carolinensis</i> | Breeding |
| Common Ground-dove <i>Columbina passerina exigua</i> | Year-round |
| Fox Sparrow <i>Passerella iliaca</i> | Wintering |
| Gull-billed Tern <i>Gelochelidon nilotica</i> http://ecos.fws.gov/ecp/species/9501 | Breeding |
| Henslow's Sparrow <i>Ammodramus henslowii</i> http://ecos.fws.gov/ecp/species/3941 | Wintering |
| Le Conte's Sparrow <i>Ammodramus leconteii</i> | Wintering |
| Least Bittern <i>Ixobrychus exilis</i> http://ecos.fws.gov/ecp/species/6175 | Breeding |
| Lesser Yellowlegs <i>Tringa flavipes</i> http://ecos.fws.gov/ecp/species/9679 | Wintering |
| Loggerhead Shrike <i>Lanius ludovicianus</i> http://ecos.fws.gov/ecp/species/8833 | Year-round |
| Long-billed Curlew <i>Numenius americanus</i> http://ecos.fws.gov/ecp/species/5511 | Wintering |
| Marbled Godwit <i>Limosa fedoa</i> http://ecos.fws.gov/ecp/species/9481 | Wintering |
| Mississippi Kite <i>Ictinia mississippiensis</i> | Breeding |

| | |
|--|------------|
| Nelson's Sparrow <i>Ammodramus nelsoni</i> | Wintering |
| Painted Bunting <i>Passerina ciris</i> | Breeding |
| Peregrine Falcon <i>Falco peregrinus</i> http://ecos.fws.gov/ecp/species/8831 | Wintering |
| Prairie Warbler <i>Dendroica discolor</i> | Breeding |
| Prothonotary Warbler <i>Protonotaria citrea</i> | Breeding |
| Red Knot <i>Calidris canutus rufa</i> http://ecos.fws.gov/ecp/species/1864 | Wintering |
| Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> | Year-round |
| Rusty Blackbird <i>Euphagus carolinus</i> | Wintering |
| Saltmarsh Sparrow <i>Ammodramus caudacutus</i> | Wintering |
| Seaside Sparrow <i>Ammodramus maritimus</i> | Year-round |
| Sedge Wren <i>Cistothorus platensis</i> | Wintering |
| Short-billed Dowitcher <i>Limnodromus griseus</i> http://ecos.fws.gov/ecp/species/9480 | Wintering |
| Short-eared Owl <i>Asio flammeus</i> http://ecos.fws.gov/ecp/species/9295 | Wintering |
| Swainson's Warbler <i>Limnothlypis swainsonii</i> | Breeding |
| Swallow-tailed Kite <i>Elanoides forficatus</i> http://ecos.fws.gov/ecp/species/8938 | Breeding |

| | |
|--|-----------|
| Whimbrel <i>Numenius phaeopus</i> http://ecos.fws.gov/ecp/species/9483 | Wintering |
| Wilson's Plover <i>Charadrius wilsonia</i> | Breeding |
| Wood Thrush <i>Hylocichla mustelina</i> | Breeding |
| Worm Eating Warbler <i>Helmitheros vermivorum</i> | Migrating |
| Yellow Rail <i>Coturnicops noveboracensis</i> http://ecos.fws.gov/ecp/species/9476 | Wintering |

What does IPaC use to generate the list of migratory bird species potentially occurring in my specified location?

Landbirds:

Migratory birds that are displayed on the IPaC species list are based on ranges in the latest edition of the National Geographic Guide, Birds of North America (6th Edition, 2011 by Jon L. Dunn, and Jonathan Alderfer). Although these ranges are coarse in nature, a number of U.S. Fish and Wildlife Service migratory bird biologists agree that these maps are some of the best range maps to date. These ranges were clipped to a specific Bird Conservation Region (BCR) or USFWS Region/Regions, if it was indicated in the 2008 list of Birds of Conservation Concern (BCC) that a species was a BCC species only in a particular Region/Regions. Additional modifications have been made to some ranges based on more local or refined range information and/or information provided by U.S. Fish and Wildlife Service biologists with species expertise. All migratory birds that show in areas on land in IPaC are those that appear in the 2008 Birds of Conservation Concern report.

Atlantic Seabirds:

Ranges in IPaC for birds off the Atlantic coast are derived from species distribution models developed by the National Oceanic and Atmospheric Association (NOAA) National Centers for Coastal Ocean Science (NCCOS) using the best available seabird survey data for the offshore Atlantic Coastal region to date. NOAA/NCCOS assisted USFWS in developing seasonal species ranges from their models for specific use in IPaC. Some of these birds are not BCC species but were of interest for inclusion because they may occur in high abundance off the coast at different times throughout the year, which potentially makes them more susceptible to certain types of development and activities taking place in that area. For more refined details about the abundance and richness of bird species within your project area off the Atlantic Coast, see the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other types of taxa that may be helpful in your project review.

About the NOAA/NCCOS models: the models were developed as part of the NOAA/NCCOS project: [Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#). The models resulting from this project are being used in a number

of decision-support/mapping products in order to help guide decision-making on activities off the Atlantic Coast with the goal of reducing impacts to migratory birds. One such product is the [Northeast Ocean Data Portal](#), which can be used to explore details about the relative occurrence and abundance of bird species in a particular area off the Atlantic Coast.

All migratory bird range maps within IPaC are continuously being updated as new and better information becomes available.

Can I get additional information about the levels of occurrence in my project area of specific birds or groups of birds listed in IPaC?

Landbirds:

The [Avian Knowledge Network \(AKN\)](#) provides a tool currently called the "Histogram Tool", which draws from the data within the AKN (latest, survey, point count, citizen science datasets) to create a view of relative abundance of species within a particular location over the course of the year. The results of the tool depict the frequency of detection of a species in survey events, averaged between multiple datasets within AKN in a particular week of the year. You may access the histogram tools through the [Migratory Bird Programs AKN Histogram Tools](#) webpage.

The tool is currently available for 4 regions (California, Northeast U.S., Southeast U.S. and Midwest), which encompasses the following 32 states: Alabama, Arkansas, California, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, West Virginia, and Wisconsin.

In the near future, there are plans to expand this tool nationwide within the AKN, and allow the graphs produced to appear with the list of trust resources generated by IPaC, providing you with an additional level of detail about the level of occurrence of the species of particular concern potentially occurring in your project area throughout the course of the year.

Atlantic Seabirds:

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAAANCCOS [Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project](#) webpage.

Facilities

Wildlife refuges and fish hatcheries

REFUGE AND FISH HATCHERY INFORMATION IS NOT AVAILABLE AT THIS TIME

Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses

or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Not for
consultation

Appendix C

❖ Section 404(b)(1)

APPENDIX C

SECTION 404 (B) (1) EVALUATION OF DREDGE AND FILL MATERIAL

SECTION 404(b)(1) EVALUATION

FOR

**SAVANNAH HARBOR EXPANSION PROJECT
MODIFICATION OF MCCOYS CUT FEATURE (MCCOYS CUT)
CHATHAM COUNTY, GEORGIA AND JASPER COUNTY, SOUTH CAROLINA**

May 2017

TABLE OF CONTENTS

| | Page No. |
|--|-----------|
| 1.0 INTRODUCTION | 1 |
| 2.0 PROPOSED ACTION AND ENVIRONMENTAL SETTING | 1 |
| 2.1 ENVIRONMENTAL SETTING | 1 |
| 2.2 PROPOSED ACTION | 1 |
| 2.3 GENERAL DESCRIPTION | 4 |
| 3.0 SUBPART B - COMPLIANCE WITH THE GUIDELINES | 8 |
| 3.1 RESTRICTIONS ON DISCHARGE - (SECTION 230.10) | 8 |
| 3.2 FACTUAL DETERMINATION. - (SECTION 230.11) | 10 |
| 3.2.1 Physical Substrate Determinations..... | 10 |
| 3.2.2 Water Circulation, Fluctuations, and Salinity Determinations | 10 |
| 3.2.2.1 Loss of Environmental Value..... | 11 |
| 3.2.2.2 Actions to Minimize Impacts | 11 |
| 3.2.3 Suspended Particulate/Turbidity Determinations..... | 11 |
| 3.2.3.1 Loss of Environmental Values | 11 |
| 3.2.3.2 Actions to Minimize Impacts | 11 |
| 3.2.4 Contamination Determination | 12 |
| 3.2.5 Aquatic Ecosystem and Organism Determinations..... | 12 |
| 3.2.5.1 Threatened and Endangered Species | 12 |
| 3.2.5.2 Fish, Crustaceans, Mollusks and other Aquatic Organisms in the Food Web..... | 12 |
| 3.2.5.3 Other Wildlife..... | 12 |
| 3.2.5.4 Special Aquatic Sites..... | 12 |
| 3.2.5.5 Potential Effects on Human Use Characteristics | 12 |
| 3.2.5.6 Possible Loss of Environmental Values..... | 13 |
| 3.2.5.7 Actions to Minimize Impacts | 13 |
| 3.2.6 Proposed Disposal Site Determination | 13 |
| 3.2.7 Determination of Cumulative Effects on the Aquatic Ecosystem | 13 |
| 3.2.8 Determination of Secondary Effects on the Aquatic Ecosystem | 13 |
| 4.0 FINDINGS OF COMPLIANCE OR NONCOMPLIANCE WITH RESTRICTIONS ON DISCHARGE – (SECTION 230.12) | 14 |
| 4.1 DETERMINATIONS | 14 |
| 4.2 FINDINGS | 14 |

**SECTION 404(b)(1) EVALUATION
OF DREDGE AND FILL MATERIAL**

**SAVANNAH HARBOR EXPANSION PROJECT
MODIFICATION OF MCCOYS CUT FEATURE (MCCOYS CUT)
CHATHAM COUNTY, GEORGIA AND JASPER COUNTY, SOUTH CAROLINA**

1.0 INTRODUCTION

The following evaluation is prepared in accordance with Section 404(b)(1) of the Clean Water Act of 1977 to evaluate the environmental effects of the proposed placement of dredged or fill material in waters of the United States. This evaluation supplements the Savannah Harbor Expansion Project (SHEP) Section 404(b)(1) evaluation which can be found in Appendix H

(<http://www.sas.usace.army.mil/Portals/61/docs/SHEP/Reports/EIS/Appendix%20H%20Section%20404b1%20SHEP%20FINAL%20EIS.pdf>) of the SHEP 2012 Final Environmental Impact Statement. Specific portions of the regulations are cited and an explanation of the regulation is given as it pertains to the project. These guidelines can be found in Title 40, Part 230 of the Code of Federal Regulations (<https://www.ecfr.gov/cgi-bin/text-idx?SID=b94f445cf586aaff7dde767b5a8a09cd&mc=true&node=pt40.27.230&rgn=div5>).

2.0 PROPOSED ACTION AND ENVIRONMENTAL SETTING

2.1 ENVIRONMENTAL SETTING

The SHEP - McCoys Cut project is located off of the Savannah River on the Middle and Little Back River.

2.2 PROPOSED ACTION

The proposed action modifies the previously approved SHEP Mitigation Flow Re-routing Plan and requires an additional 2,600 feet of dredging within Middle River (stations 58+00 to 84+00) to -7 feet mean lower low water (MLLW) to provide the required flows (Figure 1). In addition to the additional 2,600 feet of dredging, the dredging depth would also increase by four feet at the mouth of Union Creek to account for potential future shoaling. The area of additional dredging depth is within the same footprint as the previously approved dredging template, just four feet deeper for a distance of approximately 1,360 feet. This alternative consists of (1) using the majority of excavated sediments beneficially to create wetlands in both McCoombs (western arm of McCoys Cut) and Rifle Cuts (Figure 2) to enhance fish and wildlife habitat, and (2) taking the remaining balance of approximately 100,000 cubic yards of course sand from the upper reaches of Middle and Little Back River to either the Sediment Basin or to the approved upland Dredged Material Containment Areas (DMCA).



Figure 1: Location of Additional Dredging Reach in Middle River



Figure 2: Project Location – Close Up Beneficial Use Placement Areas

As a beneficial use of the sediments excavated from the Middle and Little Back Rivers, the sediment would be placed behind the cut closure structures to an elevation suitable for wetland creation. This action would occur within the Savannah National Wildlife Refuge, who conceptually supports this proposal. The volume of sediment to be dredged is sufficient to fill the two cuts to elevation +8 to +8.5 feet MLLW. Topographic surveys conducted for the project indicate that adjacent high ground in both areas are at or above elevation +8 feet MLLW. Before placement of the excavated sediments, a plug would be constructed across the western ends of both cuts to approximately elevation of +11 feet MLLW. The plug at McCombs Cut is 80 feet wide at the base. The plug at Rifle Cut is 100 feet wide at the base. Rock or concrete would be used for this plug. The eastern end will be armored with rock to +5 feet MLLW. Above that elevation, protection

against erosion will be provided by hay bales secured with live stakes and several rows of container plantings. The plantings would reduce the risk of erosion immediately after completion of the project until vegetation establishes naturally along the length of the cuts. Approximately nine acres of wetlands would be created. The remaining balance of approximately 100,000 cubic yards of coarse sand from the upper reaches of Middle and Little Back River would be placed in existing upland DMCA's or the Sediment Basin.

As a result of logistical concerns of using the Houlihan Bridge during construction, an area will be designated on U.S. Fish and Wildlife (USFWS) lands on the Savannah National Wildlife Refuge as a possible access area for the contractor to haul material and supplies to and from the construction site (Figure 4). A temporary pile supported platform will be installed on the edge of the existing tidal wetland and the Back River impacting approximately 0.13 acres of tidal wetlands and 0.10 acres of river. Dike improvements will also be completed leading to the new platform, impacting approximately 0.23 acres of managed wetlands inside the USFWS diked system. This platform is expected to be in place for the duration of the construction and would be removed after approximately one year.

2.3 GENERAL DESCRIPTION:

Lands along this portion of the Savannah River estuary are largely within the Savannah National Wildlife Refuge. The Savannah National Wildlife Refuge is located in the upper portion of the harbor and consists of 29,175 acres of freshwater marshes, tidal rivers and creeks, and bottomland hardwoods. The Refuge also contains extensive unimpounded wetlands along the Savannah, Middle and Back Rivers. Wetlands located downstream of U.S. Highway 17 are vegetated predominantly by salt marsh and brackish marsh species, while those above that point are predominantly freshwater or brackish wetlands. USFWS also manages 5,700 acres of diked impoundments for waterfowl in the Refuge. Those impoundments include 3,000 acres of freshwater pools.

The McCoy's Cut project is a component of the flow re-routing mitigation plan of Savannah Harbor Expansion Project. These features work in combination to provide increased freshwater flows into the estuary and limit salinity intrusion to reduce salinity impacts to tidal freshwater and brackish wetlands. These features benefit tidally influenced wetlands adjacent to the Middle, Back and Little Back River system, which are part of the Savannah River distributary system. This system of smaller cuts and rivers joins the navigation channel on the Savannah (or Front) River in several locations. The modification of the McCoy's Cut Project is the additional dredging and the placement of the excavated sediment to create wetlands.

Most of the impacts to the environment from implementation of the proposed alternative would be beneficial, and there have not been any significant adverse impacts identified to natural resources. As designed, the diversion structure at McCoys Cut will divert water flow to reduce the upstream movement of salinity in Middle River and Little Back River associated with the Savannah Harbor deepening. This would minimize impacts to tidal freshwater marsh. Closing the western end of McCoys Cut is designed to bring

more freshwater into Little Back and Middle Rivers. Closing Rifle Cut would reduce the amount of salt water entering the Little Back River via the Middle River.

The proposed structural improvement described below includes the creation of wetlands behind previously-approved closure structures. It does not include the construction of the diversion structure at McCoys Cut or constructing closure structures at both the lower western arm at McCoys Cut-McCoombs Cut and at Rifle Cut, since those two actions were approved through coordination of the FEIS.

Description of Actions Subject to Section 404 of Clean Water Act

The majority of the project areas is within the Savannah National Wildlife Refuge and is tidally influenced and surrounded by wetlands. The Rifle Cut area is dominated by tidal, emergent wetlands, while the McCoy's Cut area contains mostly forested wetlands with small fringe areas of emergent wetlands. The material to be dredged from the Middle and Little Back Rivers will be beneficially used to create wetlands by placing them behind the Cut Closure Structures to an elevation suitable for marsh creation. The quantity of material to be dredged is enough to fill the two cuts to elevation +8 to +8.5 feet MLLW. Geotechnical investigations were conducted to characterize the dredged material and found it be largely a coarse sandy material with very little fines and organics. Approximately 184,000 cubic yards of this material will be used to create the wetlands. Once the excavated sediments have been placed in the cuts, the eastern ends of both cuts will be armored with rock to approximately elevation +5 feet MLLW. Above this elevation, protection against erosion will be provided by hay bales secured with live stakes and several rows of container plantings. This will reduce the risk of erosion until vegetation establishes naturally along the length of the cuts. The District expects this work to construct approximately nine acres of wetlands. Hydraulic dredge equipment will be limited to 24 inches or smaller and no overflow on scows will be allowed. In addition, no bottom dump scows will be allowed.

The remaining excavated sediments could be transported to an area within the Sediment Basin where Savannah District is planning to construct a broad berm as described in the 2012 FEIS. Approximately 45 round trips will be needed to transport the excavated sediments to the Sediment Basin. Those transits will be coordinated with the Harbor Pilots to avoid traffic conflicts with other ships in the project area. Figure 3 shows the area within the Georgia waters side of the Sediment Basin where the sediments would be dumped. The state line between Georgia and South Carolina is not mid channel, but runs along the northern side of the Federal Sediment Basin. The placement of the excavated sediments will help fill the no longer operated Sediment Basin. The area is approximately 30 acres in size, with a bottom elevation of -15 feet MLLW based on an October 2016 hydrosurvey. The placement priority will be at the downstream or eastern end of the box and will be limited to a placement elevation of -10 feet MLLW (target height for broad berm as described in the 2012 FEIS) or greater.

As a result of logistical concerns of using the Houlihan Bridge during construction, an area will be designated on the Savannah National Wildlife Refuge as a possible access

site for the contractor to haul material and supplies to and from the construction site (Figure 4). A temporary pile supported platform will be installed on the edge of the existing tidal wetland and the Back River, impacting approximately 0.13 acres of tidal wetlands and 0.10 acres of river. Dike improvements will also be completed leading to the new access platform, impacting approximately 0.23 acres of managed wetlands inside USFWS diked system. This platform is expected to be in place for the duration of the construction timeframe which is estimated to be approximately one year, and will be removed at the end of the construction.



Figure 3: Approximate placement location within the Sediment Basin

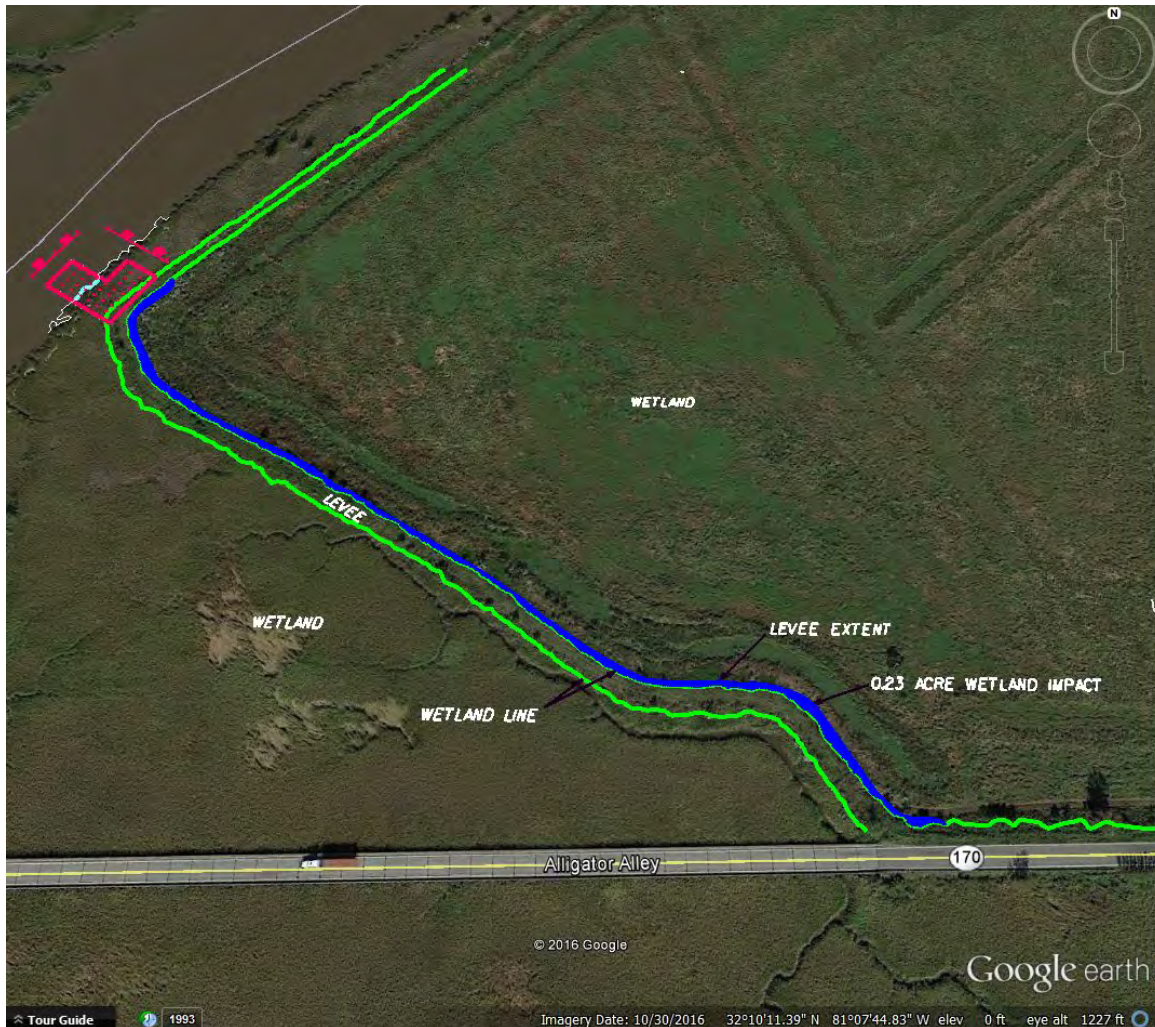


Figure 4: Approximate placement location of access area within Savannah National Wildlife Refuge

Threatened, Endangered and other Listed Species

The U.S. Fish and Wildlife Service (USFWS) provided the USACE Savannah District with the final Fish and Wildlife Coordination Act report for the Savannah River Expansion Project on March 7, 2011. The USFWS stated in that report that they preferred the alternatives that minimize the loss of already limited freshwater wetlands, minimize impacts to the Savannah National Wildlife Refuge, and minimize risk and uncertainty of impacts on fish and wildlife resources. The proposed alternative is not likely to adversely affected the protected species in the project area as the focus of the flow rerouting structures are designed to provide increase freshwater flows into the estuary and limit salinity intrusion to tidal freshwater habitat. The creation of approximately nine acres of wetlands will provide additional habitat for fish and wildlife

resources and enhance the existing wetland habitat already present at the Savannah National Wildlife Refuge.

3.0 SUBPART B - COMPLIANCE WITH THE GUIDELINES

The following objectives should be considered in making a determination of any proposed discharge of dredged or fill material into waters of the U.S.

3.1 RESTRICTIONS ON DISCHARGE - (SECTION 230.10)

"(a) except as provided under Section 404(b)(2), no discharge of dredged or fill material shall be permitted if there is a practical alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences."

No other practicable alternative with less environment impacts on the aquatic ecosystem has been identified.

"(b) Discharge of dredged material shall not be permitted if it;"

"(1) Causes or contributes, after consideration of disposal dilution and dispersions, to violations of any applicable state water quality standard;"

"(2) Violates any applicable toxic effluent standard or prohibition under Section 370 of the Clean Water Act."

The analytical results of sediment sampling indicated that no contamination exists that would impact the proposed construction activities. The visual classification of the soil samples indicate the material that will be used to create the wetland habitat is predominantly medium to coarse sands, with little to trace fines and organics. Turbidity curtains will be installed across the cuts to prevent turbidity plumes from leaving the placement site.

"(3) Jeopardizes the continued existence of species listed as endangered and threatened under the Endangered Species Act of 1973, as amended."

Endangered species are addressed in the EA for this action. No federally listed species have been found on the site and the work is expected to have no affect on listed species.

"(4) Violates any requirements imposed by the Secretary of Commerce to protect any marine sanctuary designated under Title III of the Marine Protection Research and Sanctuaries Act of 1972."

No marine sanctuary or other items addressed under this Act would be affected by the proposed work.

"(c) Except as provided under Section 404(b)(2), no discharge of dredged or fill material shall be permitted which will cause or contribute to significant degradation of the waters of the United States. Findings of significant degradation related to the proposed discharge shall be based upon appropriate factual determinations, evaluations, and tests required by Subparts B and G of the consideration of Subparts C-F with special emphasis on the persistence and permanence of the effects contributing to significant degradation considered individually or collectively include:"

"(1) Significantly adverse effects of the discharge of pollutants on human health or welfare including, but not limited to effects on municipal water supplies, plankton, fish, shellfish, wildlife, and special aquatic sites."

The proposed work is expected to improve water quality and conservation. Therefore, this project is expected to have a beneficial effect on, fish, shellfish, wildlife, and special aquatic sites.

"(2) Significantly adverse effects of the discharge of pollutants on life stages of aquatic life and other wildlife dependent upon aquatic ecosystems, including the transfer, concentration, and spread of pollutants or their by-products outside the disposal site through biological, physical, and chemical processes."

The analytical results of sediment sampling indicated that no contamination exists that would impact the proposed construction activities.

"(3) Significantly adverse effects of the discharge of pollutants on aquatic ecosystems diversity, productivity, and stability. Such effects may include, but are not limited to, loss of fish and wildlife habitat or loss of the capacity of a wetland to assimilate nutrients, purify water, or reduce wave energy; or"

"(4) Significantly adverse effects of the discharge of pollutants on recreational, aesthetic, and economic values."

The proposed changes to the project would create wetlands, improving fish and wildlife habitat quality. These improvements to wetland system will help improve water quality, provide food and habitat for various fish and wildlife species, and enhance the aesthetics and recreation opportunities.

"(d) Except as provided under Section 404(b)(2), no discharge of dredged or fill material shall be permitted unless appropriate and practical steps have been taken which will minimize the potential adverse impacts of the discharge on the aquatic ecosystem."

Approximately nine acres of tidal wetlands will be created using the dredged sediment to create additional habitat for fish and wildlife. Rather than just take all of the material

and place it in an upland disposal area, the excavated sediments can be used beneficially to create and enhance valuable tidal wetland habitat.

3.2 FACTUAL DETERMINATION. - (SECTION 230.11)

3.2.1 Physical Substrate Determinations

Consideration shall be given to the similarity in particle size, shape, and degree of compaction of the material proposed for discharge and the material constituting the substrate at the disposal site and any potential changes in substrate elevation and bottom contours.

Fill material for the project would come from the dredging sites and be comprised of predominately medium to coarse sand. Based on the location of the dredging areas, there is a very low risk of contaminants being present.

Possible loss of environmental values

No long term loss of environmental values are expected. The features in the project design are designed to improve environmental values of the project area. If the contractor constructs the access point within the Refuge, there would be only temporary impacts to approximately 0.13 acres of tidal wetlands and 0.23 acres of managed diked wetlands on the Savannah National Wildlife Refuge. Impacts would be minimized by removing the pile supported platform after construction is complete and replanting the impacted areas.

Actions to minimize impacts

Any fill material used would be the minimum necessary to fulfill the project design. Existing soil on site will be re-used to the maximum extent practicable. Turbidity curtains will be installed across the cuts to prevent turbidity plumes from leaving the placement site.

3.2.2 Water Circulation, Fluctuations, and Salinity Determinations

Consideration shall be given to water chemistry, salinity, clarity, color, odor, taste, dissolved gas levels, temperature, nutrients, and eutrophication plus other appropriate characteristics. Also to be considered are the potential diversion or obstruction of flow, alterations of bottom contours, or other significant changes in the hydrologic regime. Changing the velocity of water flow can result in adverse changes in location, structure, and dynamics of aquatic communities, shoreline erosion and deposition, mixing rates and stratification, and normal water-level fluctuation patterns. These effects can alter or destroy aquatic communities.

There is no substantial change in water circulation, fluctuation, or salinity due to the creation of wetlands from that described in the 2012 FEIS.

3.2.2.1 Loss of Environmental Value

As described above, this project is designed to increase environmental value of the sites restoring freshwater tidal wetlands by creating approximately nine acres of additional wetlands. If the contractor constructs the access point within the Refuge there would be only temporary impacts to approximately 0.13 acres of tidal wetlands and 0.23 acres of managed diked wetlands on the Savannah National Wildlife Refuge. Impacts would be minimized by removing the pile supported platform after construction is complete and replanting the impacted areas.

3.2.2.2 Actions to Minimize Impacts

Proposed fills are the minimum necessary to accomplish the project purposes. Turbidity curtains will be installed across the cuts to prevent turbidity plumes from leaving the placement site.

3.2.3 Suspended Particulate/Turbidity Determinations

Effects due to potential changes in the kinds and concentrations of suspended particulate/turbidity in the vicinity of the disposal site. Factors to be considered include grain size, shape and size of any plume generated, duration of the discharge and resulting plume, and whether or not the potential changes will cause violations of applicable water quality standards. Consideration shall include the proposed method, volume, location, and rate of discharge, as well as the individual and combined effects of current patterns, water circulation and fluctuations, wind and wave action, and other physical factors on the movement of suspended particulates.

Turbidity impacts due to construction are expected to be temporary. In addition, plans include sediment barriers and silt screens to restrict turbidity and sediment loss during construction.

3.2.3.1 Loss of Environmental Values

Due to reduction in light transmission, reduction in photosynthesis, reduced feeding and growth of sight dependent species, direct destructive effects to nektonic and planktonic species, reduced DO, increased levels of dissolved contaminants, aesthetics.

Adverse impacts are expected to be minor and temporary and cease soon after construction is completed.

3.2.3.2 Actions to Minimize Impacts

The District follows sediment and erosion control best management practices in its designs. Turbidity curtains will be installed across the cuts to prevent turbidity plumes from leaving the placement site.

The analytical results of sediment sampling indicate that no contamination exists that would impact the proposed construction activities.

The creation of approximately nine acres of wetlands and the increase of fresh water flows in the area may create or enhance some wetland functions and values, including filtering of excessive nutrients that would contribute to turbidity that are present in the project area; decreasing sedimentation/erosion; and establishing wetland vegetation.

3.2.4 Contamination Determination

Consider the degree to which the proposed discharge will introduce, relocate, or increase contaminants. This determination shall consider the material to be discharged, the aquatic environment at the proposed disposal site, and the availability of contaminants. Consideration of Evaluation and Testing (parts 230.60, and 230.61).

There is no reason to expect any contaminant related impacts from the proposed work.

3.2.5 Aquatic Ecosystem and Organism Determinations

Effect on the structure and function of the aquatic ecosystem and organisms and effect on the re-colonization and existence of indigenous aquatic organisms or communities.

3.2.5.1 Threatened and Endangered Species

This work is expected to have no effect on threatened or endangered species, with implementation of the proposed protective measures.

3.2.5.2 Fish, Crustaceans, Mollusks and other Aquatic Organisms in the Food Web

Immobile biota would be lost during construction activities. This would be minor, temporary adverse impacts since these species are expected to quickly repopulate the construction site. Other biota that are mobile would avoid the construction area. Long term benefits are anticipated from the proposed action. In addition, if the access point is constructed, approximately 0.10 acres of the Back River will be shaded by the temporary pile supported platform. The newly constructed platform may attract fish by providing a shaded area for them during the summer months.

3.2.5.3 Other Wildlife

This project is expected to result in minor improvement in the habitat for other wildlife.

3.2.5.4 Special Aquatic Sites

The proposed action will enhance the Savannah National Wildlife Refuge by creating approximately nine acres of tidal wetlands. The project will enhance the freshwater tidal wetlands at the Refuge, providing additional valuable habitat for various fish and wildlife resources in the area.

3.2.5.5 Potential Effects on Human Use Characteristics

The proposed work is expected to result in positive long term impacts regarding this issue.

3.2.5.6 Possible Loss of Environmental Values

The proposed work is expected to increase the environmental value of the site.

3.2.5.7 Actions to Minimize Impacts

Turbidity (silt) curtains will be installed across the cuts to prevent turbidity plumes from leaving the placement site.

3.2.6 Proposed Disposal Site Determination

Each disposal site shall be specified through application of the guidelines. The mixing zone shall be confined to the smallest practicable zone within each specified disposal site that is consistent with the type of dispersion determined to be appropriate by the application of the guidelines.

The proposed amount of fill required for the proposed project is the minimum required to fulfill the project purpose of the flow rerouting features and provide additional fish and wildlife habitat by creating approximately nine acres of tidal wetlands. No practicable alternatives are available that produce the same benefits.

3.2.7 Determination of Cumulative Effects on the Aquatic Ecosystem

Cumulative effects attributable to the discharge of dredged or fill material in waters of the United States should be predicted to the extent reasonable and practical.

Beneficial impacts would result throughout this portion of the Savannah River estuary which is within a majority of the Savannah National Wildlife Refuge. The Savannah National Wildlife Refuge is located in the upper portion of the harbor and consists of 29,175 acres of freshwater marshes, tidal rivers and creeks, and bottomland hardwoods. The proposed alternative would restore some of this lost natural freshwater tidal wetland habitat by creating approximately nine acres of tidal wetlands. It would also enhance existing wetland habitats by increasing the amount of freshwater flows in the project area.

If the contractor constructs the access point in the Refuge, there would be temporary impacts to approximately 0.13 acres of tidal wetlands and 0.23 acres of managed wetlands. The impacts to the tidal wetlands will be minimized by the removal of the pile supported platform and replanting of the area. The Refuge provided a list of plants that are acceptable for use in the area. The impacts to the managed wetlands will be minimized when at the end of construction the 16 foot crest width of the dike is degraded to maintain an approximately 20 foot berm. Disturbed areas of this berm will be replanted.

3.2.8 Determination of Secondary Effects on the Aquatic Ecosystem

Secondary effects are effects on an aquatic ecosystem that are associated with a discharge of dredged or fill materials, but do not result from the actual placement of the dredged or fill material.

With the proposed project, habitat for many animals would be improved by creating additional wetlands through the beneficial use of the dredged sediments.

4.0 FINDINGS OF COMPLIANCE OR NONCOMPLIANCE WITH RESTRICTIONS ON DISCHARGE – (SECTION 230.12)

4.1 DETERMINATIONS

a. An ecological evaluation of the discharge of dredged material associated with the proposed action has been made following the evaluation guidance in 40 CFR 230.6, and the evaluation considerations at 40 CFR 230.5.

b. Potential short-term and long-term effects of the proposed action on the physical, chemical, and biological components of the aquatic ecosystem have been evaluated. The proposed discharge will not result in significant degradation of the environmental values of the aquatic ecosystem.

c. There are no less environmentally damaging practicable alternatives to the proposed work that would accomplish the project goals and objectives. Several alternatives were eliminated for not accomplishing all project goals or for being too costly. The No Action alternative is found to be less acceptable.

(1) The proposed action will not cause or contribute to violations of any applicable State water quality standards, will not violate any applicable toxic effluent standard or prohibition under Section 307 of the Clean Water Act, will not jeopardize the continued existence of species listed as endangered or threatened under the Endangered Species Act of 1973, and will not violate any requirement imposed by the Secretary of Commerce to protect any marine sanctuary designated under Title III of the Marine Protection, Research, and Sanctuaries Act of 1972.

(2) The proposed work will not cause or contribute to significant degradation of the waters of the United States.

(3) The discharge includes all practicable and appropriate measures to minimize potential harm to the aquatic ecosystem.

4.2 FINDINGS

Based on the determinations made in this Section 404 (b) (1) evaluation, the finding is made that, with the conditions enumerated in this document, the proposed action complies with the Section 404(b)(1) Guidelines.

Appendix D

❖ **McCoys Cut Value Engineering Proposals Table**

VALUE ENGINEERING TEAM STUDY
SUMMARY OF RECOMMENDATIONS/ACTION

| Prop. No. | PROPOSALS | FIRST COST SAVINGS | LIFE CYCLE COST SAVINGS | ACCEPTED / REJECTED |
|-----------|--|----------------------------|-------------------------|---------------------|
| 1 | Eliminate the plug on the eastern part of Mc Coombs Cut. | \$849,849 | - | |
| 2 | Provide the eastern plug on Rifle Cut. Mutually exclusive with Proposals #6 & #7. | <\$1,400,950> | - | |
| 3 | Increase the height of the marsh land behind the plugs from 8' to 9'. | \$18,150 | - | |
| 4 | Fill New Cut if additional placement area is needed. | <2,865,900> | - | |
| 5 | Pulverize the spoil concrete into smaller than 2-1/2 ton sections. | <\$130,810> | - | |
| 6 | Use hay bales on the eastern end of plugs in lieu of stone (temporary erosion control). Mutually exclusive with Proposals #2, #7 & #11. | \$832,251 | - | |
| 7 | Armor the eastern slope at both cuts in lieu of a plug at MCoombs Cut. Mutually exclusive with Proposals #2, #6 & #8. | <\$618,761> | - | |
| 8 | Stabilize all fill areas of cuts w/ container plants. Mutually exclusive with Proposals #6, #7 & #11. | <\$14,538> | - | |
| 9 | Add notes/ details to the drawings for limits and heights of fill. | COMMENT | N.A. | |
| 10 | Determine if Fish & Wildlife need additional construction quality sand for adjacent uses. | COMMENT | N.A. | |

| | | | | |
|------------|--|------------------|-------------|-------------------|
| 11 | Combined Proposal #6 (hay bales) and #8 (planting). Mutually exclusive with Proposals #6 & #8. | \$203,629 | N.A. | |
| RP7 | Strategic Placement of Dredged Material in Upland Sites | COMMENT | - | Accepted |
| C1 | Strategically engage and partner with resource agencies in pursuit of opportunities to (1) streamline environmental compliance processing; (2) reinforce the importance of science based decisions; and (3) facilitate risk based mitigation planning concepts | COMMENT | N.A. | Accepted |
| C5 | Utilize Nontraditional Dredged Material Placement Site(s) (open water, bird islands, wetland creation) | COMMENT | N.A. | Being Done |
| C8 | Utilization of Navigation Channels as Borrow Sites for Shore Protection | COMMENT | N.A. | Rejected |
| C9 | Regional Method for Cost Estimating | COMMENT | N.A. | Being Done |

Appendix E

❖ Georgia Coastal Zone Consistency Determination

Georgia
Coastal Zone Consistency Determination (CZM)
McCoys Cut flow re-routing feature of the Savannah
Harbor Expansion Project
Chatham County, Georgia



US Army Corps of Engineers
Savannah District
Savannah, Georgia

May 2017

In 2011, the Georgia Department of Natural Resources, Coastal Resources Division wrote that the staff of the Georgia Coastal Management Program (GCMP) had reviewed the USACE Savannah District's Savannah Harbor Expansion Project (SHEP) Tier II Draft Environmental Impact Statement (DEIS) and General Re-Evaluation Report and concluded that the Savannah Harbor Expansion Project (which included the McCoys Cut flow re-rerouting feature) was with the enforceable policies of the Georgia Coastal Management Program.

After the SHEP FEIS was approved, Savannah District began detailed engineering and environmental design studies as part of its preparation of contract drawings and specifications. Through those more recent studies, USACE learned that an additional 2,600 feet of the Middle River needs to be deepened to achieve the intended flow volume of the original mitigation plan. The design team also determined that an additional four feet of dredging will be necessary at the mouth of Union Creek to address future shoaling. This area of additional dredging depth would remain in the same footprint as the previously-approved dredging template, but four feet deeper for a distance of approximately 1,360 feet.

As a result of the need for additional dredging, Savannah District evaluated alternate placement sites for the dredged sediments. These alternate placement sites include creating wetland habitat at McCoombs Cut (western arm of McCoys Cut) and Rifle Cut. The remaining balance of dredged sediment will be placed either in approved DMCA's or in a portion of the Sediment Basin, which is another flow re-routing feature of SHEP. Using the alternate sediment placement sites would reduce the amount of sediment placed into existing upland dredged material containment areas (DMCA's). Use of the alternate sites would retain maintain the capacity of the DMCA's for future Operations and Maintenance and new work sediments.

The proposed action would occur within the coastal zone, so consistency with the state's CZM Program is required. The action would result in only minor additional temporary direct and indirect impacts to those that were described in the SHEP FEIS. The quality of the sediments being proposed to be dredged and use beneficially is comprised of predominantly medium to coarse sands with little to trace fines and organics. Four out of the nearly 100 samples were comprised of mostly silts/clays, with trace to little sand. We do not expect additional negative impacts to coastal resources from this project. The 2012 Final Environmental Impact Statement for SHEP included hazardous, toxic and radioactive waste investigations for the McCoys Cut flow re-routing feature. Based on the samples collected analyzed during the most recent subsurface investigation, Savannah District concluded that no further investigation of this issue is warranted. Based on the location of the project area, there is a very low risk of contaminants being present. In addition, during the geotechnical analysis process, no unusual colors or odors were noted.

There would be no change in the method or timing of dredging, the design of the diversion structure or the rock plugs. Construction would still take place from barges to

minimize impacts to adjacent lands. To reduce adverse effects to sturgeon during construction of the flow re-routing modifications and during the harbor deepening, special provisions would be implemented to protect sturgeon. The area of the proposed flow re-routing modifications is located in foraging and resting habitat for sturgeon and is used by juvenile shortnose sturgeon during the winter. To minimize project impacts to sturgeon, construction of the diversion and closure structure at McCoys/McCoombs Cut and Rifle Cut would only occur between May 15 and November 1. Most sturgeon are not expected to be in that portion of the estuary during that period, as discussed in the November 4, 2011 final Biological Opinion for SHEP. In addition, dredging would not occur during the spawning season for striped bass, which occurs between April 1 and May 15. As a result of coordination with NMFS in February 2017, the District incorporated the following additional measures into the proposed work to minimize potential impacts to sturgeon:

- 1) Monitor water quality (DO, pH, turbidity) downstream of the dredging activity to prevent sediment plumes that could adversely affect the water quality in the deep hole located in the lower Middle River
- 2) Conduct dredging in only one area at a time (either in upper Middle River or the Back River, not both at the same time)
- 3) Regardless of dredging method used, implement precautionary warning techniques before dredging starts each day (e.g., tapping the clamshell bucket on the water surface or some similar method of providing warning)
- 4) Follow similar guidelines as those in NMFS's Sea Turtle and Smalltooth Sawfish Construction Conditions to protect sturgeon observed in or near the dredging area. More specifically, operation of any mechanical construction equipment shall cease immediately if a sturgeon is seen within a 50-foot radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition or a 30-minute waiting period.

To ensure that dredging and construction activities do not affect manatees, Savannah District has adopted and would implement on this project the "Standard State and Federal Manatee Protection Conditions."

With the creation of approximately nine acres of intertidal wetlands, long term benefits will include improved water quality, additional food and habitat for various fish and wildlife species, and enhanced aesthetics and recreation opportunities. Therefore, USACE Savannah District believes this project is fully consistent with the enforceable policies of the State of Georgia's Coastal Zone Management Program.

Appendix F

❖ **South Carolina Coastal Zone Consistency Determination**

**South Carolina
Coastal Zone Consistency Determination (CZM)
McCoys Cut flow re-routing feature of the Savannah Harbor
Expansion Project
Jasper County, South Carolina**



**US Army Corps of Engineers
Savannah District
Savannah, Georgia**

May 2017

In a November 15, 2011 letter from the South Carolina Department of Health and Environmental Control (SC DHEC), SC DHEC removed their objection to the U.S. Army Corps of Engineers (USACE), Savannah District finding of Coastal Zone Consistency for the Savannah Harbor Expansion Project (SHEP) (which included the McCoys Cut flow re-rerouting feature).

After the SHEP FEIS was approved, Savannah District began detailed engineering and environmental design studies as part of its preparation of contract drawings and specifications. Through those more recent studies, USACE learned that an additional 2,600 feet of the Middle River needs to be deepened to achieve the intended flow volume of the original mitigation plan. The design team also determined that an additional four feet of dredging will be necessary at the mouth of Union Creek to address future shoaling. This area of additional dredging depth would remain in the same footprint as the previously-approved dredging template, but four feet deeper for a distance of approximately 1,360 feet.

As a result of the need for additional dredging, Savannah District evaluated alternate placement sites for the dredged sediments. These alternate placement sites include creating wetland habitat at McCoombs Cut (western arm of McCoys Cut) and Rifle Cut. The remaining balance of dredged sediment will be placed either in approved DMCA's or in a portion of the Sediment Basin, which is another flow re-routing feature of SHEP. Using the alternate sediment placement sites would reduce the amount of sediment placed into existing upland dredged material containment areas (DMCA's). Use of the alternate sites would retain maintain the capacity of the DMCA's for future Operations and Maintenance and new work sediments.

The proposed action would occur within the coastal zone, so consistency with the state's CZM Program is required. The action would result in only minor additional temporary direct and indirect impacts to those that were described in the SHEP FEIS. The quality of the sediments being proposed to be dredged and use beneficially is comprised of predominantly medium to coarse sands with little to trace fines and organics. Four out of the nearly 100 samples were comprised of mostly silts/clays, with trace to little sand. We do not expect additional negative impacts to coastal resources from this project. The 2012 Final Environmental Impact Statement for SHEP included hazardous, toxic and radioactive waste investigations for the McCoys Cut flow re-routing feature. Based on the samples collected analyzed during the most recent subsurface investigation, Savannah District concluded that no further investigation of this issue is warranted. Based on the location of the project area, there is a very low risk of contaminants being present. In addition, during the geotechnical analysis process, no unusual colors or odors were noted.

There would be no change in the method or timing of dredging, the design of the diversion structure or the rock plugs. Construction would still take place from barges to minimize impacts to adjacent lands. To reduce adverse effects to sturgeon during construction of the flow re-routing modifications and during the harbor deepening, special provisions would be implemented to protect sturgeon. The area of the proposed

flow re-routing modifications is located in foraging and resting habitat for sturgeon and is used by juvenile shortnose sturgeon during the winter. To minimize project impacts to sturgeon, construction of the diversion and closure structure at McCoys/McCoombs Cut and Rifle Cut would only occur between May 15 and November 1. Most sturgeon are not expected to be in that portion of the estuary during that period, as discussed in the November 4, 2011 final Biological Opinion for SHEP. In addition, dredging would not occur during the spawning season for striped bass, which occurs between April 1 and May 15. As a result of coordination with NMFS in February 2017, the District incorporated the following additional measures into the proposed work to minimize potential impacts to sturgeon:

- 1) Monitor water quality (DO, pH, turbidity) downstream of the dredging activity to prevent sediment plumes that could adversely affect the water quality in the deep hole located in the lower Middle River
- 2) Conduct dredging in only one area at a time (either in upper Middle River or the Back River, not both at the same time)
- 3) Regardless of dredging method used, implement precautionary warning techniques before dredging starts each day (e.g., tapping the clamshell bucket on the water surface or some similar method of providing warning)
- 4) Follow similar guidelines as those in NMFS's Sea Turtle and Smalltooth Sawfish Construction Conditions to protect sturgeon observed in or near the dredging area. More specifically, operation of any mechanical construction equipment shall cease immediately if a sturgeon is seen within a 50-foot radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition or a 30-minute waiting period.

To ensure that dredging and construction activities do not affect manatees, Savannah District has adopted and would implement on this project the "Standard State and Federal Manatee Protection Conditions."

With the creation of approximately nine acres of intertidal wetlands, long term benefits will include improved water quality, additional food and habitat for various fish and wildlife species, and enhanced aesthetics and recreation opportunities. Therefore, USACE Savannah District believes this project is fully consistent with the enforceable policies of the State of South Carolina Coastal Zone Management Program.