ENVIRONMENTAL ASSESSMENT

of Modifications to the

RAW WATER STORAGE IMPOUNDMENT

SAVANNAH HARBOR EXPANSION PROJECT

Chatham County, Georgia and Jasper County, South Carolina

September 2013

US Army Corps of Engineers
Savannah District
South Atlantic Division

FINDING OF NO SIGNIFICANT IMPACT

Proposed Modification to the Raw Water Storage Impoundment (RWSI)

Savannah Harbor Expansion Project (SHEP) Chatham County, Georgia

NAME OF ACTION
Modification of the Raw Water Storage Impoundment (RWSI), Savannah Harbor Expansion Project (SHEP).

DESCRIPTION OF PROPOSED ACTION
Previous studies concluded that construction of the SHEP would increase salinity and chloride concentrations in the Savannah River Estuary, including Abercorn Creek. To compensate for potential impacts to the City of Savannah's Industrial and Domestic Water Treatment Plant in Port Wentworth, Georgia caused by increased salinity at the City's raw water intake in Abercorn Creek, an RWSI was included as part of the SHEP. That mitigation feature was previously approved during the public and agency coordination of the 2012 SHEP Environmental Impact Statement.

Detailed design studies conducted by Savannah District after completion of the SHEP EIS indicate that modifications are needed to the location and design of the Raw Water Storage Impoundment. During the detailed design process, several alternate sites were considered to identify the location that best meets the overall project needs. A parcel near Interstate Highway 95 and the City of Savannah's raw water pipeline was identified as the best location. Engineering and environmental studies were then performed on that site.

The selected parcel of land (117 acres) adjacent to the City's raw water pipeline would be acquired by the State of Georgia, which is the non-Federal sponsor (NFS) for SHEP. This property will be used to construct and operate an above ground RWSI on approximately 33 acres of the property. A 3,300-foot access road (1.7 acres) located on top of the existing raw water pipeline is included in the proposed action. Borrow material will be required for the construction of the earthen dikes around the impoundment and will be obtained from an off-site source.

The 33-acre RWSI facility includes an earthen dike surrounding the impoundment that is approximately 3,400 feet in total length, with a maximum height of 29 feet, requiring a total material volume of approximately 440,000 cubic yards. The impoundment would have a maximum storage capacity of 62.5 Million Gallons per Day (MGD). It includes the placement of a High Density Polyethylene (HDPE) liner; associated piping and valves; a mechanical

mixing system; a 1-megawatt generator with fuel storage; a pump station and electrical building; a powdered activated carbon system with a silo and feed equipment; a groundwater well; a hydro-pneumatic tank; and fencing of the entire facility. Influent and effluent pipelines will be required between the impoundment and the existing City of Savannah water lines. After construction of the RWSI is complete, the facility would be turned over to the City of Savannah for operation and maintenance.

As part of the design process, the US Army Corps of Engineers (USACE) examined impacts of connecting the RWSI piping into the City's existing 48-inch raw water pipeline. Should a loss of power occur after the RWSI is constructed, vacuum conditions could occur in the pipeline. To address this concern, the design will include upgrades to the 19 existing air release valves on the pipeline and construction of 3 new valves.

The preferred alternative (Site 4) would adversely impact 13.5 acres of wetlands, 2.1 acres of which are protected under restrictive covenant. The 2012 SHEP EIS stated that Savannah District would prepare and coordinate a site-specific wetland mitigation plan with Georgia Department of Natural Resources and the Federal resource agencies to compensate for wetland impacts that may occur to construct the RWSI. More detail on the compensatory wetland mitigation plan can be found in Appendix G of the EA.

ANTICIPATED ENVIRONMENTAL IMPACTS

Most of the adverse environmental impacts associated with this project involve the loss of 13.5 acres of jurisdictional non-tidal wetlands, 2.1 acres of which are under restrictive covenant. This proposed action would modify a component of the approved mitigation plan for the SHEP project. In achieving the project purpose, there would be unavoidable impacts to existing wetlands. The wetland mitigation plan is designed to compensate for these adverse impacts.

MITIGATION

The RWSI is mitigation for water quality impacts for the SHEP project. The proposed action would modify the design approved in the 2012 SHEP EIS. In achieving the project purpose, there would be unavoidable impacts to existing wetlands. However, the wetland mitigation plan is designed to compensate for these adverse impacts.

Mitigation for this proposed action would also include appropriate measures to control erosion and storm water runoff to avoid impacts from erosion to nearby wetlands. In addition, monitoring requirements for potential wildlife hazards created by the impoundment are outlined in the Appendix D of the attached Environmental Assessment (EA).

FINDING OF NO SIGNIFICANT IMPACT

The EA for this project was prepared and evaluated pursuant to the National Environmental Policy Act (NEPA) (Public Law 91-190, 42 U.S.C. 4321 et seq.). It has been concluded that the proposed modification of this project feature does not constitute a "major federal action significantly affecting the quality of the human environment" when considered individually or cumulatively in the context of the referenced act including both direct and indirect impacts; therefore, an Environmental Impact Statement is not required.

PUBLIC/AGENCY COMMENT

Copies of the Draft EA and Draft Finding of No Significant Impact (FONSI) were distributed to all appropriate Federal and state agencies that may have an interest in the project. In addition, the availability of these documents was posted on the USACE Savannah District website. All comments received in regard to the proposed action (along with the USACE responses) are located in Appendix C and the comment period ended on August 16, 2013.

Reviewed and Approved by:

8 OCT 13

Date

Thomas J. Tickner
Colonel, U.S. Army
District Engineer

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List of Acronyms and Abbreviations

CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental, Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CZMP	Coastal Zone Management Plan
CWA	Clean Water Act
DBPs	Disinfection By-Products
EA	Environmental Assessment
EO	Executive Order
EPA	United States Environmental Protection Agency
EPD	Environmental Protection Division
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
GADOT	Georgia Department of Transportation
GPA	Georgia Ports Authority
HAA	Haloacetic acids
MGD	Million Gallons per Day
msl	Mean Sea Level
NEPA	National Environmental Policy Act
NFS	Non-Federal Sponsor
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
NOA	Notice of Availability
NRCS	Natural Resources Conservation Service
RWSI	Raw Water Storage Impoundment
SCS	Soil Conservation Service
SHEP	Savannah Harbor Expansion Project
SHPO	State Historic Preservation Office
SNWR	Savannah National Wildlife Refuge
THMs	Trihalomethanes

USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Services
USGS	United States Geologic Survey
WHMP	Wildlife Hazard Management Plan

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1 Proposed Action

1.1 Background

This Environmental Assessment (EA) follows the guidelines and regulations established by the National Environmental Policy Act of 1969 (NEPA). This EA assesses and analyzes the environmental impacts that would result from implementation of the proposed action and alternatives. This EA also contains discussions of any mitigation and permit requirements, and findings and conclusions in accordance with NEPA. Such information provides the basis for the US Army Corps of Engineers to determine whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI). The use of the term "significant" (and derivations thereof) in this EA is consistent with the definition and guidelines provided in the Council on Environmental Quality (CEQ) regulations [40 Code of Federal Regulations (CFR) 1508.27], which require consideration of both the context and intensity of impacts.

1.2 Purpose and Need for the Proposed Action

The City of Savannah operates and maintains a raw water pipeline between Abercorn Creek and its Industrial and Domestic Water Treatment Plant in Port Wentworth, Georgia (Appendix A; Figures 2b and 2c). The pipeline delivers raw water that the City treats and then uses primarily as a water supply for local industries for specific plant processes, but also for drinking water to residences in west Savannah, Pooler, and south Effingham County.

Environmental studies concluded that the Savannah Harbor Expansion Project (SHEP) will increase salinity and chloride concentrations in the upper reaches of the Savannah River Estuary, including Abercorn Creek (USACE 2012a). A Raw Water Storage Impoundment (RWSI) was included as a mitigation feature in the SHEP to store low chloride raw water during periods of high chloride events at the City's water intake in Abercorn Creek. The RWSI would mitigate for 1) high chloride levels, 2) increased lead pipe corrosion, and 3) increased formation of Disinfection By-Product (DBP). This mitigation feature was approved during public and agency coordination of the SHEP EIS (USACE 2012a).

After SHEP was approved, Savannah District began detailed engineering and environmental design studies as part of its preparation of contract drawings and specifications. As those studies progressed, it became apparent that alternate locations should be considered to minimize environmental effects and maximize the efficiency of the RWSI. This EA is part of those considerations.

More detail on the project purpose/need is provided in Section 2.1 "No Action Alternative".

1.3 Description of the Proposed Action

Detailed design studies indicate that modifications are needed to the location and design of the RWSI that is a mitigation feature of the SHEP. The detailed studies reveal that the impoundment should be constructed at a different location than the one identified in the 2012 SHEP EIS.

The selected parcel of land (Site 4) adjacent to the City's raw water pipeline would be the best location for the RWSI. The site would be acquired by the non-Federal sponsor (NFS) for SHEP and used to construct and operate an above-ground raw water storage impoundment on approximately 33 acres of the property. A 3,300-foot access road (1.7 acres) located on top of the existing raw water pipeline is included in the proposed action (Appendix A; Figures 1 and 2). Borrow material will be required to construct the earthen dikes around the impoundment and will be obtained from an off-site source.

The 33-acre RWSI facility includes an earthen dike surrounding the impoundment that is approximately 3,400 feet in total length, with a maximum height of 29 feet, requiring a total material volume of approximately 440,000 cubic yards. The impoundment would have a maximum storage capacity of 62.5 Million Gallons per Day (MGD). The impoundment includes the placement of a High Density Polyethylene (HDPE) liner; associated piping and valves; a mechanical mixing system; a 1 megawatt generator with fuel storage; a pump station and electrical building; a powdered activated carbon system with a silo and feed equipment; a groundwater well, a hydropneumatic tank, and fencing of the entire facility. Influent and effluent pipelines will be required between the impoundment and the existing City of Savannah water lines. The proposed action also includes upgrades to 19 existing pipeline air release valves and construction of 3 new valves (most from 6 to 8 or 10 inches) on the City of Savannah's existing raw water pipeline. After construction of the RWSI is complete, the facility would be turned over to the City of Savannah for operation and maintenance.

This proposed action would modify a component of the approved mitigation plan for the SHEP project (SHEP 2012a). In achieving the project purpose, there would be unavoidable impacts to existing non-tidal wetlands. The preferred alternative (Site 4) would adversely impact 13.5 acres, 2.1 acres of which are under restrictive covenant. The 11.4 acres of wetlands that are not under restrictive covenant were completely clearcut in 2011 and 2012. The proposed wetland mitigation plan consisting of purchase of credits from an existing wetland mitigation bank would compensate for these adverse impacts. More detail on wetland impacts and the compensatory wetland mitigation plan can be found in Section 4.3 and Appendix G.

In accordance with the FAA Advisory Circular 150/5200-33A (FAA 2007), a Wildlife Hazard Management Plan (WHMP) has been developed (Appendix D) to ensure that project implementation would not create any unsafe wildlife attractants to the nearby Savannah-Hilton Head International Airport. This WHMP has been coordinated with the FAA for approval and includes post-construction monitoring of the site.

Table 1: Changes in RWSI from 2012 SHEP EIS

Issue	2012 EIS	EA
Project Purpose	Mitigate chloride impacts to City of Savannah Abercorn Creek water intake	Unchanged
Location	Parcel 3 of GPA's Savannah International Trade Park near Mulberry Grove	New location (Site 4)
Threatened & Endangered Species	No effect	Unchanged
Wetlands	Potential for impacts to small amount of wetlands	Impacts to 13.5 acres (2.1 acres under restrictive covenant)
Size	Approximately 35 acres	33 acres
Cultural Resources	No effect	Unchanged

As part of the detailed design process, USACE examined impacts of connecting the RWSI piping to the City's existing 48-inch raw water pipeline. Should a loss of power occur after the RWSI is constructed, vacuum conditions could occur in the pipeline. To address this concern, the design includes upgrades to 19 existing pipeline air release valves and construction of 3 new air release valves (most from 6 to 8 or 10 inches). Although USACE Civil Works activities are not governed by the USACE Section 404 regulatory permitting process, upgrades to existing valves (and new valves that may be required) that occur in wetlands within the pipeline right-of-way would be performed with the conditions in the Nationwide Permit 12 (Utility Line Activities). More detail on the Nationwide Permit 12 conditions in regard to this project may be found in Section 4.3.

Water Quality Certifications: The Georgia Department of Natural Resources Environmental Protection Division (DNR-EPD) issued a water quality certification for the SHEP (including the RWSI project) with certain conditions (USACE 2012a). The Georgia DNR-EPD (Drinking Water Program) reviewed and approved (with listed conditions) this proposed action by letter dated February 4, 2013 (Appendix C). The conditions (detailed in Section 4.1) are included in the proposed action along with all other contingencies associated with environmental clearances for this project.

In a letter dated August 19, 2013 (Appendix C), the Georgia DNR-EPD stated that the modifications to the location and design of the RWSI still conform to the requirements of the 401 water quality certification issued by EPD on February 16, 2011 for SHEP. Therefore, since the SHEP water quality certification applies the RWSI project, no further certification is required.

1.4 Location of the Proposed Action

The City of Savannah's raw water pipeline is located in northern Chatham County between Georgia Highway 21 and I-95 (Figure 1). The intake is on Abercorn Creek, a tributary of the Savannah River, and the pipeline runs southward 7.25 miles to the City's Industrial and Domestic Water Treatment Plant in Port Wentworth, Georgia.

The proposed action is sited within a large tract of timberland whose current and historical land use is silviculture, and includes jurisdictional wetlands, excavated ponds and ditches (Appendix A; Figures 2, 4, and 5). Some of the timber was recently harvested in clear cuts and the pine timber is naturally regenerating from seed in these areas. Some of the existing timber stands were planted and some were naturally produced.

The proposed RWSI lies in between the existing raw water pipeline and Interstate 95. The topography of the subject site ranges from 7 to 17 feet above mean sea level (msl) at the following coordinates: Coordinates: Latitude 32 degrees, 12 minutes, 15 N seconds; Longitude 81 degrees, 11 minutes, 10 W seconds.

2 Description of the Alternative Actions

During the feasibility phase of the SHEP, six potential sites (Figure 1 below) for the RWSI were identified and screened for suitability, environmental impacts, and costs to design and construct. As scoping for the detailed design progressed, three additional sites were identified and included in this screening process. The screening criteria were as follows:

- Soils and constructability (hydric vs. non-hydric soils, suitability for use in constructing dams/levees, depth to water table, subsurface condition risk)
- Hydrology on site (flooding frequency)
- Wetlands (likelihood of presence, potential impacts and mitigation required)
- Presence of restrictive covenants and impacts of altering these
- Endangered species (likelihood of impacts)
- Cultural resources (likelihood of impacts)
- Noise and visibility impacts
- Environmental liability risks (contamination)
- Land use compatibility (zoning, proximity to inhabited structures)
- Flood risk to adjacent properties
- Risk to infrastructure (roadways, railways, utility lines)
- Availability of the site for purchase
- Proximity to city's raw water pipeline
- Proximity to city's water plant
- Design and construction costs
- Schedule risks
- Uncertainty

The nine potential alternative sites were chosen for investigation by examining aerial photos and/or satellite imagery and identifying land areas that were undeveloped and located between the City's raw water intake on Abercorn Creek and their water treatment facility in Port Wentworth. After examining the imagery, site visits were conducted to ascertain if the sites appeared buildable and acceptable for further investigation. Each site was screened for practicability and reasonableness using the criteria listed above. At critical points during the

feasibility phase, the design and layout of the facility changed considerably. Initial plans called for a much larger impoundment than the one that was eventually included in the SHEP report documents and approved for construction. Alternative sites were screened and evaluated as the design progressed; therefore, more detailed data were available for sites screened later in the process (Phase 2). In addition, as part of the Phase 2 analysis, new sites were considered that were not previously available during Phase 1 (SHEP EIS). Details of the analysis showing a comparison of each alternative to the screening criteria is shown in Table 2 and a summary of the criteria affecting site selection are discussed in the narrative below.

2.1 No-Action Alternative

The CEQ regulations prescribe inclusion of the No Action Alternative as the benchmark against which proposed federal actions are evaluated. Under the No Action Alternative, the proposed RWSI would be constructed as part of the SHEP project. Impacts from construction of SHEP would occur and the RWSI would be constructed as described in the 2012 SHEP EIS. The SHEP EIS identified Parcel 3 of GPA's Savannah International Trade Park near Mulberry Grove as the location for the RWSI. The site is described as Site 5 in the following section and in Figure 1. Since the site had already been permitted for industrial development, the EIS stated that no wetland impacts were expected. The EIS went on to state that if detailed design studies reveal that wetlands would be impacted, the Corps would prepare a site-specific wetland mitigation plan and coordinate it with Georgia Department of Natural Resources and the Federal natural resource agencies. Since the impacts from the detailed design are more than anticipated, the Corps has elected to prepare a full Environmental Assessment of the design changes from the SHEP EIS.

2.2 Phase I Alternative Analysis

Alternative Sites Eliminated from More Detailed Analysis (Figure 1 shows the location of sites evaluated in this phase)

Alternative Site 9: This 144-acre site is almost entirely wetland, with only a small portion of upland. Use of this site would require extensive mitigation for impacts to wetlands. The Natural Resources Conservation Service (NRCS) Soil Resource Report for this site lists the water table at the ground surface, inhibiting constructability.

Two cemeteries lie within or near the upland portion of Site 9. These cemeteries limit the amount of upland available for developing the RWSI on this site since preliminary investigation indicates that most of this tract is classified as wetlands. Detailed wetland and cultural resource surveys would be required for this property. There is good potential for some prehistoric occurrences to exist on the higher ground margins of this particular site. The closest site eligible for listing on the National Register of Historic Places (NRHP) is the railroad corridor. Part of the site is under a restrictive covenant according to US Army Corps of Engineers Savannah District Regulatory Division. Altering this covenant could require triple-mitigation for wetland impacts. In addition, a natural gas line runs through the site.

Site 9 was eliminated from further consideration on the basis of the large acreage of wetland impacts, high probability of impacting cultural resources, risk to infrastructure, and reduced constructability due to high water table.

Alternative Site 5: This 76-acre site is Parcel 3 of GPA's Savannah International Trade Park near Mulberry Grove. It is bounded on the west by a railroad line/corridor that has been previously determined as a National Register-eligible historic property. Site 5 has been previously surveyed for cultural resources (Braley 2005). Several historic and prehistoric sites are recorded within the tract. Many of the recorded sites have undetermined NRHP status and would require further evaluation if the RWSI could not be designed to avoid impacting the sites. Since this is an active railroad track, there is a risk of contaminated soil and/or groundwater associated with the railroad track impacting the proposed site.

Notably, constructing the RWSI on this site would require installation of four 36-inch supply and return water pipelines that would pass underneath the railroad track. A rail or pipeline accident in this vicinity could interrupt both City water supply and rail access. In a worst-case scenario, a rail accident could damage or release a contaminant into the City's water supply, or a rupture or failure in the high pressure water line could compromise the railroad bed. Either of these results would endanger human health and safety. In addition, it is unknown when USACE could obtain the required approvals from the railroad. Based on previous interactions with the railroad, the decision process would take an indeterminate amount of time but not less than two years after design is complete.

Site 5 was eliminated from further consideration on the basis of the difficulty of approval and time required to install water supply pipelines underneath the rail line, risk of existing contamination (environmental liability), risk of impacting significant cultural resources, and risk of a railway accident or pipeline rupture endangering human health and safety and infrastructure.

Alternative Site 3: This 128-acre site straddles the Chatham-Effingham County line and is located on the west side of Georgia Highway 21. Preliminary data based on the NRCS Soil Resource Report for this site indicates the water table at the ground surface, which could inhibit constructability. The National Wetland Inventory (NWI) maps identify over half of this site as wetlands. The southern half of the site (in Chatham County) has been developed for single and multi-family residential developments. Wetlands in this portion of the site have been filled. Recent aerial photography (Google Earth Pro) shows 10 apartment buildings and several single-family homes on site. If the RWSI is built on the undeveloped portion of this site, it would be located in wetlands in the northern half of the site, 700 feet from the residential development. Noise, visibility, and the potential risk to human health and safety should the impoundment's dike break poses a considerable risk.

Site 3 is located a distant 4,000 feet from the City's raw water pipeline and 6.5 miles from the City's water treatment plant, greatly increasing cost of construction and operation. Optimally, the site would be located adjacent to the existing raw water pipeline and as close as possible to the City's municipal and industrial water treatment facility, thereby maximizing the use of the existing pumps at Abercorn Creek and minimizing new pipeline and pumping costs. Location of the RWSI at Site 3 would also require construction of a pipeline that would cross Georgia State

Highway 21. This presents a risk of service interruption or contamination of the City's water supply in the event of an accident that damaged or ruptured the pipeline and could also compromise the highway road bed.

Site 3 was eliminated from further consideration on the basis of proximity to the raw water pipeline, risk to infrastructure, risk to human health and safety, cost to run a pipeline nearly 1 mile and under a major highway, and the proximity to residential development, and reduced constructability due to high water table.

Alternative Site 1: This 110-acre site is located 1,700 feet from the City's raw water pipeline and 7.4 miles from the City's water treatment plant. The distance from the water plant would increase cost of construction and operation. The NRCS Soil Resource Report for this site shows the water table at the ground surface, inhibiting constructability.

Site 1 was eliminated from further consideration based on distance to the raw water pipeline and to the city's water treatment plant, the additional costs needed to run ½ mile pipeline to the existing raw water pipe, and reduced constructability due to high water table.

Alternative Site 2: This 132-acre site is located adjacent to the city's raw water pipeline but is 6.2 miles from the City's water treatment plant, greatly increasing cost of construction and operation. Site 2 is the furthest proposed site from the water treatment plant, along the pipeline. Compared to other potential sites, approximated 100 additional horsepower would be needed in pump capacity to deliver the water, increasing construction and operation and maintenance costs. The NRCS Soil Resource Report for this site shows the water table at the ground surface, inhibiting constructability.

Site 2 was eliminated from further consideration based on distance to the City's water treatment plant, increased costs compared to other alternatives, and reduced constructability due to high water table.

Alternative Site 7: This 31-acre site is adjacent to the raw water pipeline but is 5.2 miles from the City's water treatment plant, greatly increasing cost of construction and operation. This site is barely large enough to contain the proposed 30-acre RWSI. It affords no opportunity to reconfigure or move the RWSI within the site to minimize adverse impacts, and no room for a buffer between the RWSI and adjacent properties. For instance, although NWI shows no wetlands on the site, 100% of the site has hydric or partially hydric soils, suggesting that wetlands may be present. If this is the case, the small size of the site would preclude reconfiguring the design to avoid wetlands.

Although the site is 1,400 feet from the nearest occupied dwelling, it is zoned Residential Single Family, and a tract bordering this site is being developed for a subdivision. Should the RWSI be located on this site, there is a high risk that future land use compatibility and noise/visibility impacts could become significant with this planned development. In addition, a Phase I Cultural Resource Survey would be required prior to development of this property.

Site 7 was eliminated from further consideration based on distance to the City's water treatment plant, and design constraints imposed by the small size of the site relative to the size of the proposed RWSI.

Alternative Site 6: This 34-acre site is adjacent to the raw water pipeline but is 5.0 miles from the City's water treatment plant, greatly increasing cost of construction and operation. This site is barely large enough to contain the proposed 30-acre RWSI. It affords no opportunity to reconfigure or move the RWSI within the site to minimize adverse impacts, and no room for a buffer between the RWSI and adjacent properties. For instance, although NWI shows no wetlands on the site, 100% of the site has hydric or partially hydric soils, suggesting that wetlands may be present. If this is the case, the small size of the site would preclude reconfiguring the design to avoid wetlands. Although the site is 1,100 feet from the nearest occupied dwelling, it is zoned Residential Single Family, and a tract bordering this site is being developed for a subdivision. Should the RWSI be located on this site, there is a high risk that future land use compatibility and noise/visibility impacts could become significant with this planned development.

This 34-acre site was included in the Georgia Department of Transportation's NaviGAtor System for Hurricane Evacuation project archaeological assessment (No author, N.D.). No cultural resources sites were recorded within the site; however, the survey did not entail intensive field investigations (Phase I Cultural Resource Survey). A Phase I Cultural Resource Survey would be required prior to development of this property.

Site 6 was eliminated from further consideration based on distance to the City's water treatment plant, and design constraints imposed by the small size of the site relative to the size of the proposed RWSI.

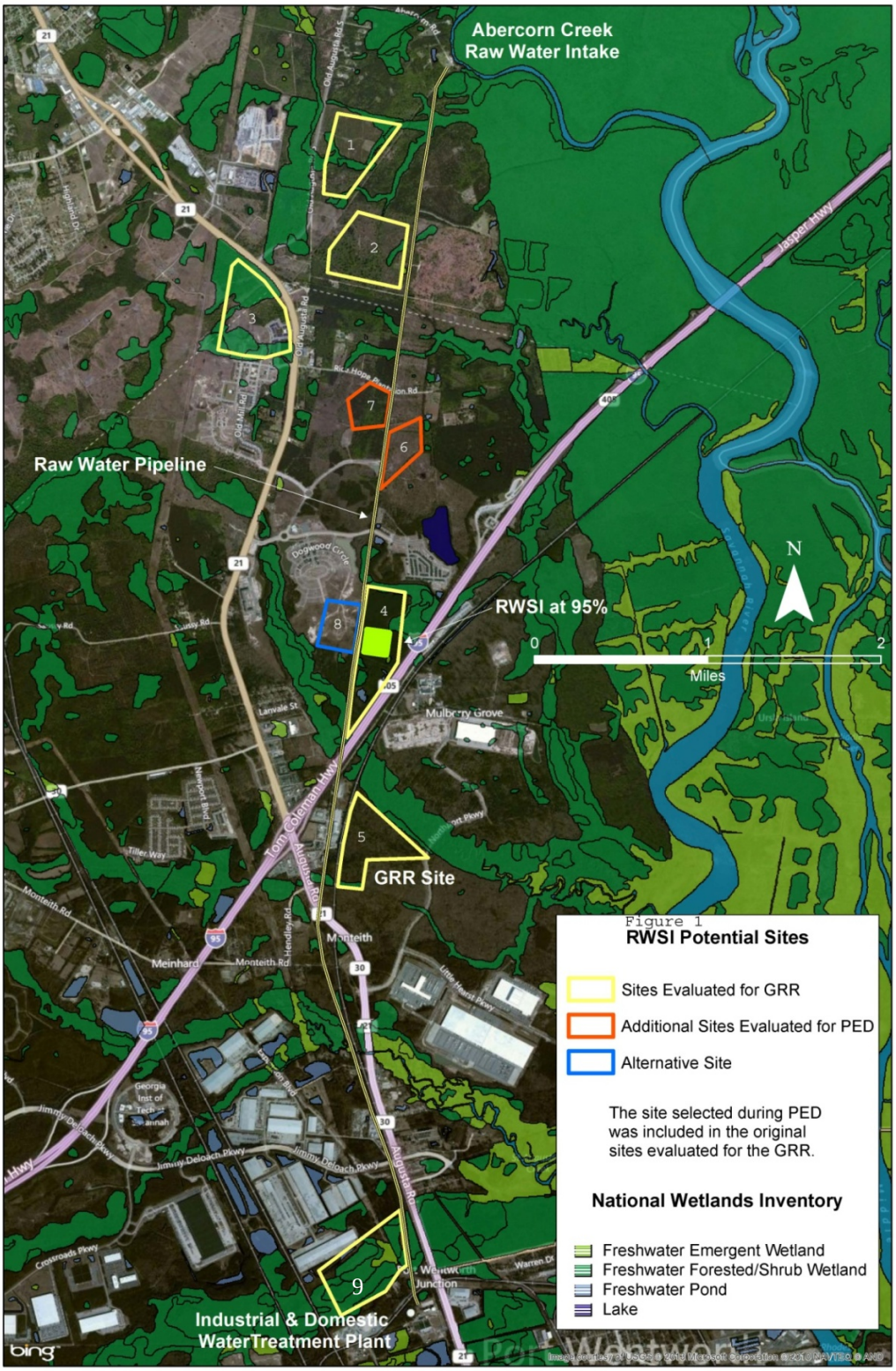

Figure 1 - Location of 9 Potential Sites for RWSI (see Appendix A for larger map)

2.3 Phase II Alternative Analysis

After completion of the feasibility phase of the SHEP (Phase I), additional site alternatives were screened based on more detailed engineering design criteria for the RWSI. In addition, a new site (Site 8) that was not previously available was evaluated. A summary of the criteria affecting site selection are discussed in the narrative below. Figure 2 shows the location of sites evaluated in this phase.

Alternative Site 4: This 117-acre site is adjacent to the raw water pipeline and 3.8 miles from the City's water treatment plant. A 65% design has been prepared that places the 33-acre impoundment footprint within the site. Wetlands have been delineated in the field on the entire 117-acre tract. The RWSI footprint as currently designed would encroach on a total of 13.5 acres of wetlands, 2.1 acres of which are protected under a restrictive covenant. The restrictive covenant would require triple-mitigation for the 2.1 acres of wetland impact. The total mitigation cost is estimated to be $666,330. The entire site has been cleared for the presence of cultural resources, endangered species, and other environmental liabilities.

The NRCS Soil Resource Report for this site and field investigations show the water table at approximately 1 foot or below within the footprint of the impoundment, which would not significantly reduce constructability. There are no known subsurface condition risks since the site is under natural conditions (planted pines, mixed pine-hardwoods). The current footprint places the RWSI 1,330 feet from the nearest residential dwellings. Therefore, the potential adverse impacts from noise and aesthetics (visibility) from the proposed facility are not significant and would result in better land use compatibility when compared to other site alternatives.

No increase in design or construction costs or schedule would be incurred for this alternative.

Alternative Site 4 Reconfigured: This alternative moves the 33-acre RWSI footprint 500 feet southward in the 117-acre Site 4 tract so that the footprint does not encroach on the wetlands protected by restrictive covenant. As with the original configuration for Site 4, this alternative places the RWSI adjacent to the raw water pipeline and 3.8 miles from the City's water treatment plant. This alternative would impact approximately 14 acres of wetlands. The entire site has been cleared for the presence of cultural resources, endangered species, and other environmental liabilities. The proposed footprint places the RWSI 1,500 feet from the nearest residential dwellings, so noise/visibility present low risk for adverse impacts and land use compatibility is acceptable when compared to other site alternatives.

This alternative would place the southern portion of the RWSI on wetlands that include water-filled borrow pits from the construction of Interstate Highway 95. These borrow pits present increased design and construction costs. The tract narrows between the water pipeline and Interstate 95, preventing shifting the southern embankment to higher ground. Construction costs to fill the borrow pits would be much higher than using the current design for Site 4. In addition, this alternative would encroach into the 100-year floodplain that lies to the south of Site 4 and conflict with Executive Order 11988 (Floodplain Management).

Design costs would increase by $400,000, construction costs would increase by $1.0 to $4.0 million, and the schedule would lengthen by 4 months if this alternative is pursued.

Alternative Site 8: This alternative would place the 33-acre RWSI on an adjacent property immediately west of Site 4. As with the original configuration for Site 4, this alternative places the RWSI adjacent to the raw water pipeline and 3.8 miles from the City's water treatment plant. The site is part of a planned subdivision that was never completed. Approximately 16 acres within the 33-acre footprint are wetlands that were filled in 2005 for construction of the subdivision. The quality of fill that was used is unknown and would require investigation during the design phase, if this alternative was implemented. This alternative would impact approximately 0.9 acres of wetlands that were not filled in 2005. Additionally, construction of the impoundment on this site, which is higher in elevation, could save approximately $2.5 to $4 million in construction costs, assuming the embankment height (and consequently amount of fill required) would decrease.

The NRCS Soil Resource Report (USDA 2013) for this site shows the water table on the site prior to placement of fill at approximately 1 foot or below within the footprint, which would not significantly reduce constructability. There are subsurface condition risks since the fill material used is of unknown quality. This alternative would place the 30-foot high RWSI dike 170 feet from the nearest residential development, posing a higher risk to human health and safety due to flooding in the event of a failure of that structure. The State of Georgia Safe Dams Program administered by GA DNR-EPD requires that a failure flood analysis to be completed for this site. Unless additional dike failure flood analysis modeling is performed, it is unknown at this time whether this site would pose a greater threat in the event of dike failure. If constructed, additional permitting and monitoring may be required. In addition, the closer proximity of the RWSI to the Rice Hope residential development poses a potentially unacceptable land use compatibility with a high risk for impacts associated with noise/visibility.

Site 8 was included in the Georgia Department of Transportation's NaviGAtor System for Hurricane Evacuation project archaeological assessment (No author, N.D.). No cultural resources sites were recorded within the site; however, the survey did not entail intensive field investigations. Although USACE has not surveyed for cultural resources and endangered species, both resources are considered to have a low probability of occurrence on the site based on work performed by the previous land owner/Section 404 permittee. A Phase I Cultural Resource Survey would be required prior to development of this property.

Design costs would increase by $1.0 to $1.5 million and the schedule would lengthen by 8 months if this alternative is pursued.

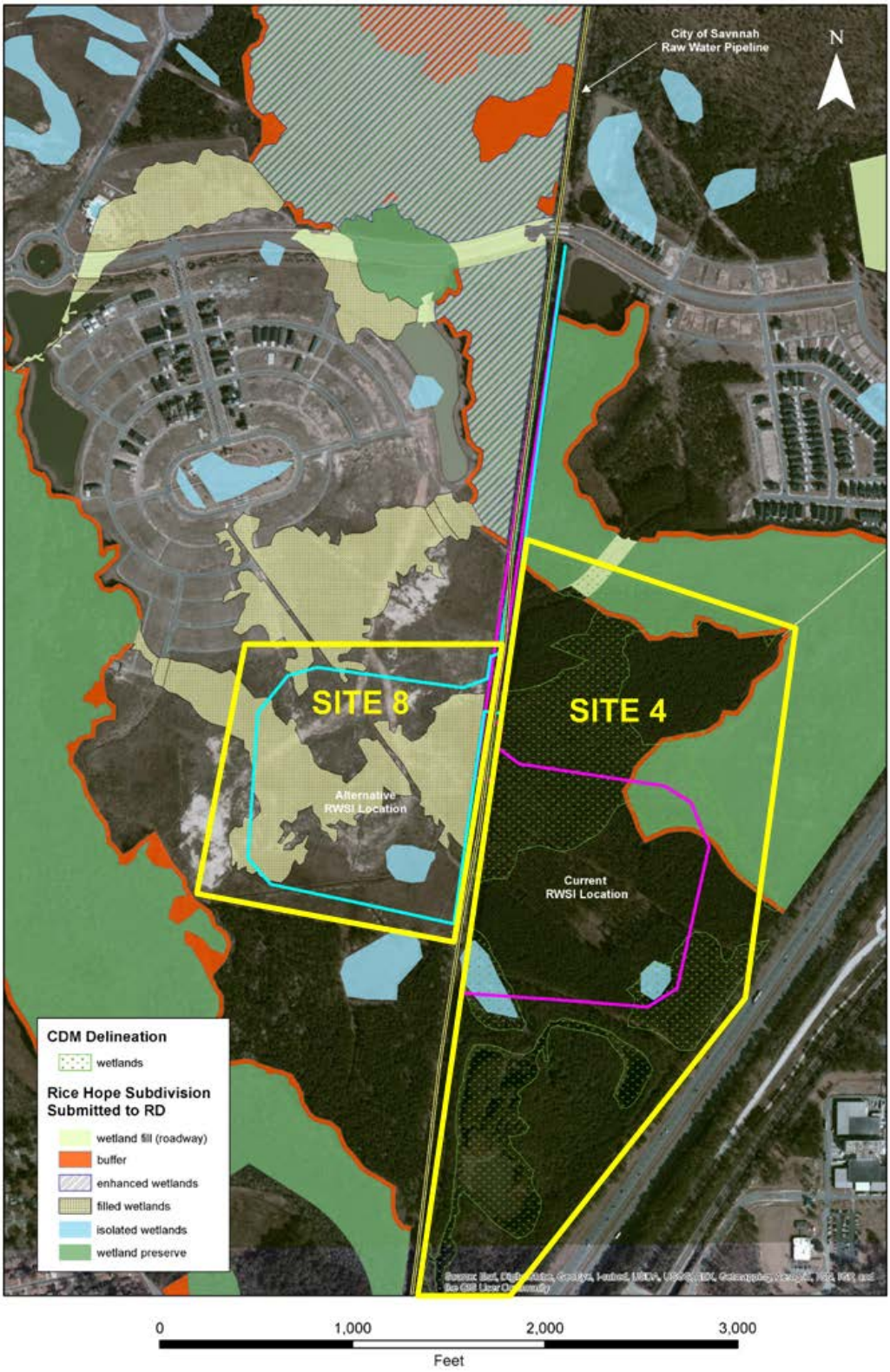

Figure 2 - Location of Phase 2 Alternatives Analysis (Sites 4 and 8)

Table 2: Raw Water Storage Impoundment Site Comparisons

Factor	Site 1 (109.5 acres)	Site 2 (131.7 acres)	Site 3[3] (127.8 acres)	Site 4 (33-acre Impoundment Footprint)	Site 4 Reconfigure[4] (33-acre Impoundment Footprint)	Site 5 (76.2 acres)	Site 6 (34.0 acres)	Site 7 (31.4 acres)	Site 8[5] (33-acre Impoundment Footprint)	Site 9 (144 acres)
Hydric Soils on Site[1]	67.0% All Hydric; 33.0% Partially Hydric	90.7% All Hydric; 8.7% Partially Hydric; 0.6% Not Hydric	98.7% All Hydric; 1.3% Partially Hydric	63.4% All Hydric; 36.6% Partially Hydric	34.1% All Hydric; 63.3% Partially Hydric; 2.6% water	25.9% All Hydric; 74.1% Partially Hydric	68.2% All Hydric; 31.8% Partially Hydric	56.3% All Hydric; 43.7% Partially Hydric	97.3% All Hydric; 2.7% Partially Hydric[5]	63.4% All Hydric; 13% Partially Hydric; 23.5% Not Hydric
Soils: Use for Dikes/Levees[1,2]	100% Very Limited	99.4% Very Limited; 0.6% Somewhat Limited	100% Very Limited	100% Very Limited	100% Very Limited	89.6% Very Limited; 10.4% Somewhat Limited	98.7% Very Limited; 1.3% Somewhat Limited	67.4% Very Limited; 32.6% Somewhat Limited	100% Very Limited	76.5% Very Limited; 11.8% Somewhat Limited; 11.7% Not Rated (borrow pits)
Depth to Water Table[1]	61% WT at 0 cm	90.7% WT at 0 cm	41.6% WT at 0 cm	63.4% WT at 15 cm; 36.6% WT at 53-61 cm	34.1% WT at 15 cm; 26.3% WT at 53-61 cm; 2.6% water	26.9% WT at 15 cm; 73.1% WT at 31-77 cm	68.2% WT at 15 cm; 31.8% WT at 53-77 cm	56.3% WT at 15 cm; 43.7% WT at 53-77 cm	97.3% WT at 15 cm; 2.7% WT at 61 cm[5]	63.4% WT at 15 cm; 13.0% WT at 61 cm; 23.5% WT >200 cm
Flooding Frequency[1]	16% Frequent; 84% None	1.0 % Frequent; 99.0% None	37.6% Frequent to Rare; 62.4% None	12.6% Frequent; 21.4% Occasional; 36.5% None	18.7% Frequent; 15.4% Occasional to Rare; 66.0 % None	26.9% Occasional to Rare; 73.1% None	68.2% Occasional to Rare; 31.8% None	25.6% Rare; 74.4% None	39.0% Frequent; 58.3% Rare; 2.7% None	11.5% Frequent; 40.0% Rare; 48.5% None
Subsurface Condition Risk	Low/ natural conditions	Low/ natural conditions	Moderate/ fill used is of unknown quality	Low/ natural conditions	Low/ natural conditions	Low/ natural conditions	Low/ natural conditions	Low/ natural conditions	Moderate/ fill used is of unknown quality	Low/ natural conditions
Constructability Risk	High/ High water table	High/ High water table	High/ High water table	Low	High/ Borrow pits	Low	Low	Low	Moderate/ fill used is of unknown quality	High/ Wetlands
Wetlands (NWI)	Present/ survey required	Present/ survey required	Present/ survey required	Present/ survey completed	Present/ survey completed	None/ need to verify NWI	None/ need to verify NWI	None/ need to verify NWI	Present/ survey completed	Present/ survey required
Potential Wetland Impacts	Moderate (11-20 acres)	Moderate (11-20 acres)	Moderate (11-20 acres)	Moderate 13.5 acres	Moderate (11-20 acres)	Minor (0-10 acres)	Minor (0-10 acres)	Minor (0-10 acres)	Minor 0.9 acres plus unknown additional amount	Significant (> 20 acres)
Wetland Mitigation Required[6]	$462K - $840K	$462K - $840K	$462K - $840K	$666K	$462K - $840K	$0 - $420K	$0 - $420K	$0 - $420K	$37.8K plus unknown additional amount	>$840K plus additional amount if Restrictive Covenant is altered
Restrictive Covenant	No	No	No	Yes (2.1 acres to be impacted)	No	No/ But CEs border NE and E sides of site	No	No	No	Yes
Endangered Species Risk	Low/ Requires further investigation and survey	Low/ Requires further investigation and survey	Low/ Requires further investigation and survey	None (per field survey results)	None (per field survey results)	Low/ Requires further investigation and survey	Low/ Requires further investigation and survey	Low/ Requires further investigation and survey	Low/ Requires further investigation and survey	Low/ Requires further investigation and survey
Cultural Resources Risk	Moderate/ Requires further investigation and survey	Moderate/ Requires further investigation and survey	Low/ Requires further investigation and survey	None (per field survey results)	None (per field survey results)	High/ Requires further investigation and survey	Moderate/ Requires further investigation and survey	Moderate/ Requires further investigation and survey	Low/ Requires further investigation and survey	High/ Requires further investigation and survey
Noise/Visibility Impacts	Low	Low	High	Moderate	Moderate	Low	High	High	High	Moderate

Table 2 Raw Water Storage Impoundment Site Comparisons (continued)

Factor	Site 1	Site 2	Site 3[3]	Site 4	Site 4 Reconfigure[4]	Site 5	Site 6	Site 7	Site 8[5]	Site 9
Environmental Liability Risk	Low/ natural conditions; planted pines and mixed pine-hardwoods	Low/ natural conditions; mixed pine-hardwoods	Moderate/ fill used is of unknown quality – field investigation needed	None (per EBS report)	None (per EBS report)	Moderate/ Potential contamination near railroad line	Low/ natural conditions planted pines	Low/ natural conditions planted pines	Moderate/ fill used is of unknown quality – field investigation needed	Low/ natural conditions; bottomland hardwoods
Zoning	Light Industrial	Light Industrial	Undeveloped Land (part); Residential Single and Multi-Family (part)	Undeveloped Land (part); Residential Single Family (part)	Undeveloped Land (part); Residential Single Family (part)	Undeveloped Land	Residential Single Family	Residential Single Family	Residential Single Family (all)	Undeveloped Land
Land Use Compatibility Risk	Low/ No residential areas nearby	Low/ No residential areas nearby	High/ 700-feet from existing residential development	Moderate/ 1500 ft from residential development (north) and 1330 ft (northwest)	Moderate/ 1700 ft from residential development (north) and 1500 ft (northwest)	Low/ No residential areas nearby; 1200 ft to businesses at I-95 and Hwy 21	High/ Adjacent to planned subdivision	High/ Adjacent to planned subdivision	High/ 170 ft from existing residential development	High/ No residential areas nearby but high ground has 2 cemeteries
Flood Risk to Adjacent Properties	Low	Low	High	Moderate	Moderate	Moderate	Low	Low	High	High
Risk to Infrastructure	Low	Low	High (must cross Hwy 21)	Low	Low	High (must cross active railway line)	Low	Low	Low	High (natural gas line)
Land Availability	Unknown	Unknown	Unknown	High	High	High	Moderate	Moderate	High	Unknown
Proximity to Pipeline	1700 ft	Adjacent	4000 ft	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent	Adjacent
Proximity to Water Plant	7.4 mi	6.2 mi	6.5 mi	3.8 mi	3.8 mi	2.7 mi	5.0 mi	5.2 mi	3.8 mi	Adjacent
Design Cost Change	+ $1.0M - 1.5 M	+ $1.0M - 1.5 M	+ $1.0M - 1.5 M	None	+ $400K	+ $1.0M - 1.5 M	+ $1.0M - 1.5 M	+ $1.0M - 1.5 M	+ $1.0M - 1.5 M	+ $1.0M - 1.5 M
Additional Design Time	+ 8 months	+ 8 months	+ 8 months	None	+ 4 months	+ 8 months	+ 8 months	+ 8 months	+ 8 months	+ 8 months
Construction Cost Change	Unknown	Unknown	Unknown	None	+ $1.5M - $4.0M	Unknown	Unknown	Unknown	- $2.5M - 4.0 M	Unknown
Schedule Risks	Unknown	Unknown	Unknown	None	Moderate	Unknown	Unknown	Unknown	High	Unknown
120-day NEPA document (EA)	+> 120 days	+> 120 days	+> 120 days	+ 120 days	+ 2 months past Redesign	+> 120 days	+> 120 days	+> 120 days	Parallel with Redesign	+> 120 days
Alter Restrictive Covenant	Not Required	Not Required	Not Required	Required	Not Required	Not Required	Not Required	Not Required	Not Required	May be Required
Uncertainty	High	High	High	Low	Moderate	High	High	High	High	High

KEY

[1]Expressed as percentage of the total site acreage.

[2]"Very Limited" indicates that the soil has one or more features that are unfavorable for use in constructing dikes/levees. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

"Somewhat Limited" indicates that the soil has features that are moderately favorable for use in constructing dikes/levees. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected.

[3]Site 3 wetlands in the southern half of the tract were filled for a residential development. Data in the Soil Survey Report presented herein represent the original condition of the property pre-fill. These data may not apply to the southern portion of Site 3 post-fill.

[4]Site 4 Reconfigure moved the impoundment southward within the existing Site 4 in order to clear the boundary of the restrictive covenant.

[5]Site 8 wetlands were filled in 2005 for a planned residential subdivision. Data in the Soil Survey Report presented herein represent the original condition of the property pre-fill. These data may not apply to Site 8 post-fill.

[6]Wetland mitigation calculated at 6 credits per acre of impact (from SAS Regulatory) and $7K per credit (per mitigation bank POC).

2.4 Final Alternative Analysis

Through refinement of the alternative screening process and progress in the detailed design of the project, Site 4, Site 4 Reconfigured, and Site 8 emerged as the most viable alternatives. A more detailed description of the pros and cons for these three alternatives is listed below.

A. Neutral Factors

The factors below showed no significant difference among the three sites:

- Soils very limited in use for dikes/levees - fill would need to be brought in
- Hydric and partially hydric soils predominate (pre-fill on Site 8)
- Environmental Assessment needed for any site

B. Site 8 Pros and Cons

Using the criteria in Table 1 and additional considerations, the pros and cons for Site 8 are summarized below:

Cons:

- Increased possibility of flood damage to residential dwellings if impoundment fails
- Requires additional Georgia Safe Dams coordination and review and failure flood analysis to be performed. In the event GA DNR-EPD classifies as Category I, additional permitting and monitoring would be required.
- Noise and visibility impacts to nearby residential area would be an issue - impoundment site is 170 feet from an existing residential development

- No design has been developed – adds 8 months to schedule and $1.0 - $ 1.5M in design costs
- Environmental Baseline Survey (EBS) needed but the expected risk is moderate
- Subsurface investigation needed to characterize the material used to fill wetlands and address any constructability issues
- Soils data (suitability for use for dikes/levees, depth to water table, etc.) no longer apply to filled portions of the site

Pros:

- No restrictive covenant issues
- Most wetlands already filled and mitigated; additional $37.8K in mitigation required
- Would save $2.5 - $4.0M in construction costs

C. Site 4 Pros and Cons

Using the criteria in Table 1 and additional considerations, the pros and cons for Site 4 are summarized below:

Cons:

- Restrictive covenant must be modified
- Wetland mitigation costs estimated at $666K

Pros:

- Reduced possibility of flood damage to residential dwellings if impoundment fails
- Noise and visibility and impacts less likely to be an issue – impoundment is 1,330 feet from inhabited dwellings
- No changes in design costs or schedule required
- No change in construction cost
- EBS, endangered species, cultural surveys completed -- no effect
- Available soils data is accurate
- Subsurface conditions not likely to be a problem

D. Site 4 Reconfigured Pros and Cons

Using the criteria in Table 1 and additional considerations, the pros and cons for Site 4 Reconfigured are summarized below:

Cons:

- Presence of borrow pits increases design and construction costs.
- Affects floodway for spillway by decreasing flow area. Additional hydraulic modeling would be required.
- Wetland mitigation costs are estimated to be between $462K and $840K
- No design has been developed – adds 4 months to schedule and $400K in design costs
- Would add $1.5 - $4.0M to construction costs
- Encroaches into 100-year floodplain conflicting with Executive Order 11988: Floodplain Management.

Pros:

- Reduced possibility of flood damage to residential dwellings if an impoundment fails
- Noise and visibility and impacts less likely to be an issue – impoundment is 1,500 feet from inhabited dwellings
- No need to modify restrictive covenant
- EBS, endangered species, cultural surveys completed -- no effect
- Available soils data is accurate

2.5 Proposed Action at Site 4 (Preferred Alternative)

This 117-acre site is adjacent to the raw water pipeline and 3.8 miles from the City's water treatment plant. A 65% design has been prepared that places the 33-acre impoundment footprint within the site. Wetlands have been delineated in the field on the entire 117-acre tract. The RWSI footprint as currently designed would encroach on a total of 13.5 acres of wetlands, 2.1 acres of which are protected under a restrictive covenant. Amending the restrictive covenant to extinguish the 2.1 acres from its coverage would require triple compensatory mitigation. The total current mitigation cost is estimated to be $666,330. The entire site has been cleared for the presence of cultural resources, threatened and endangered species, and other environmental liabilities under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

The NRCS Soil Resource Report (USDA 2013) for this site and field investigations show that the water table ranges from approximately 1 to 10 feet below the surface, which would not significantly reduce constructability. There are no known subsurface risks since the site is under natural conditions (planted pines, mixed pine-hardwoods). The design footprint places the RWSI 1,330 feet from the nearest residential dwellings, so noise/visibility present low risk for adverse impacts. Land use compatibility is acceptable and advantageous when compared to other site alternatives.

No increase in design or construction costs or schedule would be incurred for this alternative. This alternative is located between and adjacent to other infrastructure such as the City's raw water pipeline and Interstate 95, is compatible with existing land use, and would most efficiently provide the necessary raw water impoundment facility for the SHEP.

The conclusion of this alternatives analysis is that USACE identifies Site 4 as the most practicable site for construction of the RWSI. Environmental impacts for construction at that location that can be mitigated to an acceptable level. Relative to all the other sites considered, construction of the RWSI at Site 4 minimizes the acres of wetland impacts, minimizes potential land use compatibility issues, and minimizes risk to human health and safety due to flooding while optimizing the engineering design criteria of being adjacent to the existing raw water pipeline and relatively close to the City's municipal and industrial water treatment facility. Relative to the three sites considered during the second phase of the alternatives analysis, construction of the RWSI on Site 4 is further from residential developments, thereby minimizing risk to human health and safety due to flooding and minimizing the adjacent land use compatibility considerations. In addition, construction of the RWSI on Site 4 Reconfigured or Site 8 would result in an additional $1.0 to $1.5 million in design costs and delay the project construction schedule by four to eight months. Site 4 Reconfigured would also be inconsistent with EO 11988 because there is a practicable alternative (Site 4) to siting in a floodplain.

3 Affected Environment

This chapter describes the surrounding area associated with the alternative actions, and the condition of the existing environment at the location of the proposed action. The characterization of existing conditions provides a baseline for assessing the potential environmental impacts from activities associated with the proposed action. A general overall description is followed by information concerning significant resources that would be affected by implementation of any of the alternatives. This discussion does not include information on all significant resources of the study area, since many of these would not be impacted by alternatives under consideration.

3.1 Water Resources

Aquifers: The most productive aquifers in Georgia are in the Coastal Plain Province in the southern part of the state. Coastal plain aquifers are generally confined except near their northern limits, where they crop out or are near land surface. Aquifers in the Coastal Plain Province include the Floridan aquifer system and the Brunswick aquifer systems.

The Floridan aquifer system has been divided into the Upper and Lower Floridan Aquifers. The Upper Floridan is the aquifer of choice in the coastal area because it lies at a relatively shallow depth of 40-900 feet, has high water-yielding capabilities (1000-5000 gallons per minute), and yields water of good quality. This aquifer supplies 50 percent of groundwater in Georgia.

The Lower Floridan Aquifer contains highly permeable zones; however use is limited by the excessive depth and poor water quality. In the southern part of Georgia, the Lower Floridan Aquifer contains an extremely permeable water-bearing zone called the Fernandina permeable zone. The Fernandina permeable zone contains highly saline water in the southern part of coastal Georgia, and is the source of saltwater contamination in the Brunswick area.

Overlying the Floridan Aquifer are the sandy upper and lower Brunswick Aquifers, which are present mostly in the Glynn County area. This aquifer, which is at a depth of 85-390 feet is not a major source of water in coastal Georgia, but considered a supplemental water supply to the Floridan Aquifer. Most wells are multi-aquifer, tapping the upper and lower Brunswick aquifers and the Upper Floridan Aquifer. The common yield range is 10-30 gallons per minute. The Brunswick aquifers supply water for irrigation, public, and some industry use.

The Surficial Aquifer, which overlies the Brunswick Aquifers, is present throughout the coastal area. The Surficial Aquifer has a common range of 11-72 feet in depth and supplies water mostly for domestic and small-scale irrigation uses. The common range for yield is 2-25 gallons per minute.

Groundwater/Surface Water: Recent soil borings in the upland areas of the BLS tract indicated groundwater ranged from 4 to 10 feet below the surface. Based on topographic maps (Figure 3 below), groundwater and surface water flow is directed south into Black Creek (USGS 1974).

The subject parcels are relatively level and gently sloping and ranges from 8-15 feet above msl. There are excavated ponds and ditches on the subject property (Appendix A; Figures 2, 4, and 5); the nearest off-site surface water body is a storm water basin that lies 450 feet from the northwest corner of the subject property. The only potential up-gradient drainage area within 1,000 feet of this property would be on the residential development to the northwest (Appendix A; Figures 2, 4, and 5); there are three storm water basins in this area that were constructed in 2007 along with the current subdivision.

There were no wells or springs discovered during the site investigation or identified on topographic maps or soil survey maps.

Drinking Water: Based on the site investigations, soil surveys, topographic maps, and environmental database search (Veracheck 2012b), there is no history of water wells in the vicinity of this site. There is no expected impact on drinking water quality from historical activities on the subject property due to the land use history and the general land use of the area (USACE 2012b). The Environmental Baseline Study (USACE 2012b) identified the historical uses of the proposed site over the last 80 years and concluded that none of the documented activities at the site would pose an environmental threat to groundwater or drinking water resources in the area (USACE 2013a and 2013b).

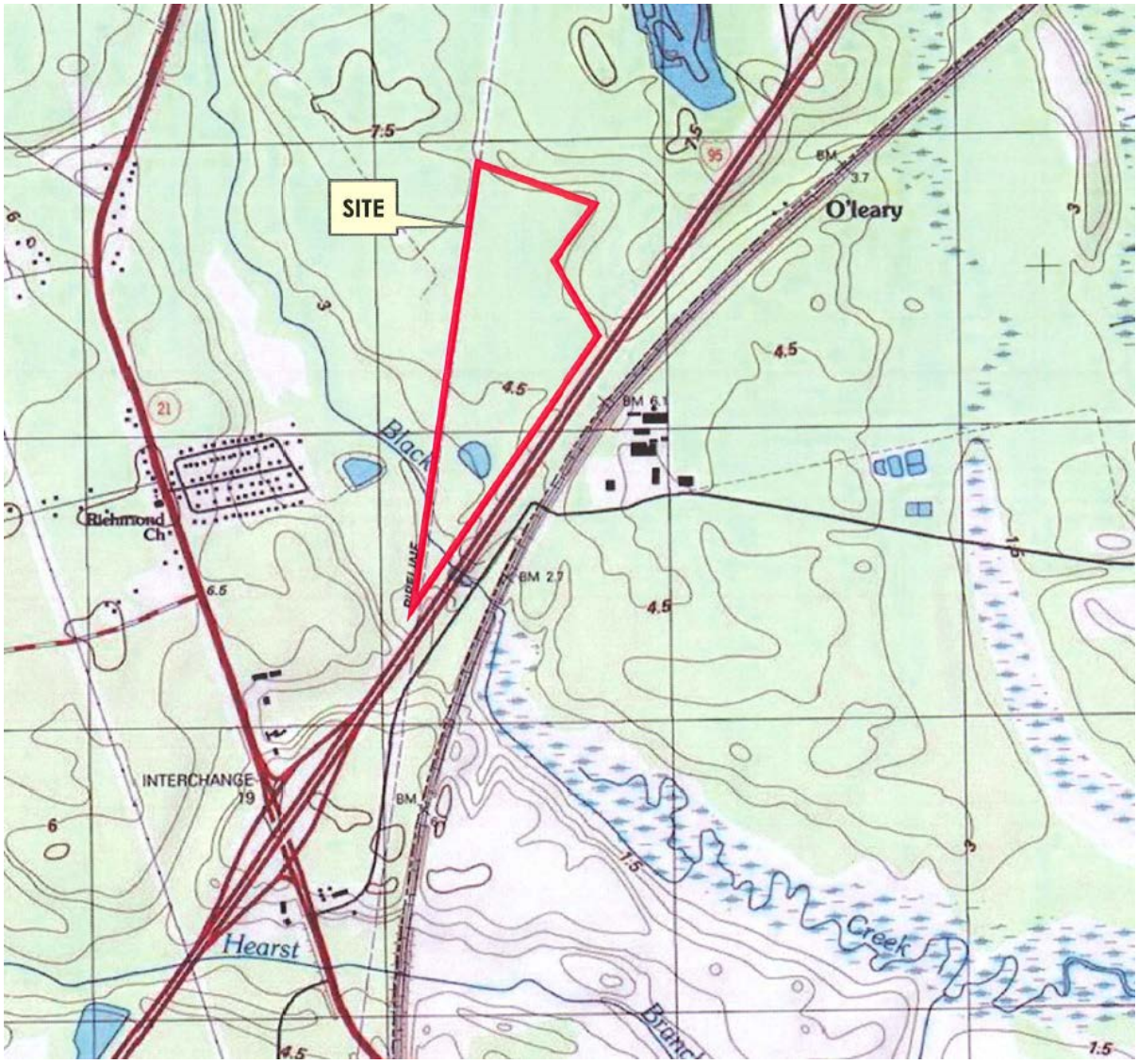

Figure 3 - 1993 Topographic Map of Subject Property

3.2 Natural Resources

Approximately 54 acres of the 117-acre property are jurisdictional wetlands, which are regulated under the Section 404 of the Clean Water Act. Most of the site of the proposed action consists of pine trees (predominantly planted), although the wetland area in the Black Creek area is predominantly hardwood. Some of the property contains excavated ponds and the remainder of the site has been clear cut as part of recent timber harvesting. The clear cut areas are naturally regenerating into stands of 2-4 year old loblolly (*Pinus taeda*) pine trees and are still under silvicultural land use. Historical aerial photograph and topographic map review indicates that this tract has been entirely forested since at least 1912, except for ponded areas.

Figure 4 - Typical vegetation in clear cut portion of the site of the preferred alternative

The 54 acres of wetlands consist of loblolly pine, bluestem palmetto, sweetpepperbush (*Clethra alnifolia*), sweetbay magnolia (*Magnolia virginiana*), Ogeechee tupelo (*Nyssa ogeche*), sweetgum (*Liquidambar styraciflua*); various sedges including *Carex albolutescens, Cyperus spp., Scleria spp., Rhynchospora inundata,* and other *Rhynchospora spp.*; red panicum (*Panicum rigidulum),* soft rush (*Juncus effusus),* witchgrasses (*Dichanthelium spp.*), post oak, willow oak (*Quercus phellos*), swamp chestnut oak (*Quercus michauxii),* water oak (*Quercus nigra),* (*Quercus laurifolia*), smartweed (*Polygonum punctatum*), and chain fern (*Woodwardia virginica*).

The upland portion of the property consists of loblolly pine (*Pinus taeda*), sweetgum (*Liquidambar styraciflua*), witchgrasses (*Dichanthelium spp.),* Beautyberry (*Callicarpa americana*), Post oak (*Quercus stellata*), water oak (*Quercus nigra),* braken fern (*Pteridium aquilinum*), huckleberry (*Gaylussacia dumosa*), milkwort (*Polygala lutea*), and dogbane (*Apocynum cannabinum).*

3.3 Soils

The following five soil types (Figure 5) exist on the subject property:

Pelham loamy sand (Pl): this poorly drained nearly level soil occurs in drainageways, flats, and depressions. Pelham is a hydric soil and the typical depth to the seasonally high water table is 0-6 inches.

Ogeechee loamy fine sand (Ok): this level poorly drained soil of the Atlantic Coastal Plain occurs on broad flats, in depressions, and in drainageways. These soils formed mainly in loamy materials on low marine terraces with slopes of 0-2 percent. The typical depth to the seasonally high water table is 0-8 inches.

Olustee fine sand (Ol): this is a poorly drained soil of the lower Coastal Plain. Olustee has slopes ranging from 0-2 percent and the typical depth to the seasonally high water table is 0-32 inches.

Cape Fear soils (Cc): This very poorly drained hydric soil floods seasonally and occurs in depressions and drainageways that do not have a well-defined natural channel. The surface layers range from clay loam to loam or sandy loam with slopes of 0-2 percent. The typical depth to the seasonally high water table is 0-10 inches.

Ocilla complex: Ocilla complex is a series of somewhat poorly drained soils formed from loamy marine material. They occur on slight ridges in the otherwise predominantly flat Coastal Plain landscape.

3.4 Jurisdictional Wetlands/Floodplain

Jurisdictional Waters of the United States:
As stated above, approximately 54 acres of the 117-acre property are jurisdictional wetlands, which are regulated under Section 404 of the Clean Water Act (Appendix A; Figures 4 and 5). Most of the subject property consists of pine trees (predominantly planted), although the wetland area in the Black Creek area is predominantly hardwood. Some of the property contains excavated ponds and the remainder of the site has been clear cut as part of recent timber harvesting. The clear cut areas are naturally regenerating into stands of pine trees and still under silvicultural land use. Historical aerial photograph and topographic map review indicates that this tract has been entirely forested since at least 1912, except for ponded areas (Appendix C) (Site 4). Savannah District's Regulatory Division has verified the delineation of wetlands on the site of the preferred alternative (Appendix A; Figures 4 and 5), and their verification is included in Appendix C. The wetland delineation and report (Environmental Resource Solutions 2012b) was conducted by Environmental Resource Solutions on July 2 and 3, 2012.

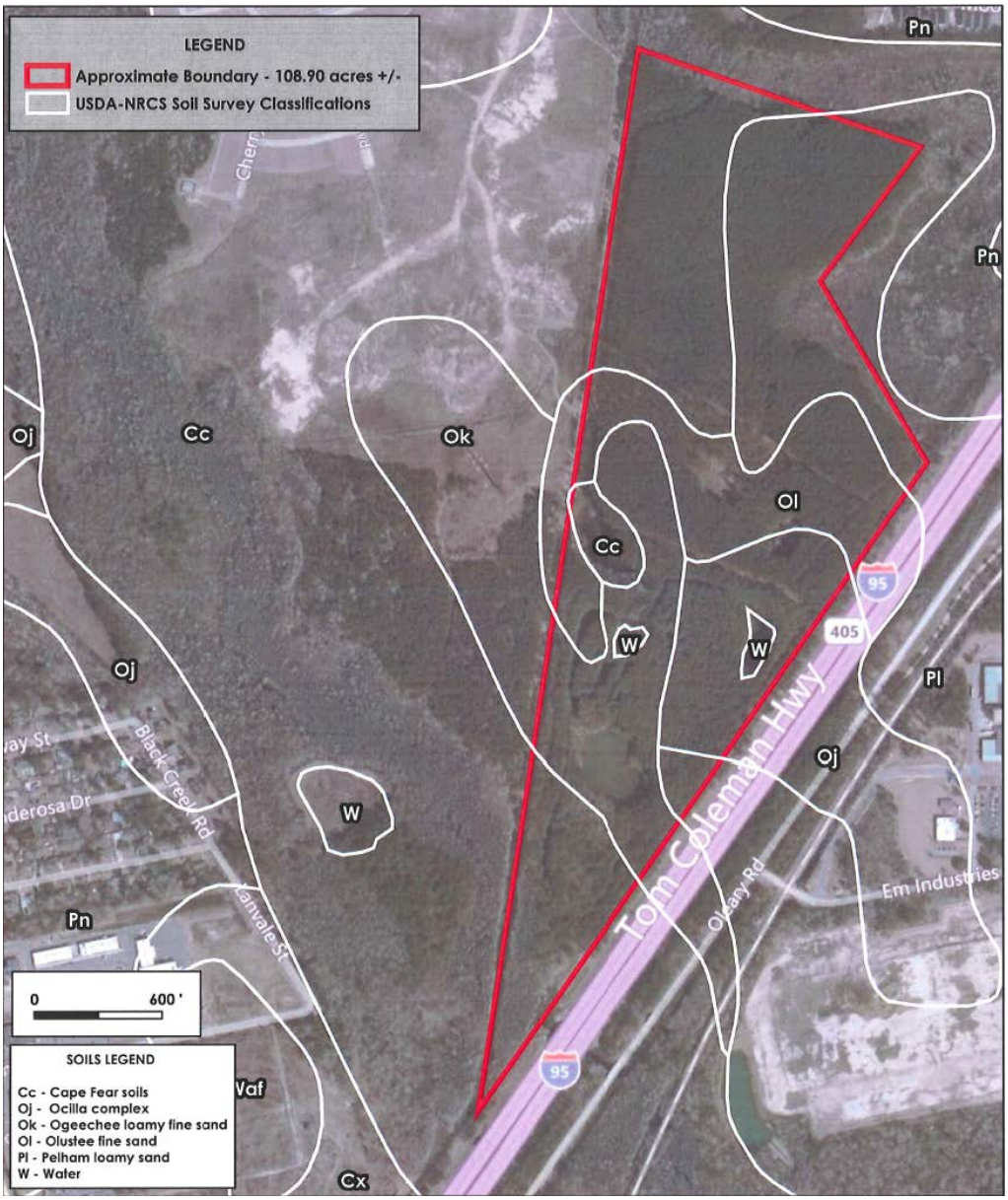

Figure 5 - Soil Survey Map of Subject Property

Floodplains: The site of the proposed action is not located within the 100-year floodplain [Federal Emergency Management Agency (FEMA) 2013]. Therefore, there is no significant potential for flooding on this site.

Figure 6 - Typical wetland vegetation on site

3.5 Protected Species

A composite list of both State and Federally protected species that have the potential for occurrence within Chatham County is located in Appendix B. A protected species survey was conducted (Environmental Resource Solutions 2012) and concluded that no protected species are likely to be adversely affected by the proposed action. Within the project impact area, there is both a lack of suitable habitat and much disturbance to existing habitat from silvicultural activities.

For the protected species survey, a number of data sources were used to determine site conditions and wildlife habitat that may be present and included:

- US Geological Survey Topographic Quadrangle for Port Wentworth, Georgia
- US Department of Agriculture-Natural Resource Conservation Service (USDA-NRCS) Soil Survey of Bryan and Chatham Counties, Georgia (1974).
- True-color aerial photographs (Bing Maps from ArcGis Online)

3.6 Land Use

The subject property's current and historical land use is silviculture, and includes jurisdictional wetlands, excavated ponds and ditches (Appendix A; Figures 2, 4, and 5). Approximately 54 acres of the 117-acre property are jurisdictional wetlands, which are regulated under the Clean Water Act. Most of the site consists of pine trees (predominantly planted); although the wetland area in the Black Creek area is predominantly hardwood. Some of the property contains excavated ponds and the remainder of the site has been clear cut as part of recent timber harvesting. The clear cut areas are naturally regenerating into stands of pine trees and still under silvicultural land use. Historical aerial photograph and topographic map review indicates that this tract has been entirely forested since at least 1912, except for ponded areas.

The existing City of Savannah raw water pipeline (adjacent to west boundary of subject property) connects the City's water supply intake on Abercorn Creek to its Municipal and Industrial water treatment plant in Port Wentworth (Appendix A; Figures 2, 2b, 2c). This water supply is used primarily by local industries for specific plant processes; however, it also supplies drinking water to residences in west Savannah, Pooler, and south Effingham County.

Review of historical aerial photographs and topographic maps indicates that the entire site and most of the surrounding areas have been undeveloped and wooded since at least 1912 (USACE 2012b). From 1951 to 1971 an old plantation road is visible at the southern end of the GA DOT property, but there are no indications of any other development activities in the project area. The road was visible on this property until construction of Interstate 95 in circa 1977.

The larger pond (1.6 acres) in the southern portion of the property was created sometime between 1977 and 1981 (USACE 2012b). The 1977 aerial photograph reveals a large 21-acre cleared area that encompasses this pond and a smaller one to the northeast on the Georgia DOT parcel. The upper portion (BLS parcel) appears to have been clearcut circa 1989.

The previous landowner (BLS Inc.) was interviewed about the subject property and did not have any knowledge or records of releases of hazardous materials or petroleum products onto the subject property (USACE 2013b). The current landowner stated the previous land uses (prior to BLS purchase on July 12, 2004) included both silviculture and a hunting club.

3.7 Cultural Resources

A Phase I Archeological survey (Southeastern Archeological Research 2012) was conducted of the proposed project site in accordance with the requirements of Section 106 of the National Historic Preservation Act (NHPA). There were no archeological sites, isolated finds, or historic structures identified during the survey on the project site.

3.8 Hazardous Materials

Site investigations of the subject property were conducted on December 4, 2012 and on March 6, 2013. The investigations were conducted by David Walker of the US Army Corps of Engineers, Savannah District (USACE). The subject property (Appendix A; Figures 2) was observed for any signs of releases of petroleum or hazardous materials and for any signs of potential for environmental liabilities for both the subject property and adjacent areas that may have potential

for migration onto the subject property. There were no issues identified pertaining to potential environmental liabilities associated with the subject property. Available records, soil survey maps, and interviews indicate that there have never been any active or inactive monitoring wells on this property.

Due to the historical silvicultural use of this site and the lack of development activities on site, there have been no documented activities on the site that have the potential for the release of hazardous substances. In addition, there is no evidence of a release or threatened release in the site vicinity. An Environmental Baseline Study was completed (USACE 2013b) that documented all of the historical uses of the property and concluded that sufficient studies have been conducted to identify all potential environmental hazards. Therefore, there is no need for any further investigation before proceeding with the purchase of the real estate required for the proposed action.

3.9 Coastal Zone Management

Construction projects are subject to consistency with the Shore Protection Act (O.C.G.A. 2-5-230, et seq.) and the Coastal Marshlands Protection Act (O.C.G.A. 12-5-280, et. seq.) if there are impacts to tidal wetlands or shoreline features. The site of the proposed action is not within or adjacent to tidal waters or the shoreline, and the proposed action would not be expected to have any potential to impact these resources. Therefore, USACE believes this project is fully consistent with the enforceable policies of the Georgia CZM program.

3.10 Air Quality

Air quality at any given location is a function of several factors, including quantity and dispersion rates of pollutants, local climate, topographic and geographic features, and also windblown dust and wildfires. Air pollution can threaten the health of human beings, animals, plants, lakes; as well as damage the ozone layer and buildings, and cause haze that reduces visibility.

The Clean Air Act of 1970, as amended, has established air quality standards for the US. The Environmental Protection Agency (EPA) has set six National Ambient Air Quality Standards (NAAQS) that regulate six pollutants: carbon monoxide (CO), lead (Pb), nitrogen oxide (NO_x), ozone (O_3), sulfur dioxide (SO_2), and particulate matter ($PM_{2.5}$ and (PM_{10}). Geographic areas have been officially designated by EPA as being in attainment or non-attainment for air quality based on an area's compliance with the NAAQS. Chatham County is currently in attainment for the NAAQS for all criteria pollutants. Therefore the project area is under no Federal or State restrictions for the purpose of improving air quality to meet any air quality standard.

4 Environmental Impacts

This chapter discusses the potential environmental impacts of the preferred site of the RWSI including potential short-term or long-term impacts associated with the implementation of this alternative. A foreseeable effect is defined as possible modification in the existing environment brought about by some activity. It is also important to note that impacts may be beneficial or adverse.

4.1 Water Resources

Drinking water: Construction of a RWSI as part of SHEP was reviewed and approved (with listed contingencies) by the Drinking Water Permitting and Engineering Program of the GA DNR-EPD (Appendix C). All of the conditions listed in the GA DNR-EPD letter dated February 4, 2013, are included in the proposed action.

The proposed changes in the design of the RWSI would allow the impoundment to be constructed in a manner that minimizes environmental impacts and maximizes its ability to provide the benefits to the City's drinking water operations that were intended in the original design.

Stream Buffer Variance: According to a January 31, 2013 letter from the GA DNR-EPD, Coastal District Office, a stream buffer variance permit is not required for this proposed action (Appendix C).

Section 401 Water Quality Certification: The adverse wetland impacts expected to result from these design changes are discussed in detail in Section 4.3 and in the Section 404(b)(1) Evaluation (Appendix E).

A Joint Public Notice (Appendix F) announcing the availability of the draft EA/FONSI and application for Water Quality Certification was mailed to all the parties on the USACE Regulatory mailing list in Georgia for the Savannah River Basin in compliance with the National Environmental Policy Act (NEPA). Copies of the draft EA was also sent to all appropriate parties, including Federal, state, and local agencies.

The Section 401 Water Quality Certification for SHEP stated that any mitigation remedy selected shall be based on the City of Savannah's maximum municipal and industrial water treatment plant capacity of 62.5 Million Gallons per Day (MGD). The certification also stated that any mitigation remedy shall be constructed in conjunction with the channel deepening.

In a letter dated August 19, 2013 (Appendix C), the Georgia DNR-EPD stated that the modifications to the location and design of the RWSI still conforms to the requirements of the 401 water quality certification issued by EPD on February 16, 2011 for SHEP. Therefore, since the SHEP water quality certification applies the RWSI project, no further certification is required.

4.2 Natural Resources

The proposed site has been recently clearcut of timber and is currently vegetated with 2-4 year old loblolly (*Pinus taeda*) pine trees. The proposed action would require the clearing and loss of approximately 40 acres of land used for silvicultural purposes. The impacts to natural resources from the selection of Alternative Site 8 would be similar, as that site is also in an early stage of pine timberland reforestation.

Therefore, the impact to natural resources from this project would be negligible, due both to the amount of timberland being lost and the vast amount of this type of timberland available.

4.3 Jurisdictional Wetlands/Floodplains

Floodplains: The preferred alternative (Site 4) and Alternative 8 are not located within the 100-year floodplain [Federal Emergency Management Agency (FEMA) 2013]. Therefore, there is no significant potential for flooding on these sites. Implementation of the proposed RWSI at Alternative Site 4 Reconfigured would encroach on the 100-year floodplain and conflict with Executive Order 11988 (Floodplain Management). Therefore, Sites 4 and 8 would be result in fewer adverse impacts to floodplains.

Wetlands: USACE contracted with an architect/engineering firm to delineate wetlands on the proposed site (Appendix C). Staff of Savannah District's Regulatory Division verified the contractor's wetland delineation (Appendix A; Figure 5). The design of the preferred alternative (Site 4) would adversely impact 13.5 acres, of which 2.1 acres is under restrictive covenant. If any other alternatives were selected, a wetland survey and jurisdictional determination would be required to assess the impacts to wetlands from the RWSI. More detail on design efforts to avoid and minimize impacts to existing wetlands on Site 4 can be found in Section 2 (Alternatives Analysis). The 13.5 aces of impacted wetlands have been significantly degraded from silvicultural activities for most of the history of the property (USACE 2013a). The portion of the 13.5 acres of wetlands that is not under restrictive covenant (11.4 acres) was completely clearcut in 2011 and 2012.

The ability to avoid wetland impacts was constrained by the screening criteria for site selection described in Section 2.0. Of the screening criteria, the most significant in avoiding the wetland impacts were the proximity of the RWSI to both the City's raw water pipeline and the City's water treatment plant, presence of wetlands/floodplains, land use compatibility, and the availability of land within this area. The minimization of the wetland impacts was constrained by the large amount of wetlands, borrow pits, and floodplains on the 117-acre property.

This proposed action would modify a component of the approved mitigation plan for the SHEP project. The RWSI was designed to offset the projected water quality impacts to the City of Savannah's water treatment system. The SHEP mitigation plan was approved during the agency coordination of the SHEP EIS (SHEP 2012a). In achieving the project purpose, there would be unavoidable impacts to existing wetlands. However, the wetland mitigation included in this EA would compensate for those adverse impacts. As stated in the SHEP Final EIS, the USACE will "follow the interagency-approved Savannah District Regulatory SOP to quantify the extent of any mitigation that may be needed". In accordance with the Regulatory Division wetland mitigation protocol, the wetland mitigation plan requires purchase of wetland credits in a wetland bank

within the primary service area at an estimated cost of $666,330 (95.19 credits at $7,000 per credit). The credits would be purchased in accordance with USACE cost sharing policy prior to putting the RWSI in service. More detail on the compensatory wetland mitigation plan can be found in Appendix G.

As part of the Corps' detailed design process, Savannah District examined impacts of connecting the RWSI piping into the City's existing 48-inch raw water pipeline. Should a loss of power occur after the RWSI is constructed, vacuum conditions in the pipeline could occur. To address this concern, the design includes upgrades to the 19 existing pipeline air release valves and construction of 3 new air release valves (most from 6 to 8 or 10 inches). Although USACE Civil Works activities are not governed by the USACE Section 404 regulatory permitting process, upgrades to the existing valves (and new valves that may be required) that occur within wetlands would be installed within the conditions described in the Nationwide Permit 12 (Utility Line Activities). Nationwide Permit 12 allows impacts for up to 0.5 of an acre of wetlands and temporary side casting of fill material for utility line maintenance; impacts of less than 0.1 of an acre do not require mitigation. Wetland impacts from installing the air release values would be less than 0.1 acres. If later design changes result in wetland impacts that warrant mitigation for this activity, Savannah District would assess the credits needed and add them to the mitigation credits it purchases.

4.4 Protected Species

Based on all completed surveys for species listed and critical habitat designated under the Endangered Species Act, as previously referenced in Section 3.5, the project impact area is not expected to contain any listed species or its critical habitat. Consequently, the proposed action is not likely to adversely affect any protected species. The USFWS sent a letter dated August 8, 2013 (Appendix C), concurring that the proposed action is not expected to significantly impact fish and wildlife resources under their jurisdiction.

4.5 Land Use

Site 4 (Preferred Alternative) is located 1,500 feet from the nearest residential development to the north and 1,330 feet to the northwest. Site 8 is located adjacent to the nearest residential development (Rice Hope) to the northwest (Rice Hope). Site 8 is also in a land use zone classified as "Residential Single Family". A portion of Site 4 is classified as "Undeveloped Land" and part is classified as "Residential Single Family" in the Port Wentworth Comprehensive Plan.

The preferred alternative (Site 4) is located between and adjacent to other infrastructure -- the City of Savannah's raw water pipeline and Interstate Highway 95. The alternative is compatible with existing land use and would most efficiently provide the necessary raw water impoundment facility for the mitigation needs of SHEP for numerous reasons. Nine other alternative locations were evaluated but were not selected due to various combination of the following issues and constraints: (1) safety of nearby residential developments; (2) adverse impacts to floodplains and conflicts with Executive Order 11988 (Floodplain Management); (3) land use compatibility; (4) proximity to the raw water pipeline (5) proximity to the city's municipal and industrial water treatment facility; (6) high potential for impacting wetlands; and (7) high potential for impacting

cultural resources. Optimally, the RWSI site should be located adjacent to the existing raw water pipeline and as close as possible to the City's municipal and industrial water treatment facility, thereby maximizing the use of the existing pumps at Abercorn Creek and minimizing new pipeline and pumping costs. More detail on the alternative analysis is contained in Section 2 of the EA.

4.6 Cultural Resources

The Corps conducted a cultural resource investigation on Site 4, the site presently proposed for the RWSI. Coordination with the Georgia State Historic Preservation Office (GA SHPO) was initiated when the Georgia Department of Natural Resources Historic Preservation Division (HPD) received a report entitled *Phase I Cultural Resources Assessment of the Proposed Raw Water Storage Impoundment Facility, Chatham County, Georgia* prepared by Southeastern Archaeological Research, Inc. and dated September 12, 2012. On November 7, 2012, the GA SHPO responded with a letter concurring that the proposed action (RWSI and associated access road) would have no effect on historic properties as defined by 36 CFR Part 800.4(d)(1). In accordance with the SHEP MOA (SHEP 2012a), Native American tribes (that have requested report copies) will be contacted separately.

If Alternative Site 8 is selected, a Phase I cultural resource survey would need to be conducted to determine the impact from the RWSI.

In the event that human remains and/or cultural materials are discovered during clearing, construction, or other activities related to the proposed undertaking, all work would cease in the vicinity of the discovery immediately. The proponent would then notify the SHPO and appropriate Native American tribes.

4.7 Hazardous Materials

Use of the Preferred Alternative (Site 4) would not be expected to incur any environmental liability. The Corps' Environmental Baseline Survey (EBS) did not identify any concerns for this property under CERCLA regulations. If an alternative other than the preferred alternative is selected, a Phase I EBS would be required to ensure that there are no environmental liabilities associated with that site. Sites 5 and 9 would be much more likely to contain environmental liabilities as they border an active railroad track, which commonly contain contaminated soil and/or groundwater.

Construction and operation of the proposed RWSI is not expected to result in an associated increase of hazardous waste generation at the site.

4.8 Coastal Zone Management

Since the project would not be within or adjacent to tidal waters or the shoreline, there are no likely impacts to coastal resources. Therefore, USACE believes this project is fully consistent with the enforceable policies of the Georgia CZM program. By letter dated August 21, 2013 (Appendix C), the Georgia DNR Coastal Resources Division concurred with this consistency determination.

4.9 Air Quality

There would be minor temporary dust generation from vehicles driving over unpaved areas during construction of the RWSI and there would also be minimal temporary impacts from vehicle emissions during the construction activities. However, there are no more than minor impacts anticipated from these activities. Construction of the RWSI at the proposed site would follow all federal, state, local regulations and applicable policies for road and building construction. Operation and maintenance is not expected to result in any adverse air quality impacts.

There would not be any new point sources of air pollution created and no additional non-point sources would be expected from operation of the RWSI. Since Chatham County is currently in attainment for the NAAQS for all criteria pollutants, the construction and operation of the RWSI would not be expected to contribute to a change in this designation.

4.10 Social and Economic Issues

The RWSI is part of the mitigation plan for the SHEP project, and therefore, would indirectly result in significant economic benefits from the improvement in import/export commerce within Savannah Harbor.

By providing storage of raw water during periods of high chloride events at the City of Savannah's Abercorn Creek intake, the RWSI would benefit drinking water quality in west Savannah, Pooler, and south Effingham County. The benefits would include lower chloride content in the drinking water and the consequent reduction in pipe corrosion and DBP's.

The proposed action (design and location changes to the RWSI) would allow the structure to provide its intended function in a more efficient manner (faster implementation and lower construction cost) and with less environmental risk (risk of a railway accident or pipeline rupture endangering human health, safety and infrastructure).

4.11 Noise Impacts

Noise impacts would occur from operation of the RWSI 24 hours a day, 7 days per week. Those impacts would occur wherever the structure is located. With the proposed alternative (Site 4), those impacts would be minimal and acceptable. The site is between the existing Interstate 95 and the existing raw water pipeline, and is located approximately 1330-feet from the nearest residential home. In addition, the remainder of the 117 property (84 acres) surrounding the 33-acre impoundment would continue to be in silvicultural land use. The remaining large stands of timber would buffer much of the noise generated from the RWSI.

With Site 8, the adverse impacts would be much more severe due to the RWSI's close (170 feet) proximity to an existing residential subdivision.

4.12 Aesthetics/Visibility

Potential impacts from the RWSI would primarily occur from the presence of the 30-foot earthen berm around the 33-acre impoundment. With Site 8, the adverse impacts would be much more severe due to the RWSI's close (170 feet) proximity to an existing residential subdivision.

Site 4 is situated between existing infrastructure (Interstate 95) and a utility (the existing raw water pipeline); and is located approximately 1,330-feet from the nearest residential home. In addition, the remainder of the 117 property (84 acres) surrounding the 33-acre impoundment continues to be in silvicultural land use. Therefore, the remaining large stands of timber will buffer much of the visual impacts from the RWSI.

4.13 Health/Safety

Selection of Site 4 (Preferred Alternative) would reduce the potential for flood damage to residential dwellings from a breach in a dike when compared with Site 8. Selection of the Site 4 Reconfigured alternative would have a similar reduction in potential for flood damage to residential dwellings from a breach in an RWSI dike. However, this site is located within the 100-year floodplain and would likely have other flood related adverse impacts.

4.14 Environmental Justice - Executive Order 12898

No minority or low-income populations were identified within the impact area of any of the sites considered for the RWSI. Therefore, minority or low-income populations would not be expected to be disproportionately affected by any of the alternatives under consideration. The preferred alternative would be in compliance with Executive Order 12898 on Environmental Justice.

4.15 Environmental Health and Safety of Children - Executive Order 12045

Children would not be expected to be impacted by construction and operation of the RWSI since there would be security measures to limit and control access. The proposed action would be expected to have no effect on the environmental health and safety of children and is in compliance with this Executive Order.

4.16 Cumulative Impacts

CEQ regulations stipulate that the cumulative effects analysis consider the potential environmental impacts resulting from "the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions." CEQ guidance in considering cumulative effects involves defining the scope of the other actions and their interrelationships with the preferred alternative.

The RWSI is part of the approved mitigation plan for the SHEP project and is designed to offset expected water quality impacts from SHEP. The proposed action (design and location changes to the RWSI) would allow the structure to provide its intended function in a more efficient

manner (faster implementation and lower construction cost) and with less environmental risk (risk of a railway accident or pipeline rupture endangering human health, safety and infrastructure). In achieving the project purpose, there would be unavoidable impacts to existing wetlands. The potential for such impacts were recognized in the SHEP EIS. As described in the SHEP EIS, the District used the Regulatory Standard Operating Procedures to quantify the amount of mitigation needed for these proposed changes. The proposed mitigation proposed for this action (purchase of credits from a wetland mitigation bank) would compensate for the expected adverse impacts to wetlands. Coordination with appropriate resource agencies will continue on other SHEP-related mitigation projects to ensure future actions do not result in direct or indirect impacts to jurisdictional wetlands or water quality in the vicinity. For more information on cumulative impacts related to the SHEP project, the reader may refer to the cumulative impact analysis section in the SHEP EIS (SHEP 2012a).

No other significant cumulative impacts associated with the proposed action and other past, present, and foreseeable actions have been identified during this assessment.

4.17 Mitigation

The RWSI would be mitigation for water quality impacts for the SHEP project. The structure is part of the approved mitigation plan for the SHEP project and is designed to offset the project's expected water quality impacts. The proposed action (design and location changes to the RWSI) would allow the structure to provide its intended function in a more efficient manner (faster implementation and lower construction cost) and with less environmental risk (risk of a railway accident or pipeline rupture endangering human health, safety and infrastructure). In achieving the project purpose, there would be unavoidable impacts to existing wetlands. As described in the SHEP EIS, the District used the Regulatory Standard Operating Procedures to quantify the amount of mitigation needed for these proposed changes. The proposed mitigation proposed for this action (purchase of credits from a wetland mitigation bank) would compensate for the expected adverse impacts to wetlands.

Mitigation would also include appropriate measures for control of erosion and storm water runoff to avoid impacts from erosion to nearby wetlands. Due to the lack of environmental impacts from the proposed action, no other mitigation measures are warranted.

5 Compliance with State/Federal Authorities

The table below summarizes compliance of proposed action with applicable Federal/State laws.

Table 3: Relationship of Project to Environmental Requirements

Federal Policy	Selected Alternative
Anadromous Fish Conservation Act, 16 U.S.C. 757, et seq.	In compliance
Archaeological and Historic Preservation Act, as amended, 16 U.S.C. 469, et seq.	In compliance, SHPO concurrence letter in Appendix C
Clean Air Act, as amended, 42 U.S.C. 1857h-7, et seq.	In compliance
Clean Water Act, as amended (Federal Water Pollution Control Act) 33 U.S.C. 1251, et seq.	In compliance
Coastal Barrier Resources Act, as amended, 16 U.S.C. 3501, et seq.	In compliance
Coastal Zone Management Act, as amended, 16 U.S.C. 1451 et seq.	In compliance, CZM concurrence letter in Appendix C
Endangered Species Act, as amended, 16 U.S.C. 1531, et seq.	In compliance
Environmental Health and Safety of Children; E.O. 13045	In compliance
Environmental Justice; E.O. 12898	In compliance
Estuary Protection Act, 16 U.S.C. 1221, et. seq.	Not applicable
Federal Water Project Recreation Act, as amended, 16 U.S.C. 4601-12, et seq.	Not applicable
Fishery Conservation and Management Act of 1976, Public Law 99-659.	In compliance
Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661, et seq.	In compliance
Floodplain Management; E.O. 11988	In compliance
Georgia Hazardous Waste Management Act (OCGA 12-8-60)	In compliance
Georgia Rules for Hazardous Waste Management; (391-3-11)	In compliance
Magnuson-Stevens Act, as amended, Public Law 104-297.	In compliance
Marine Mammal Protection Act, 15 U.S.C. 1361 et seq.	Not applicable
Marine Protection, Research, and Sanctuaries Act of 1972, 33 U.S.C. 1401, et. seq.	Not applicable
Migratory Bird Conservation Act of 1929, 16 U.S.C. 715	In compliance
Migratory Bird Treaty Act of July 3, 1918 as amended.	In compliance
National Environmental Policy Act of 1969 (NEPA), as amended, 42 U.S.C. 4321, et seq.	In compliance
National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470f, et seq.	In compliance, SHPO concurrence letter in Appendix C
Protection of Wetlands; E.O. 11990	In compliance
Rivers and Harbors Act, 33 U.S.C. 401 et seq.	Not applicable

6 Consultation and Coordination

The individuals/agencies listed below were consulted during this study:

Name	Organization
Mr. Lamar Smith	BLS Development, Inc.
Mr. Keith Saltrick	Risk Analyst; Veracheck Inc.
Mr. David Griffin	GA DOT
Ms. Alison Royal	Chatham County Tax Assessors Office
Ms. Hope Moorer	Georgia Ports Authority (GPA)
Ms. Elizabeth Shirk	Environmental Review Coordinator; GA DNR Historic Preservation Division
Ms. Susan Zimmer-Dauphinee	Air Protection Branch; GA DNR-EPD
Ms. Dana Perkins	Environmental Program Manager; FAA
Mr. Greg Kelly	Assistant Executive Director Savannah International Airport

Georgia State Historic Preservation Office (GA SHPO): Section 106 coordination with the GA SHPO to obtain their concurrence with our determination of no effects to historic properties or cultural resources from the proposed construction is complete. On November 7, 2012, the GA SHPO sent a letter (Appendix C) concurring that the proposed action would have no effect on historic properties as defined by 36 CFR Part 800.4(d)(1).

NEPA regulations require that Federal, state, and local agencies with jurisdiction or special expertise regarding environmental impacts be consulted and involved in the NEPA process. The draft EA was made available for review by the general public and natural resource agencies. On July 12, 2013, a Joint Public Notice (Appendix F) announcing the availability of the draft EA/FONSI and applying for Water Quality Certification was mailed to all the parties on the USACE Regulatory mailing list in Georgia in the Savannah River Basin in compliance with the National Environmental Policy Act (NEPA). The District also sent copies of the draft EA to all appropriate parties including Federal, state, and local agencies.

The individuals/agencies listed below responded with letters or emails regarding the draft EA/FONSI during the 30-day comment period:

Organization	Name
EPA Region 4 - NEPA Program Office	Dan Holliman
US Fish and Wildlife Service	Strant Colwell Coastal Georgia Supervisor
National Marine Fisheries Service	Virginia Fay Assistant Regional Administrator
Georgia DOT	David Griffin Waterways Program Manager

Georgia DNR-EPD	Jeffrey Larson Assistant Branch Chief Watershed Protection Branch
Georgia DNR-CRD	A.G. Woodward Director Coastal Resources Division
Federal Aviation Administration (FAA)	Dana Perkins Environmental Program Manager

All comments, letters of concurrence, and permits received regarding the proposed action are located in Appendix C.

7 List of Preparers

The agency responsible for preparing this EA is as follows:

US Army Corps of Engineers
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The following individuals contributed to the preparation of this EA:

Name	Role	Project Responsibility
Jason O'Kane	SHEP Project Manager	Project/Fiscal Management
Mackie McIntosh	SHEP Environmental Manager	SHEP NEPA Program Management; Quality Control
William Bailey	Planning Division Chief	Quality Control
Ellie Covington	NEPA Biologist	Wildlife Hazard Management Plan
Win Seyle	NEPA Biologist	Wetland Impact Assessment and mitigation
David Walker	NEPA Biologist	NEPA document preparation/coordination.
Julie Morgan	Archeologist; Section 106 Specialist	Cultural Resources; SHPO Coordination

8 References

Braley, Chad O. 2005 An Archeological Survey of 942 Acres on the Drakies and Mulberry Grove Plantation Tracts, Chatham County, Georgia. Prepared by Southeastern Archeological Services, Inc. Georgia Archaeological Site File Survey No. 3071.

Chatham County Board of Assessors. Property Record Cards. October 2012.

Department of the Army (DA) Pamphlet 200-1, Environmental Protection and Enhancement, January 2002.

Environmental Regulation 1105-2-100. USACE Planning Civil Works Guidance Notebook. April 2000.

Environmental Resource Solutions, Inc. Jacksonville Beach, FL 32216. Protected Species Report. October 2012.

Environmental Resource Solutions, Inc. Jacksonville Beach, FL 32216. Wetland Assessment Report. October 2012.

Federal Emergency Management Agency (FEMA). FEMA Map Service Center. Flood Insurance Rate Map (FIRM) Panel #13051C0035F and #13051C0030F. Chatham County, GA. May 2013.

FAA. Advisory Circular 150/5200-33B. Hazardous Wildlife Attractants on or near Airports. Augusta 8, 2007.

No Author . N.D. Archeological Assessment of NaviGAtor System for Hurricane Evacuation, Southeast Georgia. Georgia Archaeological Site File Survey No. 4795.

Southeastern Archaeological Research, Inc. Phase I Cultural Resources Assessment of the Proposed Raw Water Storage Impoundment Facility. September 2012.

USACE, Regulatory Branch, Savannah District. Hydric Soil Map Unit list for Chatham County. 1991.

USACE. Savannah District Planning Division. Final EIS for Savannah Harbor Expansion Project (SHEP). 2012a.

USACE. Savannah District Planning Division. Review of Historical Aerial Photographs and Topographic Maps 1920, 1942, 1951, 1968, 1971, 1977, 1981, 1989, 1993, 1994, 1995, 1999, 2000, 2003, 2004, 2005, 2006, 2007, 2008, 2009 and 2011. November 2012b.

USACE. Savannah District Regulatory Division. Jurisdictional Determination for RWSI property (#SAS-2012-00749). 2012c.

USACE, Savannah District . Site investigations at subject property. David Walker, Planning Division; December 4, 2012 and March 6, 2013a.

USACE, Savannah District, Planning Division. EBS for the RWSI facility. March 2013b.

United States Department of Agriculture (USDA), Soil Conservation Service. Soil Survey of Chatham County, Georgia. Based on 1970 Aerial photography. 1974.

USDA, Soil Conservation Service. Custom Soil Survey for RWSI, Chatham County, Georgia. Based on 1970 Aerial photography. March 21, 2013.

US Geologic Survey (USGS). Port Wentworth, GA Quadrangle. (7.5-minute series topographic map). 1993**.**

VERAcheck Environmental Risk Advisory. Environmental Records Search for subject properties. December 2012a.

VERAcheck Environmental Risk Advisory. Historical Aerial Photographs and Topographic Maps for subject properties. December 2012b.