



U.S. Department  
of Transportation  
**Federal Highway  
Administration**

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July 29, 2016

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In Reply Refer To:  
HDA-SC

Mr. Leland Colvin  
Deputy Secretary for Engineering  
South Carolina Department of Transportation (SCDOT)  
955 Park Street, P.O. Box 191  
Columbia, South Carolina 29202

**Subject:** Finding of No Significant Impact (FONSI) and Interchange Access Approval for the Proposed Interchange on I-26 Associated with the New Volvo Manufacturing Facility in Berkeley County, South Carolina.

Dear Mr. Colvin:

The project includes the construction of a new interchange associated with the proposed Volvo automobile manufacturing and assembly facility to be located at mile marker 190 along Interstate 26 (I-26) in Berkeley County, South Carolina. The proposed manufacturing facility will be constructed on a project site known as the Camp Hall Tract, which consists of approximately 6,781 acres. Project funding is being provided by the South Carolina Department of Commerce (SC DOC) in coordination with Berkeley County.

The United States Army Corps of Engineers (USACE) as the lead Federal Agency approved an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) determination for the overall project on July 9, 2015 (Appendix A). Under the Council on Environmental Quality's regulations, 40 CFR Part 1501.6, the Federal Highway Administration (FHWA) accepted the USACE's request to become a Cooperating Agency to the EA/FONSI. Based on this Cooperating Agency status, FHWA may accept the USACE's EA/FONSI as long as the document addresses all aspects of the project including the new interchange and associated highway work. Based on the EA/FONSI issued by the USACE, the FHWA is issuing this FONSI determination for the new interchange per FHWA regulation 23 CFR Part 771.121(c).

We have also reviewed the Interchange Justification Report (IJR) submitted on June 30, 2016, and the new Interstate access is approved. As the design year analysis assumes the widening of I-26 to a six-lane section is in place, please continue to develop the widening project so the additional capacity will be available when needed. Please note that the approved access is valid for a period of eight years and must be re-assessed if not advanced to construction within this timeframe. In addition, any revisions to the basic interchange configuration assessed in the IJR will need to be re-evaluated for operational acceptability and safety.

Please address any questions to Mr. J. Shane Belcher at [jeffrey.belcher@dot.gov](mailto:jeffrey.belcher@dot.gov) /803-253-3187 or Tad Kitowicz at [thaddeus.kitowicz@dot.gov](mailto:thaddeus.kitowicz@dot.gov) /803-253-3882.

Sincerely,



Emily O. Lawton  
Division Administrator

Enclosures

ec: Ms. Heather Robbins, SCDOT Director of Environmental Services  
Mr. Chad Long, SCDOT NEPA Manager  
Mr. Jae Mattox, SCDOT Design Build Program Manager



**FEDERAL HIGHWAY ADMINISTRATION  
SOUTH CAROLINA DIVISION OFFICE  
FINDING OF NO SIGNIFICANT IMPACT**



**For**

**Proposed Interchange at Mile Marker 190  
Associated with the Proposed Project Soter (Volvo  
Manufacturing and Assembly Facility),  
Berkeley County, South Carolina**

**Project Number: 171001612**

## **I. Project Description**

The project includes the construction of a new interchange associated with the proposed Volvo automobile manufacturing and assembly facility to be located at mile marker 190 along Interstate 26 (I-26) in Berkeley County, South Carolina (Figure 1). The proposed manufacturing facility will be constructed on a project site known as the Camp Hall Tract, which consists of approximately 6,781 acres (Figure 2). Project funding is being provided by the South Carolina Department of Commerce (SC DOC) in coordination with Berkeley County.

The United States Army Corps of Engineers (USACE) as the lead Federal Agency approved an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) determination for the overall project on July 9, 2015 (Appendix A). Under the Council on Environmental Quality's regulations, 40 CFR Part 1501.6, the Federal Highway Administration (FHWA) accepted the USACE's request to become a Cooperating Agency to the EA/FONSI. Based on this Cooperating Agency status the FHWA may accept the USACE's EA/FONSI as long as the document includes all aspects of the project including the new interchange and associated highway work. Based on the EA/FONSI issued by the USACE, the FHWA is issuing this FONSI determination for the subject project per FHWA regulation 23 CFR Part 771.121(c).

An Interchange Justification Report supporting the need for the interchange has been prepared and reviewed by the FHWA (Appendix B).

## **II. Project Purpose and Need**

The basic purpose of the proposed project is to build a transportation, distribution, and logistics sector advanced manufacturing facility. The applicant (Berkeley County) provided the following information to support the Purpose and Need for the project. A more detailed version of the Purpose and Need can be found in Section 1.4.3 of the USACE's EA/FONSI in Appendix A.

*“Berkeley County respectfully submits that the purpose of the Proposed Project is to locate, build, and operate a new advanced manufacturing facility that requires the presence of certain transportation, distribution, and logistics (TDL) sector facilities and infrastructure for viability and feasibility. These TDL cluster advanced manufacturing facilities include manufacturing and assembly facilities in the aerospace and automotive industries, for example, which in today's environment requires direct access to the Interstate Highway system and location within 50 miles of sea and air port facilities.”*



Figure 1. Project Location

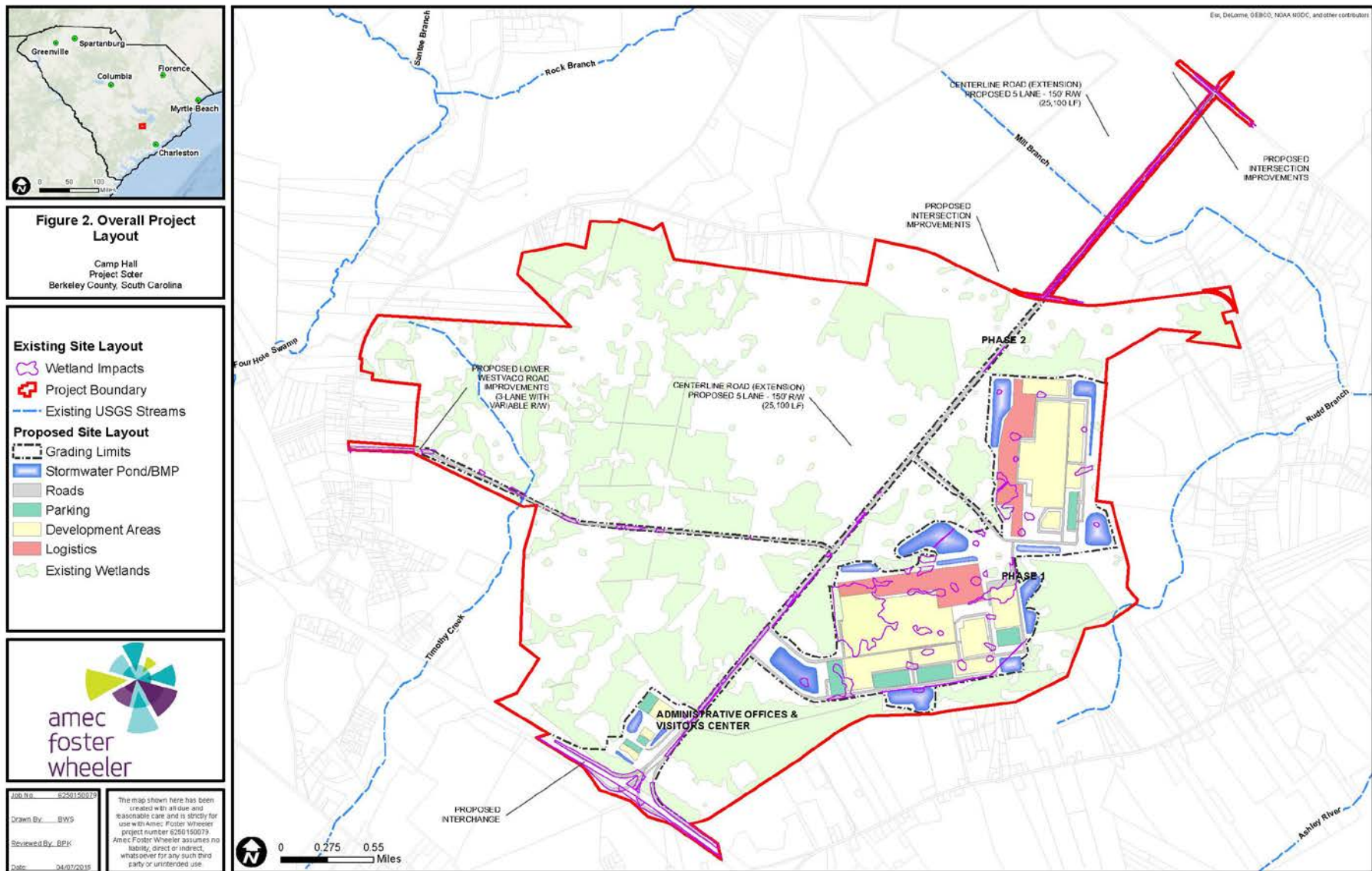


Figure 2. Project Layout

The full justification for the need for the proposed interchange at Mile 190 on Interstate 26 is provided in the Interchange Justification Report – I-26 and Volvo Boulevard,” dated June 30, 2016. The Memorandum cites the eight Federal Highway Administration policy requirements regarding interchange justification.

### III. Project Alternatives

An alternatives analysis was conducted for the project and is included in Section 4.7 of the EA/FONSI. The analysis of location alternatives included a Level 1 Screening Analysis, a Level 2 Analysis evaluating availability, cost, technological considerations, and logistical considerations, and a Level 3 Analysis to identify the least environmentally damaging practicable alternative (LEDPA) from among four onsite configuration plans. Initially, the applicant identified nine locations within the state that potentially met the project purpose criteria. (Figure 3). The Level 1 Analysis evaluated the nine location alternatives and eliminated those that failed to clearly meet the six project purpose criteria (Table 1). The Level 2 Analysis further evaluated the three remaining location alternatives with respect to development and mitigation costs, interstate visibility and access, air and sea port access, other potential adverse impacts, and waters of the U.S. impacts. The Level 3 Analysis compared and evaluated four onsite alternatives with respect to magnitude of impacts to waters of the U.S., interstate visibility to support brand recognition, and product component flow logistics based heavily on the configuration of project facilities. A description of each of the project sites evaluated begins in Section 4.7.2 of the EA/FONSI.

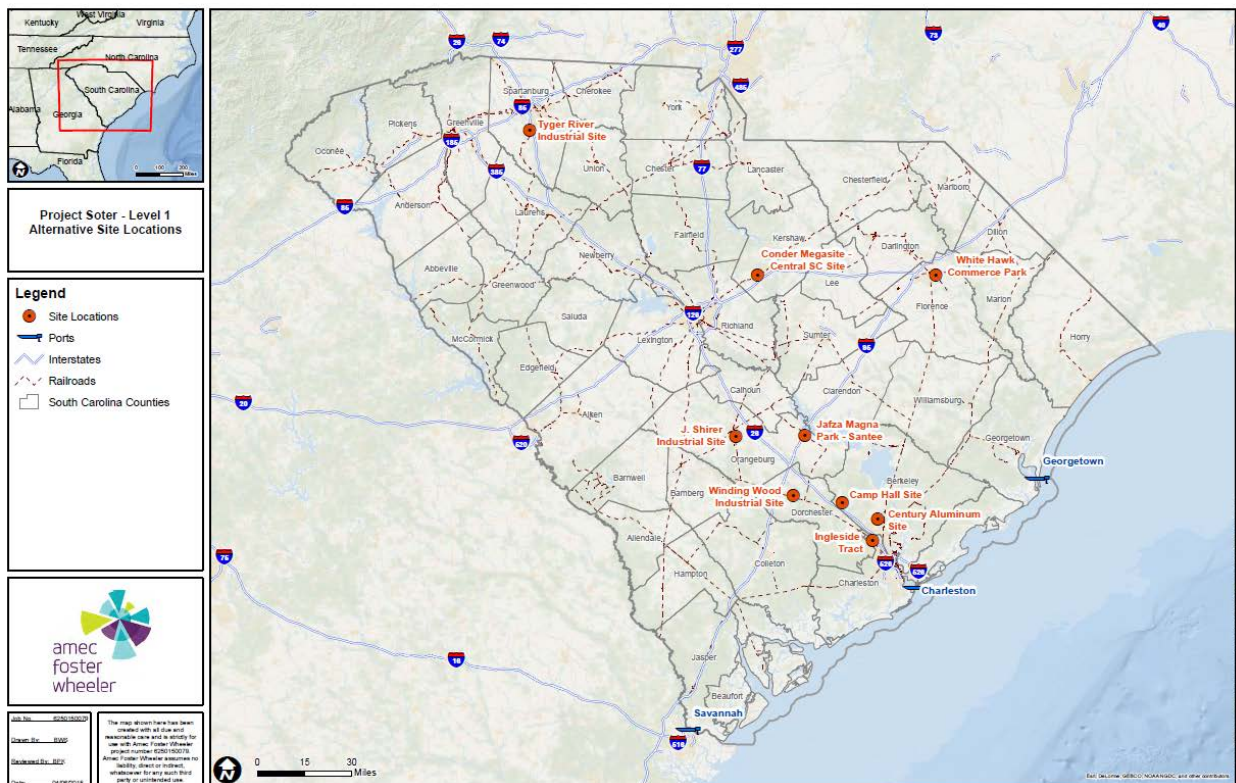


Figure 3. Location map showing all alternatives evaluated in the Level 1 Analysis.

The initial Level 1 Analysis initial compared each of the nine (9) sites with its ability to meet the site criteria which were: 1) a site of 1,500 acres or greater, 2) Interstate frontage/direct access, 3)

50 miles or less from a seaport, 4) 50 miles or less from an International airport, 5) utility access, and 6) availability of a skilled workforce.

**Table 1. Level 1 Criteria Used to Evaluate Whether Alternatives Meet Overall Project Purpose.**

Level 1 Alternatives	1,500 acres or greater	Interstate Frontage/ Direct Access	50 miles or less from seaport	50 miles or less from internat'l airport	Utility Access	Skilled Workforce
No Action	☐	☐	☐	☐	☐	☐
Camp Hall Commerce Park	■	■	■	■	■	■
Winding Wood Industrial Site	■	☐	■	■	■	■
Century Aluminum Site	■	☐	■	■	■	■
Ingleside Tract	☐	■	■	■	■	■
Tyger River Industrial Site	☐	■	☐	■	■	■
Conder Megasite – Central SC	☐	■	☐	■	■	▶
White Hawk Commerce Park	☐	☐	☐	☐	■	▶
J. Shirer Industrial Site	☐	☐	☐	■	■	▶
Jafza Magna Park – Santee	☐	■	☐	☐	■	▶

Table Legend:

- – passes criterion
- ☐ – fails criterion
- ▶ -- partially passes criterion

Based on the Level 1 analysis three of the site alternatives met at least five of the six project purpose criteria. The Camp Hall Commerce Park, the Winding Wood Industrial Site, and the Century Aluminum Sites were recommended for further Level 2 analysis. Level 2 analysis consisted of evaluating; 1) development cost, 2) mitigation cost, 3) Interstate visibility, 4) Interstate access, 5) port access (sea and air), 6) other adverse impacts (eg: impacts to historic properties), and 7) magnitude of impacts to waters of the United States (U.S.). A detailed discussion of the Level 2 analysis is included in Section 4.7.4 of the EA/FONSI. Table 2 provides a summary of the Level 2 analysis conducted for the project.

**Table 2. Summary of Evaluation Criteria for Level 2 Analysis.**

Level 2 Alternatives	Estimated Development Cost	Estimated Mitigation Cost	Interstate Visible	Interstate Access	Port (Air and Sea) Access	Other Potential Adverse Impacts	Wetland Impacts (acres)
No Action	\$0	\$0	N/A	N/A	N/A	N/A	N/A
Camp Hall Commerce	\$120 million	\$18.3 million	Available	Superior	Superior	Minimal	217
Winding Wood	\$84 million	\$32.2 million	Unavailable	Adequate	Excellent	Marginal	310
Century Aluminum	\$57 million	\$109.7 million	Unavailable	Adequate	Excellent	Moderate	1,055

Based on the results of the Level 1 Analysis and the Level 2 Analysis regarding nine location alternatives, the Applicant’s Proposed Alternative Camp Hill Commerce Park was selected to move forward to the Level 3 Analysis. The Camp Hill Commerce Park location alternative was superior to the Winding Wood Industrial Site and the Century Aluminum Site with regard to interstate access and visibility, proximity to air and sea ports, and critical to this analysis had the least impacts to wetlands. Therefore, the Camp Hill Commerce Park location was evaluated for onsite configurations to determine the Least Environmentally Damaging Practicable Alternative that meets the proposed project’s overall purpose.

Level 3 analysis consisted of comparing various on-site project layouts/configurations that were focused on site accessibility the three major roads that serve the location and the site’s visibility from Interstate 26. Four site configurations along with four interchange designs were evaluated for the Camp Hill Commerce Park Site. A description of each site configuration begins on page 40 of the attached EA/FONSI. Based on the evaluation, site configuration 2A is the preferred layout option. Table 3 provides a comparison of each of the site layouts.

**Table 3. Comparison of four onsite configuration alternatives.**

	Waters of the U.S. (Acres)	I-26 Visibility	Flow Logistics
Onsite Alternative 1	458	Maximum	Maximum
Onsite Alternative 2	273	Maximum	Acceptable
Onsite Alternative 2A	217	Maximum	Acceptable
Onsite Alternative 3	109	Unacceptable	Unacceptable

Access to the site from Interstate 26 was also a major consideration in the four onsite configurations. The rationale regarding the need for a new interchange at mile 190 is addressed in the Interchange Justification Report (IJR), and on this basis four separate interchange “options” were evaluated prior to incorporating the selected option into the onsite alternatives evaluated. The results of this impact assessment for the interchange options are presented in Table 4 below.

**Table 4. Impact assessment for interchange options associated with onsite alternatives.**

Interchange Option	Wetland Impacts	Other Adverse Environmental Impacts
Option 1: T-Type at Mile 190	26 acres	N/A
Option 2: Jug Handle at Mile 190	34 acres	N/A
Option 3: Improve Existing 187	54 acres	N/A
Option 4: New Exit at 191	17 acres	Cypress Methodist Campground*

\*National Register of Historic Places (NRHP) listed properties. This property is considered subject to FHWA regulations pursuant to Section 4(f) of the U.S. Department of Transportation Act of 1966.



### Interchange Option 1: New T-Type at Centerline Road

Construction of a new T-Type interchange at Mile 190 to connect at the proposed project's Centerline Road would impact 26 acres of wetlands and would have no other adverse environmental impacts. Based on these factors, Option 1 had the least impact and was included in the design configuration for Onsite Alternative 2 and Onsite Alternative 2A. The Option 1 interchange layout is shown below in Figure 4.

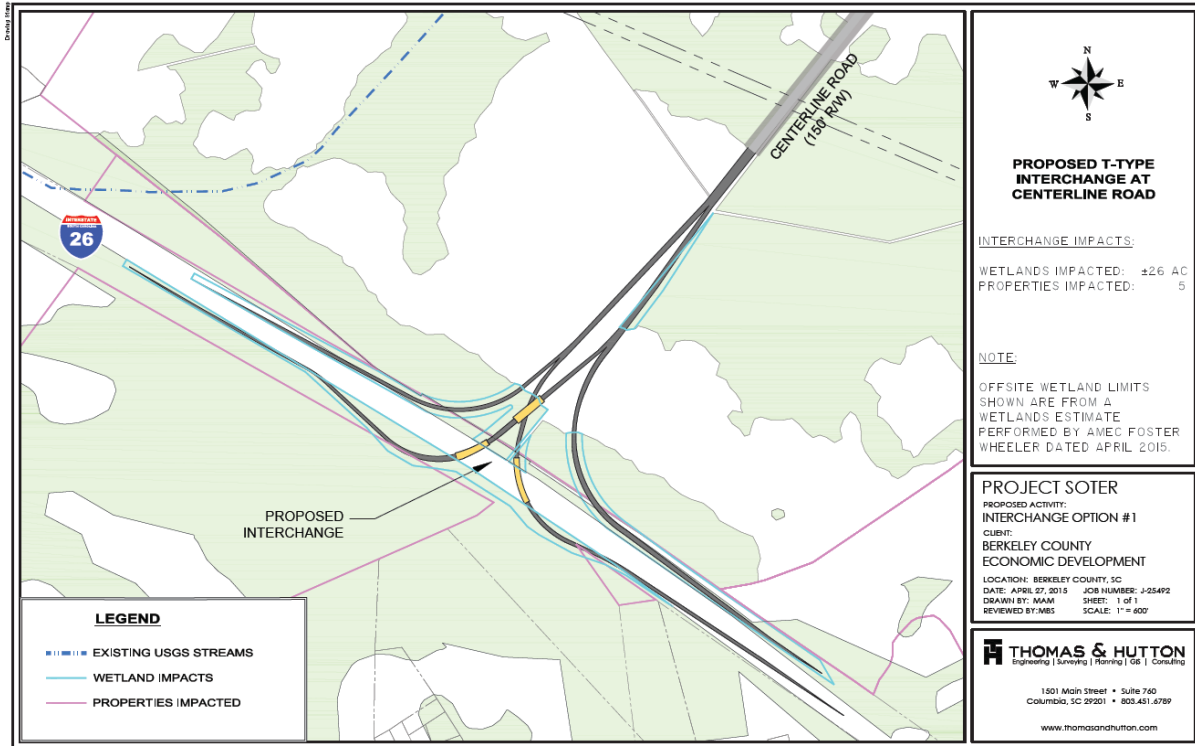
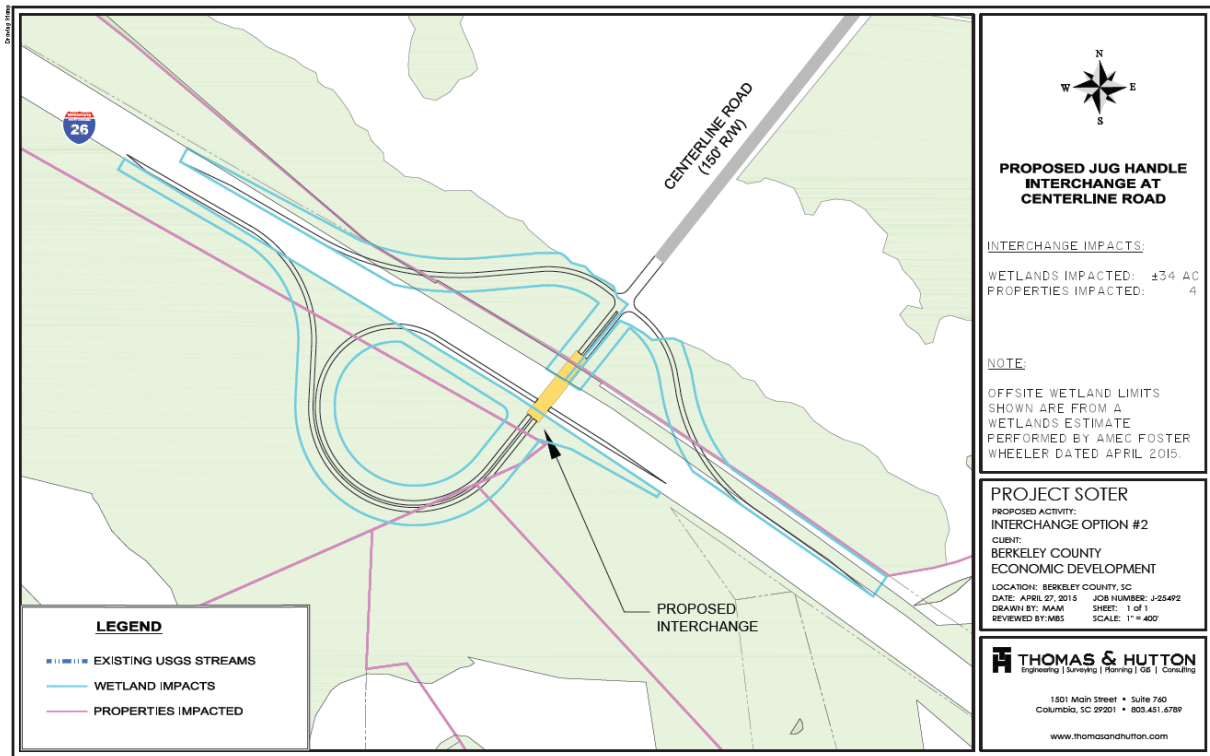


Figure 4. Interchange Option 1 would impact 26 acres of wetlands.

### Interchange Option 2: New Jug Handle at Centerline Road

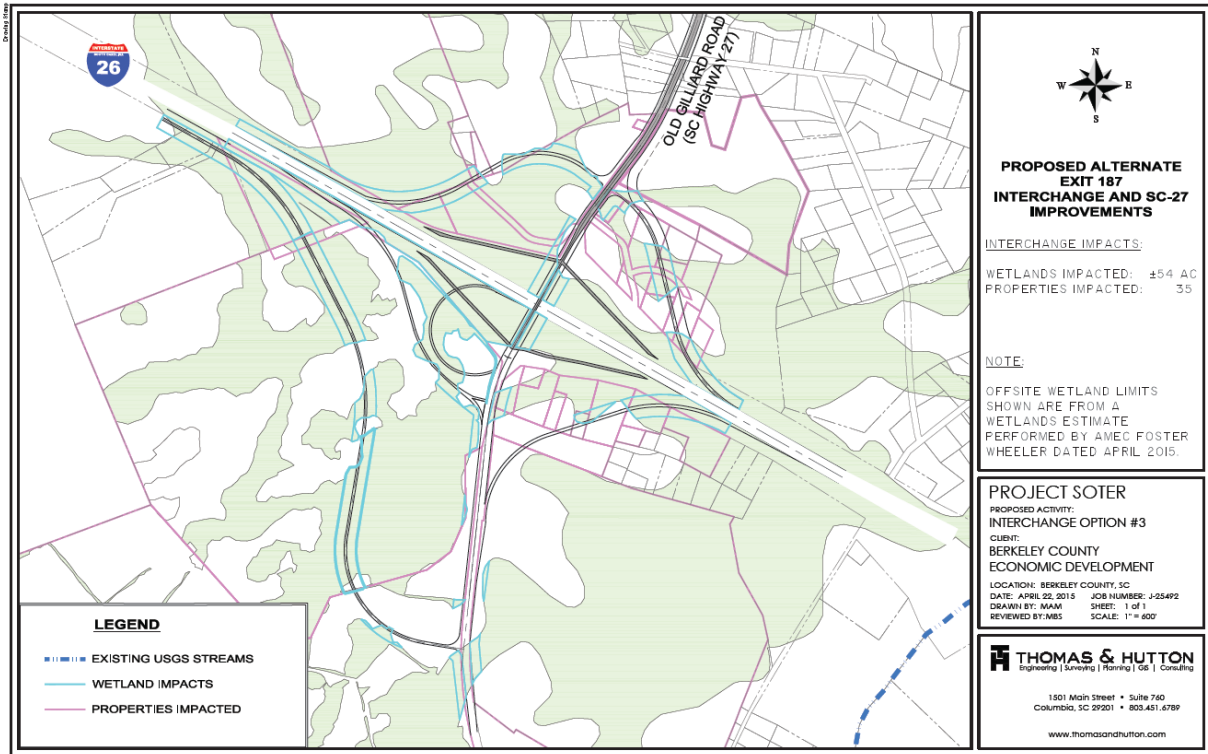
Construction of a new Jug Handle interchange design at Mile 190 would impact 34 acres of wetlands and would not involve any other adverse environmental impacts. Based on these factors, interchange Option 2 had the third highest wetland impacts and was included in the design configuration for Onsite Alternative 1 because the facility configuration in this option eliminates the feasibility of a T-type interchange. The Option 2 interchange layout is shown below in Figure 5.



**Figure 5. Interchange Option 2 would impact 34 acres of wetlands.**

**Interchange Option 3: Improvements at Existing Exit 187 at Highway 27**

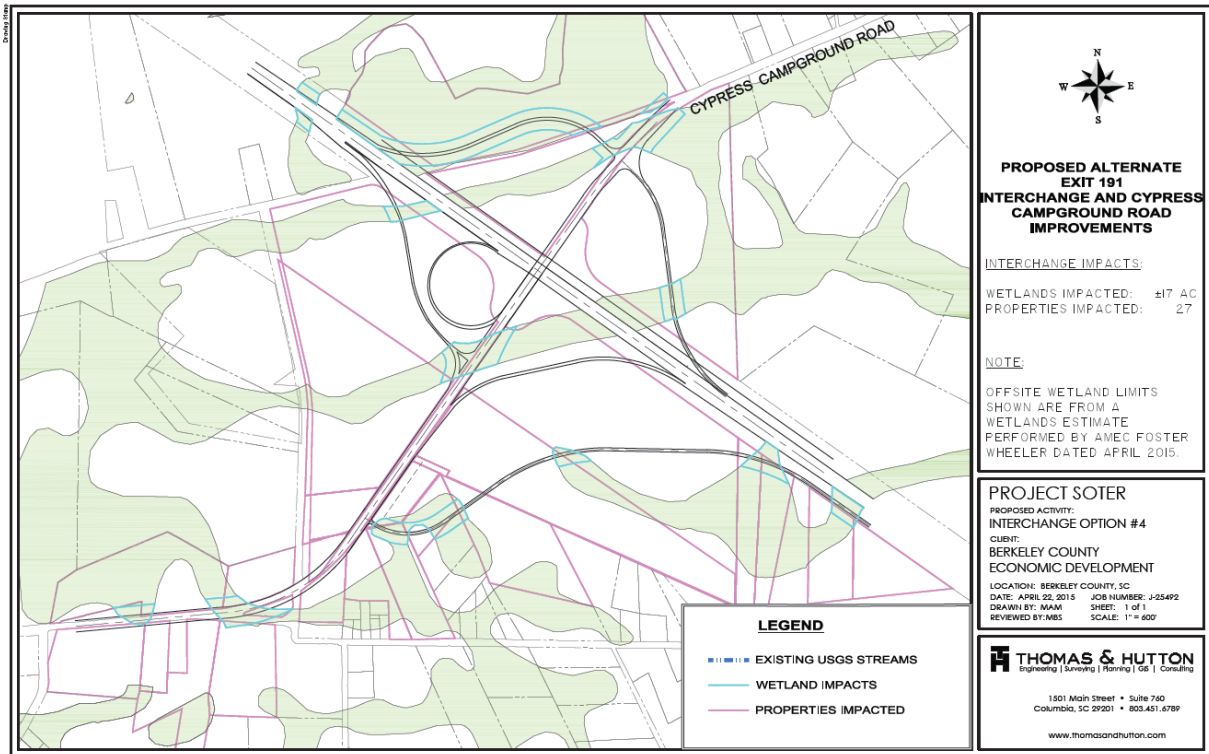
Construction of improvements at existing Exit 187 at Highway 27 would impact 54 acres of wetlands. Based on these factors, Option 3 had the most impact and was not included in the design configuration for the applicant’s proposed project. It was not included in the design configuration for any Onsite Alternative. The Option 3 interchange layout is shown below in Figure 6.



**Figure 6. Interchange Option 3 would impact 54 acres of wetlands.**

**Interchange Option 4: New Exit 191 at Cypress Campground Road**

According to the supporting information provided by the applicant, construction of a new Exit 191 at Cypress Campground Road would impact 17 acres of wetlands as well as 27 properties in the vicinity of the interchange. One of the properties that would be affected by this option would be the historic Cypress Methodist Campground, listed on the National Register of Historic Places (NRHP). Therefore, although interchange Option 4 had the least wetland impacts, it had other significant adverse environmental consequences in the form of its cultural resources impacts to the NRHP-listed Cypress Methodist Campground.



**Figure 7. Interchange Option 4 would impact 17 acres of wetlands and affect 27 properties, including NRHP-listed Cypress Methodist Campground.**

Based on the evaluation of the impacts for each alternative Onsite alternative 2A in conjunction with Interchange Option 1 (T-type) is the preferred alternative (Figure 8).

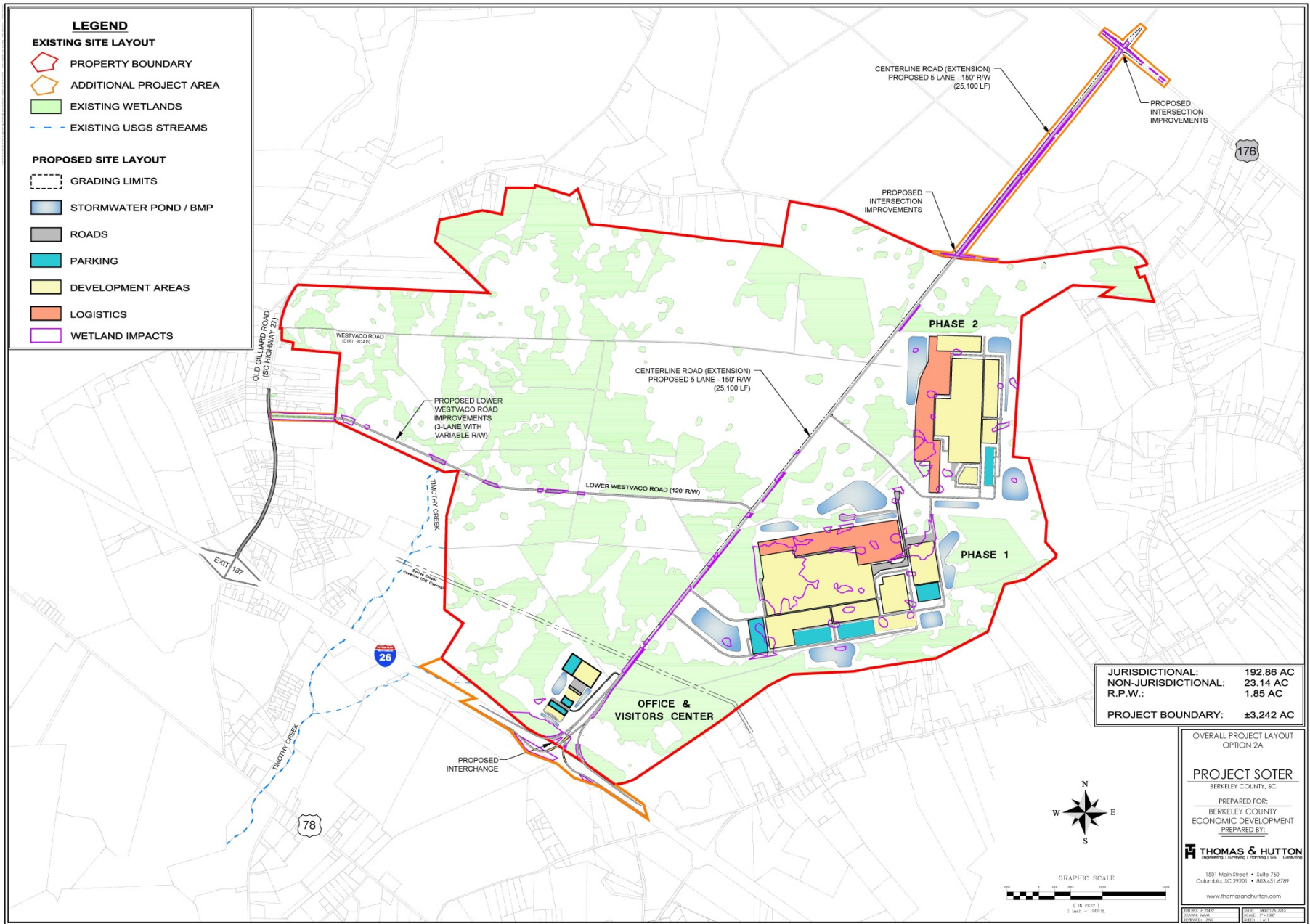


Figure 8. Preferred Alternative

## **Impacts Summary**

This section includes a summary of the potential environmental effects of the project. Expanded discussion regarding the probable impacts on the environment is included in Section 5 of the attached EA/FONSI.

### **Threatened and/or Endangered Species**

The proposed project is not likely to have any adverse effect on any threatened or endangered species or any designated or proposed critical habitat.

Pursuant to Section 7(c) of the Endangered Species Act of 1973 (as amended), a protected species survey for the project was completed (Appendix C). Based upon this report, it is determined that the project is not likely to adversely affect any federally endangered, threatened, or proposed species or result in the destruction or adverse modification of designated or proposed critical habitat. The proposed project will not adversely modify designated critical habitat.

In a letter dated April 27, 2015 (Appendix G), the USFWS concurred with the determination that the project is not likely to adversely affect any federally threatened or endangered species and will not adversely modify any designated or proposed critical habitat.

### **Wetlands and Streams**

The discharge of fill material in wetlands for this project will result in the loss of 192.94 acres (interchange impacts 26 acres) of wetlands and will adversely affect the biological productivity of the underlying wetland ecosystem. However, the project site has been intensively managed for commercial silviculture for many decades, meaning that many of the pine flatwoods wetland acres have been tilled, planted and bedded for many years. Potential impacts of the fill may result in smothering or altering the substrate elevation or periodicity of water movement. The addition of fill material will destroy wetland vegetation or result in advancement of succession to dry land species, specifically on road shoulders and other areas where no buildings or impervious surfaces will be constructed. Secondary impacts include the potential to reduce or eliminate nutrient exchange by a reduction of the system's productivity, or by altering current patterns and velocities where the surface water in wetlands is funneled through culverts or pipes.

As a result of the impacts a landscape-scale compensatory mitigation plan has been developed that will preserve and enhance 1,533 acres of aquatic resources within a total preservation and enhancement area of 2,496 acres in the Four Hole Swamp Watershed of the Edisto River Basin. This compensatory mitigation will more than offset the proposed impacts to waters of the U.S. A copy of the Landscape Mitigation Plan can be found in Appendix D.

### **Floodplains**

The proposed project will have a negligible long term effect on floodplain values. As described in the EA/FONSI, the project site is not located within a floodplain or a floodway. Stormwater management features, such as grassy swales and detention ponds will be used to manage increases in stormwater that result from a development of the project site, and will help prevent increases in downstream flows into existing floodplains.

## **Farmland**

The property is currently zoned by Berkeley County as “PD-OP/IP” which is office or industrial park. As defined, PD-OP/IP is for office, light and heavy industrial uses, and necessary accessory uses and facilities, designed with a park-like atmosphere to complement surrounding land uses by means of appropriate siting of buildings and service areas, attractive architecture, and effective landscape buffering. The proposed project development is consistent with this zoning and its requirements. On this basis, the proposed project will have a negligible long term effect on land use.

## **Relocations/Right-of-Way Impacts**

No relocations are anticipated as a result of the project. Improvements identified as necessary to Interstate 26 for the construction of a new T-Type interchange at Mile 190 would affect five properties associated with the acquisition of additional right-of-way to accommodate the interchange. Based on a review of the proposed T-Type interchange layout, the affected properties would not be wholly taken to facilitate the interchange, but rather would be partially acquired.

## **Hazardous Materials**

There are no known sources of hazardous wastes or toxic substances at the site under its current use as undeveloped and forestland. A Phase I Environmental Site Assessment (ESA) was completed for the project in October, 2013. The on-site investigation associated with the Phase I ESA was conducted on 4 and 10 October 2013. The results of the on-site investigation did not indicate the presence of recognized environmental conditions on the project site or within the immediate vicinity. Based on the information obtained during the Phase I ESA, the preparing consultant did not identify any recognized environmental conditions association with the project site.

## **Historic Properties/Cultural Resources**

A Cultural Resource Survey was completed for the project and can be found in Appendix E. The proposed project will have no effect on historic and cultural resources. Cultural resources surveys were performed by qualified cultural resources professionals and the results of these surveys were coordinated with the SHPO and the Catawba Indian Nation (CIN). One property listed for the National Register of Historic Places (NRHP), the Cypress Methodist Campground, is located in the vicinity of the project but is located outside the Area of Potential Effect (APE). The SHPO concurred in the determination of effect in a letter dated April 27, 2015. The CIN provided their response on May 4, 2015 (Appendix G).

## **Section 4(f)/6(f) Resources**

No Section 4(f) or 6(f) properties will be impacted as a result of the project.

## **Air Quality Impacts**

The proposed permit action has been analyzed for conformity applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act. It has been determined that the activities proposed under this project will not exceed de minimis levels of direct or indirect emissions of a criteria pollutant or its precursors and are exempted by 40 CFR Part 93.153. The project is located within an area of South Carolina that has been deemed in attainment for air quality, therefore is not subject to transportation conformity.

## **Noise Impacts**

Other than normal construction noise impacts no noise receptors will be impacted as a result of the project. Average daily traffic (ADT) volume for the proposed manufacturing facility is anticipated to be a maximum of approximately 48,000 vehicles. This number is based on the projected number of individuals the manufacturer will employ, the number of trucks entering and exiting the site, and local traffic. The proposed manufacturing plant will increase the amount of vehicular traffic on Centerline Road, Lower Westvaco Road, and Interstate 26. Residences located directly or near the proposed manufacturing facility will experience increases in noise levels. Most residences in the area back up to the eastern boundary of the manufacturing facility and are not located on Centerline Road, Lower Westvaco Road or along Interstate 26 West. No noise receptors are located near the proposed interchange on I-26.

## **Socio-Economic Impacts**

The proposed project will have a beneficial long term effect on economics. The construction of the advanced manufacturing and assembly facility is projected to involve over \$1 billion in private investment and generate a total of 4,000 new jobs directly associated with the project when both Phase 1 and Phase 2 are completed. It is expected that in addition to the direct jobs created at the proposed project, the project will attract a chain of suppliers and vendors to serve the project, each adding new jobs and income to the local and state economy. An Economic Impact Assessment was prepared for the project and can be found in Appendix F.

## **EO 12898 Environmental Justice**

In accordance with Title III of the Civil Rights Act of 1964 and Executive Order 12898, it has been determined that the project would not directly or through contractual or other arrangements, use criteria, methods or practices that discriminate on the basis of race, color, or national origin, nor would it have a disproportionate effect on minority or low-income communities.

Based on the existing conditions at the site and the nature of the proposed development, the project will have significant economic benefits to the community and the State. The project will not have adverse effects on the local population and will not disproportionately affect minority and/or low-income populations. No disproportionate impact on minority and disadvantaged populations are expected as a result of this proposed project.



### **Project Coordination**

The project has been coordinated with various local, state, and federal agencies; local stakeholders; and the general public to identify issues to be considered in the development of the project. A detailed summary of the coordination efforts is included in Section 3.4 of the EA/FONSI. Copies of the coordination/concurrence letters are included in Appendix G.

### **FHWA Decision**

While the proposed 192.94 acres of impacts to wetlands and other waters of the U.S. could be considered to have significant impacts, it is determined that the proposed mitigation plan, including wetland preservation and enhancement activities, more than offsets the adverse effects to the Four Hole Swamp and Cypress Swamp watersheds, such that the net result would be less than significant impacts to the quality of the human environment.

Guidance issued by the Council on Environmental Quality (CEQ), titled “Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact,” dated January 14, 2011, states as follows:

*“[A]gencies have increasingly considered mitigation measures in EAs to avoid or lessen potentially significant environmental effects of proposed actions that would otherwise need to be analyzed in an EIS. This use of mitigation may allow the agency to comply with NEPA’s procedural requirements by issuing an EA and a Finding of No Significant Impact (FONSI), or ‘mitigated FONSI,’ based on the agency’s commitment to ensure the mitigation that supports the FONSI is performed, thereby avoiding the need to prepare an EIS.”*

The FHWA has determined that this project will have no significant impact on the human environment. This Finding of No Significant Impact is based on the attached Environmental Assessment and other supporting information, which have been independently evaluated by the FHWA and determined to adequately and accurately discuss the need, environmental issues, and impacts of the proposed project and appropriate mitigation measures. The Environmental Assessment provided sufficient evidence and analysis for determining that an Environmental Impact Statement is not required. The FHWA takes full responsibility for the accuracy, scope and content of the Environmental Assessment and other environmental documentation for this project.

Date:

July 29, 2016



Emily O. Lawton  
Division Administrator

## APPENDIX A: USACE EA/FONSI

**CESAC-DE**

**MEMORANDUM FOR RECORD**

**SUBJECT:** Department of the Army Environmental Assessment, 404(b)(1) Guidelines Evaluation, Public Interest Review, and Statement of Findings for Above-Numbered Permit Application

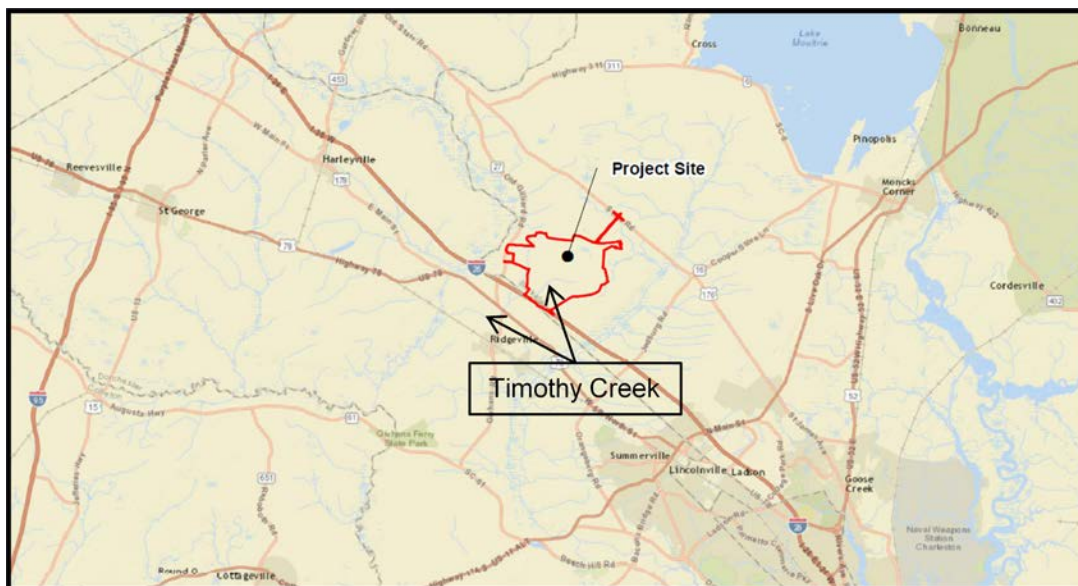
**1. Application**

**1.1 Applicant:**  
**Berkeley County**  
**c/o Mr. William Peagler**  
**1003 Highway 52**  
**Moncks Corner, South Carolina 29461**

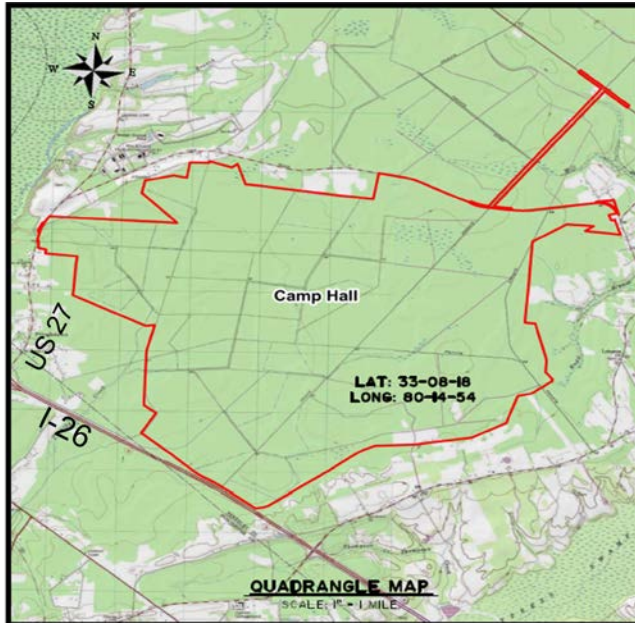
**Agent:**  
**Mr. Allen Conger**  
**Amec Foster Wheeler Environment & Infrastructure, Inc.**  
**720 Gracern Road, Suite 132**  
**Columbia, South Carolina 29210**

**1.2 Waterway & Location:**  
The proposed project is located in waters near and adjacent to Timothy Creek at a location near Interstate 26 Exit 187 at US Highway 27 N in Berkeley County, South Carolina.

Latitude North: 33.138333°  
Longitude West: -80.248333°



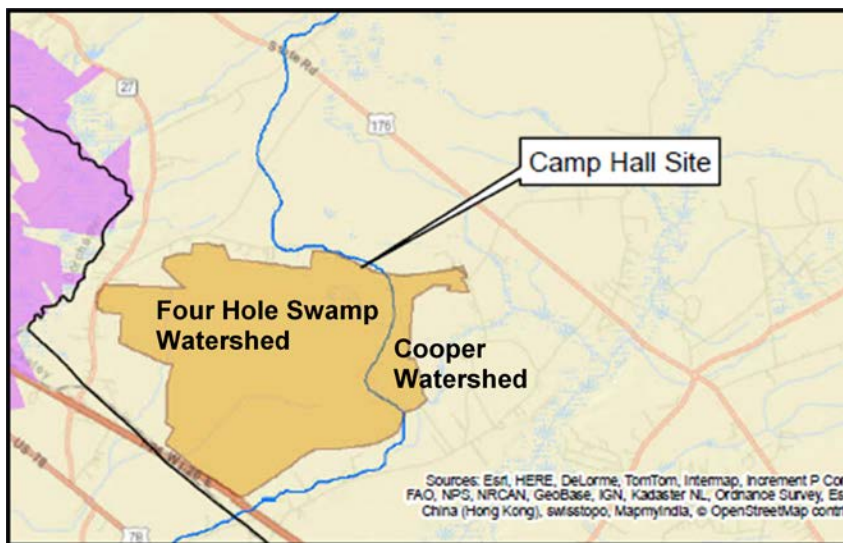
**Figure 1. Project location showing Timothy Creek.**



**Figure 2. Project location shown on USGS topographic map.**

**1.3 Existing Conditions:**

The project site, known as the Camp Hall Tract, consists of approximately 6,781 acres located at the convergence of two river drainage basins. The western portion of the property drains to the Lower Four Hole Swamp Watershed of the Edisto River, and the eastern portion of the site drains to the upper reaches of the Cypress Swamp Watershed of the Santee River and Cooper River Basins.



**Figure 3. Project location showing the drainage divide between the Cooper and Four Hole Swamp Watersheds.**

The proposed work that is the subject of this decision document is concentrated in the eastern portion of the overall tract and consists of approximately 2,880 acres draining primarily to the Four Hole Watershed. The entire site has been intensively managed as loblolly pine plantation for over 50 years, primarily in short pulp rotations (less than thirty cycles).

The 6,781-acre project site consists of 4,307 acres of uplands and 2,474 acres of aquatic resources. The 2,474 acres of aquatic resources on-site include 2,405 acres of federally jurisdictional freshwater wetlands, and 69 acres of federally non-jurisdictional wetlands. The total aquatic resources contained within the project area represent approximately 36.5% of the total site area.

The main wetland acreages present on the site include habitat types typical to the South Carolina Coastal Plain:

**Upland Loblolly Pine Plantation** – Upland habitats occupy approximately 63.5% (4,307 acres) of the total area of the site and are comprised by loblolly pine (*Pinus taeda*) plantation. These areas are managed for timber harvest and are subject to normal silvicultural practices including bedding, mechanical land clearing and burning. The average age of the pine trees in this community is approximately 20 years, with stand age ranging from 1 to 40 years.

**Pine Flatwoods Wetlands** – Pine stands occupying lower elevations on the site are wetlands with seasonally high water table elevations. These habitats are dominated by loblolly pine in the canopy and understory, along with lesser abundances of sweetgum (*Liquidambar styraciflua*), laurel oak (*Quercus laurifolia*), American holly (*Ilex opaca*), wax myrtle (*Morella cerifera*), red bay (*Persea borbonia*), fetterbush (*Lyonia lucida*) and high bush blueberry (*Vaccinium corymbosum*). Groundcover are dominated by Virginia chain fern (*Woodwardia virginica*), bristly dewberry (*Rubus hispidus*), and common panic grass (*Panicum capillare*).

**Forested Hardwood Wetlands** – The site includes bottomland hardwood and non-alluvial swamp with similar species compositions. These wetlands are seasonally or partially permanently inundated at lower elevations. The dominant vegetation consists of a dense canopy of laurel oak, water oak (*Q. nigra*) and red maple (*Acer rubrum*), with lesser abundances of loblolly and pond pine (*Pinus serotina*). The understory includes a mix of dwarf palmetto (*Sabal minor*), giant cane (*Arundinaria gigantea*), American holly, red bay, and sweetbay (*Magnolia virginiana*). The herbaceous groundcover stratum is a sparse mix of softrush, various sedges, and greenbrier (*Smilax* spp.) and muscadine (*Vitis rotundifolia*) vines.

Federally jurisdictional linear waters, characterized as relatively permanent waters (RPWs) based on their flow regimes, are man-made/manipulated linear conveyances which have been heavily channelized and straightened to remove storm water and excess surface water from the overall site. These features have minimal to no vegetation, have virtually no sinuosity, and have relatively little development of sediment sorting or other stronger channel development. On this basis, these features provide little ecological function other than conveying water, and in fact water is conveyed so rapidly that there is little to no water quality improvement function as water passes. In addition, the rapid drainage provided by these linear features actually serves to remove more water from the surrounding landscape than it should during a given period of time,

ultimately resulting in the net drainage of nearby and connected wetlands.

**1.4 Proposed Work as described in the Public Notice:**

The proposed work consists of placing 670,705 cubic yards of clean fill material in 192.94 acres, land clearing of 16.90 acres, excavating of 2.65 acres, and shading of 2.91 acres of wetlands and other waters to construct Phases 1 and 2 of the proposed project. Phase 1 will include the development of approximately 23,040,000 square feet of land for the construction of a manufacturing and production space. Phase 1 also involves the development of approximately 1,050,000 square feet of land for the construction of administrative offices and a visitor's center. The total footprint for Phase 1 is approximately 575 acres. Operating at full capacity, Phase 1 is expected to employ approximately 2,000 individuals at the manufacturing facility, administrative offices, and a visitor's center. Phase 2 will include the development of an additional 14,040,000 square feet of land for the construction of a second manufacturing, assembly, and production space occupying approximately 322 acres. While the timing of construction of Phase 2 is dependent on market conditions, it is expected to be constructed and operational within 10 years of the initiation of construction for Phase 1. Operating at full capacity, Phase 2 is expected to employ an additional 2,000 individuals at that facility. As mitigation for the proposed impacts to wetlands and waters, the applicant proposes the Project Soter—Landscape Mitigation Plan to preserve, enhance, and restore approximately 1,533 acres of wetlands within approximately 2,496 acres of property to be permanently protected in the Dean Swamp and Walnut Branch watersheds, which are tributaries of Four Hole Swamp that are defined by the National Audubon Society as critical priority areas in need of protection. According to the applicant, the project purpose is to locate, build, and operate a new advanced manufacturing facility that requires the presence of certain transportation, distribution, and logistics sector facilities and infrastructure for viability and feasibility. These TDL (transportation, distribution, and logistics) cluster advanced manufacturing facilities include manufacturing and assembly facilities in the aerospace and automotive industries, for example, which according to today's accepted industry standards requires direct access to the Interstate Highway system and location within 50 miles of sea and air port facilities.

The applicant proposes to construct the proposed development in phases and has requested a 35 year permit for the proposed work.

**Project description as provided by the applicant:**

Berkeley County is the applicant to develop the site as a means to accommodate an entity to locate, build, and operate an advanced manufacturing and assembly facility that requires the presence of certain transportation, distribution, and logistics cluster infrastructure. When the permit application was received, no specific company was identified to build and operate the proposed facility. On May 11, 2015, it was revealed that the manufacturing facility will be Volvo automobiles.

- 1.4.1 Avoidance & Minimization Statement (as stated in the application):** The applicant provided the following information: *“An extensive alternatives analysis was conducted by the applicant to evaluate practicable alternatives to the proposed site which limited wetland impacts to the greatest practicable extent and yet was feasible in light of technology, costs, and logistics. Camp Hall Option 2 was selected as the preferred alternative, as it was technically feasible, provided efficient accessibility and visibility, and reduced wetland impacts to 293 acres. Following site*

*selection, the applicant further minimized wetland impacts by 75.15 acres to a total of [216.02] acres with Option 2A. In this alignment the visitor's center/administrative offices were moved to an area of slightly lower visibility, but with greatly reduced wetlands impacts, the Phase 2 northern access road was completely removed to further reduce impacts, and the stormwater ponds associated with Phase 1 and 2 were relocated so that the site layout minimizes wetland impacts.”*

*“In addition, further minimization occurred in association with the design and planning of the Lower Westvaco Road access as a result of design enhancements and a detailed wetland delineation. Impacts were further reduced from the original permit submittal (Option 2A) by 1.82 acres. Further minimization of wetland impacts may result from additional design enhancements associated with infrastructure improvements. Final design for these areas is on-going.”*

*“The applicant has also committed to installation [sic] to installation of additional culverts along the proposed road infrastructure corridors to prevent obstruction of existing surface flows during time of saturation within the wetlands and to facilitate the passage of terrestrial and aquatic organisms.”*

1.4.2 **Compensatory Mitigation Plan (as stated in the application):** The applicant provided the following information: *“In the absence of suitable existing wetland mitigation bank or an in-lieu fee program for the watershed, all required compensatory mitigation will be obtained through off-site landscape-scale permittee-responsible mitigation activities utilizing the watershed approach. The proposed Project Soter – Landscape Mitigation Plan (Mitigation Project) will preserve and enhance approximately 1,533 acres of wetlands within 2,496 acres of property in the Dean Swamp and Walnut Branch watersheds, priority areas for the National Audubon Society.”*

1.4.3 **Project Purpose and Need (as stated in the application):** The applicant provided the following information: *“Berkeley County respectfully submits that the purpose of the Proposed Project is to locate, build, and operate a new advanced manufacturing facility that requires the presence of certain transportation, distribution, and logistics (TDL) sector facilities and infrastructure for viability and feasibility. These TDL cluster advanced manufacturing facilities include manufacturing and assembly facilities in the aerospace and automotive industries, for example, which in today’s environment requires direct access to the Interstate Highway system and location within 50 miles of sea and air port facilities.”*

*“Berkeley County further contends that the need for the Proposed Project is to provide an appropriate site for a TDL cluster advanced manufacturing that meets the minimum criteria of such a manufacturer (such as one in the automotive or aerospace industry sectors). The Proposed Project will be built in phases in order to better meet current and expected demand. Phase 1 of the Proposed Project is expected to begin construction in 2015 and requires the construction of a primary manufacturing facility, with a total developed area of approximately 575 acres. This manufacturing facility will house state-of-the-art machines and systems capable of producing and assembling parts, as well as provide office and work space to house manufacturing, technical, engineering, management, and support personnel.”*

*“Phase 2 of the Proposed Project is expected to be constructed and operational within 15 years of the start of Phase 1 and will require the construction of an additional manufacturing facility, with a Phase 2 developed area of approximately 322 acres.”*

*“In conjunction with the contemplated manufacturing facilities, Phase 1 of the Proposed Project involves the construction of a modern office facility, capable of accommodating approximately 500 full-time employees, frequent visitors, suppliers and corporate partners, consultants, and company personnel. This facility and complex will cover approximately 24 acres of developed area and will also include a visitor’s center that is intended to showcase and exhibit the new facility, the manufacturer’s products, and the history of the manufacturer. Due to the often assembly-line nature of TDL cluster advanced manufacturing for larger products (such as those found in the automotive and aerospace industries), locating advanced manufacturing companies require that the manufacturing and assembly facilities occupy large rectangular buildings and that the administrative offices and visitor’s center facilities be separate from the manufacturing footprint in order to minimize interference with manufacturing operations, employee and product traffic, secure areas, and/or other development areas, although close enough to be reasonably accessible and avoid inefficiencies caused by lengthy internal roads. Marketability of products further requires a site location that provides a significant visual presence at the site location, with proximity as close as possible to the Interstate Highway and facility interchange, with any necessary improvements that may be necessary to ensure adequate accessibility (e.g., construction of an interchange and/or road improvements).”*

*“In order to accommodate the Proposed Project, the advanced manufacturer requires a site that is a minimum total size of 1,500 acres to accommodate the approximately 900 acres required for the facility footprint and ancillary infrastructure requirements.”*

*“Any TDL cluster advanced manufacturer places significant emphasis on locating the contemplated facilities at a site that can take advantage of close proximity and availability of adequate transportation infrastructure, including roads and port facilities (both sea and air) in South Carolina, for use in domestic sales and exports and proximity and transportation for component parts and suppliers. The proposed advanced manufacturing and assembly facility also requires access to a significant available source of skilled workers with adequate education and training to fully staff the facility and meet the expected demand.”*

The full justification for the need for the proposed interchange at Mile 190 on Interstate 26 is provided in the Technical Memorandum produced by Stantec and titled, “Preliminary Interchange Justification Report – I-26 and Volvo Boulevard,” dated June 16, 2015. The Memorandum cites the eight Federal Highway Administration policy requirements regarding interchange justification. The Technical Memorandum is hereby incorporated by reference into this decision document.

- 1.4.3.1 **Basic Project Purpose (as stated in the application):** The applicant provided the following information: *“Berkeley County respectfully submits that the basic purpose of the Proposed Project resulting in the discharge of dredged or fill material is: to build a transportation,*



*distribution, and logistics sector advanced manufacturing facility.”*

1.4.3.2 **Water Dependency (preliminary determination based on the information in the application):** The project  is/  is not water dependent.

1.4.3.3 **Overall Project Purpose (as stated in the application):**

*“To build and operate a standalone TDL cluster advanced manufacturing facility in South Carolina on a property that has sufficient continuous acreage, direct Interstate Highway frontage and/or access, is located close to a seaport facility with deep water access, is located close to an international airport, and the local area has an acceptable availability of a skilled workforce.”*

1.5 **Proposed Work that is subject of this Memorandum for Record:**

The proposed work consists of placing 670,705 cubic yards of clean fill material in 192.94 acres, land clearing of 16.90 acres, excavating of 2.65 acres, and shading of 2.91 acres of wetlands and other waters to construct Phases 1 and 2 of the proposed project. Phase 1 will include the development of approximately 23,040,000 square feet of land for the construction of a manufacturing and production space. Phase 1 also involves the development of approximately 1,050,000 square feet of land for the construction of administrative offices and a visitor’s center. The total footprint for Phase 1 is approximately 575 acres. Operating at full capacity, Phase 1 is expected to employ approximately 2,000 individuals at the manufacturing facility, administrative offices, and a visitor’s center. Phase 2 will include the development of an additional 14,040,000 square feet of land for the construction of a second manufacturing, assembly, and production space occupying approximately 322 acres. While the timing of construction of Phase 2 is dependent on market conditions, it is expected to be constructed and operational within 10 years of the initiation of construction for Phase 1. Operating at full capacity, Phase 2 is expected to employ an additional 2,000 individuals at that facility. As mitigation for the proposed impacts to wetlands and waters, the applicant proposes the Project Soter—Landscape Mitigation Plan to preserve, enhance, and ecologically restore approximately 1,533 acres of wetlands within approximately 2,496 acres of property to be permanently protected in the Dean Swamp and Walnut Branch watersheds, tributaries of Four Hole Swamp that are defined by the National Audubon Society as critical priority areas in need of protection.

2. **Authority**

Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. §403).

Section 404 of the Clean Water Act (33 U.S.C. §1344).

Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

3. **Scope of Analysis and Public Involvement**

*This scope listed in sections 3.1 – 3.3 represents the scope of the final project description, which may differ from the initially proposed project. If applicable, changes to the initially proposed project will be detailed in sections 3 and 4.*

3.1 **NEPA Scope**

**Factors:**

**Whether or not the regulated activity comprises "merely a link" in a corridor type project:**  
The project is not a corridor type project.

**Whether there are aspects of the upland facility in the immediate vicinity of the regulated activity which affect the location and configuration of the regulated activity:**

The majority of the proposed upland development would not occur without the proposed discharge. The extent and distribution of wetlands and other waters of the U.S. on the project site are such that very few project elements can be constructed without substantial discharge of fill material. In addition, to the extent and distribution of wetlands and waters, the major project elements include manufacturing and assembly facilities (buildings) that collectively occupy in excess of 23 million square feet.

**The extent to which the entire project will be within USACE jurisdiction:**

The entire tract is privately owned, and includes jurisdictional freshwater wetlands and other waters of the U.S. covering approximately 35.5% of the 6,781-acre tract. While the waters of the U.S. cover only 35.5% of the overall property, their distribution across the site is uniform such that there is no area of available uplands that will accommodate the proposed project without USACE jurisdiction. These wetlands are within the jurisdiction of the Clean Water Act.

**The extent of cumulative Federal control and responsibility:**

The proposed work will be performed by the applicant. Federal control and responsibility is limited to the issuance and enforcement of the Federal permit to allow the applicant to perform the proposed work, and does include the entire 6,781-acre property.

**Determined scope:**

Only within the footprint of the regulated activity within the delineated water.

Over entire property. Explanation:

The proposed work and the areas of wetlands and other waters of the U.S. within the entire tract (6,781 acres) are within federal control and responsibility because the extent and distribution of wetlands and waters of the U.S. on the project site are such that very few project elements can be constructed without substantial discharge of fill material. In addition to the extent and distribution of wetlands and waters, the major project elements include manufacturing and assembly facilities (buildings) that collectively occupy in excess of 23 million square feet.

3.2 **NHPA Permit Area**

**Tests:**

**Activities outside waters of the U.S. are included in the Permit Area since ALL of the following tests are satisfied:**

**“Activity would not occur but for the authorization of the work or structures within the waters of the United States”.**

Yes  No

None of the construction proposed in upland areas would be able to occur without the construction proposed within wetlands and other waters of the U.S.

**“Activity is integrally related to the work or structures to be authorized within the waters of the United States. Or, conversely, the work or structures to be authorized must be essential to the completeness of the overall project or program”.**

Yes  No

The portions of the project to be constructed within waters of the U.S. are integrally related to the completeness of the overall project.

**“Activity must be directly associated (first order impact) with the work or structures to be authorized”.**

Yes  No

The upland development is directly associated with the proposed work in waters of the U.S. The upland development would not occur without the proposed discharge of fill within waters of the U.S. in order to construct the major project elements.

**Permit Area:**

The Permit Area includes the entire 6,781-acre property.

**3.3 ESA Action Area**

Action Area means all areas to be affected directly or indirectly by the Federal action, not merely the immediate area involved in the action.

**Action Area:**

The Action Area is the entire 6,781-acre property.

**Explanation:**

The proposed regulated activities extend to approximately 60% of the total land area of the project site. The footprint of manufacturing and assembly facilities and administrative offices is confined to 2,880 acres of the site; however, when the area and portions of the site where access roads must be constructed are also considered, approximately 60% of the land area becomes involved. On this basis, the Action Area includes the entire 6,781-acre property.

**3.4 Public Involvement**

**3.4.1 Public Notice**

Application received: April 10, 2015.  
Application complete: April 10, 2015.  
Public Notice date: April 16, 2015.  
Public Notice period: 15 days.

**3.4.2 Other public involvement: None**

**3.4.3 Comments Received**

**USEPA:** USEPA requested the full 30-day comment period via e-mail correspondence dated April 22, 2015. The basis for a time extension was due to the large volume of material included in the applicant's federal permit application. The time extension was granted on April 28, 2015, until May 16, 2015. A comment letter was received electronically from USEPA on May 15, 2015; the printed original copy was received on May 20, 2015. In addition, to the written comment letter, USEPA attended an agency field visit that included the applicant and their representatives on April 30, 2015. During this field meeting USEPA verbally posed some of the same questions and concerns presented later in their letter.

During the April 30, 2015, site visit and in their letter, USEPA questioned why an onsite alternative with lesser impacts [to waters of the U.S.] was not the applicant's proposed alternative. However, the USEPA letter went on to explain that this concern was sufficiently addressed based on the applicant's clarifying explanation: that the manufacturing and assembly sequencing process would require transporting manufactured products across the proposed 5-lane highway multiple times during the production process if the major project components for manufacture and assembly were not all constructed as a functional unit, such as the proposed alternative.

Regarding potential alternatives, USEPA also commented that the alternatives analysis included sites across the state of South Carolina even though the applicant is Berkeley County. USEPA commented that the applicant has very specific requirements, including direct access to the interstate and location within 50 miles of sea and air port facilities. USEPA observed that these requirements eliminated the majority of alternative sites within the state, and that once the proposed site was identified the applicant considered many onsite alternatives to minimize impacts. This portion of the USEPA letter concluded that *"Therefore, the EPA believes the applicant has sufficiently demonstrated their effort to avoid and minimize impacts to waters of the United States."*

The USEPA comment letter also posed questions regarding the proposed permittee-responsible compensatory mitigation plan. The letter stated:

*"The EPA believes the plan has potential to adequately mitigate unavoidable impacts to waters of the United States provided that our comments and concerns below are sufficiently addressed."*

*"The proposed mitigation plan indicates that several plant communities will be enhanced through planting and vegetation management techniques, including bottomland hardwood, pine flatwood, and isolated pond habitat. These communities require very different management (i.e., regular burning for pine flatwood) yet only a single vegetation performance standard is given:*

*Vegetative monitoring documents a minimum of 320 planted stems per acre survive at the end of year 3, and 260 planted stems per acre survive at the end of year 5, and no more than 25 percent of any one species and no more than 1 percent invasive species. Height, lateral growth and root collar diameter demonstrates an increase over baseline and each prior monitoring period. Planted vegetation demonstrates an average 5 to 7 feet in height at the end of year 5. If volunteers are utilized to meet the set performance*

*standards, species will be tagged in the field as a volunteer and the same data collected as for planted stems.”*

*“Performance standards should be tailored to each community. For the pine flatwood communities we recommend the applicant use an approach that has been formulated by the Alabama-Mississippi Mitigation Banking Review Team for Wet Pine Flats. This team suggests using the Functional Capacity Index of the Plant community (FCI<sub>plant</sub>) derived from Rheinhardt, R.D., Rheinhardt, M.C., and Brinson, M. M. (2002), "A Regional Guidebook for Applying the Hydrogeomorphic Approach to Assessing Wetland Functions of Wet Pine Flats on Mineral Soils in the Atlantic and Gulf Coastal Plains.”*

*“We recommend that the applicant apply this method to the reference area and to the enhancement area for baseline data.”*

*“During the site visits to some of the bottomland hardwood preservation areas, it was noted that some of the areas had been clear-cut and the applicant planned to rely on natural regeneration. The EPA indicated that while enhancement credit was not being sought, performance standards would be required to show that these areas were trending toward reference bottomland conditions and worthy of preservation.”*

*“The applicant proposes to monitor all mitigation sites for 5 years and to supply monitoring reports to the Interagency Review Team (IRT) each year. The EPA appreciates the effort to keep the IRT involved with mitigation during the entire monitoring period. During the site visit, it was indicated that clear-cut areas proposed to be put on a burning rotation might not be burned before the monitoring period is over. If this is the case, it is unclear how the success of this management technique will be assessed. We recommend that the applicant provide additional information on how success will be adequately measured or extend the monitoring period so that management techniques can be utilized and measured.”*

*“Throughout the pre-application process, the EPA's concerns regarding avoidance, minimization, and alternatives analysis were addressed. Questions regarding the compensatory mitigation for unavoidable impacts remained after the review of the plan and site visits, but overall we find the plan to have potential to mitigate for the proposed impacts.”*

**USFWS:** The USFWS commented in a letter dated April 27, 2015. In their letter USFWS concurred with the April 16, 2015, Corps determination (Public Notice SAC 2015-0476-SIR) that the proposed project is “not likely to adversely affect,” any federally protected species and/or designated or proposed critical habitat. Their comments also noted that “*obligations under section 7 of the Endangered Species Act must be reconsidered if (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner which was not considered in this assessment; or (3) a new species is listed or critical habitat is determined that may be affected by the identified action.*”

The USFWS referenced their attendance at the April 15, 2015, interagency site visit and commented that the site has been intensively managed and logged for industrial pine production

by MeadWestvaco for several decades. Their observations included *“noting that numerous roads and associated ditches crisscross the site,”* providing fast and effective storm water drainage during rain events and have adversely impacted the existing on site wetlands. Comments in this regard concluded that *“runoff from the site is untreated and likely contains sediments, residual herbicides, or other pollutants associated with forestry practices.”*

In addition to the comments noted above, the USFWS observed that the proposed project would impact 217 acres within the main project footprint of 2,880 acres. This would leave approximately 2,188 acres of waters/wetlands located on the 3,900 acres of the site where no work would occur as part of this project. USFWS expressed concern that the remaining on site wetlands were not specifically proposed for additional protection, including no proposed upland buffers around wetlands. On this basis, USFWS recommended *“minimizing impacts to wetland resources by establishing a protective buffer around all remaining wetlands within the property boundary. The Service also recommends the applicant seek avoidance and minimization of wetland impacts along all proposed roadways. We recommend the applicant seek to avoid impacts through alignment shifts of the entrance road or the use of bridging where possible. In addition, for wetlands that cannot be avoided, we recommend the applicant increase all road shoulders from 4:1 to a 2:1 side slope.*

Regarding proposed compensatory mitigation for impacts to wetlands and other waters, USFWS concluded that the plan will adequately compensate for the loss of wetlands on the project site. The USFWS specifically noted that the proposed permittee-responsible compensatory mitigation plan to purchase, enhance, and ultimately protect the Bannister, Singletary, Dean Swamp, and Walnut Branch Tracts, would satisfactorily compensate for impacts of the proposed project, but would not *provide coverage* for wetland impacts associated with future support services or vendors that may be located within the property boundaries. In this regard, USFWS recommended the Corps require future projects that propose wetland impacts on the remainder of the site to develop stand-alone compensation packages independent of Project Soter.

**NMFS:** The NMFS provided a letter dated May 1, 2015, and commented that the proposed project would not occur in the vicinity of essential fish habitat (EFH) designated by the South Atlantic Fishery Management Council or NMFS. Their letter explained that *“present staffing levels preclude further analysis of the proposed activities and no further action is planned. This position is neither supportive of nor in opposition to authorization of the proposed work.”*

**SCDNR:** SCDNR commented in a letter dated May 1, 2015. SCDNR stated that *“DNR recognizes that for various and legitimate reasons, the ability of the Applicant to avoid and minimize impacts, further than the extent described in the application and supporting documents, is not practicable.”* As such, the comment letter focused on addressing the proposed compensatory mitigation plan:

*“DNR recognizes the importance of the proposed mitigation tracts in furthering conservation efforts within the Four Holes Swamp Watershed which includes the wetland preserve known as Francis Beidler Forest. We reiterate that the Francis Beidler Forest is a nationally and internationally recognized old growth swamp forest of International Importance and an Audubon Important Bird Area. The preserve includes over 16,000*

*acres of protected wetlands and adjacent upland habitats. The protection of wetland systems such as those proposed in the Project Soter – Landscape Mitigation Plan is vital to the long-term health and sustainability of the Four Holes Swamp Watershed and the Francis Beidler Forest.”*

*“DNR believes the proposed mitigation plan will result in profound natural resource benefits through protection of vulnerable wetlands and critical fish and wildlife habitats, while adding to the collective efforts of DNR and its many public and private conservations partners. Our ongoing mission of landscape-scale conservation includes the following three basic features:*

- 1. Identification of a regional system of interconnected lands, wetlands, streams and riparian corridors,*
- 2. Actions organized to achieve and link multiple specific conservation objectives, and*
- 3. Stakeholders who cooperate in a concrete fashion to achieve those objectives.”*

*“The proposed project and its mitigation plan present a unique opportunity to embrace and further this concept while providing indispensable ecological benefits to include wetland and stream protection, restoration, and enhancement, buffering of wetlands and riparian corridors, water quality enhancement, protection of surface and source water, flood mitigation, storm water management and erosion control, connectivity of sensitive habitats, benefits to unique species, carbon sequestration, preservation of traditional uses, and broad recreational and other public uses.”*

*“It has been conclusively demonstrated that landscape-scale conservation encourages ecological resilience and economic sustainability through the use of science-based priorities. Additionally, it leverages resources and multi-functionality, is embraced by diverse stakeholders, facilitates reduced land management costs, reduces wildfire-risk potential, achieves watershed/river basin health objectives, utilizes forest products to benefit local economies, and provides public use and enjoyment of natural resources and tourism. Now, it can be used to facilitate the permitting of appropriately sited projects allowing infrastructure and development to proceed. Clearly, implementation of this mitigation plan can be one of the lasting positive legacies affecting the Four Holes Swamp Watershed.”*

**SHPO:** Preliminary comments were received from Ms. Emily Dale via e-mail on April 23, 2015. These comments identified concerns regarding an NRHP-listed resource, the Cypress Methodist Campground, located within one mile of the project area. According to the comments: *“The integrity of this campsite depends on the quiet and rural setting, which could be impacted by increased traffic on Cypress Campground Road. We recommend that the USACE consult with the public, local historical societies, and people involved with the Cypress Methodist Campground.”* The comments also requested that *“an intensive Phase I archaeological survey”* be conducted on portions of the proposed project site where moderate- to well-drained soils occur.

Comments were received from Dr. W. Eric Emerson, Director and State Historic Preservation Officer, in a letter dated April 27, 2015. This comment letter stated:

*“This letter is in response to the request for comments pursuant to Section 106 of the National Historic Preservation Act (NHPA) regarding Project Soter. This response supersedes all other communications from this office and constitutes the agency's final comments regarding this undertaking.”*

*“On April 23, 2015, Ms. Emily Dale, Archeologist and GIS Coordinator for this agency emailed a series of comments to Dr. Richard Darden, Regulatory Division, U.S. Army Corps of Engineers, Charleston District, concerning the public notice and this project. Those comments resulted from this agency's failure to appropriately consult the cultural resource assessments previously sent to this office. Those cultural resource assessments appear under the name Camp Hall Tract and not Project Soter. Those reports include the Draft Report Cultural Resource Identification Survey, Camp Hall Tract, Berkeley County, South Carolina (Amec, Foster, Wheeler, March 2015); Cultural Resources Assessment of the Camp Hall Tract Modification, Berkeley County, South Carolina (Brockington and Associates, Inc., October 2008); and Cultural Resources Assessment of the Camp Hall Tract, Berkeley County, South Carolina (Brockington and Associates, Inc., 12 March 2007).”*

*“The aforementioned reports address significantly the concerns listed in Ms. Dale's email message regarding cultural resources in the area of potential effect (APE). Cypress Methodist Campground, a National Register listed property also mentioned in that message, falls significant! y outside the APE, and therefore should not be impacted by undertaking.”*

*“Drawing upon the information ascertained from the previously noted cultural resource assessments and an onsite visit of the property by Ms. Elizabeth Johnson, Deputy State Historic Preservation Officer, and Ms. Dale, this agency concurs with the Army Corps of Engineers' determination that there will be no effect on historic properties.”*

**Tribes:** The Catawba Indian Nation commented in a letter dated May 4, 2015: *“The Catawba have no immediate concerns with regard to traditional cultural properties, sacred sites or Native American archaeological sites within the boundaries of the proposed project areas. However, the Catawba are to be notified if Native American artifacts and / or human remains are located during the ground disturbance phase of this project.”*

**Internal Corps coordination:** The Navigation Branch (OP-N) responded on April 20, 2015, that they had no comment on this application. Project Management (PM) responded on April 30, 2015, that they *“concur with Navigation”* and thus have no comment on this permit application. EN-H commented on May 13, 2015: *“It is not in a SFHA (Special Flood Hazard Area) according to FIRM 45015C0365D or 350D dated Oct 2003. All road crossings of wetland and streams will need culvert/bridges to convey flow without impacting other properties. (cross-sections do not indicate any proposed pipes)”* No concerns, objections or other comments were received from Internal Corps coordination.



**Other federal or state agencies:** James I. Newsome, III, South Carolina Ports Authority (SCPA). Representing the SCPA, Mr. Newsome commented in support of the proposed project, and commented from the perspective of the operator of the seaport that will handle inbound and outbound cargo associated with the project. In his comments, Mr. Newsome cited an estimated \$1 billion of initial investment, thousands of jobs for South Carolina, and the overwhelming public benefit of the proposed permittee-responsible compensatory mitigation. No comments were received.

**Non-governmental organizations, individuals or corporations:** Three letters were received with comments on the proposed project.

- 1) Roger Schrum and Lewis F. Gossett, South Carolina Manufacturers Alliance, commented in support of the project on April 30, 2015. From the perspective of the manufacturing industry, their comments focused on the positive contribution of the project to the state's economy and creation of 4,000 jobs, predicting that the development has the potential to transform the community with economic opportunity, as well as to enhance the local environment through the preservation of properties valued by National Audubon Society and other conservation groups.
- 2) Ted Pitts, South Carolina Chamber of Commerce, commented in support of the project on April 30, 2015. Mr. Pitts commented that the project is "*a landmark advanced manufacturing project*" that will bring development and job opportunities to the economically challenged area of the I-95 corridor. His comments also addressed the environment: "*Project Soter has the potential to transform the surrounding communities and do it in a way that is not only sensitive to the environment, but offers the ability to preserve key tracts of land that are important to the local conservation community for generations to come.*"
- 3) Adjacent property owners, Ridgeville, SC 29472 commented on April 29, 2015. The adjacent property owners expressed concern that they requested "*be taken into consideration in approving or disapproving this site for development;*"
  - *In the filling of these wetlands there is a concern with the trees and plant life that will be removed as well as the wildlife. Mitigating wetlands on another site will not restore the damage to this site.*
  - *The drainage/water runoff from this site to the 4 Hole Swamp will cause future concerns to trees, plants and wildlife.*
  - *The increase in traffic on the rural roads and the main roads (HWY 27, 176, I-26) are a concern for safety as well as pollution to the land and air.*
  - *Traffic increase in Cypress Campground Road and Lebanon Road because of the future residential development that this project will bring to this area.*
  - *Site access from Cypress Campground Road is a concern of the locals. The increase in traffic and noise.*"

3.4.4 Site was/was not visited by the Corps to obtain information in addition to delineating jurisdiction.

The site was visited on multiple occasions during the previous five years in the course of wetland delineations, jurisdictional determinations, and as part of the review of information regarding evaluation of this permit application. Most recently, the site was visited on April 15 and 30, 2015, by an inter-agency review team that included the Corps, and again on June 4, 2015, by the Corps for the purpose of completing jurisdictional determination requests for eight separate tracts associated with the project: Centerline Road Tract, Colvin Tract, Bannister Tract, Singletary Tract, Dean Swamp Tract, and the Walnut Branch Tracts (Long Tract, Mims Tract, Salisbury Tract).

3.4.5 **Issues or concerns identified by the Corps:**  N/A  **Yes (Discussed below)**

3.4.6 **Issues or concerns forwarded to the applicant:**  
 **No (Discussed below)**  **Yes (Discussed below)**  N/A

Comments received as well as issues raised by the Corps were forwarded to the applicant for their response regarding the following issues: project traffic effects on local and interstate roads; compensatory mitigation and monitoring; avoidance and minimization of impacts to waters of the U.S.; hydraulics and hydrology; and clarification of alternatives that might have less adverse effects on the aquatic ecosystem.

3.4.7 **Applicant responded to comments on:**  
 **No (Discussed below)**  **Yes (Discussed below)**  N/A

The applicant responded to the comments via letter and electronic correspondence on multiple dates. The following is the applicant's response listed according to commenter, issue, and date.

1) USFWS: The applicant responded to these comments on June 29, 2015, by providing the following: *"In response to the USFWS concerns regarding the wetlands on the Project Soter development site that will remain, as well as the wetlands that will remain on the remaining portion of the Camp Hall site. The majority of the wetland areas in the vicinity of the Project Soter development area have previously been converted to silvicultural use and the monoculture of loblolly pine is not sustainable over the long term. The remaining wetland areas within the Project Soter development area will be incorporated into the site plan and designated for no development impacts. The applicant will manage the remaining wetlands and uplands in a sustainable manner using normal forestry practices. This includes normal maintenance activities for existing roads and ditches. Protective buffers will not be applied to the remaining wetlands. This approach was discussed in detail with South Carolina Department of Health and Environmental Control and accepted by their certifying divisions."*

*"The wetlands located on the remaining portion of the Camp Hall site, not included within the Project Soter development area, are to be addressed at a future time. The landowner will manage the remaining wetlands and uplands in a sustainable manner using normal forestry practices including normal maintenance activities for existing roads and ditches. Protective buffers will not be applied to the remaining wetlands at this time."*

USFWS indicated via telephone conference their acknowledgement of the applicant's response that they have no further comment.

2) USEPA: In their comment letter dated May 15, 2015, the US Environmental Protection Agency stated that: *“The proposed mitigation plan indicates that several plant communities will be enhanced through planting and vegetation management techniques, including bottomland hardwood, pine flatwood, and isolated pond habitat. These communities require very different management (i.e., regular burning for pine flatwood) yet only a single vegetation performance standard is given.”* And also *“Performance standards should be tailored to each community.”* The USEPA recommended *“the applicant use an approach that has been formulated by the Alabama-Mississippi Mitigation Banking Review Team for Wet Pine Flats. This team suggests using the Functional Capacity Index of the Plant Community (FCI<sub>PLANT</sub>) derived from Rheinhardt, R.D., Rheinhardt, M.C., and Brinson, M.M. (2002), “A Regional Guidebook for Applying the Hydrogeomorphic Approach to Assessing Wetland Function of Wet Pine Flats on Mineral Soils in the Atlantic and Gulf Coastal Plains.”*

The applicant responded on July 6, 2015, *“The applicant agrees with the USEPA that there is a need for specifically tailored performance standards for each enhancement prescription. The applicant proposes to use a hybrid performance standard which incorporates traditional mitigation performance standards as well as FCI<sub>PLANT</sub> in selected community types. Expanded wetland enhancement prescriptions are presented below with associated performance standards.”*

#### ***“Wetland Preservation”***

*“Wetland preservation activities within the Mitigation Project are anticipated to protect approximately 890 acres of wetlands, as shown in Figures 11 – 11c in Appendix A of the Project Soter Mitigation plan. The proposed wetland preservation areas lie directly adjacent to many streams and generally consist of a mix of high quality bottomland hardwood forest communities. Wetlands within the Mitigation Project will be protected through the establishment of a conservation easement with a minimum 75 foot buffer (Bannister Tract, Dean Swamp Tract, and Mimms Tract) and generally a 100 foot buffer on the other tracts (Singletary, Long, and Salisbury).”*

#### ***“Wetland Enhancement and Ecological Restoration”***

##### *“Pine flatwoods/longleaf pine savanna enhancement Greater than 15 year old Pine*

*Sections of the Bannister Tract and the Dean Swamp Tract that have stands of existing loblolly pine greater than 15 years old will be thinned to between 20 and 50 square feet of basal area/acre and will be placed under a prescribed burn schedule. The following winter, the area also will be under-planted with longleaf pine (*Pinus palustris*) seedlings. Thinning of the existing planted loblolly pine will be conducted to reduce the basal area to open the forest canopy to allow for the recolonization of herbaceous and under-planted longleaf pine. The prescribed burn schedule will be implemented to mimic the natural burn cycle typical of this ecotype. Depending on the conditions and success of burned areas, the frequency of successive fires will be prescribed.”*

*“Pine flatwoods/longleaf pine savanna enhancement  
Less than 15 year old Pine”*

*“Sections of the Bannister Tract and the Dean Swamp Tract that support stands of loblolly pine less than 15 years old will be thinned (to between 20 and 50 square feet of basal area/acre). Longleaf pine seedlings also will be under-planted in these stands. A prescribed burn schedule will be implemented to mimic the natural burn cycle typical of this ecotype. Depending on the conditions and success of burned areas, the frequency of successive fires will be prescribed.”*

*“Pine flatwoods/longleaf pine savanna ecological restoration”*

*“The clear cut areas within the Bannister and Dean Swamp tracts will be burned, if feasible, during Monitoring Year 0 to reduce woody competition. The following late fall/winter, longleaf pine seedlings will be planted at a density of approximately 680 stems per acre. These areas will be placed into a burn regime with scheduled burns no greater than 3 years apart. Natural mortality of young seedlings is expected to reduce pine density over time to mimic natural, open grown stands. Thinning of pines may be required to prevent canopy closure.”*

*“Bottomland hardwood enhancement/ecological restoration”*

*“Sections of the Bannister Tract where the existing pine plantation has encroached into the bottomland hardwood communities located along Cedar Swamp, Sandy Run, and associated unnamed tributaries will be cleared and replanted with appropriate native hardwood species. Once the site preparation activities are completed, the wetland area will be planted with appropriate bottomland hardwood species. Wetland trees will be planted at a density of 680 trees per acre (8' x 8' spacing).”*

*“Wetland depression ecological restoration”*

*“Depressional wetlands (ponds) which have recently been cleared by silvicultural activities will be planted with pond cypress (*Taxodium ascendens*) at a density of 300 saplings per acre. Fire will be allowed to enter the edges of both the replanted ponds and currently forested ponds located within existing pine plantations, during prescribed burns of the surrounding flatwoods/pine savanna, in order to reduce the prevalence of hardwood species on the pond margins.”*

***“Success Criteria”***

*“Due to the broad range of habitats that will be enhanced or ecologically restored, a mix of traditional survival rates and FCI scores will be used to determine the success of the mitigation effort of each community type.”*

*“Pine Flatwoods/Longleaf Pine Savanna Enhancement”*

*“The overall goal of the pine flatwoods/longleaf pine savanna enhancement (in both greater and*

*less than 15 year old stands) is a reduction in loblolly pine stems, reduction in hardwood and shrub cover, and an increase in both longleaf pine and herbaceous species cover and diversity. Success criteria for the longleaf pine savanna communities will include:*

- *A reduction in loblolly pine stems to between 20 and 50 square feet of basal area/acre from pre-enhancement levels;*
- *A reduction in both hardwood and shrub cover from pre-enhancement levels. Hardwood & shrub cover will be no greater than 25% to meet success criteria;*
- *Planted longleaf pine saplings will show a survival rate of at least 50% to meet success criteria, and overall increase in height and diameter. Mortality due to fire is expected and required for overall ecosystem stability;*
- *FCI<sub>PLANT</sub> will show a general increase over time compared to pre-enhancement levels.”*

“Pine Flatwoods/Longleaf Pine Savanna Ecological Restoration”

*“Pine flatwoods/longleaf pine savanna ecological restoration will occur within areas where clear cutting of planted loblolly pines has recently occurred (excluding those areas which will be planted in either bottomland hardwood or wetland depression). The ecological restoration goal within this community type is the healthy establishment of longleaf pine seedlings, increase in herbaceous species diversity, and a lack of hardwood and shrub establishment. Success criteria for the flatwoods/longleaf pine savanna ecological restoration communities will include:*

- *Longleaf pine saplings will show a survival rate of at least 50% to meet success criteria, and overall increase in height and root collar diameter. Mortality due to fire is expected and required for overall ecosystem stability;*
- *FCI<sub>PLANT</sub> will show a general increase over time compared to pre-enhancement levels, including the longleaf pine component of FCI<sub>PLANT</sub> showing an increase of at least 25% of the same component in an identified reference plot.*
- *Hardwood & shrub cover will be no greater than 25% to meet success criteria.”*

“Bottomland Hardwood Forest Ecological Restoration”

*“Vegetative monitoring documents a minimum of 320 planted stems per acre survive at the end of year 3, and 260 planted stems per acre survive at the end of year 5, and no more than 25 percent of any one species and no more than 1 percent invasive species. Height, lateral growth and diameter demonstrates an increase over baseline and each prior monitoring period. If volunteers are utilized to meet the set performance standards, species will be tagged in the field as a volunteer and the same data collected as for planted stems.”*

“Wetland Depression Enhancement and Ecological Restoration”

*“Wetland depression ecological restoration will occur within those depressional ponds that have been recently clear cut and enhancement will occur in currently-forested ponds located within existing pine plantations. The ecological restoration goal within this community type is healthy establishment of pond cypress seedlings (within those areas which require planting), an increase in herbaceous species on the pond margins, and limited hardwood establishment. Success criteria for the wetland depression ecological restoration communities will include:*

- *Pond cypress seedlings will show a survival rate of at least 60% after 5 years, and an overall increase in height and diameter (within areas which require planting).*
- *FCI<sub>PLANT</sub> (taken on pond margins) will show a general increase over time compared to pre-enhancement levels.*

*Hardwood & shrub cover will be approximately 50% (acceptable range 30-70%) within the pond at the end of five monitoring years.”*

EPA indicated via e-mail dated July 7, 2015, that their concerns had been adequately addressed.

- 3) Corps Internal EN-H: comments about adequate culvert sizes and drainage for all project roads. *“Road crossings of wetlands and streams will be designed to provide flow conveyance in accordance with applicable design storm events and hydrological parameters set forth in state and local regulation.”*

3.4.8 **Additional coordination with commenters and applicant:**

No (Discussed below)  Yes (Discussed below)  N/A

Additional coordination with the applicant occurred as described below by issue and date:

The applicant’s responses to comments were provided to the respective agencies/commenters for review and consideration.

1) Corps Internal EN-H: comments about adequate culvert sizes and drainage for all project roads. Following the coordination of the initial comments and receipt of the applicant’s response, on June 19, 2015, the Corps requested to know whether the project plans would be revised with regard to drainage design prior to or after July 10, 2015. The applicant responded on June 19, 2015, that *“The specific designs for the roadway have not yet been completed, so the details from that effort will not be available at this time. The permit plans are only going to change to show the further minimization of impacts, that we have discussed.”*

The applicant provided an additional response on June 29, 2015, further addressing the issue of drainage design and culvert placement for the project:

*“The applicant proposes to install culverts at a maximum spacing of one culvert per 150 linear feet where wetlands currently exist adjacent (both sides) to the proposed road infrastructure corridors to prevent obstruction of existing surface flows during time of saturation within the wetlands and to facilitate the passage of terrestrial and aquatic organisms. Culverts will have a minimum diameter of 18-inches and be installed at a slope of no less than .003-0.005 ft/ft, upstream invert to downstream invert, as required by Berkeley County or SCDOT, and be placed on grade with the adjacent topography. In locations with ditches parallel to the proposed road, culverts will be appropriately designed, with a minimum diameter of 18 inches, to pass the 25-year storm event as per Berkeley County requirements and will be installed at an appropriate grade to prevent scour within the existing ditches and meet cleaning velocities, as calculated, and be installed at a slope of no less than .003-0.005 ft/ft. All culverts will be constructed of Reinforced Concrete Pipe (RCP), as required by Berkeley County.”*

EN-H reviewed the applicant's response and commented on July 6, 2015, that the issues had been addressed.

2) EPA commented on July 7, 2015: "The consultant has addressed all the outstanding concerns the EPA raised through our letter, emails, and phone conversations about the mitigation plan, monitoring, and performance standards. We appreciate that the monitoring period is not limited by a time period but by successfully demonstrating a positive trend toward a climax pine savanna community. One more recommendation the EPA has is to include language in the adaptive management section of the mitigation plan that spells out alternatives if conditions do not allow the proposed burning schedule.

The EPA believes the mitigation plan has the potential to adequately mitigate for unavoidable impacts to Waters of the United States. Thank you for the opportunity to comment on this project and for considering those comments in your permit review and issuance process.

I realize the timeline is moving quickly on this project so I wanted to give your quick feedback via email. However, if the Charleston District would like a formal letter stating that our concerns have been addressed please let me know and I will begin routing one as soon as possible."

3.4.9 **The following comments are outside the Corps purview and are not discussed further in this document:**  N/A  Yes

3.4.10 **Comments categorized by Topic:**

The comments received were concerning the following issues:

- 1) comments regarding the protection of remaining wetlands and buffers,
- 2) comments regarding how compensatory mitigation will be monitored,
- 3) comments regarding drainage design to prevent flooding on adjacent properties.

These issues are addressed in the applicant's response and in Section 6, the Public Interest Review.

#### **4. Alternatives Analysis**

4.1 **Project Purpose and Need:**

- Same as Section 1  
 Revised since P/N:

4.2 **Basic Project Purpose:**

- Same as Section 1  
 Revised since P/N:

4.3 **Water Dependency:**

- Same as Section 1
- Revised since P/N:

4.4 **Overall Project Purpose:**

- Same as Section 1
- Revised since P/N:

4.5 **Applicant Proposed Alternative:**

- Same as Section 1
- Revised since P/N:

4.6 **Criteria for Evaluating Alternatives:**

**Table 1. Criteria Used to Evaluate Whether Alternatives Meet Overall Project Purpose.**

ISSUE	MEASURE AND/OR CONSTRAINT
<b>LEVEL 1 ANALYSIS (Location Alternatives – Initial Screening)</b>	
Minimum area of developable land	1,500 acres
Direct frontage and/or access to an Interstate Highway	Presence/absence of existing interchange
Vicinity of a seaport with deep water access	50 miles or less
Vicinity of an international airport	50 miles or less
Access to utilities (including power, water, and sewer)	Presence/absence of utilities
Availability of a skilled workforce with access to education and training	Workforce = 4,000 or more and existing education infrastructure
<b>LEVEL 2 ANALYSIS (Location Alternatives – Additional Evaluation)</b>	
Development Cost	Dollars
Mitigation Cost	Dollars
Interstate Visibility	Degree of visibility
Interstate Access	Proximity to interstate exit



Port Access (Sea and Air)	Distance
Other adverse impacts	Nature and degree of resource impact(s)
Magnitude of impacts to waters of the U.S.	Acres of wetlands and linear feet of stream
<b>LEVEL 3 ANALYSIS (Onsite Alternatives Evaluation)</b>	
Magnitude of impacts to waters of the U.S.	Acres of wetlands and linear feet of stream
Interstate Visibility	Degree of visibility
Project Layout/Configuration	Acceptability of product flow logistics

The applicant’s description of each of the evaluation criteria is provided below:

Criterion 1: 1,500 acres of developable land. *“This tract size is a minimum requirement to accommodate the facility footprint for Phases 1 and 2 and requisite infrastructure, as the 1,500 acres represents a physical facility footprint of 900 acres and an additional 600 acres for supporting infrastructure and logistical and transportation concerns (a 2:1 ratio of footprint land to supporting land).”*

Criterion 2: Direct frontage and/or direct access to an Interstate Highway. *“Direct access, such as a dedicated interchange, is important for logistical and transportation reasons as well as marketability for brand identity with a location and facility adjacent to and visible from an interstate.”* The applicant cited Dean J. Uminski, *A Step-by-Step Guide to a More Strategic Site Selection Approach* (2013), which suggests *“For a manufacturing site, for example, ...highway access would be critical for both incoming raw materials and outgoing finished product. Lack of access would effectively rule out a site, regardless of any tax considerations or other incentives.”*

Criterion 3: Location within 50 miles of a seaport with deep water access. According to the applicant’s supporting information, *“A nearby deep-water port with adequate capacity for containers, break-bulk, and roll-on/roll-off capacity is vital for any advanced manufacturer, and a location within a 50-mile radius is necessary based on logistical concerns for turnaround, handling times, same-day transfers, and cost for both the import of component parts as well as the export of finished goods.”* The applicant cited American Association of Ports Authority, *Ports Benefit the Nation* [www.aapa-ports.org/Industry/content.cfm?ItemNumber=1022](http://www.aapa-ports.org/Industry/content.cfm?ItemNumber=1022) (accessed by this office June 30, 2015); and Ed McCallum, *What’s Driving Automotive Assembly Plant Locations?*, *Business Facilities* (July 2004).

Criterion 4: Location within 50 miles of an international airport. According to the applicant's supporting information, "*A nearby international airport within a 50-mile radius is necessary for any advanced manufacturer to provide immediate access to suppliers and executives from around the country and the world.*" The applicant cited Ed McCallum, *What's Driving Automotive Assembly Plant Locations?*, Business Facilities (July 2004): "*Air transport is important for...suppliers, vendors, and executives...proximity to a hub is desired.*"

Criterion 5: Access to utilities, including power, water and sewer. The applicant represented that this is a relevant criterion because not every large undeveloped/unused parcel has adequate utilities serving it.

Criterion 6: Availability of a skilled workforce with access to adequate education and training, with a minimum need of 4,000 workers. According to the applicant's supporting information, "*South Carolina's ReadySC program provides significant workforce training and development for almost any location in South Carolina. Labor profiles for various counties and metropolitan statistical areas (MSAs), combined with the close proximity of technical colleges participating in ReadySC provide the metric for the availability of a skilled workforce for the proposed project. In light of the number of workers required, only the larger MSAs could accommodate the labor need based on the critical mass of population necessary to generate a workforce profile based on volume.*"

On July 2, 2015, the applicant provided additional supporting information regarding rail. This information is important in explaining why the Applicant's Proposed Project does not include rail, but other location alternatives were evaluated with rail access. According to the applicant:

*"Summary: The Proposed Project has operational capability without immediate on-site rail access and no on-site rail access is proposed by the applicant as part of the Proposed Project."*

*"Explanation: The Proposed Project is capable of operating based on the roadway infrastructure (which includes the improvements as part of the Proposed Project)."*

*"Rail access is an additional transportation mode that enhances options for transportation, distribution, and logistics, but it is not an immediately necessary and critical component for the facility to function. Adequate roadway infrastructure is the necessary and critical transportation infrastructure to ensure that employees, suppliers, vendors, and logistics providers can access the advanced manufacturing facility. Rail cannot serve all of those constituencies adequately. In other words, an advanced manufacturing facility can function with road and without rail, but such a facility cannot function with rail and without roads. Therefore, only the roadway infrastructure is immediately necessary and critical for operations, such as "phase 1" of the Proposed Project. While rail access will be provided to the site location in the future, no proposal is available and the specifics of the provision of rail to the site location are speculative at this point in time. For example, the identity of the rail line or rail lines, proposed routes, line extensions, cost, and other factors are all unknown at this time. Information is currently insufficient to offer a "proposal" for rail access at this time. In other words, rail may be provided to the site location in an additional phase of the advanced manufacturing facility's future plans and operations. Therefore, rail access is not part of the Proposed Project."*

## 4.7 Alternatives

### 4.7.1 Discussion on Alternatives Development

The applicant provided the details of the multi-level alternatives analysis conducted for this project. The analysis of location alternatives included a Level 1 Screening Analysis, a Level 2 Analysis evaluating availability, cost, technological considerations, and logistical considerations, and a Level 3 Analysis to identify the least environmentally damaging practicable alternative (LEDPA) from among four onsite configuration plans. Initially, the applicant identified nine locations within the state that potentially met the project purpose criteria. The Level 1 Analysis evaluated the nine location alternatives and eliminated those that failed to clearly meet the six project purpose criteria identified in Table 1. The Level 2 Analysis further evaluated the three remaining location alternatives with respect to development and mitigation costs, interstate visibility and access, air and sea port access, other potential adverse impacts, and waters of the U.S. impacts. The Level 3 Analysis compared and evaluated four onsite alternatives with respect to magnitude of impacts to waters of the U.S., interstate visibility to support brand recognition, and product component flow logistics based heavily on the configuration of project facilities.

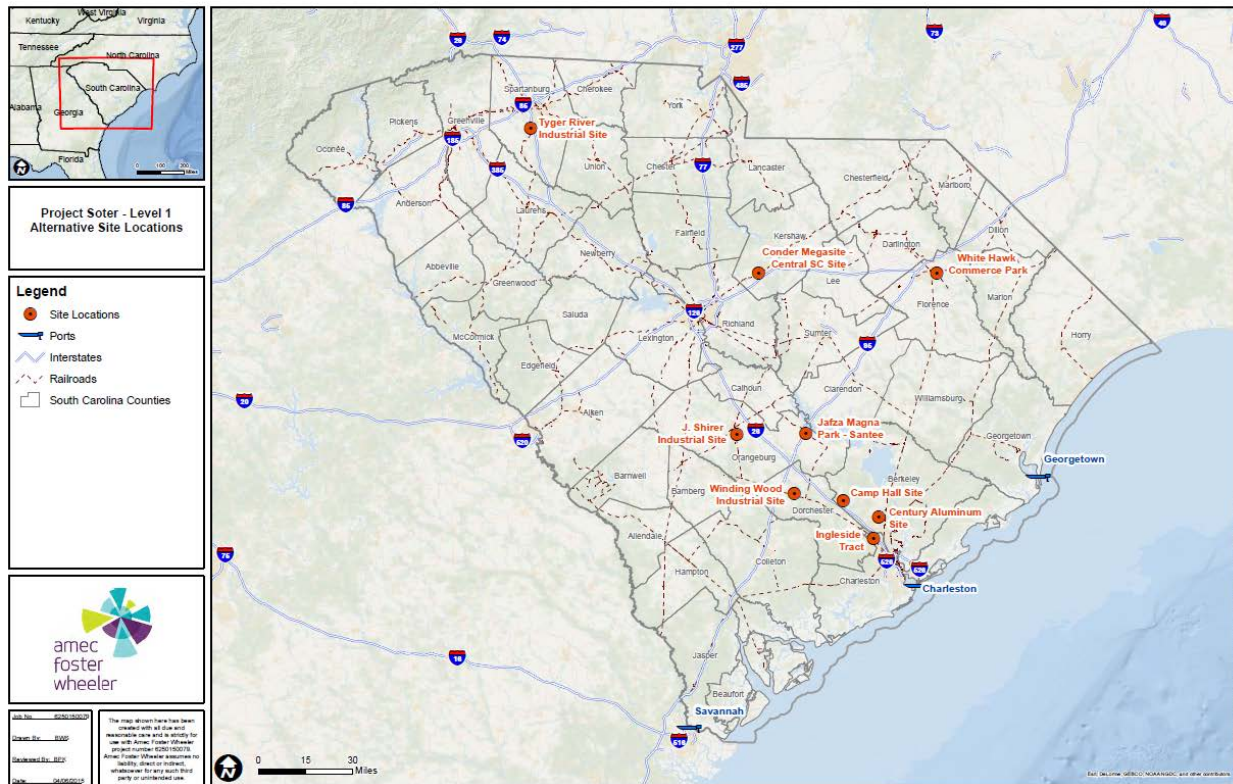
### 4.7.2 Description of Offsite Location Alternatives

Each of the nine alternative site locations that were identified and evaluated with respect to the project purpose criteria is described below, according to the applicant:

#### Applicant's Proposed Alternative

Camp Hall Commerce Park – Tax Map ID 157-00-00-003

*“This site is approximately 6,781 acres, located entirely within Berkeley County. It is adjacent to and bounded on the southwest side by Interstate 26, and is east of SC Highway 27, southwest [of] State Road (U.S. Highway 176) and west of Lebanon Road. No current interchange exists to provide direct access to Camp Hall from Interstate 26. The site’s frontage on Interstate 26 is approximately nine miles northwest of Interstate 26 Exit 199, Summerville, and approximately 2.5 miles southeast of Interstate 26 Exit 187, Ridgeville (18 miles southeast of Interstate 95). The site is approximately 28 miles northwest of the Port of Charleston and 25 miles from the Charleston International Airport. Certain due diligence of the site has already been performed. Rail access to the site is possible with a short line extension, although not currently constructed and available.”* [No rail extension is proposed as part of this project.] Figure 4 below shows the location of all Level 1 Analysis alternatives.



**Figure 4. Location map showing all alternatives evaluated in the Level 1 Analysis.**

**Winding Wood Industrial Site – Tax Map ID 059-00-00-006**

*“The site is approximately 1,573 acres, located entirely within Dorchester County. It is located adjacent to U.S. Highway 78, near the town of St. George, and approximately three miles east of Interstate 95. The site has no direct access to Interstate 26, and is approximately 48 miles from the Port of Charleston and 39 miles from the Charleston International Airport. Certain due diligence of the site has already been performed. The site has current rail access served by Norfolk Southern Railway.”*

**Century Aluminum Site – Tax Map ID 2230000019**

*“This site is approximately 2,564 acres and is located with frontage on U.S. Highway 17A, entirely within Berkeley County. The site is approximately five miles northeast of Interstate 26, approximately 25 miles from the Port of Charleston and 16 miles from the Charleston International Airport. Certain due diligence of the site has already been performed. The site does not have rail access.”*

**Ingleside Tract – Tax Map IDs: 393-00-00-005; 393-00-00-007; 393-00-00-082; 393-00-00-086; 393-00-00-092; 393-00-00-131 through 393-00-00-138**

*“This site is approximately 1,700 acres and is located entirely in Charleston County, with approximately 500 acres slated for commercial/residential mixed use development. The site is adjacent to and bounded by Interstate 26 to the east, U.S. Highway 78 to the north, and Palmetto Commerce Parkway to the west. No current interchange exists to provide direct access to the Ingleside Tract from Interstate 26; however, Exit 205 on Interstate 26 is less than a mile to the*

*north. The site has approximately 2.5 miles of frontage on Interstate 26. The site is approximately 14 miles northwest of the Port of Charleston and 11 miles from the Charleston International Airport. Certain due diligence of the site has already been performed. The site has current rail access served by Norfolk Southern Railway.”*

**Tyger River Industrial Site – Tax Map ID 6-32-00-012-00.00**

*“The site is approximately 1,316 acres, located entirely within Spartanburg County. The site is adjacent to and bounded by Interstate 26 to the northeast, and Moore Duncan Highway to the southwest. No current Interstate 26 interchange exists to provide direct access to the site; however, Exit 22 on Interstate 26 is approximately three miles from the South Carolina Ports Authority’s Inland Port in Greer, South Carolina, and approximately 197 miles from the Port of Charleston and 17 miles from the Greenville-Spartanburg International Airport. Certain due diligence of the site has already been performed. The site has current rail access served by CSX Transportation.”*

**Conder Megasite – Central South Carolina – Tax Map IDs 323-00-00-011; 323-00-00-014; 309-00-00-031; 309-00-00-032; 309-00-00-070; 310-00-00-080; 324-00-00-001; 323-00-00-006**

*“The site is approximately 1,426 acres, located entirely within Kershaw County. The site is adjacent to and bounded by Interstate 20 to the south, and U.S. Highway 1 to the north. The site is located at the approximate intersection of Interstate 20 and U.S. Highway 601. The site is located within two miles of Exit 92 on Interstate 20. The site is approximately 127 miles northwest of the Port of Charleston and 32 miles east of the Columbia Metropolitan Airport. Certain due diligence of the site has already been performed. The site has current rail access served by CSX Transportation.”*

**White Hawk Commerce Park – Tax Map IDs 176-01-013; 205-01-005; 205-01-006; 205-01-007; 205-01-008; 206-01-013; 206-01-014; 206-01-019; 206-01-197**

*“The site is approximately 1,175 acres, located entirely within Florence County. The site is bounded by East Old Marion Highway to the north and has no direct Interstate Highway access. The site is located approximately six miles from Interstate 95. The site is approximately 114 miles north of the Port of Charleston, five miles from the Florence Regional Airport, and 100 [miles] from the Columbia Metropolitan Airport. Certain due diligence of the site has already been performed. The site has current rail access served by CSX Transportation.”*

**J. Shirer Industrial Site – Tax Map Id 0184-00-01-040.000**

*“The site is approximately 745 acres, located entirely within Orangeburg County. The site is adjacent to and bounded by U.S. Highway 21 to the west and has no direct Interstate Highway access. The site is located approximately seven miles from Interstate 26. The site is approximately 73 miles north of the Port of Charleston and 45 miles south of the Columbia Metropolitan Airport. Certain due diligence of the site has already been performed. The site has current rail access served by Norfolk Southern Railway.”*

**Jafza Magna Park – Santee – Tax Map IDs 0323-00-06-012.000; 0323-00-06-001.000**

*“The site is approximately 1,322 acres, located entirely within Orangeburg County, near Santee. The site is adjacent to Interstate 95 to the west. The site is located within three miles of Exit 95 on Interstate 95. The site is approximately 61 miles northwest of the Port of Charleston and 52*

*miles northwest of the Charleston International Airport. Certain due diligence of the site has already been performed. The site has current rail access served by CSX Transportation.”*

For each alternative offsite location, a summary of the alternatives evaluation is provided below in Section 4.7.1 Offsite locations and configurations. For each onsite alternative, a summary of the alternatives evaluation is provided below in Section 4.7.2 Onsite Configurations.

#### 4.7.3 **Level 1 Analysis of Offsite Location Alternatives**

Location alternatives identified and evaluated included the Applicant’s Proposed Alternative location and eight other locations. As discussed below, six location alternatives were eliminated in the Level 1 Analysis. The criteria used to evaluate location alternatives in the Level 1 Analysis are shown in Table 2, along with evaluation results for the nine locations. Three remaining location alternatives were carried forward to a Level 2 Analysis which is summarized following the Level 1 Analysis summary.

##### **Level 1 Offsite Alternative 1: Ingleside Tract**

According to the supporting information provided by the applicant, *“This alternative only has approximately 1,200 acres of available land for development and therefore fails to meet the minimum size requirements for the Proposed Project purpose and need. Originally 1,700 acres, 500 acres of the property is currently slated for mixed-use commercial/residential development, rendering the proximity of the proposed facilities to this type of mixed-use development unsuitable and undesirable. Because this alternative fails to meet the basic minimum site requirements of the Proposed Project, it was eliminated from consideration by Level 1 analysis.”*

##### **Level 1 Offsite Alternative 2: Tyger River Industrial Site**

According to the supporting information provided by the applicant, *“This alternative is only 1,316 acres and therefore fails to meet the minimum size site requirements for the Proposed Project purpose and need. Additionally this alternative is located over 50 miles from a deep water seaport. Because this alternative fails to meet multiple basic needs of the Proposed Project, it was eliminated from consideration by Level 1 analysis.”*

##### **Level 1 Offsite Alternative 3: Conder Megasite – Central South Carolina**

According to the supporting information provided by the applicant, *“This alternative is only 1,426 acres and therefore fails to meet the minimum size site requirements for the Proposed Project purpose and need. Additionally this alternative is located over 50 miles from a deep water seaport. Finally, it is unclear if this alternative can meet the requirements of a locality that provides immediate access to skilled and sufficient workforce. Because this alternative fails to meet multiple basic needs of the Proposed Project, it was eliminated from consideration by Level 1 analysis.”*

##### **Level 1 Offsite Alternative 4: White Hawk Commerce Park**

According to the supporting information provided by the applicant, *“This alternative is only 1,175 acres and therefore fails to meet the minimum size site requirements for the Proposed Project purpose and need. This alternative is also located over 50 miles from both a deep water seaport and an international airport. Finally, it is unclear if this alternative can meet the*

*requirements of a locality that provides immediate access to skilled and sufficient workforce. Because this alternative fails to meet multiple basic needs of the Proposed Project, it was eliminated from consideration by Level 1 analysis.”*

**Level 1 Offsite Alternative 5: J. Shirer Industrial Site**

According to the supporting information provided by the applicant, “*This alternative is only 1,175 [the site is actually only 745 acres in size] acres and therefore fails to meet the minimum size site requirements for the Proposed Project purpose and need. This alternative is also located over 50 miles from both a deep water seaport and an international airport. Finally, it is unclear if this alternative can meet the requirements of a locality that provides immediate access to skilled and sufficient workforce. Because this alternative fails to meet multiple basic needs of the Proposed Project, it was eliminated from consideration by Level 1 analysis.”*

**Level 1 Offsite Alternative 6: Jafza Magna Park – Santee**

According to the supporting information provided by the applicant, “*This alternative is only 1,322 acres and therefore fails to meet the minimum size site requirements for the Proposed Project purpose and need. Additionally, this alternative is located over 50 miles from both a deep water seaport and an international airport. Finally, it is unclear if this alternative can meet the requirements of a locality that provides immediate access to skilled and sufficient workforce. Because this alternative fails to meet multiple basic needs of the Proposed Project, it was eliminated from consideration by Level 1 analysis.”*

Table 2 below summarizes the Level 1 Alternatives according to project purpose criteria.

**Table 2. Level 1 Criteria Used to Evaluate Whether Alternatives Meet Overall Project Purpose.**

Level 1 Alternatives	1,500 acres or greater	Interstate Frontage/ Direct Access	50 miles or less from seaport	50 miles or less from internat’l airport	Utility Access	Skilled Workforce
No Action	□	□	□	□	□	□
Camp Hall Commerce Park	■	■	■	■	■	■
Winding Wood Industrial Site	■	□	■	■	■	■
Century Aluminum Site	■	□	■	■	■	■
Ingleside Tract	□	■	■	■	■	■
Tyger River Industrial Site	□	■	□	■	■	■
Conder Megasite – Central SC	□	■	□	■	■	▶
White Hawk Commerce Park	□	□	□	□	■	▶
J. Shirer Industrial Site	□	□	□	■	■	▶
Jafza Magna Park – Santee	□	■	□	□	■	▶

Table Legend:

- – passes criterion
- – fails criterion
- ▶ -- partially passes criterion

#### 4.7.4 Level 2 Analysis of Offsite Location Alternatives

Each of the three remaining location alternatives met at least five of the six Level 1 project purpose criteria summarized above: minimum size requirement; proximity to deep water seaport and international airport; access to adequate utilities; and access to skilled and available workforce. The criterion of interstate highway frontage and/or direct access to an interstate was not met by all three; however, all three were carried forward for Level 2 Analysis to more fully evaluate the quantitative and qualitative site selection criteria. Discussion of each of the three Level 2 offsite alternatives is provided below with the analysis results summarized in Table 3.

##### **Level 2 Offsite Alternative 1: Camp Hall Commerce Park (Applicant's Proposed Alternative)**

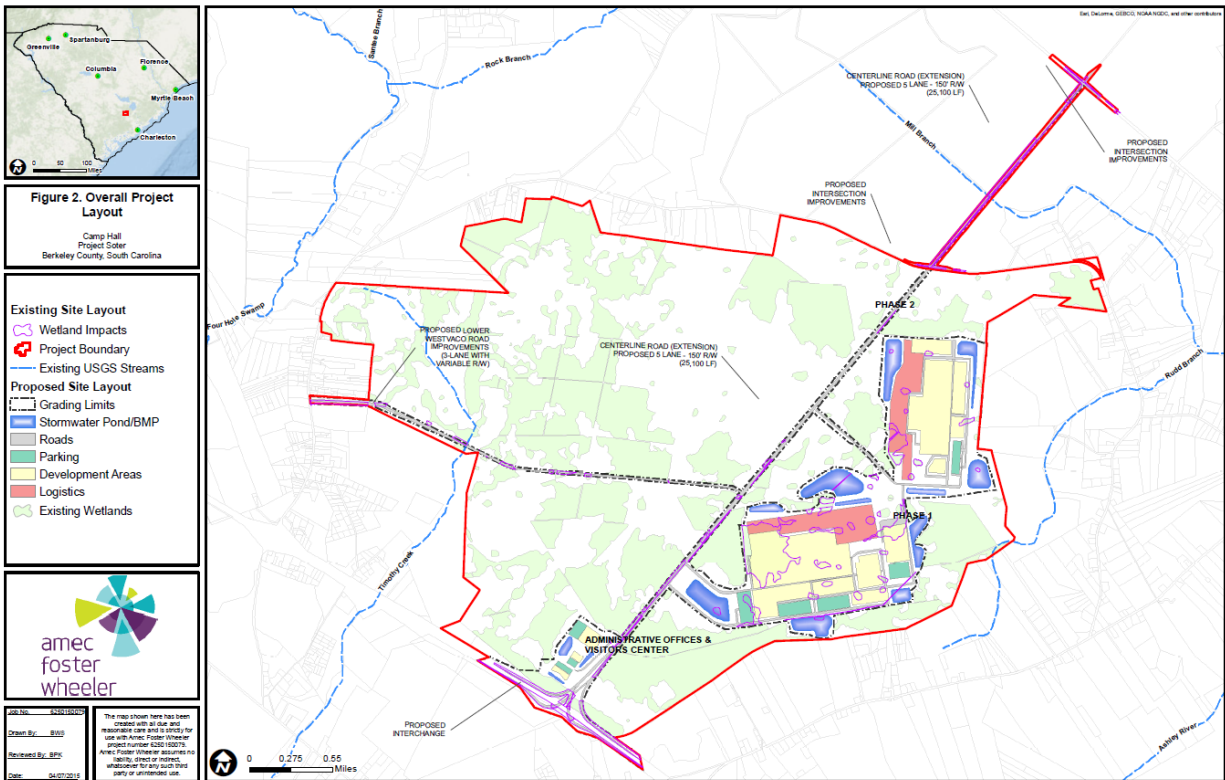
According to the supporting information provided by the applicant, *“Land acquisition costs for the Camp Hall Commerce Park are generally higher than for the Winding Wood Industrial Site and comparable to the Century Aluminum Site (approximately \$10,000 per acre). Higher land prices are likely due to the site being located in the core of the Charleston-North Charleston-Summerville Metropolitan Statistical Area and adjacent to Interstate 26. Order of magnitude costs were completed for infrastructure improvements to serve [the] Proposed Project (Phase 1 and administrative office) at the Camp Hall Commerce Park, including rough grading, roadway access, water, and wastewater improvements. Grading costs at the Camp Hall Commerce Park are estimated at \$35 million, mainly due to site stabilization for geotechnical requirements. Road infrastructure improvements are expected to be major due to the necessity for the Interstate 26 interchange and on-site road improvements. The interchange and on-site road improvements have been estimated at \$85 million. Water & wastewater improvements costs are negligible as these utilities are already in the vicinity of the site. Off-site rail improvements to serve the site are estimated to cost \$25 million. Total site development costs of the Camp Hall Commerce Park site are estimated to be \$145 million.”* It is noted that the costs presented here are exclusive of Phase 2 of this alternative and that no rail improvements are proposed as part of this project.

*“Jurisdictional wetland impacts on the Camp Hall Commerce Park are unavoidable. To meet the specific requirements of this Proposed Project, a number of jurisdictional and isolated wetlands will be impacted...approximately [192.94] acres of jurisdictional wetlands and approximately 23 acres of isolated non-jurisdictional wetlands would be impacted with the Proposed Project footprint. Preliminary impact calculations indicated that the wetland mitigation would cost \$18.3 million.”*

*“The Level 2 Analysis determined that the Camp Hall Commerce Park met the criteria required for a TDL cluster advanced manufacturing client.”*

Figure 5 below shows the applicant's proposed Camp Hall Commerce Park alternative. As this location was selected in the Level 2 Analysis, additional onsite configurations are presented below in **Section 4.7.2 Onsite Configurations**.





**Figure 5. Applicant's Proposed Alternative location at Camp Hall Commerce Park. Wetland impacts would total 214 acres.**

**Level 2 Offsite Alternative 2: Winding Wood Industrial Site**

According to the supporting information provided by the applicant, “A preliminary... plan was developed to evaluate costs and environmental impacts associated with development of the Proposed Project footprint on the Winding Wood Industrial Site. Costs associated with land acquisition, grading, utility infrastructure, roads, and railway were estimated by a civil engineer based on existing site conditions, distances to roads and utilities, and known property values.” Note also for the description of costs associated with this location alternative that rail access is not proposed as part of the applicant’s Proposed Project, and therefore no rail access costs are considered in this analysis and are not included in estimated costs summarized in Table 3 below.

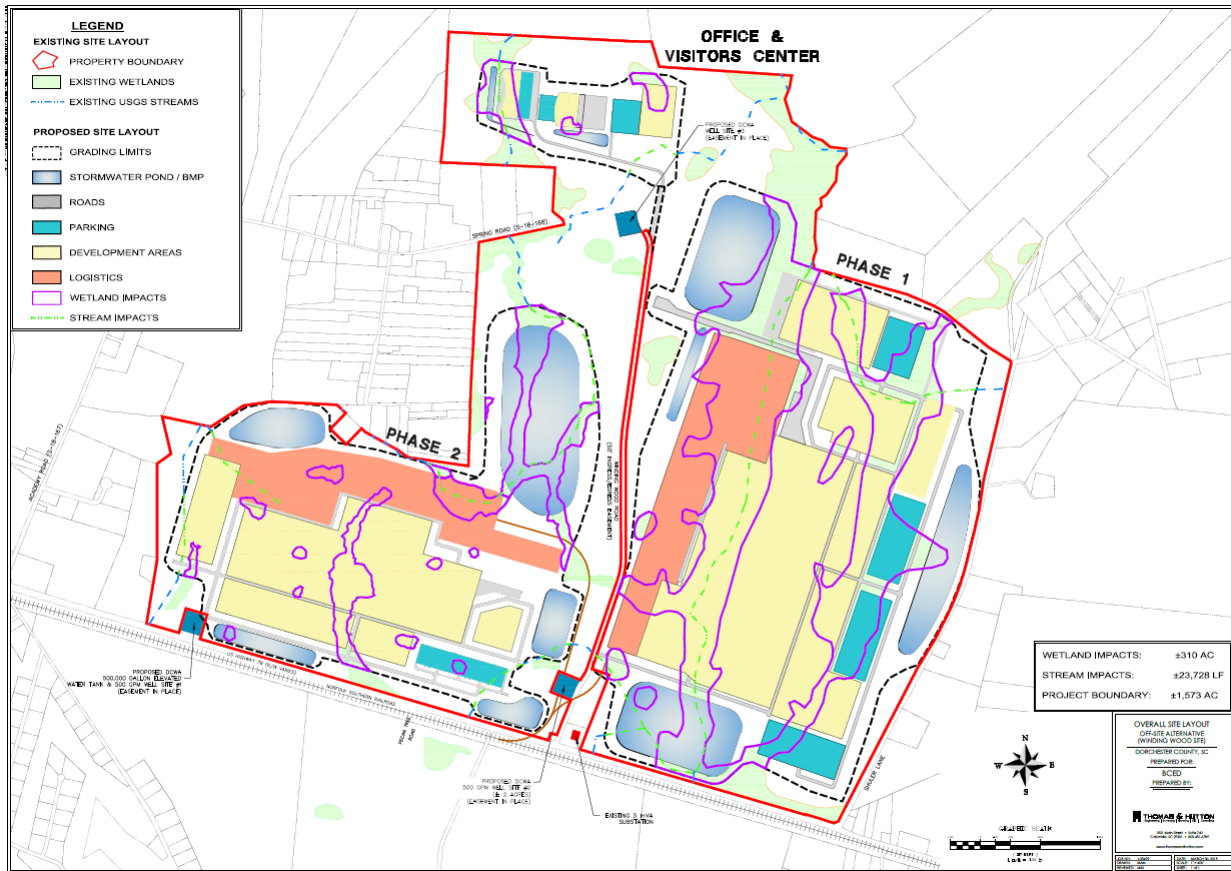
“Land acquisition costs for the Winding Wood Industrial Site are generally lower than costs for the Camp Hall Commerce Park. Lower land prices are likely due to the site being located outside of the core Charleston-North Charleston-Summerville Metropolitan Statistical Area, not adjacent to an interstate, and away [from] larger population centers. Order of magnitude costs were completed for infrastructure improvements to serve Proposed Project (Phase 1 and administrative offices) at the Winding Wood Industrial Site, including rough grading, roadway access, water, and wastewater improvements. Grading costs at the Winding Wood site are estimated at \$33 million, mainly due to mucking and infill of wetlands. Road infrastructure improvements are expected to be major due to the necessity for access to the Interstate 26 corridor. The site is approximately seven (7) miles from Interstate 26 and since direct access has been requested, the construction of a five (5) lane roadway along this route has been

*estimated at \$41 million. Water and wastewater improvements were estimated at \$10 million to design and construct. Total site development costs of the Winding Wood Industrial Site are estimated to be \$84 million.”*

*“Jurisdictional wetland impacts on the Winding Wood Industrial Site are generally unavoidable. To facilitate the development footprint of a project of similar size and scope to [the] Proposed Project, two jurisdictional wetland drainages would be impacted.” Figure 5 below shows “approximately 303 acres of jurisdictional wetlands and approximately 7 acres of isolated non-jurisdictional wetlands would be impacted with the Proposed Project footprint. Preliminary impact calculations indicated that wetland mitigation would cost \$32.2 million.”*

*“A review of the files and records at South Carolina Institute of Archaeology and Anthropology (SCIAA) [was] conducted to determine if archaeological sites are known in the Winding Wood Industrial Site tract. The tract has a moderate to low potential to contain intact cultural resources. The background research revealed that both prehistoric and historic cultural resources are located within or adjacent to the tract. Six previously identified archeological sites were identified within the vicinity of the tract; however, the sites were determined not eligible for the National Register of Historic Places (NRHP). Based on the background research, the tract could contain historic cultural resources that date to the 18<sup>th</sup> to 20<sup>th</sup> centuries. However, these historic sites are typically heavily disturbed and lack archaeological integrity. The tract does contain cemeteries associated with agricultural settlements dating to the 18<sup>th</sup> to 20<sup>th</sup> centuries. While cemeteries are not typically eligible for inclusion in the NRHP, South Carolina Code Section 16-17-600 does provide protection to cemeteries. The tract has a low potential to contain prehistoric sites based on the lack of perennial waters sources in the tract. There are no previously identified buildings within the property [or] within a mile radius of the property that are eligible for the NRHP.”*

Figure 6 below shows the applicant’s proposed project footprint overlain on the Winding Wood Industrial Site alternative location.



**Figure 6. Applicant’s proposed project footprint overlain on the Winding Wood Industrial Site alternative location. Wetland impacts would total 310 acres.**

**Level 2 Offsite Alternative 3: Century Aluminum Site**

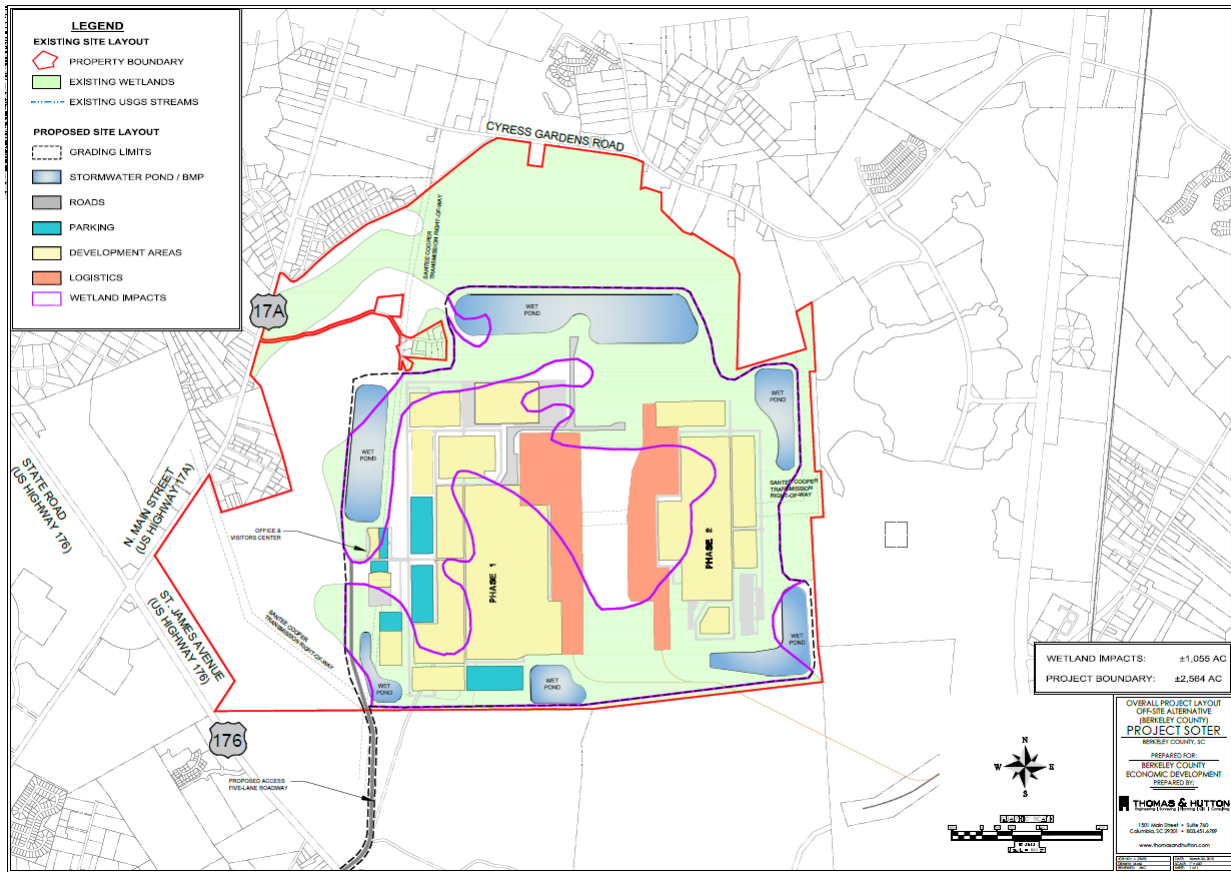
According to the supporting information provided by the applicant, “A preliminary...plan was developed to evaluate costs and environmental impacts associated with development of the Proposed Project footprint on the Century Aluminum Site. Costs associated with land acquisition, grading, utility infrastructure, roads, and railway were estimated by a civil engineer, based on existing site conditions, distances to roads and utilities, and known property values.”

“Land acquisition costs for the Century Aluminum Site are generally comparable to those at the Camp Hall Commerce Park, being approximately \$10,000 per acre at Century Aluminum. Order of magnitude costs were completed for infrastructure improvements to serve Proposed Project (Phase 1 and administrative offices) at the Century Aluminum Site, including rough grading, roadway access, water, wastewater and electrical relocation improvements. Grading costs at the Century Aluminum Site are estimated at \$41 million, mainly due to mucking and infill of wetlands. Road infrastructure improvements are expected to be minor, including a 6,500 linear foot access road and right and left turn lanes along U.S. 176 at the site entrance. These roadway improvements are anticipated to cost approximately \$4 million. Water improvements were estimated to be approximately \$7 million and wastewater was estimated at \$3 million to design and construct. The Proposed Project footprint will require the relocation of two (2)

*electric transmission right-of-ways and electric lines. The estimated cost of the electrical relocation is approximately \$1.5 million. Total site development costs of the Century Aluminum Site are estimated to be \$57 million.”*

*“Jurisdictional wetland impacts on the Century Aluminum Site are unavoidable. To facilitate the development footprint of Proposed Project, jurisdictional wetlands in and associated with Laurel Swamp and Daisy Swamp would be impacted. As shown in [Figure 7], 1,055 acres of on-site jurisdictional wetlands would be impacted with the build-out of the Proposed Project footprint. Preliminary impact calculations indicated that wetland mitigation would cost \$109.7 million.”*

*“A review of the files and records at SCIAA [was] conducted to determine if archaeological sites are known in the Century Aluminum tract. The Century Aluminum tract has a high potential to contain intact archaeological resources. Twenty-nine archaeological sites have been previously identified within the tract or within a one mile radius of the tract. One previously identified archaeological site, Site 38BK280, is located within the property boundaries and is eligible for inclusion in the NRHP. Site [38BK280] is the remains of a Plantation that was occupied between the 17th to 19th centuries. Two other sites, Sites 38BK282 and 38BK1781, have prehistoric components that were determined eligible for inclusion in the NRHP and are located in the vicinity of the tract. One cemetery, the Whaley Family Cemetery, is located in the tract. While cemeteries are not typically eligible for inclusion in the NRHP, South Carolina Code Section 16-17-600 does provide protection to cemeteries. Due to the high density of previously identified archaeological sites located in the tract and within a one mile radius of the tract, the Century Aluminum property has a high potential to contain intact archaeological resources. Construction activities could impact an existing NRHP eligible site, a family cemetery, or additional unidentified intact archaeological resources.”*



**Figure 7. Applicant’s proposed project footprint overlain on the Century Aluminum Site alternative location. Wetland impacts would total 1,055 acres.**

A summary of the Level 2 Analysis for the three location alternatives considered is presented in Table 3 below.

**Table 3. Summary of Evaluation Criteria for Level 2 Analysis.**

Level 2 Alternatives	Estimated Development Cost	Estimated Mitigation Cost	Interstate Visible	Interstate Access	Port (Air and Sea) Access	Other Potential Adverse Impacts	Wetland Impacts (acres)
No Action	\$0	\$0	N/A	N/A	N/A	N/A	N/A
Camp Hall Commerce	\$120 million	\$18.3 million	Available	Superior	Superior	Minimal	214
Winding Wood	\$84 million	\$32.2 million	Unavailable	Adequate	Excellent	Marginal	310
Century Aluminum	\$57 million	\$109.7 million	Unavailable	Adequate	Excellent	Moderate	1,055

#### 4.7.5 Conclusion of Offsite Alternatives Analysis

Based on the results of the Level 1 Analysis and the Level 2 Analysis regarding nine location alternatives, the Applicant’s Proposed Alternative Camp Hall Commerce Park was selected by the applicant to move forward to the Level 3 Analysis. The Camp Hall Commerce Park location alternative was superior to the Winding Wood Industrial Site and the Century Aluminum Site with regard to interstate access and visibility, proximity to air and sea ports, and critical to this analysis had the least impacts to wetlands. Therefore, the Camp Hall Commerce Park location was evaluated for onsite configurations to determine the Least Environmentally Damaging Practicable Alternative that meets the proposed project’s overall purpose.

**4.7.6 Level 3 Analysis of Onsite Configuration Alternatives at Camp Hall Commerce Park Site**

The Level 3 Analysis of onsite project layouts/configurations focused on site accessibility from the three major roads that serve the location and the site’s visibility from Interstate 26. In addition, the layout of major project facilities was driven by need for operational efficiency in manufacturing and assembly of the product to be manufactured, and the potential for environmental impacts, including impacts to wetlands and other waters of the U.S. Based on the specific needs for design efficiency in manufacturing and assembling components, each of the onsite layouts utilized the same identical configurations for the three main project components: 1) administrative offices and visitor center, 2) Phase 1, and 3) Phase 2. The various layout alternatives were constrained by the need to maximize the Interstate 26 visibility of the administrative offices and visitor’s center, as well as to achieve the most efficient access and internal connectivity to support deliveries, shipping and logistical flow.

Access to the site from Interstate 26 was also a major consideration in the four onsite configurations. The applicant’s rationale regarding the need for a new interchange at mile 190 was addressed above, and on this basis the applicant evaluated four separate interchange “options” prior to incorporating the selected option into the onsite alternatives evaluated below. The results of this impact assessment for the interchange options are presented in Table 4 below.

**Table 4. Impact assessment for interchange options associated with onsite alternatives.**

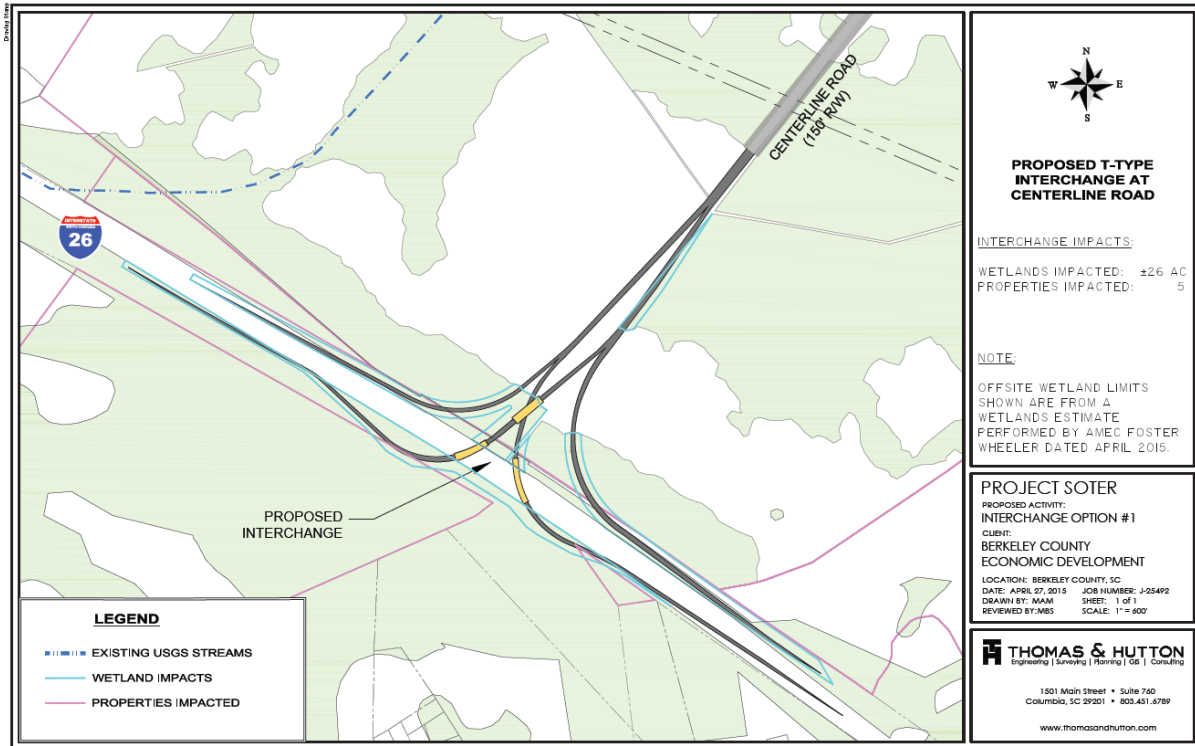
Interchange Option	Wetland Impacts	Other Adverse Environmental Impacts
Option 1: T-Type at Mile 190	26 acres	N/A
Option 2: Jug Handle at Mile 190	34 acres	N/A
Option 3: Improve Existing 187	54 acres	N/A
Option 4: New Exit at 191	17 acres	Cypress Methodist Campground*

\*National Register of Historic Places (NRHP) listed properties. This property is considered subject to FHWA regulations pursuant to Section 4(f) of the U.S. Department of Transportation Act of 1966.

**Interchange Option 1: New T-Type at Centerline Road**

According to the supporting information provided by the applicant, construction of a new T-Type interchange at Mile 190 to connect at the proposed project’s Centerline Road would impact

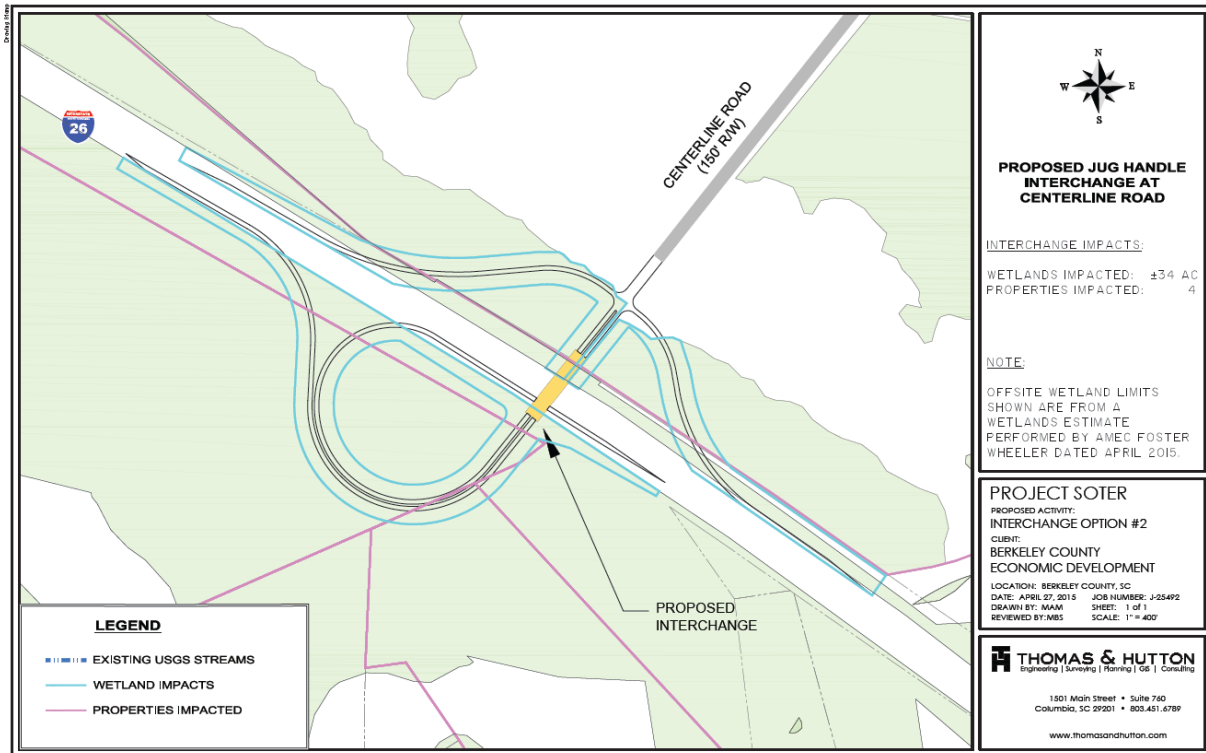
26 acres of wetlands and would have no other adverse environmental impacts. Based on these factors, Option 1 had the least impact and was included in the design configuration for Onsite Alternative 2 and Onsite Alternative 2A. The Option 1 interchange layout is shown below in Figure 8.



**Figure 8. Interchange Option 1 would impact 26 acres of wetlands.**

### **Interchange Option 2: New Jug Handle at Centerline Road**

According to the supporting information provided by the applicant, construction of a new Jug Handle interchange design at Mile 190 would impact 34 acres of wetlands and would not involve any other adverse environmental impacts. Based on these factors, interchange Option 2 had the third highest wetland impacts and was included in the design configuration for Onsite Alternative 1 because the facility configuration in this option eliminates the feasibility of a T-type interchange. The Option 2 interchange layout is shown below in Figure 9.

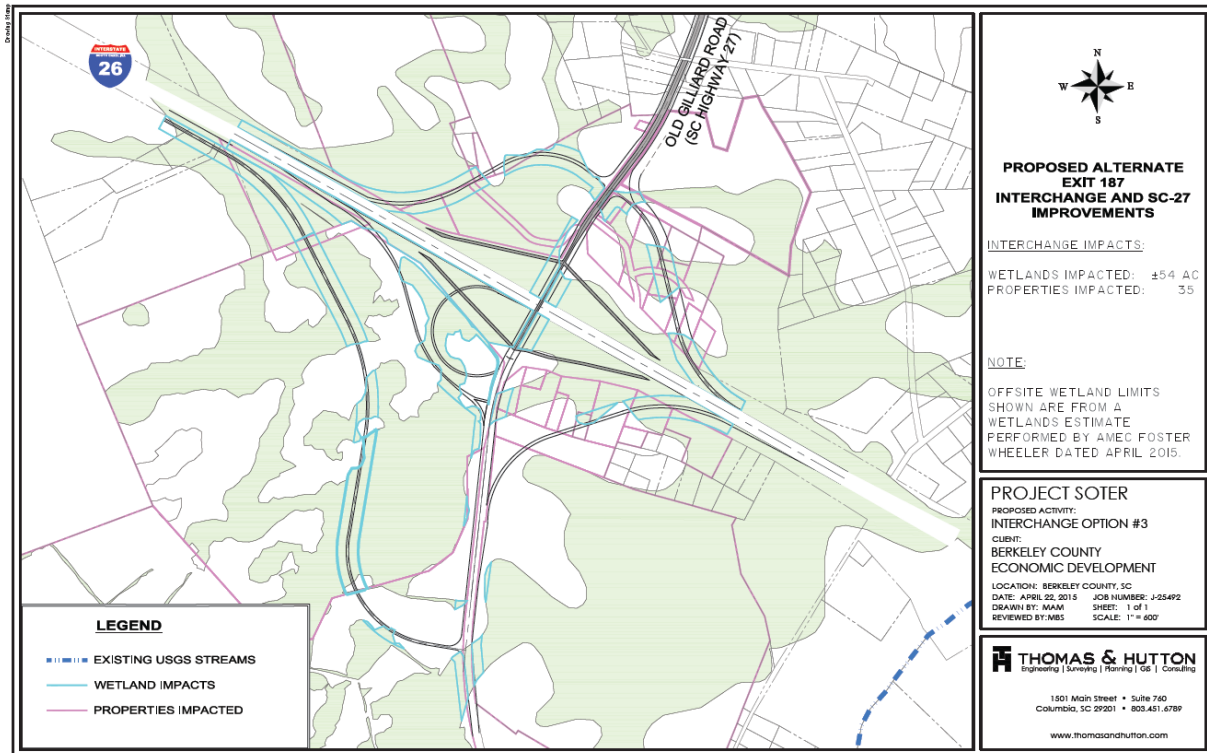


**Figure 9. Interchange Option 2 would impact 34 acres of wetlands.**

**Interchange Option 3: Improvements at Existing Exit 187 at Highway 27**

According to the supporting information provided by the applicant, construction of improvements at existing Exit 187 at Highway 27 would impact 54 acres of wetlands. Based on these factors, Option 3 had the most impact and was not included in the design configuration for the applicant’s proposed project. It was not included in the design configuration for any Onsite Alternative. The Option 3 interchange layout is shown below in Figure 10.

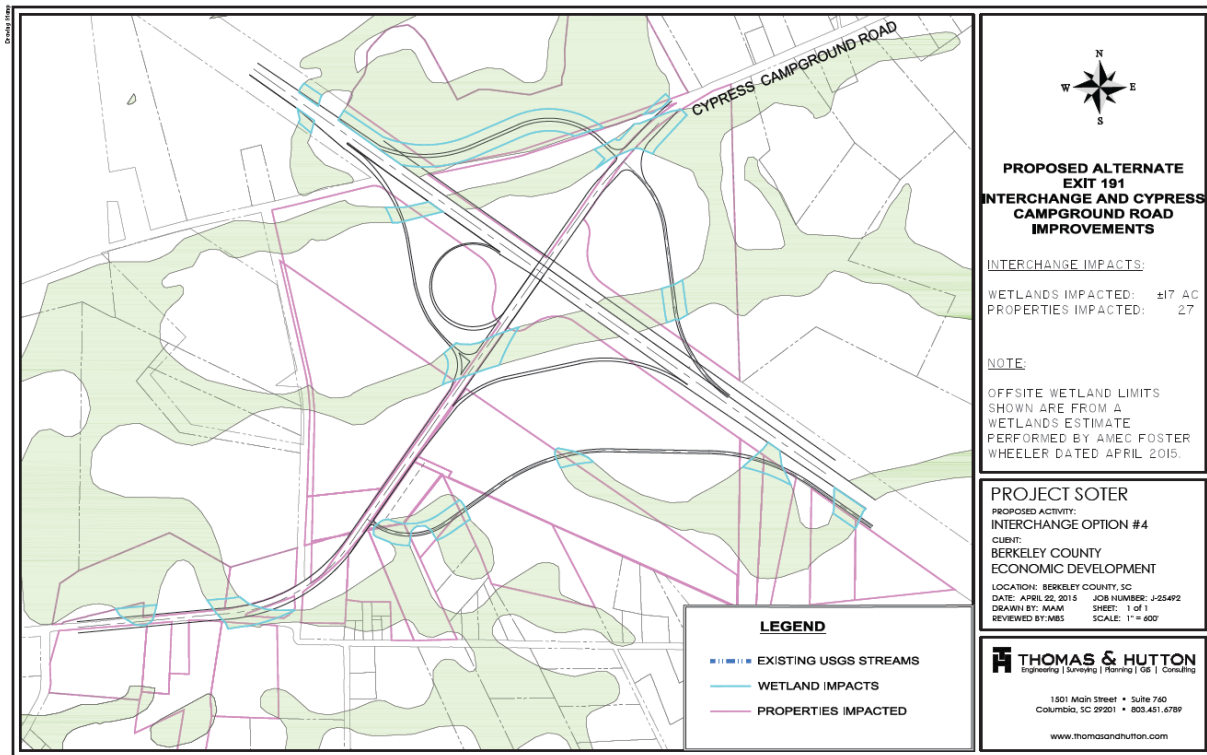




**Figure 10. Interchange Option 3 would impact 54 acres of wetlands.**

#### **Interchange Option 4: New Exit 191 at Cypress Campground Road**

According to the supporting information provided by the applicant, construction of a new Exit 191 at Cypress Campground Road would impact 17 acres of wetlands as well as 27 properties in the vicinity of the interchange. One of the properties that would be affected by this option would be the historic Cypress Methodist Campground, listed on the National Register of Historic Places (NRHP). Therefore, although interchange Option 4 had the least wetland impacts, it had other significant adverse environmental consequences in the form of its cultural resources impacts to the NRHP-listed Cypress Methodist Campground.

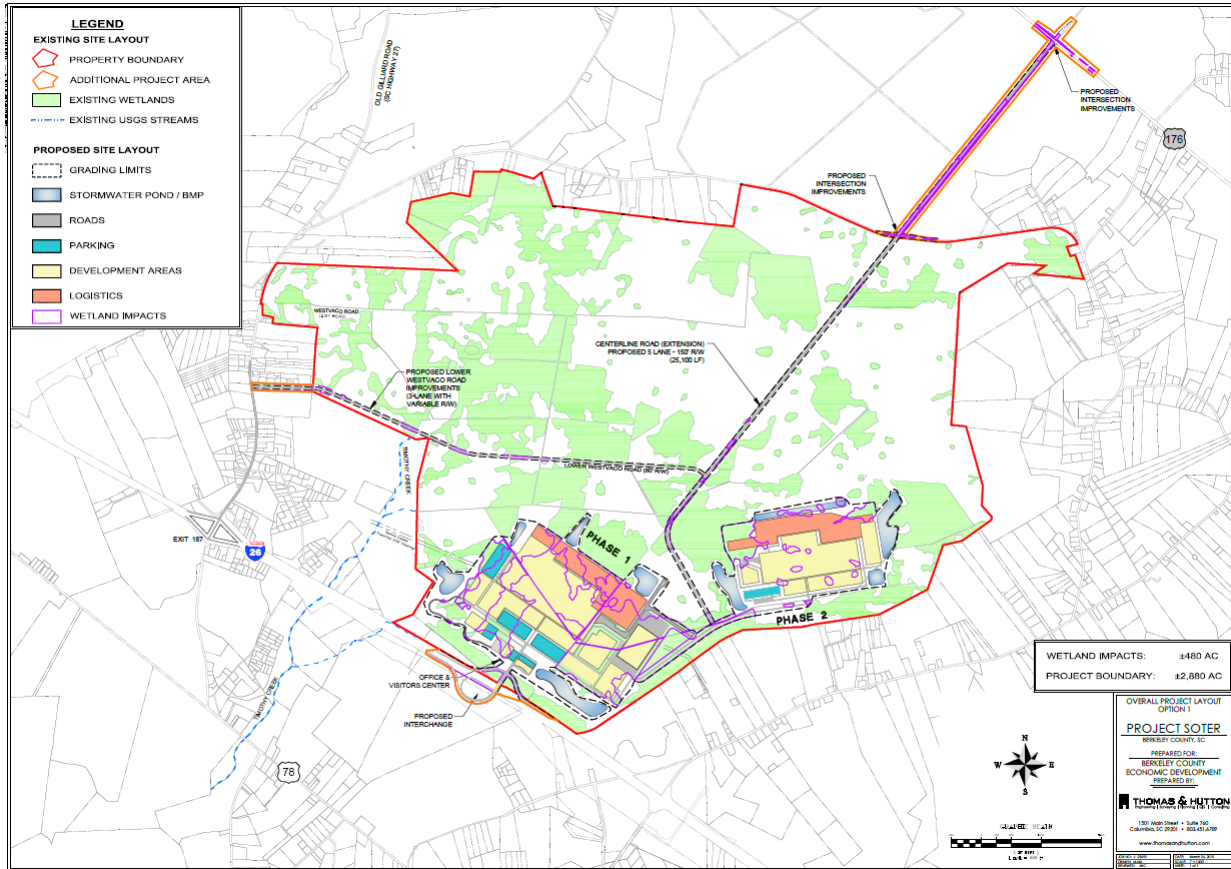


**Figure 11. Interchange Option 4 would impact 17 acres of wetlands and affect 27 properties, including NRHP-listed Cypress Methodist Campground.**

**Onsite Alternative 1:** According to the supporting information provided by the applicant, “*Option 1 [Onsite Alternative 1] is the advanced manufacturer’s preferred option from a layout perspective. The visitor’s center/administrative offices and Phase 1 are located immediately adjacent to Interstate 26, and Phase 2 is located adjacent to Phase 1. A new interchange on Interstate 26 is included that routes traffic directly into the visitor’s center/administrative offices. Additional on-site road improvements include the proposed Lower Westvaco Road improvement to create a three-lane road, creating connectivity with S.C. Highway 27 to the west, and improving the existing Centerline Road to a five-lane road, creating connectivity with S.C. Highway 176 to the north. Storm water management facilities are located immediately adjacent to the facilities and are located outside of waters of the United States.*”

“*With the visitor’s center/administrative offices located immediately adjacent to Interstate 26, the site provides ideal accessibility for suppliers and visitors. Since Phase 2 is immediately adjacent to Phase 1, access from Phase 1 into Phase 2 is seamless. Visibility is also ideal for Option 1. Vehicular traffic along Interstate 26 will be able to see the visitor’s center, providing a constant reminder of the manufacturer’s presence in the Charleston area. With close proximity between the visitor’s center, Phase 1, and Phase 2, this site layout provides a very efficient layout. With the short distances between each facility, the manufacturer will be able to reduce travel time, carbon emissions, and costs to ensure its success in this location.*”

*“Although Option 1 provides a highly desirable site layout, the environmental impacts create some significant drawbacks. The proposed site layout as shown [in Figure 12] would impact approximately 458 acres of wetlands.”*



**Figure 12. Onsite Alternative 1 would impact approximately 458 acres of wetlands.**

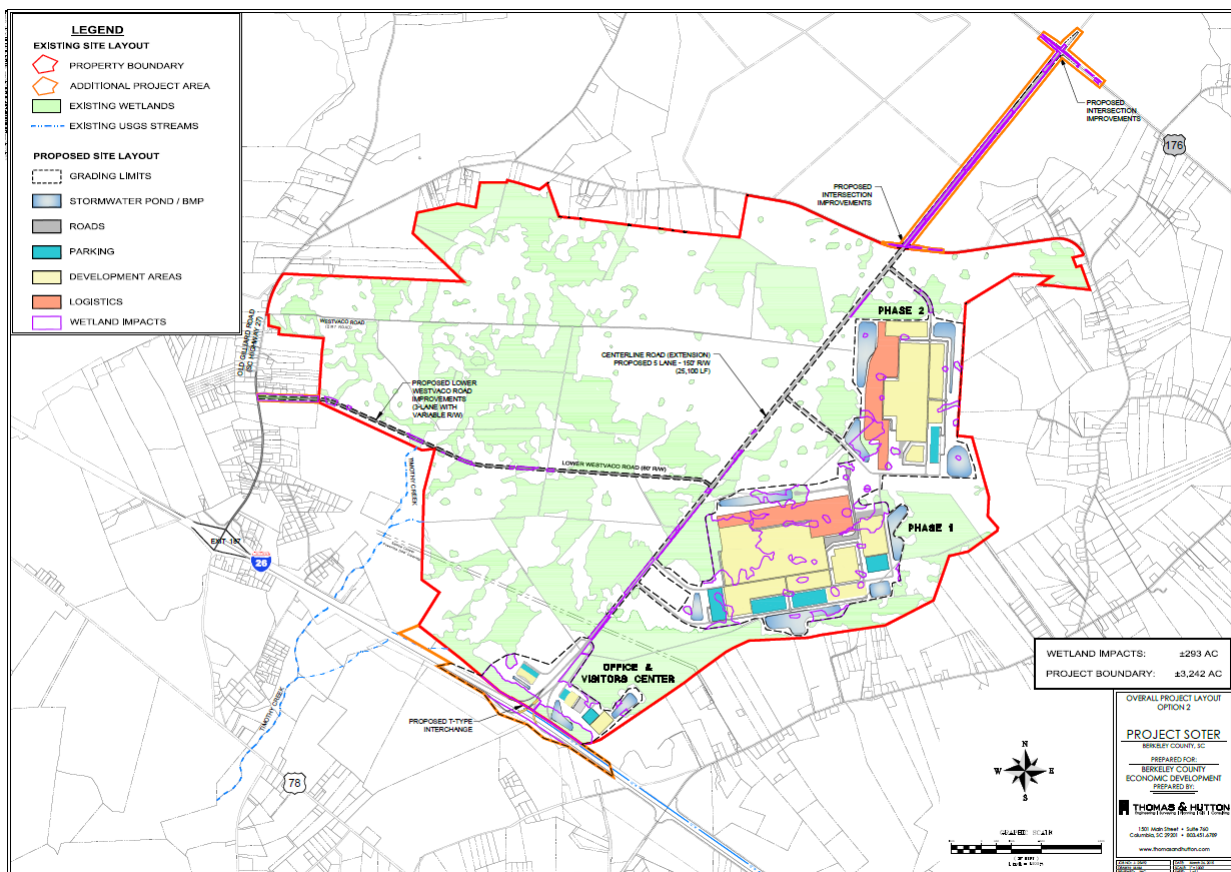
It is worth noting that Onsite Alternative 1, as shown in Figure 12, is coupled with interchange Option 2 (rather than interchange Option 1, the new T-Type interchange); however, Onsite Alternative 1 would still have approximately 450 acres of wetland impacts (rather than 458 acres) even when coupled with interchange Option 1.

**Onsite Alternative 2:** According to the supporting information provided by the applicant, *“Option 2 [Onsite Alternative 2] is a blend of maximizing the site’s layout needs while minimizing the site’s environmental impacts. The visitor’s center/administrative offices are located immediately adjacent to Interstate 26, providing maximum visibility. Phase 1 is moved away from the interstate in a position which limits wetland impacts. Phase 2 is moved deeper into the property, at a greater [distance] from Phase 1 to further reduce wetland impacts. A new interchange on Interstate 26 would route traffic onto the proposed five-lane Centerline Road, where traffic could turn into the visitor’s center/administrative offices. Additionally, Lower Westvaco Road would be improved to three lanes to provide access from the west from S.C. Highway 27. Centerline Road would provide connectivity to S.C. Highway 176 to the north.*

*Storm water management facilities are located immediately adjacent to the facilities and are located outside of waters of the United States.”*

*“While the site layout is not ideal for the proposed manufacturer, Option 2 provides an acceptable layout that would meet the needs of the project. The visitor’s center/administrative offices are located immediately adjacent to Interstate 26, providing maximum visibility and accessibility for visitors. Suppliers and trucks will have to drive slightly further to reach Phase 1 or Phase 2 for deliveries and shipping, but the accessibility is within reason. Vehicular traffic along Interstate 26 will be able to see the visitor’s center, providing a constant reminder of the manufacturer’s presence in the Charleston area. Although the proximity of the individual facilities is not as close as Option 1, the travel times between facilities are within the expectations of the manufacturer.”*

*“By relocating Phase 1 and Phase 2 of the proposed manufacturing facility, wetlands impacts are reduced when compared to Option 1. The proposed layout as shown [in Figure 13] would impact approximately 273 acres of wetlands.”*

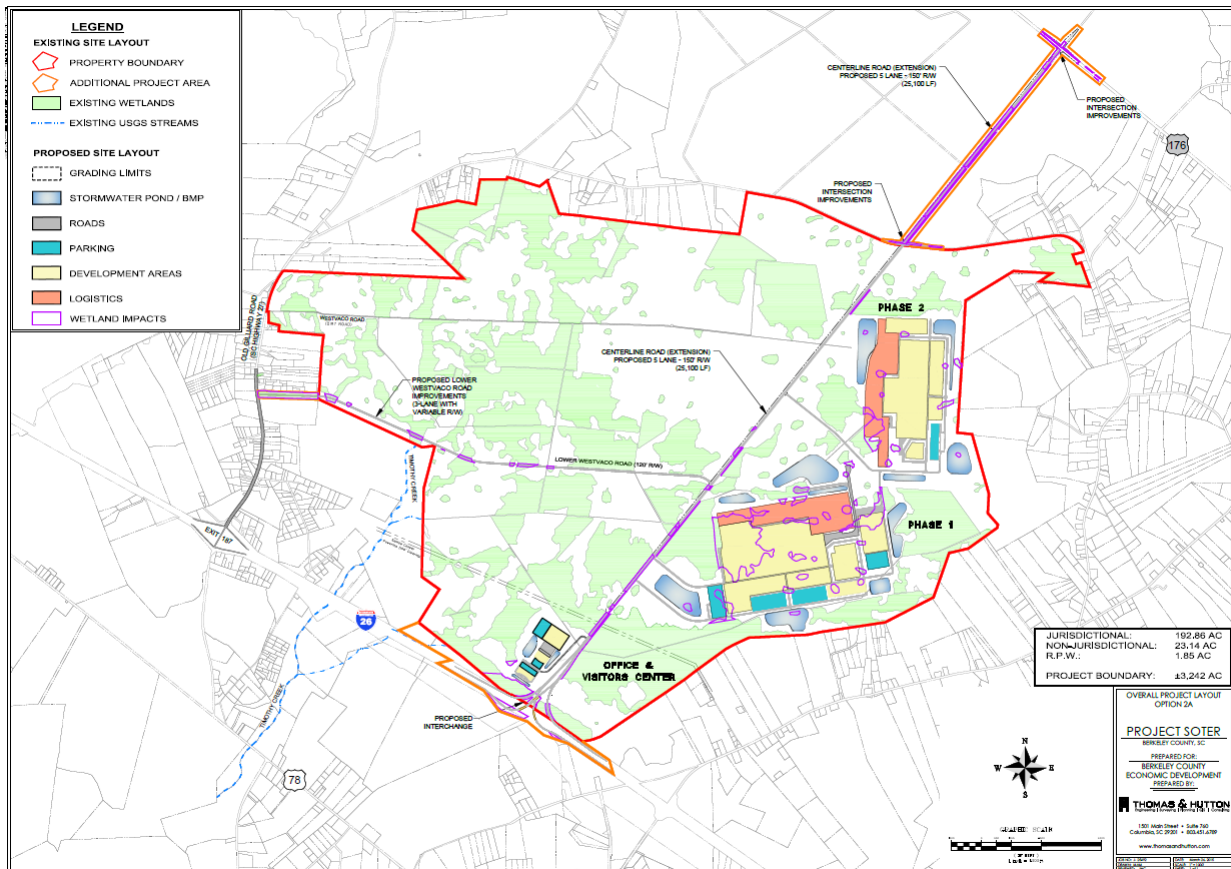


**Figure 13. Onsite Alternative 2 would impact approximately 273 acres of wetlands.**

**Onsite Alternative 2A (Applicant’s Proposed Alternative):** According to the supporting information provided by the applicant, “Option 2A [Onsite Alternative 2A] is a refinement of Option 2, designed to minimize wetland impacts of the selected on-site development concept to

*the maximum extent practicable. When compared to Option 2, Option 2A includes an adjustment of the visitor's center/administrative offices to place it in an area with the fewest wetland impacts. The proposed access road to the north of Phase 2 has been removed to eliminate the associated wetland impacts. Additionally, the stormwater ponds associated with Phase 1 and Phase 2 were relocated so that the site layout minimizes wetland impacts."*

*"The Option 2A site layout provides equivalent accessibility, visibility, and efficiency to Option 2. The proposed Option 2A site layout as shown [in Figure 14] would impact approximately 217 acres of wetlands."*



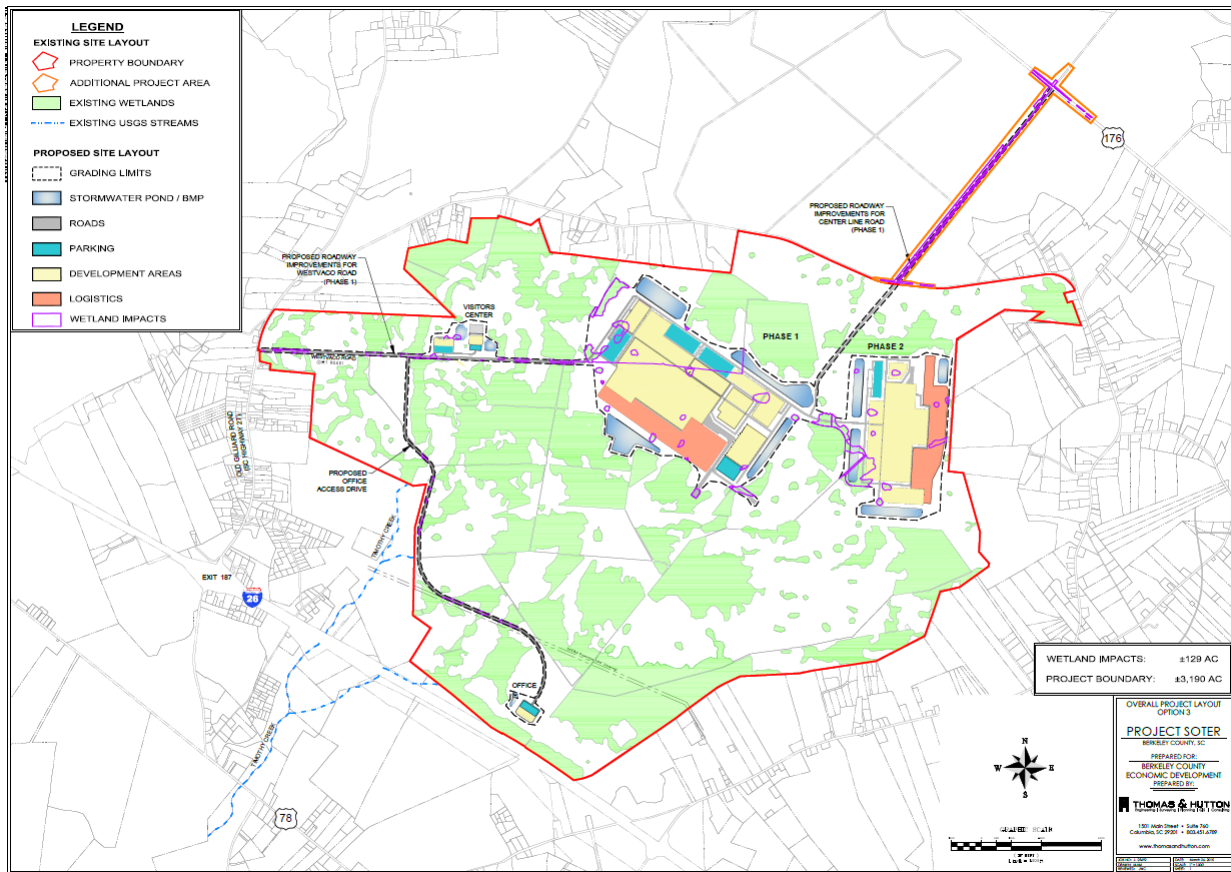
**Figure 14. Onsite Alternative 2A (Applicant's Proposed Alternative) would impact approximately 214 acres of wetlands.**

**Onsite Alternative 3:** According to the supporting information provided by the applicant, *"Option 3 [Onsite Alternative 3] positions the proposed facility components on the site while minimizing wetland impacts to the greatest extent practicable. Primary access to the facility is via S.C. Highway 27 onto Westvaco Road, which would be improved to accommodate traffic flow. Option 3 includes an administrative office facility located along the Interstate 26 frontage, but without a new interchange. A 2.5 mile road would lead to the administrative offices facility from Westvaco Road. The proposed visitor's center would be separate from the administrative offices and located along the improved Westvaco Road. Phase 1 is located in a largest contiguous upland*

*area within the tract to minimize wetland impacts. Phase 2 is also located in an area with relatively few wetlands. Centerline Road would be improved to provide access to S.C. Highway 176 to the north. Stormwater management facilities are located immediately adjacent to the facilities and are located outside of waters of the United States.”*

*“Since the primary means of access to the site is via S.C. Highway 27, visitors would have to drive approximately 5.5 miles off of Interstate 26 to reach the administrative offices and approximately 3.3 miles to reach the visitor’s center. Supplier and truck access to Phase 1 would require a four mile drive off of Interstate 26 and access to Phase 2 would require a six mile drive. With the administrative offices located along the Interstate 26 frontage, the site layout retains some visibility, but the wetland area between the administrative offices facility and Interstate 26 would need to be cleared to have effective visibility to interstate traffic. Since the visitor’s center is located away from Interstate 26, the manufacturer would lose its visibility to this important landmark. With approximately nine miles of internal roads, the internal efficiency of the proposed manufacturing facility would suffer significantly. The distance between facilities would increase travel times, carbon emissions, and costs for the advanced manufacturer. Moreover, reliance and utilization of the local roads and highways creates issues of local land use, community disturbance and interference, and potential environmental justice issues. Based on the accessibility, visibility, and efficiency of this site layout, it would not be suitable to the advanced manufacturer.”*

*“By locating the facilities in the areas of the site with the fewest wetlands, environmental impacts are reduced when compared to Options 1 and 2. The Option 3 site layout as shown [in Figure 15] would impact approximately 109 acres of wetlands.”*



**Figure 15. Onsite Alternative 3 would impact approximately 109 acres of wetlands.**

A comparison of the four onsite configuration alternatives is presented in Table 5 below.

**Table 5. Comparison of four onsite configuration alternatives.**

	Waters of the U.S. (Acres)	I-26 Visibility	Flow Logistics
<b>Onsite Alternative 1</b>	<b>458</b>	<b>Maximum</b>	<b>Maximum</b>
<b>Onsite Alternative 2</b>	<b>273</b>	<b>Maximum</b>	<b>Acceptable</b>
<b>Onsite Alternative 2A</b>	<b>214</b>	<b>Maximum</b>	<b>Acceptable</b>
<b>Onsite Alternative 3</b>	<b>109</b>	<b>Unacceptable</b>	<b>Unacceptable</b>

**4.7.7 Conclusion of Onsite Alternatives Analysis**

Based on the results of the evaluation of four different onsite project layouts, the applicant selected Onsite Alternative 2A, which was proposed in the federal permit application as the Applicant’s Proposed Alternative.

**4.7.8 Alternatives not requiring a permit, including No Action**

**No Action Alternative:** Under the No Action Alternative, either the project is constructed with

no impacts to waters of the U.S. and no permit is required or issued, or the requested permit is denied and no project is constructed. Berkeley County has submitted that it is not possible to entirely avoid wetland impacts and meet the overall project purpose at the proposed location. On this basis, the No Action Alternative can be considered equivalent to a permit denial, which would only meet the project purpose and need if another location were available which would have no impacts to waters of the U.S.

Under the No Action Alternative, impacts to the proposed project site are still possible and likely. The site might continue to exist as an active silviculture operation. While continued silviculture operations would not necessarily involve discharges of dredged or fill material, hydrological impacts to the extensive pine flatwoods wetlands would continue to occur because of the network of heavily straightened and channelized linear conveyances that drain the site.

Other scenarios that do involve discharges are also likely. In one scenario, the site might likely be proposed for residential development, similar to other properties in the outer fringe of the Charleston metro-area in western Berkeley and Dorchester Counties. Large-scale residential developments can often avoid and minimize impacts to waters of the U.S. to a high degree, but often are unable to completely avoid all impacts because of project constraints such as logical connection points to area roadways. In a second even likelier scenario, the Camp Hall Commerce Park might be pursued again as the chosen site for the previously proposed Camp Hall Industrial Campus. An application (SAC 2008-00860-2G) was received by the Charleston District on June 14, 2014, and a public notice was issued on December 23, 2014, for a permit to place fill material 7.648 acres of waters of the U.S. and 11.0 acres of additional non-jurisdictional wetlands. The proposed project included construction of access roads, building pads, stormwater management facilities, and utilities necessary for future development of the site by a “*large industrial employer.*”

- 4.7.9 **Least Environmentally Damaging Practicable Alternative (LEDPA):** It is the Corps’ determination that the applicant has adequately rebutted the presumption that practicable alternatives that do not involve impacts to special aquatic sites may exist, and further, has demonstrated that the Applicant’s Proposed Alternative Camp Hall Commerce Park is the least environmentally damaging practicable alternative (LEDPA) that meets the overall project purpose.

## 5. **FURTHER EVALUATION OF THE 404(b)(1) GUIDELINES**

For each of the below listed evaluation criteria, this section describes the potential impact, any minimization measures that would be used to reduce the level of impact, and the resultant impact level. This analysis addresses the impacts associated with placement of dredged or fill material into waters of the U.S., including special aquatic sites.

### **Potential effects on physical and chemical characteristics of the aquatic ecosystem (Subpart C)**

#### **Sec. 230.20 Substrate.**



The substrate of the aquatic ecosystem underlies open waters of the United States and constitutes the surface of wetlands. It consists of organic and inorganic solid materials and includes water and other liquids or gases that fill the spaces between solid particles. The aquatic resources on the site forested wetlands and open water channels that were excavated within wetlands and historic streams and carry storm and surface water from the site's pine plantation to the Edisto and Ashley River systems.

The discharge of fill material in waters of the U.S. will result in the loss of 192.94 acres of waters of the U.S. at the disposal sites. The proposed work consists of placing fill material in waters of the U.S. to construct buildings and associated infrastructure for an advanced manufacturing and assembly facility in the automobile industry. The project site has been intensively managed for commercial silviculture for many decades, meaning that many of the pine flatwoods wetland acres have been tilled, planted and bedded for many years.

Based thereon, the proposed work will not have a significant effect on the substrate in the footprint of the proposed fill areas.

#### **Sec. 230.21 Suspended particulates/turbidity.**

Suspended particulates in the aquatic ecosystem normally consist of fine-grained mineral particles, usually smaller than silt, and organic particles. Suspended particulates may enter water bodies as a result of natural events such as runoff, flooding, vegetative and planktonic breakdown, and resuspension of bottom sediments. Human activities, such as the dredging and filling of waters of the U.S., may also cause turbidity in open waters. The level of impact and the degree of the turbidity will depend on factors to include the amount of agitation in the water, particulate specific gravity, particle shape, and physical and chemical properties of particle surfaces.

There will be no discharges of fill material into open waters, with exception of discharges into jurisdictional ditches and relatively permanent water tributaries. Most of the fill material will be placed in seasonally inundated or saturated wetland areas. None of these areas are considered to be open waters that could have an effect on suspended particulates/turbidity. To minimize impacts from suspended particulates/turbidity, the applicant has proposed the use of Best Management Practices during construction. Additionally, the applicant is required to comply with state storm water management regulations. The use of BMPs during construction as proposed by the applicant and required by the SCDHEC 401 Water Quality Certification will reduce or eliminate the chance of particulates entering the watershed.

A special condition will be included in the federal permit requiring the use of best management practices at the fill site during construction:

**That the permittee agrees to utilize best management practices during construction and perform the work as proposed. The permittee must implement practices that will minimize erosion and migration of sediments on and off the project site during and after construction. These practices should include the use of appropriate grading and sloping techniques, mulches, silt fences, or other devices capable of preventing erosion, migration**

**of sediments and bank failure. All disturbed land surfaces and sloped areas affected by the project must be stabilized.**

The SCDHEC issued the 401 Water Quality Certification; they determined that water quality standards will not be contravened and designated uses will not be affected.

The proposed discharge will have no effect from suspended particulates/turbidity.

**Sec. 230.22 Water.**

Water is the part of the aquatic ecosystem in which organic and inorganic constituents are dissolved and suspended. It constitutes part of the liquid phase and is contained by the substrate. Water forms part of a dynamic aquatic life-supporting system. Water clarity, nutrients and chemical content, physical and biological content, dissolved gas levels, pH, and temperature contribute to its life-sustaining capabilities.

During construction, changes in the clarity, color, odor, and taste of water and the addition of contaminants can temporarily reduce or eliminate the suitability of water bodies for populations of aquatic organisms, and for human consumption, recreation, and aesthetics. The introduction of nutrients or organic material to the water column as a result of the discharge can lead to a high biochemical oxygen demand (BOD), which in turn can lead to reduced dissolved oxygen, thereby potentially affecting the survival of many aquatic organisms. Increases in nutrients can favor one group of organisms such as algae to the detriment of other more desirable types such as submerged aquatic vegetation, potentially causing adverse health effects, objectionable tastes and odors, and other problems.

The proposed project will result in the discharge of fill material in wetlands and man-made/heavily manipulated ditches and relatively permanent waters on the project site; however, the permittee is required to utilize only clean earthen fill material for the proposed work.

The applicant will use best management practices during construction. In addition, SCDHEC has issued a 401 Water Quality Certification for the project documenting that the proposed work will not contravene State water quality standards and designated uses will not be affected.

The proposed discharge will have no significant effect on water.

**Sec. 230.23 Current patterns and water circulation.**

Current patterns and water circulation are the physical movements of water in the aquatic ecosystem. Currents and circulation respond to natural forces as modified by basin shape and cover, physical and chemical characteristics of water strata and masses, and energy dissipating factors. The discharge of dredged or fill material can modify current patterns and water circulation by obstructing flow, changing the direction or velocity of water flow and circulation, or otherwise changing the dimensions of a water body.

Not applicable. The discharge of fill material to construct the buildings and associated

infrastructure for this project will result in a loss of waters of the U.S., but will not result in discharges into open water systems where current patterns and/or water circulation could be changed.

**Sec. 230.24 Normal water fluctuations.**

Normal water fluctuations in a natural aquatic system consist of daily, seasonal, and annual tidal and flood fluctuations in water level. Biological and physical components of such a system are either attuned to or characterized by these periodic water fluctuations.

The discharge of fill material to construct the buildings and associated infrastructure for this project will result in a loss of waters of the U.S., but will not result in discharges into open water systems where normal water fluctuations could be changed. No fill will be placed to impound water that could alter flood fluctuations in remaining waters of the U.S. Therefore, the proposed discharge will have no significant effect on normal water fluctuations.

**Sec. 230.25 Salinity gradients.**

Salinity gradients form where salt water from the ocean meets and mixes with fresh water from land. Since the proposed work is inland within non-saline waters of the U.S., the proposed project will have no effect on salinity gradients.

**Potential effects on biological characteristics of the aquatic ecosystem (Subpart D)**

**Sec. 230.30 Threatened and endangered species.**

The Guidelines specifically state that “where consultation with the Secretary of the Interior occurs under section 7 of the Endangered Species Act, the conclusions of the Secretary concerning the impact(s) of the discharge on threatened and endangered species and their habitat shall be considered final.” As discussed in Section 7 of this document, Corps consultation with the U.S. Fish and Wildlife Service concluded that the proposed project is not likely to adversely affect any federally-listed threatened or endangered species or their critical habitat. Therefore, the proposed discharge will have no significant effect on threatened and endangered species.

**Sec. 230.31 Fish, crustaceans, mollusks, and other aquatic organisms in the food web.**

Aquatic organisms in the food web include, but are not limited to, finfish, crustaceans, mollusks, insects, annelids, planktonic organisms, and the plants and animals on which they feed and depend upon for their needs. All forms and life stages of an organism, throughout its geographic range, are included in this category. The discharge of dredged or fill material can variously affect populations of fish, crustaceans, mollusks and other food web organisms through the release of contaminants which adversely affect adults, juveniles, larvae, or eggs, or result in the establishment or proliferation of an undesirable competitive species of plant or animal at the expense of the desired resident species. Suspended particulates settling on attached or buried eggs can smother the eggs by limiting or sealing off their exposure to oxygenated water. Discharge of dredged and fill material may result in the debilitation or death of sedentary

organisms by smothering, exposure to chemical contaminants in dissolved or suspended form, exposure to high levels of suspended particulates, reduction in food supply, or alteration of the substrate upon which they are dependent. Mollusks are particularly sensitive to the discharge of material during periods of reproduction and growth and development due primarily to their limited mobility. They can be rendered unfit for human consumption by tainting, by production and accumulation of toxins, or by ingestion and retention of pathogenic organisms, viruses, heavy metals or persistent synthetic organic chemicals. The discharge of dredged or fill material can redirect, delay, or stop the reproductive and feeding movements of some species of fish and crustacea, thus preventing their aggregation in accustomed places such as spawning or nursery grounds and potentially leading to reduced populations. Reduction of detrital feeding species or other representatives of lower trophic levels can impair the flow of energy from primary consumers to higher trophic levels. The reduction or potential elimination of food chain organism populations decreases the overall productivity and nutrient export capability of the ecosystem.

The proposed work will have a long-term negative effect on interstitial aquatic organisms in the footprint of the proposed fill, and any aquatic organisms that occupy these areas will be lost. While sedentary organisms will not be able to move from the impact area and will be lost, more mobile organisms may move to other wetland areas as fill activities commence.

The SCDHEC issued the 401 Water Quality Certification wherein they determined that water quality standards will not be contravened and designated uses will not be affected.

The proposed discharge will have no significant adverse effect on fish, crustaceans, mollusks, and other aquatic organisms in the food web at the project site or in adjacent waters.

### **Sec. 230.32 Other wildlife.**

Wildlife associated with aquatic ecosystems includes resident and transient mammals, birds, reptiles, and amphibians. The discharge of fill material can result in the loss or change of breeding and nesting areas, escape cover, travel corridors, and preferred food sources for resident and transient wildlife species associated with the aquatic ecosystem. These adverse impacts upon wildlife habitat may result from changes in water levels, water flow and circulation, salinity, chemical content, and substrate characteristics and elevation. Increased water turbidity can adversely affect wildlife species which rely upon sight to feed, and disrupt the respiration and feeding of certain aquatic wildlife and food chain organisms. The availability of contaminants from the discharge of dredged or fill material may lead to the bioaccumulation of such contaminants in wildlife. Changes in such physical and chemical factors of the environment may favor the introduction of undesirable plant and animal species at the expense of resident species and communities. In some aquatic environments lowering plant and animal species diversity may disrupt the normal functions of the ecosystem and lead to reductions in overall biological productivity.

Since the fill for this project will eliminate 192.94 acres of waters of the U.S., individuals of wildlife species occupying these areas will be impacted through loss or displacement. While sedentary species will not be able to move from the impact area and will be lost, it is anticipated

that larger and more motile wildlife may move to other aquatic and high land areas as fill activities commence. In proportion to the overall wetland acreage within the project area, these fill impacts are considered to be minor long term impacts based on the relatively smaller amount of area to be lost.

There will be no significant effect on other wildlife.

### **Potential Effects on Special Aquatic Sites (Subpart E)**

#### **Sec. 230.40 Sanctuaries and refuges.**

Sanctuaries and refuges consist of areas designated under State and Federal laws or local ordinances to be managed principally for the preservation and use of fish and wildlife resources.

Not applicable. There are no sanctuaries or refuges on or adjacent to the project site.

#### **Sec. 230.41 Wetlands.**

Wetlands consist of areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

The discharge of fill material in wetlands for this project will result in the loss of 192.94 acres of wetlands and will adversely affect the biological productivity of the underlying wetland ecosystem. However, the project site has been intensively managed for commercial silviculture for many decades, meaning that many of the pine flatwoods wetland acres have been tilled, planted and bedded for many years. Potential impacts of the fill may result in smothering or altering the substrate elevation or periodicity of water movement. The addition of fill material will destroy wetland vegetation or result in advancement of succession to dry land species, specifically on road shoulders and other areas where no buildings or impervious surfaces will be constructed. Secondary impacts include the potential to reduce or eliminate nutrient exchange by a reduction of the system's productivity, or by altering current patterns and velocities where the surface water in wetlands is funneled through culverts or pipes.

The proposed discharge will not have a significant effect on wetlands at the disposal site.

#### **Sec. 230.42 Mud flats.**

Mud flats are broad flat areas along the sea coast and in coastal rivers to the head of tidal influence and in inland lakes, ponds and riverine systems. When mud flats are inundated, wind and wave action may re-suspend bottom sediments. Coastal mud flats are exposed at extremely low tides and inundated at high tides with the water table at or near the surface of the substrate. The substrate of mud flats contains organic material and particles smaller in size than sand. They are either un-vegetated or vegetated only by algal mats.

Not applicable. There are no mud flats on the project site.

**Sec. 230.43 Vegetated shallows.**

Vegetated shallows are permanently inundated areas that under normal circumstances support communities of rooted aquatic vegetation, such as freshwater species in rivers and lakes in South Carolina. The discharge of dredged or fill material can smother vegetation and benthic organisms. It may also create unsuitable conditions for their continued vigor by: changing water circulation patterns; releasing nutrients that increase undesirable algal populations; releasing chemicals that adversely affect plants and animals; increasing turbidity levels, thereby reducing light penetration and hence photosynthesis; and changing the capacity of a vegetated shallow to stabilize bottom materials and decrease channel shoaling. The discharge of dredged or fill material may reduce the value of vegetated shallows as nesting, spawning, nursery, cover, and forage areas, as well as their value in protecting shorelines from erosion and wave actions. It may also encourage the growth of nuisance vegetation.

Not applicable. There are no vegetated shallows on the project site.

**Sec. 230.44 Coral reefs.**

Coral reefs consist of the skeletal deposits, usually of calcareous or siliceous materials, produced by the vital activities of anthozoan polyps or other invertebrate organisms present in growing portions of the reef.

Not Applicable. There are no coral reefs in the project area.

**Sec. 230.45 Riffle and pool complexes.**

Steep gradient sections of streams are sometimes characterized by riffle and pool complexes. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a coarse substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. Pools are characterized by a slower stream velocity, a steaming flow, a smooth surface, and a finer substrate. Riffle and pool complexes are particularly valuable habitat for fish and wildlife.

Not applicable. There are no riffle and pool complexes within the project area.

**Potential effects on human use characteristics (Subpart F)**

**Sec. 230.50 Municipal and private water supplies.**

Municipal and private water supplies consist of surface water or ground water which is directed to the intake of a municipal or private water supply system. Discharges can affect the quality of water supplies with respect to color, taste, odor, chemical content and suspended particulate concentration, in such a way as to reduce the fitness of the water for consumption. Water can be rendered unpalatable or unhealthy by the addition of suspended particulates, viruses and pathogenic organisms, and dissolved materials. The expense of removing such substances before the water is delivered for consumption can be high. Discharges may also affect the quantity of

water available for municipal and private water supplies. In addition, certain commonly used water treatment chemicals have the potential for combining with some suspended or dissolved substances from dredged or fill material to form other products that can have a toxic effect on consumers.

This project is located on a topographic divide such that most of the site drains to the Four Hole Swamp Watershed of the Edisto River Basin, and the remaining smaller portion of the site drains to the Cypress Swamp Watershed, which is part of the Santee and Cooper Rivers Basin. Stormwater on the site will be required to pass through stormwater detention ponds designed to meet the requirements of Section 402 of the Clean Water Act for treatment before it is released and allowed to flow off the site. The proposed project has been issued a Water Quality Certification pursuant to Section 401 of the Clean Water Act and will be required to use only clean fill to accomplish work that is the subject to Section 404 of the Clean Water Act. On this basis, there will be no effect on municipal and private water supplies.

### **Sec. 230.51 Recreational and commercial fisheries.**

Recreational and commercial fisheries consist of harvestable fish, crustaceans, shellfish, and other aquatic organisms used by man. The discharge of dredged or fill material can affect the suitability of recreational and commercial fishing grounds as habitat for populations of consumable aquatic organisms. Discharges can result in the chemical contamination of recreational or commercial fisheries. They may also interfere with the reproductive success of recreational and commercially important aquatic species through disruption of migration and spawning areas. The introduction of pollutants at critical times in their life cycle may directly reduce populations of commercially important aquatic organisms or indirectly reduce them by reducing organisms upon which they depend for food. Any of these impacts can be of short duration or prolonged, depending upon the physical and chemical impacts of the discharge and the biological availability of contaminants to aquatic organisms.

This project will result in the loss of 192.94 acres of freshwater wetlands and linear conveyances that drain the site. There are no open waters or deep water habitats to be affected on the site. The SCDHEC has issued a Water Quality Certification pursuant to Section 401 of the Clean Water Act, wherein they determined that water quality standards will not be contravened and designated uses will not be affected. Stormwater on the site will be required to pass through stormwater detention ponds designed to meet the requirements of Section 402 of the Clean Water Act for treatment before it is released and allowed to flow off the site. On this basis, there will be no effect on recreational and commercial fisheries.

### **Sec. 230.52 Water-related recreation.**

Water-related recreation encompasses activities undertaken for amusement and relaxation. Activities encompass two broad categories of use: consumptive, e.g., harvesting resources by hunting and fishing; and non-consumptive, e.g. canoeing and sight-seeing. One of the more important direct impacts of dredged or fill disposal is to impair or destroy the resources which support recreation activities. The disposal of dredged or fill material may adversely modify or destroy water use for recreation by changing turbidity, suspended particulates, temperature,

dissolved oxygen, dissolved materials, toxic materials, pathogenic organisms, quality of habitat, and the aesthetic qualities of sight, taste, odor, and color.

The discharges of fill material into wetlands are in areas that have been used intensively for commercial silviculture on privately-owned land for decades. No open waters or deep water habitats are present. Therefore, the proposed discharge will have no effect on water-related recreation.

### **Sec. 230.53 Aesthetics.**

Aesthetics associated with the aquatic ecosystem consist of the perception of beauty by one or a combination of the senses of sight, hearing, touch, and smell. Aesthetics of aquatic ecosystems apply to the quality of life enjoyed by the general public and property owners. The discharge of dredged or fill material can mar the beauty of natural aquatic ecosystems by degrading water quality, creating distracting disposal sites, inducing inappropriate development, encouraging unplanned and incompatible human access, and by destroying vital elements that contribute to the compositional harmony or unity, visual distinctiveness, or diversity of an area. The discharge of dredged or fill material can adversely affect the particular features, traits, or characteristics of an aquatic area which make it valuable to property owners. Activities which degrade water quality, disrupt natural substrate and vegetative characteristics, deny access to or visibility of the resource, or result in changes in odor, air quality, or noise levels may reduce the value of an aquatic area to private property owners.

The proposed fill activities necessary to construct the advanced manufacturing and assembly facility will affect the aesthetics of the area during construction. It is noted that large areas of privately-owned pine plantation are maintained for the purpose of logging, and are clear cut on a rotational basis similar to the site preparation activities proposed as part of this project. The disposal sites will change in aesthetic appearance from wooded landscape to buildings and associated infrastructure. The proposed discharge will have a significant effect on aesthetics.

### **Sec. 230.54 Parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves.**

These preserves consist of areas designated under Federal and State laws or local ordinances to be managed for their aesthetic, educational, historical, recreational, or scientific value. The discharge of dredged or fill material into such areas may modify the aesthetic, educational, historical, recreational and/or scientific qualities thereby reducing or eliminating the uses for which such sites are set aside and managed.

The proposed project is located on privately-owned lands and will not encroach onto lands of the any park; therefore there will be no impact to these resources.

This project will not involve encroachment into or location adjacent to national monuments, national seashores, wilderness areas, research sites, and similar preserves; therefore, the proposed discharge will have no effect on Parks, national monuments, national seashores, wilderness areas, research sites, and similar areas.



### **Evaluation and testing (Subpart G)**

#### **Sec. 230.60 and 230.61 General evaluation of dredged or fill material and Chemical, biological and physical evaluation and testing.**

All fill material that will be used on the project site will be clean material from upland sources. Therefore, no chemical, biological, or physical testing was required.

### **Actions to minimize adverse effects (Subpart H)**

Actions regarding the location of the discharge, the material to be discharged, controlling the material after discharge, the method of dispersion, those related to technology, plant and animal populations, spawning or migration seasons and other biologically critical time periods were considered. In evaluating this application, the direct fill in waters of the U.S. has been minimized to the maximum extent practicable and the following special conditions have been inserted in the federal permit to minimize the secondary impacts of the discharges:

**That the permittee agrees to utilize best management practices during construction and perform the work as proposed. The permittee must implement practices that will minimize erosion and migration of sediments on and off the project site during and after construction. These practices should include the use of appropriate grading and sloping techniques, mulches, silt fences, or other devices capable of preventing erosion, migration of sediments and bank failure. All disturbed land surfaces and sloped areas affected by the project must be stabilized.**

**All necessary steps must be taken to prevent oil, tar, trash, debris, and other pollutants from entering the adjacent waters or wetlands.**

**Land disturbing activities must avoid encroachment into any wetland areas outside the permitted impact area.**

**Upon completion of construction activities, all disturbed areas, which are not paved, must be permanently stabilized with a vegetative cover. This may include sprigging trees, shrubs, vines or ground cover.**

**Factual Determinations (Subpart B, section 230.11)** A review of appropriate information indicates there is minimal potential for significant short or long-term environmental effects of the proposed discharge as related to:

#### **Sec. 230.11 Factual Determinations**

The permitting authority shall determine in writing the potential short-term or long-term effects of a proposed discharge of dredged or fill material on the physical, chemical, and biological components of the aquatic environment in light of subparts C through F. Such factual determinations shall be used in Sec. 230.12 in making findings of compliance or non-compliance with the restrictions on discharge in Sec. 230.10. The evaluation and testing procedures

described in Sec. 230.60 and Sec. 230.61 of subpart G shall be used as necessary to make, and shall be described in, such determination. The determinations of effects of each proposed discharge shall include the following:

**Physical substrate.** (40 CFR 230.11(a)) As a result of fill-related earthwork and other construction activities, the proposed project will result in localized alterations of topography, geology, and soils on the project site. Additionally, as construction materials are added to and removed from the project site, soils will be replaced, redistributed, and/or compacted. The addition or removal of material will also raise or lower the elevations of specific areas on the project site. All earthmoving activities will employ best management practices as the substrate is and graded, lessening the potential for erosion of material from the project site.

The placement of dredged and/or fill material on the project site will result in a loss of 192.94 acres of wetlands and other waters of the U.S. The project is expected to have a major long-term adverse impact on the physical substrate underlying the fill areas.

**Water circulation, fluctuation, and salinity.** (40 CFR 230.11(b)) The discharge of dredged or fill material can modify current patterns and water circulation by obstructing flow, changing the direction or velocity of water flow and circulation, or otherwise changing the dimensions of a water body. The discharge of fill material to construct the advanced manufacturing and assembly facility will result in the loss of 192.94 acres of wetlands on the project site. Facilities to be constructed will include buildings, parking areas, and impervious surfaces that will alter surface drainage pathways for stormwater and wetland hydrology. Based thereon, there is minimal potential for short-term or long-term adverse effects on water circulation, fluctuation, or salinity. There will be no discharges of fill material into wetlands and open waters; therefore the proposed discharge will not have a significant adverse effect on current patterns and water circulation.

**Suspended particulate/turbidity.** (40 CFR 230.11(c)) Suspended particulates in the aquatic ecosystem normally consist of fine-grained mineral particles, usually smaller than silt, and organic particles. Suspended particulates may enter water bodies as a result of natural events such as runoff, flooding, vegetative and planktonic breakdown, and resuspension of bottom sediments. Human activities, such as the dredging and filling of waters of the U.S., may also cause turbidity in said waters. The level of impact and the degree of the turbidity will depend on factors to include the amount of agitation in the water, particulate specific gravity, particle shape, and physical and chemical properties of particle surfaces.

Approximately 622,960 cubic yards of fill material will be placed within 192.94 acres of wetlands and other waters of the U.S. to construct the advanced manufacturing and assembly facility. The proposed work may cause a temporary increase in turbidity levels within wetlands directly affected by the fill placement, but overall the proposed work will result in decreased suspended particulates and turbidity as storm flow and drainage from the site are routed to water quality treatment systems prior to discharge off the site. To minimize impacts from suspended particulates/turbidity during construction, the applicant has proposed the use of Best Management Practices and will be required to employ the same as permit special conditions. Additionally, the applicant is required to comply with state storm water management regulations. The use of BMPs during construction as proposed by the applicant and required by the SCDHEC 401 Water Quality Certification will reduce or eliminate the chance of

particulates entering the watershed. The State issued a Section 401 Water Quality Certification, documenting that the proposed project will not contravene state water quality standards.

Based thereon, there is minimal potential for short term or long term adverse effects on suspended particulates/turbidity.

**Contaminant availability.** (40 CFR 230.11(d)) See Section 5.0 above for Evaluation and testing (Subpart G), Chemical, Biological, and Physical Evaluation and Testing.

Based thereon, there is minimal potential for long term adverse effects from contaminants.

**Aquatic ecosystem effects.** (40 CFR 230.11(e)) Since the project will result in the loss of wetlands, organisms occupying these areas will be eliminated and/or displaced. While sedentary organisms will not be able to move away from the impact area and will be lost, more mobile organisms may move to other aquatic areas once the excavation and fill activities commence. Although the construction of the project site will result in the loss of a relatively large acreage (192.94 acres) of aquatic resources, the available habitat is considered common and abundant within the region and the loss of these aquatic resources will be more than offset by the proposed compensatory mitigation plan that is a part of this project. The work will have no effect on federally-listed threatened or endangered species or their critical habitat. Review and discussion of potential effects on the aquatic ecosystem are located in the Public Interest Review Section below and in the 404(b)(1) Guidelines Section above. Therefore, the Corps has determined that impacts on the aquatic ecosystem and organisms supported by the aquatic ecosystem will result in long-term major effects in the specific fill areas, but not any particular aquatic species.

**Proposed disposal site.** (40 CFR 230.11(f))(1) A close evaluation of 40 CFR 230.11(f)(1) states that each disposal site shall be specified through the application of the Guidelines defined within this section. These guidelines relate specifically to disposal sites in open waters and the factors to consider when determining the acceptability of a proposed mixing zone. Since the proposed discharge is located in wetlands and not open waters, this section is not applicable.

**Cumulative effects.** (40 CFR 230.11(g)) A full discussion of cumulative effects on the aquatic ecosystem can be found in Section 7.5. Based thereon, the Corps has concluded that there is minimal potential for short or long term adverse cumulative effects.

**Secondary effects.** (40 CFR 230.11(h)) A full discussion of secondary effects on the aquatic ecosystem can be found in Section 7.5. Based thereon, the Corps has concluded that there is minimal potential for short or long term adverse secondary effects.

### **Restrictions on Discharges (Subpart B, section 230.10)**

#### **(1) Alternatives (230.10 (a)):**

There is no practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem and the alternative does not have other significant adverse environmental consequences. (See paragraph 4 for supporting information on this

determination)

**True**    **False**

**(2) Other program requirements (230.10(b)):**

(a) The proposed activity violates applicable State water quality standards or Section 307 prohibitions or effluent standards. (See paragraph 7 for supporting information on this determination)

**No**    **Yes**

(b) The proposed activity jeopardizes the continued existence of federally listed threatened or endangered species or affects their critical habitat. (See Section 230.30 above and paragraph 7 for supporting information on this determination)

**No**    **Yes**

(c) The proposed activity violates the requirements of a federally designated marine sanctuary. (See paragraph 7 for supporting information on this determination)

**No**    **Yes**

**(3) Significant Degradation (230.10(c)):**

The activity will not cause or contribute to significant degradation of waters of the United States. This finding is based on appropriate factual determinations, evaluations, and tests required by Subparts B and G, after consideration of Subparts C through F, with special emphasis on the persistence and permanence of the effects as discussed above.

**True**    **False**

**(4) Minimization of adverse effects (230.10(d)):**

(a) Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem.

**True**    **False**

**6.0. Public Interest Review**

All public interest factors have been reviewed as discussed below. Both cumulative and secondary impacts on the public interest were considered.

1. Conservation. (33 CFR 320.4(a),(m),(n)) Conservation is the efficient use of resources by actions that involve the significant use of the resource or that significantly affect the availability of the resource for alternative uses.

The proposed project will have a beneficial long term effect on conservation. As described in Section 8.0 of this document, the applicant has proposed a landscape-scale compensatory mitigation plan that will protect 2,496 acres of high quality habitat, including 1,533 acres of aquatic habitats. The proposed

compensatory mitigation plan is proposed in a watershed that includes the Francis Beidler Forest, designated as a RAMSAR site. The **Ramsar Convention** (formally, the **Convention on Wetlands of International Importance, especially as Waterfowl Habitat**) is an international treaty for the conservation and sustainable utilization of wetlands, recognizing the fundamental ecological functions of wetlands and their economic, cultural, scientific, and recreational value. The compensatory mitigation plan as proposed will more than offset unavoidable adverse impacts associated with the construction project. Unlike many compensatory mitigation plans that restore, enhance, and/or preserve aquatic resources, the proposed landscape scale compensatory mitigation plan will also transfer easements and ownership of the restored, enhanced and preserved properties to South Carolina Department of Natural Resources, Low Country Open Land Trust, Lord Berkeley Conservation Trust, and Audubon Society for long term management, protection, and substantial public use and benefit.

2. Economics. (33 CFR 320.4 (q)) The proposed project will have a beneficial long term effect on economics. The construction of the advanced manufacturing and assembly facility is projected to involve over \$1 billion in private investment and generate a total of 4,000 new jobs directly associated with the project when both Phase 1 and Phase 2 are completed. It is expected that in addition to the direct jobs created at the proposed project, the project will attract a chain of suppliers and vendors to serve the project, each adding new jobs and income to the local and state economy. Consistent with other large industry operators in South Carolina, the manufacturer is anticipated to encourage and support its employees to volunteer for various community activities, and contribute to charities that help the local and state economy.

3. Aesthetics. (33 CFR 320.4(e), 40 CFR 230.53) Aesthetics issues are highly subjective and difficult to evaluate. The subject of aesthetics is generally one involving personal and subjective evaluations of the acceptability of visual scenes. The subject is often approached in terms of “viewsheds”—the scene of the proposed facility location as viewed from various locations. The public commonly describes such scenes in qualitative terms such as “beautiful,” “ugly,” “pastoral,” and “striking,” which do not lend themselves to quantitative evaluation and for which there are commonly no regulatory standards. Therefore, the treatment of this topic in this document will not attempt to make any value judgments regarding aesthetic qualities. Rather, the discussion will be to provide a description of the existing surroundings and the potential changes that may occur as a result of the proposed project.

The proposed project will have a neutral long term effect on aesthetics. While the project layout and design concept are consistent with other similar-scale industrial manufacturing and assembly operations in South Carolina and specifically along the proposed section of Interstate 26, it may be reasonable to conclude that some residents in the area, including adjacent property owners (see Section 3.4.3 of this document), would prefer the area to remain undeveloped. The existing condition of the project site is undeveloped commercial pine plantation, and has been for many decades. On this basis, local and area residents may consider the property to represent a buffer between themselves and interstate traffic or other industrial development in the area.

4. General environmental concerns. (33 CFR 320.4(a)(1) and 33 CFR 320.4(p)) The proposed project will have negligible long term effect on general environmental concerns. The environmental concerns for this project focus on the potential impacts of the proposed project on wetlands, cultural resources, and fish and wildlife values. Each of these concerns is further discussed elsewhere in this document. No other adverse environmental impacts are anticipated.

The net adverse effect of this project on the environmental factors, which are evaluated herein, would be negligible.

5. Wetlands. (33 CFR 320.4(b)) The proposed project will have a major long term adverse effect on the wetlands underlying the fill areas. However, the project site has been intensively managed for commercial silviculture for many decades, meaning that many of the pine flatwoods wetland acres have been tilled, planted and bedded for many years. Arguably most important in the context of wetland function and value, the conversion of native flatwoods wetlands to the monoculture loblolly pine plantation reduces the vegetative diversity of the habitat, and therefore the diversity of wildlife species that inhabit these areas. Even so, commercial pine plantation wetlands still retain much of their array of wetland functions, particularly seasonal water storage capacity, flood flow alteration and reduction, and maintenance of annual stream flows. While these aquatic resources will be lost when the project site is cleared and developed, the proposed landscape-scale compensatory mitigation plan is expected to more than offset the permitted losses of wetlands and other waters of the U.S.

6. Historic and cultural resources. (33 CFR 320.4(e)) The proposed project will have no effect on historic and cultural resources. Cultural resources surveys were performed by qualified cultural resources professionals and the results of these surveys were coordinated with the SHPO, who concurred with the Corps' determination that the proposed project would have no effect on historic properties.

The Corps is including the following special condition in the permit to ensure that proper coordination occurs if any previously unknown historic or archaeological remains are discovered during the development of the project site:

**That the permittee agrees to stop work and to notify this office immediately if any previously unknown historic or archaeological remains are discovered while accomplishing the activity authorized by this permit. The Corps will initiate the Federal, State, and/or Tribal coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.**

7. Fish and wildlife values. (33 CFR 320.4(c)) The project site is currently undeveloped pine plantation and provides habitat commensurate with that land use for a variety of wildlife species. The construction of this project will have a long term adverse effect on wildlife that use the habitat. However, the proposed landscape-scale compensatory mitigation plan will result in the long term protection of 2,496 acres of upland and aquatic habitats within the Four Hole Swamp Watershed of the Edisto River Basin. The plan includes ecological restoration and wetland enhancement and preservation of 1,533 acres of aquatic resources, including transfer of these lands to qualified and suitable land conservation and stewardship entities as described in Section 8.0 of this document.

8. Flood hazards. The project design has not yet been completed to include the hydraulic analysis that will ensure that the project will not contribute to or increase the risk of flood hazards in the area, and in particular on properties adjacent to the site. However, the Corps requested that the applicant provide documentation and assurance that the project's final design

would meet these requirements. The applicant responded to this request by providing assurance that “*Road crossings of wetlands and streams will be designed to provide flow conveyance in accordance with applicable design storm events and hydrological parameters set forth in state and local regulation.*” The applicant’s full response to this issue is provided above in Section 3.4.8. Similar to other development projects, the advanced manufacturing and assembly facility will be required to obtain a stormwater discharge permit from SCDHEC and to document that the proposed stormwater management plan complies with the appropriate Federal and State regulations. In addition, in order to insure that there are minimal impacts to flooding, the following special condition has been included in the federal permit:

**That the permittee agrees that the drainage/conveyance system shall be designed by a licensed Professional Engineer (PE) and constructed by the permittee (or his designated assignee) to provide for the proper drainage of surface water of the drainage area of which it is a part, to permit the flow of natural or manmade watercourses, and to maintain positive drainage for adjacent properties. In addition, the drainage/conveyance system shall be sufficient to prevent any appreciable increase in water surface elevations or expansion/increases of the flood hazard area.**

9. Floodplain values. (33CFR320.4(l)) The proposed project will have a negligible long term effect on floodplain values. As described above, the project site is not located within a floodplain or a floodway. Stormwater management features, such as grassy swales and detention ponds will be used to manage increases in stormwater that result from a development of the project site, and will help prevent increases in downstream flows into existing floodplains.

10. Land use. (33 CFR 320.4(a)(1) and 33 CR 320.4(j)) The proposed project will have a negligible long term effect on land use. The primary responsibility for determining zoning and land use matters rests with state, local and tribal governments. The district engineer will normally accept decisions by such governments on those matters unless there are significant issues of overriding national importance. The property is currently zoned by Berkeley County as “PD-OP/IP” which is office or industrial park. As defined, PD-OP/IP is for office, light and heavy industrial uses, and necessary accessory uses and facilities, designed with a park-like atmosphere to complement surrounding land uses by means of appropriate siting of buildings and service areas, attractive architecture, and effective landscape buffering. The proposed project development is consistent with this zoning and its requirements. On this basis, the proposed project will have a negligible long term effect on land use.

11. Navigation. (33CFR320.4(o))

The proposed project will have no effect on navigation. The proposed project is primarily located in uplands. Although the proposed project will result in the loss of 192.94 acres of wetlands and other waters of the U.S., these aquatic resources are not considered waters that are suitable for navigation.

12. Shore erosion and accretion. (33 CFR 320.4(a)(1) and 33 CFR 320.4(g)) The proposed project will have a neutral long term effect on shore erosion and accretion. The proposed project is primarily located in uplands. Although the development of the proposed project site will result in an increase in the total acreage of impervious surfaces on the project site and within the

watershed, the stormwater management plan for the project site will ensure that any additional stormwater does not cause shore erosion or accretion within downstream waters.

13. Recreation. (33 CFR 320.4(a)(1) and 33 CFR 320.4(e))

The proposed project will have a neutral effect on recreation. The development of the advanced manufacturing and assembly facility will not create, destroy, or restrict access to any parks or recreational facilities on or near the project site. However, the landscape-scale compensatory mitigation plan will result in the transfer of the largest of the proposed mitigation tracts to the SCDNR for long term management and stewardship. A longstanding component of the SCDNR land management philosophy and policy continues to be public access for outdoor recreation activities such as hiking, birding, wildlife viewing, etc.

14. Water supply and conservation. (33CFR320.4(m)) The proposed project will have a negligible long term effect on water supply and conservation. The construction of the proposed project will use limited amounts of water for activities such as dust abatement during clearing and grading operations and as part of the mixture of concrete/aggregates for development of the project site. The Corps is unaware of any required water withdrawal permits that would be necessary for the success of the proposed project, and the project's operation is not expected to use substantial volumes of water above and beyond the water volumes that are typically required for employees at other commercial facilities. On this basis, the proposed project will have a negligible long term effect on water supply and conservation.

15. Water quality. (33 CFR 320.4(d)) The proposed project will have a negligible long term effect on water quality. Construction activities will have temporary negative impacts on water quality when the project site is being cleared, graded, and prepared for development. However, potential impacts will be minimized through the use of best management practices specified as conditions by SCDHEC in its Water Quality Certification issued to address water quality specific to this project. These conditions have been incorporated into the Department of the Army permit by reference. In addition, storm flow and drainage from the site will be routed to water quality treatment systems prior to discharge off the site as required by permits to be issued pursuant to Section 402 of the Clean Water Act.

16. Energy needs. (33 CFR 320.4(n)) Not applicable. The project does not involve energy conservation and development.

17. Safety. (33 CFR 320.4 (n)) The proposed project will have a negligible long term effect on safety. The construction and operation of the advanced manufacturing and assembly facility will be required to comply with the appropriate OSHA guidelines regarding employee safety.

18. Food and fiber production. Not applicable. The proposed project does not involve food or fiber production.

19. Mineral needs. Not applicable. The proposed project does not involve mineral needs.

20. Considerations of property ownership. (33 CFR 320.4(g))

The proposed project will have a negligible long term effect on property ownership.



Improvements identified as necessary to Interstate 26 for the construction of a new T-Type interchange at Mile 190 would affect five properties associated with the acquisition of additional right-of-way to accommodate the interchange. Based on a review of the proposed T-Type interchange layout, the affected properties would not be wholly taken to facilitate the interchange, but rather would be partially acquired. Improvements associated with the new interchange at Mile 190 would not be undertaken until after Phase 1 of the project is underway. All work associated with developing new interchange improvements to the interstate will require the review and approval of the Federal Highway Administration (FHWA), and in particular will require the development of an Interchange Justification Report (IJR) before design and construction could proceed. The IJR process will consider issues of property ownership.

21. Needs and welfare of the people.

The proposed project will have a beneficial long term effect on the needs and welfare of the people. The proposed project will provide approximately 4,000 new jobs as full-time employees at the advanced manufacturing and assembly facility, and will likely attract a chain of supplier and vendor businesses to the area that will represent additional jobs and economy to the local area and the state. Therefore, as long as the permittee complies with environmental commitments and permit conditions issued to ensure the short and long term protection of the environment, the project will have a beneficial long term effect on the needs and welfare of the people.

**7. Effects, Policies and Other Laws**

7.1 **Public Interest Factors:** See section 6.

7.2 **Endangered Species Act**

The proposed project is not likely to have any adverse effect on any threatened or endangered species or any designated or proposed critical habitat.

Pursuant to Section 7(c) of the Endangered Species Act of 1973 (as amended), the applicant provided a protected species survey for the property associated with the activity described above. Based upon this report, the District Engineer has determined that the project is not likely to adversely affect any federally endangered, threatened, or proposed species or result in the destruction or adverse modification of designated or proposed critical habitat.

The proposed project **will not** adversely modify designated critical habitat.  
Species:

The Services  concurred/ provided a Biological Opinion(s).

In a letter dated April 27, 2015, USFWS concurred with the Corps determination that the project is not likely to adversely affect any federally threatened or endangered species and will not adversely modify any designated or proposed critical habitat.

7.3 **Magnuson-Stevens Fishery Conservation and Management Act**

The proposed project will not result in adverse impacts to Essential Fish Habitat. Conservation Recommendations were not provided by the National Marine Fisheries Service. Conservation Recommendations will not be incorporated into the project or added as special conditions to the permit.

#### 7.4 **Section 106 of the National Historic Preservation Act**

The proposed project will have no effect on historic properties. No sites listed, or eligible for listing, in the National Register of Historic Places or of other national, state or local significance are found on the proposed project site. The SHPO concurred with the Corps' determination of effect in a letter dated April 27, 2015.

The Corps is including the following special condition in the permit to ensure that proper coordination occurs if any previously unknown historic or archaeological remains are discovered during the development of the project site:

**That the permittee agrees to stop work and to notify this office immediately if any previously unknown historic or archaeological remains are discovered while accomplishing the activity authorized by this permit. The Corps will initiate the Federal, State, and/or Tribal coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.**

#### 7.5 **Cumulative and Secondary Effects**

This assessment is commensurate with the degree of the proposed impact, the existing and reasonably foreseeable watershed stress to aquatic resources, and the degree to which information and data are readily available.

Geographic area for the assessment:

The project site is 2,880 acres within an overall tract that is 6,781 acres in size. The largest portion of the overall site, and also the portion where the project is to be constructed, is located within the Lower Four Hole Swamp Watershed in the Edisto River Basin. Approximately 35% of the proposed project is located within the Cypress Swamp Watershed in the Santee River and Cooper River Basin.

Lower Four Hole Swamp Watershed (HUC 03050205-03) in the Edisto River Basin is 183,907 acres in area and includes 33.7% forested land, 30.8% forested swamp wetlands, 29.2% agricultural land, 5.0% urban land, 0.6% barren land, 0.4% non-forested marsh wetlands, and 0.3% open waters.

Cypress Swamp Watershed (03050201-05) is 139,162 acres in area and includes 52.5% forested uplands, 25.3% forested wetlands, 14.4% agricultural land, 7.1% urban land, 0.4% non-forested wetlands, 0.2% open water, and 0.1% barren land.

#### **Baseline information**

Percent of the watershed that is wetland:

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Berkeley County  
c/o Mr. William Peagler

Lower Four Hole Swamp Watershed: 31.2%

Cypress Swamp Watershed: 25.7%

Stream miles in the watershed:

Lower Four Hole Swamp Watershed: 501.4 miles

Perennial: unknown

Intermittent: unknown

Ephemeral: unknown

Cypress Swamp Watershed: 357.9 miles

Perennial: unknown

Intermittent: unknown

Ephemeral: unknown

Corps permits issued in the last 5 years have authorized:

Lower Four Hole Swamp Watershed:

Acres of fill: 9.80

Linear feet of stream: 0

Cypress Swamp Watershed:

Acres of fill: 19.92

Linear feet of stream: 103

It is projected that authorizations will continue in the region at the current rate in the future.

Reason: Development pressure is increasing around the watersheds where this project is proposed. Population growth numbers for Berkeley County, SC are projected to increase over the next five, ten and twenty years for which data are available through the South Carolina Revenue and Fiscal Affairs Office (<http://www.sccommunityprofiles.org/census/proj0035.php>). Table 6 presents population data for Berkeley, Charleston and Dorchester Counties.

**Table 6. Census numbers and population projections for the project area.**

County	2000 Census	2005 Estimate	2010	2015	2020	2025	2030	2035
Berkeley	142,651	152,858	170,270	181,350	192,450	203,520	214,140	225,010
Charleston	309,969	337,199	348,370	357,370	366,380	375,390	386,660	396,640
Dorchester	96,413	111,722	129,450	139,370	149,300	159,210	170,210	180,580

From the population data in Table 6, the Corps calculated average growth and percent population increase for each of the three counties. These values are shown below in Table 7.

**Table 7. Growth projections and percentage growth for the project area.**

Data Years	Berkeley		Charleston		Dorchester	
	Growth	% Growth	Growth	% Growth	Growth	% Growth
2015 - 2020	11,100	6.1	9,010	2.5	9,930	7.1
2020 - 2025	11,070	5.8	9,010	2.5	9,910	6.6
2025 - 2030	10,620	5.2	11,270	3.0	11,000	6.9
2030 - 2035	10,870	5.1	9,980	2.6	10,370	6.1
Averages	10,915	5.6	9,984	2.7	10,303	6.8

Based on population numbers and projected population growth in the three counties most relevant to the proposed project, as well as the past five-year history of permits to allow fill in wetlands and streams in the two watersheds where the project is proposed, it is reasonable to conclude that the need for authorizations will continue at the same level. The Port of Charleston is developing a new marine container terminal at the former Charleston Navy Base, the Corps of Engineers Civil Works Review Board (CWRB) approved the Charleston Harbor Post 45 Deepening Project Final Feasibility Study and Integrated Environmental Impact Statement on June 25, 2015, Palmetto Railways is evaluating the development of a new regional Intermodal Container Transfer Facility (EIS underway with Charleston District acting as lead agency), as well as various other new industries proposed along the Cooper River industrial complex. Natural resource issues of concern in the watershed: According to a watershed assessment prepared by the USGS for the Cooper River watershed, habitat preservation is the number one priority within the watershed because of substantial growth and urban sprawl predicted within the region over the next 30 years (<http://sc.water.usgs.gov/nawqa/>).

**Context**

The proposed project is considered relatively large from an acreage standpoint and extremely large from an economic investment and job creation standpoint as compared to other projects in the area.

History of development similar to this proposal: Among other large-scale industrial manufacturing and assembly facilities in the local area and within the state, Boeing Commercial Airplanes South Carolina, located in North Charleston, was constructed within the past 10 years. That operation has been successful as an employer of approximately 6,500 employees, and was

issued a DA permit during 2015 to expand the facility and add an additional 2,000 employees. Outside the local area, but within the state economy, BMW Manufacturing Company was issued a DA permit during the past two decades to build automobiles in Greer, SC, which is near Spartanburg. BMW Manufacturing Company employs approximately 8,000 people and has applied for a DA permit to expand the facility by an additional 800 employees.

Future conditions are expected to be: Over the past decade there have been numerous large developments permitted and constructed in the Charleston-North Charleston-Summerville statistical area, including major residential projects at Daniel Island and Cane Bay (between Summerville and Moncks Corner). In addition, the South Carolina Ports Authority (commenting by letter to the public notice for this project) obtained a DA permit to develop a new marine container terminal at the former Charleston Navy Base; Palmetto Railways has submitted a proposal to develop a regional Intermodal Container Transfer Facility (with the Corps acting as lead agency on a regulatory EIS); and the Corps of Engineers CWRB approved the Charleston Harbor Post 45 Deepening Project Final Feasibility Study and Integrated EIS on June 25, 2015.

Besides Corps-authorized projects, other activities include: Various residential, commercial, and industrial activities that are constructed in uplands, construction and operation of upland borrow pits to obtain fill material, and exempt activities such as forestry.

Resulting natural resource changes and stresses include: Habitat fragmentation and loss, increases in impervious surfaces, changes to habitat, incremental changes to water quality, and non-point source discharges.

These resources are also being affected by: pollution, climate, weather, and sea level rise.

A key issue(s) of concern in this watershed is: increased human pressure on natural resources and the degradation of water quality resulting from development and wetland loss.

### **Mitigation and Monitoring**

The project would affect the following key issue(s): wetlands, land use and water quality.

The magnitude of the proposed effect in the watershed is: The proposed project consists of constructing an advanced manufacturing and assembly facility on a 2,880-acre portion of an overall 6,781-acre tract of historic loblolly pine plantation along Interstate 26 and U.S. Highway 176 in Berkeley County. The construction of this project will result in the loss of 192.94 acres of wetlands and other waters of the U.S. In fact, this project will result in the loss of more aquatic resources than any other DA permit issued by the Corps in this watershed. However, the landscape-scale compensatory mitigation plan will preserve and enhance 1,533 acres of aquatic resources within a total preservation and enhancement area of 2,496 acres in the Four Hole Swamp Watershed of the Edisto River Basin. This compensatory mitigation will more than offset the proposed impacts to waters of the U.S.

There will be increased traffic associated with suppliers and vendors bringing materials to the facility, finished products being transported off the site, and increased construction traffic while the project is being built. As a result of increased traffic, Interstate 26 is expected to experience

sharply reduced Levels of Service, including failing Levels E and F. For this reason the project includes the proposal to improve Interstate 26 with the installation of a new T-Type interchange at Mile 190 to serve the project site.

Avoidance and minimization methods include: According to the applicant, *“An extensive alternatives analysis was conducted by the applicant to evaluate practicable alternatives to the proposed site which limited wetland impacts to the greatest practicable extent and yet was feasible in light of technology, costs, and logistics. Camp Hall Option 2 was selected as the preferred alternative, as it was technically feasible, provided efficient accessibility and visibility, and reduced wetland impacts to 293 acres. Following site selection, the applicant further minimized wetland impacts by 75.15 acres to a total of 217.85 acres with Option 2A. In this alignment the visitor's center/administrative offices were moved to an area of slightly lower visibility, but with greatly reduced wetlands impacts, the Phase 2 northern access road was completely removed to further reduce impacts, and the stormwater ponds associated with Phase 1 and 2 were relocated so that the site layout minimizes wetland impacts.”*

*“In addition, further minimization occurred in association with the design and planning of the Lower Westvaco Road access as a result of design enhancements and a detailed wetland delineation. Impacts were further reduced from the original permit submittal (Option 2A) by 1.82 acres. Further minimization of wetland impacts may result from additional design enhancements associated with infrastructure improvements. Final design for these areas is on-going.”*

*“The applicant has also committed to installation [sic] to installation of additional culverts along the proposed road infrastructure corridors to prevent obstruction of existing surface flows during time of saturation within the wetlands and to facilitate the passage of terrestrial and aquatic organisms.”*

Compensatory mitigation and monitoring include: As described in Section 8 of this document, the landscape-scale compensatory mitigation plan which was provided as part of this permit application will preserve and enhance 1,533 acres of high-quality aquatic ecosystems within six tracts of land in the Four Hole Swamp Watershed that together total 2,496 acres. The Corps believes the proposed compensatory mitigation plan exceeds the amount of compensatory mitigation that would normally be required to offset the proposed impacts to waters of the U.S. The specific compensatory mitigation sites were selected specifically to offset the impacts of this project, and thereby reduce the proposed impacts below the level of significance. The proposed compensatory mitigation tracts are strategically located within a corridor of conservation lands that form a high-quality ecosystem buffer around the Charleston metropolitan area, and also serve as an important headwater watershed of the mighty Edisto River Basin that forms a vital portion of the ACE Basin in the Lowcountry of South Carolina.

## 7.6 **Water Quality Certification under section 401 of the CWA**

SCDHEC issued a Notice of Department Decision – State Certification regarding Water Quality Certification on June 12, 2015. The Water Quality Certification was considered final on June 27, 2015. The State 401 Water Quality Certification is incorporated in the federal permit by general condition.

**7.7 Coastal Zone Management Consistency / Permit**

Coastal zone consistency certification/permit was issued on June 12, 2015.

**7.8 State Navigable Waters Permit**

State Navigable Waters Permit was not applicable.

**7.9 Corps Wetland Policy**

Based on the public interest review herein, the beneficial effects of the proposed project outweigh the detrimental effects.

**7.10 Effect on Federal Projects**

The proposed project will not have an adverse effect on any Federal project.

**7.11 Effects on the limits of the territorial seas**

The proposed project will not alter the coastline or baseline from the territorial sea is measured for purposes of the Submerged Lands Act and international law.

**7.13 Safety of impoundment structures**

The applicant demonstrated that impoundment structures comply with established dam safety criteria or have been designed by qualified persons and independently reviewed:

True  False  Not Applicable

**7.14 Activities in Marine Sanctuaries**

If the proposed project would occur in a marine sanctuary, certification from the Secretary of Commerce was received:

True  False  Not Applicable

**7.15 Other Authorizations**

As described in this document, the applicant will be required to obtain and comply with other permits to construct various aspects of the project. For example, National Pollutant Discharge Elimination System (NPDES) permits pursuant to Clean Water Act Section 402 will be required to treat stormwater on the site before it will be allowed to outfall to receiving waters. Air quality permits will be required from the SCDHEC Bureau of Air Quality pursuant to the Clean Air Act.

**7.16 Significant Issues of Overriding National Importance**

None

**8. Compensation and Other Mitigative Actions**

**Compensatory mitigation**

Is compensatory mitigation required?  Yes  No (If no, do not complete the rest of this section.)

Is the impact in the service area of an approved mitigation bank?  Yes  No

Does the mitigation bank have appropriate number and resource type of credits available?

Yes  No

What is the name of the Bank? Pigeon Pond Mitigation Bank; Congaree-Carton Mitigation Bank

Is the impact in the service area of an approved in-lieu fee program?  Yes  No

Does the in-lieu fee program have appropriate number and resource type of credits available?  Yes  No

Check the selected compensatory mitigation option(s):

- mitigation bank credits
- in-lieu fee program credits
- permittee-responsible mitigation under a watershed approach
- permittee-responsible mitigation, on-site and in-kind
- permittee-responsible mitigation, off-site and out-of-kind

If a selected compensatory mitigation option deviates from the order of the options presented in §332.3(b)(2)-(6), explain why the selected compensatory mitigation option is environmentally preferable. Address the criteria provided in §332.3(a)(1)(i.e., the likelihood for ecological success and sustainability, the location of the compensation site relative to the impact site and their significance within the watershed, and the costs of the compensatory mitigation project):

Although there are two existing mitigation banks (Pigeon Pond and Congaree-Carton) located within the same watershed as the proposed project, the proposed project would use all of the available mitigation credits from both mitigation banks and the applicant would still be required to conduct a PRM plan to offset the remainder of the unavoidable impacts to waters of the U.S. Rather than proceed this way, the applicant elected to propose a landscape scale watershed approach to identify potential mitigation sites that would have regional and national importance.

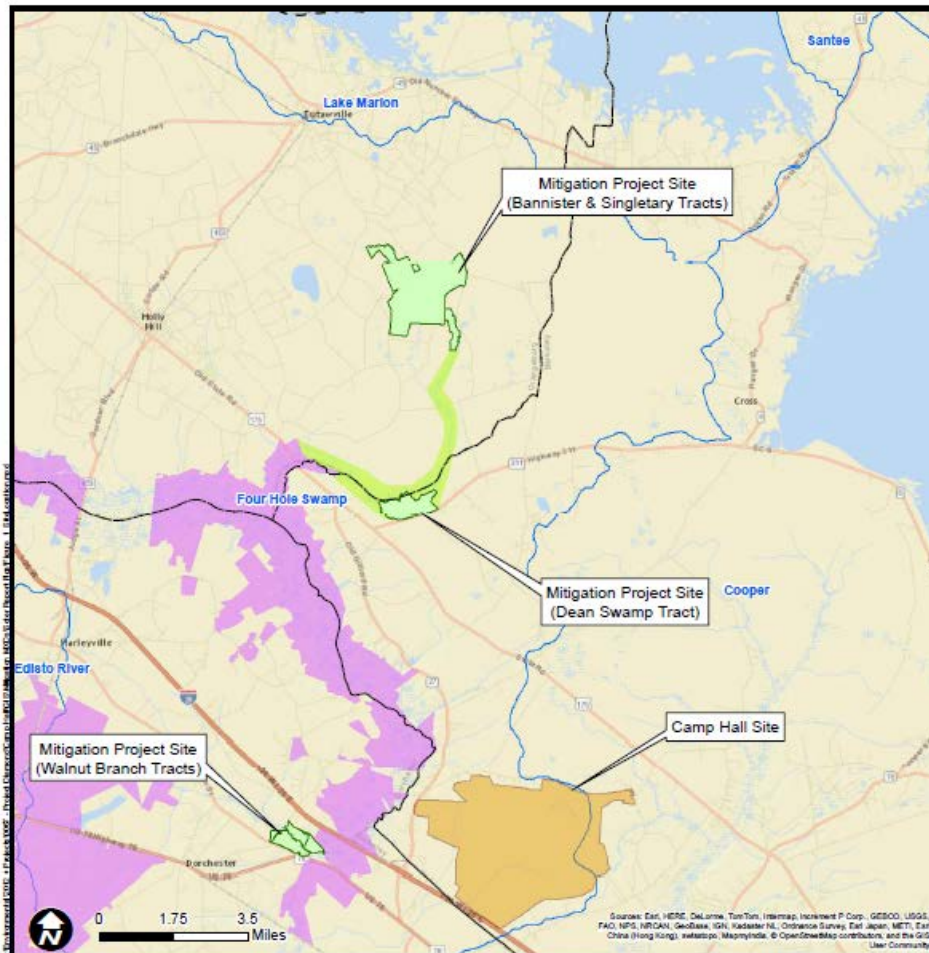
Based on coordination with local conservation stakeholders, the applicant identified portions of the Four Hole Swamp Watershed that comprise six separate tracts of high-quality aquatic ecosystems: Bannister Tract; Singletary Tract; Dean Swamp Tract; Mimms Tract, Long Tract, and Salisbury Tract (collectively referred to as the Walnut Branch Tracts). Four Hole Swamp is an important headwater portion of the Edisto River Basin, and provides approximately one-third of the flow to the lower Edisto River as it enters the ACE Basin. The six tracts that together comprise the applicant's "Landscape Mitigation Plan" (LMP) that is part of this project's federal permit application and overall project design are presented in Table 8 below, along with approximate acreages for each, and information about proposed long term owners/stewards.



**Table 8. Long Term Management Scheme for Compensatory Mitigation Tracts.**

<b>Tract</b>	<b>Bannister</b>	<b>Dean Swamp</b>	<b>Mimms</b>	<b>Singletary</b>	<b>Long</b>	<b>Salisbury</b>
<b>Current owner</b>	Plum Creek	Plum Creek	Mead Westvaco	Celeste Singletary	Walnut Branch, LLC	Dorchester Mining, LLC
<b>Approximate Acreage</b>	1,667	380	177	112	85	75
<b>Interim Owner</b>	South Carolina Public Service Authority			N/A Or Current Property Owner		
<b>Long Term Owner</b>	SCDNR	Lord Berkeley Conservation Trust, LLC	Audubon			
<b>Long Term Protective Instrument</b>	LOLT Conservation Easement	LBCT Deed Restriction	LOLT Conservation Easement	USACE-approved Conservation Easement		
<b>Easement Holder</b>	LOLT	LBCT	LOLT	Lord Berkeley Conservation Trust	Low Country Open Land Trust	
<b>Long Term Manager</b>	SCDNR	Audubon				

Figure 16 below shows the six proposed compensatory mitigation tracts and their locations with respect to each other, Four Hole Swamp, and the proposed project location at Camp Hall Site.



**Figure 16. Compensatory mitigation tracts within Four Hole Swamp near the Camp Hall Site (taken from applicant’s LMP Figure 1).**

As mitigation for the proposed impacts, the permittee proposes as part of the original permit application the “Landscape Mitigation Plan” using a watershed approach to compensate and offset losses of waters of the U.S. associated with construction of this project. According to the work plan proposed by the applicant, “*wetland preservation activities within the Mitigation Project is anticipated to protect approximately 890 acres of wetlands... The proposed wetland preservation areas lie directly adjacent to many streams and unnamed tributaries within the proposed mitigation corridor and consist of a mix of high quality bottomland hardwood forests communities. Wetlands within the Mitigation Project will be protected through the establishment of a conservation easement with a minimum 75 foot buffer (Bannister Tract, Dean Swamp Tract, and Mimms Tract) and maximum 100 foot buffer on the other tracts (Singletary, Long, and Salisbury) and an additional 200 foot no construction buffer (total 300 feet buffer) where possible.*”

“*Wetland enhancement activities within the Mitigation Project are proposed on the Bannister Tract and the Dean Swamp Tract... The majority of the wetlands not found within the floodplain of Cedar Swamp, Sandy Run, Dean Swamp, and associated unnamed tributaries have been*

*converted to loblolly pine plantation and are in various stages of production. For the purposes of this mitigation work plan the pine plantation has been categorized as clearcut, greater than 15-year, or less than 15-years of age. An in-depth discussion of the plant communities associated with the pine plantation community found within the Bannister Tract can be found in Section 5.4.4” [of the LMP]. “The proposed wetland enhancement activities will primarily consist of converting existing pine plantation wetlands into pine flatwoods and longleaf forest communities, where applicable. Sections of the pine plantation that have encroached into the bottomland hardwood communities will be converted back into bottomland hardwood forest. The wetland enhancement work plan to be implemented on the Bannister Tract and Dean Swamp Tract has been categorized by activities based on the existing habitat and a detailed discussion is located below for each proposed enhancement activity.”*

***“Pine Flatwoods Enhancement (Thinning/Burning)***

*Sections of the Bannister Tract and the Dean Swamp Tract that have been planted and have stands of existing loblolly pine greater than 15 years old will be thinned and considered for prescribed burning. Thinning of the planted pine will be conducted to reduce the basal area the [sic] of the existing loblolly pine stands to open the forest canopy to allow for the recolonization of herbaceous and understory layers associated with the pine flatwoods community. A prescribed burn schedule will be implemented to mimic the natural burn cycle typical of this ecotype. Depending on the conditions and success of burned areas, the frequency of successive fires will be prescribed. Where necessary, appropriate plant species will be planted to increase species diversity and accelerate forest regeneration.”*

***“Pine Flatwoods Enhancement (Thinning/Flattening/Burning)***

*Sections of the Bannister Tract and the Dean Swamp Tract that have been planted and have stands of loblolly pine less than 15 years old will be thinned and the topography will be smoothed with tracked and wheeled forestry machinery to match the surrounding contours to reduce furrows that were constructed during the planting process. Mechanical mulching equipment may be used during this process to thin the pines and deposit the resulting pine chips into the depressional areas. The existing loblolly pine stands will be thinned to appropriate ratios to mimic the pine flatwoods communities. At the appropriate time, a prescribed burn schedule will be implemented to mimic the natural burn cycle typical of this ecosystem. Depending on the conditions and success of burned areas, the frequency of successive fires will be prescribed. Where necessary, appropriate plant species will be planted to increase species diversity and accelerate forest regeneration.”*

*“Wetland restoration activities within the Mitigation Project are proposed on the Bannister Tract and the Dean Swamp Tract... The proposed wetland restoration activities will primarily consist of converting [or] replanting clearcut wetlands with either pine flatwoods, bottomland hardwood, or isolated pond communities. The wetland restoration work plan to be implemented on the Bannister Tract and Dean Swamp Tract has been categorized by activities based on the existing habitat and a detailed discussion is located below for each proposed enhancement activity.”*

Note in the applicant’s discussion below regarding “wetland restoration” that the areas are already wetlands and thus will actually undergo wetland enhancement.

***“Bottomland Hardwood Vegetative Restoration***

*Sections of the Bannister Tract where the existing pine plantation have encroached into the bottomland hardwood communities located along Cedar Swamp, Sandy Run, and associated unnamed tributaries will be cleared and replanted with appropriate native hardwood species. Prior to clearing activities, herbicides may be used to control unwanted vegetation, as appropriate. Clearing activities may include mechanized equipment to smooth out the raised beds to restore the natural and historic topography. The residual pine stumps will be sheared below ground elevation or extracted from the soil only if necessary. After the clearing activities are complete and if necessary, equipment will be utilized to remove debris from the area (e.g. roots, stumps, limbs, etc.). The residual debris will be piled in the adjacent uplands for disposal. Once the site preparation activities are completed, the wetland area will be planted with appropriate bottomland hardwood species.”*

***“Isolated Pond Restoration***

*Sections of the Bannister Tract and Dean Swamp Tract have isolated ponds that have been impacted through silviculture practices. The majority of these areas have been encroached upon to expand timber production. The vegetative enhancement activity will be same as for the Bottomland Hardwood Vegetative Enhancement. Existing native hardwood species will not be removed during the clearing activities. Once the site preparation activities are completed, the wetland area will be planted with appropriate isolated pond species.”*

***“Pine Flatwoods Restoration***

*Sections of the Bannister Tract and the Dean Swamp Tract that [sic] have been clear cut prior to the execution of this mitigation plan. Appropriate wetland areas not associated with the bottomland hardwood forest community will be converted into pine flatwoods/pine savannah communities. Prior to mechanical activities herbicides may be used to control unwanted vegetation, as appropriate. Machinery may be used on the raised beds to smooth the landscape to mimic the historical topography and reduce the existing rutting that has occurred from clearcutting activities. During this process, the residual pine stumps will be sheared below ground elevation or extracted from the soil as necessary. After the clearing operations are complete, equipment will be employed to remove debris from the area (e.g. roots, stumps, limbs, etc.). The residual debris will be piled in the adjacent uplands for disposal. It is anticipated that the existing road infrastructure will be used for fire breaks. Once the site preparation activities are complete, the wetland area will be planted with appropriate pine flatwoods species. At the appropriate time, a prescribed burn schedule will be implemented to mimic the natural burn cycle typical of this ecotype.”*

*“The upland loblolly plantation and clearcut buffers (75 feet) along the wetland enhancement and preservation areas within the Bannister and Dean Swamp Tract will be restored/converted to a longleaf pine forest ecosystem, where appropriate. Existing clear cut areas within the upland buffer will be planted with longleaf pine seedlings and other species, as appropriate, at a rate of 450 stems per acre. Existing loblolly plantation stands will remain intact through the required monitoring period. At the appropriate time, a prescribed burn schedule will be implemented to mimic the natural burn cycle typical of this ecotype.”*

*“It is anticipated that the existing upland areas not converted to longleaf pine and the remaining upland loblolly plantation areas, not associated with mitigation activities, within the Banister Tract will be converted to a longleaf pine ecosystem at a future time by the SCDNR at their discretion and in accordance with their WMA management plan.”*

*“Prescribed burning will be implemented every two to three years in the pine flatwoods enhancement areas and the upland longleaf restoration areas. Fire intensity will be adjusted in subsequent years to provide the best results of this habitat management technique. All initial and subsequent burns will be conducted by prescribed fire professionals with experience within the region. Specifically, only Certified Prescribed Fire Managers will conduct these burns. Burns will be conducted when conditions favor fire across the range of forest communities within the Mitigation Project Site. The burns will not be conducted when ponded water dominates the site or when dry weather creates dangerous fire conditions and fire control problems. Burning will only operate during conditions where smoke will have the least effect on adjacent populated areas.”*

*“Wetland reference areas will be identified within either the Mitigation Project tracts, Francis Marion National Forest, or Francis Beidler Forest. The target plant communities of the Mitigation Project wetland enhancement areas will attempt to replicate the species composition of the reference wetlands and show a progression towards the vegetation strata and diversity of the reference site by the end of the monitoring period.”*

*“Stream preservation activities within the Mitigation Project is anticipated to protect approximately 47,932 acres (9 miles) of streams consisting of Cedar Swamp, Sandy Run, Dean Swamp, Walnut Branch and associated tributaries. For the purposes of this PRMP, streams lengths were calculated using the available USGS hydro lines. Further evaluation of the streams will be conducted following the acceptance of this PRMP and the information will be provided in the FPRMP. Streams within the Mitigation Project will be protected through the establishment of a conservation easement with a minimum 75 foot buffer (Bannister Tract, Dean Swamp Tract, and Mimms Tract) and maximum 100 foot buffer on the other tracts (Singletary, Long, and Salisbury) and an additional 200 foot no construction buffer (total 300 feet buffer) where possible.”*

*“A planting plan will be developed following the acceptance of this PRMP. The planting plan for the different ecosystems will be developed to mimic the natural plant communities similar to high functioning ecosystems, such as Francis Beidler Forest and/or Francis Marion National Forest.”*

The Landscape Mitigation Plan was carefully and thoroughly reviewed by this office and by other resource agency personnel who frequently review and comment on permit applications, including proposed impacts and compensatory mitigation. Regarding this project’s compensatory mitigation plan, SCDNR provided the following supportive comments.

*“DNR is familiar with the sites as mitigation and recognizes they have been identified as important potential conservation/preservation tracts for several decades through various conservation plans developed by the National Audubon Society working with other conservation*

*organizations partnering on landscape-scale conservation in the watershed. This area is of regional, national, and international conservation significance, and is located adjacent to the Francis Beidler Forest (RAMSAR site no. 1773) which is one of only two such sites in South Carolina, 37 sites in the United States, and 2,000 sites globally which have been designated by the RAMSAR Convention as Wetlands of International Importance.*”

*“DNR recognizes the importance of the proposed mitigation tracts in furthering conservation efforts within the Four Holes Swamp Watershed which includes the wetland nature preserve known as Francis Beidler Forest. We reiterate that the Francis Beidler Forest is a nationally and internationally recognized old growth swamp forest of International Importance and an Audubon Important Bird Area. The preserve includes over 16,000 acres of protected wetlands and adjacent upland habitats. The protection of wetland systems such as those proposed in the Project Soter – Landscape Mitigation Plan is vital to the long-term health and sustainability of the Four Holes Swamp Watershed and the Francis Beidler Forest.”*

*“DNR believes the proposed mitigation plan will result in profound natural resource benefits through protection of vulnerable wetlands and critical fish and wildlife habitats, while adding to the collective efforts of DNR and its many public and private conservation partners. Our ongoing mission of landscape-scale conservation includes the following three basic features:*

- 1. Identification of a regional system of interconnected lands, wetlands, streams and riparian corridors,*
- 2. Actions organized to achieve and link multiple specific conservation objectives, and*
- 3. Stakeholders who cooperate in a concrete fashion to achieve those objectives.”*

*“It has been conclusively demonstrated that landscape-scale conservation encourages ecological resilience and economic sustainability through the use of science-based priorities. Additionally it leverages resources and multi-functionality, is embraced by diverse stakeholders, facilitates reduced land management costs, reduces wildfire-risk potential, achieves watershed/river basin health objectives, utilizes forest products to benefit local economies, and provides public use and enjoyment of natural resources and tourism. Now, it can be used to facilitate the permitting of appropriately sites projects allowing infrastructure and development to proceed. Clearly, implementation of this mitigation plan can be one of the lasting positive legacies affecting the Four-Holes Swamp Watershed.”*

Based on the Landscape Mitigation Plan proposed as part of this project, the Corps concludes that the Applicant’s proposed compensatory mitigation plan is environmentally preferable and adequately compensates for the Project’s impacts on Waters of the U.S. This includes the acquisition of six high-quality and ecologically valuable, wetland-dominated tracts to be enhanced and preserved in perpetuity, and ultimately conveyed to suitable qualifying stewards for long-term management. In accordance with Corps regulations (33 CFR 325.4(a); 33 CFR Part 325, App. B, Par. 21; and 33 CFR 230.15), the Corps is including the following special conditions to ensure that appropriate oversight and monitoring are conducted regarding the implementation of the mitigation plan underlying the Corps’ mitigated Finding of No Significant Impact (FONSI) determination (see Section 10.8):

- 1. That as compensatory mitigation to offset impacts to aquatic resources, the permittee will implement and fully comply with the “Project Soter – Landscape Mitigation Plan” dated April 10, 2015 (revised July 8, 2015) (the Plan), including the provision to provide \$1.5 million into an escrow account to be held by Lord Berkeley Conservation Trust, and to also provide a Corps-approved performance bond as financial assurance for the mitigation activities proposed in the Plan. Your responsibility to complete the Plan as set forth in this Special Condition will not be considered fulfilled until you have demonstrated mitigation success and have received written verification from the U.S. Army Corps of Engineers.**
- 2. The permittee understands and agrees that a Corps-approved performance bond must be in place prior to commencement of the authorized work, and may not be terminated until the Corps of Engineers verifies that the compensatory mitigation requirement for the proposed project has been satisfied.**
- 3. That the permittee must submit evidence of execution and recording of the Corps-approved conservation easements and surveyed plat of the mitigation area to both the Corps of Engineers and DHEC not later than 180 days from the effective date of this authorization, or prior to commencement of the authorized work, whichever is later.**

Other Mitigative Actions: None proposed.

**9.0 Public Interest Review General Criteria: (33 CFR 320.4(a)(2))** - The following general criteria were considered in the public interest review.

- a. The relative extent of the public and private need for the proposed structure or work. The public benefits of the project include employment opportunities and an increase in the local tax base. Private benefits include land use and economic return on the property for the manufacturer and the local and state economy; transportation benefits include safety, capacity and adequate levels of service.
- b. There are no unresolved conflicts as to resource use. The proposed project would result in the loss of 192.94 acres of waters of the U.S. The proposed impacts to waters of the U.S. are unavoidable and there are no other conflicts regarding resource use.
- c. The extent and permanence of the beneficial and/or detrimental effects which the proposed work is likely to have on the public and private uses to which the area is suited. Detrimental impacts are expected to be minimal although they would be permanent in the construction area. The beneficial effects associated with utilization of the property would be permanent. As described in Section 6.0 of this document, the permittee will invest over \$1 billion in private investment to construct and operate the advanced manufacturing and assembly facility. The facility will employ approximately 4,000 people following completion of Phase 2 within a period of ten years.

Potential negative impacts include the loss of waters of the U.S., additional traffic on existing roadways,

increases in impervious surfaces, and stormwater on the project site. From the Corps' perspective, the loss of waters of the U.S. is more than offset by the proposed compensatory mitigation plan, and the potential increase in stormwater will be addressed during the review and approval of stormwater permits required pursuant to Section 402 of the Clean Water Act.

## 10. **Determinations**

### 10.1 **Public Hearing Request**

There were no requests for a public hearing. The Corps had no requests for a public hearing.

I have reviewed and evaluated the requests for a public hearing. There is sufficient information available to evaluate the proposed project; therefore, the requests for a public hearing were denied.

In response to the requests for a public hearing, I determined that a public hearing was appropriate.

### 10.2 **Section 176(c) of the Clean Air Act General Conformity Rule Review**

The proposed permit action has been analyzed for conformity applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act. It has been determined that the activities proposed under this permit will not exceed de minimis levels of direct or indirect emissions of a criteria pollutant or its precursors and are exempted by 40 CFR Part 93.153. Any later indirect emissions are generally not within the Corps' continuing program responsibility and generally cannot be predictably controlled by the Corps. For these reasons a conformity determination is not required for this permit action.

### 10.3 **EO 13175 Consultation with Indian Tribes, Alaska Natives and Native Hawaiians.**

This action does not have a substantial direct effect on one or more Indian tribes. As described above in Section 3.4.3, the Catawba Indian Nation commented that they have no concerns with regard to traditional cultural properties, sacred sites, or Native American archaeological sites within the boundaries of the project site. A special condition is included in this authorization to address the discovery of any Native American artifacts and/or human remains during the ground disturbance phases of this project.

### 10.4 **EO 11988 Floodplain Management**

The proposed project is not in a floodplain

The evaluations in this document considered alternatives to locating the project in the floodplain, and minimizing and compensating for effects on the floodplain and are discussed above.

### 10.5 **EO 12898 Environmental Justice**

In accordance with Title III of the Civil Rights Act of 1964 and Executive Order 12898, it has



been determined that the project would not directly or through contractual or other arrangements, use criteria, methods or practices that discriminate on the basis of race, color, or national origin, nor would it have a disproportionate effect on minority or low-income communities.

#### 10.6 **EO 13112 Invasive Species**

There were no invasive species issues involved.

The evaluation in this document included invasive species concerns in the analysis of effects at the project site and associated compensatory mitigation.

Through the following special conditions, the permittee will be required to control the introduction and spread of exotic species.

#### 10.7 **EO 13212 and 13302 Energy Supply and Availability**

The proposed project will not increase the production, transmission or conservation of energy, or strengthen pipeline safety.

This review was expedited or other actions were taken to the extent permitted by law and regulation to accelerate completion of this energy-related (including pipeline safety) project while maintaining safety, public health and environmental protections.

#### 10.8 **Finding of No Significant Impact (FONSI)**

While the proposed 192.94 acres of impacts to wetlands and other waters of the U.S. could be considered to have significant impacts, it is the Corps' determination that the proposed mitigation plan, including wetland preservation and enhancement activities, more than offsets the adverse effects to the Four Hole Swamp and Cypress Swamp watersheds, such that the net result would be less than significant impacts to the quality of the human environment.

Guidance issued by the Council on Environmental Quality (CEQ), titled "Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact," dated January 14, 2011, states as follows:

*"[A]gencies have increasingly considered mitigation measures in EAs to avoid or lessen potentially significant environmental effects of proposed actions that would otherwise need to be analyzed in an EIS. This use of mitigation may allow the agency to comply with NEPA's procedural requirements by issuing an EA and a Finding of No Significant Impact (FONSI), or 'mitigated FONSI,' based on the agency's commitment to ensure the mitigation that supports the FONSI is performed, thereby avoiding the need to prepare an EIS."*

In accordance with Corps regulations (33 CFR 325.4(a); 33 CFR Part 325, App. B, Par. 21; and 33 CFR 230.15), the Corps' mitigated FONSI determination is supported by multiple special conditions that will ensure that appropriate oversight and monitoring are conducted regarding the implementation of the mitigation plan underlying the Corps' determination.

Having reviewed the information provided by the applicant and all interested parties and an assessment of the environmental impacts, the undersigned finds that this permit action **will not** have a significant impact on the quality of the human environment. Therefore, an Environmental Impact Statement **will not** be required.

10.9 **Findings of compliance or non-compliance with the restrictions on discharge. (Sec. 230.12 of the 404(b)(1) Guidelines**

The proposed site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines.

The proposed disposal site for discharge or dredged or fill material complies with Section 404(b)(1) guidelines with the inclusion of conditions contained in this MFR.

The proposed disposal site for discharge of dredged or fill material does **not** comply with the Section 404(b)(1) guidelines for the following reasons:

There is a less damaging practicable alternative

The proposed discharge will result in significant degradation of the aquatic ecosystem

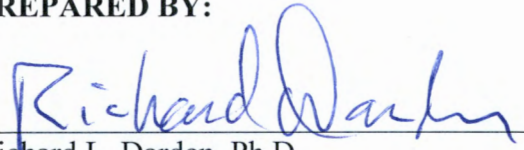
The proposed discharge does not include all practicable and appropriate measures to minimize potential harm to the aquatic ecosystem.

10.10 **Public Interest Determination**

The undersigned finds that the issuance of a Department of the Army permit **is not** contrary to the public interest.

10.11 The above determinations were based on consideration of the final project description and the imposition of special conditions, both of which are detailed in Appendix A.

**PREPARED BY:**

  
Richard L. Darden, Ph.D.  
Project Manager

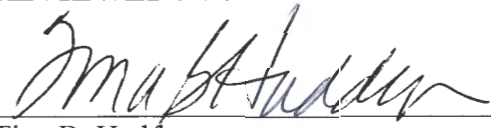
Date 7-9-2015

**REVIEWED BY:**

  
Travis G. Hughes  
Chief, Special Projects Branch

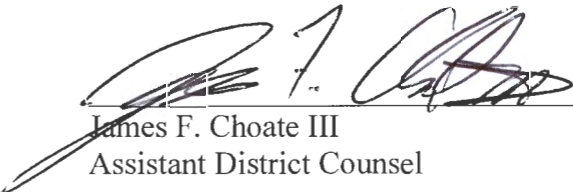
Date 7/9/2015

**REVIEWED BY:**

  
Tina B. Hadden  
Chief, Regulatory Division

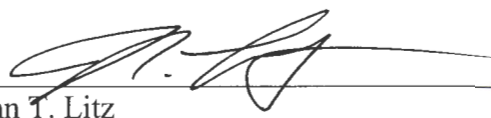
Date 7/9/2015

**REVIEWED BY:**

  
James F. Choate III  
Assistant District Counsel

Date 7/9/2015

**APPROVED BY:**

  
John T. Litz  
Lieutenant Colonel, U.S. Army  
District Commander

Date 09 JUL 15

## Appendix A

**Final project description:** The proposed work consists of placing 670,705 cubic yards of clean fill material in 192.94 acres, land clearing of 16.90 acres, excavating of 2.65 acres, and shading of 2.91 acres of wetlands and other waters to construct Phases 1 and 2 of the proposed project. Phase 1 will include the development of approximately 23,040,000 square feet of land for the construction of a manufacturing and production space. Phase 1 also involves the development of approximately 1,050,000 square feet of land for the construction of administrative offices and a visitor's center. The total footprint for Phase 1 is approximately 575 acres. Operating at full capacity, Phase 1 is expected to employ approximately 2,000 individuals at the manufacturing facility, administrative offices, and a visitor's center. Phase 2 will include the development of an additional 14,040,000 square feet of land for the construction of a second manufacturing, assembly, and production space occupying approximately 322 acres. While the timing of construction of Phase 2 is dependent on market conditions, it is expected to be constructed and operational within 10 years of the initiation of construction for Phase 1. Operating at full capacity, Phase 2 is expected to employ an additional 2,000 individuals at that facility. As mitigation for the proposed impacts to wetlands and waters, the applicant proposes the Project Soter—Landscape Mitigation Plan to preserve, enhance, and ecologically restore approximately 1,533 acres of wetlands within approximately 2,496 acres of property to be permanently protected in the Dean Swamp and Walnut Branch watersheds, tributaries of Four Hole Swamp that are defined by the National Audubon Society as critical priority areas in need of protection.

The applicant proposes to construct the proposed development in phases and has requested a 35 year permit for the proposed work.

### **Special Conditions:**

An \* denotes special conditions required by regulation. The rationale for all other special conditions is included in the evaluation in sections 4 through 8.

- A. That the permittee agrees to provide all contractors associated with construction of the authorized activity a copy of the permit and drawings. A copy of the permit will be available at the construction site at all times. \***
- B. That the permittee shall submit a signed compliance certification to the Corps within 60 days following completion of the authorized work and any required mitigation. The certification will include:**
  - 1. A copy of this permit;**
  - 2. A statement that the authorized work was done in accordance with the Corps authorization, including any general or specific conditions;**
  - 3. A statement that any required mitigation was completed in accordance with the permit conditions;**
  - 4. The signature of the permittee certifying the completion of the work and mitigation.\***

**C. That the permittee recognizes that its commitment to perform and implement the following conditions was a deciding factor toward the favorable and timely decision on this permit and that the permittee recognizes that a failure on its part to both actively pursue and implement these conditions may be grounds for modification, suspension or revocation of this Department of the Army authorization:**

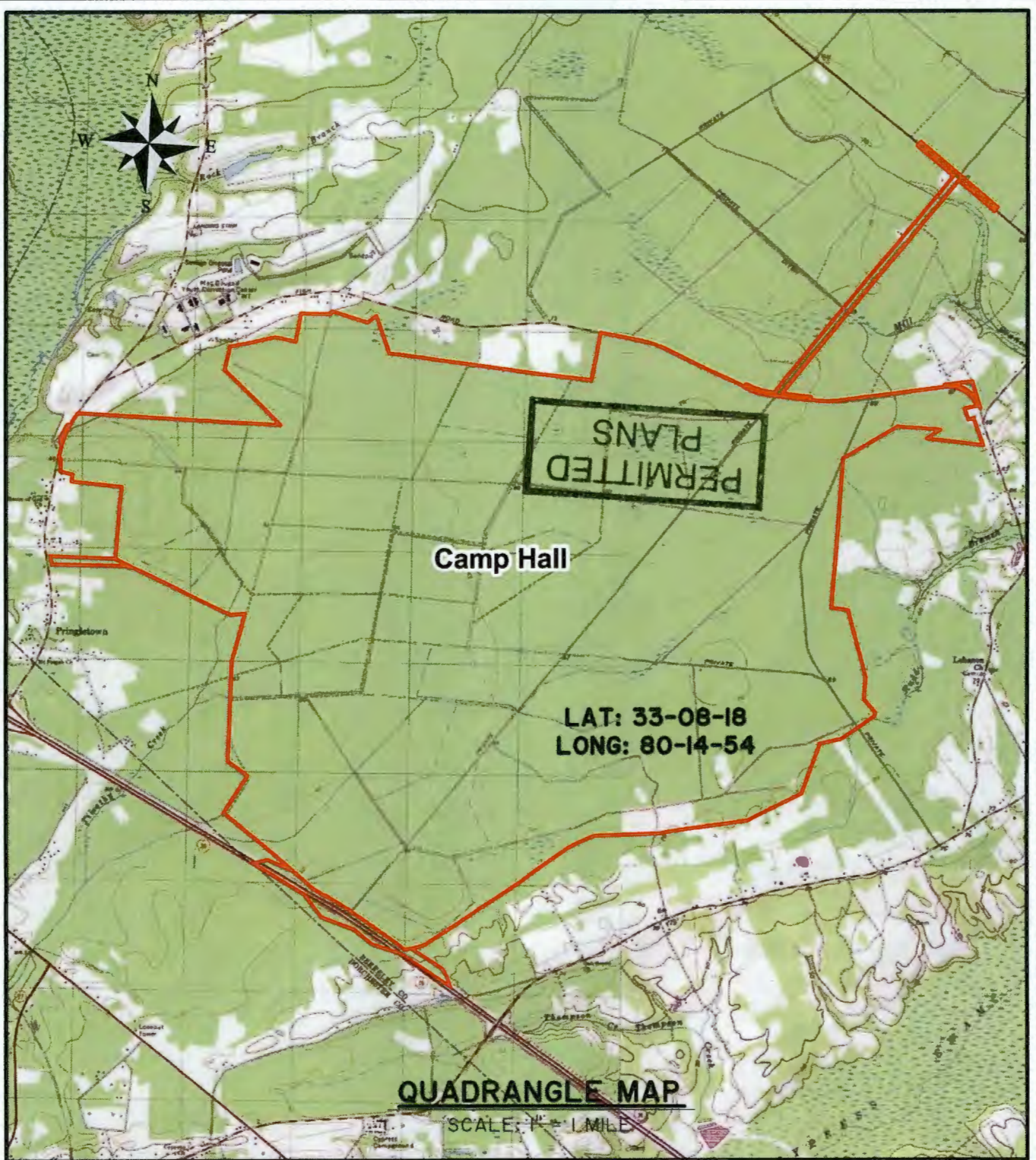
- 1. That as compensatory mitigation to offset impacts to aquatic resources, the permittee will implement and fully comply with the “Project Soter – Landscape Mitigation Plan” dated April 10, 2015 (revised July 8, 2015) (the Plan), including the provision to provide \$1.5 million into an escrow account to be held by Lord Berkeley Conservation Trust, and to also provide a Corps-approved performance bond as financial assurance for the mitigation activities proposed in the Plan. Your responsibility to complete the Plan as set forth in this Special Condition will not be considered fulfilled until you have demonstrated mitigation success and have received written verification from the U.S. Army Corps of Engineers (Corps).**
- 2. The permittee understands and agrees that a Corps-approved performance bond must be in place prior to commencement of the authorized work, and may not be terminated until the Corps verifies in writing that the compensatory mitigation requirement for the proposed project has been satisfied.**
- 3. That the permittee must submit evidence of execution and recording of the Corps-approved conservation easements and surveyed plat of the mitigation area to both the Corps and DHEC not later than 180 days from the effective date of this authorization, or prior to commencement of the authorized work, whichever is later.**

**D. That the permittee agrees to utilize best management practices during construction and perform the work as proposed. The permittee must implement practices that will minimize erosion and migration of sediments on and off the project site during and after construction. These practices should include the use of appropriate grading and sloping techniques, mulches, silt fences, or other devices capable of preventing erosion, migration of sediments and bank failure. All disturbed land surfaces and sloped areas affected by the project must be stabilized.**

- 1. All necessary steps must be taken to prevent oil, tar, trash, debris, and other pollutants from entering the adjacent waters or wetlands.**
- 2. Land disturbing activities must avoid encroachment into any wetland areas outside the permitted impact area.**
- 3. Upon completion of construction activities, all disturbed areas, which are not paved, must be permanently stabilized with a vegetative cover. This may include sprigging trees, shrubs, vines or ground cover.**

- E. That the permittee agrees that the drainage/conveyance system shall be designed by a licensed Professional Engineer (PE) and constructed by the permittee (or his designated assignee) to provide for the proper drainage of surface water of the drainage area of which it is a part, to permit the flow of natural or manmade watercourses, and to maintain positive drainage for adjacent properties. In addition, the drainage/conveyance system shall be sufficient to prevent any appreciable increase in water surface elevations or expansion/increases of the flood hazard area.**
  
- F. That the permittee agrees to stop work and to notify this office immediately if any previously unknown historic or archaeological remains are discovered while accomplishing the activity authorized by this permit. The Corps will initiate the Federal, State, and/or Tribal coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.**

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# PROJECT SOTER

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015

JOB NUMBER: 25492

DRAWN BY: MAM

REVIEWED BY: MBS

SHEET: 1 of 35

SCALE: 1" = 1'

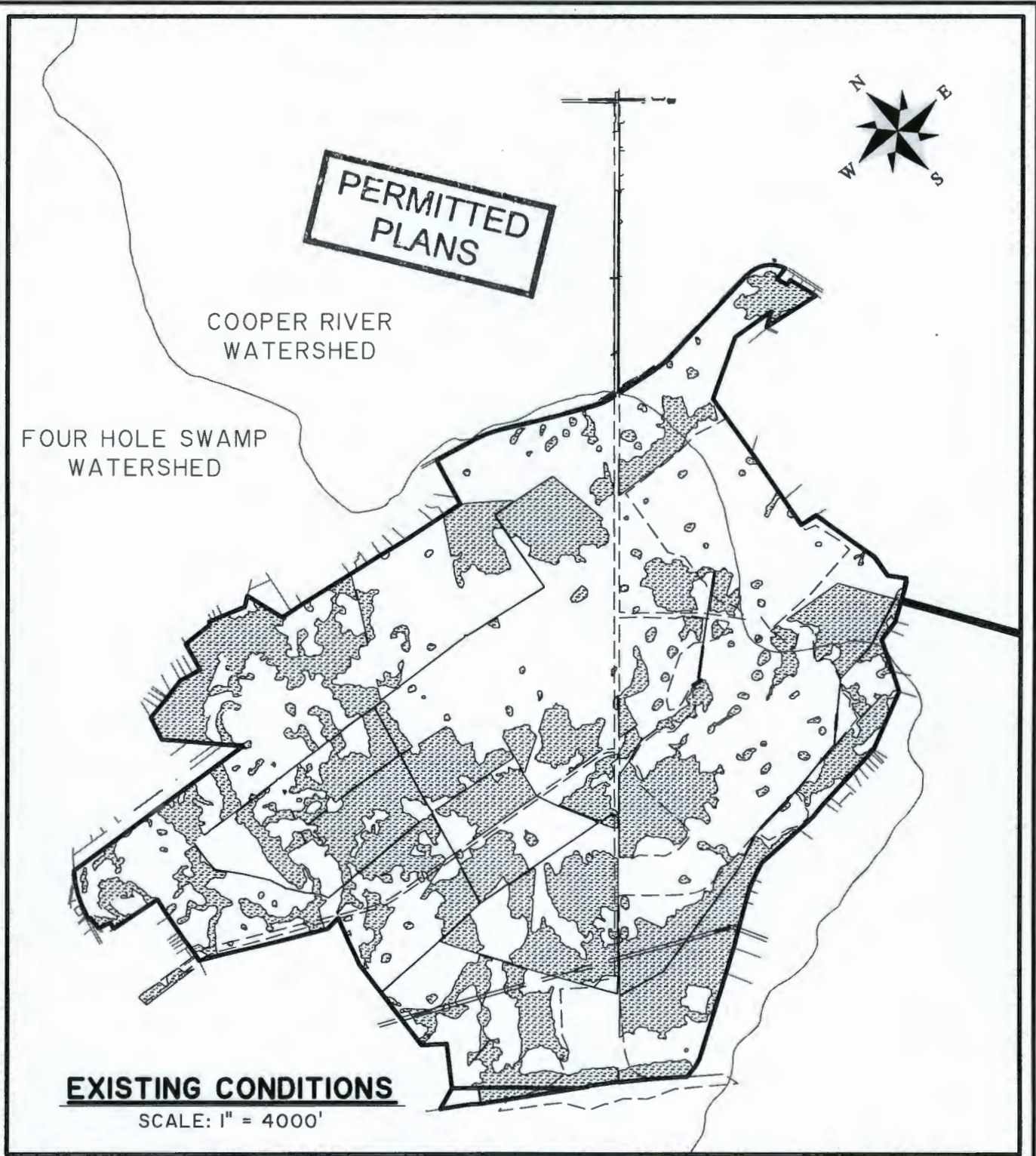


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DRAWN BY: MAM  
REVIEWED BY: MBS

SHEET: 2 of 35  
SCALE: 1" = 4000'



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**FILL  
AREA**



**WATERS OF THE US IMPACT SUMMARY**

**NON JURISDICTIONAL**

**JURISDICTIONAL**

**TOTAL**

**EXCAVATION**

**2.65 ACRES**

**0 ACRES**

**2.65 ACRES**

**LAND CLEARING**

**0 ACRES**

**16.90 ACRES**

**16.90 ACRES**

**RPW FILL**

**0 ACRES**

**1.23 ACRES**

**1.23 ACRES**

**RPW EXCAVATION**

**0 ACRES**

**0.62 ACRES**

**0.62 ACRES**

**SHADING**

**0 ACRES**

**2.91 ACRES**

**2.91 ACRES**

**SITE DEVELOPMENT FILL**

**20.49 ACRES**

**171.22 ACRES**

**191.71 ACRES**

**TOTAL**

**23.14 ACRES**

**192.88 ACRES**

**216.02 ACRES**

**PERMITTED  
PLANS**

**PROJECT SOTER**

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**WETLAND FILL**

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LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015  
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DRAWN BY: MAM  
REVIEWED BY: MBS

SHEET: 3 of 35  
SCALE: N/A

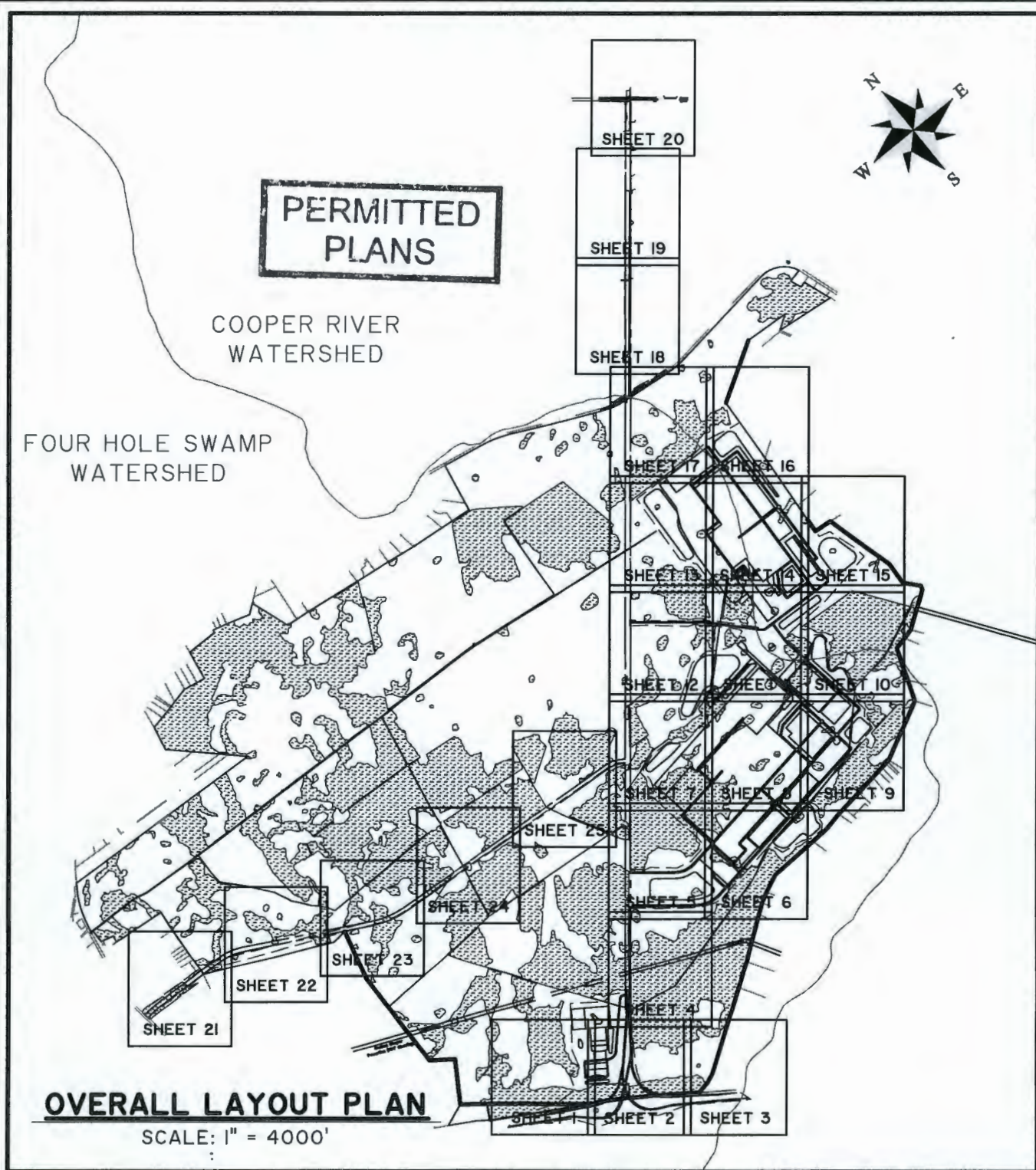


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REVIEWED BY: MBS

SHEET: 4 of 35

SCALE: 1" = 4000'

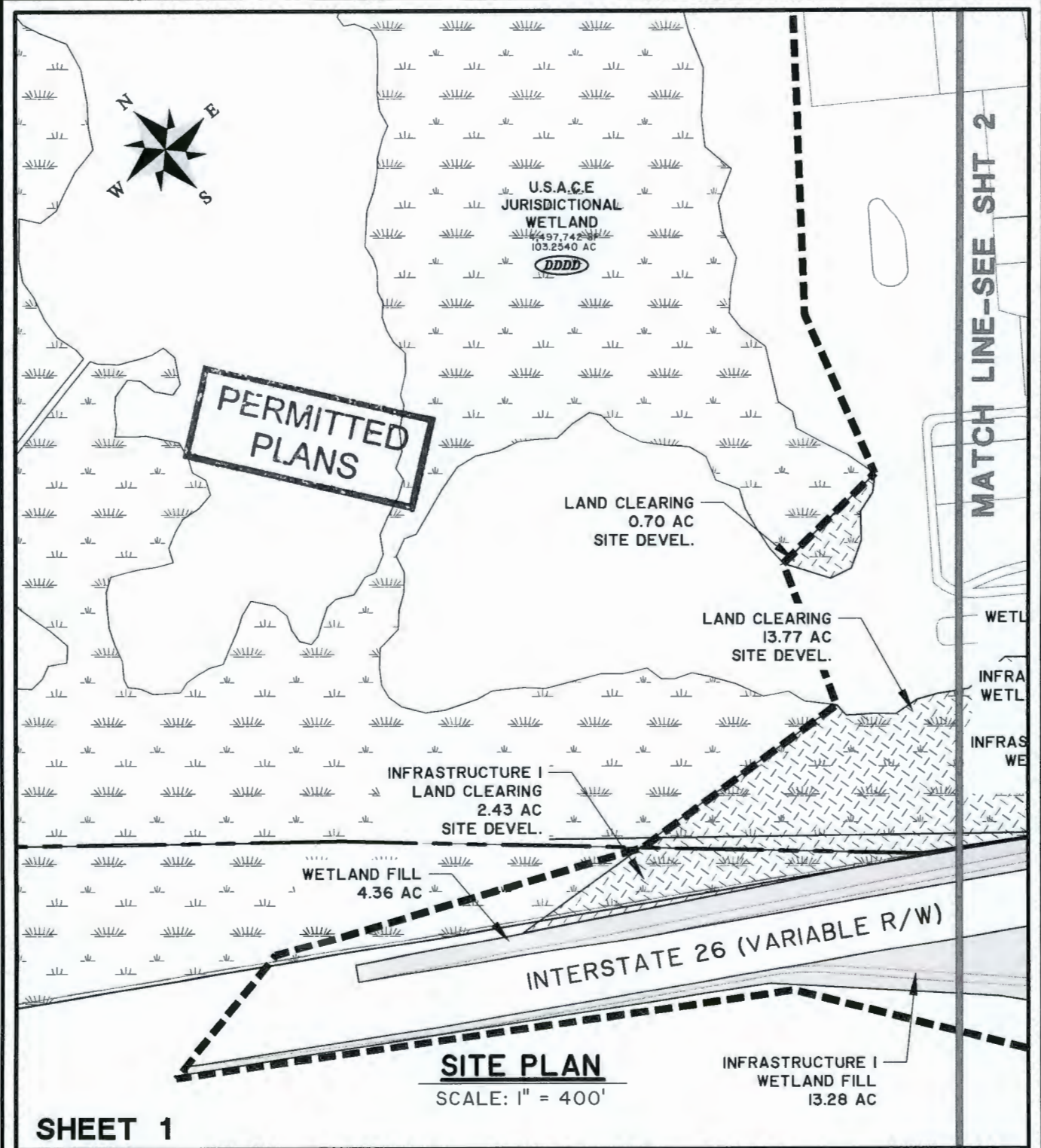


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SHEET: 5 of 35

SCALE: 1" = 400'

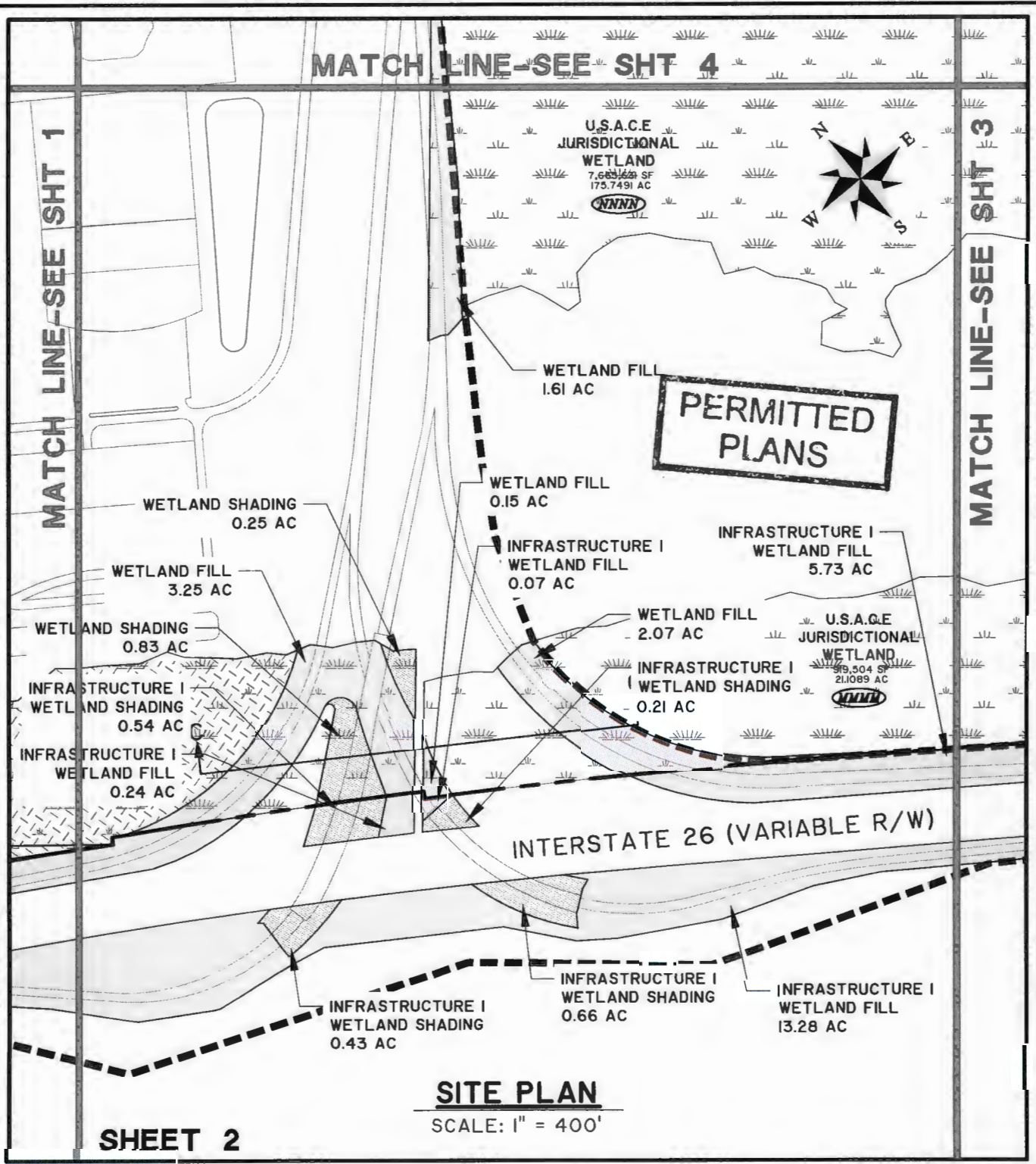


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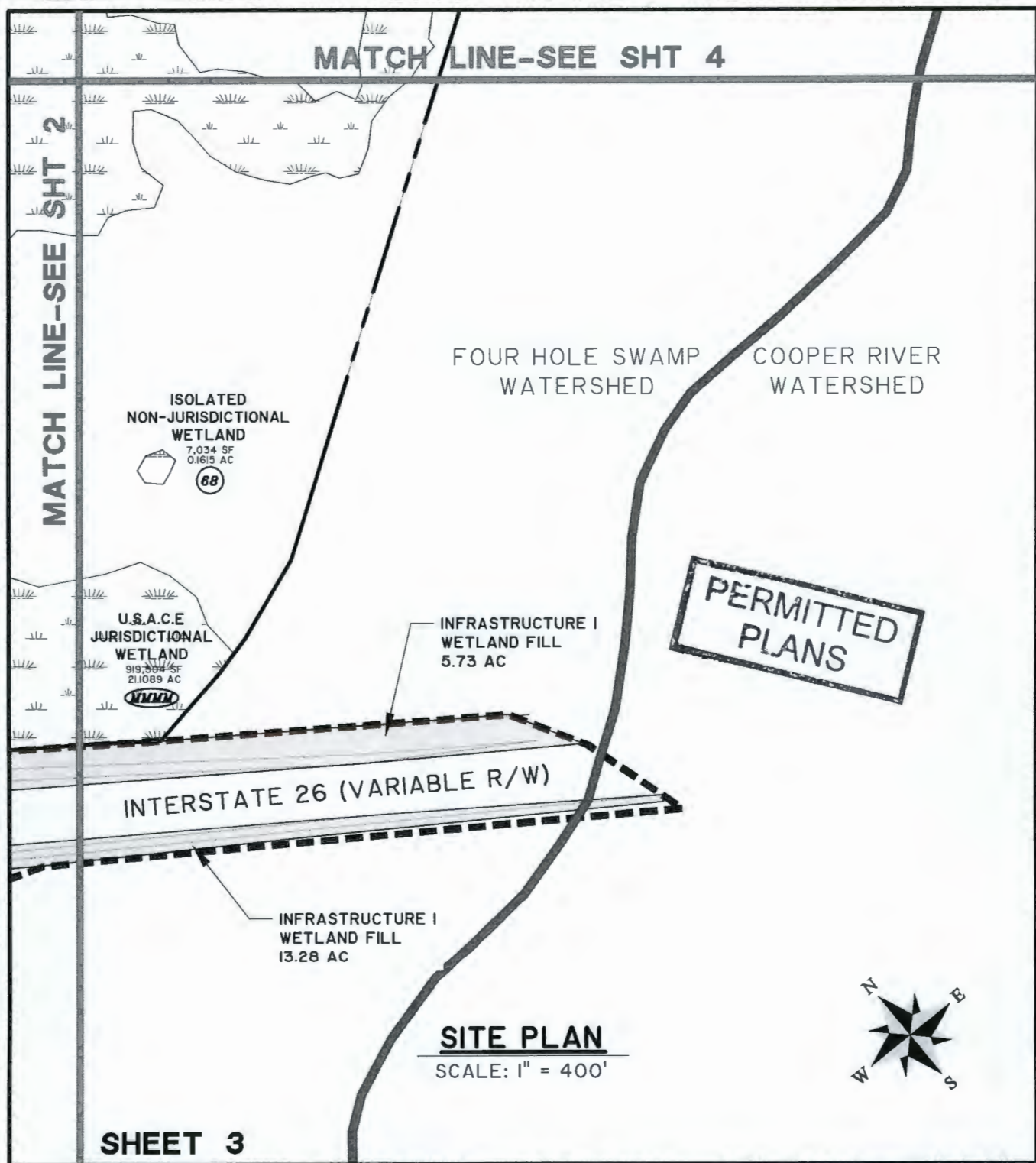


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SHEET: 7 of 35

SCALE: 1" = 400'



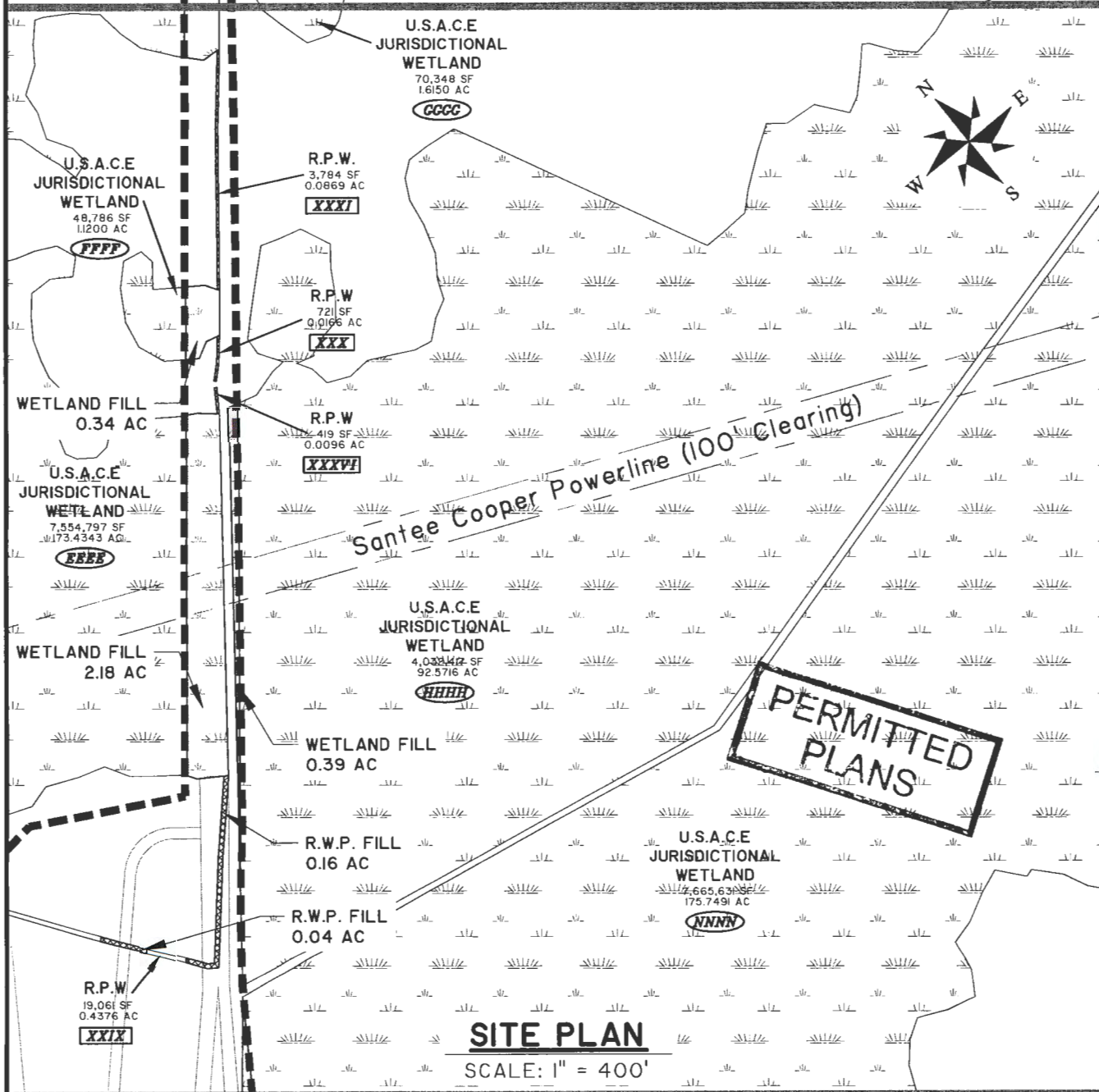
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MATCH LINE-SEE SHT 5



Santee Cooper Powerline (100' Clearing)

PERMITTED PLANS

**SITE PLAN**

SCALE: 1" = 400'

MATCH LINE-SEE SHT 2

**SHEET 4**

**PROJECT SOTER**

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WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC  
DATE: APRIL 2, 2015  
JOB NUMBER: 25492

DRAWN BY: MAM  
REVIEWED BY: MBS  
SHEET: 8 of 35  
SCALE: 1" = 400'



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MATCH LINE-SEE SHT 25

MATCH LINE-SEE SHT 7

MATCH LINE-SEE SHT 6

# SITE PLAN

SCALE: 1" = 400'

U.S.A.C.E JURISDICTIONAL WETLAND  
1,357,852 SF  
31,715 AC



WETLAND FILL  
0.25 AC

U.S.A.C.E JURISDICTIONAL WETLAND  
3,660,342 SF  
129,946 AC



WETLAND FILL  
0.73 AC

WETLAND FILL  
63.46 AC

U.S.A.C.E JURISDICTIONAL WETLAND  
116,768 SF  
2,680 AC



WETLAND FILL  
0.94 AC

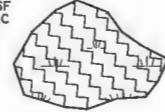
PERMITTED PLANS

CENTERLINE ROAD  
(150' R/W)

WETLAND FILL  
3.28 AC

ISOLATED NON-JURISDICTIONAL WETLAND

51,262 SF  
1,176 AC



U.S.A.C.E JURISDICTIONAL WETLAND  
7,554,797 SF  
173,443 AC



U.S.A.C.E JURISDICTIONAL WETLAND  
70,349 SF  
1,615 AC



SHEET 5

MATCH LINE-SEE SHT 4

## PROJECT SOTER

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015

JOB NUMBER: 25492

DRAWN BY: MAM

REVIEWED BY: MRS

SHEET: 9 of 35

SCALE: 1" = 400'

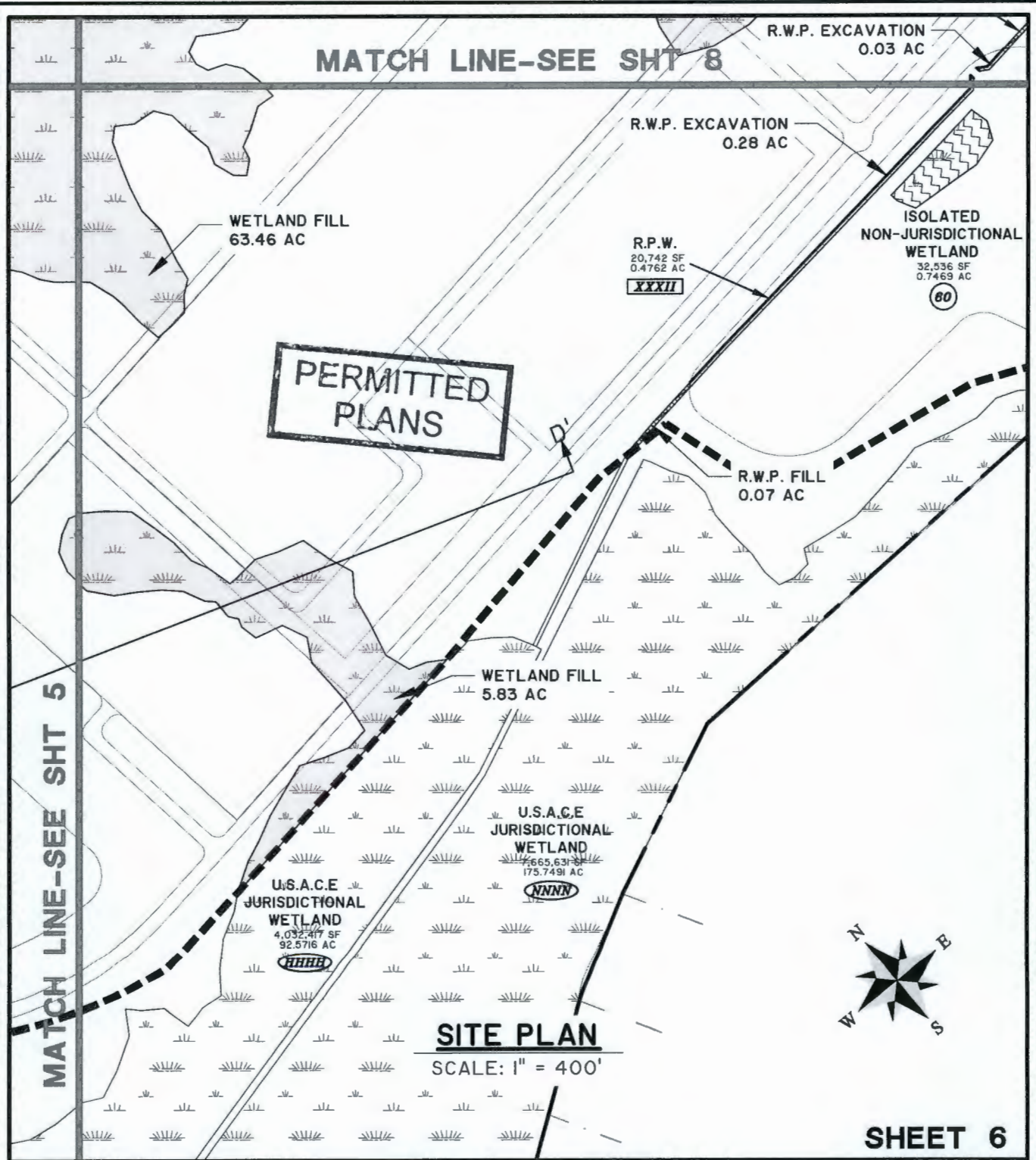


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# PROJECT SOTER

PROPOSED ACTIVITY:  
**WETLAND FILL**

CLIENT:  
**BERKELEY COUNTY ECONOMIC DEVELOPMENT**

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015

JOB NUMBER: 25492

DRAWN BY: MAM

REVIEWED BY: MBS

SHEET: 10 of 35

SCALE: 1" = 400'



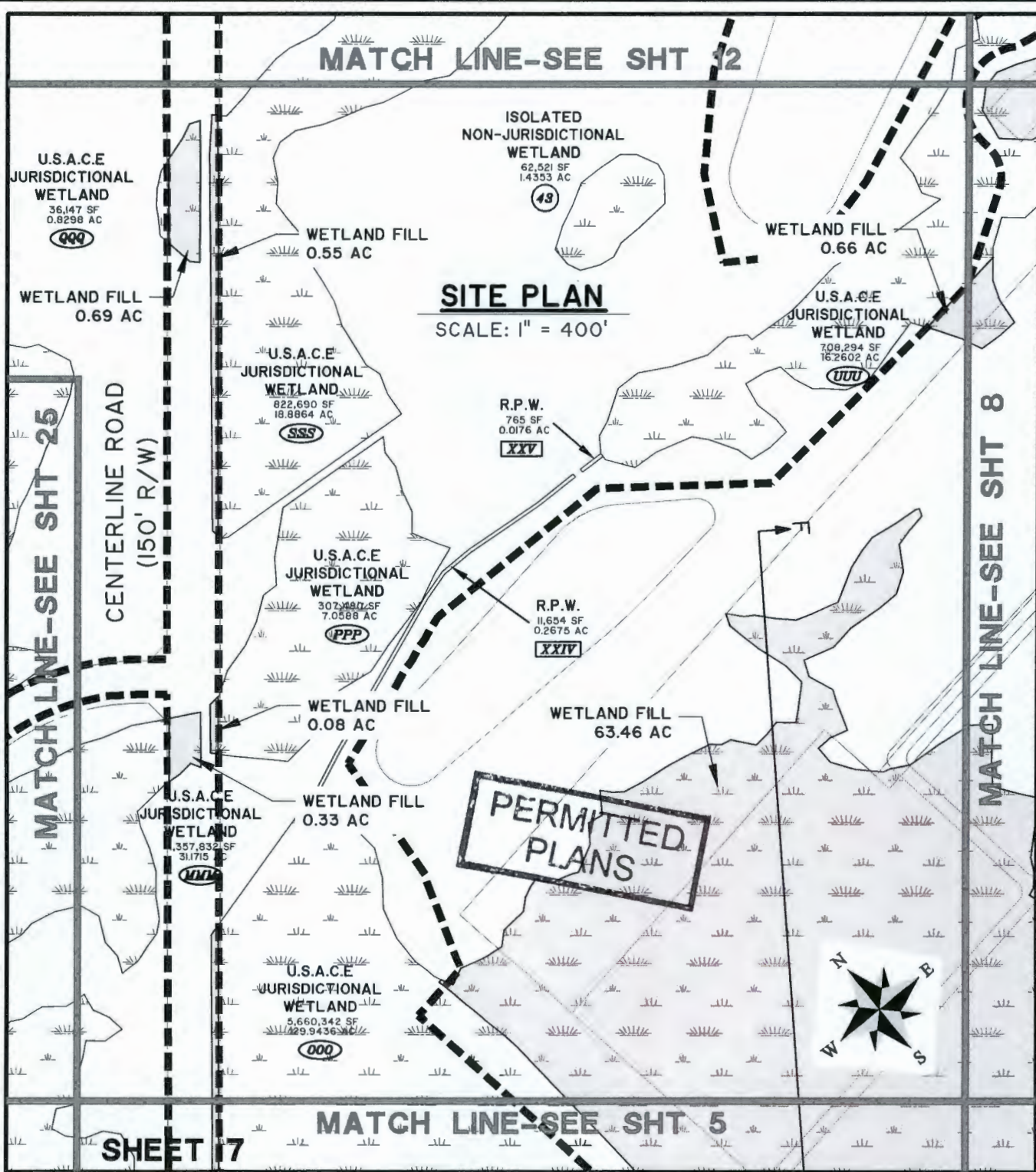
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# PROJECT SOTER

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015  
JOB NUMBER: 25492

DRAWN BY: MAM  
REVIEWED BY: MBS

SHEET: 11 of 35  
SCALE: 1" = 400'

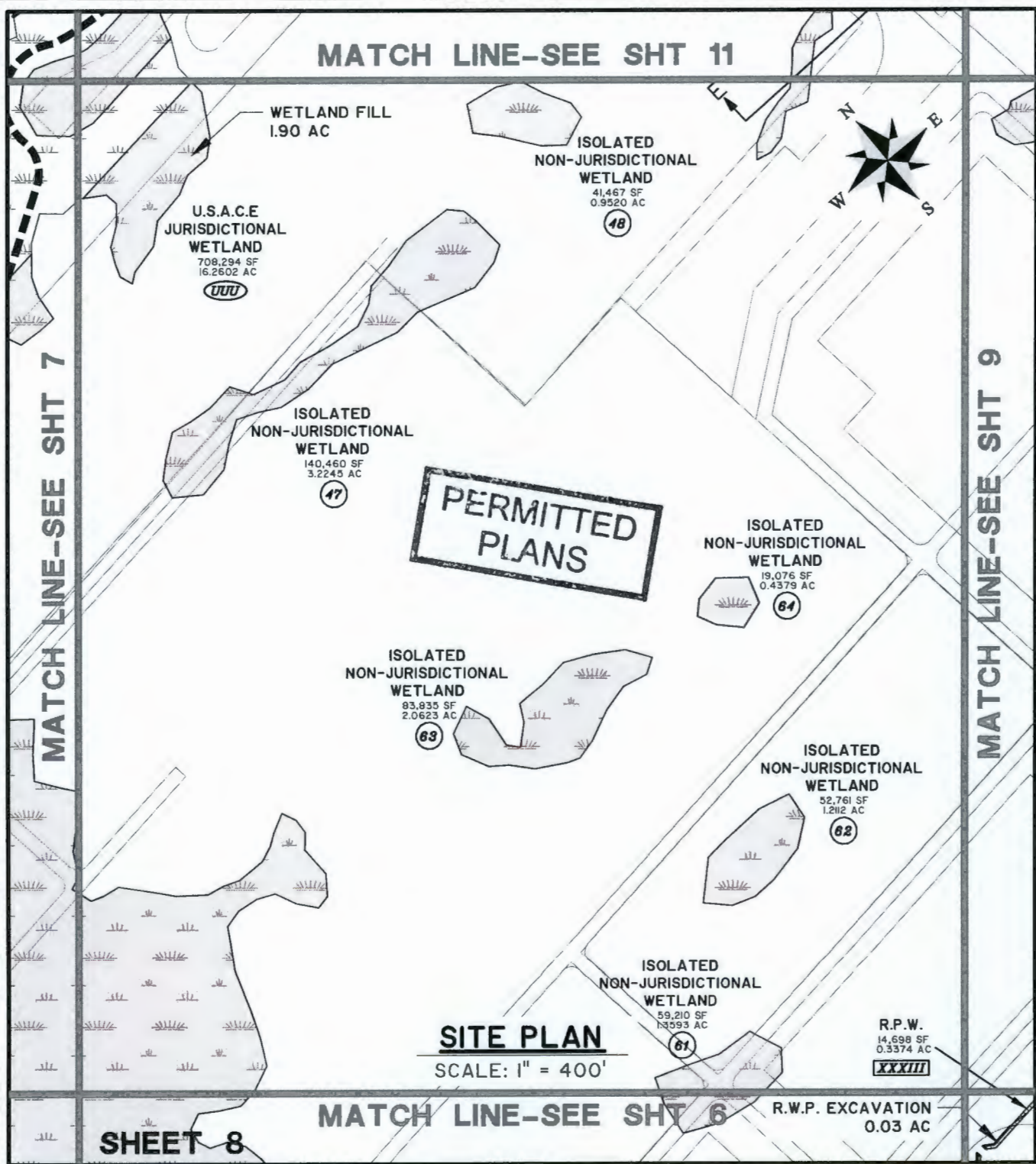


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# PROJECT SOTER

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC	DRAWN BY: MAM	SHEET: 12 of 35
DATE: APRIL 2, 2015	REVIEWED BY: MBS	SCALE: 1" = 400'
JOB NUMBER: 25492		



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MATCH LINE-SEE SHT 10

MATCH LINE-SEE SHT 8

U.S.A.C.E JURISDICTIONAL WETLAND  
31,884 SF  
0.7319 AC  
**XXX**

R.P.W.  
25,088 SF  
0.5739 AC  
**XXXIV**

R.W.P. FILL  
0.18 AC

U.S.A.C.E JURISDICTIONAL WETLAND  
298,949 SF  
6.8334 AC  
**KKKX**

ISOLATED NON-JURISDICTIONAL WETLAND  
41,499 SF  
0.9527 AC  
**67**

R.W.P. EXCAVATION  
0.10 AC

ISOLATED NON-JURISDICTIONAL WETLAND  
31,155 SF  
0.7152 AC  
**68**

R.W.P. FILL  
0.23 AC

ISOLATED NON-JURISDICTIONAL WETLAND  
60,568 SF  
1.3904 AC  
**65**

U.S.A.C.E JURISDICTIONAL WETLAND  
2301,783 SF  
48.2503 AC  
**III**

**PERMITTED PLANS**

R.R.W.  
14,698 SF  
0.3374 AC  
**XXXIII**

R.W.P. FILL  
0.31 AC

**SITE PLAN**  
SCALE: 1" = 400'



**SHEET 9**

### PROJECT SOTER

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015

JOB NUMBER: 25492

DRAWN BY: MAM

REVIEWED BY: MBS

SHEET: 13 of 35

SCALE: 1" = 400'



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MATCH LINE-SEE SHT 15

MATCH LINE-SEE SHT 11

### SITE PLAN

SCALE: 1" = 400'

**PERMITTED  
PLANS**

U.S.A.C.E  
JURISDICTIONAL  
WETLAND  
42037.497 SF  
92.6882 AC

YYY

COOPER RIVER  
WATERSHED

WETLAND FILL  
12.83 AC

FOUR HOLE SWAMP  
WATERSHED

U.S.A.C.E  
JURISDICTIONAL  
WETLAND  
577,645 SF  
13.2809 AC

LLL

U.S.A.C.E  
JURISDICTIONAL  
WETLAND  
836,636 SF  
19.2065 AC

YYY



MATCH LINE-SEE SHT 9

SHEET 10

## PROJECT SOTER

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015

JOB NUMBER: 25492

DRAWN BY: MAM

REVIEWED BY: MBS

SHEET: 14 of 35

SCALE: 1" = 400'

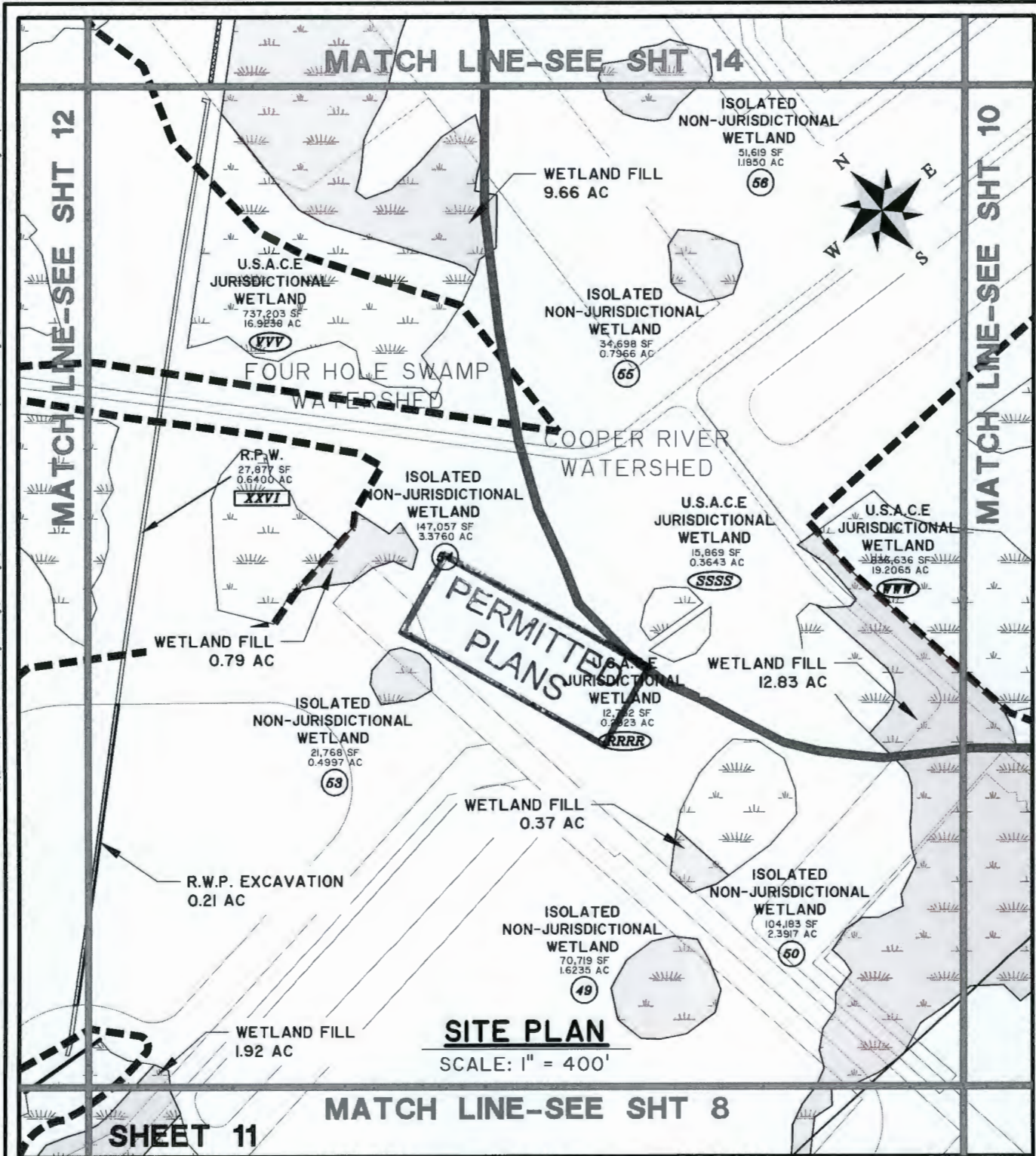


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## PROJECT SOTER

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015

JOB NUMBER: 25492

DRAWN BY: MAM

REVIEWED BY: MBS

SHEET: 15 of 35

SCALE: 1" = 400'



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CENTERLINE ROAD  
(150' R/W)

MATCH LINE-SEE SHT 13

ISOLATED  
NON-JURISDICTIONAL  
WETLAND  
35,022 SF  
0.8040 AC  
(31)

U.S.A.C.E  
JURISDICTIONAL  
WETLAND  
1,832,551 SF  
42.0696 AC  
(AA)

ISOLATED  
NON-JURISDICTIONAL  
WETLAND  
25,002 SF  
0.5740 AC  
(32)

ISOLATED  
NON-JURISDICTIONAL  
WETLAND  
90,276 SF  
2.0725 AC  
(48)

U.S.A.C.E  
JURISDICTIONAL  
WETLAND  
283,900 SF  
6.5175 AC  
(TTT)

**PERMITTED  
PLANS**

ISOLATED  
NON-JURISDICTIONAL  
WETLAND  
68,223 SF  
1.5662 AC  
(46)

U.S.A.C.E  
JURISDICTIONAL  
WETLAND  
20,089 SF  
0.4612 AC  
(RRR)

WETLAND FILL  
0.13 AC

U.S.A.C.E  
JURISDICTIONAL  
WETLAND  
822,690 SF  
18.8864 AC  
(SSS)

ISOLATED  
NON-JURISDICTIONAL  
WETLAND  
44,953 SF  
1.0321 AC  
(7)

**SITE PLAN**  
SCALE: 1" = 400'

MATCH LINE-SEE SHT 11

SHEET 12

MATCH LINE-SEE SHT 7

### PROJECT SOTER

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC  
DATE: APRIL 2, 2015  
JOB NUMBER: 25492

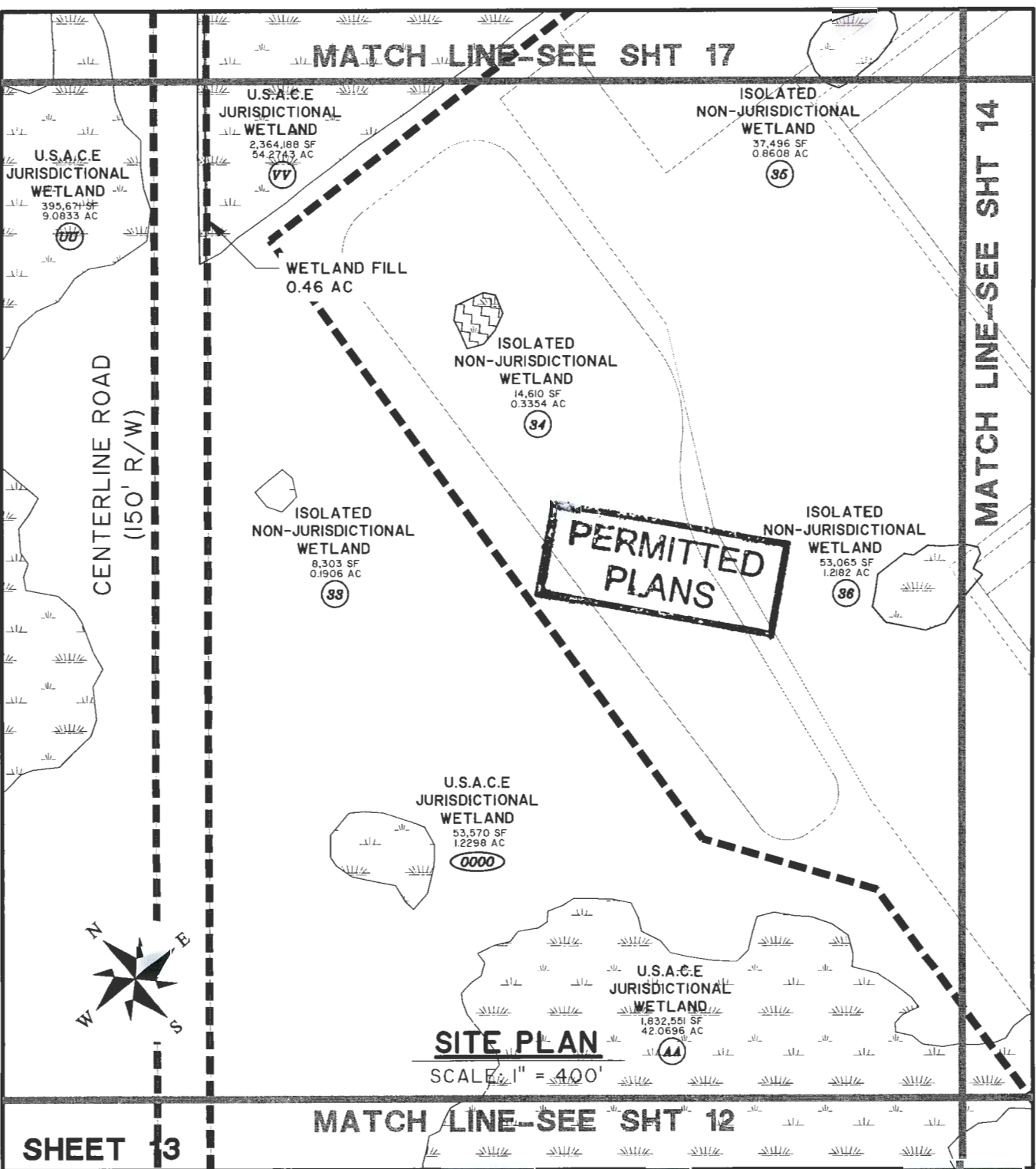
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REVIEWED BY: MRS  
SHEET: 16 of 35  
SCALE: 1" = 400'

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# PROJECT SOTER

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015  
JOB NUMBER: 25492

DRAWN BY: MAM  
REVIEWED BY: MBS

SHEET: 17 of 35  
SCALE: 1" = 400'



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MATCH LINE-SEE SHT 16

# SITE PLAN

SCALE: 1" = 400'

**PERMITTED  
PLANS**

WETLAND FILL  
1.67 AC

U.S.A.C.E  
JURISDICTIONAL  
WETLAND  
101,927 SF  
2.3399 AC  
(XX)

U.S.A.C.E  
JURISDICTIONAL  
WETLAND  
28,738 SF  
0.6597 AC  
(YY)

FOUR HOLE SWAMP  
WATERSHED

COOPER RIVER  
WATERSHED

ISOLATED  
NON-JURISDICTIONAL  
WETLAND  
15,087 SF  
0.3464 AC  
(37)

U.S.A.C.E  
JURISDICTIONAL  
WETLAND  
1,832,551 SF  
42.0696 AC  
(AA)

WETLAND FILL  
1.23 AC

R.P.W.  
3,637 SF  
0.0835 AC  
(XXVII)

WETLAND FILL  
9.66 AC

U.S.A.C.E  
JURISDICTIONAL  
WETLAND  
737,203 SF  
16.9238 AC  
(VVV)



MATCH LINE-SEE SHT 13

MATCH LINE-SEE SHT 15

MATCH LINE-SEE SHT 11

SHEET 14

## PROJECT SOTER

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015

JOB NUMBER: 25492

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REVIEWED BY: MBS

SHEET: 18 of 35

SCALE: 1" = 400'



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# SITE PLAN

SCALE: 1" = 400'



**PERMITTED  
PLANS**

MATCH LINE--SEE SHT 14

ISOLATED  
NON-JURISDICTIONAL  
WETLAND



17,161 SF  
0.3940 AC

67

U.S.A.C.E  
JURISDICTIONAL  
WETLAND



46,054 SF  
1.0573 AC

222

MATCH LINE--SEE SHT 10

**SHEET 15**

## PROJECT SOTER

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015

JOB NUMBER: 25492

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REVIEWED BY: MBS

SHEET: 19 of 35

SCALE: 1" = 400'



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# SITE PLAN

SCALE: 1" = 400'



MATCH LINE-SEE SHT 17

**PERMITTED  
PLANS**

ISOLATED  
NON-JURISDICTIONAL  
WETLAND  
21,359 SF  
0.4853 AC  
**38**

U.S.A.C.E  
JURISDICTIONAL  
WETLAND  
45,803 SF  
1.0515 AC  
**37**

**SHEET 16**

MATCH LINE-SEE SHT 14

## PROJECT SOTER

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015

JOB NUMBER: 25492

DRAWN BY: MAM

REVIEWED BY: MRS

SHEET: 20 of 35

SCALE: 1" = 400'

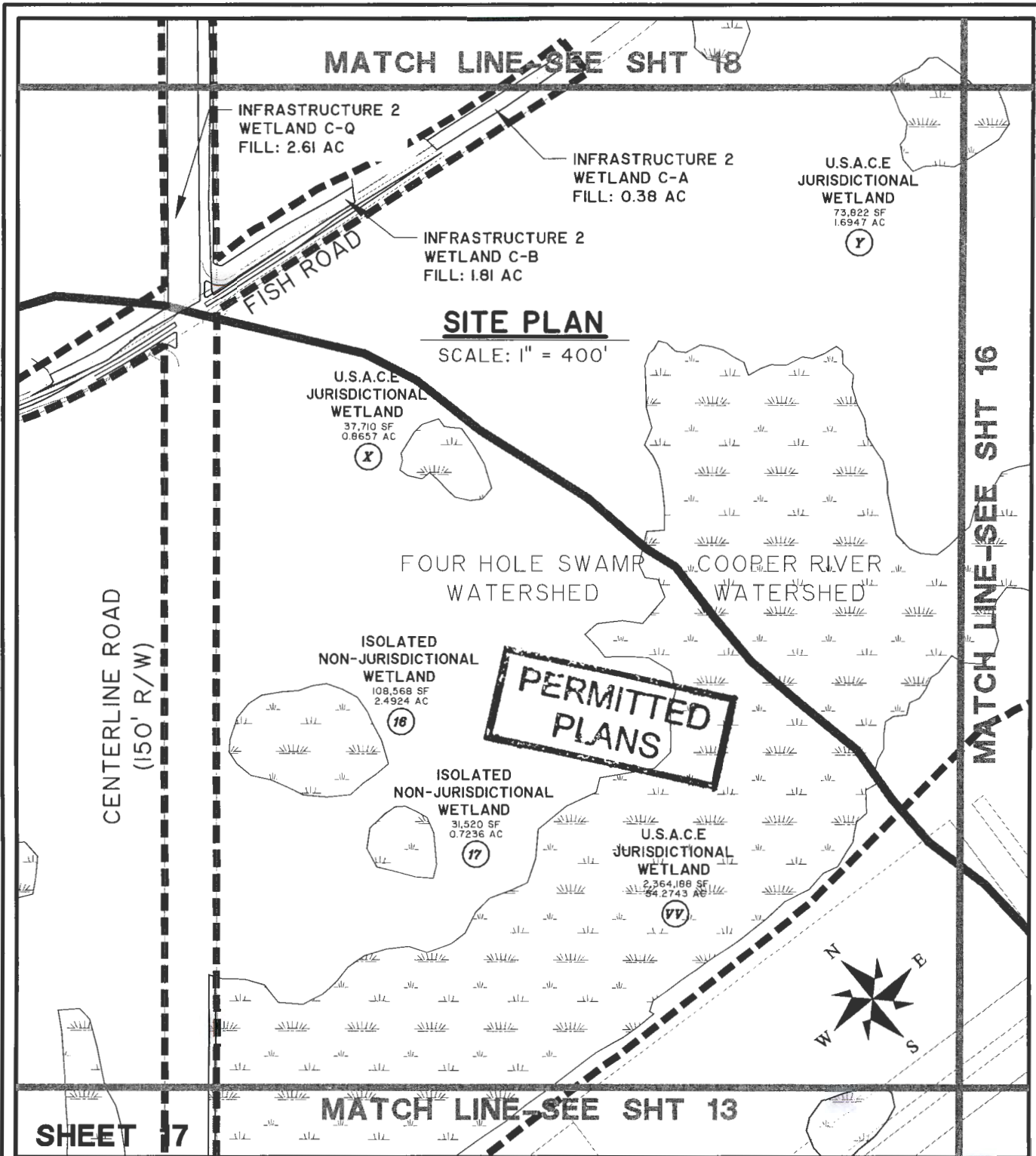


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**PROJECT SOTER**  
 PROPOSED ACTIVITY:  
**WETLAND FILL**  
 CLIENT:  
**BERKELEY COUNTY ECONOMIC DEVELOPMENT**  
 LOCATION: BERKELEY COUNTY, SC  
 DATE: APRIL 2, 2015      DRAWN BY: MAM      SHEET: 21 of 35  
 JOB NUMBER: 25492      REVIEWED BY: MBS      SCALE: 1" = 400'

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MATCH LINE-SEE SHT 19

INFRASTRUCTURE 2  
WETLAND C-P  
FILL: 5.43 AC

INFRASTRUCTURE 2  
WETLAND C-B  
FILL: 0.87 AC



**PERMITTED  
PLANS**

CENTERLINE ROAD  
(150' R/W)

INFRASTRUCTURE 2  
WETLAND C-B  
FILL: 1.81 AC

INFRASTRUCTURE 2  
WETLAND C-V  
FILL: 4.47 AC

**SITE PLAN**

SCALE: 1" = 400'

**SHEET 18**

MATCH LINE-SEE SHT 17

**PROJECT SOTER**

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015

JOB NUMBER: 25492

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REVIEWED BY: MBS

SHEET: 22 of 35

SCALE: 1" = 400'



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MATCH LINE-SEE SHT 20



**PERMITTED  
PLANS**

CENTERLINE ROAD  
(150' R/W)

INFRASTRUCTURE 2  
WETLAND C-F  
FILL: 0.90 AC

INFRASTRUCTURE 2  
WETLAND C-P  
FILL: 5.43 AC

INFRASTRUCTURE 2  
WETLAND C-B  
FILL: 0.87 AC

**SITE PLAN**  
SCALE: 1" = 400'

**SHEET 19**

MATCH LINE-SEE SHT 18

**PROJECT SOTER**

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC  
DATE: APRIL 2, 2015      DRAWN BY: MAM      SHEET: 23 of 35  
JOB NUMBER: 25492      REVIEWED BY: MBS      SCALE: 1" = 400'

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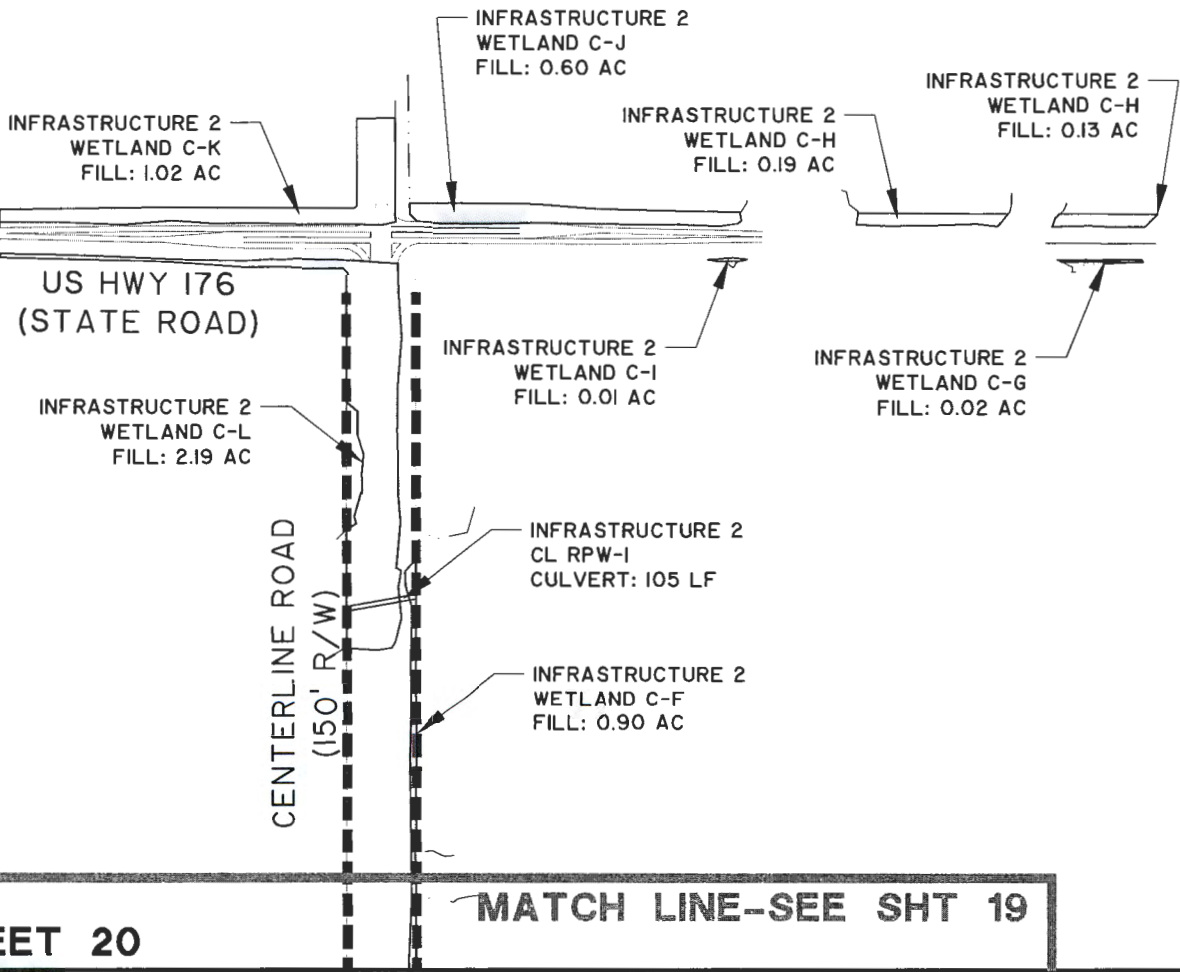
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# SITE PLAN

SCALE: 1" = 400'



**PERMITTED  
PLANS**



**SHEET 20**

**MATCH LINE--SEE SHT 19**

## PROJECT SOTER

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015  
JOB NUMBER: 25492

DRAWN BY: MAM  
REVIEWED BY: MBS

SHEET: 24 of 35  
SCALE: 1" = 400'

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INFRASTRUCTURE I  
WETLAND FILL  
1.96 AC

INFRASTRUCTURE I  
WETLAND FILL  
1.34 AC

WETLAND FILL  
1.00 AC

U.S.A.C.E  
JURISDICTIONAL  
WETLAND  
1,636,086 SF  
37.5594 AC

PP

U.S.A.C.E  
JURISDICTIONAL  
WETLAND  
1,636,086 SF  
37.5594 AC

SC HWY 27 (OLD GILLIARD RD)

LOWER WESTVICO ROAD  
(120' R/W)

PERMITTED  
PLANS

**SITE PLAN**

SCALE: 1" = 400'

**SHEET 21**

**PROJECT SOTER**

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015

JOB NUMBER: 25492

DRAWN BY: MAM

REVIEWED BY: MBS

SHEET: 25 of 35

SCALE: 1" = 400'



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MATCH LINE--SEE SHT 21

U.S.A.C.E  
JURISDICTIONAL  
WETLAND  
1,636,086 SF  
37.5594 AC

PP

U.S.A.C.E  
JURISDICTIONAL  
WETLAND  
956,431 SF  
21.9566 AC

BB

LOWER WESTVACO ROAD  
(120' R/W)

WETLAND FILL  
1.31 AC

WETLAND FILL  
0.37 AC

U.S.A.C.E  
JURISDICTIONAL  
WETLAND  
16,422 SF  
0.3778 AC

GC

PERMITTED  
PLANS

**SITE PLAN**

SCALE: 1" = 400'



MATCH LINE--SEE SHT 23

**SHEET 22**

**PROJECT SOTER**

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015

JOB NUMBER: 25492

DRAWN BY: MAM

REVIEWED BY: MBS

SHEET: 26 of 35

SCALE: 1" = 400'



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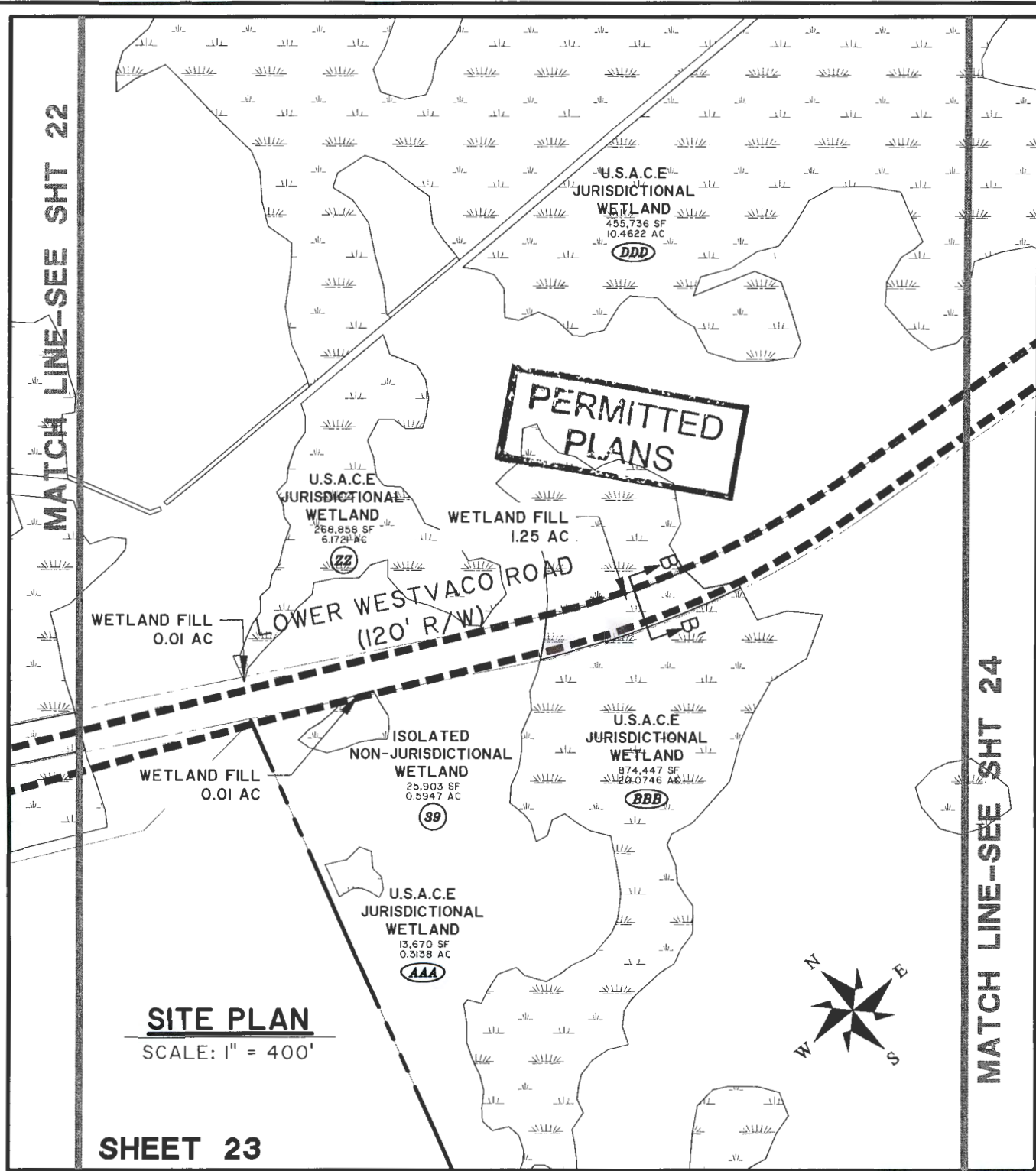
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MATCH LINE-SEE SHT 22

MATCH LINE-SEE SHT 24



**SITE PLAN**  
SCALE: 1" = 400'

**SHEET 23**

### PROJECT SOTER

PROPOSED ACTIVITY:  
**WETLAND FILL**

CLIENT:  
**BERKELEY COUNTY ECONOMIC DEVELOPMENT**

LOCATION: BERKELEY COUNTY, SC  
 DATE: APRIL 2, 2015  
 JOB NUMBER: 25492

DRAWN BY: MAM  
 REVIEWED BY: MBS

SHEET: 27 of 35  
 SCALE: 1" = 400'



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MATCH LINE-SEE SHT 23

MATCH LINE-SEE SHT 25

**PERMITTED PLANS**

R.P.W.  
16,591 SF  
0.3809 AC  
**XXI**

R.W.P. FILL  
0.01 AC

LOWER WESTVACO ROAD  
(120' R/W)

WETLAND FILL  
0.50 AC

U.S.A.C.E  
JURISDICTIONAL  
WETLAND  
1617,673 SF  
37.1367 AC  
**EEF**

U.S.A.C.E  
JURISDICTIONAL  
WETLAND  
37,912 SF  
0.8680 AC  
**FFP**

R.P.W.  
2,751 SF  
0.0632 AC  
**XX**

U.S.A.C.E  
JURISDICTIONAL  
WETLAND  
2402,835 SF  
48.2744 AC  
**III**

WETLAND FILL  
1.32 AC

WETLAND FILL  
0.35 AC

**SITE PLAN**  
SCALE: 1" = 400'



**SHEET 24**

# PROJECT SOTER

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015

JOB NUMBER: 25492

DRAWN BY: MAM

REVIEWED BY: MARS

SHEET: 28 of 35

SCALE: 1" = 400'

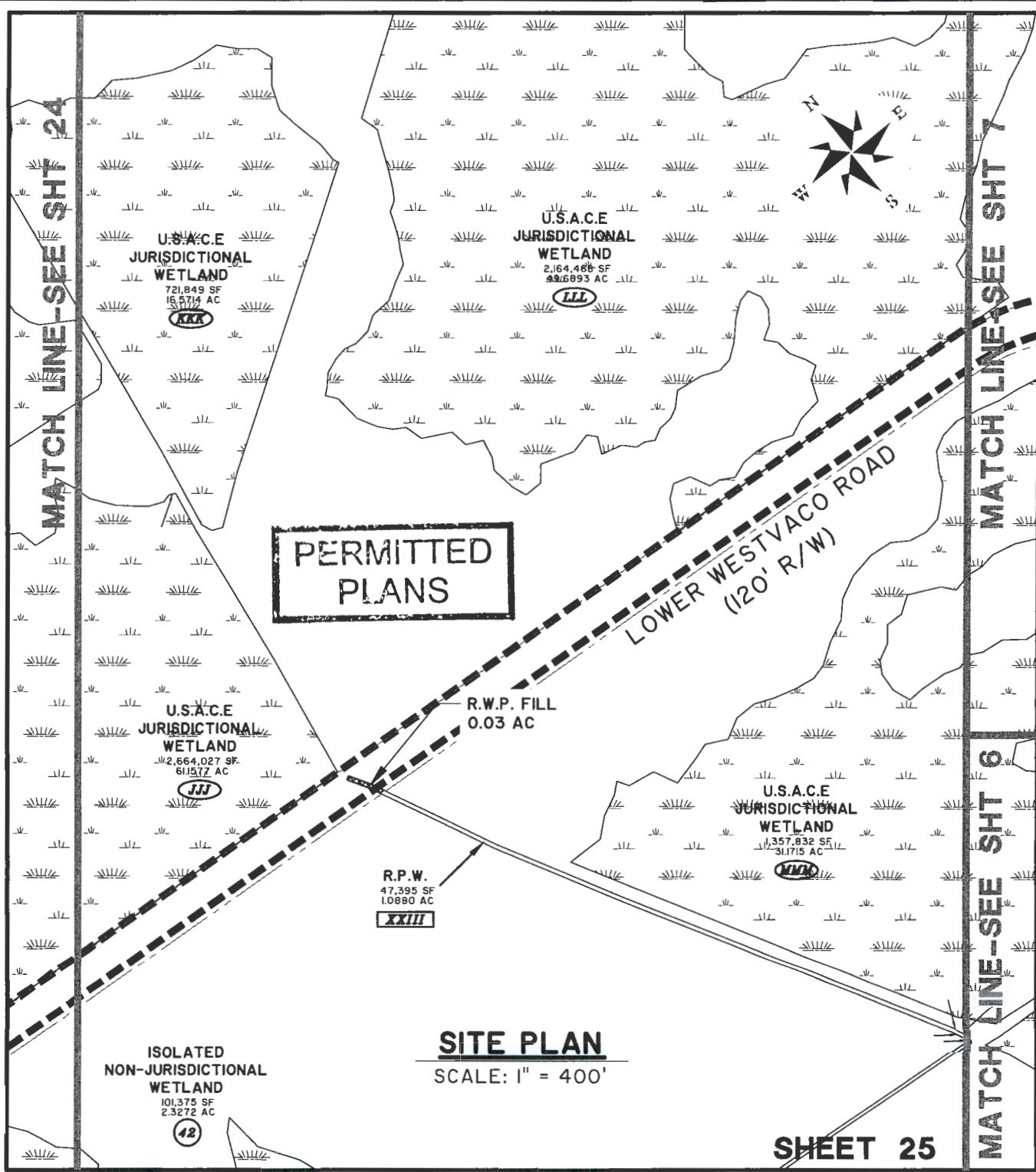


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# PROJECT SOTER

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

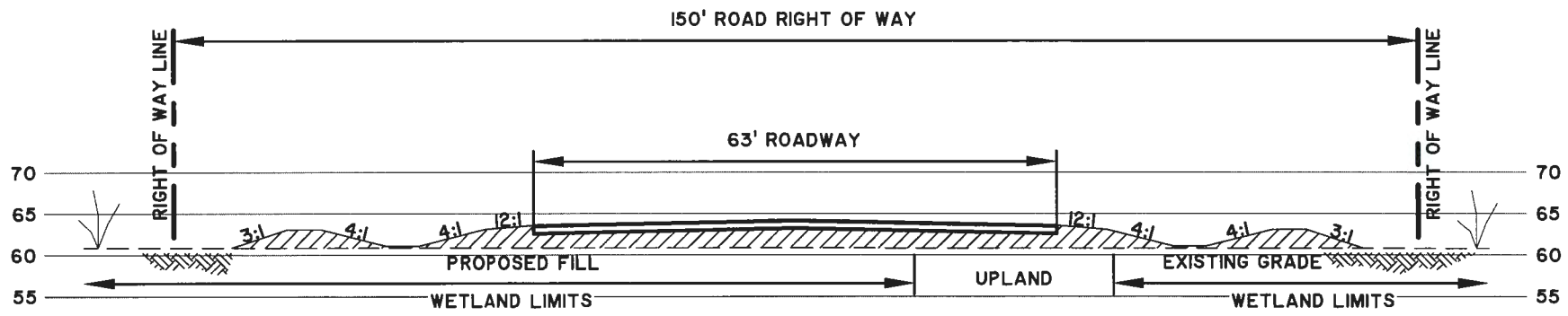
LOCATION: BERKELEY COUNTY, SC	DRAWN BY: MAM	SHEET: 29 of 35
DATE: APRIL 2, 2015	REVIEWED BY: MBS	SCALE: 1" = 400'
JOB NUMBER: 25492		

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**PERMITTED  
PLANS**



**TYPICAL CENTERLINE ROAD SECTION (SECTION A-A')**

SCALE: 1" = 20'

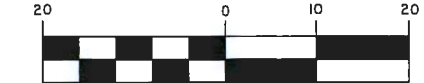
**PROJECT SOTER**

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015  
JOB NUMBER: J-25492



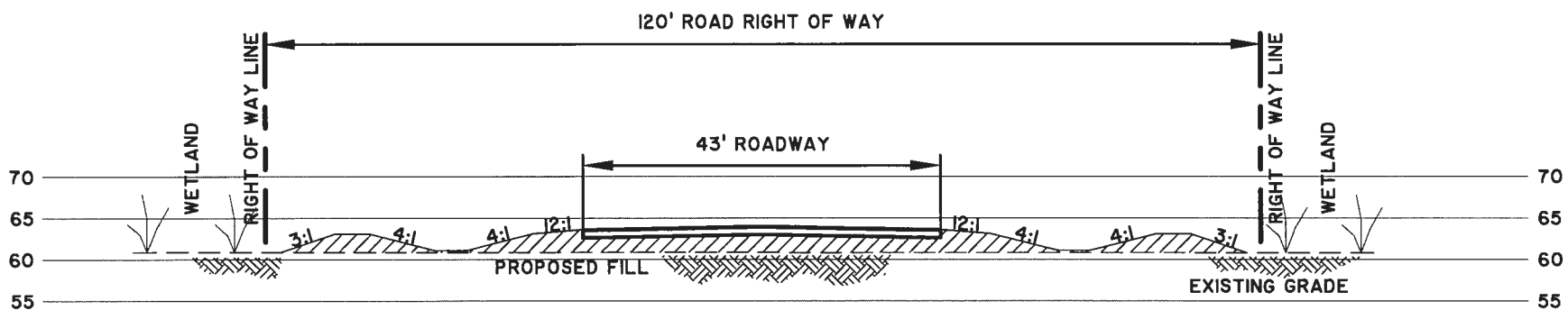
DRAWN BY: MAM  
REVIEWED BY: MBS  
SHEET: 30 of 35  
SCALE: 1" = 20'

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**PERMITTED  
PLANS**



## TYPICAL LOWER WESTVACO ROAD SECTION (SECTION B-B')

SCALE: 1" = 20'

### PROJECT SOTER

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015

JOB NUMBER: J-25492



DRAWN BY: MAM

REVIEWED BY: MBS

SHEET: 31 of 35

SCALE: 1" = 20'

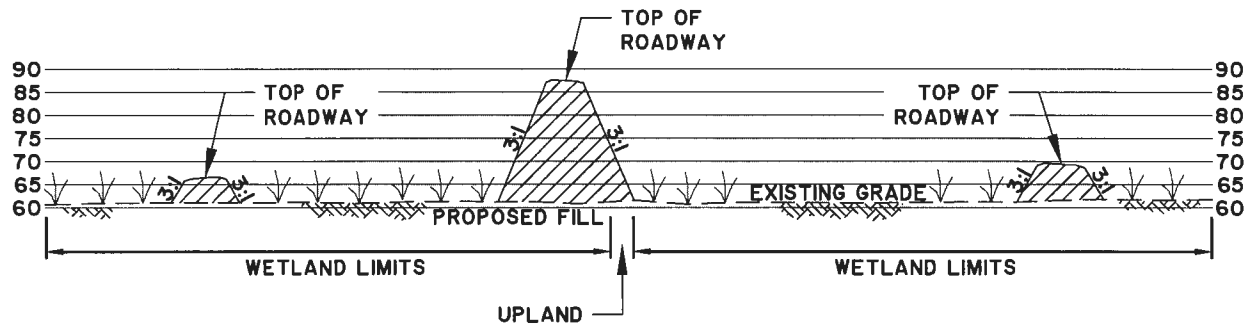


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**PERMITTED  
PLANS**



**TYPICAL INTERCHANGE SECTION (SECTION C-C')**

SCALE: HOR: 1" = 200'  
VERT: 1" = 40'

**PROJECT SOTER**

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:

BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015

JOB NUMBER: J-25492



DRAWN BY: MAM

REVIEWED BY: MBS

SHEET: 32 of 35

SCALE: 1" = 40'

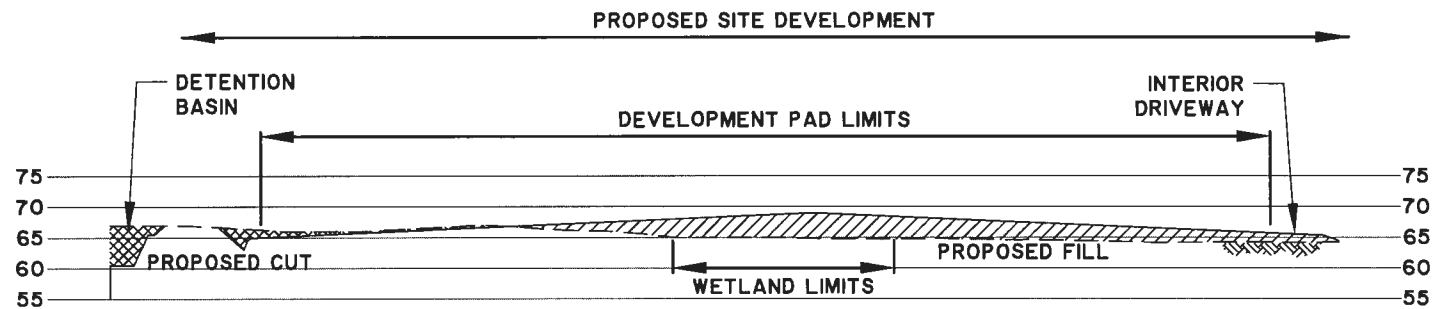


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**PERMITTED  
PLANS**



**TYPICAL DEVELOPMENT PAD SECTION (SECTION D-D')**

SCALE: HOR: 1" = 300'  
VERT: 1" = 30'

**PROJECT SOTER**

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015

JOB NUMBER: J-25492



DRAWN BY: MAM  
REVIEWED BY: MBS

SHEET: 33 of 35  
SCALE: 1" = 30'

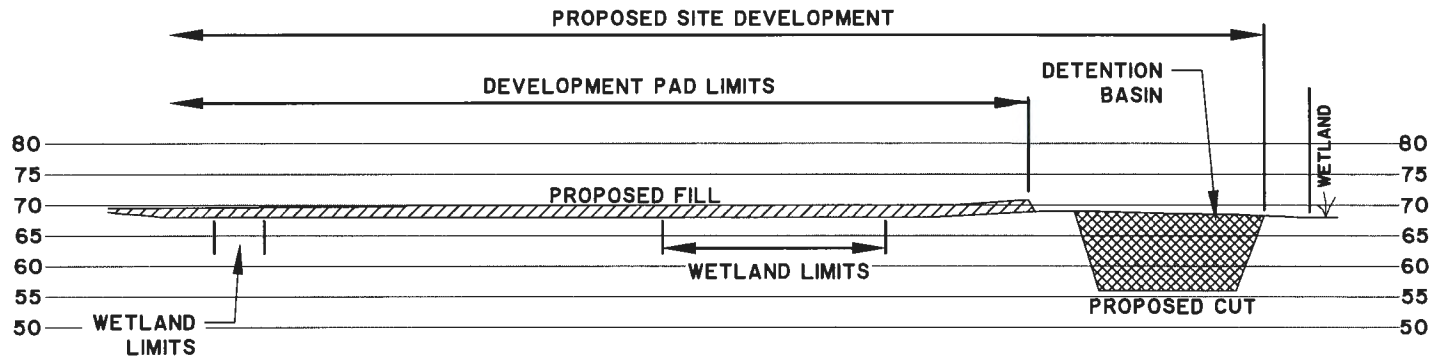


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**PERMITTED  
PLANS**



**TYPICAL DEVELOPMENT PAD SECTION (SECTION E-E')**

SCALE: HOR: 1" = 300'  
VERT: 1" = 30'

**PROJECT SOTER**

PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC  
DATE: APRIL 2, 2015  
JOB NUMBER: J-25492

DRAWN BY: MAM  
REVIEWED BY: MBS

SHEET: 34 of 35  
SCALE: 1" = 30'



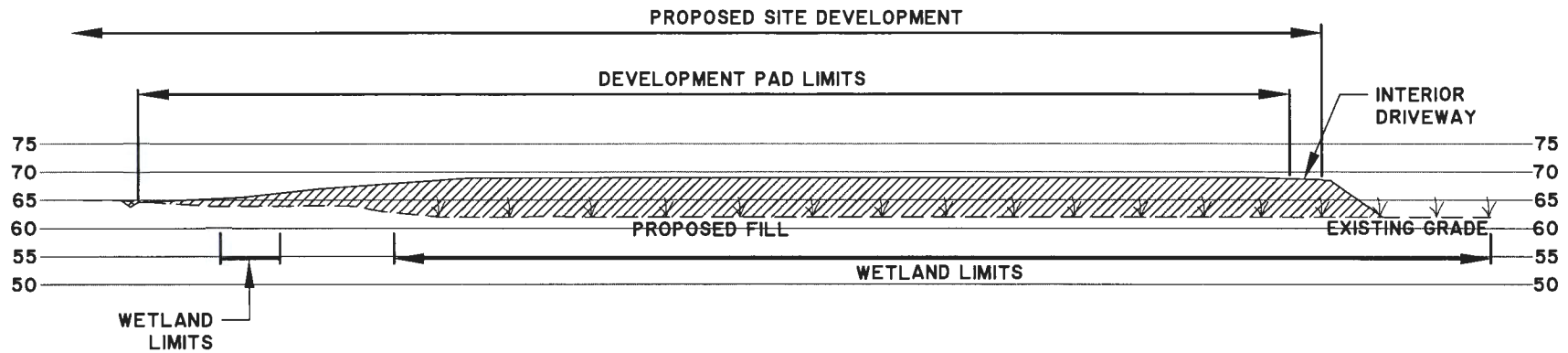
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**PERMITTED  
PLANS**



## TYPICAL DEVELOPMENT PAD SECTION (SECTION F-F')

SCALE: HOR: 1" = 300'  
VERT: 1" = 30'

### PROJECT SOTER

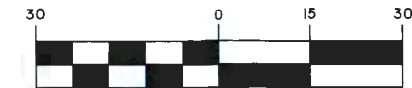
PROPOSED ACTIVITY:  
WETLAND FILL

CLIENT:  
BERKELEY COUNTY ECONOMIC DEVELOPMENT

LOCATION: BERKELEY COUNTY, SC

DATE: APRIL 2, 2015

JOB NUMBER: J-25492



DRAWN BY: MAM

REVIEWED BY: MBS

SHEET: 35 of 35

SCALE: 1" = 30'



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## **APPENDIX B: INTERCHANGE JUSTIFICATION REPORT**

## APPENDIX C: BIOLOGICAL ASSESSMENT



March 23, 2015

Mr. Barry Jurs  
Economic Development Director  
Berkeley County  
1003 Highway 52  
Moncks Corner, SC 29511

Enclosed for your review are the following documents:  
1. Biological Assessment Report  
2. Environmental Impact Statement  
3. Final Environmental Assessment Report

Dear Mr. Jurs,

AmeC Foster Wheeler Environment and Infrastructure, Inc. (AmeC Foster Wheeler) is pleased to submit this report regarding the protected species assessment for the approximately 1,000-acre Cañon Hall site, located northwest of Edgeville, in Berkeley County, South Carolina. The South Carolina Department of Commerce (SCDC) is interested in developing this property for industrial development.

Findings

Plants and animals listed as federally threatened and endangered are protected under the Endangered Species Act (ESA) of 1973, which is administered and enforced by the United States Fish and Wildlife Service (USFWS). The bald eagle is federally protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. This biological assessment documents the results of a literature search, review of past biological assessments, and an on-site habitat assessment for federally endangered and threatened species and the bald eagle for the Cañon Hall tract in Berkeley County, South Carolina.

Conclusions

This biological assessment (BIA) is an update to the BIA written by Newkirk Environmental, Inc. dated January 2008 (Newkirk 2008) that accompanied public notice SC-2008-0023, M-08-Cañon Hall, SC-08-0023. The Newkirk BIA (2008) concluded that activities on this tract are not likely to cause adverse effects to overall populations of any threatened or endangered species.

The [redacted] response dated January 21, 2015 to the [redacted] CE stated that they concurred with the [redacted] B [redacted] findings. The [redacted] letter stated [redacted] the [redacted] concurs with your determination that this action is not likely to adversely affect federally endangered or threatened species or adversely modify designated critical habitat. In view of this, we believe that the requirements of section 7 of the ESA have been satisfied.

Appendix B

The current list of federally endangered and threatened species for Berkeley County was compiled from the [redacted] Charleston Field Office website in March 2015 and the [redacted] information planning and conservation system [redacted] March 2015. The list is in Table 1. The South Carolina Rare and Endangered Species Inventory website, a geographic information system natural resources data layer that includes the locations of all documented occurrences of federally endangered or threatened species, was reviewed for known occurrences of such species on or proximate to the subject project. There are no known occurrences of federally endangered or threatened species on the Ringletown, Ridgeville, and Quaker Hill quadrangles in Berkeley County, SC.

Table 1. Current list of federally endangered, threatened, and candidate species in Berkeley County, South Carolina [redacted] 2015 and their habitat types.

Common Name	Scientific Name	Status	General Habitat Type
West Indian manatee	<i>Trichechus manatus</i>	E	coastal waters
Frosted flatwoods salamander	<i>Ambystoma cingulatum</i>	T, CH	pine areas maintained in an open state by fire with isolated ponds for breeding sites
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA	coastlines, rivers, large lakes or streams
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	mature pine forests
Wood stork	<i>Mycteria americana</i>	E	marshes, swamps, lagoons, ponds, flooded fields; depressions in marshes are important during drought; also occurs in brackish wetlands
Atlantic sturgeon	<i>Acipenser oxyrinchus</i>	E	major river systems along the eastern seaboard
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	E	major river systems along the eastern seaboard
Pondberry	<i>Lindera melissifolia</i>	E	swamp and pond margins, sandy sinks, swampy depressions, wet flats
Canby's dropwort	<i>Oxypolis canbyi</i>	E	pond-cypress savannahs dominated by grasses, sedges or ditches next to bays; borders and shallows of cypress-pond pine ponds and sloughs
American chaffseed	<i>Schwalbea americana</i>	E	fire maintained open pine forest

E	Federally endangered
T	Federally threatened
CH	Critical habitat
BGEPA	Federally protected under the Bald and Golden Eagle Protection Act

## Methodology

Amec Foster Wheeler conducted a literature search, desktop habitat assessment, a review of the previous BFW Kirk 200 and on-site ground truthing to determine the likelihood of the presence or absence of each of the above listed species and the conclusions/findings of the previous BFW have changed over time. The above list was used as the baseline for the on-site habitat assessment and survey. Aerial photography and ground truthing was used to generalize habitat types on the site. General habitat types located on the tract are described below in the Habitats section. There are approximately 5 areas that could be characterized as seasonally to permanently flooded wetland depressions isolated ponds on-site. We conducted an on-site inspection of 35 of these isolated ponds in 5 on-site field work was conducted from March 2 to 5, 2015.

## Observations

Based on review of aerial photography, forest stand maps, the previous BFW Kirk 200 and ground truthing the 1,000-acre site contains six general habitat types including pine plantation, longleaf pine plantation, isolated ponds, mixed pine hardwood forest, and lower line right-of-way. The entire site is intensely managed for timber production e.g., bedding, planting lines, ditching with no evidence of recent fire management. The lowerline right-of-way was not reviewed for protected species since these habitats do not constitute suitable habitat for any protected species known to occur in Berkeley County.

## Vegetation Observations

The site is dominated by even-aged planted pine stands ranging from one to 10 year old longleaf pine (*Pinus taeda*). Saplings and shrubs in these areas vary in percent cover based on age of the pine and when the stand was thinned. Saplings and shrubs include longleaf pine, sweet gum (*Liquidambar styraciflua*), red bay (*Persea borbonia*), sweet bay (*Magnolia virginiana*), wax myrtle (*Morella cerifera*), red maple (*Acer rubrum*), letter-club (*Lyonia lucida*), and high bush blueberry (*Vaccinium corymbosum*). The herbaceous layer was nearly absent in all of the stands except the newly cut and planted stands. In those stands the herbaceous layer included planted longleaf pine, rosette sedge (*Andropogon virginicus*), bushy bluestem (*A. glomeratus*), dog fennel (*Eupatorium capillifolium*), blackberry (*Rubus spp.*), panic grass (*Panicum spp.*), St. John's wort (*Hypericum hypericoides*), and bracken fern (*Pteridium aquilinum*).

**Wetland Plant Communities**

There is one small stand of planted longleaf pine (*Pinus palustris*) in the northeast section of the site along Fish Road. There is approximately 20% overstory of longleaf pine and 10% overstory of loblolly pine. Saplings and shrubs include sweet gum, inkberry (*Ilex glabra*), wax myrtle, high bush blueberry, horse sugar (*Symplocos tinctoria*), and sweet pepperbush (*Clethra alnifolia*). The herbaceous layer included cracker fern and heavy pine straw.

**Wetland Plant Communities**

Isolated ponds are seasonally to permanently flooded wetland depressions. The on-site ponds are dominated by a nearly closed canopy of hardwoods including sweet gum, red maple, water oak (*Quercus nigra*), diamondleaf oak (*Q. laurifolia*), pond pine. Wax myrtle, blackgum (*Nyssa biflora*) was only observed in a couple of ponds. The edges of these ponds were densely vegetated with shrubby species including pepperbush, sweet bay, sweet pepperbush, inkberry, red bay, wax myrtle, cane (*Arundinaria gigantea*) and a few grasses. Many of the ponds that appeared isolated were depressional landforms in larger wetland systems or connected to Little Creek and other wetlands via the ditch system.

**Wetland Plant Communities**

There are several wetland areas classified as mixed hardwood pine forests associated with Little Creek. Little Creek is deeply incised and channelized in this area. These areas are dominated by sweet gum, red maple, water oak, diamondleaf oak, and loblolly pine. The sapling and shrub layer is dominated by pepperbush, sweet bay magnolia, sweet pepperbush, wax myrtle, high bush blueberry, American holly (*Ilex opaca*). The herbaceous layer included cinnamon fern (*Osmunda cinnamomea*) and a few sedges (*Carex spp.*)

**Wetland Plant Communities**

**Wetland Plant Communities**

The West Indian Manatee was listed as endangered on March 11, 1993. It is a large gray or brown aquatic mammal averaging 10 feet long and weighing about 1,000 pounds (1000 to 1200 lbs). During the winter months, the United States manatee population confines itself to the coastal waters of the southern half of the Florida peninsula and to springs and warm water outfalls as far north as southeast Georgia. During the summer months, they may migrate as far north as coastal Virginia on the east coast and the Louisiana coast on the Gulf of Mexico (1000 to 1200 lbs). The West Indian Manatee inhabits both salt and fresh water and may be encountered in canals, rivers, estuarine habitats, and saltwater bays (1000 to 1200 lbs).

None of these habitat types occur on the site.

## Introduction

The flatwoods salamander was listed as threatened on April 1, 1988. In 2004 the flatwoods salamander was divided into two distinct species: the rosted flatwoods salamander (*Ambystoma cingulatum*) and the reticulated flatwoods salamander (*Ambystoma bishopi*) due to a recognized taxonomic reclassification (Smith et al. 2004). The rosted flatwoods salamander is located east of the Palachicola River Basin. Critical Habitat (CH) has been designated for the rosted flatwoods salamander in Berkeley, Charleston, and Jasper counties, SC (Smith et al. 2004) but the closest designated CH is over 20 miles away on the Francis Marion National Forest (Moss 2004). The rosted flatwoods salamander occurs in isolated populations scattered across the lower southeastern Coastal Plain in Florida, Georgia, and South Carolina (Smith et al. 1994, Smith et al. 2004). There are four known populations of rosted flatwoods salamander in South Carolina (Smith et al. 2004) with the closest population over 20 miles away on the MOC.

It is a slender, small-headed mole salamander. Adult dorsal color ranges from dark black to chocolate black with grayish or silvery network pattern or rosted appearance running along the lateral and dorsal surfaces. Aquatic larvae are long and slender, broad-headed and bushy-gilled, with white bellies and yellow stripes on the sides (Smith 1995).

Typical breeding sites are isolated wetland depressions, which dry completely on a cyclic basis, thus eliminating fish species. The isolated ponds are typically small with an open canopy allowing grasses and sedges to grow on the edge where adult salamanders will lay their eggs in the fall. During the non-breeding season, the terrestrial adults return to the upland pine areas that are maintained by frequent fire.

The habitat on-site does not meet the criteria for this species because 1) the ponds have a fairly closed canopy, 2) any of the ponds are not truly isolated but connected to larger wetlands via a large ditch system, 3) the upland pine habitat has not been burned or allowed to mature and will not support the adults.

## Endangered

The bald eagle was listed as endangered on March 11, 1988. The species was reclassified from endangered to threatened throughout the lower 48 states on July 12, 1985 (Smith et al. 1995). It was proposed to be re-added to the federal endangered species list on July 1, 1988 (Smith et al. 1995a). On July 1, 2004, the bald eagle was re-added to the endangered species list (Smith et al. 2004). The bald eagle is still federally protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

The bald eagle, with a wingspread of about seven feet, is mainly dark brown and adults have a pure white head and tail. The bald eagle feeds primarily on fish but also takes a variety of birds,



owls, and turtles when fish are not readily available (USFWS 2012). It nests in large, sturdy trees with open canopies typically near large open water bodies. Many nests are used annually. It has been documented that egg laying for the bald eagle peaks in late December in the South. The nesting season in the Southeast extends from October to May 15.

Based on review of the USFWS Heritage Trust Database (USFWS 2015) the closest known bald eagle nest is more than 10 miles to the northeast in on Lake Moultrie. In addition, there is no open water within 1 mile of the site. Therefore, based on lack of suitable nesting or foraging habitat and the closest known nest being over 10 miles away, it is unlikely that the proposed project will disturb the bald eagle.

#### Red-shouldered Hawk

In 1980, the RSH was officially listed as endangered (USFWS 2003). With passage of the ESA in 1973, the RSH received the protection afforded listed species under the ESA. The endangered status of the RSH primarily is due to four environmental factors that have been shown to limit its numbers: 1) hardwood encroachment, 2) a shortage of suitable cavity trees, 3) loss and fragmentation of habitat, and 4) demographic isolation (Conner and Tudor 1981, Tudor 1981, Tudor and Conner 1984).

The RSH is endemic to pine forests of the Southeast (USFWS 2003). RSHs are territorial, non-migratory, cooperative breeders (Pennart et al. 1984). RSHs are unique in that they excavate cavities for roosting and nesting in living pines (USFWS 2003) and use living pines almost exclusively for foraging substrate, preferring longleaf pine when available (Tudor 1981). RSHs require open pine woodlands and savannahs with large old pines for nesting and roosting habitat (i.e., cavity trees). Cavity trees must be in open pine stands with little or no hardwood midstory and few or no overstory hardwoods. For purposes of surveying, suitable nesting habitat consists of pine, pine-hardwood, and hardwood-pine stands that contain pines 30 years in age or older and that are within 0.5 mile of suitable foraging habitat. For the purposes of surveying, suitable foraging habitat consists of a pine or pine-hardwood stand in which 50 percent or more of the dominant trees are pines and the dominant pine trees are generally 30 years in age or older. (USFWS 2003)

Based on review of aerial photography, review of the previous BIA (Newkirk 2000) and an on-site visit, it was determined that marginal suitable foraging and nesting habitat for the RSH is onsite. However, there is no evidence of burning or mechanical midstory control on any of the pine areas. The few stands of mature pines have a dense midstory, the remaining pine plantations are too young and/or too thick to be considered RSH habitat. The long leaf pine stand in the northeast corner of the property was surveyed for evidence of RSH cavity trees. No cavity trees were located. In addition, the closest known RSH clusters are more than 10 miles northeast on the Brosnan forest.

#### Wood Stork

The U.S. breeding population of the wood stork was listed as endangered on February 20, 1993 (58 FR 10220). The U.S. breeding population was downlisted to threatened and established as a distinct population segment on July 30, 2011. Wood storks are large, long-legged wading birds. They are white except for black primaries and secondaries and a short black tail. The head and neck are largely unfeathered and dark gray in color. The bill is black, thick at the base, and slightly decurved (58 FR 10220).

Wood storks have been seen in South Carolina during every month of the year. However they are uncommon from December through mid-March (58 FR 10220). They typically nest in cypress/tupelo gum ponds with standing water. It is a highly colonial species usually nesting in large rookeries and feeding in flocks. The wood stork forages in a wide variety of shallow wetlands, where they may reach high enough densities, in water that is shallow and open enough for the birds to be successful in their hunting efforts (Maden et al. 1993, Browder 1993). Nesting wood storks generally use foraging sites that are located within 31 miles flight range of the colony (58 FR 10220).

There are no known wood stork rookeries present on or near the site (CD 2015). The onsite wetlands within the project boundaries could provide initial suitable foraging habitat for this species, however foraging habitat is not the limiting factor for the wood stork. Therefore, it is our determination that the proposed project will not likely adversely affect the wood stork.

#### Shortnose Sturgeon

The shortnose sturgeon was listed as endangered on March 11, 1993 (58 FR 1001). It is an anadromous fish that spawns in the coastal rivers along the east coast of North America from the St. John River in Canada to the St. Johns River in Florida. In South Carolina, the species is present in theaccaaw, Lee Dee, Black Mityah Bay system,antee, Cooper, Shebo, Coahahee, Edisto, andaannah rivers (M 1993). The shortnose sturgeon prefers the nearshore marine, estuarine and riverine habitat of large river systems (M 2012). Adults have separate summer and winter areas.

There is no suitable habitat for the shortnose sturgeon on site.

#### Atlantic Sturgeon

The Carolina and the South Atlantic Distinct Population Segments (D) of the Atlantic sturgeon were listed as endangered in February 2012 (77 FR 2012). D is a certificate population or group of populations that is discrete from other populations of the species and significant in

relation to the entire species. The EOP provides for listing species, subspecies, or distinct population segments of vertebrate species (50 CFR 2012).

The Atlantic sturgeon is a long-lived, estuarine dependent, anadromous fish. Spawning adults migrate upstream in spring, beginning in February-March in the south. Adults spawn in freshwater or large rivers and migrate into estuarine and marine waters where they spend most of their lives. They spawn in moderately flowing water channels in deep parts of large rivers.

There is no suitable habitat for the Atlantic sturgeon on site.

#### **Dracopis**

Dracopis was listed as endangered on February 25, 1991 (56 FR 1001). It is a perennial herb with erect, hollow stems, aromatic foliage and elongate, stoloniferous rhizomes. It has minute white flowers produced in terminal or axillary umbels. The fruit is a strongly winged schizocar. The species flowers from May through early August and fruits in early fall (1991).

This species occurs in pond cypress savannas, shallows and edges of cypress pond line sloughs, and wet pine savannas. The healthiest populations seem to occur in open bays or ponds which are wet most of the year and have little or no canopy cover.

Based on review of aerial photography, review of the previous BFW 2000, and on-site assessment of the isolated ponds it is our determination that there is no suitable habitat for this species. None of the ponds had the open characteristics this species requires. In addition, the closest known population is more than 15 miles north of the site.

#### **Dryas**

Dryas was listed as endangered on July 31, 1990 (55 FR 10000). Dryas is a dioecious, deciduous shrub with pale yellow flowers. The fruit is a bright red drupe that matures in the fall. Flowering occurs late in February to mid-March. Fruiting occurs from August to early October. The leaves have a strong, sassafras-like odor when crushed. Reproduction seems to be primarily vegetative by means of stolons (1992a).

Dryas is found in shallow depression ponds of the sandhills, along margins of cypress ponds in the inland coastal areas of South Carolina, and in seasonally wet, low areas among bottomland hardwoods in interior areas.

Based on review of aerial photography, review of the previous BFW 2000, and on-site assessment of the isolated ponds, it is our determination that the on-site ponds are not suitable habitat for this species due to the thick overstory, mid-story, and understory. The on-site surveys of the ponds were conducted during the flowering season of this species and no

individuals were observed. In addition, the closest known population is more than 20 miles east of the site on the M.

**Florida**

American chaffseed was listed as endangered on October 2, 1992. It is a perennial, erect herb in the figwort family with large, purplish-yellow tubular flowers. The fruit is a long and narrow capsule, enclosed in a loose-fitting sac-like structure that provides the basis for the common name, chaffseed (Musselman and Mann 1999 in USFWS 2002). Flowering occurs from April to June (USFWS 2002a).

American chaffseed occurs in sandy acidic, seasonally moist to dry soils (USFWS 2002a). It typically occurs in fire-maintained ecosystems, such as the longleaf-pine-wiregrass ecosystem of the southeastern coastal plain, open, moist pine flatwoods, and fire-maintained savannas. American chaffseed seems to require fire for persistence. One of the most serious threats to its continued existence is fire suppression (USFWS 2002a).

Due to lack of fire management, there is no suitable habitat on site for American chaffseed. In addition, the closest known population of chaffseed is more than 15 miles to the east in the M.


**Conclusion**

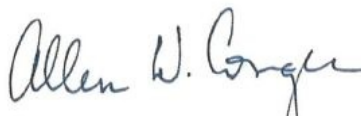
Based on review of the literature, USFWS database, aerial photography, review of the previous BOWEN 2000, and on-site assessments it is our determination that the proposed project will have no effect on the least Indian manatee, bald eagle, forested flatwoods salamander, C, Atlantic sturgeon, shortnose sturgeon, Canada's drowort, ponderry, and American chaffseed, and may affect, but not likely to adversely affect the wood stork.

**References**

If you have any questions or comments, please feel free to contact Brendon Kelly at (303) 441-1200 or [brendon.kelly@afec.com](mailto:brendon.kelly@afec.com). We greatly appreciate your time and consideration.

Project Manager      Project Manager      Project Manager      Project Manager      Project Manager

  
Brendon Kelly  
State Environmental Scientist

  
Allen W. Conger, PE  
Principal Scientist

Attachments: References  
Biological Assessment Addendum      Centerline Road Infrastructure Project Permit Area

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March 30, 2015



Mr. Barry Jurs
Economic Development Director
Berkeley County
1003 Highway 52
Moncks Corner, SC 29511

Enclosed is the addendum to the Carolina Hall Biological Assessment Report dated March 23, 2015. This report analyzes the potential impacts of the Centerline Road Infrastructure Improvement Area on Federally Protected Species.

Dear Mr. Jurs,

This document is an addendum to the Carolina Hall Biological Assessment Report dated March 23, 2015. This report analyzes the potential impacts of the Centerline Road Infrastructure Improvement Area on Federally Protected Species.

The entire Improvement Area was surveyed on the ground on March 23, 2015 for potential habitat for the Federally Protected Species in Berkeley County, South Carolina. Table 1 in March 23, 2015 Report. The general habitat types along the corridors are: Loblolly Pine Pinus taeda plantation ranging from 5 to 35 year old planted lines, mixed pine/hardwood on a small area of 0.25 acre, older 30 diameter at breast height loblolly pines, and isolated ponds. Habitat types are described in the March 23, 2015 Report. The older loblolly pine stand that is described below.

The older loblolly pine stand at the corner of Centerline Road and 1001 consists of loblolly pine overstory, no midstory and a mowed understory. There is no evidence of turning. Due to the lack of turning, the area would not be considered suitable habitat for American chaffseed (Schwalbea americana). This area would be considered potential habitat for the red-cockaded woodpecker (Picoides borealis) in SC. Each tree was examined for evidence of C&S. No cavities were observed. The stand would not be considered as foraging habitat for the species because there are no mature pine stands within 300 feet.

The mixed-pine hardwood stands do not represent suitable habitat for protected species in Berkeley County.

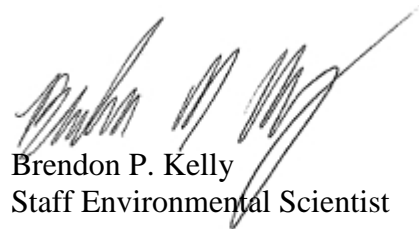
The isolated ponds do not represent suitable habitat for the forested flatwoods salamander (Ambystoma cingulatum) because the ponds have a fairly closed canopy, and the upland pine habitat has not been burned or allowed to mature and will not support the adults.

The isolated ponds do not represent suitable habitat for Canby's drowort (Oxypolis canbyi) because the ponds do not have the open characteristics this species requires.

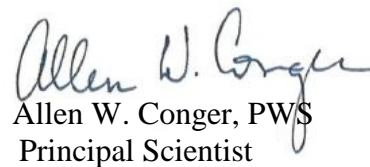
The isolated ponds do not represent suitable habitat for ponderry *Lindera melissifolia* due to the thick overstory, midstory, and understory. The on-site surveys of the ponds were conducted during the flowering season of this species and no individuals were observed.

This information should be considered along with the March 23, 2015 B. This information further supports our determination that the proposed project will have no effect on the least Indian heron, bald eagle, cypress swamp sparrow, Carolina parakeet, Atlantic sturgeon, shortnose sturgeon, Canada warbler, ponderry, and American cypress, and may affect, but not likely to adversely affect the wood stork.

**Amec Foster Wheeler Environment and Infrastructure, Inc.**



Brendon P. Kelly  
Staff Environmental Scientist



Allen W. Conger, PWS  
Principal Scientist



## APPENDIX D: LANDSCAPE MITIGATION PLAN

**PROJECT SOTER – LANDSCAPE MITIGATION PLAN  
BERKELEY, DORCHESTER and  
ORANGEBURG COUNTIES, SOUTH CAROLINA**

**APPLICANT:**

**BERKELEY COUNTY  
1003 HIGHWAY 52  
MONCKS CORNER, SOUTH CAROLINA 29461**

**SUBMITTED TO:**

U.S. Army Corps of Engineers, Charleston District (USACE)  
South Carolina Department of Health and Environmental Control (SCDHEC)  
South Carolina Department of Health and Environmental Control - Division of Ocean and  
Coastal Resource Management (OCRM)  
U.S. Environmental Protection Agency, Region 4 (USEPA)  
U.S. Fish and Wildlife Service, Charleston Ecological Services (USFWS)  
National Oceanic and Atmosphere Administration, National Marine Fisheries Service (NOAA)  
U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS)  
South Carolina Department of Natural Resources (SCDNR)  
South Carolina Department of History and Archives State Historic Preservation Office (SCHPO)

**PREPARED BY:**



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1307 Broad Street  
Camden, South Carolina 29020**

**and**



**Amec Foster Wheeler Environment & Infrastructure, Inc.  
720 Gracern Road, Suite 132  
Columbia, South Carolina 29210**

***SUBMISSION DATE***

**Rev. April 16, 2015**

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**APPENDIX C: PHOTO LOG**

**APPENDIX D: LANDOWNER AUTHORIZATION FORMS**

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## 1. EXECUTIVE SUMMARY

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Berkeley County Economic Development Authority is promoting a portion of the existing Camp Hall Commerce Park in Berkeley County to attract Project Soter, a major advanced manufacturing facility into South Carolina.

The Camp Hall Commerce Park (Camp Hall Site) is proposed for a singular large development known as Project Soter, which would include an initial investment of approximately \$1 billion with a projected labor force of up to 4,000 workers within 10 years of start of production. The potential development of the Camp Hall Site would provide a significant positive economic impact on Berkeley County, the Greater Charleston Area, and the State of South Carolina. The proposed development will impact a total of 192.86 acres of jurisdictional wetlands, 23.14 acres of non-jurisdictional isolated wetlands, and 1.85 acres of Relatively Permanent Waters (RPWs) on the Camp Hall Site.

In the absence of suitable existing wetland mitigation bank credits or an in-lieu fee program for the watershed, all required compensatory mitigation will be obtained through off-site landscape scale permittee-responsible mitigation activities utilizing the watershed approach. The Project Soter-Landscape Mitigation Plan was designed to achieve a landscape scale conservation outcome based on the priorities of both local and regional environmental advocacy groups and the Federal and State regulatory and resource agencies.

Located with the same watershed as the Camp Hall Site is 16,000 acre The Francis Beidler Forest (RAMSAR site no. 1773); one of only two RAMSAR sites in South Carolina, 37 sites in the United States, and 2,000 sites globally which have been designated by the RAMSAR Convention as “Wetlands of International Importance”. Therefore the overall goal of the watershed approach was to enhance and improve the protection of this critical national and global resource. The National Audubon Society oversees the Francis Beidler Forest, and based on its guidance two key tributaries, Dean Swamp and Walnut Branch, were defined as the top priority areas for immediate conservation.

Berkeley County, the Lord Berkeley Conservation Trust and the South Carolina Department of Natural Resources communicated the importance to consider the needs of the local community as an important aspect of a landscape mitigation approach. This included both the availability of public lands for recreation and the support and protection of rural lifestyles.

The regional conservation advocacy groups, specifically the Coastal Conservation League and the Low Country Open Land Trust, communicated the importance of creating a greenbelt of conserved lands around Charleston (the “Greenbelt”). The gap in protected lands between the Francis Beidler Forest and the Santee River Corridor was identified as an important area for conservation efforts. Based on this guidance, the Mitigation Plan focused selecting properties for inclusion in the Greenbelt gap between the Francis Beidler Forest and the Santee River Corridor.

Based on the guidance of these and other key stakeholders, and to meet the requirements of an acceptable mitigation plan as defined by the federal regulatory agencies, the proposed Project Soter – Landscape Mitigation Plan (Mitigation Project) was designed to include the following key components:

1. The Project Soter – Landscape Mitigation Plan will preserve and enhance approximately 1,533 acres of wetlands within approximately 2,496 acres of property to be permanently protected in the Dean Swamp and Walnut Branch watersheds, tributaries of Four Hole Swamp defined as critical priority areas needing protection by the National Audubon Society.



2. The featured landscape mitigation parcel, the Bannister Tract, is an approximately 1,667 acre forested tract on Sandy Run Creek (a component of the Dean Swamp sub-watershed). This tract has extensive bottomland hardwoods and pine flatwoods wetlands which are currently under intensive silviculture management that will be returned to natural condition through enhancement and restoration activities as described in this mitigation plan. This tract will be purchased and conveyed to the SCDNR for use as a wetland demonstration site and for use as a public access wildlife management area with the intent of designating the property as a SC Heritage Trust Preserve.
3. The Bannister Tract, Singletary Tract, and Dean Swamp Tract constitute approximately 2,160 acres of conserved land in the Greenbelt gap between The Francis Beidler Forest and the Santee River Corridor.
4. As a special condition of the permit and to fully satisfy the parameters of this Landscape Scale Mitigation Plan, the Applicant proposes to provide \$1.5 million (herein after, “Fund”) into an escrow account to be held by Lord Berkeley Conservation Trust. The funds are to be used for fee simple conservation property acquisition or to support conservation easements on important conservation properties. The conservation projects chosen for the Fund will be administered by the representatives of the following organizations: Audubon, Lord Berkley Land Trust, and the Low Country Open Land Trust (collectively, the “Fund Oversight Committee”).

The priority of use for the Funds will be for conservation projects such as follows:

1. Along Dean Swamp and its tributaries to provide connectivity between the Bannister Tract and Francis Beidler Forest;
2. Within the Four Hole Swamp watershed;
3. Upper Berkeley County; and
4. Projects of regional significance in the Greater Charleston Area.

The Fund Oversight Committee will approve these conservation projects to acquire additional parcels or easements that have not yet been identified, but that are an integral part of the overall Mitigation Project to mitigate impacts occurring on the Camp Hall Site as a result of the proposed project. Approval of conservation projects within Four Hole Swamp will require a majority vote of the Fund Oversight Committee; conservation projects outside of Four Hole Swamp watershed will require unanimous approval.

Finally, the Mitigation Project satisfies the USACE requirements under the 2010 USACE-Charleston District Compensatory Mitigation Guidelines (2010 Draft Compensatory Mitigation Guidelines) and includes the twelve components required by the 2008 United States Environmental Protection Agency (EPA) and Department of the Army, United States Army Corps of Engineers (USACE) 33 C.F.R. Parts 325 and 332 & 40 C.F.R. Part 230 (Mitigation Rule). Proposed mitigation activities are not anticipated to adversely impact protected species or cultural resources. The Permittee Responsible Mitigation Plan (PRMP), presented in Appendix E, includes specific goals and objectives for water resource mitigation, as well as site selection factors, site protection, baseline conditions of the mitigation and reference sites, mitigation work plan, maintenance plan, performance standards, monitoring requirements, long term management plans, adaptive management provisions, and financial assurances for its success.

In conclusion, the Mitigation Project is designed to achieve a meaningful landscape conservation outcome based on the guidance of the local and regional environmental groups and also satisfy the requirements of the State and Federal resource agencies.

## **2. PROJECT DESCRIPTION**

---

The Project Soter – Landscape Mitigation Plan (hereinafter “Mitigation Project”) includes approximately 2,496 acres of proposed conservation easement areas located in Orangeburg, Berkeley, and Dorchester Counties, South Carolina. The Mitigation Project site is made up of private land holdings located along Sandy Run, Dean Swamp, and Walnut Branch, all of which are tributaries to Four Hole Swamp. This Mitigation Project is intended to provide mitigation for jurisdictional impacts to waters of the U.S. associated with the development of the Camp Hall Site. The mitigation area is within the same United States Geologic Survey (USGS) 8-digit Hydrologic Unit Code (HUC) 03050205 of the Four Hole Swamp watershed and is wholly located within the Middle Atlantic Coastal Plain EPA Level III Ecoregion (N 33.332°, W 80.300°; Figure 1 in Appendix A). The proposed Mitigation Project site provides the opportunity to protect a large contiguous acreage of wetlands and headwater tributaries that will further advance the efforts of the National Audubon Society and the Greenbelt - Ace Basin Conservation programs within the Four Hole Swamp watershed and provide desirable continuity to previously conserved lands as well as enhance and protect this RAMSAR resource of global significance.

The Mitigation Project area consists of bottomland hardwood, isolated ponds, and pine flatwoods wetlands along Tributaries to Four Hole Swamp including Walnut Branch, Sandy Run, and Dean Swamp tributaries. The mitigation plan will include wetland preservation, enhancement, and restoration of approximately 1,533 acres of wetlands and preservation of approximately 47,932 linear feet of streams within the 2,496 acre Mitigation Project.

The Permittee Responsible Mitigation Plan (PRMP) contained within the following pages is based upon the best information available at this time and all prescriptions and quantities provided herein for stream and wetland features are subject to change following USACE verification. Comments from the USACE, SCDHEC and resource agencies and the commenting public will be addressed in order to finalize this mitigation plan. Once all comments have been received and addressed, a Final Mitigation Plan will be prepared for approval. The Final Permittee Responsible Mitigation Plan (FPRMP) will include additional data and information to further support these proposed mitigation activities.

### 3. AVAILABLE MITIGATION

The anticipated Section 404 Individual Permit for the development of the Camp Hall site within the Four Hole Swamp watershed (HUC 03050205) near Ridgeville, Berkeley County, South Carolina requires mitigation for impacts to 192.86 acres of jurisdictional wetlands, 23.14 acres of non-jurisdictional isolated wetlands, and 1.85 acres of RPWs.

Since this large-scale mitigation effort cannot be addressed with existing mitigation banks or a single mitigation site, a landscape scale mitigation plan with multiple permittee-responsible mitigation sites are proposed to meet the required compensatory wetland mitigation requirement. The Applicant has prepared this PRMP to satisfy the proposed impacts to jurisdictional waters of the U.S.

This PRMP includes the Mitigation Project sites which is comprised of the Bannister Tract, Singletary Tract, Dean Swamp Tract, and the Walnut Branch Tracts and is intended to provide complete mitigation for jurisdictional impacts to waters of the U.S. associated with the development of the Camp Hall Site. All wetland and stream acreages are estimates in this PRMP and are subject to change, pending review/comments by the regulatory agencies.

A summary of the jurisdictional waters of the U.S. proposed for mitigation is provided below in Table 1.

**Table 1. Summary of Wetland and Stream Mitigation**

<b>Project Soter - Landscape Mitigation Plan</b>					
<b>Mitigation Work Plan</b>	<b>Tract Acreage</b>	<b>Wetland Preservation Acreage</b>	<b>Wetland Enhancement Acreage</b>	<b>Wetland Restoration Acreage</b>	<b>Stream Preservation Linear Feet</b>
<b>Bannister Tract</b>	1,667	431	249	203	28,857
<b>Singletary Tract</b>	112	100	0	0	6,402
<b>Dean Swamp Tract</b>	380	94	27	132	4,480
<b>Walnut Branch Tracts</b>	337	265	0	0	8,193
<b>Total</b>	<b>2,496</b>	<b>890</b>	<b>276</b>	<b>335</b>	<b>47,932</b>

<sup>1</sup>The wetland acreages shown above illustrates the wetlands that are available for potential wetland mitigation. Wetlands located within forestry access roads and utility easement rights-of-way were not included in this assessment. In total the Mitigation Project proposes to protect approximately 1,533 acres of wetlands and approximately 9 miles of stream.

## **4. WATERSHED APPROACH**

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### **4.1. 8-DIGIT HUC FOUR HOLE SWAMP**

The proposed mitigation site is within the Four Hole Swamp watershed (8-digit HUC 03050205). Four Hole Swamp originates in Calhoun County in the Atlantic Southern Loam Plains of South Carolina and drains approximately 653 square miles (418,000 acres) flowing generally from NW to SE through Orangeburg, Dorchester and Berkeley Counties. Just west of Ridgeville it abruptly turns SW and flows on through Dorchester County to its confluence with the Edisto River, just upstream from Givhans Ferry State Park (USACE 2000). Four Hole Swamp is a low gradient, black water, swamp-stream floodplain system that is separated by a low divide from the Congaree River Valley before joining the Edisto River to complete its journey to the Atlantic Ocean (NRCS 2010). Thus Four Hole Swamp is different from the usual river bottom swamp. This swamp-stream floodplain system is fed largely by springs and runoff from surrounding higher areas; significant tributaries to Four Hole Swamp include Cowcastle Creek and Dean Swamp (NRCS 2010). No major unbroken channel occupies the floodplain, yet swamp water moves slowly and relentlessly seaward through a network of waterways (NRCS 2010).

Through most of Four Hole Swamp's 62 mile length, the swamp's floodplain is about 1 ½ miles wide and woven with numerous braided channels (USACE 2000). The swamp is contained variously within gentle slopes and steep bluffs, with some bluffs being almost vertical and up to thirty feet in height. On and at the bases of some of these bluffs, some of which have exposed limestone outcrops, are some of the more unusual plants. Frequent clear, cool springs emerge from the bases of these bluffs. These attractive springs and seeps support numerous amphibians (USACE 2000).

The Four Hole Swamp watershed drains two EPA Level III Ecoregions from Calhoun County towards the South Carolina coast: Southeastern Plains and Middle Atlantic Coastal Plain. The upper reaches of the river's watershed covers the fertile Southeastern Plain (65) and, in the lower reaches where the proposed site is located, the predominant ecoregion is the Middle Atlantic Coastal Plain (63) (NRCS 2010). The Southeastern Plains can be described as irregular with broad inter-stream areas with a mosaic of cropland, pasture, woodland, and forest. The Middle Atlantic Coastal consists of low elevation, flat plains, with many swamps, marshes, and estuaries (NRCS 2010).

The watershed is comprised of mostly rural land cover, with less than 7 percent of the area being classified as "developed" according to the 2011 National Land Cover Dataset (NLCD 2015). The largest developed area in the Four Hole Swamp watershed includes the Town of Orangeburg which lies to the upper northwest portion of the watershed. Other small municipalities in the watershed including Cameron, Bowman, Santee, Eutawville, Holly Hill, and Harleyville make up other developed areas in the Four Hole Swamp watershed.

The rest of the land cover is divided relatively evenly between forested (34 percent), agricultural (30 percent), and woody/emergent wetlands (29 percent). "Evergreen Forest" makes up 18 percent of the non-wetland forest cover, mostly in the southern portion in the lower coastal plain of the watershed, which is characterized as the Middle Atlantic Coastal Plains EPA Level III Ecoregion (NLCD 2015). The concentration of agricultural lands is quite predominant throughout the watershed, especially in the northwest portion of the watershed while in the lower segment forestry tends to dominate. The majority of farmland in the watershed is devoted to field and forage crops (NLCD 2015, NRCS 2010). The high percentage of wetland land cover reflects the extensive floodplains of the Four Hole Swamp and its coastal plain tributaries.

The basin is an important area for conservation of coastal plain swamp-stream ecosystems. The proposed Mitigation Project site(s) are focused in the Dean Swamp watershed, a smaller tributary of Four Hole Swamp, but falls in-line with the existing overall conservation efforts to protect the Four Hole Swamp watershed. Within the Four Hole Swamp watershed, the National Audubon Society (Audubon), in conjunction with the Nature Conservancy, owns and protects the Francis Beidler Forest. Beidler Forest sits within the Four Holes Swamp, a 45,000-acre matrix of black water sloughs and lakes, shallow bottomland hardwoods, and deep bald cypress and tupelo gum flats (Audubon 2015). Four Holes Swamp is also a major tributary of the Edisto River, part of the Charleston area's famous ACE basin. Francis Beidler, a lumberman with good conservation instincts, bought part of the swamp as a business investment in the 1890s. Later generations of lumbermen cut much of the forest over the years, though Beidler's family helped preserve 1,800 acres of old-growth bald cypress and tupelo gum. By the late 1960s conservationists realized that further cutting would shrink the swamp to insignificance. The National Audubon Society (Audubon), working with The Nature Conservancy, raised \$1.5 million to buy the property at the heart of the swamp, and Audubon took over managing 3,415 acres (Graham 2011). Over 16,000 of the Four Hole Swamp and upland acres are owned by Audubon, buffered by 6,000 more acres under private conservation easements, and make up what is known as the Francis Beidler Forest (Audubon 2015, LOLT 2011).

Francis Beidler Forest is a protected swamp forest along a broad, flat-bottomed alluvial valley within the Four Holes Swamp watershed, constituting the largest remaining virgin stand of bald cypress and tupelo gum trees in the world and is also designated as a National Natural Landmark. More than 300 vertebrates and 300 plants depend upon the site for survival, and a number of threatened and/or vulnerable species are present, such as the International Union for Conservation of Nature and Natural Resources (IUCN) Red Listed Flatwoods Salamander (*Ambystoma cingulatum*) and several bat and snake species; threatened flora include Southern Twayblade (*Listera australis*), Green-fly Orchid (*Epidendrum magnoliae*), and Shadow-witch Orchid (*Ponthieva racemosa*). Some 140 species of birds are supported and the site has been designated a Bird Life Important Bird Area (IBA). The forest is principally owned by Audubon, with a parcel owned by The Nature Conservancy and a small parcel belonging to a private landowner, and a model management (and expansion) plan is being implemented. The site is used by bird- and nature-enthusiasts and students, as well as fishers and deer- and hog-hunters in some parts, and low-density farming and grazing occurs in the surrounding area. A principal hydrological role of the site is the improvement and maintenance of water quality of the waters flowing through it, but high levels of mercury have been found in the fish. Logging, farm run-off, and urban sprawl from Charleston are seen as potential threats from outside the site. The visitors' center offers a full range of environmental education programs. The Francis Beidler Forest (RAMSAR site no. 1773) is one of only two sites in South Carolina, 37 sites in the United States, and 2,000 sites globally which have been designated by the RAMSAR Convention as "Wetlands of International Importance". The other RAMSAR Site in South Carolina is the Congaree National Park located in the Midlands outside Columbia, SC. The Francis Beidler Forest is located in the same watershed as the proposed wetland impacts (LOLT 2011, RAMSAR).

It is the mission of the Francis Beidler Forest to maintain and/or enhance functional integrity of Four Hole Swamp and its watershed, and leverage that success to aid in the protection of the Edisto River Basin, of which Four Hole Swamp is a part (USACE 2000). "There is a definitive need for development of alternative compensatory mitigation options in this Service Area" (USACE 2000). Hence, incremental ecological improvement of the Four Hole Swamp watershed is offered via the proposed mitigation sites in critical conservation areas that are located adjacent and connected to the Francis Beidler Forest conservation tracts. The Bannister Tract is anticipated to be transferred to SCDNR, which will act as the long-term steward for the property, along with a number of other conservation easements along Sandy Run and Dean Swamp to create an anchor for future conservations efforts in connection with Audubon's conserved lands with the Beidler Forest. Of the total acreage being protected, 1,667 acres (Bannister Tract) will be donated to SCDNR with the intent to be dedicated as a SC Heritage Trust Preserve, which

will provide permanent access and recreational use for the local community members. The other mitigation tracts downstream of the Bannister Tract on Dean Swamp and Walnut Branch will be placed under a conservation easement to be held by one of the Land Trusts actively engaged in the Four Hole Swamp watershed. Figure 2a in Appendix A illustrates the proximity of the Mitigation Project with previously conserved lands.

The Four Hole Swamp watershed is also situated adjacent to the “Charleston Greenbelt” corridor which consists of protected and productive open lands surrounding Lowcountry cities. This “Charleston Greenbelt” concept was developed by the Lowcountry Open Land Trust (LOLT) with a mission to preserve wildlife habitats, outstanding natural areas, and sites of unique ecological significance, historical sites, forestlands, farmlands, watershed, open space and urban parks. LOLT is also a major partner with Audubon, and holds a majority of the conservation easements in the Four Hole Swamp watershed. The proposed mitigation sites fall within the Charleston Greenbelt initiative area and propose expansion of the current efforts by conservation groups within the Four Hole Swamp watershed with the acquisition of key tracts within the Dean Swamp watershed and Walnut Branch watershed which will intern support healthy ecosystems and abundant wildlife in the area, a chief goal of the LOLT. Figure 2 in Appendix A illustrates the proximity of the proposed Mitigation Project and the “Charleston Greenbelt”.

As mentioned previously, Four Hole Swamp comprises one-third of the Edisto River’s water flow. The Edisto in turn supplies 60 percent of the Ashepoo, Combahee, and Edisto (ACE) Basin’s freshwater supply (LOLT 2011). The ACE Basin is one of the largest undeveloped wetland ecosystems remaining along the Atlantic Coast and is recognized as a system supporting numerous high quality wetland plant communities and highly intact, extensive riparian habitats. It has been identified as a unique coastal ecosystem of national and regional significance under the National Wetlands Priority Conservation Plan (LOLT 2015, NWACC 2010). Today, 208,000 acres out of the 350,000-acre basin are now conserved (LOLT 2011). As a result, working ‘upstream’ within the Four Hole Swamp watershed can provide ecological benefits for the status of the ACE Basin downstream.

Many conservation programs within the Lowcountry are striving for the same goals of protecting and preserving the vital resources these coastal plain swamp-stream ecosystems provide. Other programs within the area include The Nature Conservancy, ACE Basin, Lord Berkeley Conservation Trust, Coastal Conservation League, U.S. Forest Service, U.S. Fish and Wildlife Service (FWS), the SC Department of Health and Environmental Control, Natural Resource Conservation Service (NRCS), and Ducks Unlimited, just to name a few.

#### **4.1.1. Water Quality**

##### **4.1.1.1. Historical Changes of Aquatic Resources in Watershed**

Historical changes in land cover from 1992 to 2011 were analyzed for the Four Hole Swamp watershed using the National Land Cover Database data and is illustrated on Figure 3 in Appendix A. During this 19 year time period, the developed areas increased slightly from 2 to 6 percent for the basin. Developed areas in the basin are noted in the SC DHEC 2007 report as low growth potential areas. Other land cover classes have remained generally the same over this period, with a slight decrease in forested land cover (9 percent of watershed). This fluctuation in forest cover could reflect slight urban growth and cycles of timber harvesting, as the number of “shrub/scrub” acres increased over the decade. This suggests that timber was harvested and the plots are beginning to regenerate over this time period.

Though substantial land cover changes have not occurred in the past 19 years, the region’s aquatic resources have been historically impacted. Between the 1780s and the 1980s, South Carolina lost 27 percent of its wetlands of all types (Dahl 1990). South Carolina is in the top six states for the most extensive wetlands losses in the United States since the 1970s (Mitsch and Gosselink 1993). Historically in the coastal plain, many hydrologic features were altered for agricultural development, and agricultural

land uses are very predominant within the Four Hole Swamp watershed. Rice was introduced into the region in the late seventeenth century and by 1720 accounted for half of South Carolina's economy. Initially, rice was produced inland, grown in swamps that were irrigated by fresh water streams (Berkeley County 1989). Planters bought thousands of acres in the bottomland hardwood forest areas for rice plantations (Upchurch, n.d.). This system employed a series of dams, dikes, and trunks with which to control water flow in and out of the fields as well as large reservoirs, called reserves, in which the fresh water was accumulated (Berkeley County 1989). These types of hydrologic modifications are evident when viewing GIS data such as the National Hydrography Dataset, which distinguishes man-made hydrographic features (e.g. ditches) from streams, and LiDAR data in the basin, which helps visualize hydrologic features in elevation. As many of these features were associated with agriculture, these areas were also affected by conversion from forest to farmland (US EPA 2012).

Bottomland hardwood forest in the US has substantially decreased in the past century. A 1988 report from the National Wetlands Research Center of the US Fish and Wildlife Service states that over 80 percent of the Southeast's original freshwater forested wetlands had been lost (Haynes, Allen and Pendleton 1988), including many acres of bottomland hardwood forests. Virgin cypress swamps were an important source of timber for early settlers and by the late 1930's, virgin cypress was extremely scarce (USFS 1998). Protection and restoration of these ecosystems has become a priority (USFS 1998). Haynes, Allen and Pendleton 1988; Kupfer, Meitzen and Pipkin 2010) as these areas serve a critical role by reducing the risk and severity of flooding to downstream communities by providing areas to store floodwater (US EPA 2012). In addition, these wetlands improve water quality by filtering and flushing nutrients, processing organic wastes, and reducing sediment before it reaches open water (US EPA 2012).

Along with the loss of bottomland hardwood forests, longleaf pine ecosystems have suffered loss within the southeast region. The longleaf pine ecosystem once covered approximately 90 million acres in the southeastern US. This unique ecosystem has been reduced to fewer than two million acres, representing a 97 percent decline in this important ecosystem. Today, only scattered patches of the longleaf pine/wiregrass ecosystem occur, primarily in the coastal plains of the Carolinas, Georgia, Florida, Alabama, Louisiana, and Texas. About half of these surviving stands of longleaf pine exist on public lands. Factors contributing to the demise of this ecosystem include fire suppression efforts, clearing for agriculture and development, aggressive logging at the turn of the last century, and conversion to other pine types for faster growth and profits. To protect and restore these valuable forests, restoration efforts from NRCS's Longleaf Pine Initiative and other regional conservation partners are working with forestland owners in nine states, including South Carolina, to restore longleaf pine forests (NRCS 2015).

#### **4.1.1.2. Water Quality Issues in Watershed**

The major water quality concern in the Four Hole Swamp watershed is fecal coliform ("FC") and biological (aquatic community) criteria (NRCS 2010). The South Carolina Department of Health and Environmental Control (the "SC DHEC") monitors approximately 20 permanent and random water quality stations in the watershed. Water quality stations are cited for fecal coliform, dissolved oxygen, aquatic community (macroinvertebrates) and mercury impairments more than any other impairment in the watershed. The fecal coliform impairments in the upper part of the watershed, cited as a result of nonpoint sources such as agricultural issues, failing septic systems, and overland contributions from impervious surfaces, is being addressed through the 2005 Four Hole Swamp TMDL.

The region's historical land cover change from the loss of longleaf pine and bottomland hardwood forests and the conversion to agricultural lands and silviculture practices with practices such as ditching and channelizing the land has posed water quality threats to the watershed. Hydrologic modifications such as shorter time of concentrations, decreases in infiltration and evapotranspiration rates have most likely altered the watershed's natural runoff characteristics. The increase in runoff rates has the potential to carry more pollutants, thus higher potential for impaired waters within the watershed, such as the ones listed above.

#### 4.1.2. Wildlife

##### 4.1.2.1. Historical Losses of Wildlife Habitat

Southeastern bottomland hardwood support high levels of diversity in both the flora and fauna. As well, longleaf pine habitats are noted for their extreme levels of diversity and have 29 species associated with the ecosystem, such as the federally endangered Red-cockaded Woodpecker (NRCS 2011). However, post European settlement disturbance and conversion of land use in the region has impacted this ecosystem substantially in the southern United States (US EPA 2012). Coastal plain hydrologic systems were modified by early settlers for agriculture, timber harvest and to support waterway travel. Since settlement, bottomland hardwood forest has been altered by timber and most substantially, conversion to agricultural land uses. Longleaf pine forests significant decrease can also be attributed to aggressive logging practices and clearing for agricultural land uses, along with development, fire suppression efforts, and conversion to other types of pine. Loss and fragmentation of habitat has been identified as a major threat to many of the species listed as threatened and endangered in South Carolina (NRCS 2010). Specifically, within the Beidler Forest, more than 300 vertebrates and 300 plants depend upon the swamp for survival, and a number of threatened and/or vulnerable species are present (LOLT 2011). A host of federally endangered or threatened flora and fauna are listed for the basin and SC DNR recognizes that habitat protection is of utmost importance to protection of these species (NRCS 2010).

**Table 2. List of Federally Endangered or Threatened Species in the Four Hole Swamp watershed.**

<b>Plant Species</b>	
<b>Common Name (<i>Latin Name</i>)</b>	<b>Status</b>
American chaffseed ( <i>Schwalbea americana</i> )	Endangered
Bog Asphodel ( <i>Narthecium americanum</i> )	Candidate
Canby's dropwort ( <i>Oxypolis canbyi</i> )	Endangered
Pondberry ( <i>Lindera melissifolia</i> )	Endangered
<b>Wildlife Species</b>	
<b>Common Name (<i>Latin Name</i>)</b>	<b>Status</b>
Arctic peregrine falcon ( <i>Falco peregrinus tundrius</i> )	Recovery
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	Recovery
Brown pelican ( <i>Pelecanus occidentalis</i> )	Recovery
Red-cockaded woodpecker ( <i>Picoides borealis</i> )	Endangered
Wood stork ( <i>Mycteria americana</i> )	Endangered
Red wolf ( <i>Canis rufus</i> )	Endangered
West Indian manatee ( <i>Trichechus manatus</i> )	Endangered
Loggerhead sea turtle ( <i>Caretta caretta</i> )	Threatened
<b>Aquatic Species</b>	
<b>Common Name (<i>Latin Name</i>)</b>	<b>Status</b>
Frosted Flatwoods salamander ( <i>Ambystoma cingulatum</i> )	Threatened
Shortnose sturgeon ( <i>Acipenser brevirostrum</i> )	Endangered



## **4.2. 10-DIGIT HUC DEAN SWAMP**

Majority of the Mitigation Project sites are situated in the 10 digit HUC Dean Swamp subwatershed (0305020502). The subwatershed is located in Orangeburg and Berkeley Counties and consists primarily of Dean Swamp and its tributaries. The subwatershed has a drainage area of 103 square miles (66,766 acres) with a total of 158.2 stream miles and 397.5 acres of lake waters. All streams in the subwatershed are classified as Freshwater (SCDHEC 2012).

The sites are mostly within the lower portion of the Dean Swamp subwatershed HUC 10, situated adjacent to Dean Swamp and Sandy Run above Highway 311. At the level IV Ecoregion, the majority of the proposed site is within the Mid-Atlantic Floodplains and Low Terraces associated with Dean Swamp and Sandy Run floodplain and fluvial terraces. As well, parts of the watershed adjacent to these floodplains reach into the Carolina Flatwoods.

Land cover in the subwatershed is 51 percent forested (non-wetland forest), 24 percent wetlands, 20 percent agriculture, 3 percent developed and 1 percent open water according to the National Land Cover Database for 2011 (NLCD 2015). The large numbers of wetland in the watersheds correspond to the extensive swamp-stream floodplains of Dean Swamp and its tributaries, and 23 of the 24 percent are characterized as “woody wetlands” as opposed to “emergent herbaceous wetlands”. As well, the large percent of forested areas mostly attribute to the loblolly pine plantations that were most likely converted from the historical longleaf pine forests within the watershed.

### **4.2.1. Water Quality**

#### **4.2.1.1. Historical Changes of Aquatic Resources in Watershed**

Historical changes in land cover were compared from 1992 to 2011 for the Dean Swamp watershed and is illustrated on Figure 4 in Appendix A. During this nineteen year period, the developed area remained in the 1 to 3 percent of the watershed and it is projected that there is a low potential of growth in the subwatershed (SCDHEC 2012). A slight decrease in forested land and increase in shrub/scrub in the watersheds suggest logging activity in the watershed. Continuing farming and agriculture activities and vast areas of floodplain wetlands have remained consistent over the last decade. Native upland hardwood forests continue to be harvested and converted to pine monoculture, largely loblolly (USACE 2000). Large industrial forestlands are above Dean Swamp in Orangeburg County (USACE 2000).

However, the watershed has not been without historical changes to aquatic resources. Much of the region experienced historical changes to support agriculture, including conversion of forested wetlands and uplands (Haynes, Allen and Pendleton 1988) and early hydrologic alterations such as water diversions, canals, and reservoirs for managing water. The lasting imprint of hydrologic and geomorphic alterations in the watershed is documented by the U.S. Forest Service in the coastal plain (USFS 2013). Alterations include dams, dikes, ditching and straightening channels, and water diversion (USFS 2013). A review of historical maps and aerial photographs (USGS) reveal many alterations to the landscape through the 20<sup>th</sup> century. Review of current National Hydrography Dataset and elevation data from LiDAR highlight these features in the watershed. It is now understood that these modifications affect the larger ecosystem by disrupting natural hydrologic regimes that maintain natural wetlands and streams.

The US Forest Service has documented the changes to hydrology and aquatic resources for watersheds within Francis Marion National Forest lands in the same eco-regions. Management strategies such as those suggested in the USFS Draft Forest Plan (2013) for Francis Marion National Forest put priority on restoring hydrology closer to “natural potential condition.” Aquatic resource restoration at the proposed bank site can help with moving forward with conservation goals that the US Forest Service recognizes as important, as well as conservation goals set forth by the Audubon’s Francis Beidler Forest and its partners

for the vital wetlands and uplands in the Four Hole Swamp watershed.

Along with the conservation goals for the US Forest Service, as stated previously, the mission of Audubon's Francis Beidler Forest and its partners is to significantly enhance land and habitat protection efforts through conservation easements to protect the Forest and lands directly linked to the Beidler Forest or to the Four Hole Swamp in order to create the most complete wetland system possible. Beidler Forest was originally established to preserve the vital 1,800 acres of old-growth swamp forest, one of only two such stands still left in the state. However, the natural resources of the Forest and Swamp provide outstanding recreational benefits as well. A visitor center, 1.75-mile boardwalk trail, and a canoe and kayak trail for naturalist-guided paddling tours provide visitors the chance to explore deep within the swamp's interior (Audubon 2015). Hence the importance of the Forest and its expansion to promote stewardship of the area for the benefit and enjoyment of the present and future generations by conservation, utilization, awareness, protection and enhancements of the watershed's resources.

#### **4.2.1.2. Water Quality Issues in Watershed**

Within the 10-digit HUC, there are three permanent and/or random water quality monitoring stations monitored by SCDHEC. Cedar Swamp is monitored by both E-115 and E-596 water quality monitoring stations, where E-596 is a macroinvertebrate sampling station. Aquatic life uses are fully supported based on macroinvertebrate community data (SCDHEC 2012) and SCDHEC's 2012 303(d) List of Impaired Waters. Dean Swamp is monitored by water quality monitoring station E-030. Aquatic life uses are fully supported at E-030 on Dean Swamp. There is a significant increasing trend in pH. Significant decreasing trends in total phosphorous and total nitrogen concentration suggest improving conditions for these parameters (SCDHEC 2012). However, recreational uses are not supported due to fecal coliform bacteria excursions, which are compounded by a significant increasing trend in fecal coliform bacteria concentration. Hence, WQMS E-030 is on the 2012 303(d) List of Impaired Waters due to fecal coliform violations.

Potential water quality impacts in this watershed and the proposed mitigation site could come from agricultural land uses in the uplands and areas adjacent to the mitigation sites that make their way into the floodplains. Agricultural land uses can contribute to common water quality issues including high nutrient loadings and fecal coliform bacteria. Agricultural land can be a source of fecal coliform bacteria via runoff from grazing pastures, improper land application of animal wastes, livestock operations, and livestock with access to waterbodies.

As well, adjacent timber harvesting practices in the watershed, such as the large industrial forestlands above Dean Swamp and the mitigation sites, can cause significant water quality problems if forestry activities are improperly managed. Sources of nonpoint source (NPS) pollution associated with forestry activities include removal of streamside vegetation, road construction and use, timber harvesting, and mechanical preparation for the planting of trees (US EPA 1996). Sediment is the pollutant most associated with forestry activities via accelerated erosion, mass wasting, and/or road construction and road use (US EPA 2005). Harvesting trees in the area beside a stream can affect water quality by reducing the streambank shading that regulates water temperature and by removing vegetation that stabilizes the streambanks. These changes can harm aquatic life by limiting sources of food, shade, and shelter (US EPA 1996). Such impacts from sediment loadings can include light reduction for photosynthesis for aquatic vegetation (physical), aquatic biota suffocation (physical), and the introduction of organic contaminants, heavy metals, nutrients and biological pollutants via the adsorption to sediment surfaces (biological/chemical).

## **4.2.2. Wildlife**

### **4.2.2.1. Historical Losses of Wildlife Habitat**

Southeastern longleaf pine and bottomland hardwood forest supports high levels of diversity in both the flora and fauna. However, post European settlement disturbance and conversion of land use in the region has impacted this ecosystem substantially in the southern United States (US EPA 2012). Coastal plain hydrologic systems were modified by early settlers for agriculture, timber harvest and to support waterway travel. Since settlement, bottomland hardwood and long leaf pine forests have been altered by timber and most substantially, conversion to agricultural land uses. Within the Four Hole Swamp and Dean Swamp watershed, both are predominately present. As hydrologic and ecological systems are closely related, hydrologic modifications and past land use practices in the watershed have led to an altered hydrologic regime, the loss of biodiversity and the loss of native ecosystems in some areas of the watershed. Loss and fragmentation of habitat has been identified as a major threat to many of the species listed as threatened and endangered in South Carolina (NRCS 2010).

Audubon recognizes the importance and potential for conservation management of the lands in these watersheds, especially in the river floodplains of South Carolina. Through the Beidler Forest, Audubon and its partners have been able to protect the largest stand (1,800 acres) of the untouched old growth virgin blackwater bald cypress and tupelo gum forest in the world, some of which are thousands of years old (NAWCC 2010). The Forest's wetland habitat supports over 300 vertebrates and 300 plant species, including 38 species of breeding neotropical migrants (NAWCC 2010) and a number of threatened and/or endangered species are present. As such, Beidler Forest is a Globally Important Bird Area, a scientific designation by the American Bird Conservancy and Audubon that recognizes sites that have vital habitat for bird populations. As such, SCDNR, the LOLT and the Lord Berkeley Conservation Trust recognize this importance and are striving to preserve these adjacent wetland and uplands within the Dean Swamp watershed to complete the Four Hole Swamp watershed's functionality.

## **4.3. 10-DIGIT HUC LOWER FOUR HOLE SWAMP**

Within the Four Hole Swamp watershed, the Mitigation Project sites are also located in the 10 digit HUC Lower Four Hole Swamp subwatershed (0305020503). The subwatershed is located in Orangeburg, Berkeley and Dorchester Counties and consists primarily of Four Hole Swamp and its tributaries from Cow Castle Creek to its confluence with the Edisto River. The subwatershed has a drainage area of 287 square miles (183,907 acres) with a total of 501.4 stream miles and 931.9 acres of lake waters. All streams in the subwatershed are classified as Freshwater (SCDHEC 2012).

A portion of the Mitigation Project is located in the Lower Four Hole Swamp subwatershed HUC 10, situated adjacent to Walnut Branch, between Highway 178 and Interstate 26, until the confluence with Four Hole Swamp. At the level IV Ecoregion, the majority of the proposed site is within the Mid-Atlantic Floodplains and Low Terraces associated with Four Hole Swamp and Walnut Branch floodplain and fluvial terraces. As well, parts of the watershed adjacent to these floodplains reach into the Carolina Flatwoods.

Land cover in the subwatershed is 35 percent forested wetlands, 34 percent forested (non-wetland forest), 23 percent agriculture, 5 percent developed, 1.5 percent non-forested wetland and 0.4 percent open water according to the National Land Cover Database for 2011 (NLCD 2015). The large numbers of wetland in the watersheds correspond to the extensive swamp-stream floodplains of Four Hole Swamp and its tributaries, such as the Francis Beidler Forest being located within this subwatershed. The large percent of forested areas mostly attribute to the loblolly pine plantations that were most likely converted from the historical pine flatwoods and longleaf pine forests within the watershed.

In the northern portion of the Lower Four Hole Swamp subwatershed, SCDHEC's water quality monitoring stations on Providence Swamp (E-051) and Horse Range Swamp (RS-02303 and E-052) are incorporated in the 2005 Four Hole Swamp TMDL for fecal coliform impairments. Probable sources of fecal coliform bacteria that were identified in the subwatershed from the TMDL included grazing animals (especially cattle with access to streams), land application of litter, failing septic systems, urban runoff, and wildlife. As for where the Mitigation Project sites are located within this subwatershed, there are three SCDHEC monitoring stations along this section of Four Hole Swamp. At the upstream site (E-112), aquatic life uses are not supported due to dissolved oxygen excursions and therefore is on SCDHEC's 2012 303(d) impaired list. As well, this site is also on the 2012 303(d) list for fish consumption for mercury violations. There is a significant trend in pH at this location and significant decreasing trend in turbidity, suggesting improving conditions for this parameter. At the midstream site (E-100), aquatic life uses are fully supported. Although dissolved oxygen excursions have occurred, they were typical values seen in blackwater systems and were considered natural, not standard violations (SCDHEC 2012). There is a significant increasing trend in pH and recreational uses are not supported due to fecal coliform bacteria excursion (on the 2012 303(d) Impaired List). At the downstream site (E-015A), aquatic life and recreational uses are fully supported; however there is a significant increasing trend in five-day biochemical oxygen demand. The Mitigation Project on Walnut Branch drains directly to monitoring station E-100 on Four Hole Swamp, thus, the site has the potential to improve water quality impairments for this location and further protect downstream, such as station E-015A, from becoming impaired.

Potential water quality and wildlife impacts in this subwatershed and the proposed mitigation site could come from silviculture practices and agricultural land uses in the uplands and areas adjacent to the mitigation sites that make their way into the floodplains. For historical wildlife and aquatic resource losses within the subwatershed, since European settlement, bottomland hardwood and long leaf pine forests within this region have been altered by timber and most substantially, conversion to agricultural land uses. As well, the lower portion of this subwatershed is heavily impacted with mining practices (majority sand mines) and landfills. Though these facilities have individual NPDES permits, nonpoint source pollution can still be associated with these activities and a threat to the watershed's natural resources.

#### **4.4. Areas for Watershed Improvement**

After assessing the historical losses and concerns for water quality and wildlife in the aforementioned watersheds, the following items have been identified as areas for improvement.

##### **4.4.1. Water Quality Needs in the Watershed**

Due to the historical hydrologic and ecological alterations in the basin, and the priority that the National Audubon Society, US Forest Service (2013), USDA NRCS (2015), USFWS National Wetlands Research Center (Haynes, Allen and Pendleton 1988), the US EPA (US EPA 2012), and The Nature Conservancy (Land Trust Alliance 2015) on conservation of these lands, there is a need for wetland restoration, protection, and enhancement to improve hydrologic and ecological conditions. Land use practices associated with timber and agricultural in the watershed could pose a threat to water quality. Protection of these pine flatwoods, headwaters areas and floodplain forests is important for maintaining water quality downstream and meeting the goals of SC DHEC and EPA water quality standards. Bottomland hardwood forests provide critical ecosystem services, including storing floodwaters and reducing flooding to downstream communities and improving water quality by effectively filtering pollutants. In this way, restoring and protecting an important hydrologic resource in this part of the basin contributes to protecting water quality throughout the basin. Along with the environmental benefits to protecting water quality throughout this watershed, it is also recreationally important to preserve and protect this area, especially for the Francis Beidler Forest.

#### **4.4.2. Wildlife Needs in the Watershed**

Restoring hydrologic resources closer to their natural condition will help meet wildlife and forest management goals in the watershed. The importance of conservation management in the watershed is evident, especially within the swamp-stream floodplains. Four Holes Swamp and the lower ACE Basin are priority sites under the 1992 Emergency Wetlands Resources Act's Southeast Regional Wetlands Plan (NAWCC 2010). Francis Beidler Forest, Audubon, Nature Conservancy, and Lord Berkeley Conservation Trust's properties, downstream and adjacent of the Mitigation Project, are managed to protect natural resources that include bottomland hardwood forests and floodplain wetlands. Therefore, hydrologic restoration on the bank sites would complement this management goal on surrounding lands and further promote wildlife needs in the watershed, such as extending habitat for birds near the "Important Bird Area" at Beidler Forest. In addition, conserving the property will help provide conservation connectivity between the already protected Audubon and its partner's lands. Finally, it is recognized that climate change may impact habitats in the coastal plain region. Protecting lands within the coastal ACE River basins are important for resiliency in the face of a changing climate that may alter habitats. Therefore, the Nature Conservancy and their partners recommend conservation that abuts and expands existing protected lands to increase connectivity of habitat (Land Trust Alliance 2015).

#### **4.4.3. Ecological (Physical, Chemical and Biological) Suitability and Technical Feasibility of the Site to Meet Water Quality and Wildlife Habitat Needs in Watershed**

As previously mentioned, hydrologic alterations in the watershed have been recognized by USFS at similar watersheds in the ecoregions, such as in Francis Marion National Forest in Berkeley County, SC. These modifications in the watershed have altered hydrologic and geomorphic processes away from the "natural potential condition." The proposed mitigation site is an opportunity to support ecological management of the property in congruence with Audubon and its partner's goals on the surrounding Four Hole Swamp/Beidler Forest as well as address conservation goals for protection of swamp-stream floodplain, bottomland hardwood forest and long leaf pine ecosystems. Hydrologic regimes and habitat are closely related, especially in these coastal plain systems. Restoration goals may include: replanting of bottomland hardwoods along existing drainages and stream corridors, preservation of bottomland hardwoods along Sandy Run, Dean Swamp, Walnut Branch, and associated unnamed tributaries (all tributaries of Four Hole Swamp), enhancement of pine plantation to pine flatwoods communities within jurisdictional wetlands, enhancement of isolated pond wetlands interspersed throughout the existing pine plantation, establishment of protected riparian buffers, and the long-term establishment of long-leaf pine flatwoods communities predominately in the upland areas.

#### **4.4.4. Offsite Threats to Mitigation Efforts Constructed within the Mitigation Project Sites**

By the late 20th century excessive logging, drainage, farm chemicals, and urban sprawl threatened the Four Hole Swamp's integrity, namely the Beidler Forest. Currently the threats to water quality and aquatic/riparian habitats at the Mitigation Project site(s) include timber activities in the floodplain, surrounding agricultural land uses and mining activities. The site is frequently inundated by the Walnut Branch, Sandy Run and Dean Swamp floodwaters, therefore impacts (such as water quality) upstream could potentially affect the site. However, these areas are being addressed with conservation easements within the floodplain, the easements can play a role in mitigating water quality issues with adequate buffers that will protect the success for downstream ecosystems and users.

## **5. COMPENSATORY MITIGATION PLAN**

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### **5.1. GOALS AND OBJECTIVES**

Proposed wetland mitigation activities within the Mitigation Project site(s) is expected to provide preservation and enhancement opportunities of pine flatwoods and bottomland hardwood wetlands along Walnut Branch, Sandy Run and Dean Swamp and the potential future establishment of long leaf pine forest in the uplands within the same 8 digit HUC (Four Hole Swamp watershed HUC 03050205) as the proposed impacts to the Camp Hall property.

#### **5.1.1. Mitigation Project Objectives**

The proposed Mitigation Project will provide numerous ecological and water quality benefits within the Four Hole Swamp watershed (HUC 03050205) and the Mid-Atlantic Coastal Plain ecoregion. The Four Hole Swamp watershed is primarily rural and agricultural with some industrial use. Streams and wetlands in the coastal plain of South Carolina have been heavily impacted as part of historical silviculture and agriculture land management practices. The potential threat of these practices is likely to impact terrestrial and aquatic habitats and disrupt habitat corridors.

The Mitigation Project is proposing to protect approximately 2,496 acres in perpetuity and further expand the conservation efforts of the National Audubon Society in the Four Hole Swamp watershed. The proposed Mitigation Project will potentially include:

- Protection of approximately 1,533 acres of wetland through the establishment of conservation easements.
- Preservation of approximately 890 acres of mature bottomland hardwood wetlands along Sandy Run, Dean Swamp, and Walnut Branch, all tributaries of Four Hole Swamp. Enhancement of approximately 611 acres of both clear cut and established pine plantation wetlands.
- Connectivity to other conserved lands, such as those managed by National Audubon Society. Fragmented landscapes are viewed as a top threat to wildlife and ecosystems (Land Trust Alliance 2014; NRCS 2010), thus a top conservation goal is connectivity.
- Provide ecological benefits to address water quality impairments, hydrologic modifications, and vital habitat within the Four Hole Swamp watershed.

Table 3 provides the estimated ecological benefits offered by the proposed Mitigation Project to water quality, hydrology and habitat.

**Table 3. Objectives for the Mitigation Project**

<b>Water Quality Benefits</b>	<b>Accomplished By</b>
Water quality	Benefit will be achieved through protection, enhancement, and preservation of existing riparian vegetation. Silviculture activities are currently active within a large portion of the Mitigation Project sites. Enhancement and preservation of these areas will allow the floodplain to continue to receive and filter runoff, thereby reducing nutrients and sediment concentrations reaching aquatic resources. As such, benefit will be achieved through the reduction of sediment loss with timber harvest/reforestation and the stabilization of eroding stream banks. Protection and enhancement of riparian vegetation will benefit surface water and groundwater quality by minimizing nitrogen and phosphorus concentrations in runoff from surrounding uplands, improving surface soil structure to facilitate groundwater infiltration, and protecting groundwater discharge areas along riparian corridors.
<b>Hydrological Function Goals</b>	<b>Accomplished By</b>
Floodplain function	Preserve existing floodplain functions by eliminating the threat of future silviculture operations which would most likely require the construction of logging roads to access portions of the property. Protection of the existing vegetation will also allow the floodplains of Walnut Branch, Sandy Run and Dean Swamp to function naturally providing benefits to water quality and habitat corridors.
Water Storage	Enhancement of buffer areas, including floodplain wetlands, will store more water during precipitation event than under current drainage conditions, thus, reducing flooding in the watershed.
<b>Biological Function Goals</b>	<b>Accomplished By</b>
Habitat for macroinvertebrates and fish	Protecting the existing properties, which are crossed by multiple drainages dotted wetland depressions, will preserve valuable floodplain habitat vital to the native macroinvertebrates and fish that inhabit the Mitigation Project sites.
Vegetative Habitat Protection	Preservation of bottomland hardwood ecosystems, which are under threat from silviculture practices maintains the presence of native species and diverse ecosystems that have historically been stripped from the Four Hole Swamp, Lower Four Hole Swamp and Dean Swamp watersheds.
Habitat Corridor Protection	The establishment of the Mitigation Project and associated conservation easements, with its proximity to previously conserved lands, will preserve natural travel corridors for native species and reduce habitat fragmentation.
Long Term Protection of Ecological Resources	The proposed protective mechanisms for lands within the Mitigation Project is expected to protect the proposed ecological benefits in perpetuity.

Conservation Goals	Accomplished By
Reduction of Habitat Fragmentation	Establishment of the proposed conservation and development restriction easements. According to SCDNR’s “Comprehensive Wildlife Conservation Strategy: 2005 – 2010”, Biologist have identified habitat protection as one of the most important actions to ensure protection of South Carolina priority species. Loss and fragmentation of habitat have been identified as a major threat to many of the species listed as threatened and endangered in South Carolina. The proposed Mitigation Project is in close proximity to Audubon, Nature Conservancy, and Lord Berkeley Conservation Trust properties and identified by the Nature Conservancy as a property of interest.

## 5.2. SITE SELECTION

An extensive process was undertaken to locate a suitable PRMP site(s) that meets and adheres to the USACE 33 CFR Parts 325 and 332 and EPA 40 CFR Part 230 and South Carolina Department of Health and Environmental Control (SCDHEC) – Office of Ocean and Coastal Resource Management (OCRM) Statutory Authority: 1976 Code § 48-39-10 through 48-39-230; R.30-4.G: Mitigation Criteria. In an effort to locate a site or sites which would provide the significant opportunity for ecological uplift a watershed approach was utilized, which took an in-depth look at the environmental issues facing the Four Hole Swamp watershed. A watershed approach focusing on the Four Hole Swamp watershed was utilized to search for the ideal PRMP site(s) to satisfy the compensatory wetland mitigation requirement for impacts associated with the Camp Hall Site while simultaneously furthering the conservation goals of Audubon and others. Based on the results of this analysis and the site selection process, it was determined that a large contiguous area with opportunities to protect a valuable aquatic resource and expand on the existing conservation efforts by the State and private conservation organizations would be preferred. In an effort to provide mitigation within close proximity to the impact site, a detailed search was conducted, but no sites were either available or could be located that could provide large scale land continuity for the protective site protection instruments.

The Mitigation Project area was selected because it meets the needs of the watershed and proposes to protect a significant portion of the Dean Swamp and Lower Four Hole Swamp watersheds, which is a priority for the National Audubon Society. The Mitigation Project is proposed as compensatory mitigation to off-set unavoidable impacts to jurisdictional wetlands due to the construction of the Industrial Site Development. In accordance with both the USACE –*Compensatory Mitigation Guidelines* (USACE 2010) and the most current federal mitigation regulations (Compensatory Mitigation for Losses of Aquatic Resources; Final Rule dated April 10, 2008) primary consideration was given toward identifying mitigation sites that: 1) supported a watershed restoration approach, 2) provided for In-Kind mitigation, and 3) existed within the primary service area.

The Mitigation Project tracts were selected for inclusion into this PRMP due to their location in the same 8-digit HUC and same Level IV Ecoregion as the impact site. The Mitigation Project sites were also chosen for in-kind wetland areas that are being disturbed on the impact site. Additionally, the Mitigation Project provides connectivity with previously conserved lands, allowing for ecosystem management continuity and an expansion of protected aquatic resources and wildlife habitat within the Four Hole Swamp watershed.

Consistent with the In-Kind mitigation requirements and location within the primary service area, the proposed impact site and potential mitigation sites are located within the Four Hole Swamp watershed (8-digit HUC 03050205).



### 5.2.1. Resource Equivalency

#### 5.2.1.1. Comparison of Waters of the U.S.

The jurisdictional waters of the U.S. on the impact site are a mix of wet loblolly pine plantation, wet sweetgum plantation, isolated ponds, mixed pine-hardwood forest, bottomland hardwood forest, Non-Alluvial Swamp Forest, and RPWs. The proposed development will impact a total of 192.86 acres of jurisdictional wetlands, 23.14 acres of non-jurisdictional isolated wetlands, and 1.85 acres of RPWs on the Camp Hall Site.

The jurisdictional waters associated with the Mitigation Project site(s) include approximately 1,533 acres of palustrine, forested wetlands classified as a mix of bottomland hardwood, pine plantation flatwoods, and isolated ponds and approximately 47,932 linear feet (9 miles) of streams consisting of Cedar Swamp, Sandy Run, Dean Swamp, Walnut Branch, and associated unnamed tributaries. The site is also located within Four Hole Swamp watershed (8-digit HUC 03050205) approximately eleven miles northwest of the proposed Camp Hall Site.

The Mitigation Project will provide an excellent opportunity for the preservation, enhancement, and restoration of bottomland hardwood and pine flatwoods wetlands, within one of the primary focus areas for Audubon and the Four Hole Swamp watershed. Wetlands slated for preservation are generally high quality wetlands which will offset impacts to low and medium quality wetlands. In addition, the Mitigation Project integrates the Green Belt initiative with a primary goal of establishing a conservation zone around the Charleston metropolitan area and further expands the conservation goals of Audubon and the Nature Conservancy in the Four Hole Swamp watershed.

### 5.3. SITE PROTECTION

Long-term protection of the mitigation properties will involve either a conservation easement or a restrictive covenant. Each site protection instrument will specify permissible activities such as access, hunting, and other recreational uses under the restriction that the activity causes no negative effect on the functions and values of the aquatic resources within the mitigation properties. The following section provides site protection information for the properties involved in the Mitigation Project: Bannister Tract, Singletary Tract, Dean Swamp Tract, and the Walnut Branch Tracts (Mimms, Long, and Salisbury).

#### **Bannister Tract**

##### *Ownership of the Mitigation Project*

Upon issuance of a valid Section 404 permit by the USACE, the purchase of the Bannister property will be purchased in fee simple title by South Carolina Public Service Authority. Upon completion of the work activities specified in the Mitigation Plan, fee simple title to the Bannister tract will be conveyed to SCDNR for long-term stewardship.

##### *Long Term Protective Instrument*

Upon issuance of a valid Section 404 permit by the USACE, the Bannister property will be encumbered by conservation easement in a form similar to that used by Low County Open Land Trust on the Boeing-Keystone Tract. The conservation easement will be held by the Low Country Open Land Trust.

Easement Holder	Contact Name	Phone	Address
Low Country Open Land Trust	Ashley Desmosthenes	(843) 577-6510	43 Wentworth Street Charleston, South Carolina 29401

Upon completion of the work activities specified in the Mitigation Plan, the Bannister property will be conveyed to SCDNR under a Long-Term Management Agreement with the intent for the property to be designated as SC Heritage Trust Preserve. The conservation easement will continue to be in effect in perpetuity.

**Dean Swamp and Mimms Tracts**

***Ownership of the Mitigation Project***

Upon issuance of a valid Section 404 permit by the USACE, the purchase of the Dean Swamp and Mimms properties will be completed in fee simple title by South Carolina Public Service Authority. Upon completion of the work activities specified in the Mitigation Plan, fee simple title to the Dean Swamp Tract will be conveyed to Lord Berkeley Conservation Trust and fee simple title to the Mimms tract will be conveyed to the Audubon Society.

***Long Term Protective Instrument***

Upon issuance of a valid Section 404 permit by the USACE, the Dean Swamp Tract, Mimms Tract, Long Tract, and Salisbury Tract properties will be encumbered by restrictive covenant in a form similar to that used by The Nature Conservancy on the Boeing-Fairlawn Tracts.

***Identity of the Long-Term Steward***

<b>Property</b>	<b>Long-Term Steward</b>	<b>Contact Name</b>	<b>Phone</b>	<b>Address</b>
Dean Swamp Tract	Lord Berkeley Conservation Trust	Raleigh West	(843) 899-5228	223 East Main Street, Suite B Moncks Corner, SC 29461
Mimms Tract	Audubon Society	TBD	(843) 462-2150	336 Sanctuary Road Harleyville, SC 29448

**Singletary, Long, and Salisbury Tracts**

***Ownership of the Mitigation Project***

The ownership of the Protected Property will stay with the current landowners.

***Long Term Protective Instrument***

Upon issuance of a valid Section 404 permit by the USACE, the Singletary, Long, and Salisbury properties will be encumbered by conservation easement in a form similar to the Corps 2010 Template Conservation Easement.

<b>Property</b>	<b>Easement Holder</b>	<b>Contact Name</b>	<b>Phone</b>	<b>Address</b>
Singletary Tract	Lord Berkeley Conservation Trust	Raleigh West	(843) 899-5228	223 East Main Street, Suite B Moncks Corner, SC 29461
Long Tract	Low Country Open Land Trust	Ashley Desmosthenes	(843) 577-6510	43 Wentworth Street Charleston, South Carolina 29401
Salisbury Tract	Low Country Open Land Trust	Ashley Desmosthenes	(843) 577-6510	43 Wentworth Street Charleston, South Carolina 29401

**5.4. BASELINE CONDITIONS**

**5.4.1. Physiography, Topography, and Land Use**

The Mitigation Project sites are located in the Coastal Plain physiographic province of South Carolina within the Four Hole Swamp watershed (USGS 8-digit HUC 03050205), specifically the Dean Swamp subwatershed (USGS 10-digit HUC 03050205-02) and the Lower Four Hole Swamp subwatershed (USGS 10-digit HUC 03050205-03). The Four Hole Swamp watershed drains two EPA Level III Ecoregions: Southeastern Plains and Middle Atlantic Coastal Plain. The majority of the proposed site, associated with Dean Swamp and Sandy Run, is within two Level IV Ecoregions: the Mid-Atlantic Floodplains and Low Terraces. In addition, parts of the proposed site reach into a third Level IV Ecoregion: the Carolina Flatwoods.

The Southeastern Plains in the northern portion of the HUC 8 Four Hole Swamp watershed can be described as irregular with broad inter-stream areas with a mosaic of cropland, pasture, woodland, and forest. The Middle Atlantic Coastal Plain Ecoregion, of which the Mitigation Project sites are located in, consists of low elevation, flat plains, with many swamps, marshes, and estuaries. Its low terraces, marshes, dunes, barrier islands, and beaches are underlain by unconsolidated sediments. Poorly drained soils are common, and the region has a mix of coarse and finer textured soils. Topography across the Mitigation Project sites is generally flat, with lower, bottomland hardwoods within the main drainages.

The Mitigation Project sites are currently utilized for silviculture uses. The sites are mostly within the lower portion of the Dean Swamp subwatershed HUC 10, situated adjacent to Dean Swamp and Sandy Run above Highway 311. Some sites located in the Lower Four Hole Swamp subwatershed HUC 10 are adjacent to Walnut Branch, between Interstate 26 and highway 178, until the confluence with Four Hole Swamp. Sites border and connect with the National Audubon Society’s protected Francis Beidler Forest via the Walnut Branch and Dean Swamp mitigation project areas.

The Four Hole Swamp and the Dean Swamp watersheds are comprised of mostly rural land cover. Private land use in the area is a mix of silvicultural and agricultural land, with some interspersed low density residential areas. The largest developed area in the Four Hole Swamp watershed includes the Town of Orangeburg which lies to the upper northwest portion of the watershed. Additional developed area is made up of other small municipalities in the watershed including Cameron, Bowman, Santee, Eutawville, Holly Hill, and Harleyville. Land use within the Dean Swamp and Lower Four Hole Swamp subwatershed is mostly attributed to forested areas (34-51%), wetlands (24-31%), and agricultural lands (20-30%). The large percent of forested areas mostly attribute to the loblolly pine plantations that were most likely converted from the historical longleaf pine forests within the watershed. The majority of farmland in the watersheds is devoted to field and forage crops. The high percentage of wetland land cover reflects the extensive floodplains of the Four Hole Swamp and its coastal plain tributaries.

#### 5.4.2. Soils

Soils within the Mitigation Project site(s) have been mapped by the United States Department of Agriculture (the “USDA”) Natural Resource Conservation Service (the “NRCS”) (USDA 2010) and are displayed on Figures 9 – 9c in Appendix A. Twenty-five soil series are mapped within the Mitigation Project: Alpin fine sand, Blanton fine sand , Bonneau loamy sand, Bonneau sand, Byars loam, Chipley sand, Coxville fine sandy loam, Coxville sandy loam, Dunbar sandy loam, Duplin loamy sand, Goldsboro sandy loam, Lynchburg fine sandy loam, Meggett loam, Mouzon fine sandy loam, Noboco loamy sand, Ocilla loamy sand, Osier loamy fine sand, Pantego fine sandy loam, Pelham sand, Rains sandy loam, Rutlege loamy fine sand, Stallings loamy sand, and Seagate loamy sand.

Table 4 shows the soil map units found within the Mitigation Project Site(s).

**Table 4. Natural Resources Conservation Service Soils**

Map Unit Name	Unit Symbol	Hydric Rating
Alpin fine sand, 0 to 6 percent slopes	ApB	Predominantly Non-Hydric
Blanton fine sand, 0 to 2 percent slopes	B1A	Predominantly Non-Hydric
Blanton fine sand, 2 to 6 percent slopes	B1B	Predominantly Non-Hydric
Bonneau loamy sand, 0 to 2 percent slopes	BoA	Non-Hydric
Bonneau sand, 0 to 4 percent slopes	BoB	Predominantly Non-Hydric
Byars loam	By	Predominantly Hydric
Chipley sand, 0 to 2 percent slopes	ChA	Predominantly Non-Hydric
Coxville fine sandy loam	Cu	Predominantly Hydric
Coxville sandy loam	Cx	Predominantly Hydric
Dunbar sandy loam	Dn	Predominantly Non-Hydric
Duplin loamy sand, 0 to 2 percent slopes	DpA	Non-Hydric
Goldsboro sandy loam, 0 to 2 percent slopes	GoA	Predominantly Non-Hydric
Lynchburg fine sandy loam	Ly	Predominantly Non-Hydric
Meggett loam	Mg	Hydric
Mouzon fine sandy loam	Mo	Predominantly Hydric
Noboco loamy sand, 0 to 2 percent slopes	NoA	Predominantly Non-Hydric
Noboco loamy sand, 2 to 6 percent slopes	NoB	Predominantly Non-Hydric
Ocilla loamy sand, 0 to 2 percent slopes	OcA	Predominantly Non-Hydric
Osier loamy fine sand, frequently flooded	Os	Hydric
Pantego fine sandy loam	Pa	Predominantly Hydric
Pelham sand	Pe	Predominantly Hydric
Rains sandy loam	Ra	Hydric
Rutlege loamy fine sand, frequently flooded	Ru	Hydric
Stallings loamy sand	Sa	Predominantly Non-Hydric
Seagate loamy sand	Se	Predominantly Non-Hydric

### **5.4.3. Jurisdictional Delineation**

A jurisdictional determination request will be submitted to the USACE for all wetlands and streams associated with this Mitigation Project upon the acceptance of this PRMP.

### **5.4.4. Existing Plant Communities**

*The Natural Communities of South Carolina* (Nelson 1986) was utilized to characterize the existing plant communities within the Mitigation Project area. Three predominant vegetative communities exist within the Mitigation Project sites: Bottomland Hardwood Forest, Loblolly Pine Plantation, and Isolated Ponds. A map illustrating the existing plant communities is included as Figures 12 – 12c in Appendix A.

#### **Bottomland Hardwood Forest**

The bottomland hardwood community within the Bannister Tract, Singletary Tract, Salisbury Tract, overstory consist largely of diamond-leaf oak (*Quercus laurifolia*), water oak (*Q. nigra*), and red maple (*Acer rubrum*), ash (*Fraxinus spp.*), swamp tupelo (*Nyssa biflora*), winged elm (*Ulmus alata*), American elm (*Ulmus americana*), American hornbeam (*Carpinus caroliniana*), sweetgum (*Liquidambar styraciflua*), and sweetbay (*Magnolia virginiana*). The understory in the bottomland hardwood community is limited by the overstory, ponding, and flowing drainage patterns, and includes dwarf palmetto (*Sabal minor*), giant cane (*Arundinaria gigantea*), roundleaf greenbrier (*Smilax rotundifolia*), and saplings from canopy species.

The main drainages and runs of the bottomland hardwood community include additional species that are not present or are present in limited numbers in the bottomland hardwood forest. The noticeable addition to the overstory is the presence of baldcypress (*Taxodium distichum*), while other species include swamp chestnut oak (*Quercus michauxii*), swamp tupelo, diamond-leaf oak, ash, and red maple. A limited understory includes southern arrowwood (*Viburnum dentatum*) and dwarf palmetto, and species from the overstory.

The edges of the bottomland hardwood community transition into surrounding communities, and contain additional species that are not present or are present in limited numbers in the interior of the bottomland hardwood forest. The edge overstory includes swamp chestnut oak, American holly (*Ilex opaca*), and sweetbay, while the understory includes giant cane, wax myrtle (*Morella cerifera*), and muscadine vine (*Vitis rotundifolia*).

#### **Non-Alluvial Swamp Forest**

The species composition is very similar to the bottomland hardwood forest, with the exception of the absence of dwarf palmetto in the understory. The overstory of the swamp forest consists largely of diamond-leaf oak, water oak, and red maple, though a limited number of loblolly pines and pond pines are also present. Saplings and shrubs include giant cane, American holly, redbay, sweetbay, and saplings from the hardwood overstory species. The herbaceous layer is very limited due to the overstory and ponding, and includes sedges, soft rush, greenbrier, and muscadine vine.

### **Mesic Mixed Hardwood Forest**

A Mesic Mixed Hardwood Forest community is located on the bluffs adjacent to Marshall Branch and Walnut Branch. The overstory is dominated by diamond leaf oak (*Quercus laurifolia*), water oak (*Quercus nigra*), live oak (*Quercus virginiana*), red maple (*Acer rubrum*), pignut hickory (*Carya glabra*), sweetgum (*Liquidambar styraciflua*), and spruce pine (*Pinus glabra*). The understory includes ironwood (*Carpinus caroliniana*), horse sugar (*Symplocos tinctoria*), American holly (*Ilex opaca*), and Elliott's blueberry (*Vaccinium elliotii*), wild azalea (*Rhododendron canescens*), and dwarf palmetto (*Sabal minor*). The herbaceous and vine layers are relatively sparse, containing Virginia chain fern (*Woodwardia virginica*), netted chain fern (*Woodwardia areolata*), bladder sedge (*Carex intumescens*), poison ivy (*Toxicodendron radicans*), and muscadine (*Vitis rotundifolia*).

### **Calcareous Forest**

A Calcareous Forest community is located on the bluffs adjacent to Marshall Branch. The overstory of this community is similar in composition to the Mesic Mixed Hardwood Forest community, with the addition of swamp chestnut oak (*Quercus michauxii*). The understory is generally more diverse than the mesic mixed hardwood forest, and includes buckeye (*Aesculus flava*), American beautyberry (*Callicarpa americana*), flowering dogwood (*Cornus florida*), red bud (*Cercis canadensis*), sparkleberry (*Vaccinium arboreum*), and American snowbell (*Styrax americanus*). The herbaceous layer is well developed and includes violets (*viola sp.*), jack in the pulpit (*Arisaema triphyllum*), ebony spleenwort (*Asplenium platyneuron*), bloodroot (*Sanguinaria canadensis*), netted chain fern, and bladder sedge.

### **Loblolly Pine Plantation**

The Bannister Tract contains even-aged planted loblolly pine (*Pinus taeda*) stands in various stages of rotation). The overstory within the pine plantations is dominated exclusively by established and bedded loblolly pine. The saplings and shrubs in the Bannister Tract loblolly pine plantations vary in percent cover based on age of the pine and when the stand was thinned, and within un-thinned stands this layer can be very limited.

Established stands include an understory of sweetbay, sweetgum, red maple, wax myrtle, diamond-leaf oak, bracken fern (*Pteridium aquilinum*), yellow jasmine (*Gelsemium sempervirens*), blackberry (*Rubus spp.*), fetterbush (*Lyonia lucida*), and inkberry (*Ilex glabra*). In addition, older established stands include common sweetleaf (*Symplocos tinctoria*), flowering dogwood (*Cornus florida*), and black cherry (*Prunus serotina*).

Clear-cut, or newly established loblolly pine plantations are dominated shrub and herbaceous layers, and have a different species composition when compared to more mature established stands. In addition to loblolly pine, these areas include broom sedge (*Andropogon virginicus*), dog fennel (*Eupatorium capillifolium*), blackberry, wax myrtle, yellow jasmine, velvet panic grass (*Dichanthelium scoparium*), needleleaf rosette grass (*D. aciculare*), and sugarcane plumegrass (*Saccharum giganteum*).

### **Isolated Ponds**

Isolated ponds are seasonally to permanently flooded wetland depressions. The Bannister Tract ponds are dominated by a nearly closed canopy of hardwoods which includes swamp tupelo. The overstory in isolated ponds on the Bannister Tract includes swamp tupelo, loblolly pine, pond pine (*Pinus serotina*), sweetgum, red maple, and diamond-leaf oak. The understory includes sweetbay, redbay (*Persea Borbonia*), wax myrtle, high bush blueberry (*Vaccinium corymbosum*), giant cane, fetterbush, laurel greenbrier (*Smilax laurifolia*), lanceleaf greenbrier (*S. smallii*), and sweet pepperbush (*Clethra alnifolia*).

### **5.4.5. Wildlife**

The most common big game mammal expected to be found within the Mitigation Project sites are the white-tailed deer (*Odocoileus virginianus*) and feral pig (*Sus scrofa*). Small game species that occur on the Mitigation Project sites include rabbits (*Sylvilagus* spp.), raccoon (*Procyon lotor*), gray squirrel (*Sciurus carolinensis*), Eastern wild turkey (*Meleagris gallapavo*) and American woodcock (*Scolopax minor*) and wood duck (*Aix sponsa*). Important mammalian furbearers that were reported to inhabit the area include muskrat (*Ondatra zibethicus*), beaver (*Castor canadensis*), mink (*Mustela vison*), opossum (*Didelphis virginiana*), river otter (*Lutra canadensis*), red fox (*Vulpes vulpes*), grey fox (*Urocyon cinereoargenteus*), and coyotes (*Canis latrans*).

### **5.4.6. Protected Species**

#### **5.4.6.1. Federally Listed Species**

Plants and animals listed as federally threatened and endangered are protected under the Endangered Species Act (P.L. 92-205) (ESA) which is administered and enforced by the United States Fish and Wildlife Service (USFWS). The bald eagle is federally protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. This report documents the results of a literature and database search and on-site survey to determine the likelihood that federally endangered or threatened species and the bald eagle will be impacted by the mitigation activities on these sites in Berkeley, Dorchester, and Orangeburg Counties, South Carolina.

A current list of federally endangered and threatened species for Berkeley, Orangeburg, and Dorchester Counties was compiled from the USFWS Information, Planning and Conservation System (USFWS 2015), the USFWS Charleston Field Office website (USFWS 2012a) and the South Carolina Department of Natural Resources (SCDNR) Natural Heritage Program website (SCDNR 2015). The three lists were combined and are listed in Table 5.

The South Carolina Rare and Endangered Species Inventory website, a Geographic Information System natural resources data layer that includes the locations of all documented occurrences of federally endangered and threatened species, was also reviewed for known occurrences of such species on or proximate to the subject project.

**Table 5. Current list of federally protected species in Berkeley, Dorchester, and Orangeburg Counties, SC (USFWS 2015; SCDNR 2015) and their habitat types.**

Common Name	Scientific Name	County	Status <sup>1</sup>	General Habitat Type
<b>Vertebrates</b>				
Atlantic sturgeon	<i>Acipenser oxyrinchus</i>	Berkeley	E	major river systems along the eastern seaboard
Bald eagle	<i>Haliaeetus leucocephalus</i>	Berkeley / Orangeburg	BGEPA	coastlines, rivers, large lakes or streams
Frosted Flatwoods Salamander	<i>Ambystoma cingulatum</i>	Berkeley	T, CH	pine areas maintained in an open state by fire with isolated ponds for breeding sites
Red-cockaded Woodpecker	<i>Picoides borealis</i>	Berkeley / Orangeburg / Dorchester	E	mature pine forests
Shortnose Sturgeon	<i>Acipenser brevirostrum</i>	Berkeley / Orangeburg	E	major river systems along the eastern seaboard
West Indian manatee	<i>Trichechus manatus</i>	Berkeley	E	coastal waters
Wood stork	<i>Mycteria americana</i>	Berkeley	E	marshes, swamps, lagoons, ponds, flooded fields; depressions in marshes are important during drought; also occurs in brackish wetlands
<b>Vascular Plants</b>				
American chaffseed	<i>Schwalbea americana</i>	Berkeley	E	fire maintained open pine forest
Canby's Dropwort	<i>Oxypolis canbyi</i>	Berkeley / Orangeburg	E	pond-cypress savannahs dominated by grasses, sedges or ditches next to bays; borders and shallows of cypress-pond pine ponds and sloughs
Pondberry	<i>Lindera melissifolia</i>	Berkeley	E	swamp and pond margins, sandy sinks, swampy depressions, wet flats

<sup>1</sup>E Federally Endangered

<sup>1</sup>T Federally Threatened

<sup>1</sup>CH Critical Habitat

<sup>1</sup>BGEPA Federally Protected under the Bald and Golden Eagle Protection Act

## Methodology

A literature search and an on-site habitat assessment were conducted to determine the likelihood of the presence or absence of each of the above listed species. The lists received from USFWS and SCDNR were used as the baseline for the on-site habitat assessment and comparison. Aerial photography, the onsite habitat characterization, the on-site wetland delineation, and an on-site field survey were used to generalize habitat types on the site. General habitat types located on the tract are described below in the Habitats section.



## **Habitats**

Habitats within the mitigation site are described in Section 5.4.4 above.

### *Literature Search, Database Review, and On-Site Habitat Assessment Results*

#### **Atlantic sturgeon**

The Carolina and the South Atlantic Distinct Population Segments (DPS) of the Atlantic sturgeon were listed as endangered in February 2012 (NOAA 2012). A DPS is a vertebrate population or group of populations that is discrete from other populations of the species and significant in relation to the entire species. The ESA provides for listing species, subspecies, or distinct population segments of vertebrate species (NOAA 2012).

The Atlantic sturgeon is a long-lived, estuarine dependent, anadromous fish. Spawning adults migrate upriver in spring, beginning in February-March in the south. Adults spawn in freshwater of large rivers and migrate into estuarine and marine waters where they spend most of their lives. They spawn in moderately flowing water (46-76 cm/s) in deep parts of large rivers.

#### **Bald eagle**

The bald eagle was listed as endangered on March 11, 1967 (USFWS 1967). The species was reclassified from endangered to threatened throughout the lower 48 states on July 12, 1995 (USFWS 1995). It was proposed to be removed from the federal endangered species list on July 6, 1999 (USFWS 1999a). On July 9, 2007, the bald eagle was removed from the endangered species list (USFWS 2007). The bald eagle is still federally protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

The bald eagle, with a wingspread of about seven feet, is mainly dark brown and adults have a pure white head and tail. The bald eagle feeds primarily on fish but also takes a variety of bird, mammals, and turtles when fish are not readily available (USFWS 1992a). It nests in large, sturdy trees with open canopies typically near large open water bodies. Many nests are used annually. It has been documented that egg laying for the bald eagle peaks in late December in the South. The nesting season in the Southeast extends from October to May 15.

#### **Frosted flatwoods salamander**

The flatwoods salamander was listed as threatened on April 1, 1999 (USFWS 1999b). In 2009 the flatwoods salamander was divided into two distinct species: the frosted flatwoods salamander (*Ambystoma cingulatum*) and the reticulated flatwoods salamander (*Ambystoma bishopi*) due to a recognized taxonomic reclassification (USFWS 2009). The frosted flatwoods salamander is located east of the Apalachicola River Basin. Critical habitat (CH) has been designated for the frosted flatwoods salamander in Berkeley, Charleston, and Jasper counties, SC (USFWS 2009). The frosted flatwoods salamander occurs in isolated populations scattered across the lower southeastern Coastal Plain in Florida, Georgia, and South Carolina (USFWS 1999b, USFWS 2009). There are four known populations of frosted flatwoods salamander in South Carolina (USFWS 2009) with the closest population over 20 miles away on the Francis Marion National Forest (FMNF).

It is a slender, small-headed mole salamander. Adult dorsal color ranges from dark black to chocolate black with grayish or silvery network pattern or frosted appearance running along the lateral and dorsal surfaces. Aquatic larvae are long and slender, broad-headed and bushy-gilled, with white bellies and yellow stripes on the sides (Palis 1995).

Typical breeding sites are isolated wetland depressions, which dry completely on a cyclic basis, thus eliminating fish species. The isolated ponds are typically small with an open canopy allowing grasses and sedges to grow on the edge where adult salamanders will lay their eggs in the fall. During the non-breeding season, the fossorial adults return to the upland pine areas that are maintained by frequent fire.

### **Red-cockaded woodpecker (RCW)**

In 1970, the RCW was officially listed as endangered (USFWS 2003). With passage of the ESA in 1973, the RCW received the protection afforded listed species under the ESA. The endangered status of the RCW primarily is due to four environmental factors that have been shown to limit its numbers: (1) hardwood encroachment; (2) a shortage of suitable cavity trees; (3) loss and fragmentation of habitat, and (4) demographic isolation (Conner and Rudolph 1991, Walters 1991, Rudolph and Conner 1994).

The RCW is endemic to pine forests of the southeast (Ligon 1970). RCWs are territorial, non-migratory, cooperative breeders (Lennartz et al. 1987). RCWs are unique in that they excavate cavities for roosting and nesting in living pines (USFWS 2003) and use living pines almost exclusively for foraging substrate, preferring longleaf pine when available (Walters 1991). RCWs require open pine woodlands and savannahs with large old pines for nesting and roosting habitat (i.e., cavity trees). Cavity trees must be in open pine stands with little or no hardwood midstory and few or no over-story hardwoods. For purposes of surveying, suitable nesting habitat consists of pine, pine/hardwood, and hardwood/pine stands that contain pines 60 years in age or older and that are within 0.5 mile of suitable foraging habitat. For the purposes of surveying, suitable foraging habitat consists of a pine or pine/hardwood stand in which 50 percent or more of the dominant trees are pines and the dominant pine trees are generally 30 years in age or older. (USFWS 2003)

### **Shortnose sturgeon**

The shortnose sturgeon was listed as endangered on March 11, 1967 (32 FR 4001). It is an anadromous fish that spawns in the coastal rivers along the east coast of North America from the St. John River in Canada to the St. Johns River in Florida. In South Carolina, the species is present in the Waccamaw, Pee Dee, Black (Winyah Bay system), Santee, Cooper, Ashepoo, Combahee, Edisto, and Savannah Rivers (NMFS 1998). The shortnose sturgeon prefers the nearshore marine, estuarine and riverine habitat of large river systems (NMFS/NOAA 2012). Adults have separate summer and winter areas.

### **West Indian manatee**

The West Indian manatee was listed as endangered on March 11, 1967 (USFWS 1967). It is a large gray or brown aquatic mammal averaging 10 feet long and weighing about 1,000 pounds (USFWS 1992a). During the winter months, the United States' manatee population confines itself to the coastal waters of the southern half of peninsular Florida and to springs and warm water outfalls as far north as southeast Georgia. During the summer months, they may migrate as far north as coastal Virginia on the east coast and the Louisiana coast on the Gulf of Mexico (USFWS 1992a). The West Indian manatee inhabits both salt and fresh water and may be encountered in canals, rivers, estuarine habitats, and saltwater bays (USFWS 1992a).

### **Wood stork**

The U.S. breeding population of the wood stork was listed as endangered on February 28, 1984 (USFWS 1992a). The U.S. breeding population was down-listed to threatened and established as a distinct population segment on July 30, 2014. Wood storks are large, long-legged wading birds. They are white except for black primaries and secondaries and a short black tail. The head and neck are largely unfeathered and dark gray in color. The bill is black, thick at the base, and slightly decurved (USFWS 1992a).

Wood storks have been seen in South Carolina during every month of the year. However they are uncommon from December through mid-March (USFWS 1996). They typically nest in cypress/tupelo gum ponds with standing water. It is a highly colonial species usually nesting in large rookeries and feeding in flocks. The wood stork forages in a wide variety of shallow wetlands, wherever prey concentration reach high enough densities, in water that is shallow and open enough for the birds to be successful in their hunting efforts (Ogden et al. 1978, Browder 1984). Nesting wood storks generally use foraging sites that are located within 31 miles flight range of the colony (USFWS 1996).

### **American chaffseed**

American chaffseed was listed as endangered on September 29, 1992 (USFWS 1992b). It is a perennial, erect herb in the figwort family with large, purplish-yellow tubular flowers. The fruit is a long and narrow capsule, enclosed in a loose-fitting sac-like structure that provides the basis for the common name, chaffseed (Musselman and Mann 1978 *in* USFWS 1992b). Flowering occurs from April to June (USFWS 1992a).

American chaffseed occurs in sandy acidic, seasonally moist to dry soils (USFWS 1992a). It typically occurs in fire-maintained ecosystems, such as the longleaf pine-wiregrass ecosystem of the southeastern coastal plain, open, moist pine flatwoods, and fire-maintained savannas. American chaffseed seems to require fire for persistence. One of the most serious threats to its continued existence is fire-suppression (USFWS 1992a).

### **Canby's dropwort**

Canby's dropwort was listed as endangered on February 25, 1991 (USFWS 1991). It is a perennial herb with erect, hollow stems, aromatic foliage and elongate, stoloniferous rhizomes. It has minute white flowers produced in terminal or axillary umbels; sepals may be tinged red. The fruit is a strongly-winged schizocarp. The species flowers from May through early August and fruits in early fall (USFWS 1991).

This species occurs in pond cypress savannas, shallows and edges of cypress/pond pine sloughs, and wet pine savannas. The healthiest populations seem to occur in open bays or ponds which are wet most of the year and have little or no canopy cover.

### **Pondberry**

Pondberry was listed as endangered on July 31, 1986 (USFWS 1986). Pondberry is a dioecious, deciduous shrub with pale yellow flowers. The fruit is a bright red drupe that matures in the fall. Flowering occurs late in February to mid-March; fruiting occurs from August to early October. The leaves have a strong, sassafras-like odor when crushed. Reproduction seems to be primarily vegetative by means of stolons (USFWS 1992).

Pondberry is found in shallow depression ponds of the sandhills, along margins of cypress ponds in the pineland coastal areas of South Carolina, and in seasonally wet, low areas among bottomland hardwoods in interior areas.

### **5.4.6.2. State Species of Concern**

The South Carolina Nongame and Endangered Species Act outlines the State of South Carolina's role in establishing guidelines to protect wildlife species that have been determined to be of concern in the state. These state species of concern are those thought to have populations that are of declining, rare, or unknown status other than those listed under the Federal Endangered Species Act. While the state species of concern are not protected by law, the list provides a valuable tool for conservation measures and protection planning.

Table 6 provides the state species of concern for Marion County (February 2015) for which there may be suitable habitat within the mitigation site.

**Table 6. Site Suitable, State Species of Concern for Berkeley, Dorchester and Orangeburg Counties, South Carolina\***

Common Name	Scientific Name	County	Status <sup>1</sup>	Habitat	Documented Occurrence within 2 Miles of Site <sup>2</sup>
<b>Vertebrates</b>					
Eastern Tiger Salamander	<i>Ambystoma trigrinum trigrinum</i>	Berkeley	S2,S3	Virtually any habitat, providing there is a terrestrial substrate suitable for burrowing and a body of water nearby suitable for breeding. In the southeastern U.S., requires relatively flatwoods ponds that do not contain fishes for breeding.	No
Spotted Turtle	<i>Clemmys guttata</i>	Berkeley / Dorchester	ST	Inhabits a variety of wetland types, including vernal pools, swamps, bogs and marshes, small streams, wet meadows, and early and mature wet forests.	No
Star-nosed Mole	<i>Condylura cristata</i>	Dorchester	S3	Tunnels in wet soils in flood plains, swamps, meadows, and other openings near water with nests placed in a hummock, under a stump or log, in humus among rotten tree roots, or in other areas above high water, often near a stream. Occasionally occurs in leaf mold on the floor of dense forests.	No
Rafinesque's Big-eared Bat	<i>Corynorhinus rafinesquii</i>	Berkeley / Dorchester / Orangeburg	SE	Roosts in cave entrances, hollow trees, crevices behind bark, and dry leaves in the forest. Also abandoned buildings and under bridges	No
American Swallow-tailed Kite	<i>Elanoides forficatus</i>	Berkeley / Dorchester	SE	Woodland and forested wetlands near nesting locations. Nests are built in trees, usually near water.	No
Gopher Tortoise	<i>Gopherus polyphemus</i>	Dorchester	SE	Dry landscapes with a well-drained, sandy substrate such as sandhill (pine-turkey oak), sand pine scrub, xeric hammock, pine flatwoods, dry prairie, coastal grasslands and dunes, and mixed hardwood-pine communities. Prefers open habitats with ample herbaceous vegetation for food and sunlit areas for nesting.	No
Southeastern Bat	<i>Myotis austroriparius</i>	Berkeley / Dorchester / Orangeburg	S1	Roosting in spring and summer typically occurs in buildings and other structures, mines, and hollow trees (e.g., water tupelo, black gum, water hickory, black cypress). Foraging habitat is riparian floodplain forests or wooded wetlands with permanent open water nearby.	No

Common Name	Scientific Name	County	Status <sup>1</sup>	Habitat	Documented Occurrence within 2 Miles of Site <sup>2</sup>
Eastern Woodrat	<i>Neotoma floridana floridana</i>	Berkeley / Dorchester	S3	Found in a range of different habitats, from coastal to mountain regions. It is often found in rocky areas and is known to nest under rocks and boulders. In woodland areas, nestings occurs beneath hollow logs or stumps and piles of wooden debris.	No
Florida Green Water Snake	<i>Nerodia floridana</i>	Berkeley	S2	Prefer to live in vegetation choked, still waters such as swamp and marshes. Also can be found in lakes, ponds, ditches, and slow rivers and occasionally in brackish water.	No
Pine or Gopher Snake	<i>Pituophis melanoleucus</i>	Berkeley / Orangeburg	S3	Flat and dry habitats with open canopies and are most common in sand hill and sandy pine barren habitats	No
Dwarf Siren	<i>Pseudobranchius striatus</i>	Orangeburg	ST	Cypress domes, cypress strands, marshes, lime-sink ponds, ditches, Carolina bays, and other shallow freshwater habitats, including both permanent and temporary waters. Cypress ponds in areas of acid pine flatwoods, thick vegetation or in bottomg mud and debris.	No
Gopher Frog	<i>Rana capito</i>	Berkeley / Dorchester / Orangeburg	S1	Native xeric upland habitats, particularly longleaf pine-turkey oak sand hill associations; also xeric to mesic longleaf pine flat woods, sand pine sruc, xeric oak hammoks, and ruderal successional stages of these habitats.	No
Least Tern	<i>Sterna antillarum</i>	Berkeley / Dorchester	S3	Sandy and pebbly beaches and on sandbars in large rivers.	No
<b>Invertebrates</b>					
Carolina Slabshell	<i>Elliptio congaraea</i>	Orangeburg	S3	Swift water of medium sized rivers to smaller creeks. Prefers sandy substrates.	No
Savannah Lilliput	<i>Toxolasma pullus</i>	Orangeburg	S1	Lotic streams and ponds, where it prefers mud or sand near banks. Rarely found in deep water, but usually in small colonies in less than six inches of water.	No
<b>Vascular Plants</b>					
Coastal Plain False-foxgolve	<i>Agalinis aphylla</i>	Berkeley	S1	Moist to wet pine savannas; disturbed savannas fields); also flatwoods, depressions in pinelands, bogs, and edges of cypress-gum ponds.	No

Common Name	Scientific Name	County	Status <sup>1</sup>	Habitat	Documented Occurrence within 2 Miles of Site <sup>2</sup>
Incised Groovebur	<i>Agrimonia incisa</i>	Berkeley / Orangeburg	S2	Fire-maintained longleaf pine-oak community	No
Blue Maiden-cane	<i>Amphicarpum muehlenbergianum</i>	Berkeley / Orangeburg	S2,S3	moist to wet pine savannas and flatwoods, exposed shores and bottoms of ponds and lakes and margins of cypress-gum ponds.	No
Elliot's Bluestem	<i>Andropogon gyrans</i> var. <i>stenophyllus</i>	Berkeley	S1	Ditches, bogs, savannas, and pond margins	No
Broomsedge	<i>Andropogon mohrii</i>	Berkeley	S2	Permanently wet savannas and herb-dominated seepage slopes.	No
Purple Silkyscale	<i>Anthaenania rufa</i>	Berkeley	S2	Wet pine flatwoods, wet pine savannas, and adjacent roadsides.	No
Piedmont Three-awned Grass	<i>Aristida condensata</i>	Berkeley / Orangeburg	S2	Sandy soil of low, open, and seasonally wet pineland and savannas	No
Wagner's Spleenwort	<i>Asplenium heteroresiliens</i>	Berkeley / Orangeburg	S1	Limestone and marl outcroppings in dense hardwood forests.	Yes
Black-stem Spleenwort	<i>Asplenium resiliens</i>	Berkeley / Dorchester / Orangeburg	S1	Base of cliffs or sinkholes, on limestone or other alkaline rocks. Also found in forest on boulders, ledges, and crevices of cliffs.	Yes
Coastal-plain Water-hyssop	<i>Bacopa cyclophylla</i>	Berkeley / Orangeburg	S1	Moist, sandy soil in low marshy areas near pine flatwoods	No
Northern Burmannia	<i>Burmannia biflora</i>	Berkeley	S2	Wet areas, including bogs, swamps, ditches, and lake shores.	No
Bearded Grass-pink	<i>Calopogon barbatus</i>	Berkeley	S2	Moist, acidic, sandy pine savannas and grasslands.	No
Many-flower Grass-pink	<i>Calopogon multiflorus</i>	Berkeley	S1	Well-drained soils of open, damp to somewhat drier pine savannas-flatwoods and meadows. Thrives with habitat disturbance from fire.	No
Window Sedge	<i>Carex basiantha</i>	Berkeley / Dorchester / Orangeburg	S2	Neutral or slightly acidic soils in mesic to wet mesic deciduous forests, usually on lower slopes above flood plains of rivers and streams	No
Chapman's Sedge	<i>Carex chapmanii</i>	Berkeley	S1	Well-drained, wet, sandy, acidic soils, sometimes over limestone, under deciduous or mixed deciduous-evergreen forests in floodplains of blackwater streams subject to intermittent floods of brief duration.	No

Common Name	Scientific Name	County	Status <sup>1</sup>	Habitat	Documented Occurrence within 2 Miles of Site <sup>2</sup>
Cherokee Sedge	<i>Carex cherokeensis</i>	Berkeley / Dorchester	S2	Sandy loam woodlands	No
Ravenfoot Sedge	<i>Carex cruscovri</i>	Berkeley	S2	Seasonally saturated or inundated soils in wet meadows, marshes, swamps, alluvial bottomlands	No
Cypress-knee Sedge	<i>Carex decomposita</i>	Orangeburg	S2	Undisturbed, organic-rich backwaters of swamps and pond margins. Occurs on floating or partially-submersed rotting logs or stumps.	No
Elliott's Sedge	<i>Carex elliotii</i>	Berkeley	S1	Acidic soil in swamp forests and forest openings, open seeps, sandy and peaty pond shores	No
Meadow Sedge	<i>Carex granularis</i>	Berkeley / Dorchester / Orangeburg	S2	Calcareous soils in low, wet woodlands, bottomland swamps, moist depressions in limestone cliffs, and abandoned fields, especially along borders, clearings, streams, and trails	Yes
Nutmeg Hickory	<i>Carya myristiciformis</i>	Berkeley	S2	Calcium-rich soils associated with higher bottomlands, moist hillsides, and stream banks	No
Scarlet Indian-paintbrush	<i>Castilleja coccinea</i>	Berkeley	S2	Circumneutral to alkaline soils in open areas with ample moisture and sun exposure such as herbaceous wetlands, fens, wet meadows, and open woodlands.	No
Ciliate-leaf Tickseed	<i>Coreopsis integrifolia</i>	Berkeley	S1	Moist sandy loam in semi-shaded areas along edges of low floodplain woodlands near small blackwater streams	No
Robbins Spikerush	<i>Eleocharis robbinsii</i>	Berkeley	S2	Sandy-peaty soils in shallow waters of fresh lakes and ponds	No
Three-angle Spikerush	<i>Eleocharis tricostata</i>	Berkeley	S2	Wet sandy or peaty soils of low depressions, pond margins, swamps, marshes, pine barrens, and savannas	No
Viviparous Spike-rush	<i>Eleocharis vivipara</i>	Dorchester	S1	Sandy and peaty soils, ditches, pond margins, shallow waters bordering pine-flatwoods and pine-palmetto scrub	No
Green-fly Orchid	<i>Epidendrum conopseum</i>	Berkeley / Dorchester	S3	High on the limbs of evergreen deciduous trees in hammocks, low woods, and cypress swamps	No
Ravenel's Eryngo	<i>Eryngium aquaticum var. ravenelii</i>	Berkeley	S1	Wet savannas with limestone close to the surface such as wet longleaf pine savanna and pine flatwoods next to drainages	No



Common Name	Scientific Name	County	Status <sup>1</sup>	Habitat	Documented Occurrence within 2 Miles of Site <sup>2</sup>
Coastal-plain Thoroughwort	<i>Eupatorium recurvans</i>	Berkeley	S1	Moist areas, areas with acidic soils, and pine barrens.	No
Long-horn Orchid	<i>Habenaria quinqueseta</i>	Berkeley	S1	Rich, moist hardwood hammocks in dry to wet pine savannas and mixed oak-pine flatwoods, swamps, meadows, and roadsides	No
Southeastern Sneezeweed	<i>Helenium pinnatifidum</i>	Berkeley / Orangeburg	S2	Sandy and peaty substrate in small depressions and flatlands that are seasonally inundated and subject to frequent or occasional fire	No
Sarvis Holly	<i>Ilex amelanchar</i>	Dorchester / Orangeburg	S3	Sandy swamps; wet woods; stream banks	No
Walter's Iris	<i>Iris hexagona</i>	Berkeley	S1	Savannas, wet prairie, marshes, wet pinelands, and swamps	No
River Bank Quillwort	<i>Isoetes riparia</i>	Orangeburg	S2	Margins of lakes, ponds, and streams. Tidal shores or estuaries. Circumneutral or slightly acidic, oligotrophic waters.	No
Small's Bog Button	<i>Lachnocaulon minus</i>	Berkeley	S1	Wet, sandy or peaty soil along the margins of pineland or flatwoods ponds, or mildly acidic seepage areas and mildly acidic marshes	No
Slender Gayfeather	<i>Liatris gracilis</i>	Berkeley	S1	Well-drained and open areas of mesic to wet flatwoods, bogs, savannas, and deciduous woodlands	No
Southern Twayblade	<i>Listera australis</i>	Berkeley / Dorchester	S2	Rich humus of low moist woods, marshes, and sphagnum bogs	No
Pondspice	<i>Litsea aestivalis</i>	Berkeley / Orangeburg	S3	Wet, sandy or peaty, and acidic soil along margins of swamps, lime sink ponds, bay heads, small ponds, natural doline ponds and in low wet woodlands	No
Boykin's Lobelia	<i>Lobelia boykinii</i>	Berkeley / Orangeburg	S3	Cypress-gum depressions or ponds, wet pine savannas and flatwoods in either continuous, shallow standing water or areas that are seasonally very moist or inundated	No
Lance-leaf Seedbox	<i>Ludwigia lanceolata</i>	Berkeley	S1	Shallow water or marshes of low pine flatwoods with Sphagnum	No
Lance-leaf Loosestrife	<i>Lysimachia hybrida</i>	Berkeley	S1	Moist to mesic, hardpan clay or sandy soil of open woodlands, floodplains, and wetland margins	No
Bigleaf Magnolia	<i>Magnolia macrophylla</i>	Dorchester	S1	Rich alluvial, mesic woods and sheltered valleys. Shade tolerant.	No

Common Name	Scientific Name	County	Status <sup>1</sup>	Habitat	Documented Occurrence within 2 Miles of Site <sup>2</sup>
Virginia Bunchflower	<i>Melanthium virginicum</i>	Berkeley	S2	Lowland prairies, bogs, marshes, wet open woods, savannas, and meadows.	No
Canada Moonseed	<i>Menispermum canadense</i>	Berkeley / Dorchester	S2,S3	Open deciduous woodlands and thickets, woodland borders, and semi-shaded riverbanks	No
Piedmont Water-milfoil	<i>Myriophyllum laxum</i>	Berkeley / Orangeburg	S2	Shallow, highly acidic water of natural sinkhole ponds and lakes, impoundments and beaver ponds, blackwater streams, backwaters, sloughs, drainage ditches, and canals.	No
Georgia Beargrass	<i>Nolina georgiana</i>	Orangeburg	S3	Sandy soil in pinelands, savanna, turkey-oak woods	No
Longstem Adder's-tongue Fern	<i>Ophioglossum petiolatum</i>	Berkeley	S1	Wet, sandy soils of ephemeral wetlands, moist talus and grassy areas, lake margins, swamps and streams, and damp hollows	No
Bead-grass	<i>Paspalum bifidum</i>	Berkeley	S2	Dry sand of mixed pine-oak woodlands	No
Spoon-flower	<i>Peltandra sagittifolia</i>	Berkeley	S2	Acidic bogs and swampy woodlands	No
Pineland Plantain	<i>Plantago sparsiflora</i>	Berkeley / Dorchester / Orangeburg	S2	Marshy/seasonally wet pine savannas and adjacent roadsides and ditches	Yes
Yellow Fringeless Orchid	<i>Platanthera integra</i>	Berkeley	S1	Organic black sandy peat of wet depressions within pine flatwoods, wet prairies, seepage often on slopes, marshes, swamps, and acid bogs.	No
Green-fringe Orchis	<i>Platanthera lacera</i>	Berkeley	S2	Moist, sandy soil of prairies, swamps, open woodlands, shrubby Sphagnum bogs, acidic gravelly seeps, low areas along streams, roadside clearances, and ditches	No
Shadow-witch Orchid	<i>Ponthieva racemosa</i>	Berkeley / Dorchester	S2	Moist soils over calcareous rock in the shady margins of woodland streams and ponds, sloughs, moist ravines, bottomlands, swamps, ravines, and wet savannas	No
Crestless Plume Orchid	<i>Pteroglossaspis ecristata</i>	Berkeley / Dorchester	S2	Range from very xeric to seasonally inundated or almost permanently saturated soils of scrub oak lands, pine rocklands, pine-palmetto flatwoods, and dry-mesic pine savanna	No

Common Name	Scientific Name	County	Status <sup>1</sup>	Habitat	Documented Occurrence within 2 Miles of Site <sup>2</sup>
Bottom-land Post Oak	<i>Quercus similis</i>	Berkeley / Orangeburg	S1	Forests in wet stream bottomlands, flatwoods, river valleys	No
Awned Meadowbeauty	<i>Rhexia aristosa</i>	Berkeley / Orangeburg	S3	Limesink and depression ponds, Carolina bays, wet savannas	No
Piedmont Azalea	<i>Rhododendron flammeum</i>	Orangeburg	S3	Rocky, dry upland woods on dry slopes, sand hills, and ridges of rivers or stream banks	No
Short-bristle Baldrush	<i>Rhynchospora breviseta</i>	Berkeley	S1	Wet, sandy soils of pine savannas and pine flatwoods	No
Horned Beakrush	<i>Rhynchospora careyana</i>	Berkeley	S3	Mostly acidic soils in or along the shallow edges of ponds, ditches, marshes, swamps, lakes, streams, and flatwoods depressions.	No
Pocosin Beaksedge	<i>Rhynchospora cephalantha var. attenuate</i>	Berkeley	S1	Sphagnum peat seepage bogs and seasonally flooded ponds, depressions, savannas, and flatwoods	No
Harper Beakrush	<i>Rhynchospora harperi</i>	Berkeley / Orangeburg	S1	Sandy or peaty soils of bogs, stream banks, and edges of pineland or savanna ponds	No
Drowned Hornedrush	<i>Rhynchospora inundata</i>	Berkeley	S2	Sandy or peaty soils of drying shores and shallows of small ponds in savannas.	No
Few-flowered Beaked-rush	<i>Rhynchospora oligantha</i>	Berkeley	S2	Sandy or peaty soils of bogs, depressions in savannas, and open pinelands	No
Brown Beaked-rush	<i>Rhynchospora pleiantha</i>	Berkeley	S1	Sandy or peaty soils along shores of freshwater ponds, lakes, and lime sinks and moist pine savannas	No
Long-beaked Baldrush	<i>Rhynchospora scirpoides</i>	Berkeley	S1	Sandy or peaty soils of marshes and borders of sloughs and lakes, flatwoods depressions, beaver ponds, lime sinks, and wet savannas.	No
Chapman Beakrush	<i>Rhynchospora stenophylla</i>	Berkeley	S2	Sandy or peaty soils of bogs, seeps, pond shores, and depressions in pineland and savannas	No
Tracy Beakrush	<i>Rhynchospora tracyi</i>	Berkeley / Orangeburg	S3	Sandy or peaty soils of shallows of cypress domes, marshes and swales, and depressions and ponds in pineland and savannas	No
Sun-facing Coneflower	<i>Rudbeckia heliopsisidis</i>	Berkeley	S1,S2	Sandy or peaty soils in swales in pine-oak woodlands, seeps in meadows, and alluvium along streams	No

Common Name	Scientific Name	County	Status <sup>1</sup>	Habitat	Documented Occurrence within 2 Miles of Site <sup>2</sup>
Sweet Pitcher-plant	<i>Sarracenia rubra</i>	Berkeley	S3	Acidic, seepage, or sandy-gravelly bogs, savannas, or on wet granite and near headwaters of small springs.	No
Baldwin Nutrush	<i>Scleria baldwinii</i>	Berkeley / Orangeburg	S2	Wet, sandy or peaty soils in pinelands, savannas, and borders of ponds and lagoons	No
Biltmore Greenbriar	<i>Smilax biltmoreana</i>	Berkeley	S2	Rich, open woods in ravines, along streams, and at bases of bluffs	No
Lace-lip Ladies'-tresses	<i>Spiranthes laciniata</i>	Berkeley	S1,S2	Swamps, marshes, meadows, dry to damp roadsides, ditches, and fields; occasionally in standing water	No
Pineland Dropseed	<i>Sporobolus lacinata</i>	Berkeley	S1	Pinelands and sandhills	No
Carolina Dropseed	<i>Sporobolus pinetorum</i>	Berkeley	S2	Wet to moist pine woodlands, in soils seasonally to semi-permanently saturated	No
Reclined Meadow-rue	<i>Thalictrum subrotundum</i>	Berkeley	S1,S2	Low swampy woodlands, slopes, cliffs, limestone sinks	No
Virginia Spiderwort	<i>Tradescantia virginiana</i>	Orangeburg	S1	Moist to mesic black soil prairies, sand prairies, savannas, thickets, openings and edges of woodlands, and sandstone cliffs	No
Carolina Fluff Grass	<i>Tridens carolinianus</i>	Berkeley / Orangeburg	S1	Sandy soils in upland pinelands mesic swales in sandhills	No
Least Trillium	<i>Trillium pusillum</i> var. <i>pusillum</i>	Berkeley / Dorchester	S1	Bottomland forests along small streams, ecotones of calcareous savannas and swamp forests, or moist slopes	No
Nodding Pogonia	<i>Triphora trianthophora</i>	Berkeley	S2	Dark, moist, and leaf-lined depressions on gentle slopes in mixed deciduous old-age/maturing forests	No
Greater Bladderwort	<i>Utricularia macrorhiza</i>	Berkeley	S1	Lakes, interdunal ponds, wet marshes, and rivers and streams	No
Piedmont Bladderwort	<i>Utricularia olivacea</i>	Orangeburg	S2	Seasonally dry ponds/depressions in sand pine scrub	No
Short-leaved Yellow-eyed Grass	<i>Xyris brevifolia</i>	Berkeley	S1	Acidic, sandy, and moist soils of savannas and cleared areas	No
Florida Yellow-eyed Grass	<i>Xyris difformis</i> var. <i>floridana</i>	Berkeley	S2	Moist soils of pine flatwoods, stream banks, and floodplains usually in seasonally flooded areas that draw down during the growing season	No

Common Name	Scientific Name	County	Status <sup>1</sup>	Habitat	Documented Occurrence within 2 Miles of Site <sup>2</sup>
Elliott Yellow-eyed Grass	<i>Xyris elliotii</i>	Berkeley	S2	Wet, acidic, sandy soils in flatwoods, marshes, pineland pond margins, cypress swamps, clay-based Carolina bays, and lime sinks	No
Savanah Yellow-eyed Grass	<i>Xyris flabelliformis</i>	Berkeley	S1	Moist acidic sands or sandy-peats of pine flatwoods, pineland pond shores, or lakeshores	No
Pineland Yellow-eyed Grass	<i>Xyris stricta</i>	Dorchester	S1	Moist sandy or peaty soils in depression ponds, seeps, and ditches of pine savannas and wet meadows	No

<sup>1</sup> SE – State Endangered

ST – State threatened

S1 – Critically imperiled state-wide because of extreme rarity or special factor

S2 – Imperiled state-wide because of extreme rarity

S3 – Rare or uncommon in state

<sup>2</sup> South Carolina Rare, Threatened & Endangered Species Inventory – Data Availability for the Gresham and Johnsonville Quadrangles, accessed March 26, 2015.

\*Federally protected species are not included here but are discussed in detail in the biological assessment.

#### 5.4.7. Regional Corridors and Adjacent Natural Areas

The Mitigation Project site(s) are located in the Dean Swamp subwatershed 10-digit HUC 03050205-05 and the Lower Four Swamp Watershed 10 digit HUC 03050205-03, situated adjacent to Dean Swamp, Sandy Run, and Walnut Branch, all tributaries to Four Hole Swamp. The proposed Mitigation Project site(s) are focused on the Four Hole Swamp watershed and its tributaries which falls in-line with the existing overall conservation efforts to protect the Four Hole Swamp watershed (8-digit HUC 03050205).

Within the Four Hole Swamp watershed, the National Audubon Society (Audubon) in conjunction with the Nature Conservancy owns and protects the Francis Beidler Forest. Beidler Forest sits within the Four Holes Swamp, a matrix of black water sloughs and lakes, shallow bottomland hardwoods, and deep bald cypress and tupelo gum flats (Audubon 2015). Over 16,000 of the Four Hole Swamp and upland acres are owned by the National Audubon Society, buffered by 6,000 more acres under private conservation easements, and make up what is known as the Francis Beidler Forest (Audubon 2015, LOLT 2011). Beidler Forest is one of the largest forested wetland habitat protection projects on the East Coast of the United States, including approximately 1,800 acres of the largest old growth cypress-tupelo swamp forest in the world (LOLT 2011). The Beidler Forest was named a RAMSAR Wetland of International Importance in 2008 and is recognized as both a National Natural Landmark and an Important Bird Area (LOLT 2011). It is the mission of the Francis Beidler Forest to maintain and/or enhance functional integrity of Four Hole Swamp and its watershed, and leverage that success to aid in the protection of the Edisto River Basin, of which Four Hole Swamp is a part (USACE 2000). Hence, incremental ecological improvement of the Four Hole Swamp watershed is offered via the proposed mitigation sites that are located adjacent and connected to the Francis Beidler Forest conservation tracts.

The Mitigation Project site(s) are also situated within and adjacent to the “Charleston Greenbelt” corridor which consists of protected and productive open lands surrounding Lowcountry cities. This “Charleston Greenbelt” concept has been developed Lowcountry Open Land Trust (LOLT). It is LOLT’s mission to preserve wildlife habitats, outstanding natural areas, and sites of unique ecological significance, historical sites, forestlands, farmlands, watershed, open space and urban parks. With the proposed mitigation sites

adjacent to this Lowcountry Greenbelt, it will advance connectivity in order to support healthy ecosystems and abundant wildlife in the area. LOLT is a major partner with Audubon, and holds a majority of the conservation easements in the Four Hole Swamp watershed.

#### 5.4.8. Cultural Resources and Environmental Screening

A cultural resources literature review was conducted on March 30, 2015 and April 6, 2015 by an Amec Foster Wheeler Archaeologist. The goal of the background literature review was to determine if any previously recorded archaeological sites or historic resources were within or adjacent to the project tract. Research was conducted at the South Carolina Department of Archives and History (SCDAH) in Columbia, South Carolina, and at the South Carolina Institute of Archaeology and Anthropology (SCIAA) in Columbia, SC. The information collected was supplemented with digital data available from ArchSite, an on-line Geographical Information System created and maintained by SCDAH and SCIAA. The records examined at SCDAH included a review of the SCDAH Finding Aid for previous architectural surveys near the project tract. The records examined at SCIAA include the master archaeological site maps, state archaeological site files, and any associated archaeological reports.

#### Archaeological Sites

A review of the files and records at SCIAA revealed that two sites were identified within the project tract. There were eleven identified recorded sites within a one-mile radius of the project tract. Six sites within one mile of the project tract have been recommended for additional work or are eligible for the National Register of Historic Places (NRHP). Sites 38BK1826 and 38BK1827 are Civil War Earthworks that were fortifications known as Dennis’ Fort. Records for site 38BK255 were unavailable; the site is located outside the project tract. Sites 38DR149 is located adjacent to the project tract boundary and is recommended for additional work. Site 38DR150 is eligible and located along the extent of the one mile radius. Site 38DR73 is located south of the project tract boundary and is eligible for the NRHP. Site 38DR157 which consists of low density prehistoric scatter is located within the project area but is ineligible for the NRHP. Cultivation and erosion have caused this site to lose integrity for further study. Site 38DR347 is eligible for the NRHP and is located inside the project tract. The site is located along US Highway 78 along a high bluff overlooking the Four Holes Swamp. The site consists of remnants of an 18<sup>th</sup> century causeway that crosses Four Hole Swamp, a bridge and road from the early 20<sup>th</sup> century and the existing bridge constructed in 1948. Archaeological evidence for this site relates to American Revolutionary and Civil Wars. Many skirmishes and encampments were located in this area during those wars.

**Table 7. Archaeological Sites within a 1.0 Mile Radius of the Project Tract.**

Site No.	Description	NRHP Status
38BK1826	Civil War Earthworks	Additional Work
38BK1827	Civil War Earthworks	Additional Work
38BK2555	Unknown	Unknown
38DR2	Prehistoric Ceramic Scatter	Ineligible
38DR17	Prehistoric Ceramic Scatter	Ineligible
38DR73	Woodland Site	Eligible
38DR149	Prehistoric Ceramic Scatter	Additional Work
38DR150	Mississippian Site	Eligible
38DR157	Prehistoric Scatter	Ineligible
38DR344	Prehistoric Ceramic Scatter	Ineligible
38DR347	American Revolution Outpost and Skirmish Site	Eligible

## Historic Structures

A review of the ArcSite on-line database files and records at SCIAA and SCDAH revealed that there are twenty-six historic structures within a one mile radius of the project tract. The Hilton House (410-0143) and the Four Holes Swamp Monument (410-0144) are located within the project tract but are ineligible. Structure 454-0011 (S. F. Singletary & Son General Store) is an historic structure located on Highway 176 approximately 0.8 miles south of the project area and it is eligible for the NRHP.

**Table 8. Surveyed Structures within a 1.0 Mile Radius of the Mitigation Project Sites.**

Site No.	Description	NRHP Status
410-0011	Mamie Ayers House	Ineligible
454-0001	Rev. Stephen Williams Home	Ineligible
454-0002	Unknown House	Ineligible
454-0003	Unknown Structure	Ineligible
454-0004	Unknown Structure	Ineligible
454-0005	Lou Hunter House	Ineligible
454-0006	Dean Swamp Bridge	Ineligible
454-0007	Singletary/Weatherford House	Ineligible
454-0008	Stephen Mckinley Singletary House	Ineligible
454-0009	Unknown Structure	Ineligible
454-0010	Stephen Singletary House	Ineligible
454-0011	Singletary and Son General Store	Ineligible
454-0012	Alva Mims Rental Home	Ineligible
454-0013	Dennis' Confederate Fort	Ineligible
454-0014	Ebenezer A.M.E. Church Cemetery	Ineligible
454-0015	James Benjamin Singletary House	Ineligible
454-0016	Godfrey's Mill House	Ineligible
454-0017	S.F. Singletary & Son General Store	Eligible
1169	Unknown Structure	Ineligible
1168	Unknown Structure	Ineligible
410-0144	Four Holes Bridge Monument	Ineligible
410-0143	Hilton House	Ineligible
410-0141	Limestone Baptist Cemetery	Ineligible
410-0142	Old Harley Cemetery	Ineligible
410-1082	Brownlee Cemetery	Ineligible
219-0704	DeLee Cemetery	Ineligible

## National Register Sites

There are no National Register Listed Properties or Traditional Cultural Properties within one mile of the project tracts.

## Summary

The background literature review identified eleven previously recorded archaeological sites within a one mile radius. There are two identified site located within the project tract. Site 38DR157 is ineligible Site 38DR347 is historically significant and is eligible for the NRHP. S. F. Singletary & Son General Store, located approximately 0.8 mile outside the project tract, is eligible for the National Register of Historic Places but at the time of this report is not listed. The Hilton House (410-0143) and the Four Holes Swamp Monument (410-0144) are located within the project tract but are ineligible. There are no records of

Traditional Cultural Properties or National Landmark sites in the vicinity of the project area. To reiterate, there are two structures and two identified archaeological site within the project area.

The Mitigation Project sites are generally to be used as a wetland mitigation area with buffer zones. Minor land disturbing alterations associated with wetland enhancement activities may occur in sections of the project areas. A general predictive model based on the location of cultural resources indicates a relationship exists between archaeological site location, relative topography, and available water sources (Anderson 1996). Prehistoric sites in the Coastal Plains are most often located on well drained low slope areas adjacent to water or uplands overlooking water. Prehistoric sites are also often found located in the vicinity of lithic raw material sources regardless of slope or proximity to water.

## **5.5. MITIGATION WORK PLAN**

### **5.5.1. Mitigation Project Site(s)**

The Mitigation Project site(s) are located within the Four Hole Swamp watershed and generally lie along Sandy Run, Dean Swamp, and Walnut Branch. The Mitigation Project consists of the Bannister Tract, Singletary Tract, Dean Swamp Tract, and the Walnut Branch Tracts. The site is generally located at 33.333 °N and 80.301 °W. The proposed mitigation tracts are either under an option to purchase agreement by Resource Environmental Solutions, LLC or other holding entities or are currently in negotiations to be optioned. The Mitigation Project encompasses approximately 2,496 acres of protected land and is expected to permanently protect approximately 1,533 acres of wetlands.

The Mitigation Project will be made up of multiple tracts of land. The primary tract of land, known as the Bannister Tract, will place approximately 1,667 acres under a protective agreement with the SCDNR and the Low Country Land Trust with an intent to dedicate the tract as a Heritage Trust Preserve. The Bannister Tract will include approximately 910 acres of wetland preservation/enhancement and protect approximately 2.64 miles (13,932 linear feet) of Cedar Swamp, Sandy Run, and associated unnamed tributaries.

The other properties that will make-up the Mitigation Project will be placed under conservation easements to be held by either the Low Country Land Trust, Lord Berkley Land Trust, or the Audubon Society and will include approximately 623 acres of wetland preservation and enhancement.

No construction activities will take place in the preservation areas.

### **5.5.2. Wetland Preservation**

Wetland preservation activities within the Mitigation Project is anticipated to protect approximately 890 acres of wetlands, as shown in Figures 11 – 11c in Appendix A. The proposed wetland preservation areas lie directly adjacent to many streams and unnamed tributaries within the proposed mitigation corridor and consist of a mix of high quality bottomland hardwood forests communities. Wetlands within the Mitigation Project will be protected through the establishment of a conservation easement with a minimum 75 foot buffer (Bannister Tract, Dean Swamp Tract, and Mimms Tract) and maximum 100 foot buffer on the other tracts (Singletary, Long, and Salisbury) and an additional 200 foot no construction buffer (total 300 feet buffer) where possible.



### **5.5.3. Wetland Enhancement**

Wetland enhancement activities within the Mitigation Project are proposed on the Bannister Tract and the Dean Swamp Tract as shown in Figures 11, 11a, 11b, 13, and 14 of Appendix A. The majority of the wetlands not found within the floodplain of Cedar Swamp, Sandy Run, Dean Swamp, and associated unnamed tributaries have been converted to loblolly pine plantation and are in various stages of production. For the purposes of this mitigation work plan the pine plantation has been categorized as clearcut, greater than 15-year, or less than 15-years of age. An in-depth discussion of the plant communities associated with the pine plantation community found within the Bannister Tract can be found in Section 5.4.4.

The proposed wetland enhancement activities will primarily consist of converting existing pine plantation wetlands into pine flatwoods and longleaf forest communities, where applicable. Sections of the pine plantation that have encroached into the bottomland hardwood communities will be converted back into bottomland hardwood forest. The wetland enhancement work plan to be implemented on the Bannister Tract and Dean Swamp Tract has been categorized by activities based on the existing habitat and a detailed discussion is located below for each proposed enhancement activity.

#### **Pine Flatwoods Enhancement (Thinning/Burning)**

Sections of the Bannister Tract and the Dean Swamp Tract that have been planted and have stands of existing loblolly pine greater than 15 years old will be thinned and considered for prescribed burning. Thinning of the planted pine will be conducted to reduce the basal area of the existing loblolly pine stands to open the forest canopy to allow for the recolonization of herbaceous and understory layers associated with the pine flatwoods community. A prescribed burn schedule will be implemented to mimic the natural burn cycle typical of this ecotype. Depending on the conditions and success of burned areas, the frequency of successive fires will be prescribed. Where necessary, appropriate plant species will be planted to increase species diversity and accelerate forest regeneration.

#### **Pine Flatwoods Enhancement (Thinning/Flattening/Burning)**

Sections of the Bannister Tract and the Dean Swamp Tract that have been planted and have stands of loblolly pine less than 15 years old will be thinned and the topography will be smoothed with tracked and wheeled forestry machinery to match the surrounding contours to reduce furrows that were constructed during the planting process. Mechanical mulching equipment may be used during this process to thin the pines and deposit the resulting pine chips into the depressional areas. The existing loblolly pine stands will be thinned to appropriate ratios to mimic the pine flatwoods communities. At the appropriate time, a prescribed burn schedule will be implemented to mimic the natural burn cycle typical of this ecosystem. Depending on the conditions and success of burned areas, the frequency of successive fires will be prescribed. Where necessary, appropriate plant species will be planted to increase species diversity and accelerate forest regeneration.

### **5.5.4. Wetland Restoration**

Wetland restoration activities within the Mitigation Project are proposed on the Bannister Tract and the Dean Swamp Tract as shown in Figures 11, 11a, 11b, 13, and 14 of Appendix A. The proposed wetland restoration activities will primarily consist of converting replanting clearcut wetlands with either pine flatwoods, bottomland hardwood, or isolated pond communities. The wetland restoration work plan to be implemented on the Bannister Tract and Dean Swamp Tract has been categorized by activities based on the existing habitat and a detailed discussion is located below for each proposed enhancement activity.

### **Bottomland Hardwood Vegetative Restoration**

Sections of the Bannister Tract where the existing pine plantation have encroached into the bottomland hardwood communities located along Cedar Swamp, Sandy Run, and associated unnamed tributaries will be cleared and replanted with appropriate native hardwood species. Prior to clearing activities, herbicides may be used to control unwanted vegetation, as appropriate. Clearing activities may include mechanized equipment to smooth out the raised beds to restore the natural and historic topography. The residual pine stumps will be sheared below ground elevation or extracted from the soil only if necessary. After the clearing activities are complete and if necessary, equipment will be utilized to remove debris from the area (e.g. roots, stumps, limbs, etc.). The residual debris will be piled in the adjacent uplands for disposal. Once the site preparation activities are completed, the wetland area will be planted with appropriate bottomland hardwood species.

### **Isolated Pond Restoration**

Sections of the Bannister Tract and Dean Swamp Tract have isolated ponds that have been impacted through silviculture practices. The majority of these areas have been encroached upon to expand timber production. The vegetative enhancement activity will be same as for the Bottomland Hardwood Vegetative Enhancement. Existing native hardwood species will not be removed during the clearing activities. Once the site preparation activities are completed, the wetland area will be planted with appropriate isolated pond species.

### **Pine Flatwoods Restoration**

Sections of the Bannister Tract and the Dean Swamp Tract that have been clear cut prior to the execution of this mitigation plan. Appropriate wetland areas not associated with the bottomland hardwood forest community will be converted into pine flatwoods/pine savannah communities. Prior to mechanical activities herbicides may be used to control unwanted vegetation, as appropriate. Machinery may be used on the raised beds to smooth the landscape to mimic the historical topography and reduce the existing rutting that has occurred from clearcutting activities. During this process, the residual pine stumps will be sheared below ground elevation or extracted from the soil as necessary. After the clearing operations are complete, equipment will be employed to remove debris from the area (e.g. roots, stumps, limbs, etc.). The residual debris will be piled in the adjacent uplands for disposal. It is anticipated that the existing road infrastructure will be used for fire breaks. Once the site preparation activities are complete, the wetland area will be planted with appropriate pine flatwoods species. At the appropriate time, a prescribed burn schedule will be implemented to mimic the natural burn cycle typical of this ecotype.

#### **5.5.5. Upland Buffer Enhancement**

The upland loblolly plantation and clearcut buffers (75 feet) along the wetland enhancement and preservation areas within the Bannister and Dean Swamp Tract will be restored/converted to a longleaf pine forest ecosystem, where appropriate. Existing clear cut areas within the upland buffer will be planted with longleaf pine seedlings and other species, as appropriate, at a rate of 450 stems per acre. Existing loblolly plantation stands will remain intact through the required monitoring period. At the appropriate time, a prescribed burn schedule will be implemented to mimic the natural burn cycle typical of this ecotype.

It is anticipated that the existing upland areas not converted to longleaf pine and the remaining upland loblolly plantation areas, not associated with mitigation activities, within the Banister Tract will be converted to a longleaf pine ecosystem at a future time by the SCDNR at their discretion and in accordance with their WMA management plan.

### **5.5.6. Prescribed Burns**

Prescribed burning will be implemented every two to three years in the pine flatwoods enhancement areas and the upland longleaf restoration areas. Fire intensity will be adjusted in subsequent years to provide the best results of this habitat management technique. All initial and subsequent burns will be conducted by prescribed fire professionals with experience within the region. Specifically, only Certified Prescribed Fire Managers will conduct these burns. Burns will be conducted when conditions favor fire across the range of forest communities within the Mitigation Project Site. The burns will not be conducted when ponded water dominates the site or when dry weather creates dangerous fire conditions and fire control problems. Burning will only operate during conditions where smoke will have the least effect on adjacent populated areas.

### **5.5.7. Wetland Reference Areas**

Wetland reference areas will be identified within either the Mitigation Project tracts, Francis Marion National Forest, or Francis Beidler Forest. The target plant communities of the Mitigation Project wetland enhancement areas will attempt to replicate the species composition of the reference wetlands and show a progression towards the vegetation strata and diversity of the reference site by the end of the monitoring period.

### **5.5.8. Stream Preservation**

Stream preservation activities within the Mitigation Project is anticipated to protect approximately 47,932 acres (9 miles) of streams consisting of Cedar Swamp, Sandy Run, Dean Swamp, Walnut Branch and associated tributaries. For the purposes of this PRMP, streams lengths were calculated using the available USGS hydro lines. Further evaluation of the streams will be conducted following the acceptance of this PRMP and the information will be provided in the FPRMP. Streams within the Mitigation Project will be protected through the establishment of a conservation easement with a minimum 75 foot buffer (Bannister Tract, Dean Swamp Tract, and Mimms Tract) and maximum 100 foot buffer on the other tracts (Singletary, Long, and Salisbury) and an additional 200 foot no construction buffer (total 300 feet buffer) where possible.

### **5.5.9. Planting Plan**

A planting plan will be developed following the acceptance of this PRMP. The planting plan for the different ecosystems will be developed to mimic the natural plant communities similar to high functioning ecosystems, such as Francis Beidler Forest and/or Francis Marion National Forest.

## **5.6. MAINTENANCE PLAN**

All access roadways used for vehicular access within the Mitigation Project tracts will be used as fire breaks and future access to the properties. Annual inspection will be conducted on all access roadways and fire breaks as needed. All maintenance activities will be consistent with the long-term management practices and objectives. All other activities (prescribed burns, mechanical treatment, and chemical treatment) to be conducted are considered part of the mitigation work plan.

## **5.7. PERFORMANCE STANDARDS**

All measurements and photographs taken during each monitoring year will be compared to the previous year's data to ensure that the project is progressing towards the stated goals. The data and comparisons will be interpreted to indicate whether the wetland restoration and enhancement area are meeting the restoration/enhancement goals of creating a diverse wetland ecosystem. The following criteria will be used in determining the necessary performance to determine success or failure of the mitigation activities within the Mitigation Project Site:

### **5.7.1. Wetland Preservation**

Initial success will be achieved upon approval by USACE of the conservation easement documentation and the recordation of the easement within the local jurisdiction. Permanent photograph stations will be used to document any changes during the five-year monitoring period in existing vegetation, particularly invasive and noxious species, and hydrologic indicators. The final monitoring report will document that all preserved areas are intact in their approved condition.

### **5.7.2. Wetland Enhancement and Restoration**

Vegetative monitoring documents a minimum of 320 planted stems per acre survive at the end of year 3, and 260 planted stems per acre survive at the end of year 5, and no more than 25 percent of any one species and no more than 1 percent invasive species. Height, lateral growth and root collar diameter demonstrates an increase over baseline and each prior monitoring period. Planted vegetation demonstrates an average 5 to 7 feet in height at the end of year 5. If volunteers are utilized to meet the set performance standards, species will be tagged in the field as a volunteer and the same data collected as for planted stems.

### **5.7.3. Stream Preservation**

Initial success will be achieved upon approval by USACE of the conservation easement documentation and the recordation of the easement within the local jurisdiction. The stream top-of-bank will be surveyed on the conservation easement plat to be submitted to the local jurisdiction for recordation with the County Records Office. The condition of each preservation reach will be documented with yearly photographs, for the duration of the required monitoring period, taken at permanent photographic monitoring locations. The final monitoring report will document that all preserved areas are intact in their approved condition.

## **5.8. MONITORING REQUIREMENTS**

Monitoring activities will take place for a minimum period of 5 years. Monitoring reports will be submitted to the Interagency Review Team (IRT) by March 15 of the year following the monitoring period. It is anticipated that the following activities will be incorporated into the proposed monitoring plan and will be further refined following acceptance of the PRMP:

### **5.8.1. Wetland Preservation**

Visual assessments will be conducted annually to qualitatively evaluate Mitigation Project site conditions. Permanent photograph stations will be established at representative locations within the wetland preservation areas. The placement of stations should consider spatial distribution of the wetland preservation areas and document various wetland types. Each photograph station will be permanently marked in the field using rebar with a standard survey cap as well as a tall poly-vinyl chloride (PVC) pipe to aid in location (metal pipe to be used in areas where prescribed burns are planned). Photograph stations will be located with three-dimensional coordinates and georeferenced to NAD83-State Plane Feet.

Successive photographs taken at the photograph station will replicate the orientation and capture area of previous photographs. Photographs will also be used to document significant or adverse changes in other portions of the wetland preservation area.

### **5.8.2. Wetland Enhancement and Restoration**

Vegetative monitoring will occur between July 1 and mid-October. Data collected will include stem count and for each stem: height, root collar diameter, lateral growth, include number and species. The presence of invasive species will be noted. All data will be included in the monitoring report. Boundaries of each plot will be staked and marked. Plots will represent approximately two percent of planted area and planting should occur during November 2015 to March 2016. For each plot, all stems will be tagged, numbered, and species noted.

### **5.8.3. Stream Preservation**

Stream preservation monitoring stations will be established in representative areas along the protected streams. The placement of stations will consider spatial distribution of the stream preservation areas and document a variety of stream orders. Stream condition will be documented annually at permanent photograph stations. Each photograph station will be permanently marked in the field using rebar with a standard survey cap and a 10-foot tall PVC or metal pole with the photograph number demarcated. Photograph stations will be located with three-dimensional coordinates and georeferenced to NAD83-State Plane Feet. Successive photographs taken at the photograph station will replicate the orientation and capture the area of previous photographs.

## **5.9. LONG-TERM MANAGEMENT PLAN**

The Long-Term Management and Maintenance Plan ("LTMP") provides a description of how the mitigation areas will be managed to ensure the long-term sustainability of the resource, including party responsible for long-term management. A summary of the various parcels is provided below in Table 9.

**Table 9. Long-term Management Breakdown**

<b>Tract Name</b>	<b>Bannister</b>	<b>Dean Swamp</b>	<b>Mimms</b>	<b>Singletary</b>	<b>Long</b>	<b>Salisbury</b>
<b>Current owner</b>	Plum Creek	Plum Creek	MWV	Celeste Singletary et al.	Walnut Branch, LLC	Dorchester Mining, LLC
<b>Acreage</b>	1,667	380	177	112	85	75
<b>Interim Owner</b>	South Carolina Public Service Authority			N/A		
<b>Long-Term owner</b>	DNR	Lord Berkeley Conservation Trust	Audubon			
<b>Long-Term Protective Instrument</b>	LOLT Conservation Easement	LBCT Conservation Easement tract	LOLT Conservation Easement	USACE-approved Conservation Easement		
<b>Easement Holder</b>	Low Country Open Land Trust	LBCT or Other Ownership	Audubon	Lord Berkeley Conservation Trust	Low Country Open Land Trust	
<b>Easement Endowment</b>	Funds paid to Easement Holder	N/A		Funds paid to Easement Holder		
<b>Long-Term manager</b>	SCDNR	Lord Berkeley Conservation Trust	Audubon	Land Trust for America	Land Trust for America	Land Trust for America
<b>Long-term management endowment</b>	Ongoing Timber revenue		Endowment funded to compensate Long-Term Manager			

**5.9.1. Bannister Tract**

**5.9.1.1. Ownership of the Mitigation Site**

Upon issuance of a valid Section 404 permit by the USACE, the purchase of the Bannister property will be completed in fee simple title by South Carolina Public Service Authority. Upon completion of the work activities specified in the Mitigation Plan, fee simple title to the Bannister tract will be conveyed to SCDNR for long-term stewardship.

**5.9.1.2. Identity of the Long-Term Steward**

Upon issuance of a valid Section 404 permit by the USACE, the Bannister property will be encumbered by a conservation easement in a form similar to that used by Low Country Open Land Trust on the Boeing-Keystone Tract. The conservation easement will be held by the Low Country Open Land Trust.

Easement Holder	Contact Name	Phone	Address
Low Country Open Land Trust	Ashley Desmosthenes	(843) 577-6510	43 Wentworth Street Charleston, South Carolina 29401

Upon completion of the work activities specified in the Mitigation Plan, the Bannister property will be conveyed to SCDNR under a Long-Term Management Agreement. The conservation easement will continue to be in effect in perpetuity.

**5.9.1.3. Easement Holder Funding Mechanism**

Funds will be provided for enforcement of the conservation easement through a non-wasting endowment in an amount agreed upon with the Easement Holder.

**5.9.1.4. Identity of Long-Term Steward**

The SCDNR will be the Long-Term Steward of the Bannister property and the property will be managed in accordance with an Agreement between SCDNR and the Corps of Engineers in a form similar to that used for the Boeing-Keystone property (“Long-Term Management Agreement”). The Long-Term Steward Contact information is provided in Table 4.13.

Long-Term Steward	Contact Name	Phone	Address
South Carolina Department of Natural Resources	Billy Dukes Chief of Wildlife Management	(803) 744-3939	South Carolina Department of Natural Resources Post Office Box 167 Columbia, South Carolina 29202

#### **5.9.1.5. Long-Term Management**

Long-term management begins once the Compensatory Mitigation described under the Plan is successfully completed and approved by the Corps and SCDHEC, and title to the Protected Property is conveyed to SCDNR. Long-term management by SCDNR will occur in accordance with the Conservation Easement, the Agreement, the Plan, and as defined by South Carolina Code of Laws Title 51, Chapter 17. The required long-term management activities include but are not limited to the items specified below:

- a) Site Inspections and Reporting. Upon conveyance of the Protected Property, SCDNR shall inspect to ensure that the approved signage on the Protected Property remains intact. SCDNR will enforce trespass, vandalism and other laws of the State of South Carolina as observed on the Protected Property.
- b) Conservation Easement Monitoring. LOLT will annually monitor the Protected Property to ensure compliance with the terms of the Conservation Easement. SCDNR will comply with the terms of the Conservation Easement.
- c) Access Road Maintenance. The primary access roads on the Protected Property will be maintained by SCDNR as part of the long-term management. Road maintenance includes the repair and maintenance of culverts or any other crossings that facilitate access to, over or through the Protected Property.
- d) Other Activities. SCDNR may engage in other acts not prohibited and not inconsistent with the Purpose of this Agreement. Such activities include timber harvesting, burning, and longleaf pine planting.

Nothing herein shall be construed to authorize the Corps and/or SCDHEC to institute any proceedings against SCDNR for any changes to the Protected Property caused by circumstances beyond SCDNR's control, including the U.S. Department of Justice (DOJ) on behalf of the USACE, and their respective successors and assigns, and no general third party beneficiary rights, including but not limited to third party rights of enforcement.

#### **5.9.1.6. Enforcement**

Enforcement shall be defined in the Long-Term Management Agreement, in a similar fashion as provided for on the Boeing-Keystone property.

#### **5.9.1.7. Long-Term Management Funding Mechanism**

Funds for long-term maintenance of the Bannister Tract will be available from timber harvests. Section 5.6 of this Mitigation Plan, describes the management of the approximately 458 acres of uplands on the Bannister tract that are located outside of the wetlands and protected wetland buffers. These uplands are presently planted with loblolly pine. The Mitigation Plan describes a long-term management program of harvesting 458 acres of uplands over time and replanting it with longleaf pine. Revenue generated from the harvesting of existing loblolly pine stands on the uplands outside the wetland mitigation area, and revenues generate by periodic thinning the planted longleaf stands in the uplands which will also be necessary as part of overall site management, will be used by SCDNR for long term management of the Bannister tract.

Following completion of the mitigation activities, long-term management costs for the Bannister Tract will be low as the protected areas will be preserved wetlands. The primary costs will be related to periodic, prescribed burns of the uplands that will penetrate the wetlands to some extent, management of invasive species, management of site access, and maintenance of the road system suitable for light duty use.



## 5.9.2. Dean Swamp and Mimms Tracts

### 5.9.2.1. Ownership of the Mitigation Project

Upon issuance of a valid Section 404 permit by the USACE, the purchase of the Dean Swamp Tract and Mimms Tract will be completed in fee simple title by South Carolina Public Service Authority. Upon completion of the work activities specified in the Mitigation Plan, fee simple title to the Dean Swamp tract will be conveyed to Lord Berkeley Conservation Trust and fee simple title to the Mimms tract will be conveyed to the Audubon Society.

The residual portions of the properties not included in the restricted areas within the Mimms Tract and Dean Swamp Tract will be used by Audubon and Berkeley County, respectively, for secondary purposes which may include silviculture, community agriculture fields, research projects/facilities, and other uses. This residual area will not be included under the conservation easements or long-term stewardship responsibilities.

### 5.9.2.2. Long-Term Protective Instrument

Upon issuance of a valid Section 404 permit by the USACE, the Dean Swamp and Mimms properties will be encumbered by restrictive covenant in a form similar to that used by The Nature Conservancy on the Boeing-Fairlawn Tracts.

### 5.9.2.3. Identity of Long-Term Steward

Property	Long-Term Steward	Contact Name	Phone	Address
Dean Swamp Tract	Lord Berkeley Conservation Trust	Raleigh West	(843) 899-5228	223 East Main Street, Suite B Moncks Corner, SC 29461
Mimms Tract	Audubon Society	TBD	(843) 462-2150	336 Sanctuary Road Harleyville, SC 29448

### 5.9.2.4. Long-Term Management

Long-term management begins once the Compensatory Mitigation Activities described under the Plan for the respective property is successfully completed and approved by the Corps and SCDHEC. Long-term management by the Long-Term Steward will occur in accordance with the Restrictive Covenant. The required long-term management activities include but are not limited to the items specified below:

- a) Site Inspections and Reporting. Upon conveyance of the Protected Property, the Long-Term Steward shall inspect to ensure that the approved signage on the Protected Property remains intact. The Long-Term steward will enforce trespass, vandalism and other laws of the State of South Carolina as observed on the Protected Property.
- b) Access Road Maintenance. The primary access roads on the Protected Property will be maintained by the Long-Term Steward as part of the long-term management. Road maintenance includes the repair and maintenance of culverts or any other crossings that facilitate access to, over or through the Protected Property.
- c) Other Activities. The Long-Term Steward may engage in other acts not prohibited and not inconsistent with the Restrictive Covenant. Such activities include timber harvesting, burning, and longleaf pine planting.

**5.9.2.5. Enforcement**

Enforcement shall be defined in the Restrictive Covenant, in a similar fashion as provided for on the Boeing-Fairlawn properties.

**5.9.2.6. Long-Term Management Funding Mechanism**

Funds for long-term maintenance will be provided through a non-wasting endowment in an amount provided for under the Long-Term Management Agreement.

**5.9.3. Singletary, Long, and Salisbury Tracts**

**5.9.3.1. Ownership of the Mitigation Project**

The ownership of the Protected Property will stay with the current landowners.

**5.9.3.2. Long-Term Protective Instrument**

Upon issuance of a valid Section 404 permit by the USACE, the Singletary, Long, and Salisbury properties will be encumbered by conservation easement in a form similar to the Corps 2010 Template Conservation Easement.

<b>Property</b>	<b>Easement Holder</b>	<b>Contact Name</b>	<b>Phone</b>	<b>Address</b>
Singletary	Lord Berkeley Conservation Trust	Raleigh West	(843) 899-5228	223 East Main Street, Suite B Moncks Corner, SC 29461
Long	Low Country Open Land Trust	Ashley Desmosthenes	(843) 577-6510	43 Wentworth Street Charleston, South Carolina 29401
Salisbury	Low Country Open Land Trust	Ashley Desmosthenes	(843) 577-6510	43 Wentworth Street Charleston, South Carolina 29401

**5.9.3.3. Easement Holder Funding Mechanism**

Funds will be provided for enforcement of the conservation easement through a non-wasting endowment in an amount agreed upon with the Easement Holder.

**5.9.3.4. Identity of the Long-Term Steward**

The Long-Term Steward for the lands encumbered by the conservation easement will be third party entity under a long-term contract to perform the long-term management obligations.

**5.9.3.5. Long-Term Management**

Long-term management begins once the Compensatory Mitigation Activities described under the Plan for the respective property is successfully completed and approved by the Corps and SCDHEC. Long-term management by the Long-Term Steward will occur in accordance with the Long-Term Stewardship Agreement.

A primary goal of this Mitigation Project is to create a self-sustaining natural aquatic system that achieves the intended level of aquatic ecosystem functionality with minimal human intervention, including long-term site maintenance. The anticipated mitigation activities within the Mitigation Project will include wetland and stream preservation only. Long-term management activities will include annual site visits by the Long-Term Steward to inspect preservation areas, identify any issues such as signs of trespass and vandalism, invasive species occurrences, and perform sign maintenance to ensure the easement is clearly marked. A brief report will be prepared and submitted to USACE describing any issues, as well as any corrective actions to be taken. Long Term Management Reports (LTMP) reports will be submitted to the USACE annually for the first five years post-monitoring (years 6 to 10). From years 11 to 25 a report will be submitted every five years. From Year 25 - Perpetuity LTMP reports will no longer be submitted pending approval from the USACE.

#### **5.9.3.6. Enforcement**

Enforcement of the Long-Term Stewardship Agreement shall performed by the Easement Holder under their obligations as defined in the Conservation Easement, with third-party enforcement rights provided to The Corps and SCDHEC.

#### **5.9.3.7. Long-Term Management Funding Mechanism**

Funds for long-term maintenance will be provided through a non-wasting endowment in an amount agreed upon with the Long-Term Steward. The amount of the non-wasting endowment will be finalized prior to the issuance of the FPRMP.

### **5.10. ADAPTIVE MANAGEMENT PLAN**

In the event, one or more of the performance objectives within the Project Area fails to achieve the necessary performance standards as specified in the PRMP, the permit applicant and/or its Agents shall notify the USACE immediately. Adaptive management activities may consist of corrective actions and additional monitoring of the approved Mitigation Project or implementation of an alternate PRMP. Failure to actively pursue and implement an approved mitigation plan or to develop and implement an adaptive management plan may be grounds for modification, suspension or revocation of the associated USACE authorization.

### **5.11. FINANCIAL ASSURANCES**

Financial assurances will be provided in the form of performance bonds for the mitigation activities specified in the mitigation work plans of this Mitigation Plan. The bonds will assure performance of construction and monitoring work to restore, enhance and or preserve the aquatic resources as described in the mitigation work plans. The amounts of the performance bonds will be determined in conjunction with USACE once the proposed mitigation activities outlined in the Mitigation Plan have been approved.

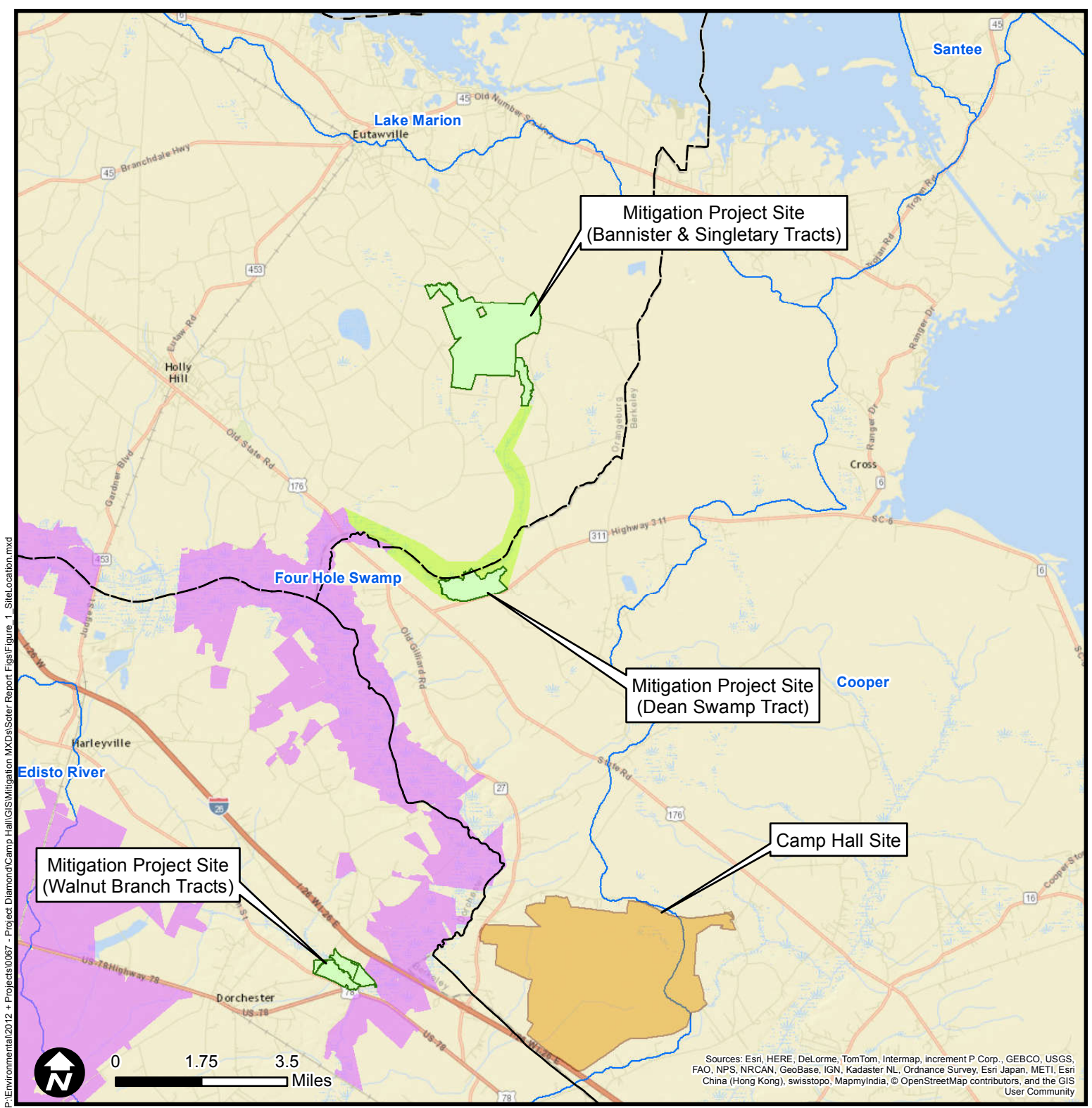
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## **APPENDIX A: MAPS AND FIGURES**



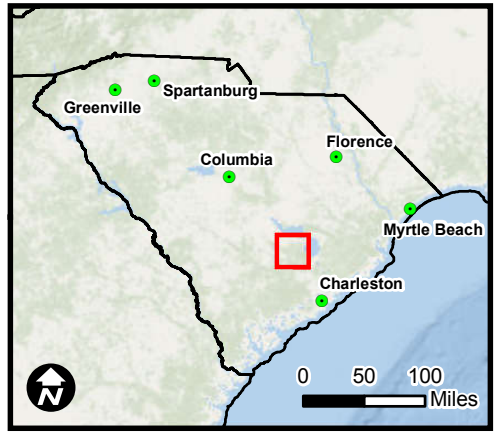
P:\Environmental\2012 - Projects\0067 - Project Diamond\Camp Hall\GIS\Mitigation MXDs\Soter Report Figs\Figure\_1\_SiteLocation.mxd

Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

**Legend**

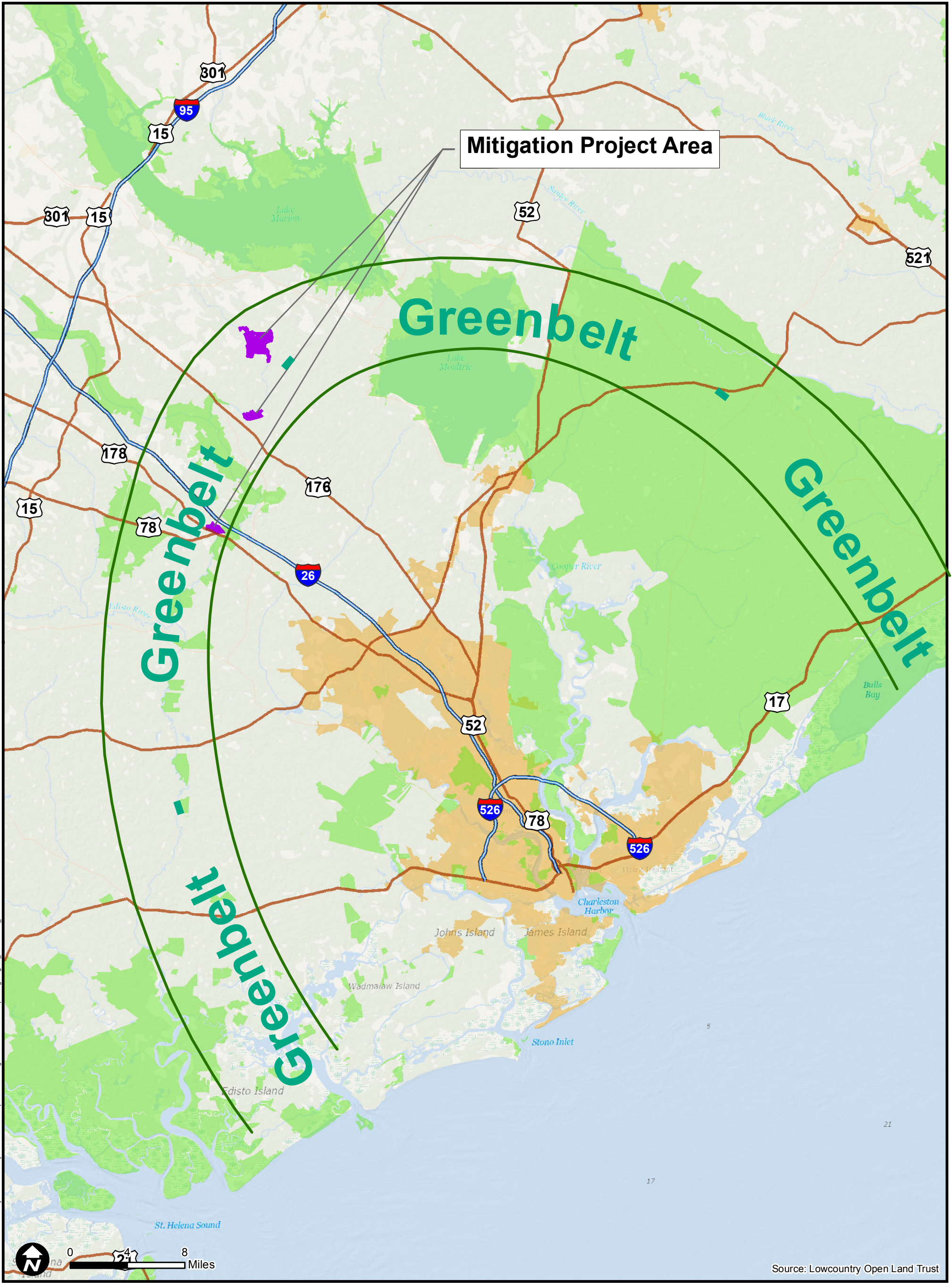
- SC\_County\_Boundaries
- CampHallBoundary
- Mitigation Project Boundary
- Priority Easement Acquisition Area
- Protected Lands
- 8-Digit HUC

**Figure 1. Site Location Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina



Job No. 6250150080  
 Drawn By: BWS  
 Reviewed By: WAR  
 Date: 03/25/2015

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Source: Lowcountry Open Land Trust

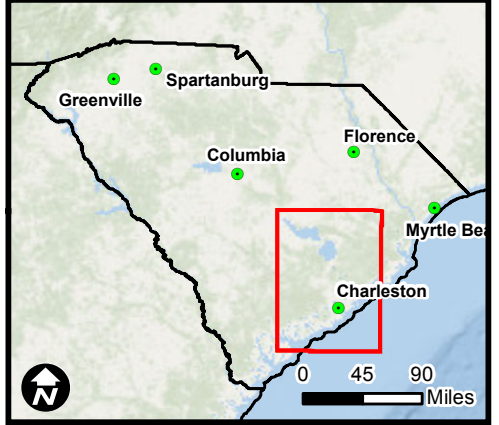
Legend	
	Existing Private, Protected, and Public Lands
	2010 Urbanized
	Interstates
	Highway

Job No.	6250150080
Drawn By:	CLS
Reviewed By:	WAR
Date:	03/31/2015

**Figure 2. Growth & Conservation in the Balance**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina

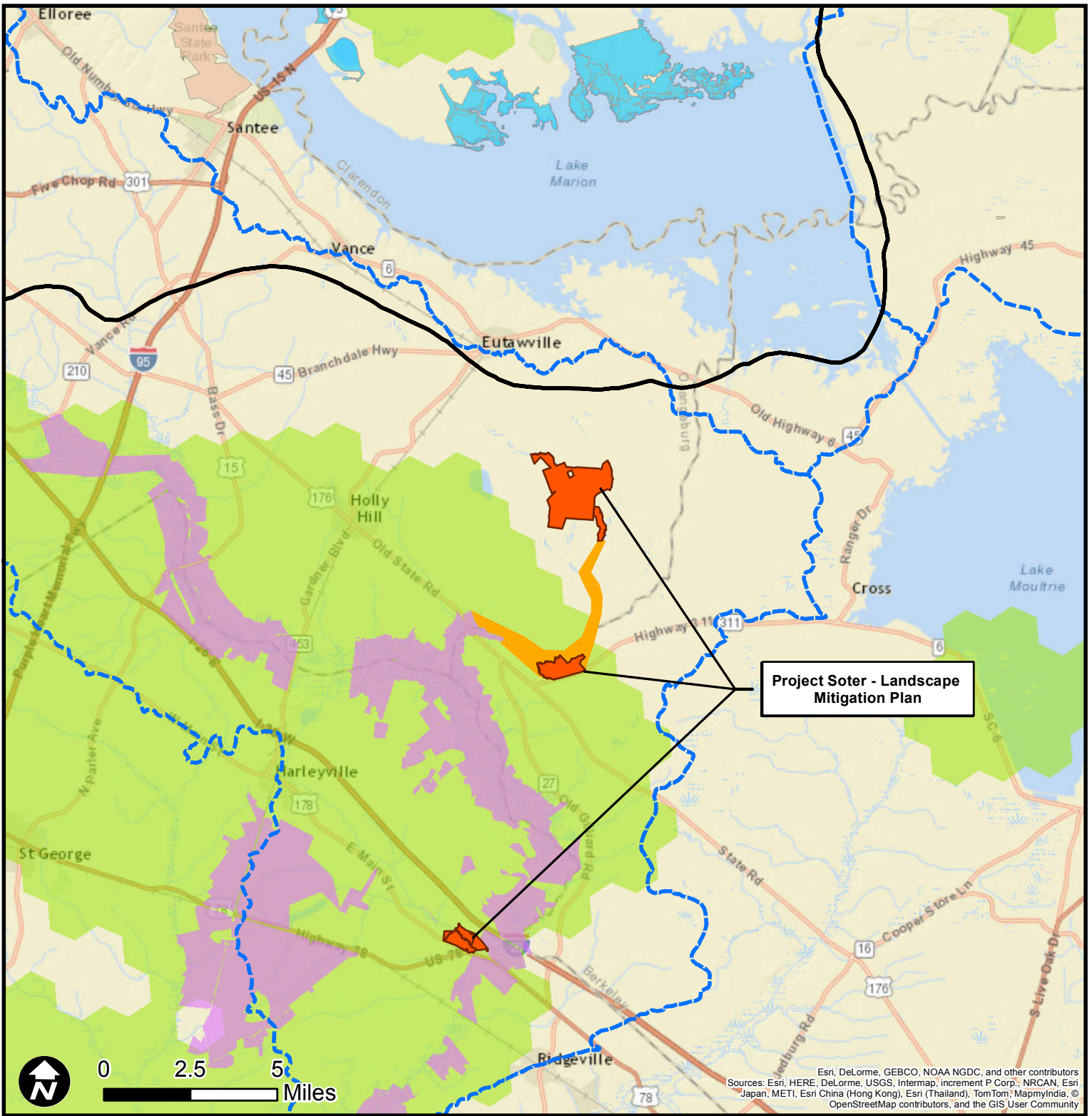
Thoughtful conservation is needed outside of the urban growth boundary in balance with development throughout the region.

Greenbelt - Focus area for thoughtful conservation and intended connectivity.





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Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors  
 Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri  
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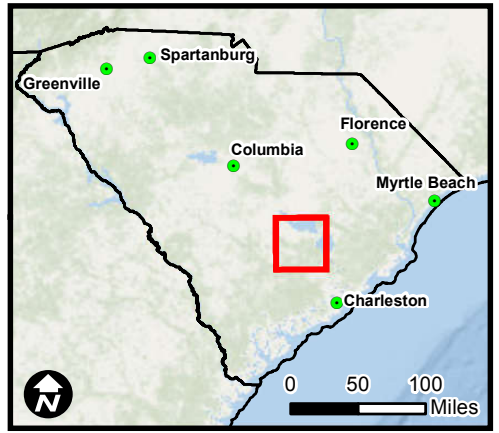
**Legend**

- Mitigation Project Boundary
- Priority Easement Acquisition Area
- Fish and Wildlife Service (FWS)
- Private Owned Protected Lands
- The Nature Conservancy Priority Areas
- SC Ecoregion Level III
- USGS HUC 8

**Figure 2a. Proximity to Conserved Lands Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester County  
 South Carolina

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1992

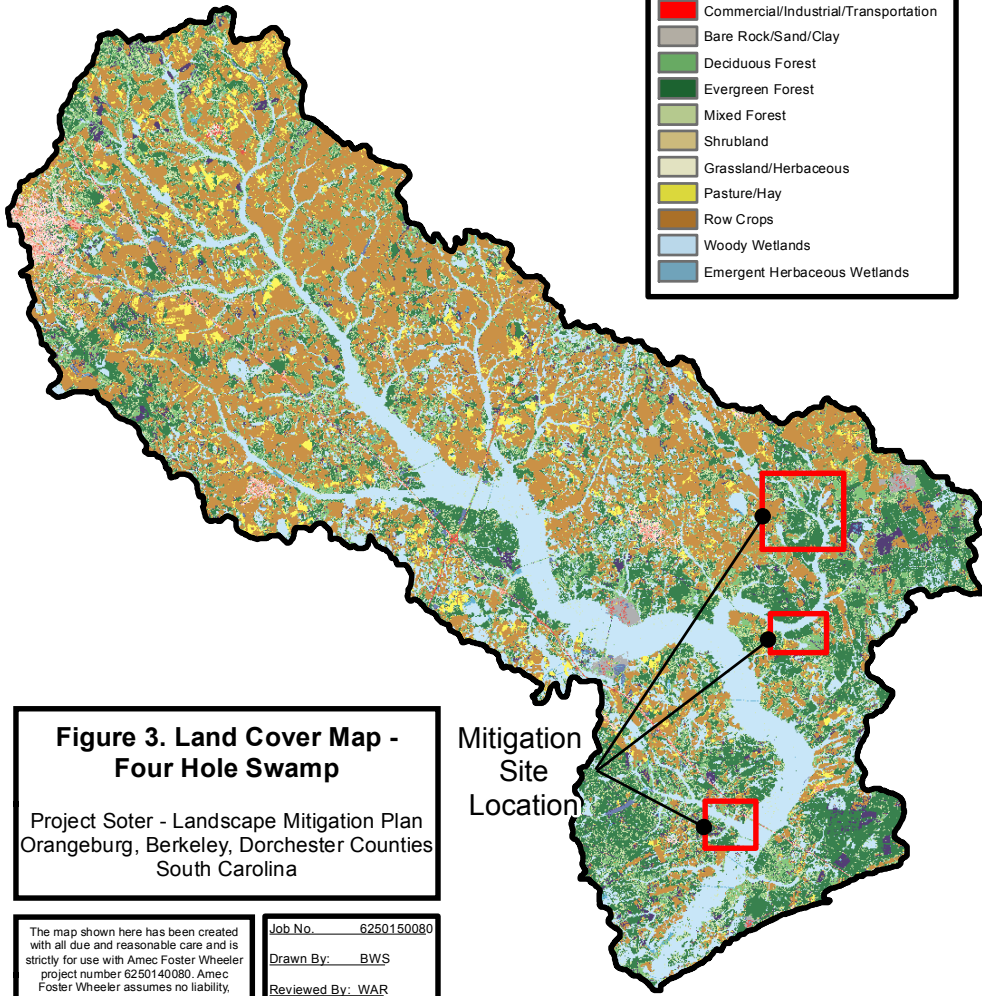


**Legend**

Four Hole Swamp Watershed

**Land Classification Legend**

- Open Water
- Urban/Recreational Grasses
- Low Intensity Residential
- High Intensity Residential
- Commercial/Industrial/Transportation
- Bare Rock/Sand/Clay
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrubland
- Grassland/Herbaceous
- Pasture/Hay
- Row Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands

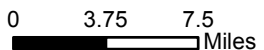


**Figure 3. Land Cover Map - Four Hole Swamp**

Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina

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2011

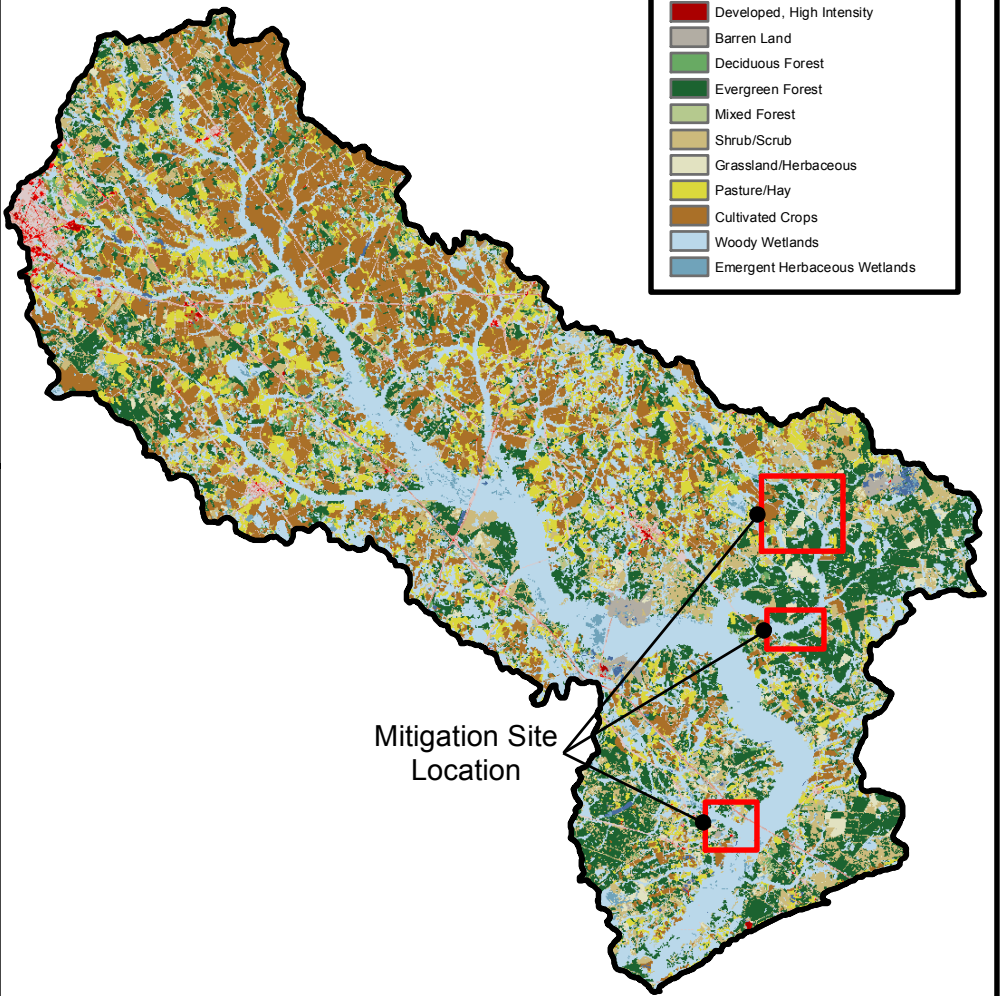


**Legend**

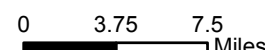
Four Hole Swamp Watershed

**Land Classification Legend**

- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Grassland/Herbaceous
- Pasture/Hay
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands



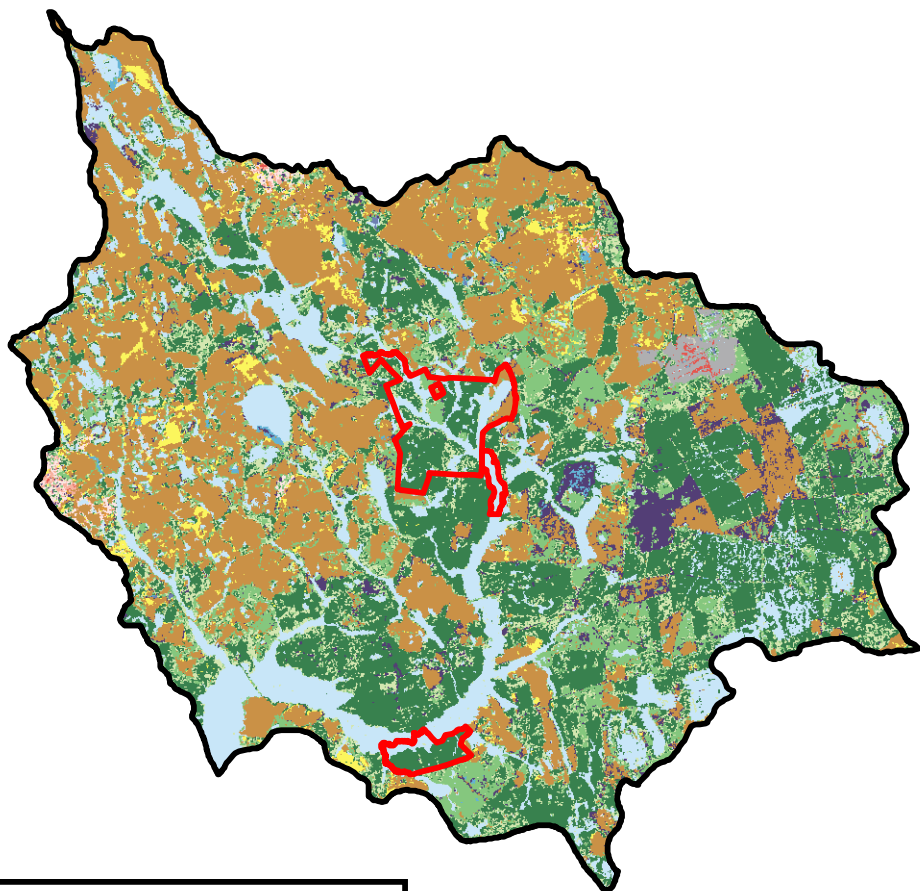
Mitigation Site Location





1992

0 1.25 2.5 Miles



**Figure 4a. Land Cover Map - Dean Swamp**  
Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina

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Drawn By: BWS  
Reviewed By: WAR  
Date: 04/06/2015



**Legend**

- Mitigation Project Boundary
- Dean Swamp Watershed

**Land Classification Legend**

- Open Water
- Urban/Recreational Grasses
- Low Intensity Residential
- High Intensity Residential
- Commercial/Industrial/Transportation
- Bare Rock/Sand/Clay
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrubland
- Grassland/Herbaceous
- Pasture/Hay
- Row Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands



2011

0 1.25 2.5 Miles



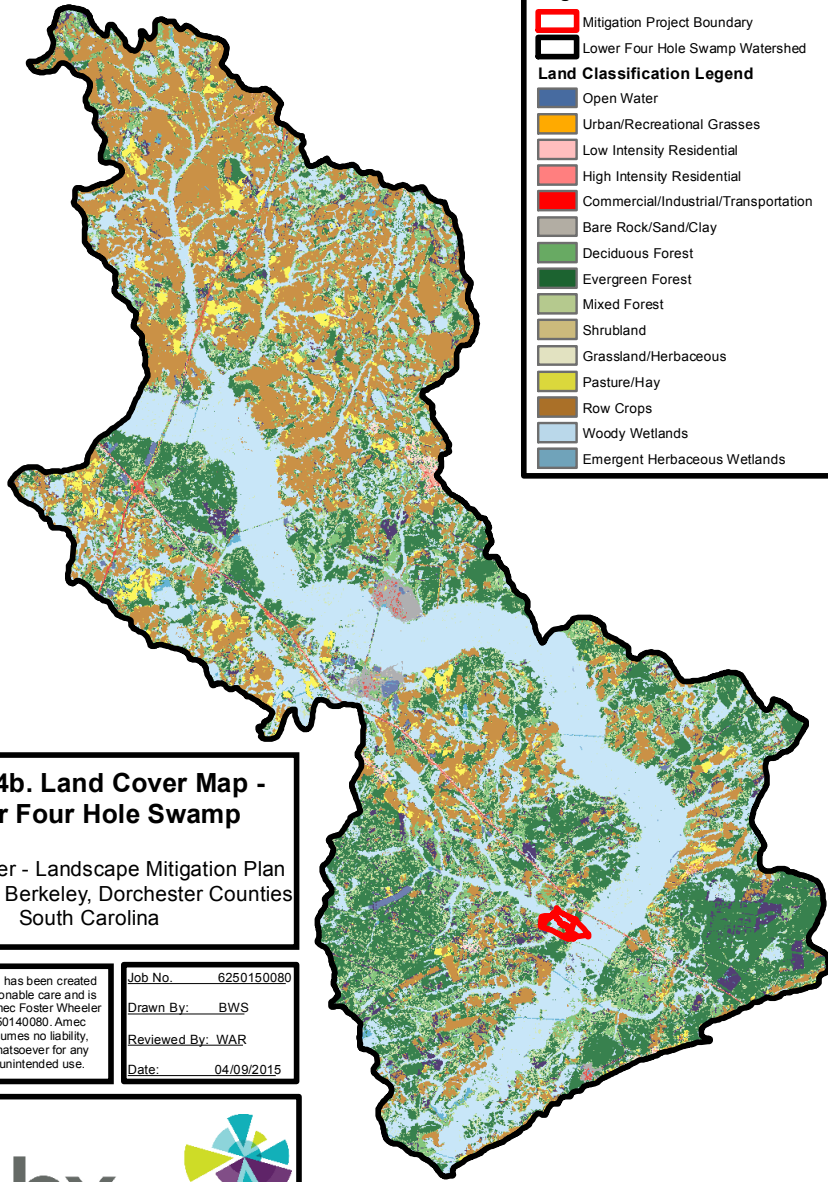
**Legend**

- Mitigation Project Boundary
- Dean Swamp Watershed

**Land Classification Legend**

- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Grassland/Herbaceous
- Pasture/Hay
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands

1992

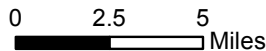


**Figure 4b. Land Cover Map - Lower Four Hole Swamp**

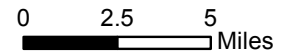
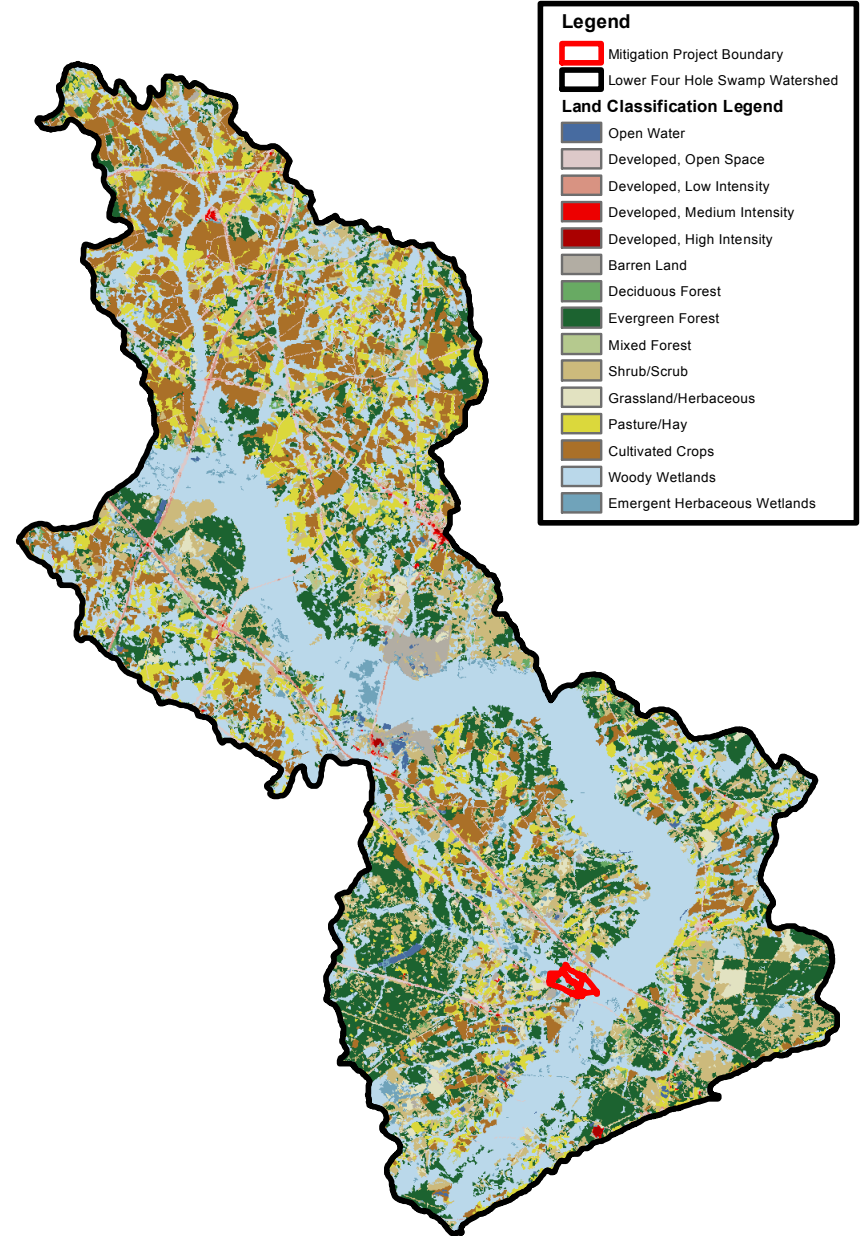
Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina

The map shown here has been created with all due and reasonable care and is strictly for use with Amec Foster Wheeler project number 6250140080. Amec Foster Wheeler assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.

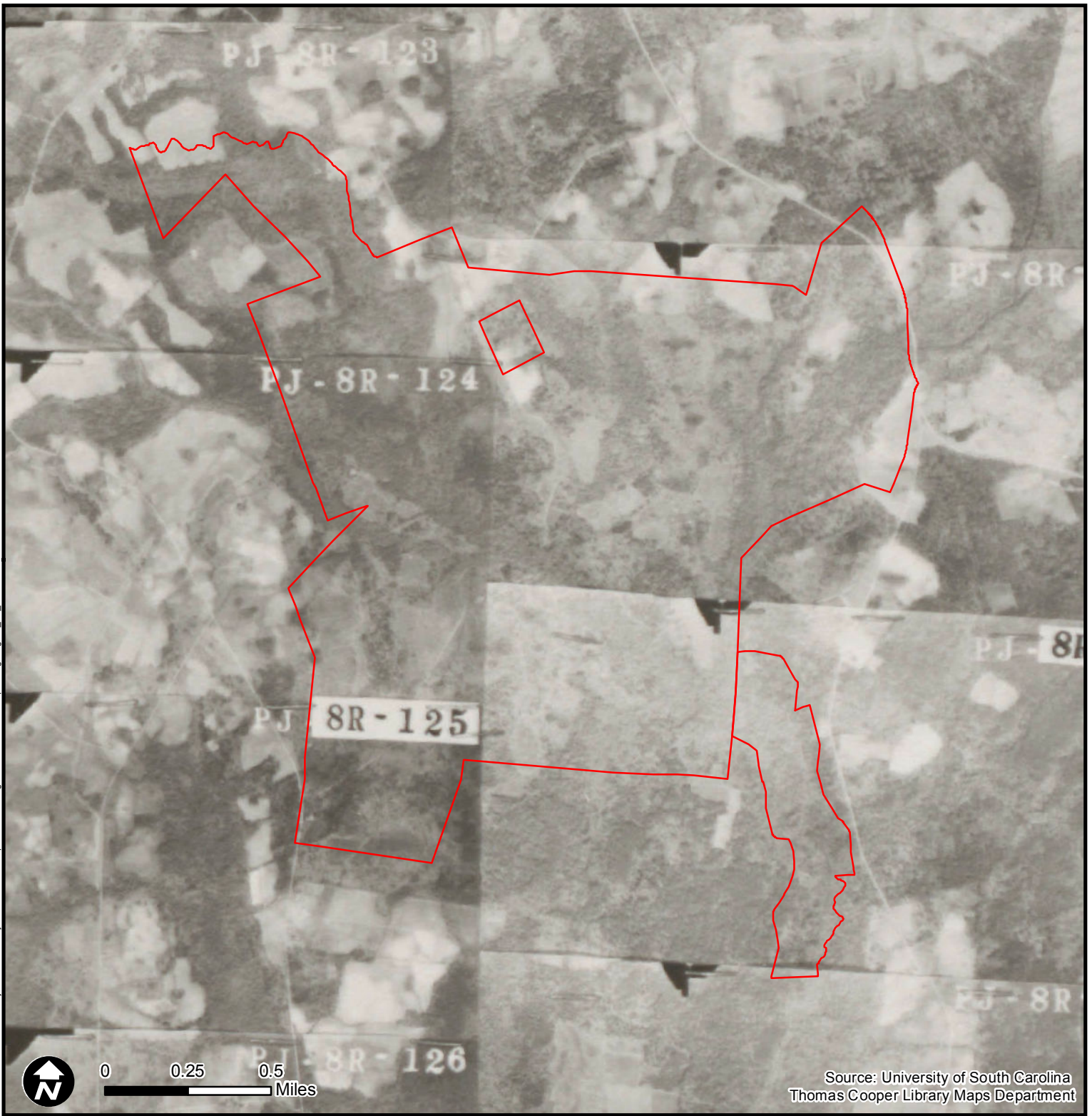
Job No.	6250150080
Drawn By:	BWS
Reviewed By:	WAR
Date:	04/09/2015



2011




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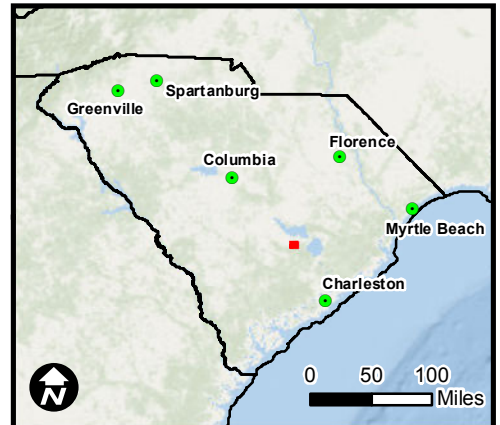


Source: University of South Carolina  
Thomas Cooper Library Maps Department

**Legend**

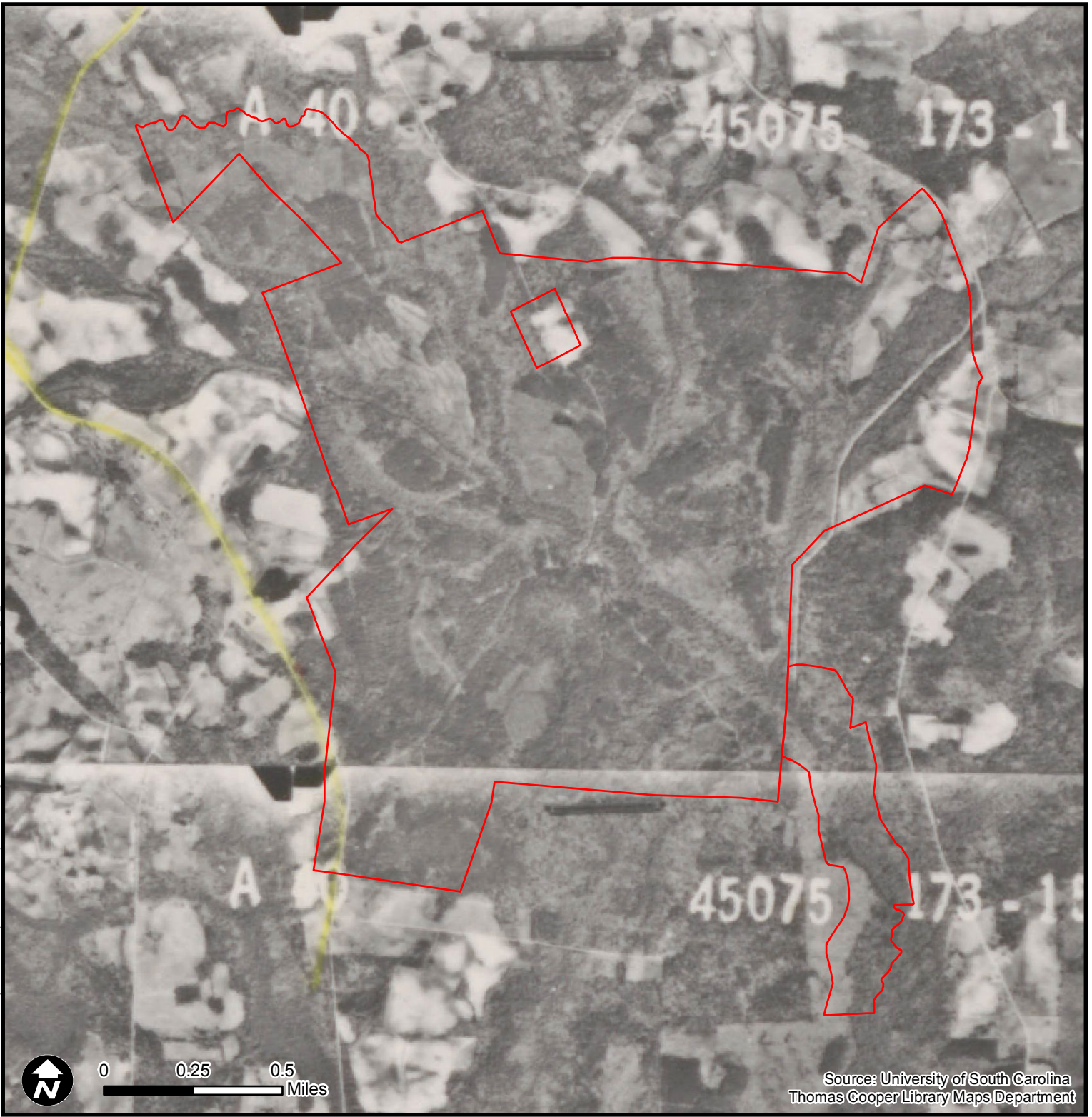
 Mitigation Project Boundary

**Figure 5a. Aerial Map - 1958**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina




Job No. 6250150080  
 Drawn By: BWS  
 Reviewed By: WAR  
 Date: 04/06/2015

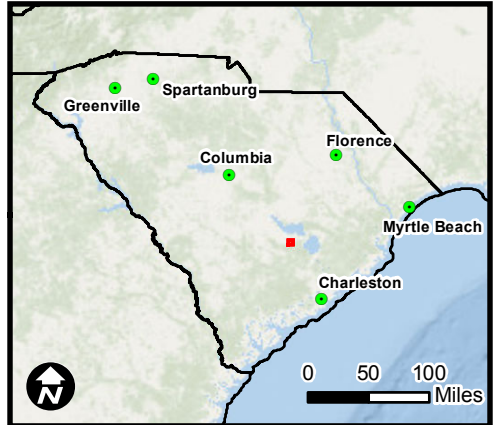
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**Legend**

 Mitigation Project Boundary

**Figure 5b. Aerial Map - 1973**  
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 South Carolina



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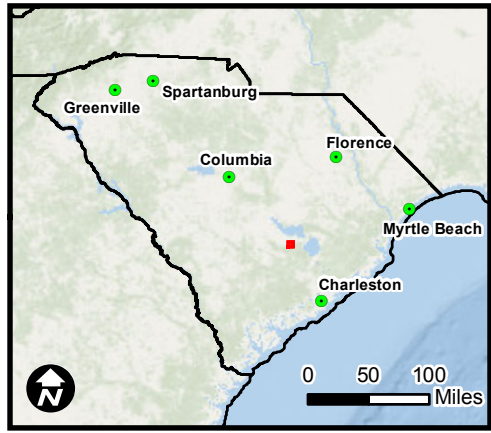
P:\Environmental\2012 + Projects\0067 - Project Diamond\Camp Hill\GIS\Mitigation MXDs\Soter Report Figs\Figure\_5c\_Aerial.mxd



**Legend**

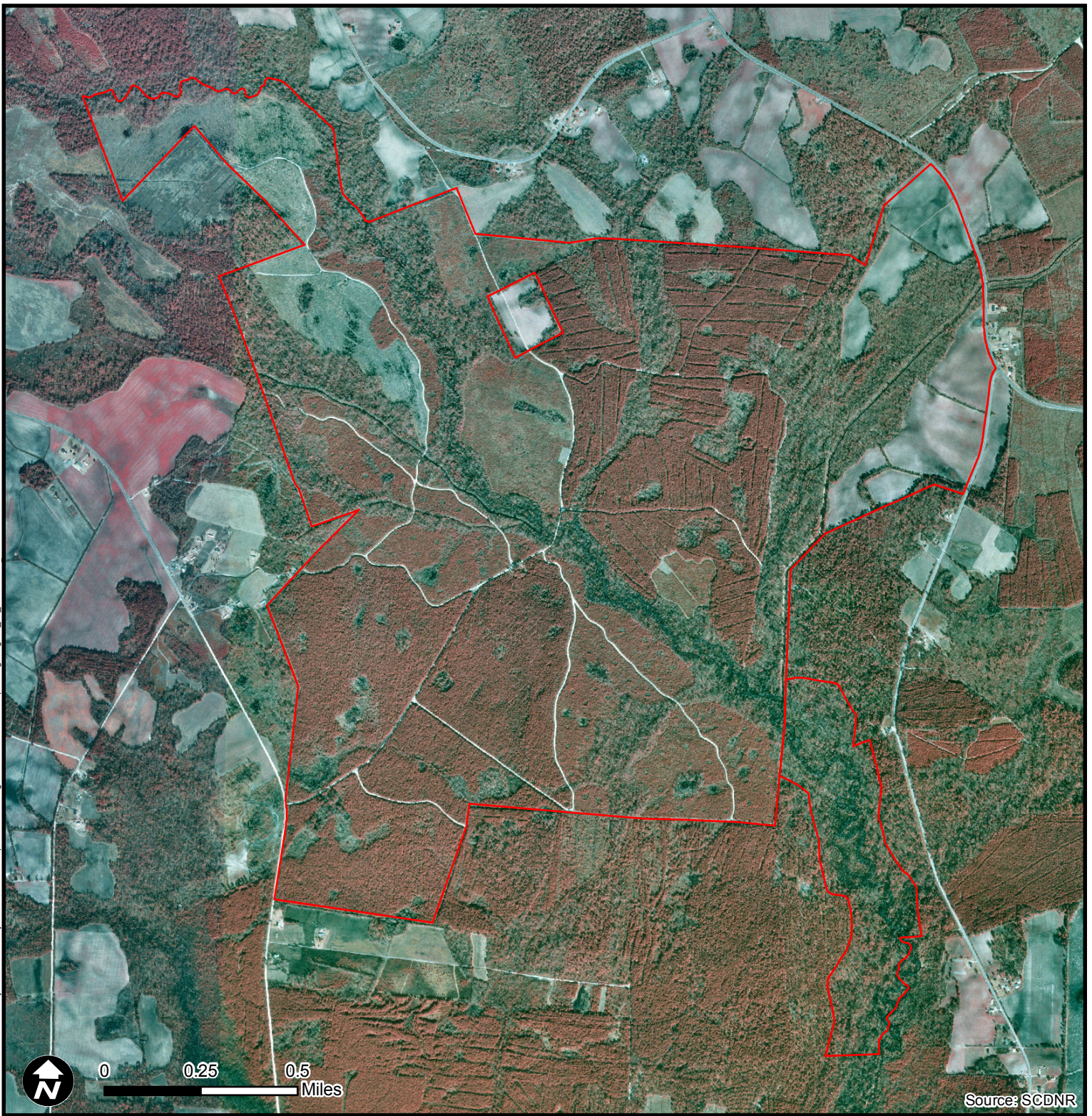
 Mitigation Project Boundary

**Figure 5c. Aerial Map - 1981**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina



Job No. 6250150080  
 Drawn By: BWS  
 Reviewed By: WAR  
 Date: 04/06/2015

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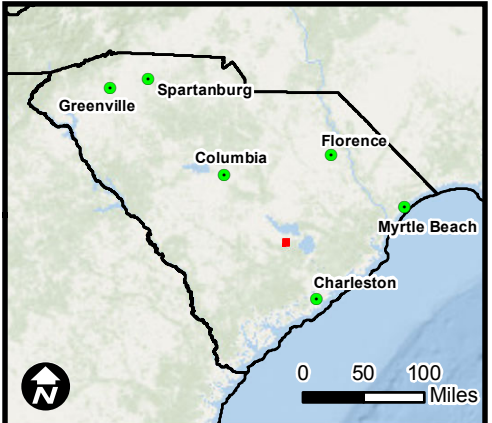
**Legend**

 Mitigation Project Boundary

Job No. 6250150080  
 Drawn By: BWS  
 Reviewed By: WAR  
 Date: 04/06/2015

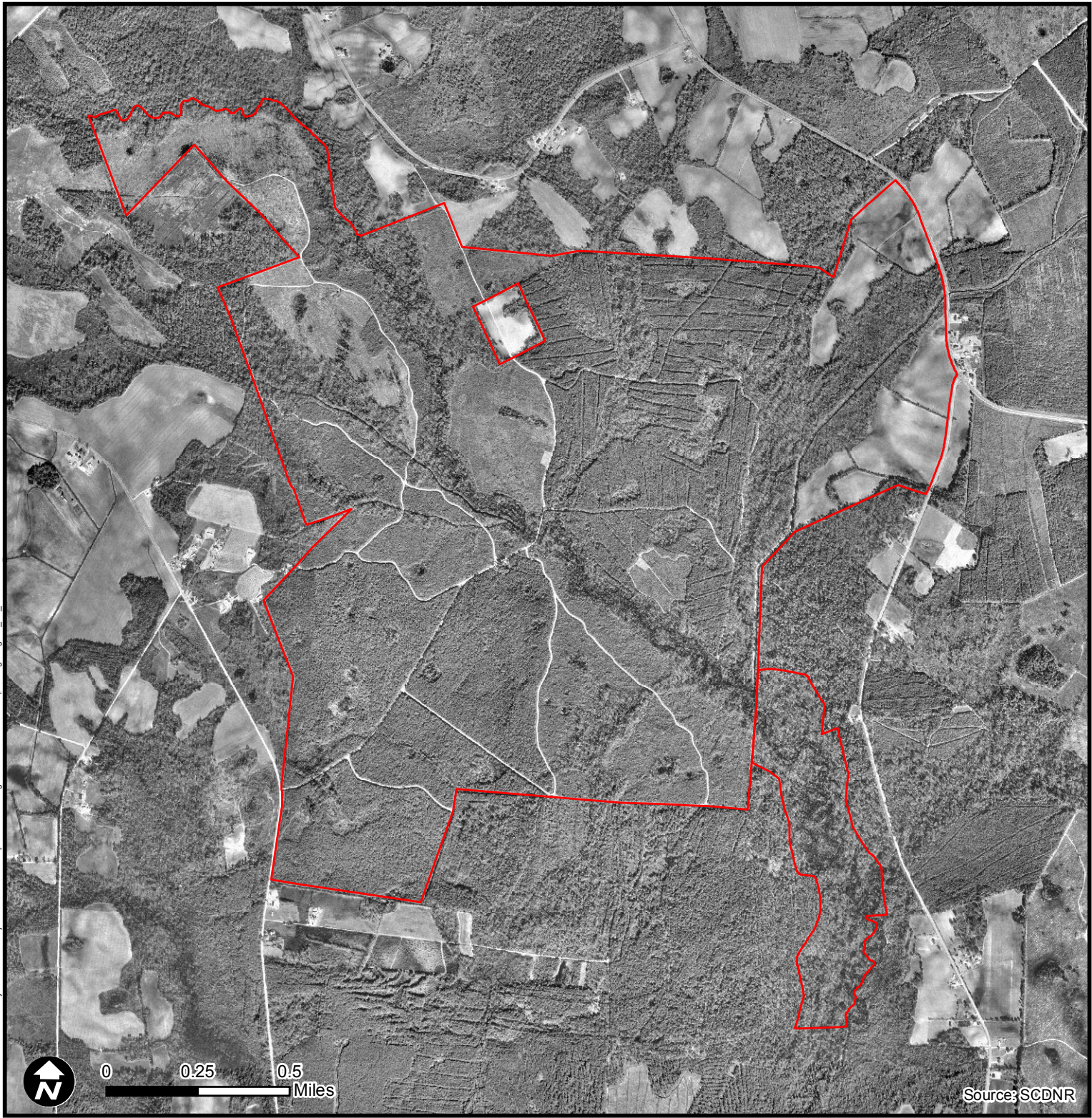
The map shown here has been created with all due and reasonable care and is strictly for use with Amec Foster Wheeler project number 6250150080. Amec Foster Wheeler assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.

**Figure 5d. Aerial Map - 1994**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina




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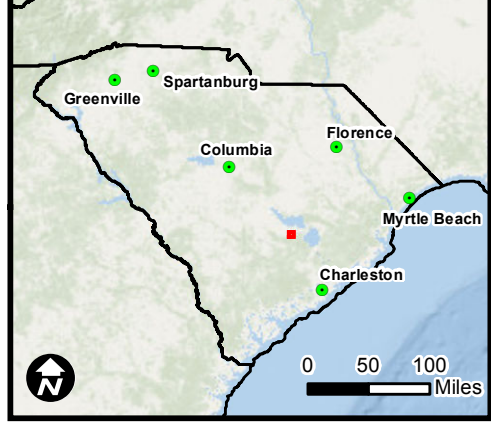


Source: SCDNR

**Legend**

 Mitigation Project Boundary

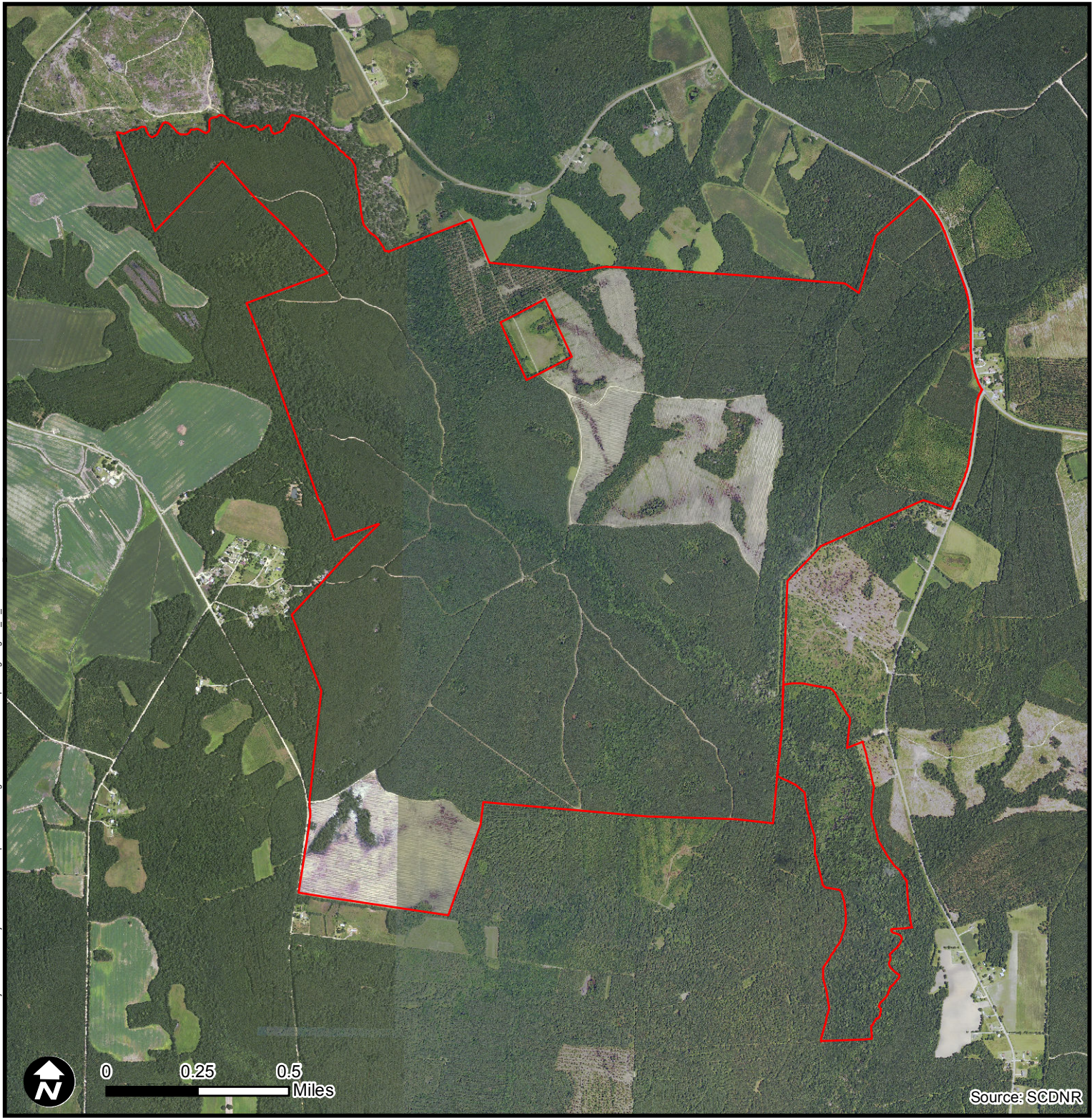
**Figure 5e. Aerial Map - 2002**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina



Job No. 6250150080  
 Drawn By: BWS  
 Reviewed By: WAR  
 Date: 04/06/2015


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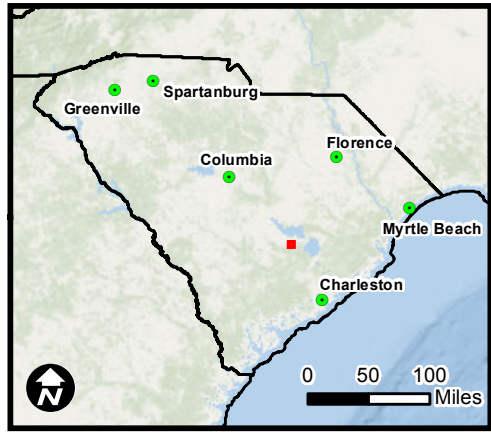
Source: SCDNR

**Legend**

 Mitigation Project Boundary

**Figure 5f. Aerial Map - 2005**

Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina

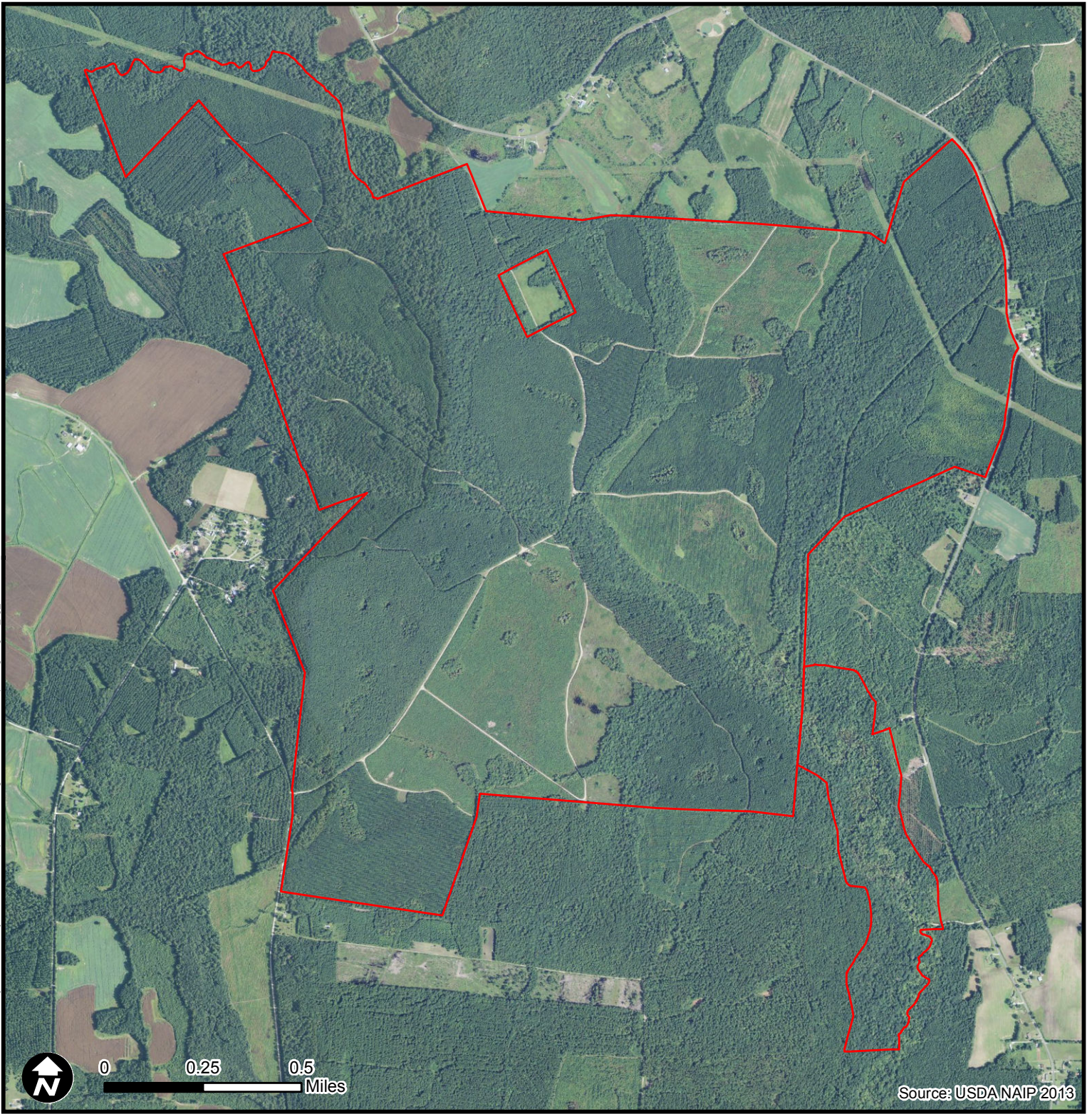


Job No. 6250150080  
 Drawn By: BWS  
 Reviewed By: WAR  
 Date: 04/06/2015

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Source: USDA NAIP 2013

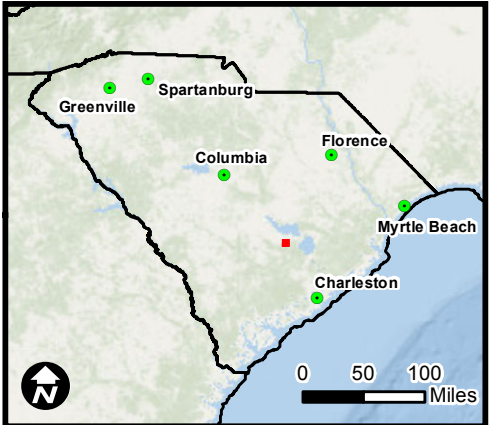
**Legend**

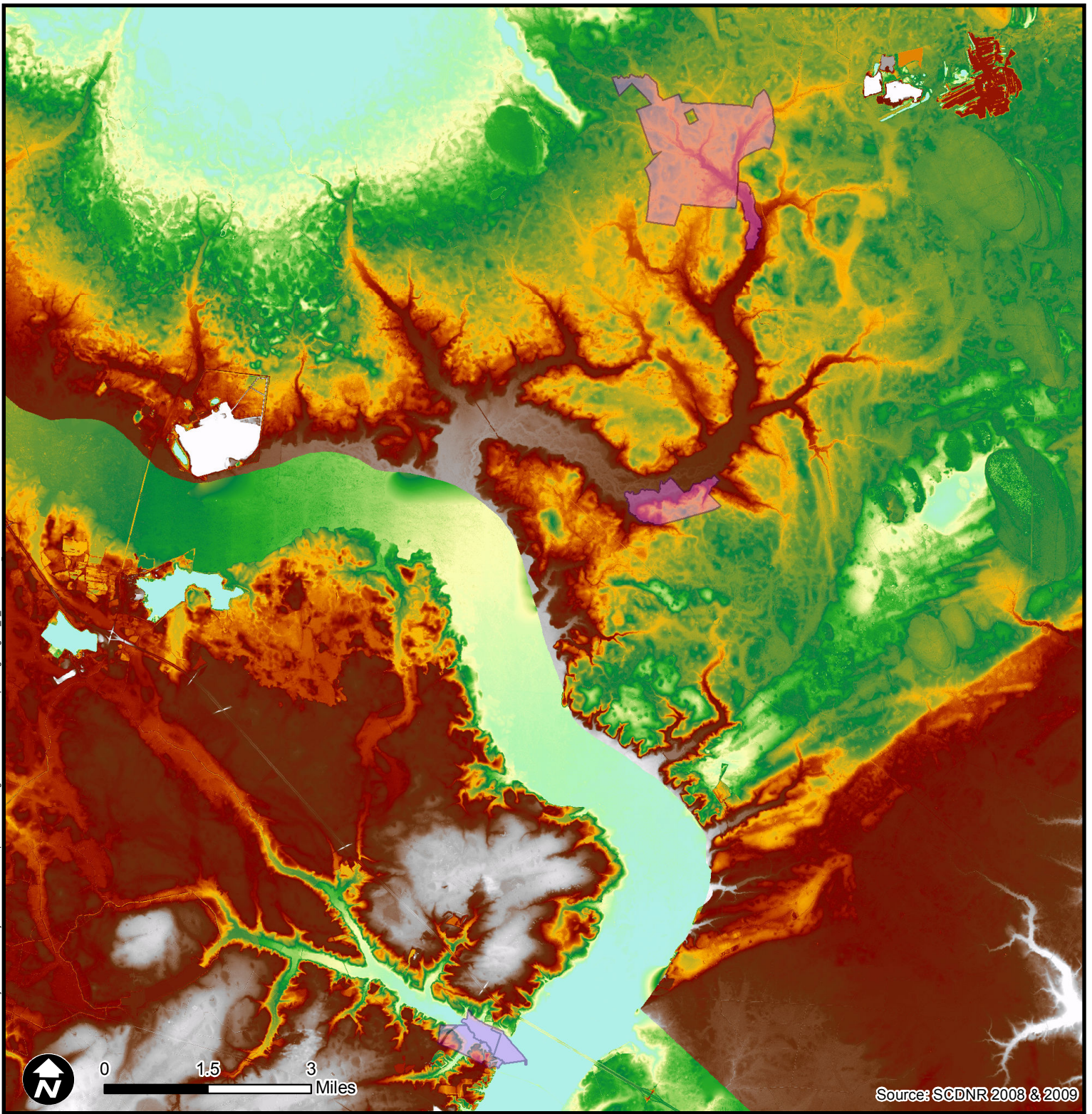
 Mitigation Project Boundary

Job No. 6250150080  
 Drawn By: BWS  
 Reviewed By: WAR  
 Date: 04/06/2015

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**Figure 5g. Aerial Map - 2013**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina




Source: SCDNR 2008 & 2009

**Legend**

 Mitigation Project Boundary

**Elevation (ft)**

 High : 110  
Low : 45

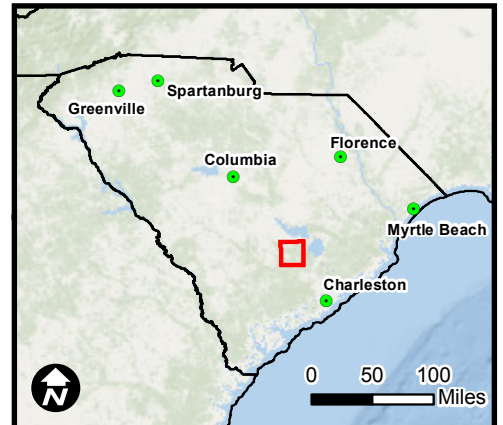
**Figure 6. LiDAR Map**  
Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina

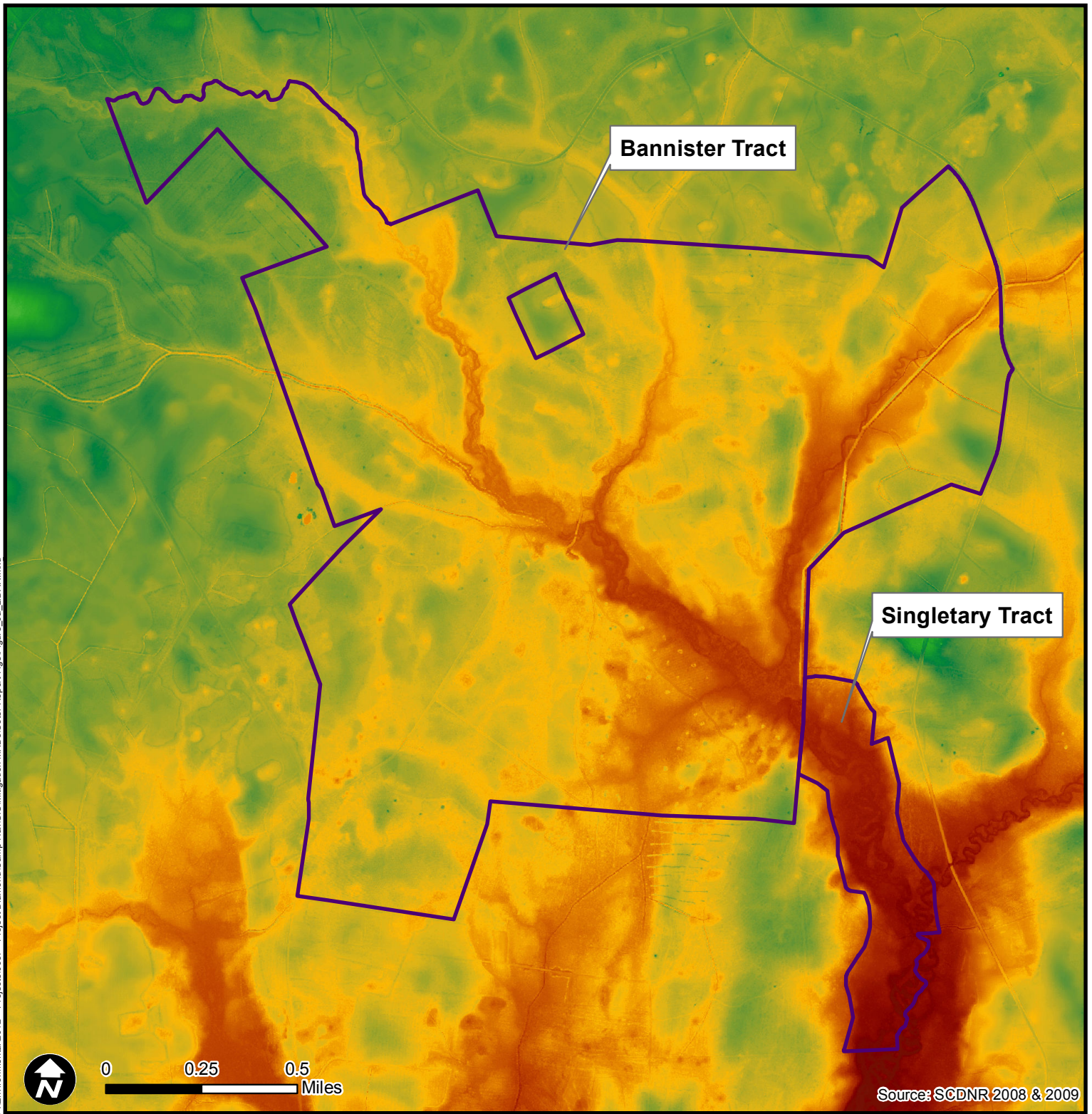
Job No. 6250150080  
Drawn By: BWS  
Reviewed By: WAR  
Date: 04/06/2015

The map shown here has been created with all due and reasonable care and is strictly for use with Amec Foster Wheeler project number 6250150080. Amec Foster Wheeler assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.

 **ebx**  
AN **res** COMPANY

 **amec foster wheeler**





**Legend**

Mitigation Project Boundary

**Elevation (ft)**

High : 110  
Low : 45

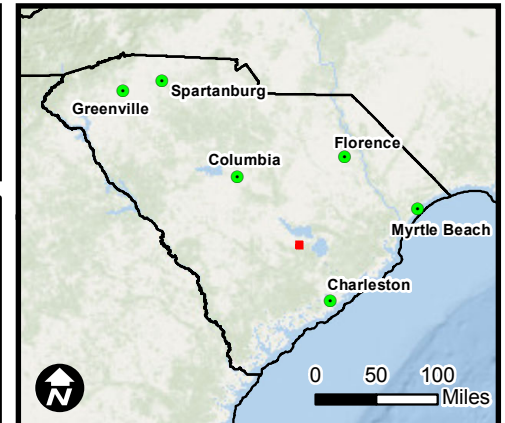
Job No. 6250150080  
 Drawn By: BWS  
 Reviewed By: WAR  
 Date: 04/06/2015

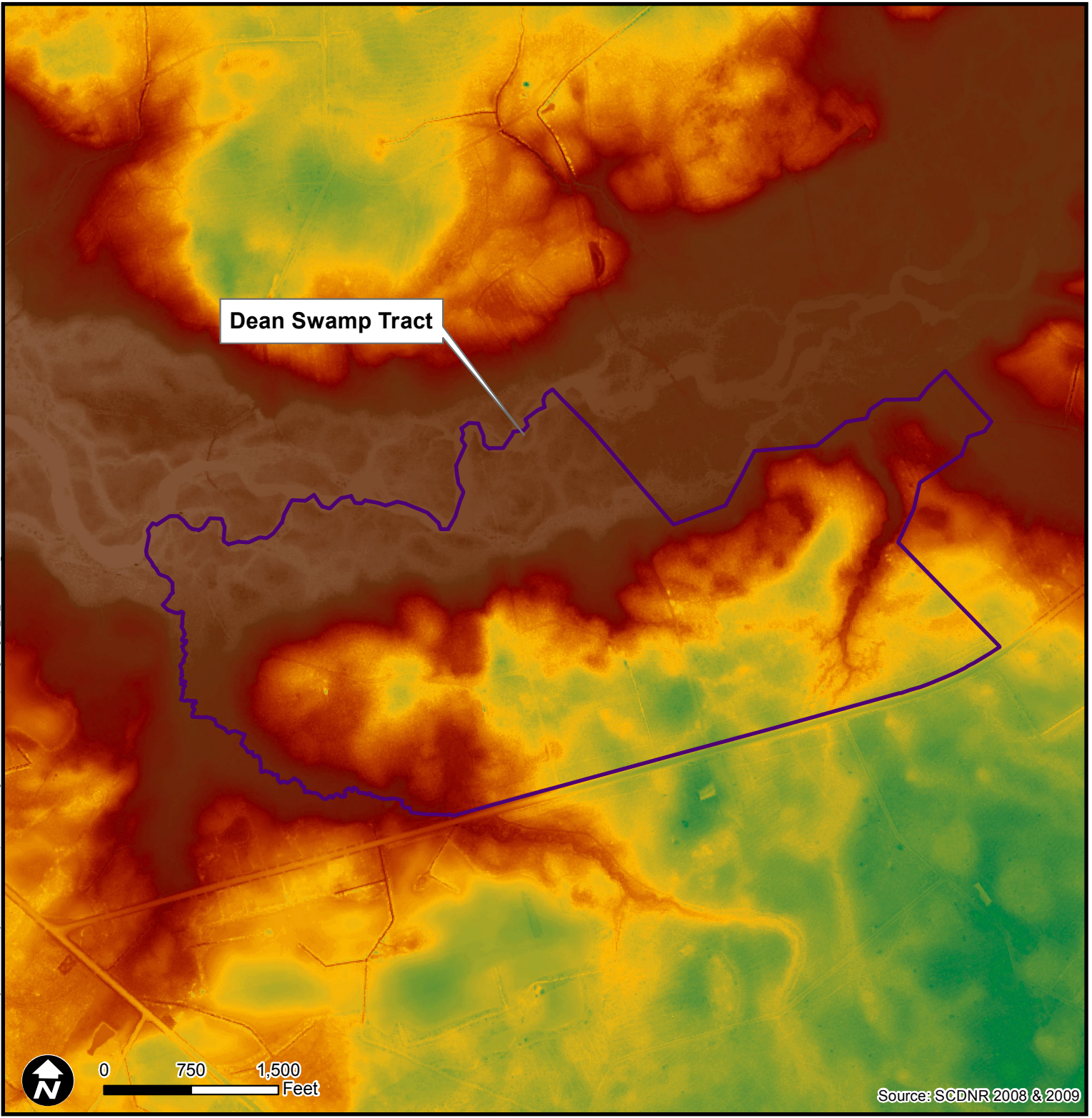
The map shown here has been created with all due and reasonable care and is strictly for use with Amec Foster Wheeler project number 6250150080. Amec Foster Wheeler assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.

**Figure 6a. LiDAR Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina

**ebx**  
 AN **res** COMPANY

**amec foster wheeler**





**Legend**

Mitigation Project Boundary

**Elevation (ft)**

High : 110  
Low : 45

**Figure 6b. LiDAR Map**

Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina

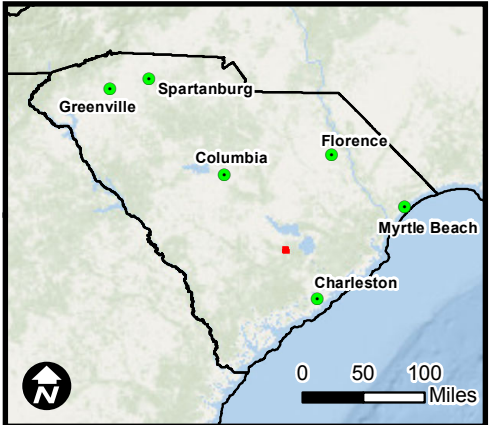
Job No. 6250150080

Drawn By: BWS

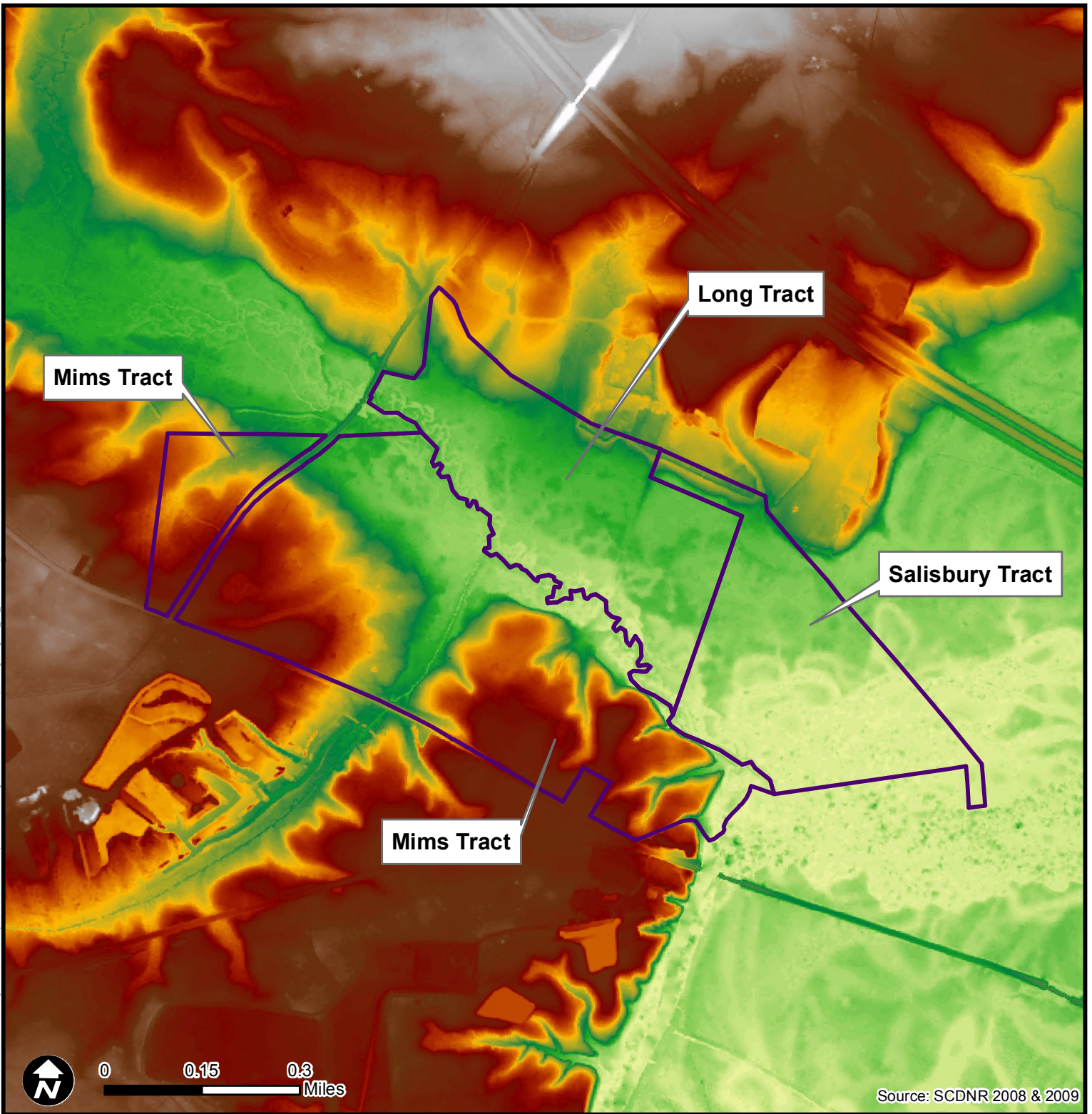
Reviewed By: WAR

Date: 04/06/2015

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Source: SCDNR 2008 & 2009

**Legend**

- Mitigation Project Boundary

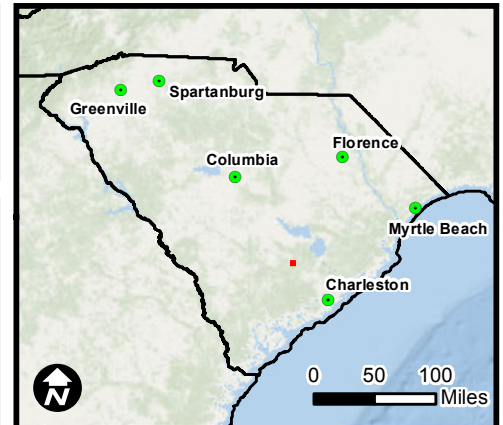
**Elevation (ft)**

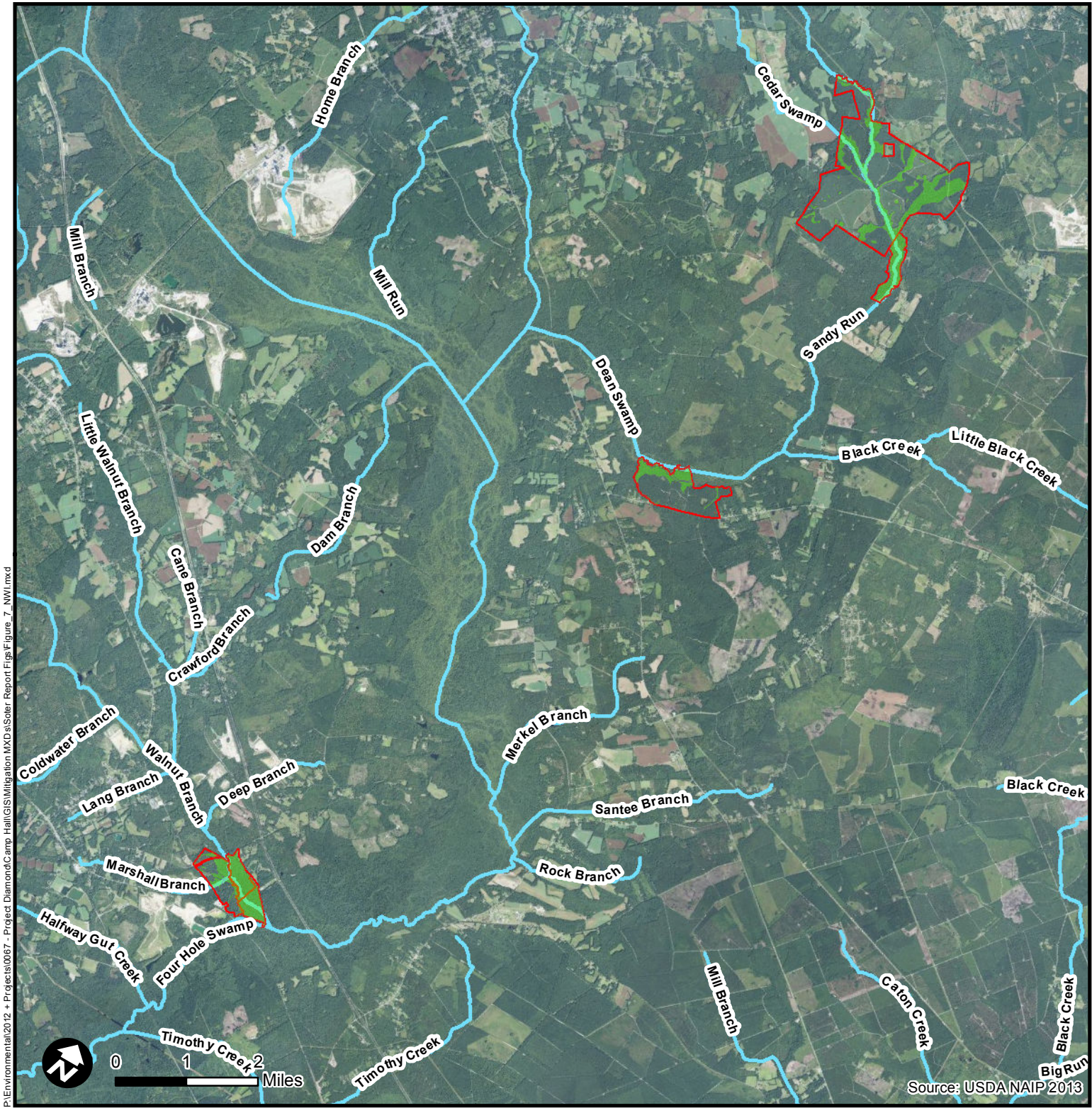
- High : 110
- Low : 25

**Figure 6c. LiDAR Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina

Job No. 6250150080  
 Drawn By: BWS  
 Reviewed By: WAR  
 Date: 04/06/2015

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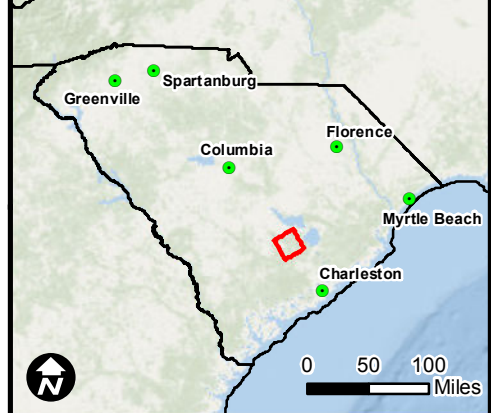
**Legend**

- Mitigation Project Boundary
- USGS Streams
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

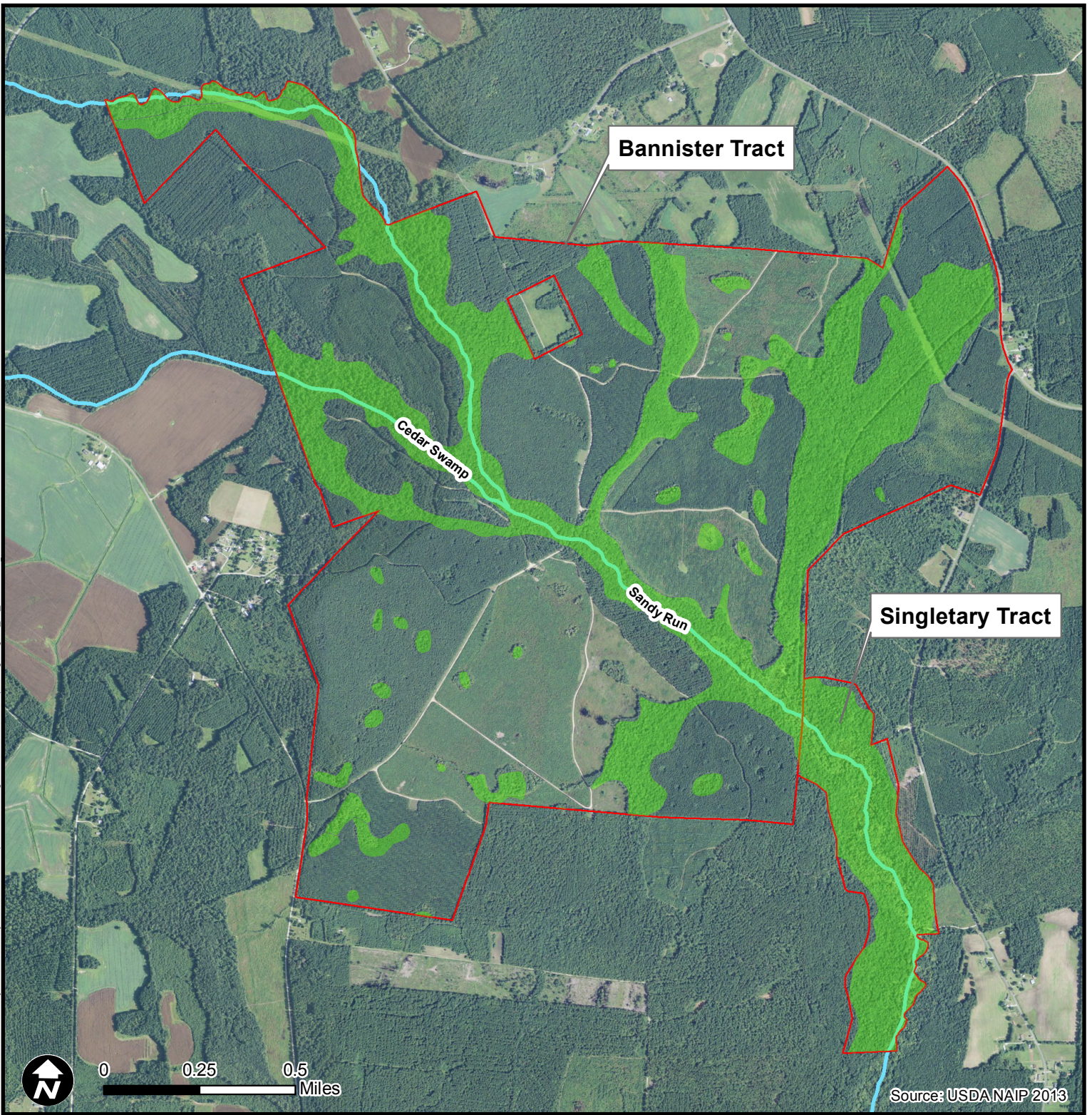
Job No. 6250150080  
 Drawn By: BWS  
 Reviewed By: WAR  
 Date: 04/06/2015

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**Figure 7. National Wetland Inventory Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina



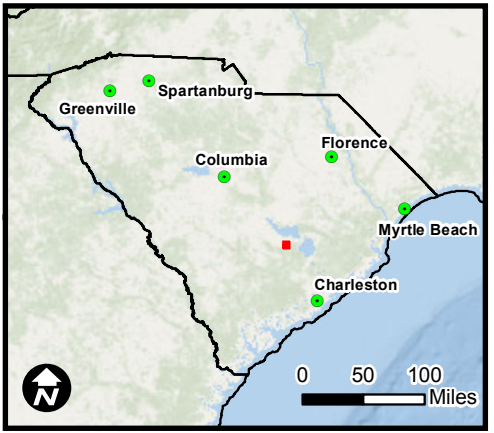




**Legend**

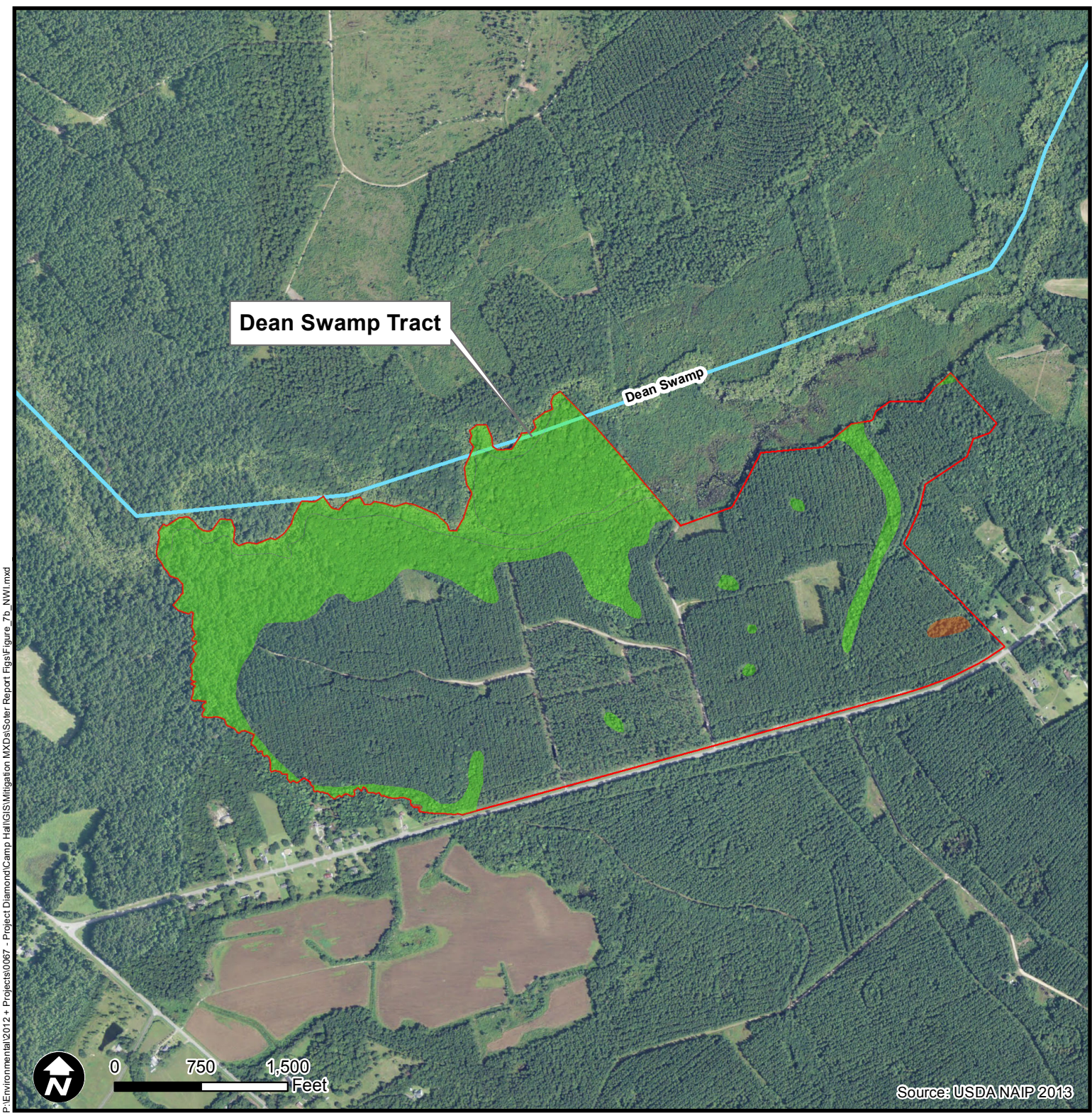
- Mitigation Project Boundary
- USGS Streams
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

**Figure 7a. National Wetland Inventory Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina



Job No. 6250150080  
 Drawn By: BWS  
 Reviewed By: WAR  
 Date: 04/06/2015

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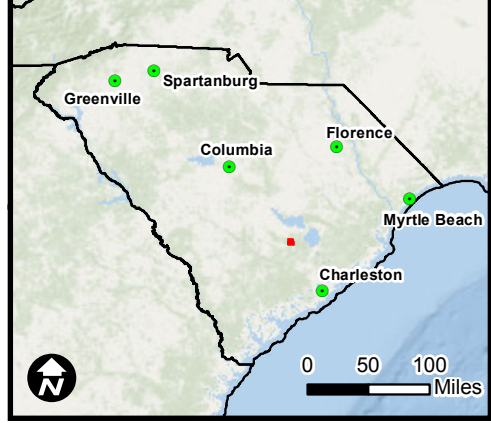


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**Legend**

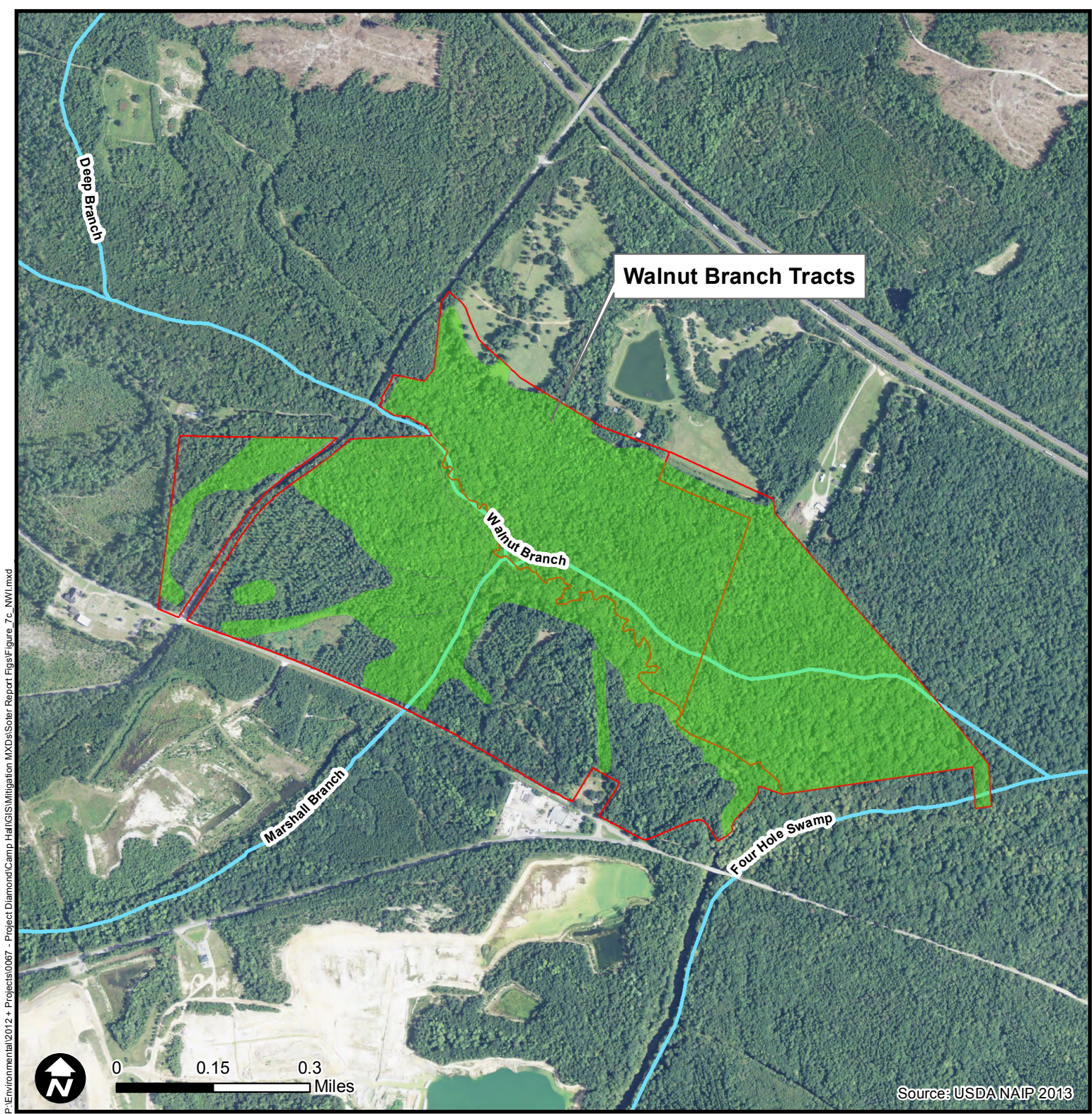
- Mitigation Project Boundary
- USGS Streams
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

**Figure 7b. National Wetland Inventory Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina



Job No. 6250150080  
 Drawn By: BWS  
 Reviewed By: WAR  
 Date: 04/06/2015

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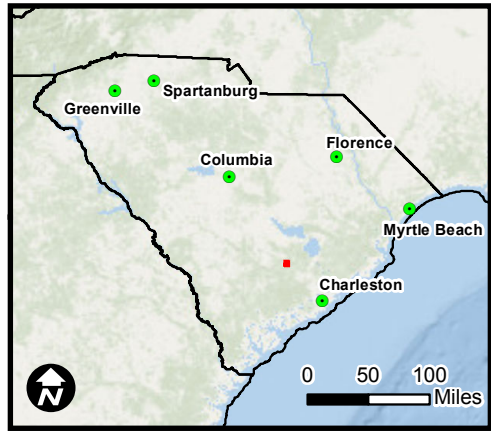
P:\Environmental\2012 + Projects\067 - Project Diamond\Camp\_Hall\GIS\Mitigation\_MXD\Soter\_Report\_Figs\Figure\_7c\_NWI.mxd

**Legend**

- Mitigation Project Boundary
- USGS Streams
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

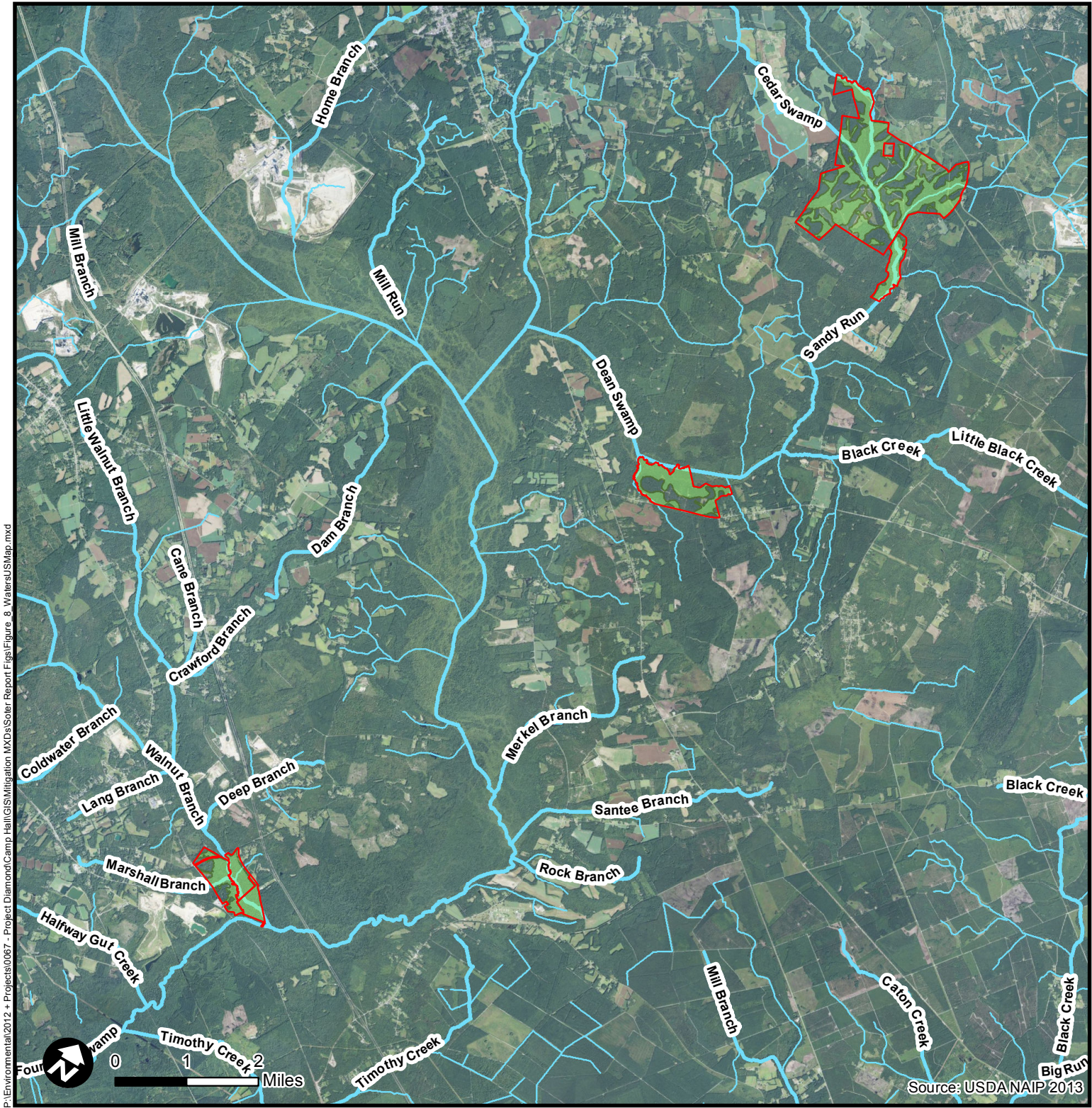
**Figure 7c. National Wetland Inventory Map**

Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina






Job No. 6250150080  
 Drawn By: BWS  
 Reviewed By: WAR  
 Date: 04/06/2015

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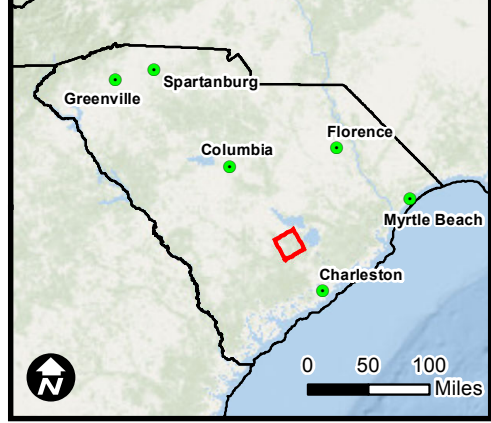


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**Legend**

-  Mitigation Project Boundary
-  Estimated Wetlands (~1,533 Acres)
-  USGS Streams

**Figure 8. Approximate Waters of the US Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina



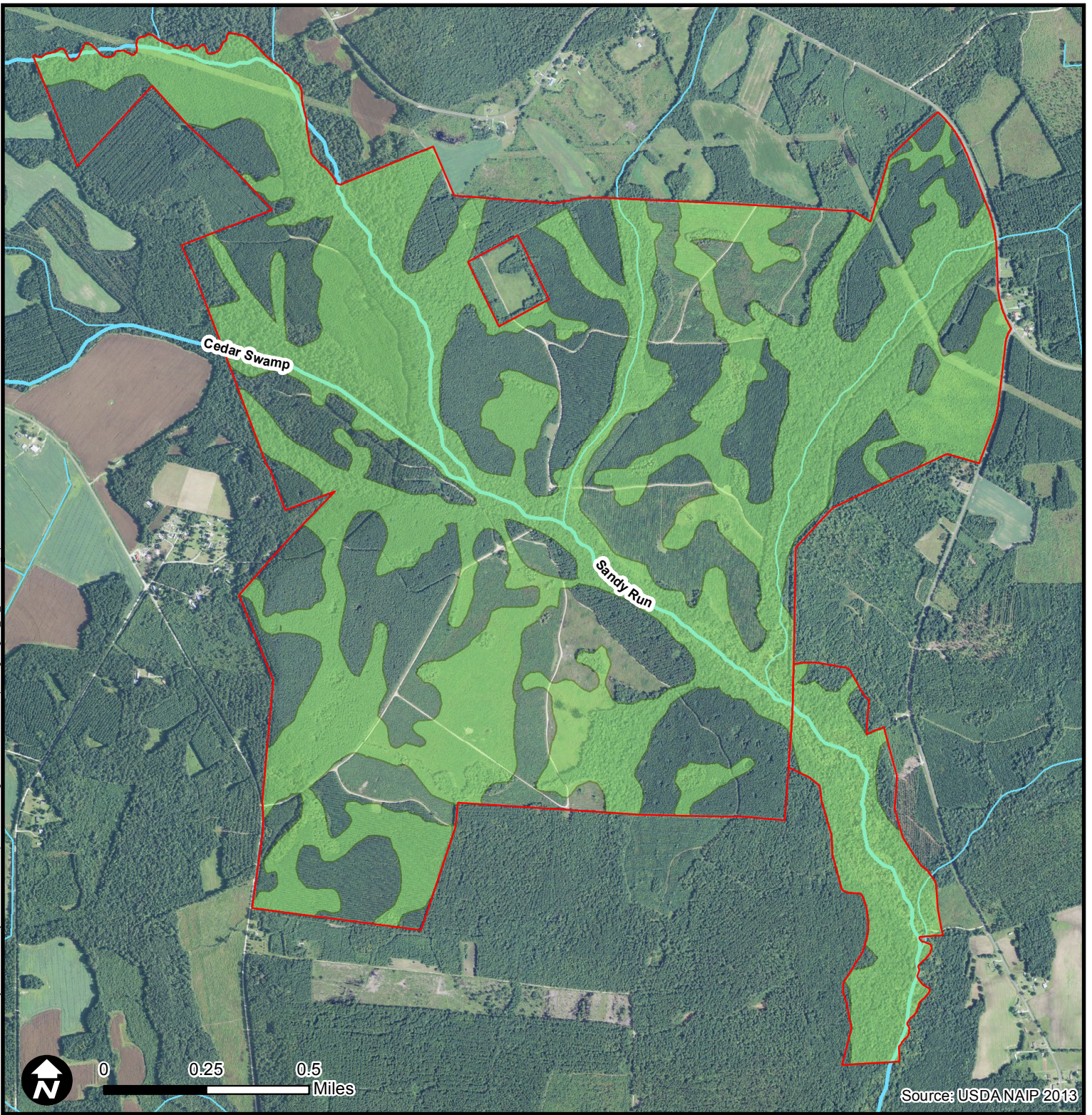
Job No.  
6250150080

Drawn By:  
BWS

Reviewed By:  
WAR

Date:  
03/25/2015

The limits of jurisdictional wetlands for the proposed Project Soter Landscape Mitigation Plan were conducted from an analysis by wetland professionals of aerial photogrammetric sources, soil maps, SC hydrographic maps, and National Wetland Inventory maps. The approximate limits of waters of the U.S. were demarcated on base drawings and then digitized in a GIS format to allow an estimate of approximate impacts. Please note that this jurisdictional approximation is meant for estimation of wetland boundary lengths. These approximate wetlands boundaries are subject to change following a comprehensive delineation and verification by the USACE.



**Legend**

- Mitigation Project Boundary
- Estimated Wetlands (~1,010 Acres)
- USGS Streams

Job No.  
6250150080

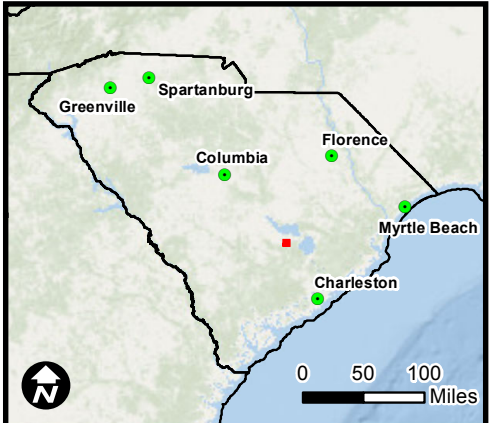
Drawn By:  
BWS

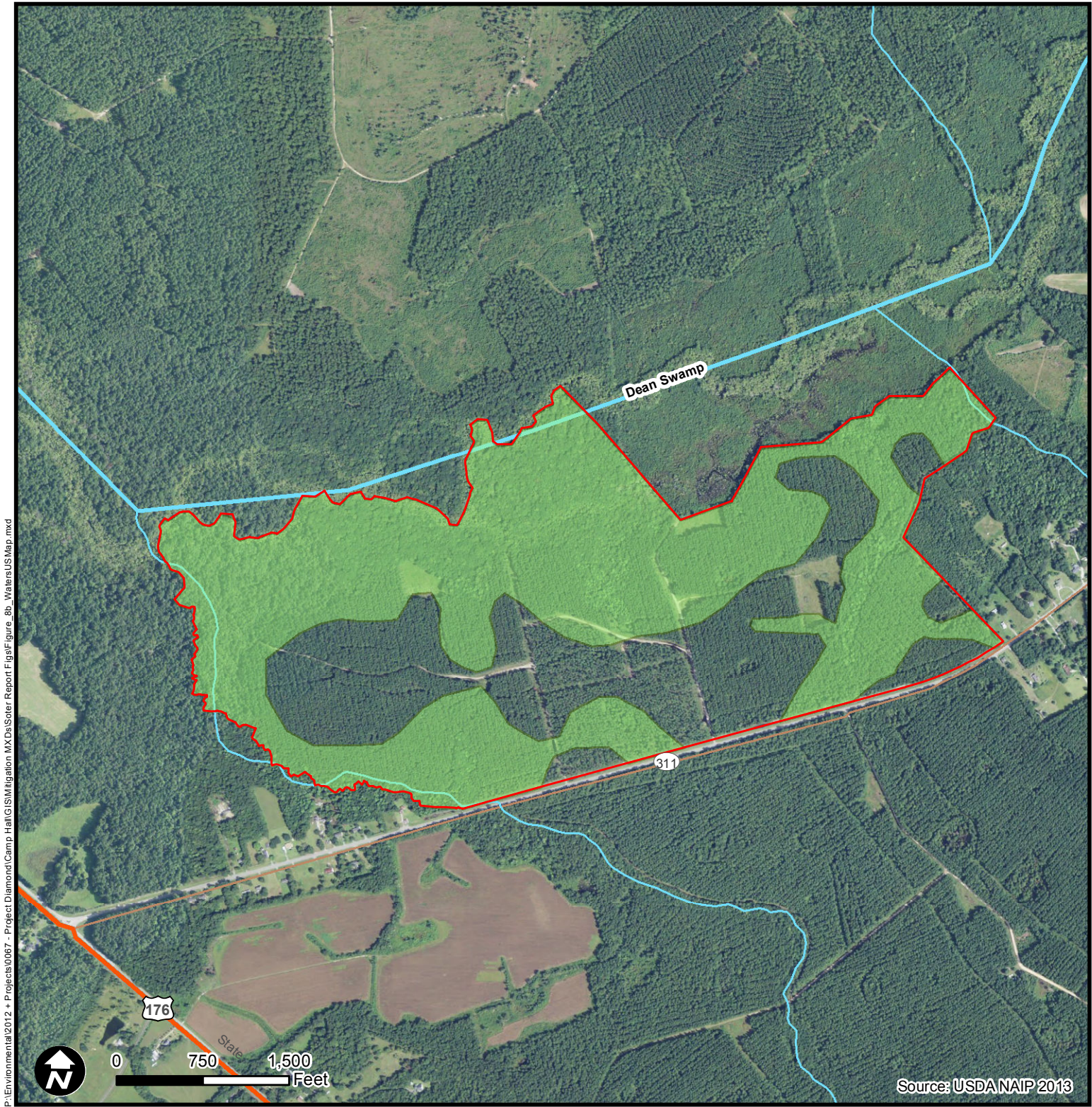
Reviewed By:  
WAR

Date:  
03/25/2015

The limits of jurisdictional wetlands for the proposed Project Soter Landscape Mitigation Plan were conducted from an analysis by wetland professionals of aerial photogrammetric sources, soil maps, SC hydrographic maps, and National Wetland Inventory maps. The approximate limits of waters of the U.S. were demarcated on base drawings and then digitized in a GIS format to allow an estimate of approximate impacts. Please note that this jurisdictional approximation is meant for estimation of wetland boundary lengths. These approximate wetlands boundaries are subject to change following a comprehensive delineation and verification by the USACE.

**Figure 8a. Approximate Waters of the US Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina





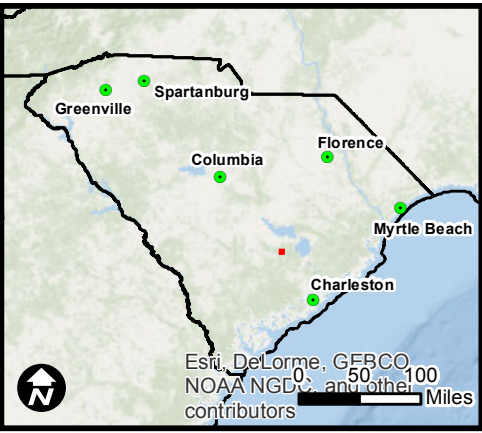
P:\Environmental\2012 - Projects\0067 - Project Diamond\Camp\_Hall\GIS\Mitigation\_MXD\Soter\_Report\_Figs\Figure\_8b\_WatersUSMap.mxd

**Legend**

- Mitigation Project Boundary
- Estimated Wetlands (~258 Acres)
- USGS Streams

**Figure 8b. Approximate Waters of the US Map**

Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina



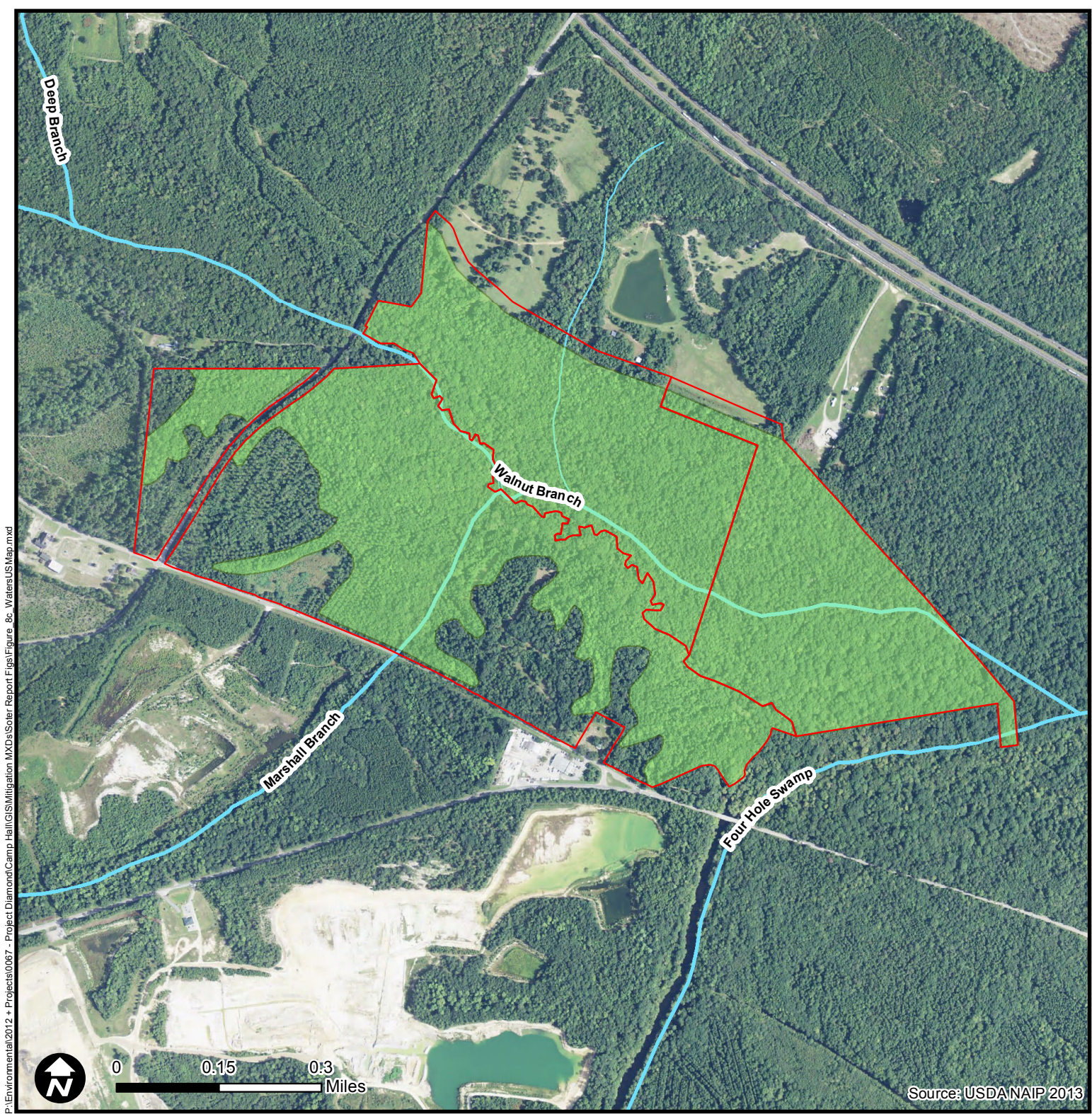
Job No.  
6250150080

Drawn By:  
BWS

Reviewed By:  
WAR

Date:  
03/25/2015

The limits of jurisdictional wetlands for the proposed Project Soter Landscape Mitigation Plan were conducted from an analysis by wetland professionals of aerial photogrammetric sources, soil maps, SC hydrographic maps, and National Wetland Inventory maps. The approximate limits of waters of the U.S. were demarcated on base drawings and then digitized in a GIS format to allow an estimate of approximate impacts. Please note that this jurisdictional approximation is meant for estimation of wetland boundary lengths. These approximate wetlands boundaries are subject to change following a comprehensive delineation and verification by the USACE.

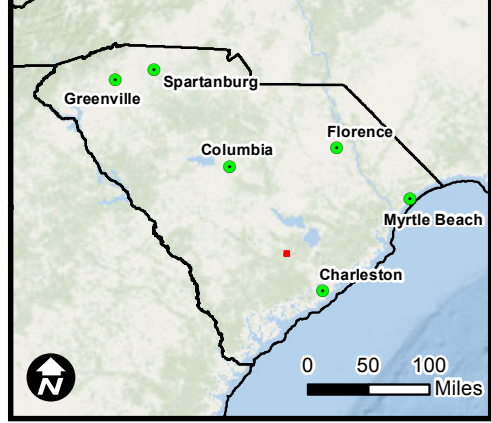


P:\Environmental\2012 - Projects\0067 - Project Diamond\Camp Hill\GIS\Mitigation MXDs\Soter Report Figs\Figure\_8c\_WatersUSMap.mxd

**Legend**

- Mitigation Project Boundary
- Estimated Wetlands (~265 Acres)
- USGS Streams

**Figure 8c. Approximate Waters of the US Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina



Job No.  
6250150080

Drawn By:  
BWS

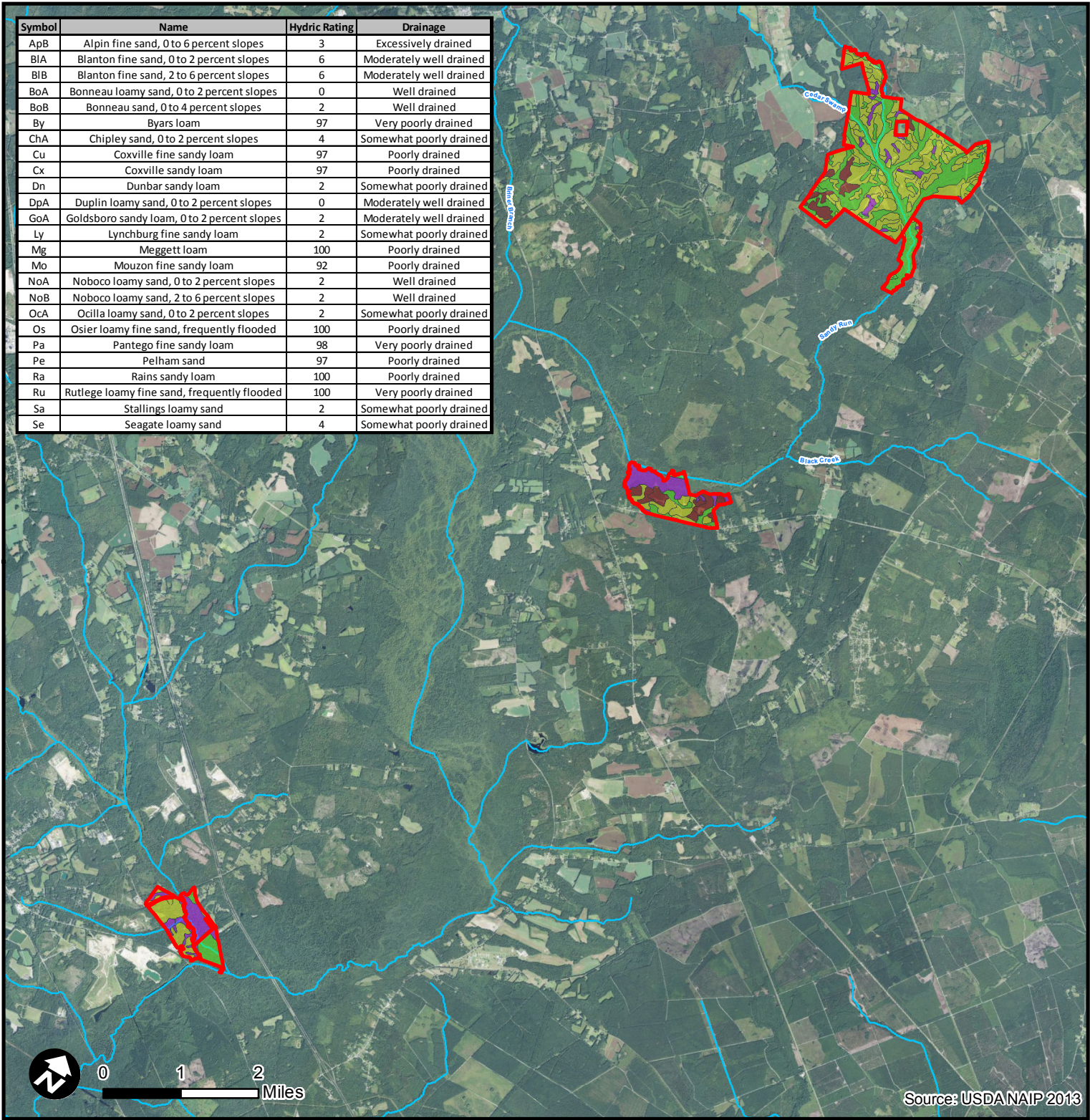
Reviewed By:  
WAR

Date:  
03/25/2015

The limits of jurisdictional wetlands for the proposed Project Soter Landscape Mitigation Plan were conducted from an analysis by wetland professionals of aerial photogrammetric sources, soil maps, SC hydrographic maps, and National Wetland Inventory maps. The approximate limits of waters of the U.S. were demarcated on base drawings and then digitized in a GIS format to allow an estimate of approximate impacts. Please note that this jurisdictional approximation is meant for estimation of wetland boundary lengths. These approximate wetlands boundaries are subject to change following a comprehensive delineation and verification by the USACE.

P:\Environmental\2012 - Projects\067 - Project Diamond\Camp Hill\GIS\Mitigation MXDs\Soter\_Report\Figs\Figure\_9\_Soils.mxd

Symbol	Name	Hydric Rating	Drainage
ApB	Alpin fine sand, 0 to 6 percent slopes	3	Excessively drained
BIA	Blanton fine sand, 0 to 2 percent slopes	6	Moderately well drained
BIB	Blanton fine sand, 2 to 6 percent slopes	6	Moderately well drained
BoA	Bonneau loamy sand, 0 to 2 percent slopes	0	Well drained
BoB	Bonneau sand, 0 to 4 percent slopes	2	Well drained
By	Byars loam	97	Very poorly drained
ChA	Chipleay sand, 0 to 2 percent slopes	4	Somewhat poorly drained
Cu	Coxville fine sandy loam	97	Poorly drained
Cx	Coxville sandy loam	97	Poorly drained
Dn	Dunbar sandy loam	2	Somewhat poorly drained
DpA	Duplin loamy sand, 0 to 2 percent slopes	0	Moderately well drained
GoA	Goldsboro sandy loam, 0 to 2 percent slopes	2	Moderately well drained
Ly	Lynchburg fine sandy loam	2	Somewhat poorly drained
Mg	Meggett loam	100	Poorly drained
Mo	Mouzon fine sandy loam	92	Poorly drained
NoA	Noboco loamy sand, 0 to 2 percent slopes	2	Well drained
NoB	Noboco loamy sand, 2 to 6 percent slopes	2	Well drained
OcA	Ocilla loamy sand, 0 to 2 percent slopes	2	Somewhat poorly drained
Os	Osier loamy fine sand, frequently flooded	100	Poorly drained
Pa	Pantego fine sandy loam	98	Very poorly drained
Pe	Pelham sand	97	Poorly drained
Ra	Rains sandy loam	100	Poorly drained
Ru	Rutledge loamy fine sand, frequently flooded	100	Very poorly drained
Sa	Stallings loamy sand	2	Somewhat poorly drained
Se	Seagate loamy sand	4	Somewhat poorly drained



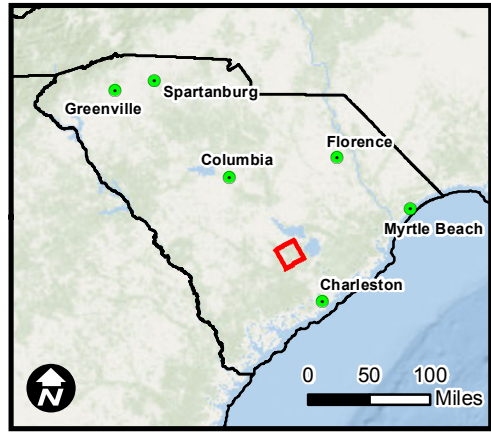
**Legend**

- Mitigation Project Boundary (Red outline)
- USGS Streams (Blue line)

**Soils Hydric Rating**

- Nonhydric (Pink)
- Predominantly Nonhydric (Yellow)
- Predominantly Hydric (Green)
- Hydric (Purple)

**Figure 9. USDA Soil Survey Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina

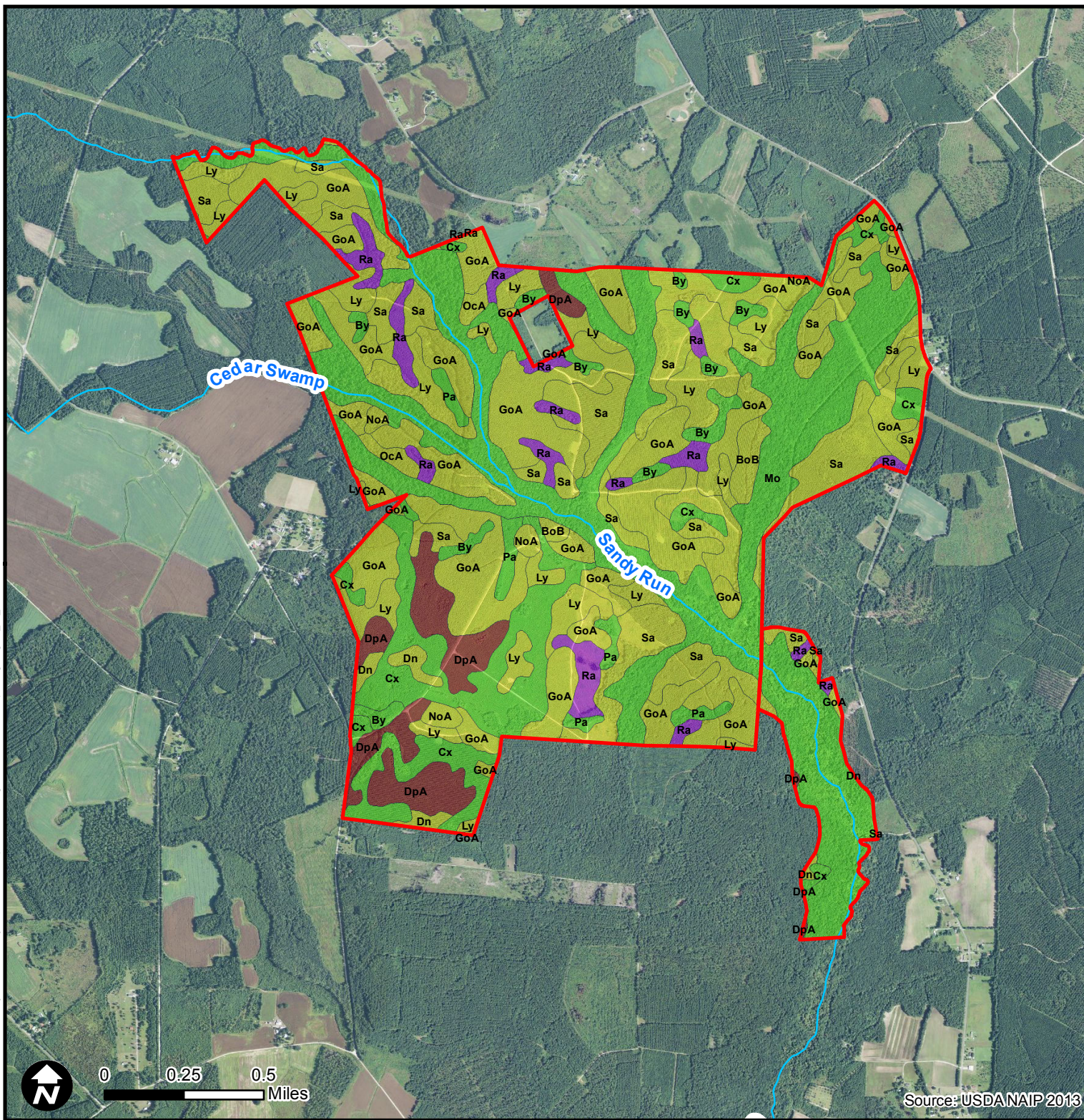


Job No. 6250150080  
 Drawn By: BWS  
 Reviewed By: WAR  
 Date: 04/06/2015

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**Legend**

- Mitigation Project Boundary
- USGS Streams

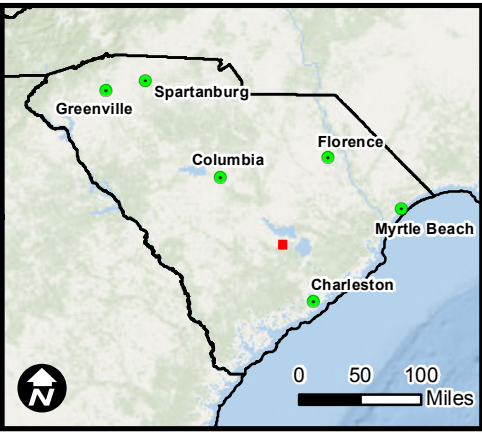
**Soils Hydric Rating**

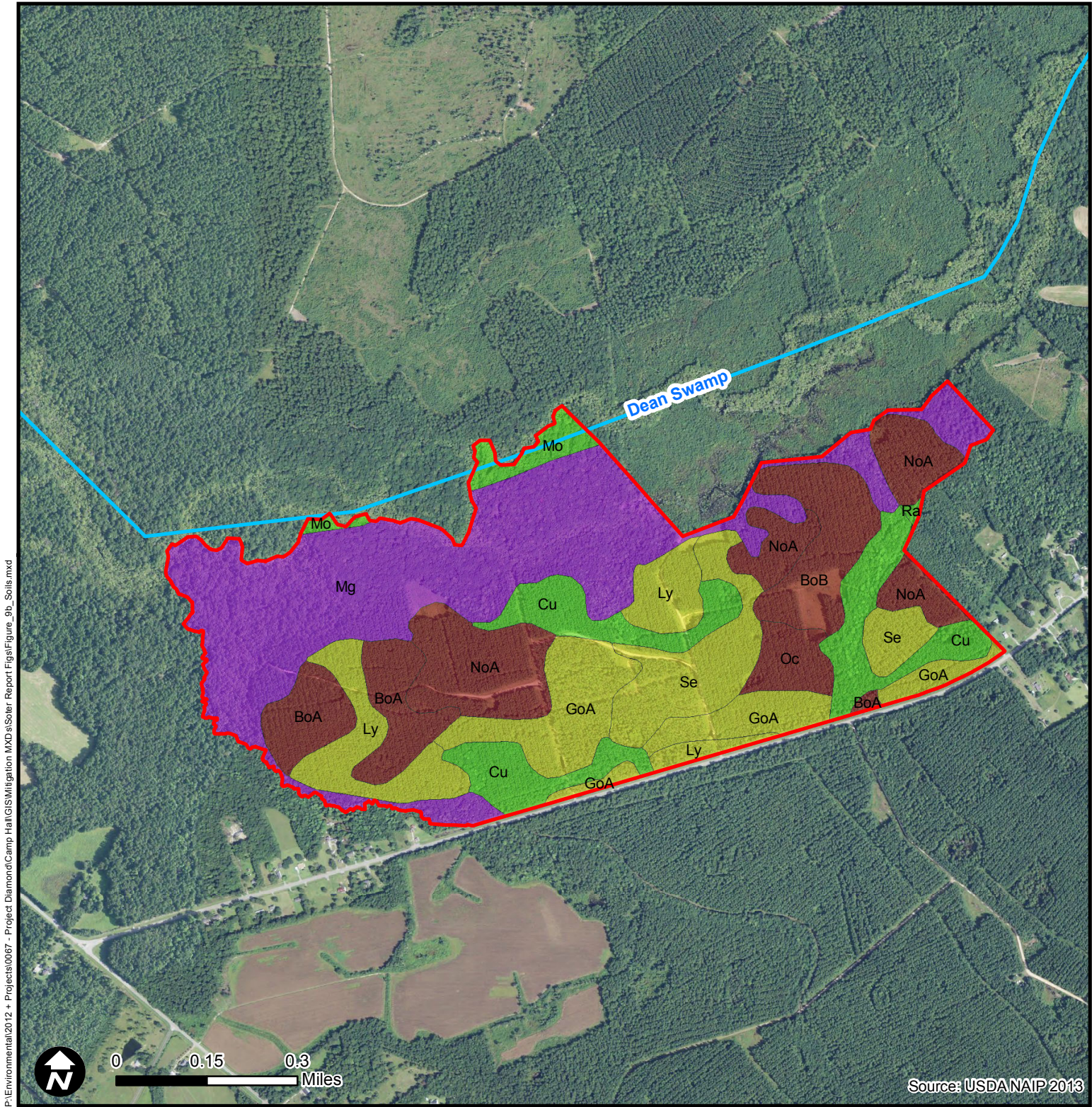
- Nonhydric
- Predominantly Nonhydric
- Predominantly Hydric
- Hydric

**Figure 9a. USDA Soil Survey Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina

Job No. 6250150080  
 Drawn By: BWS  
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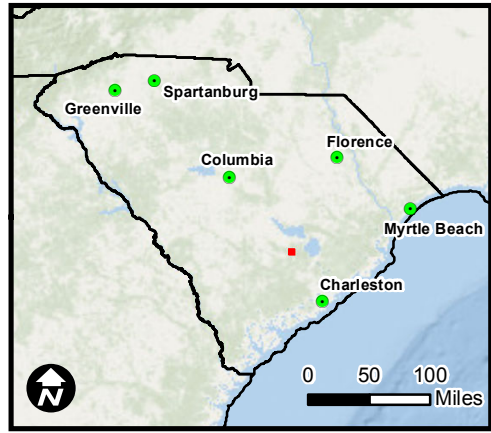
**Legend**

- Mitigation Project Boundary
- USGS Streams

**Soils Hydric Rating**

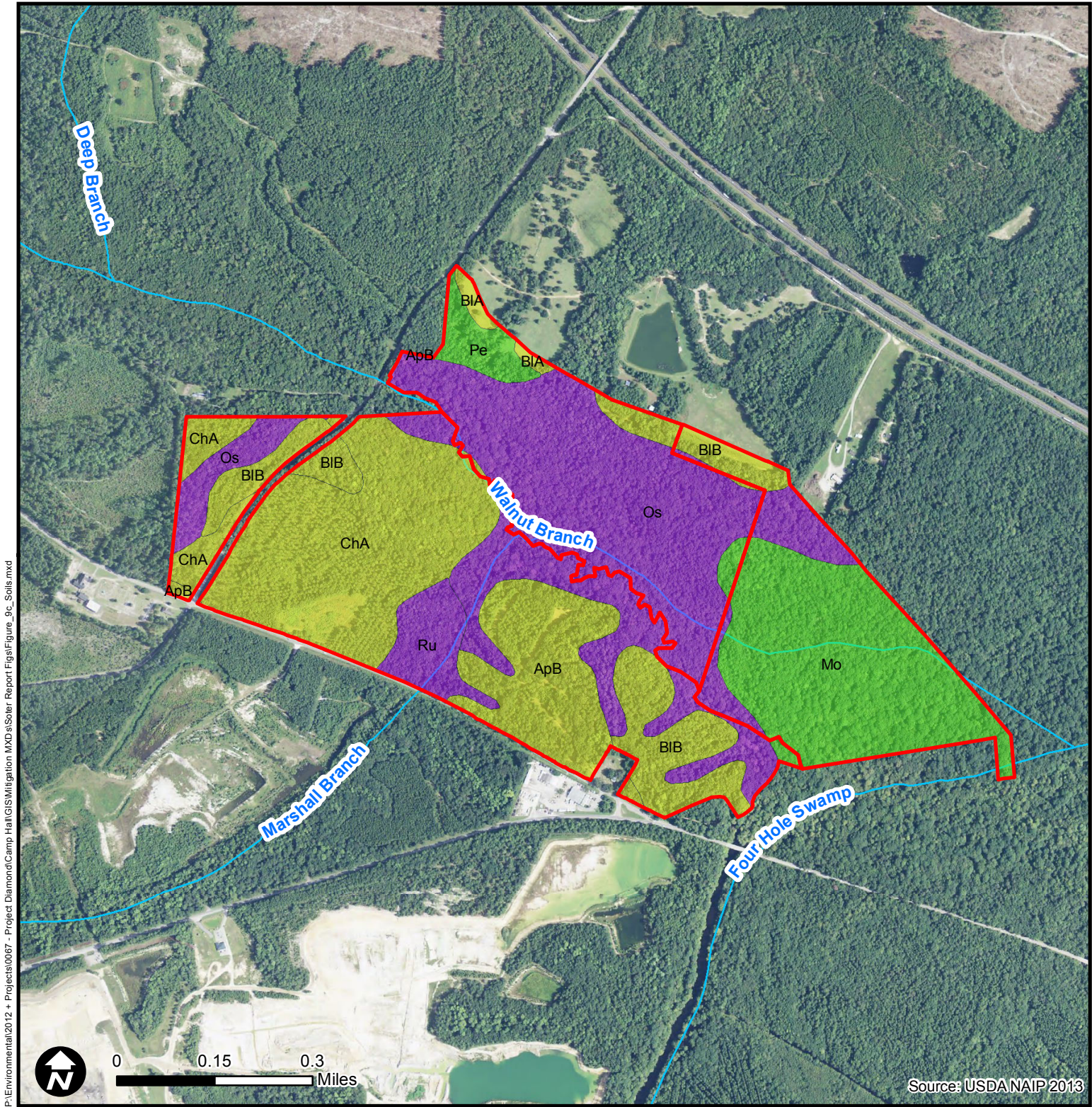
- Nonhydric
- Predominantly Nonhydric
- Predominantly Hydric
- Hydric

**Figure 9b. USDA Soil Survey Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester County  
 South Carolina



Job No. 6250150080  
 Drawn By: BWS  
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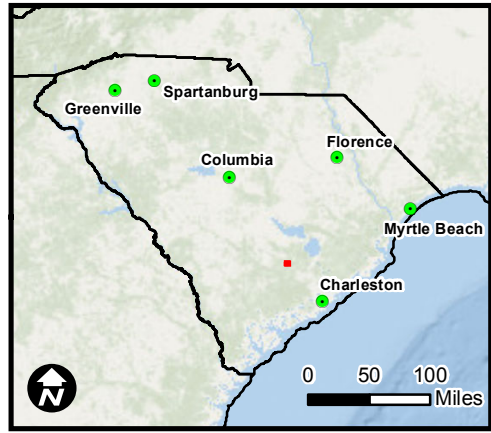
**Legend**

- Mitigation Project Boundary
- USGS Streams

**Soils Hydric Rating**

- Nonhydryc
- Predominantly Nonhydryc
- Predominantly Hydryc
- Hydryc

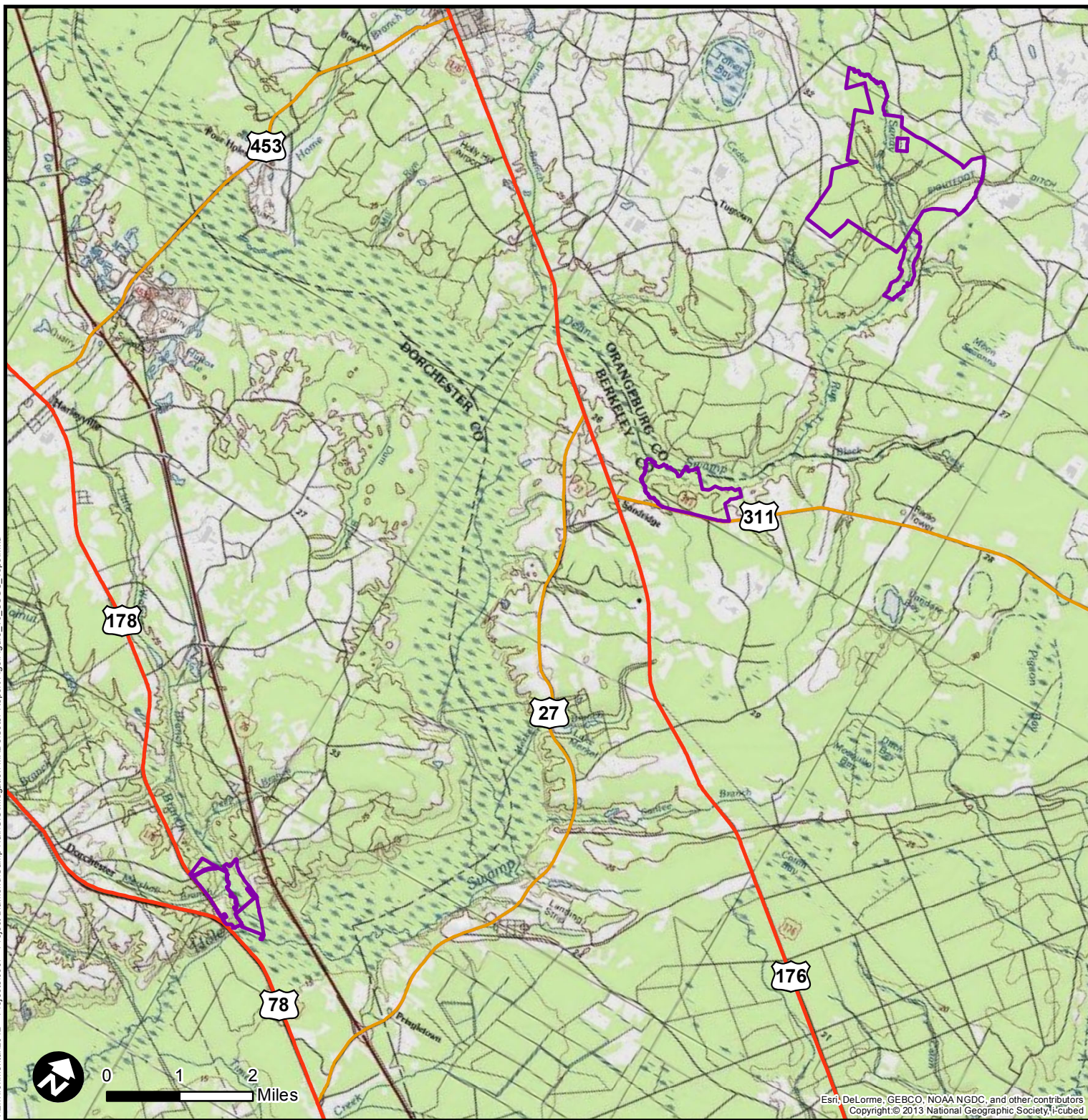
**Figure 9c. USDA Soil Survey Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester County  
 South Carolina



Job No. 6250150080  
 Drawn By: BWS  
 Reviewed By: WAR  
 Date: 04/06/2015




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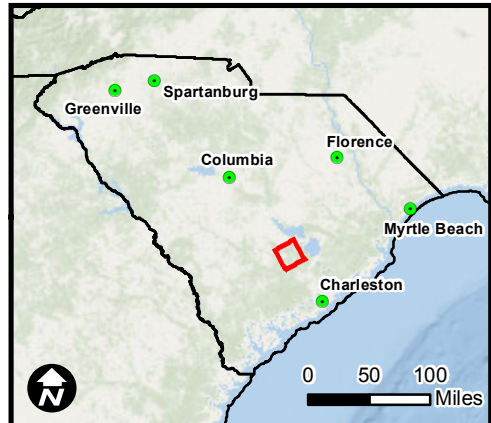
**Legend**

-  Mitigation Project Boundary
-  Highway
-  Major Road

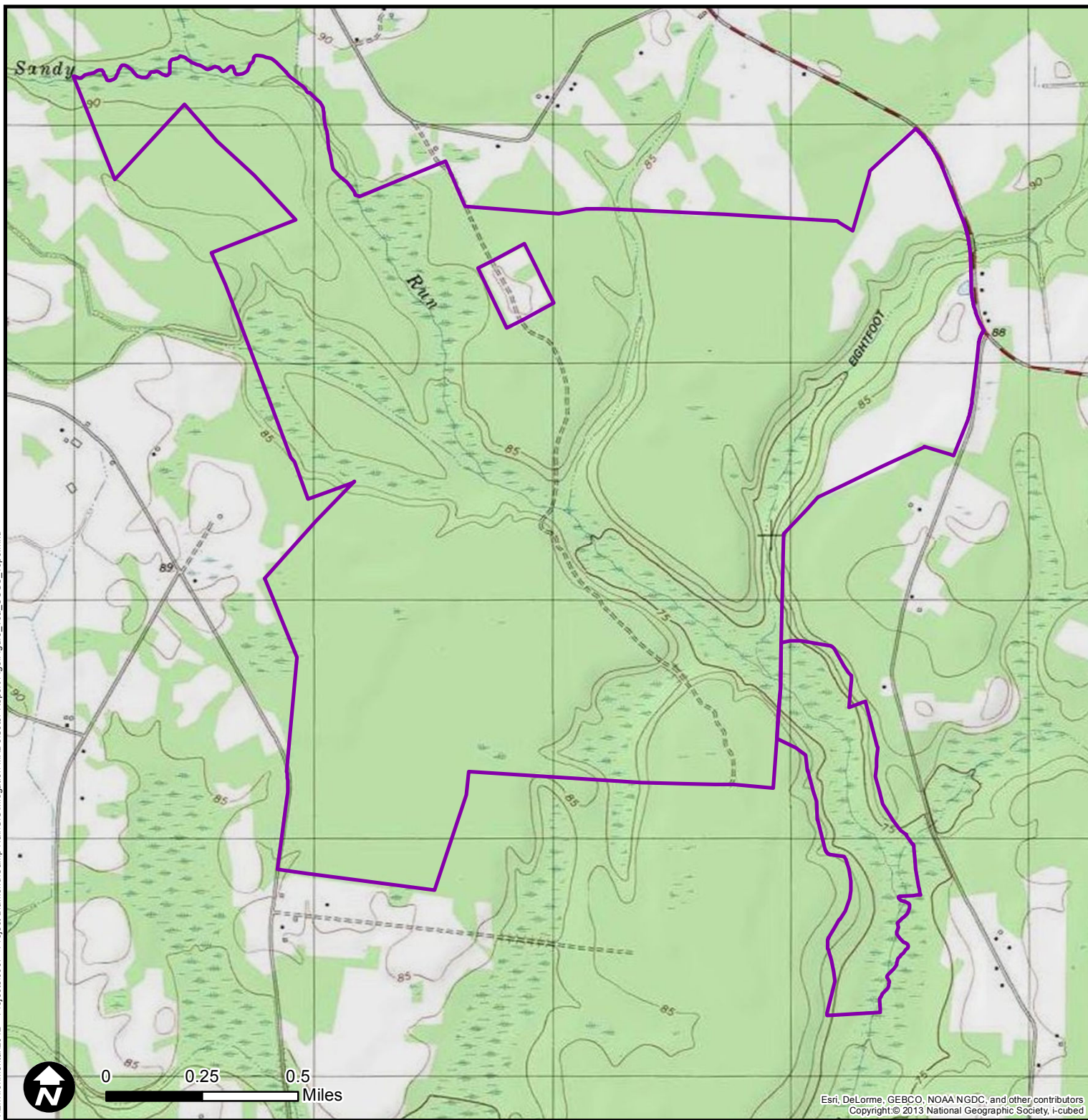
Job No. 6250150080  
 Drawn By: BWS  
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 Date: 04/06/2015

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**Figure 10. USGS Topographic Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina

P:\Environmental\2012 - Projects\0067 - Project Diamond\Camp Hill\GIS\Mitigation MXD\Soter\_Report\_Figs\Figure\_10a\_USGS\_Topo.mxd



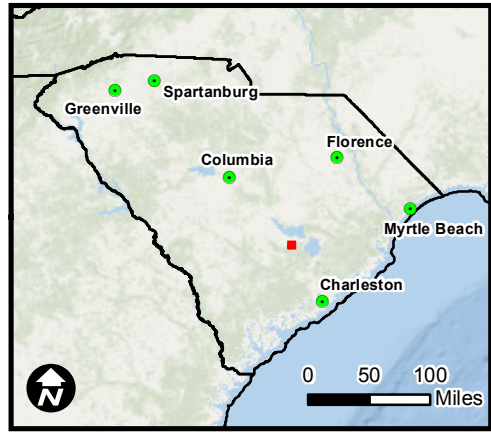
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**Legend**

- Mitigation Project Boundary
- Highway
- Major Road

**Figure 10a. USGS Topographic Map**

Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina

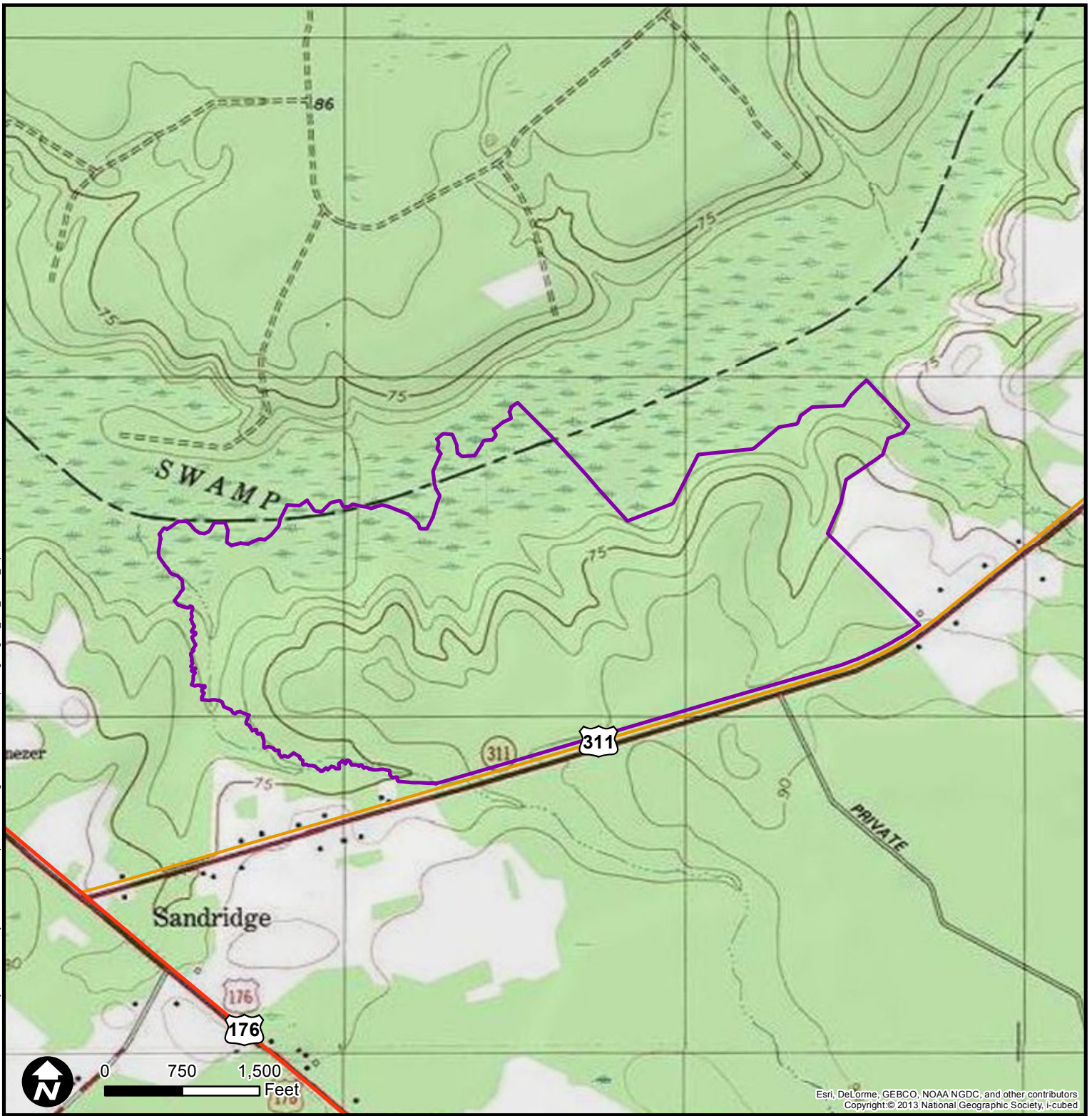


Job No. 6250150080  
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The block contains the logos for 'ebx AN res COMPANY' and 'amec foster wheeler'. The ebx logo features a stylized leaf and the text 'ebx AN res COMPANY'. The amec foster wheeler logo consists of a colorful circular graphic and the text 'amec foster wheeler'.

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**Legend**

-  Mitigation Project Boundary
-  Highway
-  Major Road

**Figure 10b. USGS Topographic Map**

Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina

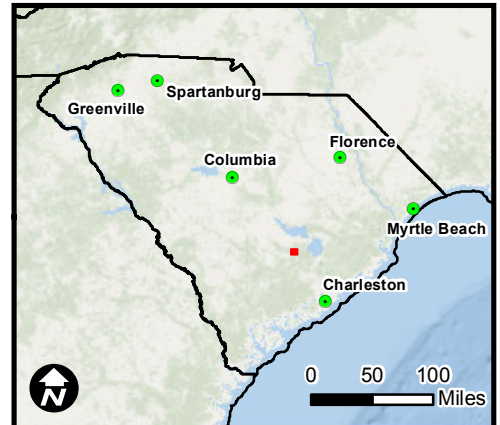
Job No. 6250150080  
 Drawn By: BWS  
 Reviewed By: WAR  
 Date: 04/06/2015

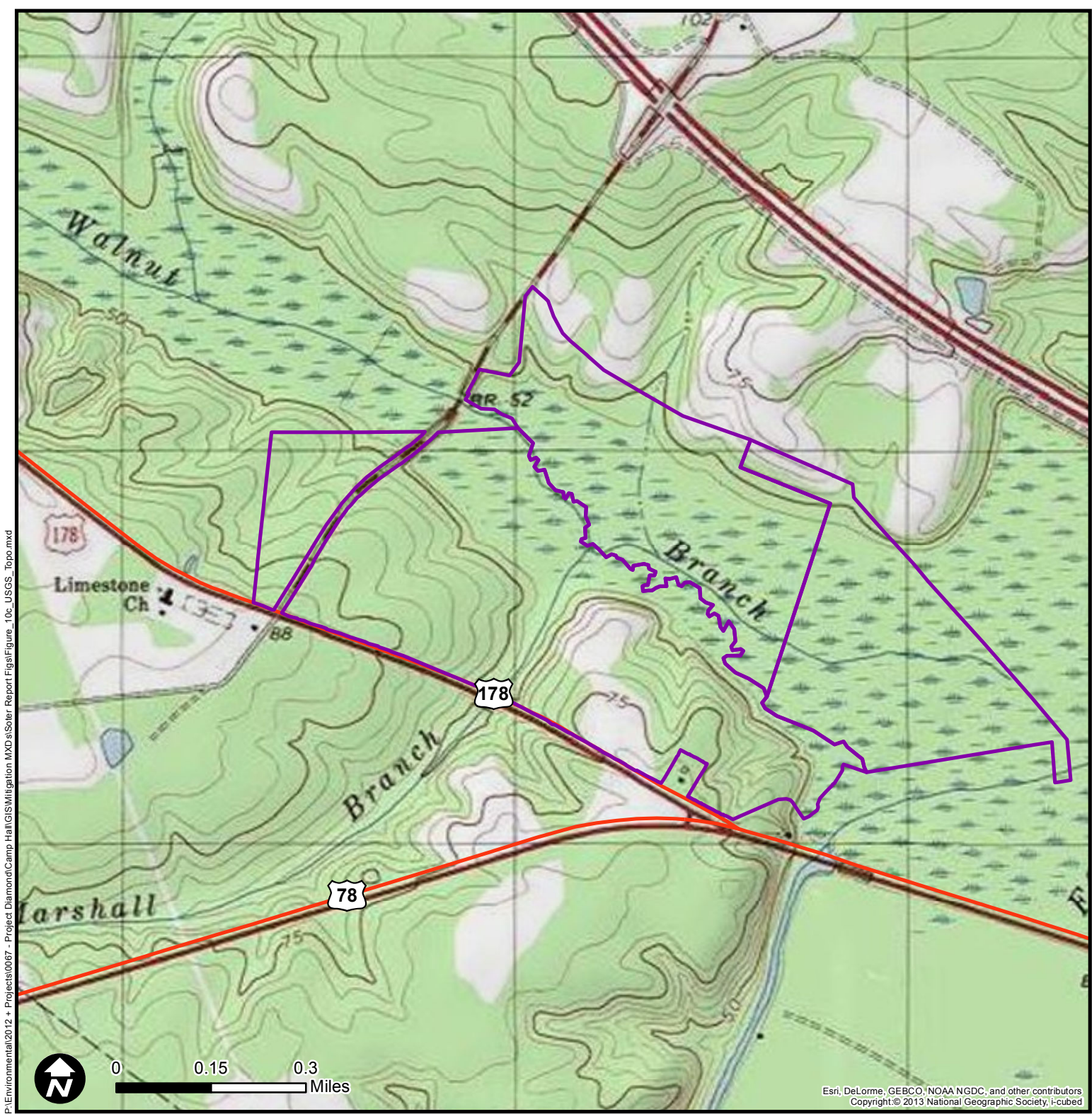
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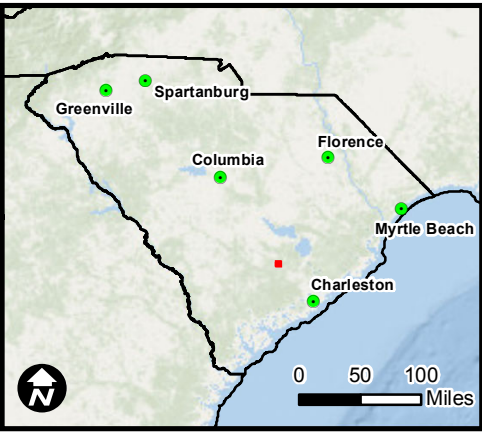
P:\Environmental\2012 - Projects\067 - Project Diamond\Camp Hill\GIS\Mitigation MXD\Soter\_Report\Figs\Figure\_10c\_USGS\_Topo.mxd

**Legend**

- Mitigation Project Boundary
- Highway

**Figure 10c. USGS Topographic Map**

Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina



Job No. 6250150080

Drawn By: BWS

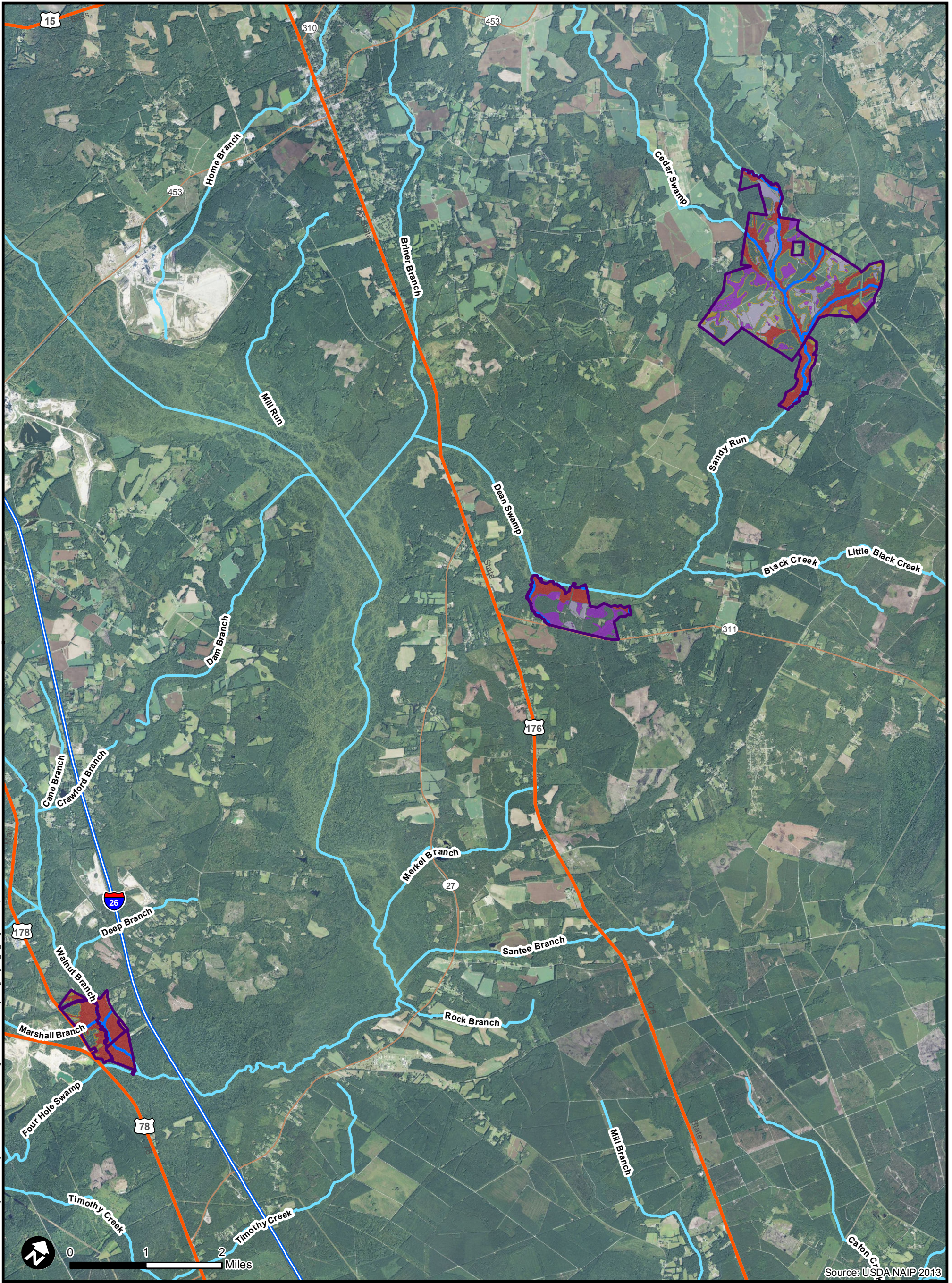
Reviewed By: WAR

Date: 04/06/2015

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Source: USDA NAIP 2013

**Legend**

- Mitigation Project Boundary
- USGS Streams

**Mitigation Work Plan**

- Wetland Restoration (~335 Acres)
- Wetland Enhancement (~276 Acres)
- Wetland Preservation (~890 Acres)
- Estimated Upland Buffer (~376 Acres)
- Stream Preservation (~47,932 LF)

---

Job No. 6250150080

Drawn By: WAR

Reviewed By: WAR

Date: 04/09/2015

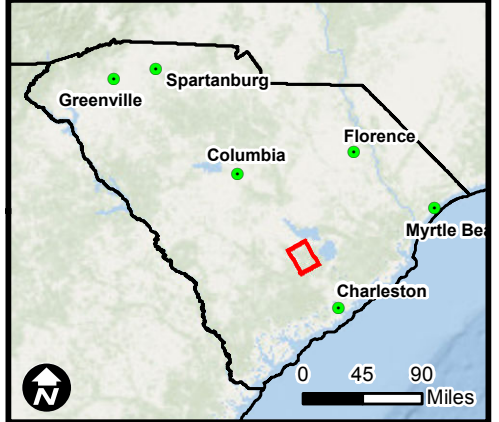
**Figure 11. Mitigation Work Plan**

Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina

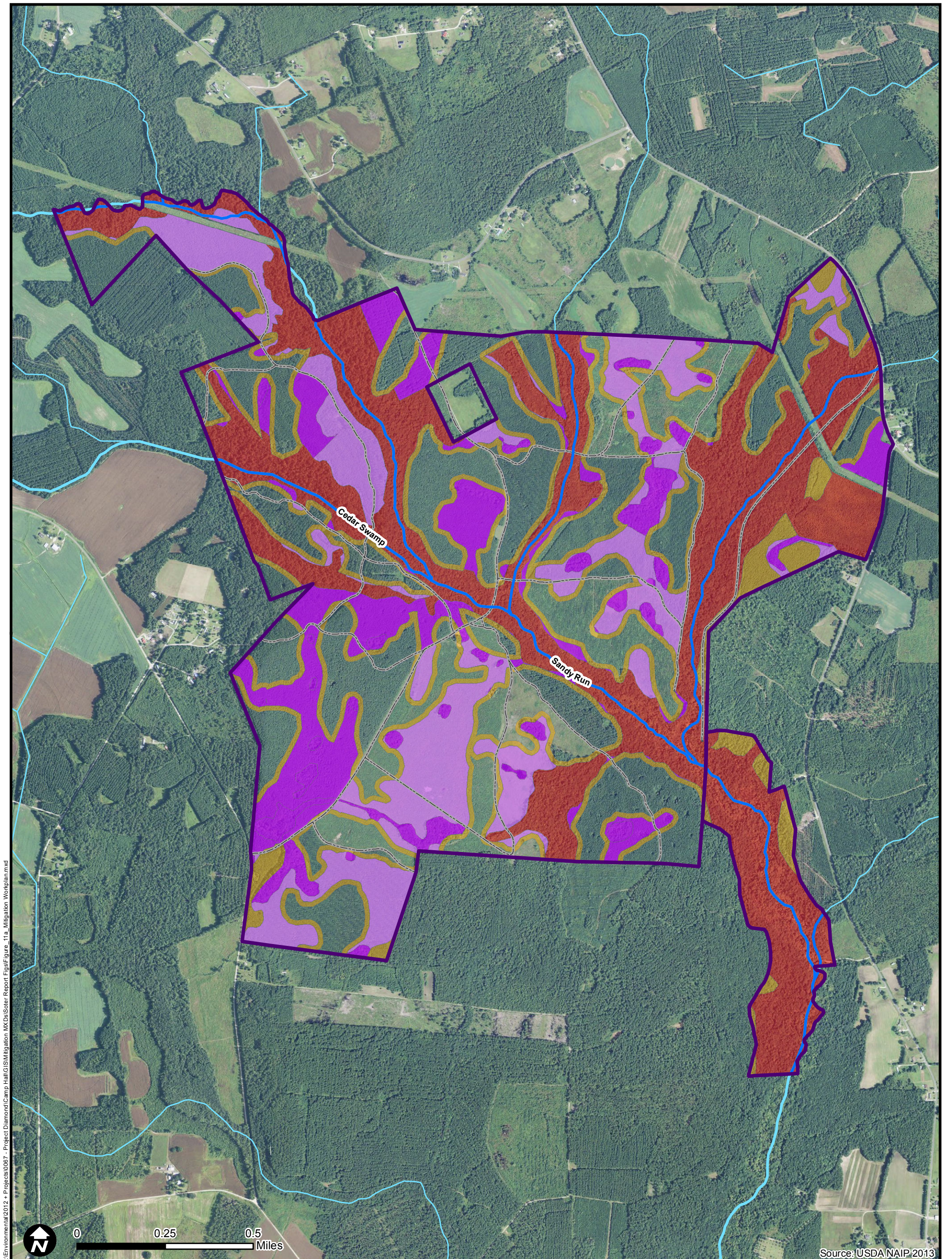
The limits of jurisdictional wetlands for the proposed Project Soter Landscape Mitigation Plan were conducted from an analysis by wetland professionals of aerial photogrammetric sources, soil maps, SC hydrographic maps, and National Wetland Inventory maps. The approximate limits of waters of the U.S. were demarcated on base drawings and then digitized in a GIS format to allow an estimate of approximate impacts. Please note that this jurisdictional approximation is meant for estimation of wetland boundary lengths. These approximate wetlands boundaries are subject to change following a comprehensive delineation and verification by the USACE.











Source: USDA NAIP 2013

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**Legend**

- Mitigation Project Boundary
- USGS Streams
- Forestry Road

**Mitigation Work Plan - 4/14/2015**

- Wetland Enhancement (~249 Acres)
- Wetland Restoration (~203 Acres)
- Wetland Preservation (~531 Acres)
- Estimated Upland Buffer (~274 Acres)
- Stream Preservation (~35,259 LF)

---

Job No. 6250150080

Drawn By: WAR

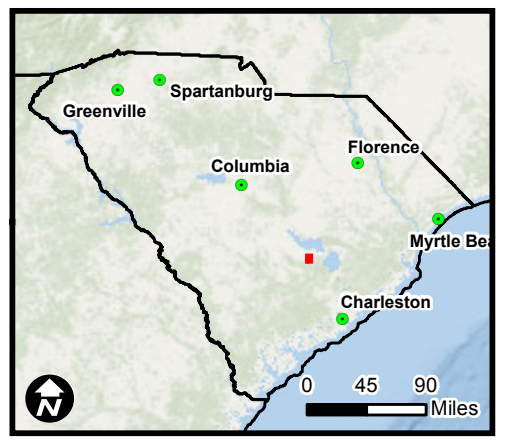
Reviewed By: WAR

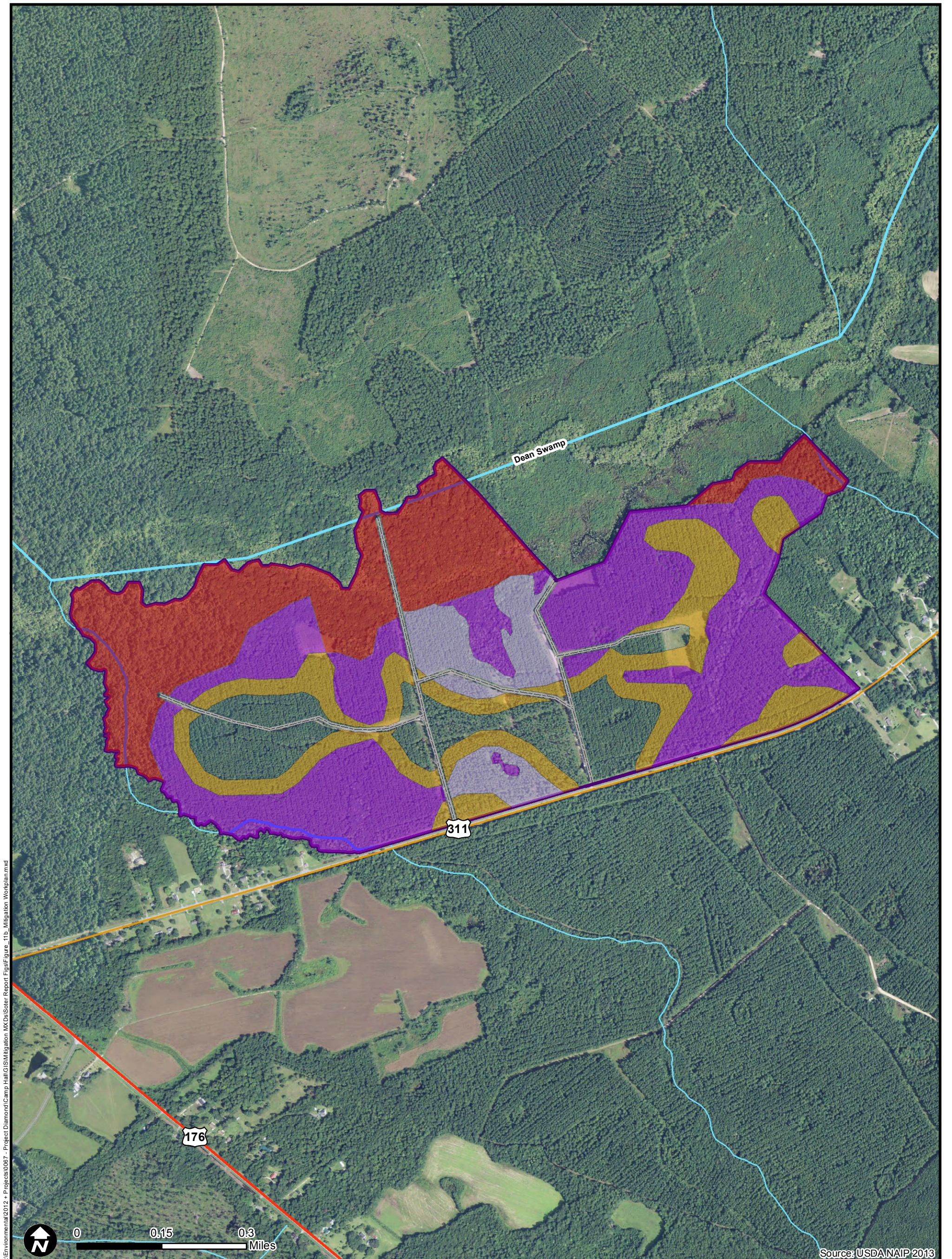
Date: 04/09/2015

### Figure 11a. Mitigation Work Plan

Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina

The limits of jurisdictional wetlands for the proposed Project Soter Landscape Mitigation Plan were conducted from an analysis by wetland professionals of aerial photogrammetric sources, soil maps, SC hydrographic maps, and National Wetland Inventory maps. The approximate limits of waters of the U.S. were demarcated on base drawings and then digitized in a GIS format to allow an estimate of approximate impacts. Please note that this jurisdictional approximation is meant for estimation of wetland boundary lengths. These approximate wetlands boundaries are subject to change following a comprehensive delineation and verification by the USACE.





Source: USDA NAIP 2013

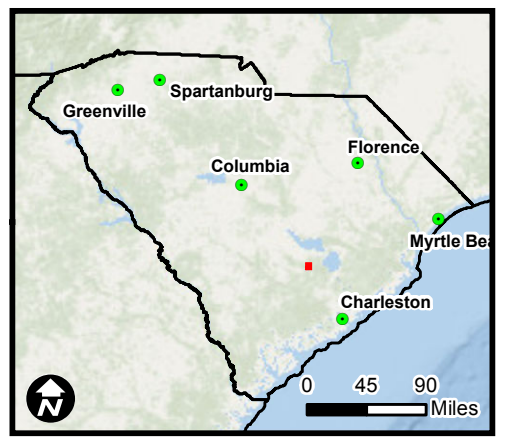
P:\Environmental\2012 - Projects\0067 - Project Diamond\Camp Hill\GIS\Mitigation MXDs\Soter Report Figs\Figure\_11b\_Mitigation Workplan.mxd

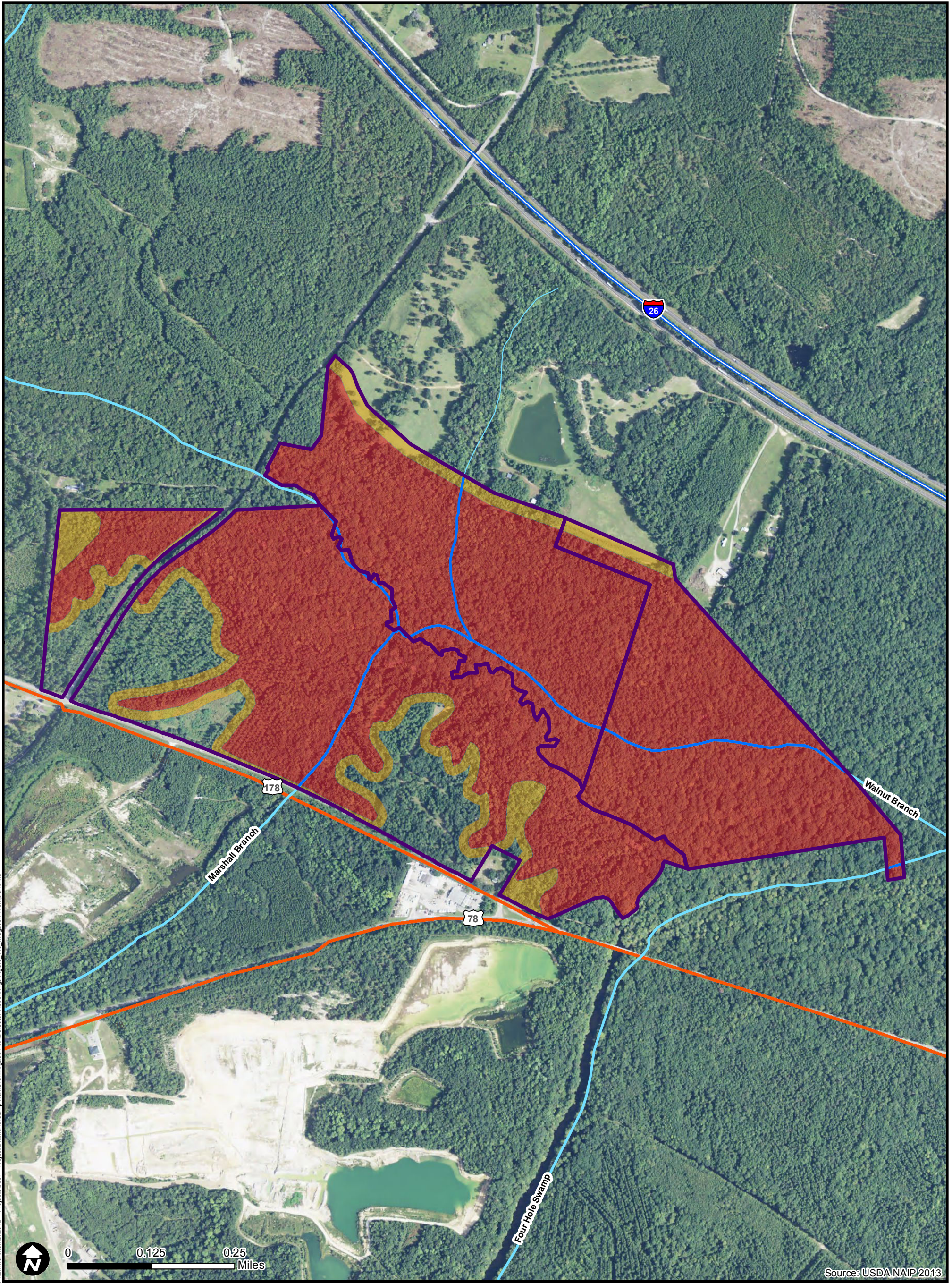
<b>Legend</b>	
	Mitigation Project Boundary
	Forestry Roads
	USGS Streams
<b>Mitigation Work Plan</b>	
	Wetland Enhancement (~27 Acres)
	Wetland Restoration (~132 Acres)
	Bottomland Hardwood Preservation (~94 Acres)
	Estimated Upland Buffer (68 Acres)
	Stream Preservation (~4,480 LF)
Job No. 6250150080	
Drawn By: BWS	
Reviewed By: WAR	
Date: 04/09/2015	

### Figure 11b. Mitigation Work Plan

Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina

The limits of jurisdictional wetlands for the proposed Project Soter Landscape Mitigation Plan were conducted from an analysis by wetland professionals of aerial photogrammetric sources, soil maps, SC hydrographic maps, and National Wetland Inventory maps. The approximate limits of waters of the U.S. were demarcated on base drawings and then digitized in a GIS format to allow an estimate of approximate impacts. Please note that this jurisdictional approximation is meant for estimation of wetland boundary lengths. These approximate wetlands boundaries are subject to change following a comprehensive delineation and verification by the USACE.





P:\Environmental\2012 - Projects\0607 - Project Diamond\Camp Hill\GIS\Mitigation\_MXD\Soter\_Report\_Figs\Figure\_11c\_Mitigation\_Workplan.mxd

Source: USDA NAIP 2013

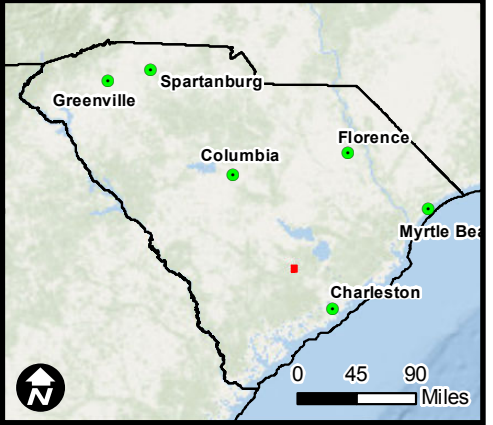
Legend	
	Mitigation Project Boundary
	USGS Streams
	Wetland Preservation (265 Acres)
	Estimated Upland Buffer (34 Acres)
	Stream Preservation (~8,193 LF)

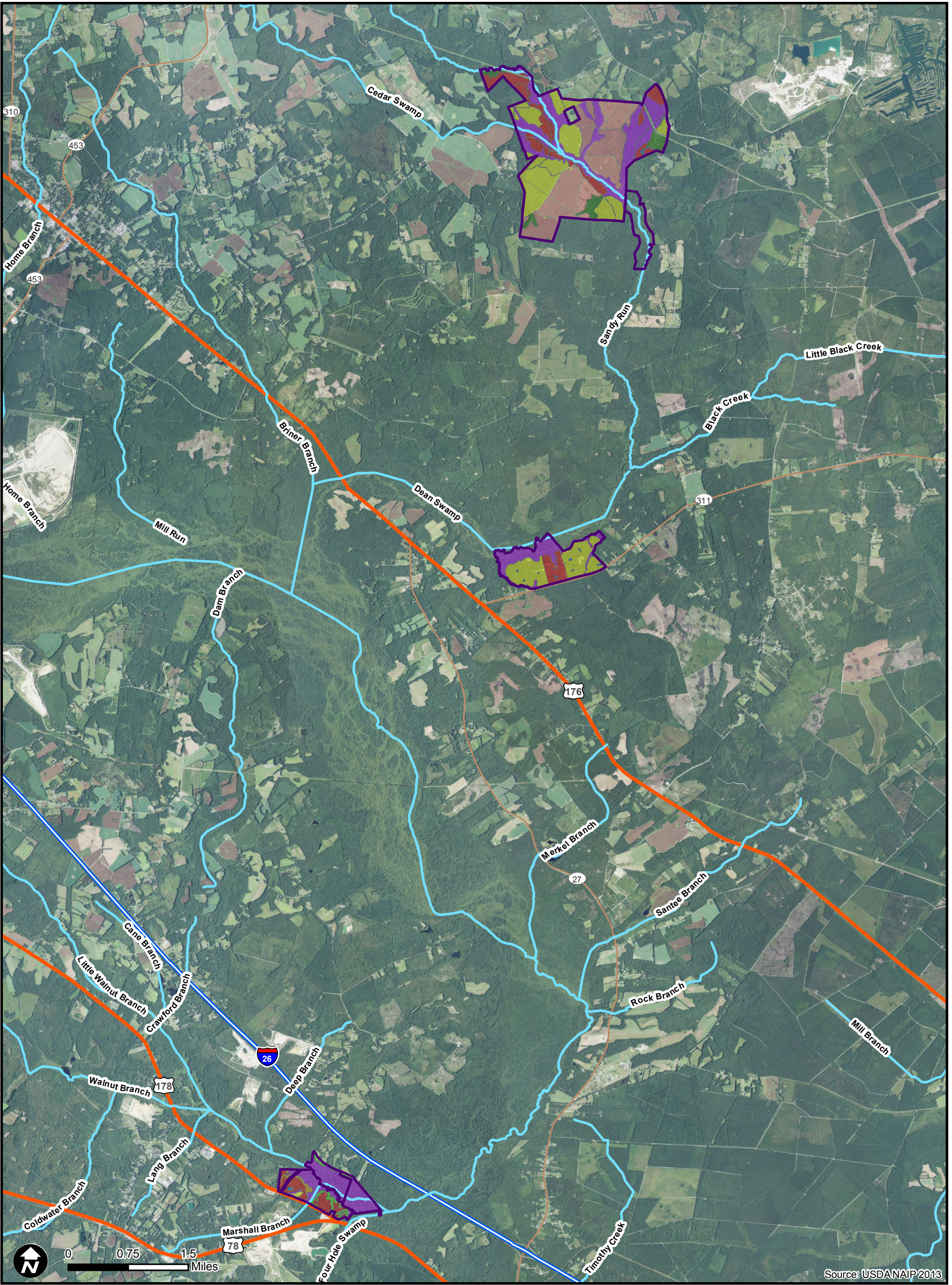
Job No.	6250150080
Drawn By:	WAR
Reviewed By:	WAR
Date:	04/06/2015

### Figure 11c. Mitigation Work Plan

Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina

The limits of jurisdictional wetlands for the proposed Project Soter Landscape Mitigation Plan were conducted from an analysis by wetland professionals of aerial photogrammetric sources, soil maps, SC hydrographic maps, and National Wetland Inventory maps. The approximate limits of waters of the U.S. were demarcated on base drawings and then digitized in a GIS format to allow an estimate of approximate impacts. Please note that this jurisdictional approximation is meant for estimation of wetland boundary lengths. These approximate wetlands boundaries are subject to change following a comprehensive delineation and verification by the USACE.





Source: USDANAP 2013

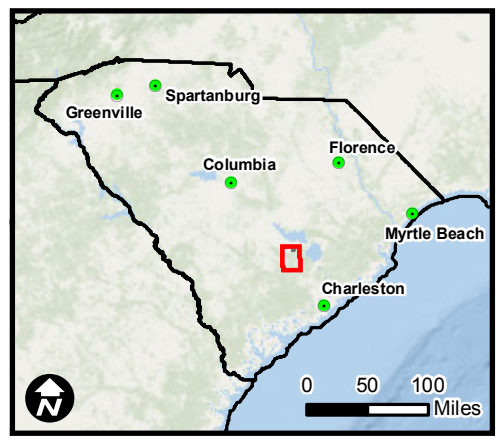
P:\Environmental\2012 - Projects\0067 - Project Diamond\Camp Hill\GIS\Mitigation\_MXD\Soter\_Report\_Figs\Figure\_12\_PlantCommunities.mxd

Legend	
	Mitigation Project Boundary
	USGS Streams
	Interstate
	Highway
	Major Road
Plant Community	
	Bottomland Hardwood
	Calcareous Forest
	Clear Cut
	Isolated Ponds
	Mesic Hardwood Forest
	Non Alluvial Swamp Forest
	Pine Plantation <= 15 Years
	Pine Plantation > 15 Years

Job No.	6250150080
Drawn By:	BWS
Reviewed By:	WAR
Date:	04/07/2015

**Figure 12. Plant Communities Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina

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Source: USDA NAIP 2013

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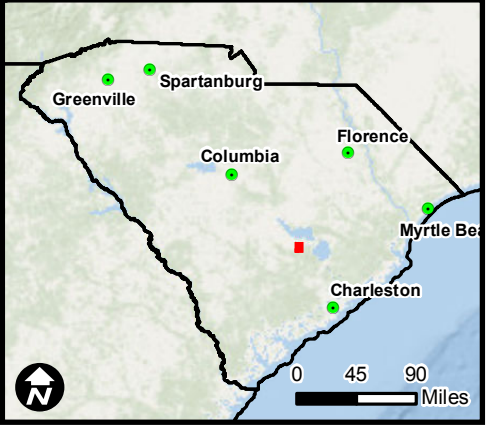
<b>Legend</b>	
Mitigation Project Boundary	<b>Plant Community</b>
USGS Streams	Bottomland Hardwood
ForestryRoads_12	Clear Cut
	Isolated Ponds
	Non Alluvial Swamp Forest
	Pine Plantation <= 15 Years
	Pine Plantation > 15 Years

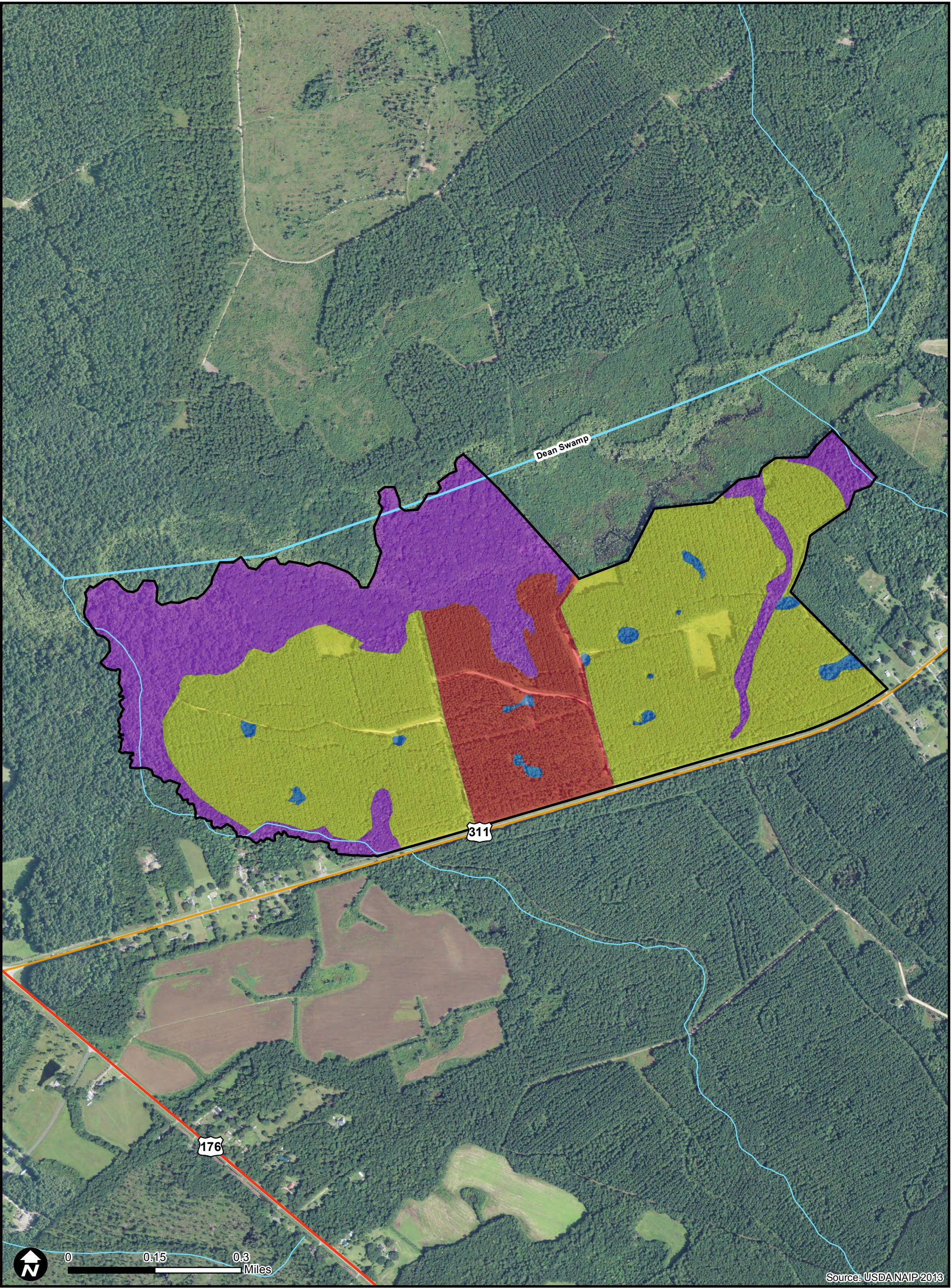
**Figure 12a. Plant Communities Map (At Receipt of Property)**

Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina

The limits of jurisdictional wetlands for the proposed Project Soter Landscape Mitigation Plan were conducted from an analysis by wetland professionals of aerial photogrammetric sources, soil maps, SC hydrographic maps, and National Wetland Inventory maps. The approximate limits of waters of the U.S. were demarcated on base drawings and then digitized in a GIS format to allow an estimate of approximate impacts. Please note that this jurisdictional approximation is meant for estimation of wetland boundary lengths. These approximate wetlands boundaries are subject to change following a comprehensive delineation and verification by the USACE.

Job No.	6250150080
Drawn By:	WAR
Reviewed By:	WAR
Date:	04/08/2015





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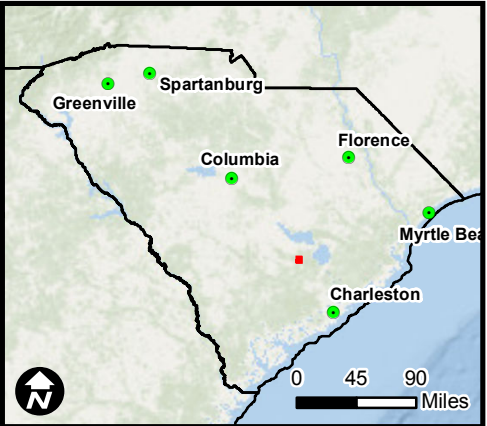
Source: USDA NAIP 2013

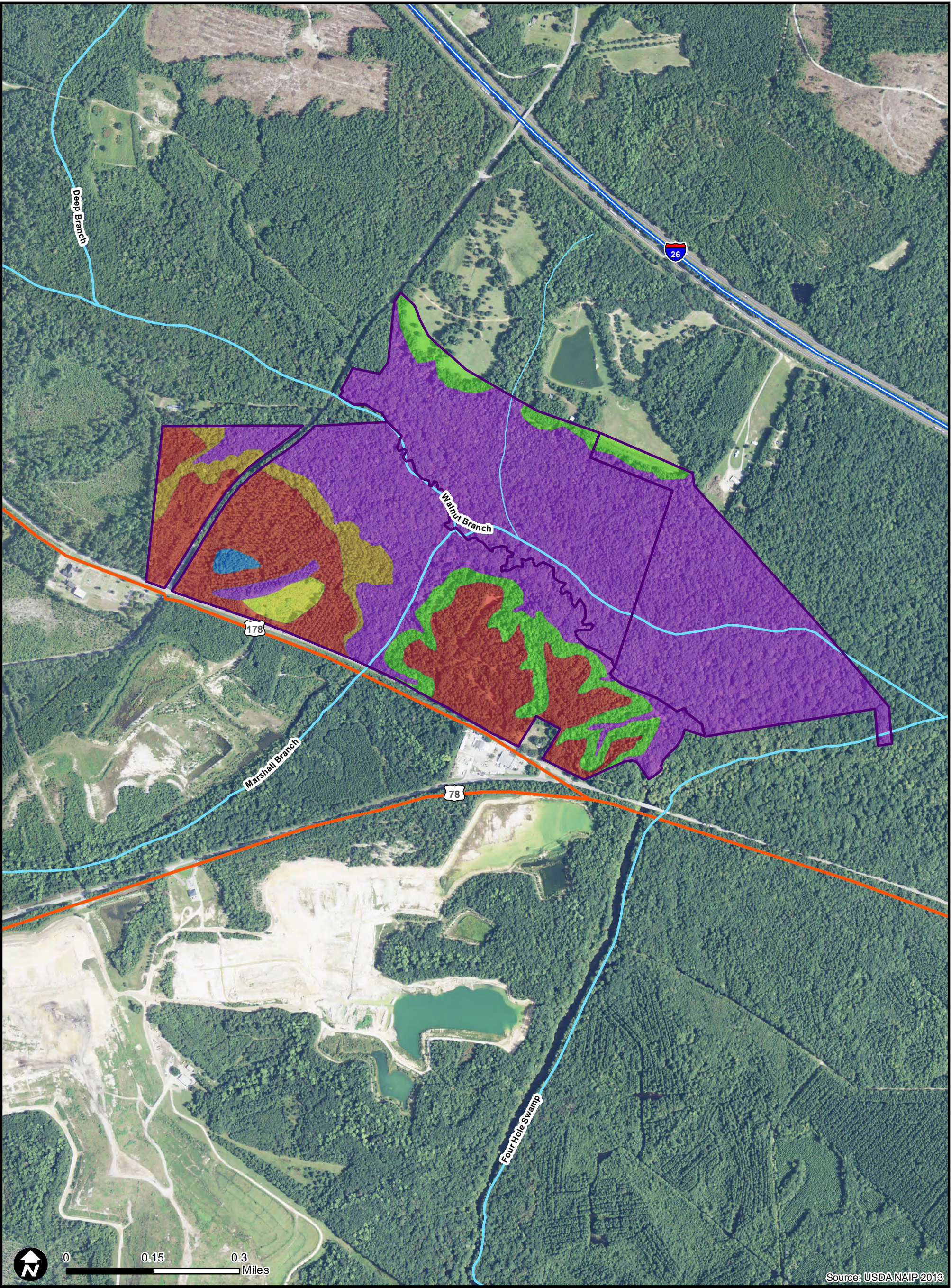
Legend	
Mitigation Project Boundary	Bottomland Hardwood
USGS Streams	Calcareous Forest
Highway	Clear Cut
Major Road	Isolated Ponds
	Mesic Hardwood Forest
	Non Alluvial Swamp Forest
	Pine Plantation <= 15 Years
	Pine Plantation > 15 Years

Job No.	6250150080
Drawn By:	WAR
Reviewed By:	WAR
Date:	04/07/2015

**Figure 12b. Plant Communities Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina

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Source: USDA NAIP 2013

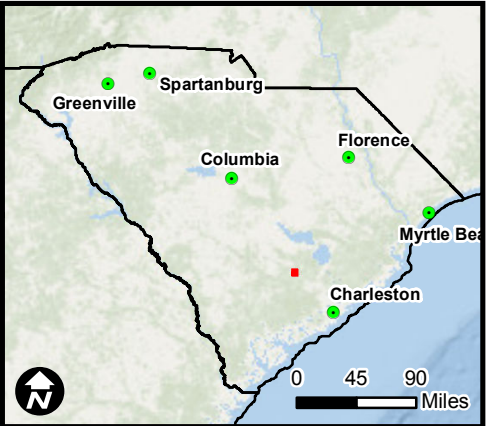
P:\Environmental\2012 - Projects\0667 - Project Diamond\Camp Hill\GIS\Mitigation.MXD\Soter Report Figs\Figure\_12c\_PlantCommunities.mxd

Legend	
	Mitigation Project Boundary
	USGS Streams
	Bottomland Hardwood
	Calcareous Forest
	Clear Cut
	Isolated Ponds
	Mesic Hardwood Forest
	Non Alluvial Swamp Forest
	Pine Plantation <= 15 Years
	Pine Plantation > 15 Years

Job No.	6250150080
Drawn By:	WAR
Reviewed By:	WAR
Date:	04/06/2015

**Figure 12c. Plant Communities Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina

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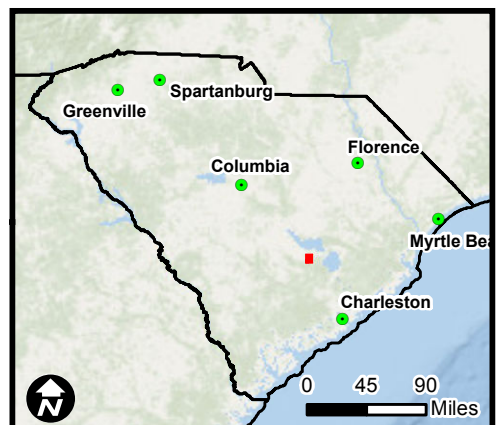
Legend	
Bannister Tract	< 15 Pine Flatwood Enhancement (177 Acres)
Forestry Road	> 15 Pine Flatwood Enhancement (72 Acres)
USGS Streams	Bottomland Hardwood Restoration (12 Acres)
	Bottomland Hardwood Preservation (431 Acres)
	Isolated Ponds Restoration (62 Acres)
	Pine Flatwood Restoration (129 Acres)
	Upland Buffer (261 Acres)
	Stream Preservation (~28,857 LF)

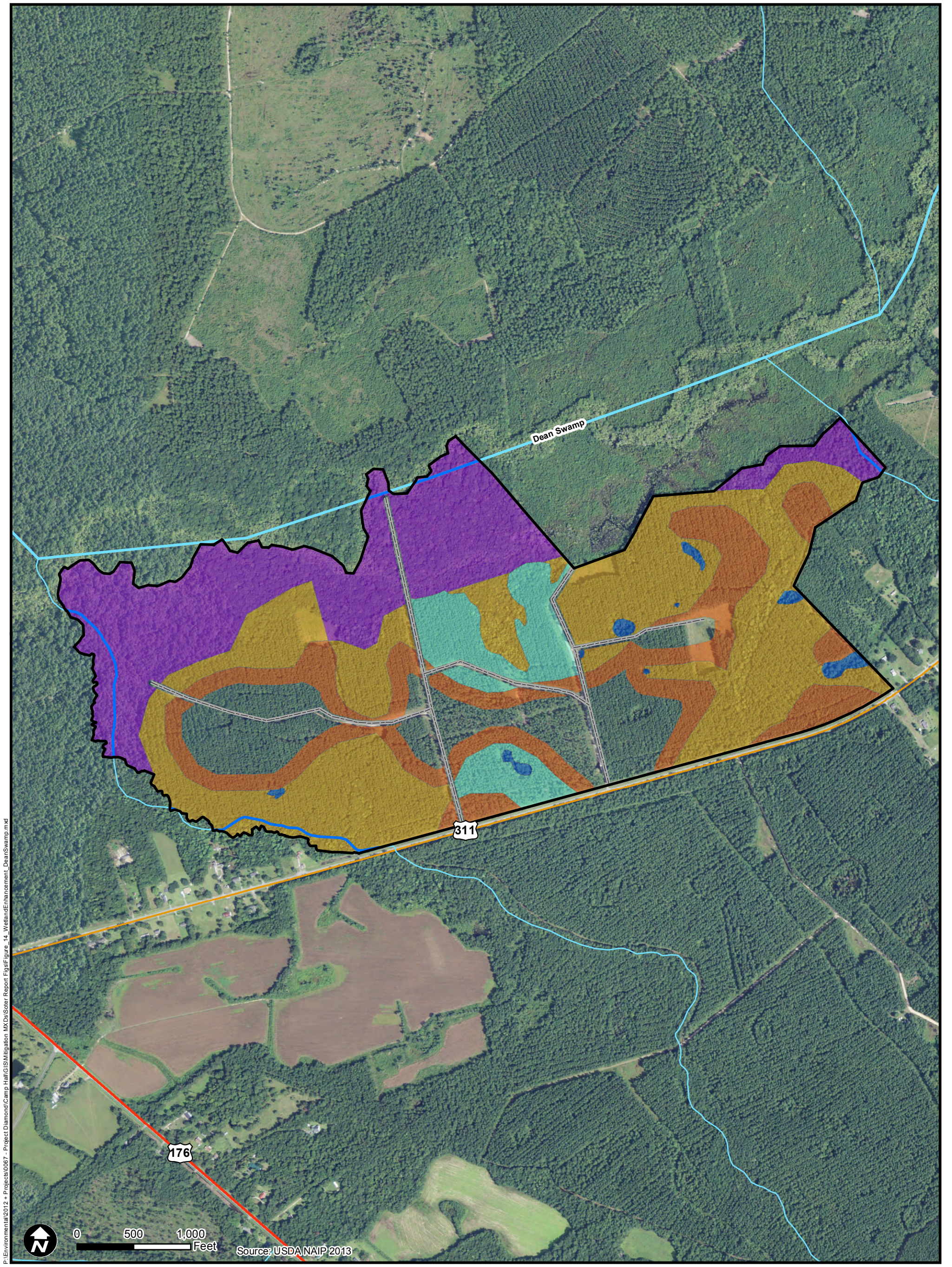
Job No.	6250150080
Drawn By:	WAR
Reviewed By:	AWC
Date:	04/08/2015

**Figure 13. Mitigation Work Plan  
Bannister Tract**  
Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina

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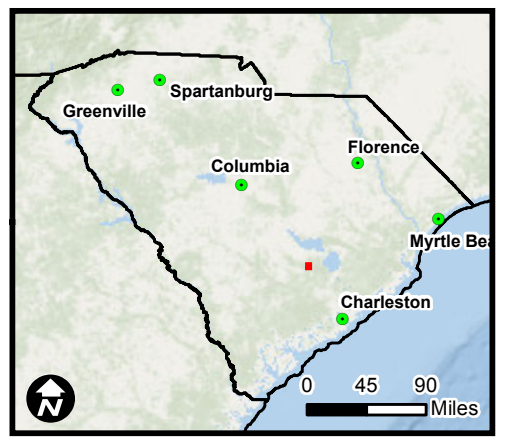
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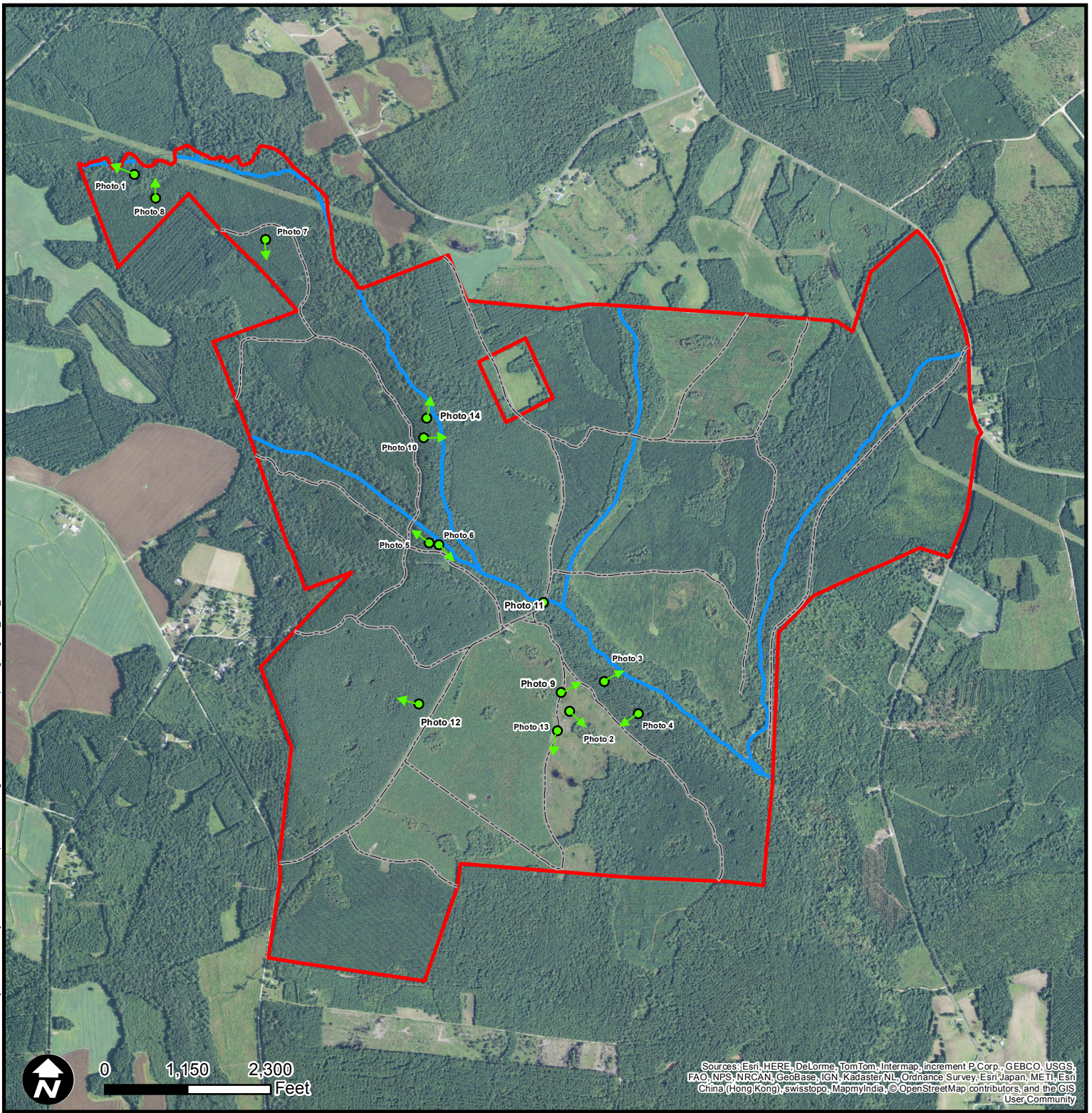
<b>Legend</b>	
<ul style="list-style-type: none"> <li> Mitigation Project Boundary</li> <li> Forestry Roads</li> <li> USGS Streams</li> <li> Highway</li> <li> Major Road</li> </ul>	<ul style="list-style-type: none"> <li> &gt; 15 Pine Flatwoods Enhancement (27 Acres)</li> <li> Bottomland Hardwood Preservation (94 Acres)</li> <li> Isolated Ponds Restoration (4 Acres)</li> <li> Pine Flatwood Restoration (128 Acres)</li> <li> Estimated Upland Buffer (68 Acres)</li> <li> Stream Preservation (~4,480 LF)</li> </ul>
Job No.:	6250150080
Drawn By:	BWS
Reviewed By:	WAR
Date:	04/09/2015

**Figure 14. Mitigation Work Plan  
Dean Swamp**

Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina

The map shown here has been created with all due and reasonable care and is strictly for use with Amec Foster Wheeler project number 6250150080. Amec Foster Wheeler assumes no liability, direct or indirect, whatsoever for any such third party or unintended use. Property Vegetation stand is to be assumed at receipt of property.





Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

**Legend**

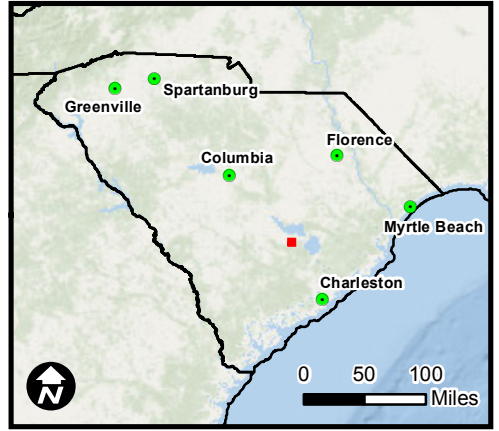
- Photo Locations
- Forestry Road
- Mitigation Site
- Stream

**Figure 15a. Photo Locations Map**

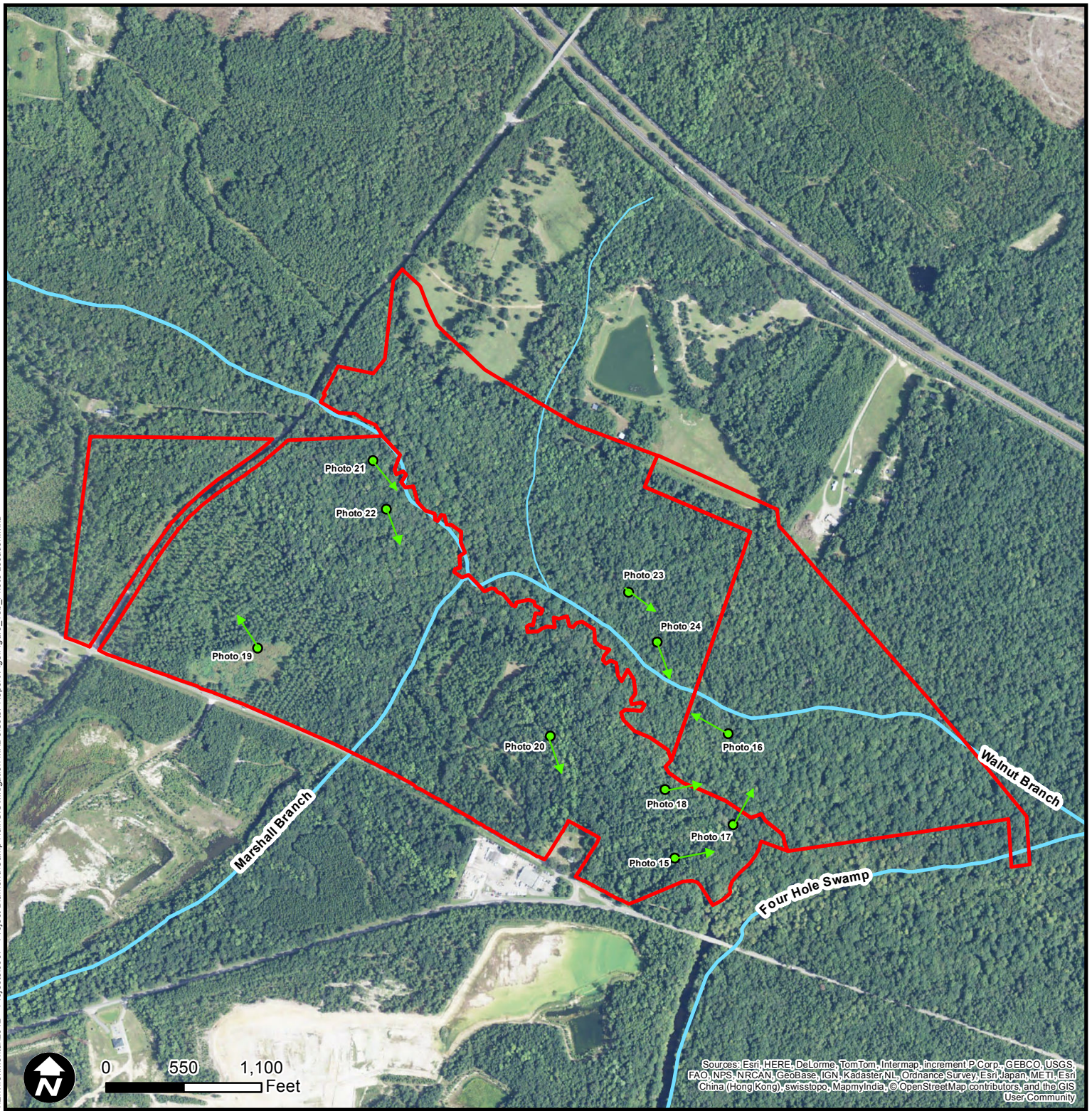
Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina

Job No. 6250150080  
 Drawn By: CLS  
 Reviewed By: WAR  
 Date: 03/25/2015

The map shown here has been created with all due and reasonable care and is strictly for use with Amec Foster Wheeler project number 6250150080. Amec Foster Wheeler assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.



P:\Environmental\2012 - Projects\067 - Project Diamond\Camp Hill\GIS\Mitigation MXD\Soter\_Report\Figs\Figure\_15b\_Photo\_Location.mxd

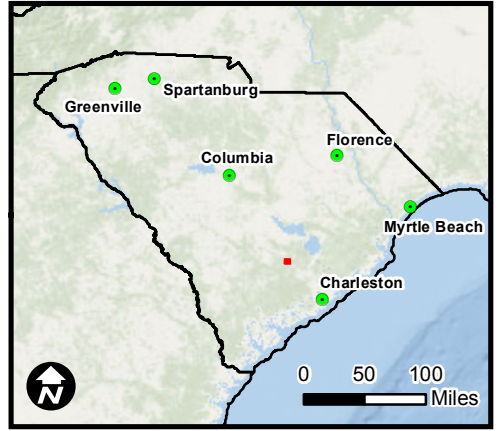


**Legend**

- Photo Locations
- ⬮ Mitigation Project Boundary
- ~ USGS Streams

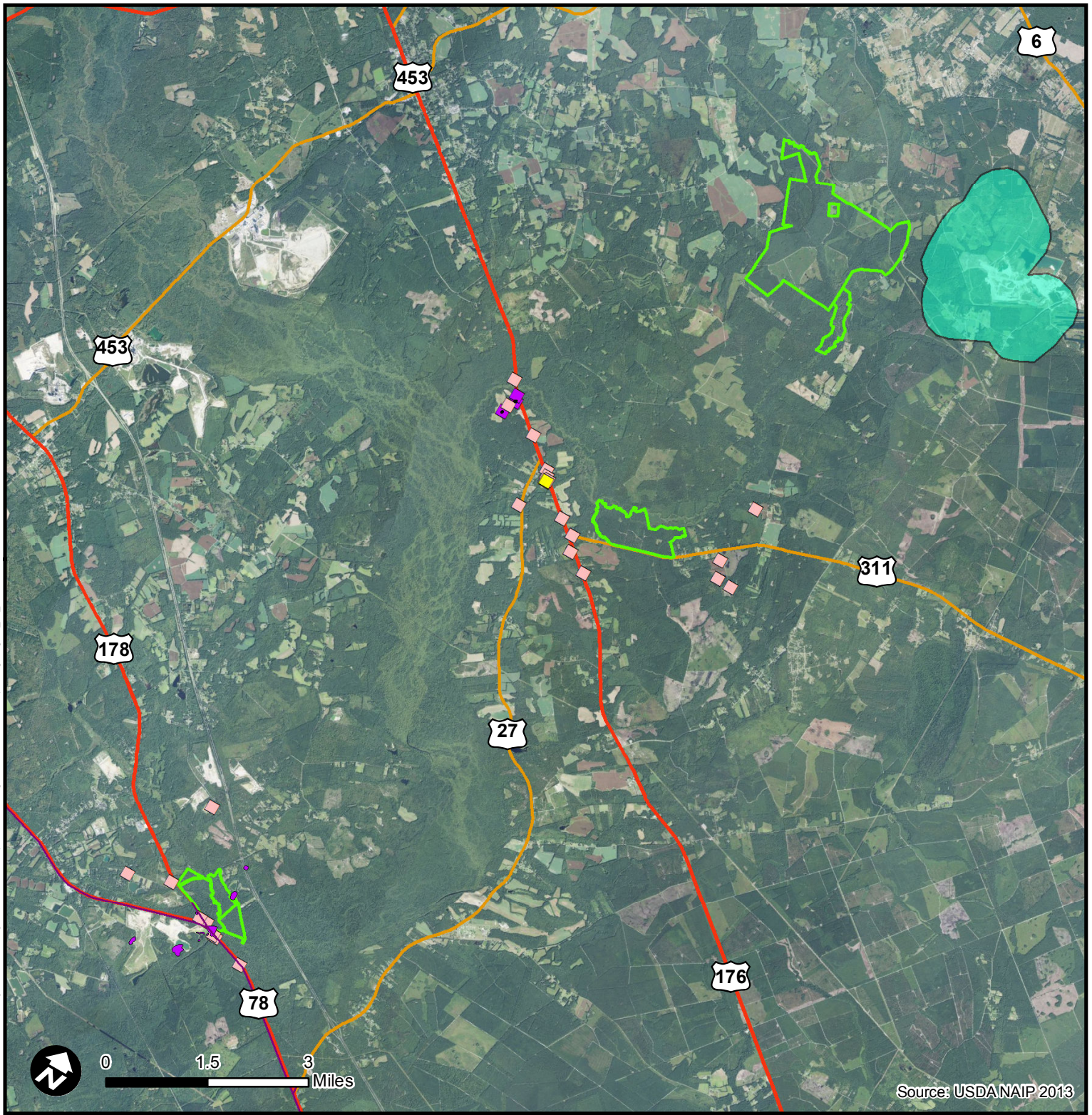
**Figure 15b. Photo Locations Map**

Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina



Job No. 6250150080  
 Drawn By: CLS  
 Reviewed By: WAR  
 Date: 03/25/2015

The map shown here has been created with all due and reasonable care and is strictly for use with Amec Foster Wheeler project number 6250150080. Amec Foster Wheeler assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.



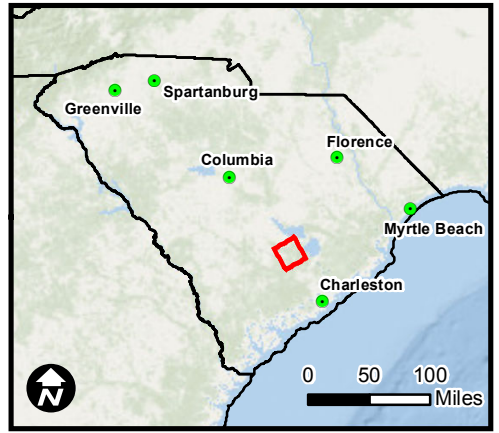
**Legend**

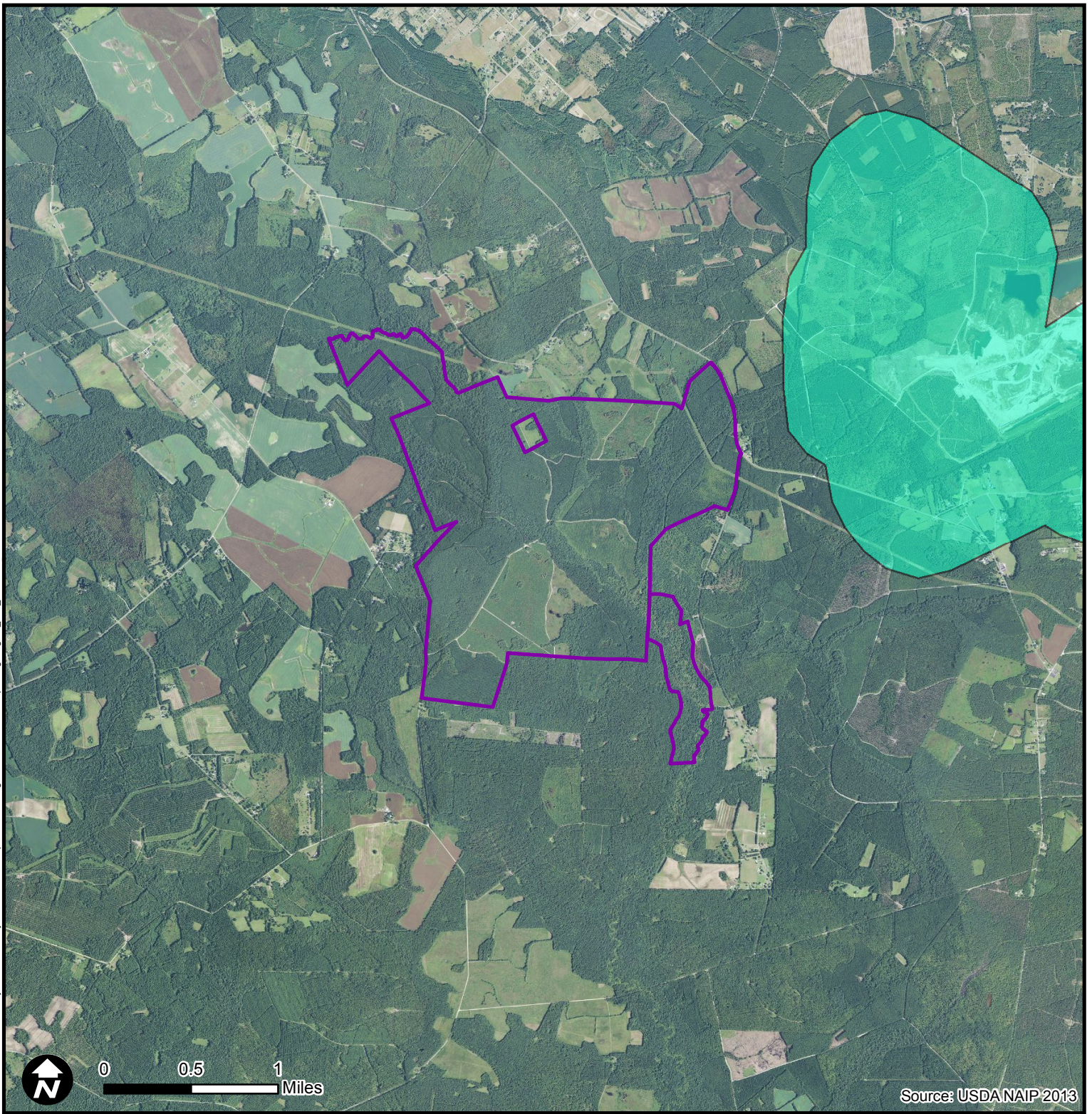
Archaeological Sites	Major Road
Survey Areas	Eligible Structures
Mitigation Project Boundary	Not Eligible Structures
Highway	

**Figure 16. Cultural Resources Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina

Job No. 6250150080  
 Drawn By: BWS  
 Reviewed By: WAR  
 Date: 04/06/2015

The map shown here has been created with all due and reasonable care and is strictly for use with Amec Foster Wheeler project number 6250150080. Amec Foster Wheeler assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.





Source: USDA NAIP 2013

**Legend**

- Mitigation Project Boundary
- Archaeological Sites
- Survey Areas

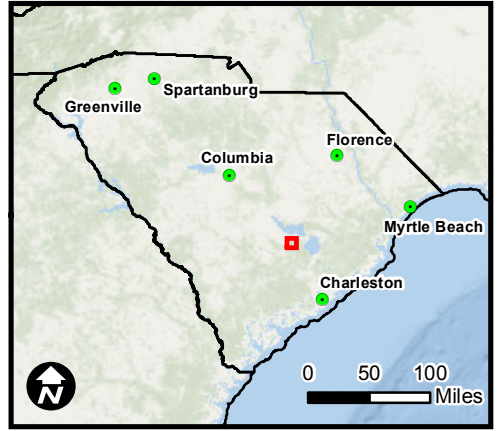
**Historic Structures**

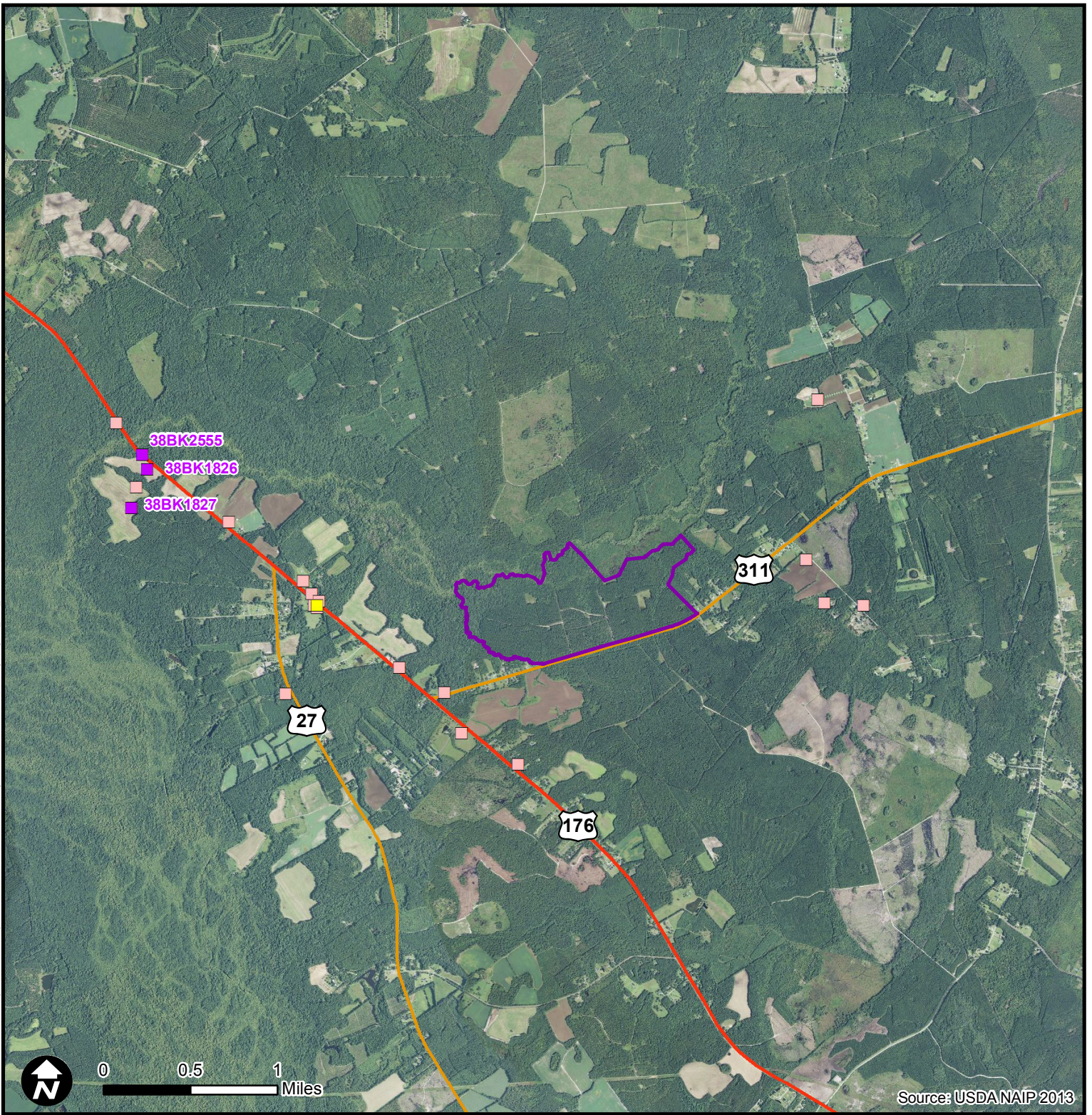
- Eligible Structures
- Not Eligible Structures

Job No. 6250150080  
 Drawn By: BWS  
 Reviewed By: WAR  
 Date: 04/07/2015

The map shown here has been created with all due and reasonable care and is strictly for use with Amec Foster Wheeler project number 6250150080. Amec Foster Wheeler assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.

**Figure 16a. Cultural Resources Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina

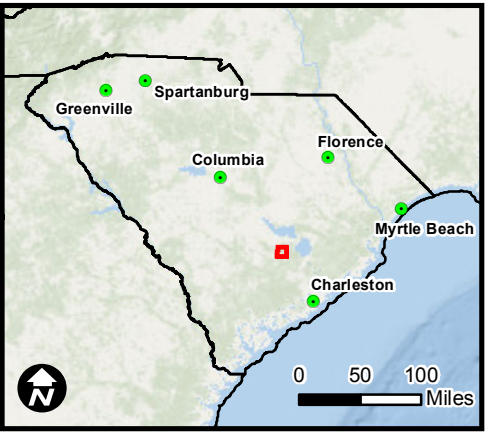




**Legend**

- Mitigation Project Boundary
- Major Road
- Survey Areas
- Eligible Structures
- Highway
- Not Eligible Structures

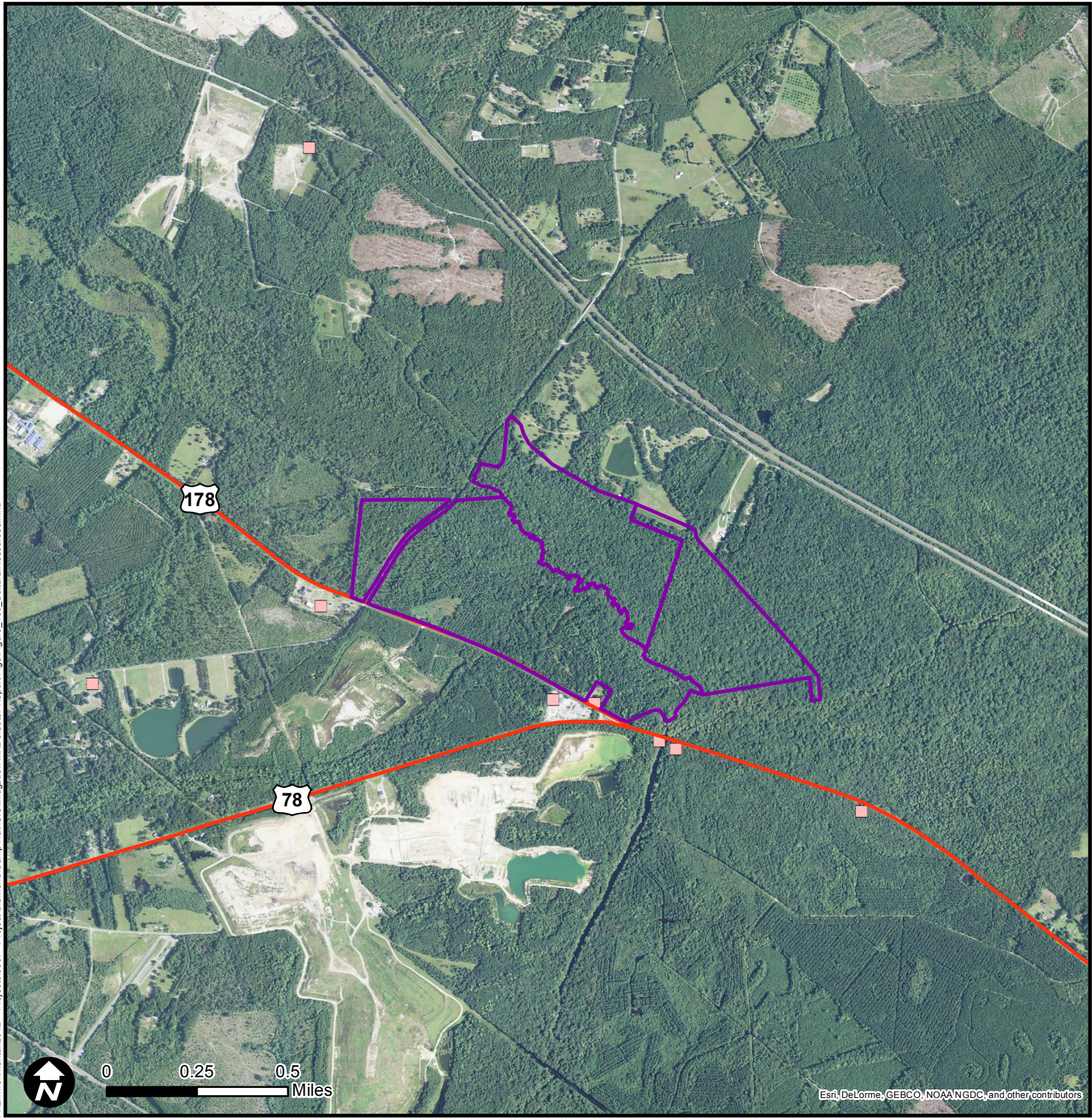
**Figure 16b. Cultural Resources Map**  
 Project Soter - Landscape Mitigation Plan  
 Orangeburg, Berkeley, Dorchester Counties  
 South Carolina



Job No. 6250150080  
 Drawn By: BWS  
 Reviewed By: WAR  
 Date: 04/06/2015

The map shown here has been created with all due and reasonable care and is strictly for use with Amec Foster Wheeler project number 6250150080. Amec Foster Wheeler assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.

P:\Environmental\2012 - Projects\067 - Project Diamond\Camp Hill\GIS\Mitigation MXDs\Soter\_Report\_Figs\Figure\_16c\_CulturalResources.mxd



Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors

**Legend**

- Mitigation Project Boundary
- Highway
- Archaeological Sites
- Survey Areas

**Historic Structures**

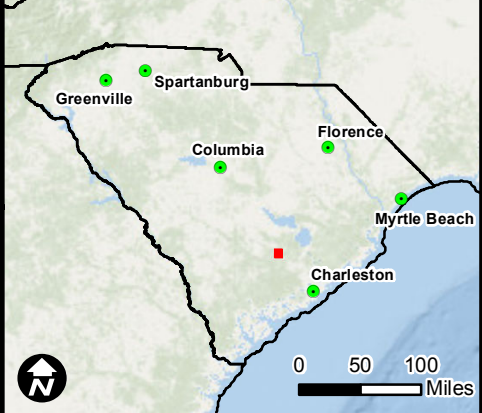
- Eligible Structures
- Not Eligible Structures

**Figure 16c. Cultural Resources Map**

Project Soter - Landscape Mitigation Plan  
Orangeburg, Berkeley, Dorchester Counties  
South Carolina

Job No. 6250150080  
 Drawn By: BWS  
 Reviewed By: WAR  
 Date: 04/06/2015

The map shown here has been created with all due and reasonable care and is strictly for use with Amec Foster Wheeler project number 6250150080. Amec Foster Wheeler assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.



**APPENDIX B: DRAFT SITE  
PROTECTION INSTRUMENTS  
(USACE Template)**



**Charleston District Conservation Easement Model of September 2010**

See <http://www.sac.usace.army.mil> for latest edition of this model.

**STATE OF SOUTH CAROLINA CONSERVATION EASEMENT AND ACCEPTANCE**

COUNTY OF \_\_\_\_\_

**THIS INDENTURE**, is made this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between \_\_\_\_\_ ("Grantor(s)"), of \_\_\_\_\_, South Carolina, and \_\_\_\_\_, ("Grantee(s)"), of \_\_\_\_\_, South Carolina.

WHEREAS, Grantor is the owner in fee simple of certain real property [*"real property" includes surface waters and wetlands, any interest in submerged lands, uplands, associated riparian/littoral rights*] located in \_\_\_\_\_ County, South Carolina, more particularly described [*description of tract must include: 1) acreage, and 2) reference the surveyed plat(s) required below*] ("Protected Property");

WHEREAS, Grantor desires to convey to the Holder a conservation easement placing certain limitations and affirmative obligations on the Protected Property for the protection of wetlands, scenic, resource, environmental, and other values, and in order that the Protected Property shall remain substantially in its natural condition forever;

WHEREAS, Holder is qualified to hold a conservation easement, and is either  
(a) a governmental body empowered to hold an interest in real property under the laws of this State or the United States; or  
(b) a charitable, not-for-profit or educational corporation, association, or trust [*qualified under § 501(c)(3) and §170 (h) of the Internal Revenue Code*], the purposes or powers of which include one or more of the purposes (a) - (d) listed below;

- (a) retaining or protecting natural, scenic, or open-space aspects of real property;
- (b) ensuring the availability of real property for recreational, educational, or open-space use;
- (c) protecting natural resources;
- (d) maintaining or enhancing air or water quality.

WHEREAS, Grantor and Holder agree that third-party rights of enforcement shall be held by the U.S. Army Corps of Engineers, Charleston District and the S.C. Department of Health and Environmental Control ("Third-Parties," to include any successor agencies), and may be exercised through the appropriate enforcement agencies of the United States and the State of South Carolina, and that these rights are in addition to, and do not limit, the rights of enforcement under Department of the Army permit number \_\_\_\_\_, or any permit or certification issued by the Third-Parties.

[Insert for approved mitigation banks: WHEREAS, the Protected Property has been approved by the Third-Parties for use as a mitigation bank, to be known as \_\_\_\_\_ Mitigation Bank;]

**COVENANTS, TERMS, CONDITIONS, AND RESTRICTIONS**

**A. PURPOSE**

1. The purpose of this Conservation Easement is to ensure the Property will be preserved in a "Natural Condition", as defined herein in perpetuity and to prevent any use of the Property that will materially impair or interfere with the Conservation Values of the property (the "Purpose"). Grantor intends that this Conservation Easement will confine the use of the Property to such activities, including without limitation, those involving the restoration, enhancement, and/or preservation of aquatic resources in a manner consistent with the conservation purposes of this Conservation Easement.

2. The term "natural condition," as referenced in the preceding paragraph and other portions of this conservation easement, shall mean the condition of the property, as it exists at the time this Conservation easement is executed, as well as future restoration, enhancement, or other changes to the property that occur directly as a

## Charleston District Conservation Easement Model of September 2010

See <http://www.sac.usace.army.mil> for latest edition of this model.

result of the compensatory mitigation measures required by section 404 Permit(s) pursuant [to the Mitigation Banking Instrument [*and/or described in the Final Mitigation and Monitoring Plan*] dated, \_\_\_\_\_, 20\_\_ (“Mitigation Plan”), the cover page and Executive Summary of which are attached as Exhibit “\_,” including implementation, maintenance, and monitoring activities (collectively, “Compensatory Mitigation”).

3. **Baseline Documentation.** The Current Conditions (which may or may not include restoration and enhancement efforts pursuant to compensatory mitigation activities), of the Property as of the date of this Deed are further documented in a "Present Conditions Report," dated, \_\_\_\_\_, 20\_\_ and prepared by [*preparer's name*], which report is acknowledged as accurate by Grantor and Grantee. The present conditions report includes:

(a) a current aerial photograph of the Protected Property at an appropriate scale taken as close as possible to the date the donation is made;

(b) on-site photographs taken at appropriate locations on the Protected Property, including of major natural features; and,

(c) a surveyed plat of the Protected Property showing all relevant property lines, all existing man-made structures, improvements, features, and major, distinct natural features such as waters of the United States, and shall be recorded in the RMC office for each county in which the Protected Property is situated prior to the recording of this Conservation Easement, and is recorded at [insert book and page references, county and date of recording]

(d) [etc. - insert any additional documentation which may be used to evidence the natural condition of the Protected Property]

The Present Conditions Report has been provided to both parties and will be used by Grantee to assure that any future changes in the use of the Property will be consistent with the terms of this Deed. However, the Present Conditions Report is not intended to preclude the use of other evidence to establish the condition of the Property as of the date of this Deed.

4. **Baseline Documentation Update.** After the completion of the compensatory mitigation activities on the protected property, Grantor, grantee, and third-parties agree that the baseline documentation can and should be updated to reflect the new conditions of the protected property. In the event that such an update is needed, grantor agrees to provide such necessary update, including photographs, narratives, and any other data needed to accurately reflect the conditions of the protected property.

5. Grantor certifies to Third Parties and Grantee that to the Grantors actual knowledge, there are no previously granted easements existing on the property that interfere or conflict with the Purpose of this Conservation Easement as evidenced by the title Report attached at “Exhibit \_.”

6. **Current Liens.** [*fill in as appropriate*] At the time of conveyance of this Easement, the Property is subject to a Mortgage or Deed of Trust, the holder of which has agreed, by separate instrument, a copy of which is attached hereto as **Exhibit** \_\_, to subordinate its rights in the Property to the extent necessary to permit the Trust to enforce the purposes of this Easement in perpetuity and to prevent any modification or extinguishment of this Easement Deed by the exercise of any rights of the Deed of Trust holder.

NOW THEREFORE, for the foregoing consideration, and in further consideration of the restrictions, rights, and agreements herein, Grantor hereby conveys to Holder a conservation easement over the Protected Property consisting of the following:

### **B. PROHIBITED USES**

Any activity on or use of the property inconsistent with the Purpose of this Conservation Easement and not reserved as a right of Grantor is prohibited. These Restrictions shall run with the land and be binding on Grantor’s heirs, successors, administrators, assigns, lessees, or other occupiers and users, and are subject to the Reserved Rights which follow. The Following uses by Grantor, Grantee, their respective guests, agents, assigns, employees, representatives, successors, and third parties are expressly prohibited on the Property except as otherwise provided herein or unless specifically provided for in the Section 404 Permit and any amendments thereto, the Mitigation

## Charleston District Conservation Easement Model of September 2010

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Plan, and any easements and reservations of rights in the chain of title to the property at the time of this conveyance (as set forth on Exhibit \_\_):

1. **General.** There shall be no filling, flooding, excavating, mining or drilling; no removal of natural materials; no dumping of materials; and, no alteration of the topography in any manner.
2. **Waters and Wetlands.** In addition to the General restrictions above, there shall be no draining, dredging, damming or impounding; no changing the grade or elevation, impairing the flow or circulation of waters, reducing the reach of waters; and, no other discharge or activity requiring a permit under applicable clean water or water pollution control laws and regulations, as amended.
3. **Trees/Vegetation.** There shall be no clearing, burning, cutting or destroying of trees or vegetation, except as expressly authorized in the Reserved Rights; there shall be no planting or introduction of non-native or exotic species of trees or vegetation.
4. **Activities.** No industrial activities, commercial activities, residential activities, or agricultural activities (including livestock grazing) shall be undertaken or allowed.
5. **Structures.** There shall be no construction, erection, or placement of buildings, billboards, or any other structures, nor any additions to existing structures.
6. **New Roads.** There shall be no construction of new roads, trails or walkways without the prior written approval of the Holder and Third-Parties, including of the manner in which they are constructed.
7. **Utilities.** There shall be no construction or placement of utilities or related facilities without the prior written approval of Holder and Third-Parties.
8. **Pest Control.** There shall be no application of pesticides or biological controls, including for problem vegetation, without prior written approval from the Holder and Third-Parties.
9. **Subdivision.** There shall be no legal or de facto division, subdivision or portioning of the property.
10. **Other Prohibitions.** Any other use of, or activity on, the Protected Property which is or may become inconsistent with the purposes of this grant, the preservation of the Protected Property substantially in its natural condition, or the protection of its environmental systems, is prohibited.

[11. *Additional, case-specific restrictions may need to be inserted*]

### **C. GRANTEE'S RIGHTS**

To accomplish the Purpose of this Conservation Easement, Grantor, its successor and assign hereby grants and conveys the following rights to Grantee and Third Parties.

1. To preserve and protect the Conservation Values of the Property, including enforcing the terms of this Conservation Easement in order to assure the protected property remains in its "natural condition," defined herein, in perpetuity.
2. To enter upon the property at reasonable times in order to monitor compliance with and to otherwise enforce the terms of this Conservation Easement.
3. To prevent any activity on or use of the property that is inconsistent with the Purpose of this Conservation Easement and to require the restoration of such areas or features of the Property that may be damaged by any act, failure to act, or any use that is inconsistent with the Purpose of this Conservation Easement.

## Charleston District Conservation Easement Model of September 2010

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4. All mineral, air, and water rights necessary to protect and sustain the biological resources of the Property, provided that any exercise or sale of such rights by Grantee shall not result in conflict with the Conservation Purpose.

5. All present and future development rights allocated, implied, reserved or inherent in the properties; such rights are hereby terminated and extinguished, and may not be used or transferred to any portion of the Properties.

6. The right to enforce by means, including, without limitation, injunctive relief, the terms and conditions of this Conservation Easement.

### **D. GRANTOR'S RESERVED RIGHTS**

Notwithstanding the foregoing Restrictions, Grantor reserves for Grantor, its heirs, successors, administrators, and assigns the following Reserved Rights, which may be exercised upon providing prior written notice to Holder and to Third-Parties, except where expressly provided otherwise:

1. **Landscape Management.** Landscaping by the Grantor to prevent severe erosion or damage to the Protected Property or portions thereof, or significant detriment to existing or permitted uses, is allowed, provided that such landscaping is generally consistent with preserving the natural condition of the Protected Property.

2. **Forest Management.** Harvesting and management of timber by Grantor is limited to the extent necessary to protect the natural environment in areas where the forest is damaged by natural forces such as fire, flood, storm, insects or infectious organisms. *[Additional language related to fire management plans may be added as necessary]* Such timber harvest and management shall be carried out in accordance with Best Management Practices approved by the South Carolina Forestry Commission or successor agency, as amended.

3. **Recreation.** Grantor reserves the right to engage in any outdoor, non-commercial recreational activities, including hunting (excluding planting or burning) and fishing, with cumulatively very small impacts, and which are consistent with the continuing natural condition of the Protected Property. No written notice required.

4. **Mineral Interests.** Grantor specifically reserves a qualified mineral interest (as defined in § 170(h)(6) of the Internal Revenue Code) in subsurface oil, gas or other minerals and the right to access such minerals. However, there shall be no extraction or removal of, or exploration for, minerals by any surface mining method, nor by any method which results in subsidence or which otherwise interferes with the continuing natural condition of the Protected Property.

5. **Road Maintenance.** Grantor reserves the right to maintain existing roads, trails or walkways. Maintenance shall be limited to: removal or pruning of dead or hazardous vegetation; application of permeable materials (e.g., sand, gravel, crushed) necessary to correct or impede erosion; grading; replacement of culverts, water control structures, or bridges; and, maintenance of roadside ditches.

6. **Vegetation, Debris, and Exotic Species Removal.** Grantor reserves the right to engage in the removal or trimming of vegetation downed or damaged due to natural disaster, removal of man-made debris, removal of parasitic vegetation (as it relates to the health of the host plant) and removal of non-native or exotic plant or animal species.

7. **Compensatory Mitigation.** Grantor reserves the right to perform any restoration, enhancement, and other wetland mitigation activities required by Section 404 permit's and/or Mitigation Banking Instruments, including the use of all equipment necessary to successfully complete any mitigation requirements contained therein.

## Charleston District Conservation Easement Model of September 2010

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8. **Other Reserved Rights.** Grantor reserves the right to engage in all acts or uses not prohibited by the Restrictions, and which are not inconsistent with the conservation purposes of this grant, the preservation of the Protected Property in its natural condition, and the protection of its environmental systems.
9. *[Insert for approved mitigation banks: 7. Grantor reserves the sole and unrestricted right to sell credits or other entitlements or interests in the Protected Property in order to perfect and carry out the purpose of a mitigation bank.]*
10. *[Additional, case-specific reservations may be listed, e.g., fire or wildlife management plans.]*

### **E. GENERAL PROVISIONS**

The following General Provisions shall be binding upon, and inure to the benefit of, the Grantor, Holder and Third-Parties, and the heirs, successors, administrators, assigns, lessees, licensees and agents of each:

1. **Marking of Property.** Grantor shall install and maintain permanent signs saying “Protected Natural Area” or establish an equivalent, permanent, marking system along the boundary of any protected areas such as upland buffers, riparian zones, and aquatic resources.
2. **Rights of Access and Entry.** Holder and Third-Parties shall have the right to enter and go upon the Protected Property for purposes of inspection, and to take actions necessary to verify compliance with the Restrictions. Holder shall also have the rights of visual access and view, and to enter and go upon the Protected Property for purposes of making scientific or educational observations and studies, and taking samples, in such a manner as will not disturb the quiet enjoyment of the Protected Property by Grantor. No right of access or entry by the general public to any portion of the Protected Property is conveyed by this Conservation Easement.
3. **Enforcement.** In the event of a breach of the Restrictions by Grantor or another party, the Holder or one of the Third-Parties must notify the Grantor in writing of the breach. The Grantor shall have thirty (30) days after receipt of such notice to undertake actions that are reasonably calculated to swiftly correct the conditions constituting the breach. If the Grantor fails to take such corrective action within thirty (30) days, or fails to complete the necessary corrective action, the Holder and/or the Third-Parties may undertake such actions, including legal proceedings, as are necessary to effect such corrective action. Among other relief, Holder and/or Third-Parties shall be entitled to a complete restoration for any breach of the Restrictions. Breaches of General Provisions of this Conservation Easement shall be actionable without notice. The costs of a breach, correction or restoration, including the Holder’s expenses, court costs, and attorneys’ fees, shall be paid by Grantor, provided Grantor is determined to be responsible for the breach. Enforcement shall be at the discretion of the Holder and/or Third-Parties, and no omission or delay in acting shall constitute a waiver of any enforcement right. These enforcement rights are in addition to, and shall not limit, enforcement rights available under other provisions of law or equity, or under any applicable permit or certification.
4. **Events Beyond Grantor’s Control.** Nothing herein shall be construed to authorize the Holder or Third-Parties to institute any proceedings against Grantor for any changes to the Protected Property caused by acts of God or circumstances beyond the Grantor’s control such as earthquake, fire, flood, storm, war, civil disturbance, strike, the unauthorized acts of third persons, or similar causes.
5. **Obligations of Ownership.** Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Protected Property. Grantor shall keep the Protected Property free of any liens or other encumbrances for obligations incurred by Grantor. Holder shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Protected Property, except as expressly provided herein. Nothing herein shall relieve the Grantor of the obligation to comply with federal, state or local laws, regulations and permits which may apply to the exercise of the Reserved Rights.
6. **Long Term Management.** Grantor will accomplish the long-term management activities identified in the approved mitigation plan, dated \_\_\_\_\_. The required activities include but are not limited to *management activities (i.e., control of invasive species, fire, etc) and the maintenance and/or replacement of structures (fences,*

**Charleston District Conservation Easement Model of September 2010**

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*ditch plugs, weirs, etc) that are critical to the long-term success of the mitigation activities as described in the approved mitigation plan.*

7. **Extinguishment.** In the event that changed conditions render impossible the continued use of the Protected Property for the conservation purposes, this Conservation Easement may only be extinguished, in whole or in part, by judicial proceeding.

8. **Eminent Domain.** Whenever all or part of the Protected Property is taken in the exercise of eminent domain so as to substantially abrogate the Restrictions imposed by this Conservation Easement, the Grantor and Holder shall join in appropriate actions at the time of such taking to recover the full value of the taking, and all incidental and direct damages due to the taking.

9. **Proceeds.** This Conservation Easement constitutes a real property interest immediately vested in Holder. In the event that all or a portion of this Protected Property is sold, exchanged, or involuntarily converted following an extinguishment or the exercise of eminent domain, Holder shall be entitled to the fair market value of this Conservation Easement. The parties stipulate that the fair market value of this Conservation Easement shall be determined by multiplying the fair market value of the Protected Property unencumbered by this Conservation Easement (minus any increase in value after the date of this grant attributable to improvements) by the ratio of the value of this easement at the time of this grant to the value of the Protected Property (without deduction for the value of this Conservation Easement) at the time of this grant. The values at the time of this grant shall be the values used, or which would have been used, to calculate a deduction for federal income tax purposes, pursuant to Section 170(h) of the Internal Revenue Code (whether eligible or ineligible for such a deduction). Holder shall use its share of the proceeds in a manner consistent with the purposes of this Conservation Easement.

10. **Notification.** Any notice, request for approval, or other communication required under this Conservation Easement shall be sent by registered or certified mail, postage prepaid, to the following addresses (or such address as may be hereafter specified by notice pursuant to this paragraph):

To Grantor: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

To Holder: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

To Third Parties: U.S. Army Corps of Engineers  
Attn: Regulatory Division  
69A Hagood Avenue  
Charleston, South Carolina 29403

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

9. **Assignment.** This Conservation Easement is transferable, but only to a qualified holder under 501 (C)(3) and § 170(h) of the Internal Revenue Code as described herein. As a condition of such transfer, the transferee shall agree to all of the restrictions, rights, and provisions herein, and to continue to carry out the purposes of this Conservation Easement. Assignments shall be accomplished by amendment of this Conservation Easement under paragraph 12. Grantee shall notify Third Parties at least 60 days prior to any such assignment or transfer.

10. **Failure of Holder.** If at any time Grantee is unable or fails to enforce this Conservation Easement, or if Grantee ceases to be a qualified holder under §501(c)(3) and § 170(h) of the Internal Revenue Code, and if within a reasonable period of time after the occurrence of one of these events the Grantee fails to make an assignment pursuant to paragraph 9, then the Holder’s interest shall become vested in another qualified holder in accordance with an appropriate (e.g., cy pres) proceeding in a court of competent jurisdiction.

11. **Subsequent Transfer.** Grantor agrees to incorporate the terms of this Conservation Easement in any deed or other legal instrument which transfers any interest in all or a portion of the Protected Property. Grantor agrees to provide written notice of such transfer to Grantee and Third Parties at least 60 days prior to the date of transfer. The

**Charleston District Conservation Easement Model of September 2010**

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failure of Grantor to comply with this paragraph shall not impair the validity or enforceability of this Conservation Easement.

12. **Amendment.** This Conservation Easement may be amended, but only in writing signed by all parties hereto, and provided such amendment does not affect the purpose of this Conservation Easement or the status of the Grantee under any applicable laws, including S.C. Code Title 7, Chapter. Any amendments must be consistent with the conservation purposes of this grant.

13. **Severability.** Should any separable part of this Conservation Easement be found void or unenforceable by a court of competent jurisdiction, the remainder shall continue in full force and effect.

14. **Warranty.** Grantor warrants that it owns the Protected Property in fee simple, and that Grantor either owns all interests in the Protected Property which may be impaired by the granting of this Conservation Easement or that there are no outstanding mortgages, tax liens, encumbrances, or other interests in the Protected Property which have not been expressly subordinated to this Conservation Easement. Grantor further warrants that Holder shall have the use of and enjoy all the benefits derived from and arising out of this Conservation Easement.

15. **Habendum Clause.** To have and to hold, this Easement together with all and singular the appurtenances and privileges belonging or in any way pertaining thereto, either in law or equity, either in possession or expectancy, for the proper use and benefit of the Grantee, its successors and assigns, forever.

[Signature Pages Attached]

**Charleston District Conservation Easement Model of September 2010**

See <http://www.sac.usace.army.mil> for latest edition of this model.

IN WITNESS WHEREOF, Grantor and Grantee have executed this Conservation Easement, and the Third-Parties have approved this Conservation Easement, on the date written above. By its execution and acceptance of this Conservation Easement, Grantee accepts the third-party rights of enforcement herein.

SIGNED, SEALED AND  
DELIVERED IN THE PRESENCE OF:

GRANTOR:

Signature: \_\_\_\_\_

\_\_\_\_\_  
(Witness)

\_\_\_\_\_  
(Witness)

\_\_\_\_\_  
[type/print name of grantor]

STATE OF SOUTH CAROLINA            )  
  ) ss.  
COUNTY OF \_\_\_\_\_ )

I, a Notary Public, do hereby certify that \_\_\_\_\_ personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

WITNESS my hand and seal this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_.

\_\_\_\_\_  
Signature of Notary Public) (S

\_\_\_\_\_  
(Typed/Printed name of Notary Public)

NOTARY PUBLIC FOR SOUTH CAROLINA  
My Commission Expires: \_\_\_\_\_



**Charleston District Conservation Easement Model of September 2010**

See <http://www.sac.usace.army.mil> for latest edition of this model.

**Continuation of Signature Page  
For Deed of Conservation Easement**

GRANTEE:

Signature: \_\_\_\_\_

\_\_\_\_\_  
(Witness)

\_\_\_\_\_  
(Witness)

\_\_\_\_\_  
[type/print name of grantee]

\_\_\_\_\_  
[Title and Organization]

STATE OF SOUTH CAROLINA            )  
  ) ss.  
COUNTY OF \_\_\_\_\_)

I, a Notary Public, do hereby certify that \_\_\_\_\_ personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

WITNESS my hand and seal this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_.

\_\_\_\_\_  
(Signature of Notary Public)

\_\_\_\_\_  
(Typed/Printed name of Notary Public)

NOTARY PUBLIC FOR SOUTH CAROLINA  
My Commission Expires: \_\_\_\_\_

**Charleston District Conservation Easement Model of September 2010**

See <http://www.sac.usace.army.mil> for latest edition of this model.

Approval by Third-Parties

U.S. Army Corps of Engineers,  
Charleston District,

By: \_\_\_\_\_

\_\_\_\_\_  
[type/print name]

Title: \_\_\_\_\_

S.C. Department of Health and  
Environmental Control

By: \_\_\_\_\_

\_\_\_\_\_  
[type/print name]



Title: \_\_\_\_\_

## **APPENDIX C: PHOTO LOG**

**Project Soter – Landscape Mitigation Plan  
Photographic Log  
Berkeley, Dorchester, and Orangeburg Counties, SC**

Photographic Log  
March - April 2015





	Client: Berkeley County Economic Development
	Location: Bannister Tract
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 1
	Photographer: WR
Description: View of bottomland hardwood forest along the Sandy Run floodplain in the northwest portion of the tract.	
	Client: Berkeley County Economic Development
	Location: Bannister Tract
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 2
	Photographer: WR
Description: View of isolated pond that drains southeast to Sandy Run in the southeast portion of the tract.	

**Project Soter – Landscape Mitigation Plan  
Photographic Log  
Berkeley, Dorchester, and Orangeburg Counties, SC**

Photographic Log  
March - April 2015



	<p>Client: Berkeley County Economic Development</p> <p>Location: Bannister Tract</p> <p>Project No.: 6250150080.01</p> <p>Date: 03.26.15</p> <p>Photo No.: 3</p> <p>Photographer: WR</p> <p>Description: View of flooded bottomland hardwood forest in the northwest portion of the tract.</p>
	<p>Client: Berkeley County Economic Development</p> <p>Location: Bannister Tract</p> <p>Project No.: 6250150080.01</p> <p>Date: 03.26.15</p> <p>Photo No.: 4</p> <p>Photographer: WR</p> <p>Description: View of wet loblolly pine plantation stand in the northwest portion of the tract.</p>

**Project Soter – Landscape Mitigation Plan  
Photographic Log  
Berkeley, Dorchester, and Orangeburg Counties, SC**

Photographic Log  
March - April 2015



	<p>Client: Berkeley County Economic Development</p> <p>Location: Bannister Tract</p> <p>Project No.: 6250150080.01</p> <p>Date: 03.26.15</p> <p>Photo No.: 5</p> <p>Photographer: WR</p> <p>Description: View upstream of Cedar Swamp in the north-central portion of the tract.</p>
	<p>Client: Berkeley County Economic Development</p> <p>Location: Bannister Tract</p> <p>Project No.: 6250150080.01</p> <p>Date: 03.26.15</p> <p>Photo No.: 6</p> <p>Photographer: WR</p> <p>Description: View downstream of Cedar Swamp in the north-central portion of the tract.</p>

**Project Soter – Landscape Mitigation Plan  
Photographic Log  
Berkeley, Dorchester, and Orangeburg Counties, SC**

Photographic Log  
March - April 2015



	<p>Client: Berkeley County Economic Development</p> <p>Location: Bannister Tract</p> <p>Project No.: 6250150080.01</p> <p>Date: 03.26.15</p> <p>Photo No.: 7</p> <p>Photographer: WR</p> <p>Description: View of an un-thinned loblolly pine plantation stand in the north-central portion of the tract.</p>
	<p>Client: Berkeley County Economic Development</p> <p>Location: Bannister Tract</p> <p>Project No.: 6250150080.01</p> <p>Date: 03.26.15</p> <p>Photo No.: 8</p> <p>Photographer: WR</p> <p>Description: View of a thinned loblolly pine plantation stand in the northwest portion of the tract.</p>

**Project Soter – Landscape Mitigation Plan  
Photographic Log  
Berkeley, Dorchester, and Orangeburg Counties, SC**

Photographic Log  
March - April 2015



	Client: Berkeley County Economic Development
	Location: Bannister Tract
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 9
	Photographer: WR
Description: View of a young loblolly pine plantation stand (foreground) in the northwest portion of the tract.	
	Client: Berkeley County Economic Development
	Location: Bannister Tract
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 10
	Photographer: WR
Description: View of bottomland hardwood forest edge along Sandy Run in the north-central portion of the tract.	



**Project Soter – Landscape Mitigation Plan  
Photographic Log  
Berkeley, Dorchester, and Orangeburg Counties, SC**

Photographic Log  
March - April 2015



	<p>Client: Berkeley County Economic Development</p>
	<p>Location: Bannister Tract</p>
	<p>Project No.: 6250150080.01</p>
	<p>Date: 03.26.15</p>
	<p>Photo No.: 11</p>
	<p>Photographer: WR</p>
<p>Description: View of an existing bridge that crosses Sandy Run just below the confluence with Cedar Swamp.</p>	
	<p>Client: Berkeley County Economic Development</p>
	<p>Location: Bannister Tract</p>
	<p>Project No.: 6250150080.01</p>
	<p>Date: 03.26.15</p>
	<p>Photo No.: 12</p>
	<p>Photographer: WR</p>
<p>Description: View of the recent clear-cutting activities along the central portion of the tract.</p>	

**Project Soter – Landscape Mitigation Plan  
Photographic Log  
Berkeley, Dorchester, and Orangeburg Counties, SC**

Photographic Log  
March - April 2015



	<p>Client: Berkeley County Economic Development</p>
	<p>Location: Bannister Tract</p>
	<p>Project No.: 6250150080.01</p>
	<p>Date: 03.26.15</p>
	<p>Photo No.: 13</p>
	<p>Photographer: WR</p>
<p>Description: View of the existing forestry access roads within the tract.</p>	
	<p>Client: Berkeley County Economic Development</p>
	<p>Location: Bannister Tract</p>
	<p>Project No.: 6250150080.01</p>
	<p>Date: 03.26.15</p>
	<p>Photo No.: 14</p>
	<p>Photographer: WR</p>
<p>Description: View of Sandy Run and associated bottomland hardwood community.</p>	

**Project Soter – Landscape Mitigation Plan  
Photographic Log  
Berkeley, Dorchester, and Orangeburg Counties, SC**

Photographic Log  
March - April 2015



	<p>Client: Berkeley County Economic Development</p> <p>Location: Walnut Branch Tracts</p> <p>Project No.: 6250150080.01</p> <p>Date: 03.26.15</p> <p>Photo No.: 15</p> <p>Photographer: LD</p> <p>Description: View of the bluff overlooking the Walnut Branch floodplain forest.</p>
	<p>Client: Berkeley County Economic Development</p> <p>Location: Walnut Branch Tracts</p> <p>Project No.: 6250150080.01</p> <p>Date: 03.26.15</p> <p>Photo No.: 16</p> <p>Photographer: LD</p> <p>Description: View of the bottomland hardwood forest along Walnut Branch.</p>

**Project Soter – Landscape Mitigation Plan  
Photographic Log  
Berkeley, Dorchester, and Orangeburg Counties, SC**

Photographic Log  
March - April 2015



	<p>Client: Berkeley County Economic Development</p> <p>Location: Walnut Branch Tracts</p> <p>Project No.: 6250150080.01</p> <p>Date: 03.26.15</p> <p>Photo No.: 17</p> <p>Photographer: LD</p> <p>Description: Bottomland hardwood forest community within the floodplain of Walnut Branch.</p>
	<p>Client: Berkeley County Economic Development</p> <p>Location: Walnut Branch Tracts</p> <p>Project No.: 6250150080.01</p> <p>Date: 03.26.15</p> <p>Photo No.: 18</p> <p>Photographer: LD</p> <p>Description: View of the swamp adjacent to Walnut Branch.</p>

**Project Soter – Landscape Mitigation Plan  
Photographic Log  
Berkeley, Dorchester, and Orangeburg Counties, SC**

Photographic Log  
March - April 2015



	<p>Client: Berkeley County Economic Development</p> <p>Location: Walnut Branch Tracts</p> <p>Project No.: 6250150080.01</p> <p>Date: 03.26.15</p> <p>Photo No.: 19</p> <p>Photographer: LD</p> <p>Description: View of an open field within the uplands of the Walnut Branch Tracts.</p>
	<p>Client: Berkeley County Economic Development</p> <p>Location: Walnut Branch Tracts</p> <p>Project No.: 6250150080.01</p> <p>Date: 03.26.15</p> <p>Photo No.: 20</p> <p>Photographer: LD</p> <p>Description: View of the uplands along Walnut Branch. The bluff along Walnut Branch is approximately 20 feet high above the floodplain in some locations.</p>

**Project Soter – Landscape Mitigation Plan  
Photographic Log  
Berkeley, Dorchester, and Orangeburg Counties, SC**

Photographic Log  
March - April 2015



	Client: Berkeley County Economic Development
	Location: Walnut Branch Tracts
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 21
	Photographer: LD
Description: View of Walnut Branch.	
	Client: Berkeley County Economic Development
	Location: Walnut Branch Tracts
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 22
	Photographer: LD
Description: View of the floodplain along Walnut Branch.	

**Project Soter – Landscape Mitigation Plan  
Photographic Log  
Berkeley, Dorchester, and Orangeburg Counties, SC**

Photographic Log  
March - April 2015



	Client: Berkeley County Economic Development
	Location: Walnut Branch Tracts
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 23
	Photographer: LD
Description: View of Walnut Branch flowing through the Walnut Branch tracts.	
	Client: Berkeley County Economic Development
	Location: Walnut Branch Tracts
	Project No.: 6250150080.01
	Date: 03.26.15
	Photo No.: 24
	Photographer: LD
Description: View of the floodplain along Walnut Branch.	

**APPENDIX D: LANDOWNER  
AUTHORIZATION FORMS**



Land Owner Authorization Forms  
to be submitted at a later date.

## APPENDIX E: CULTURAL RESOURCES SURVEY

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## MANAGEMENT SUMMARY

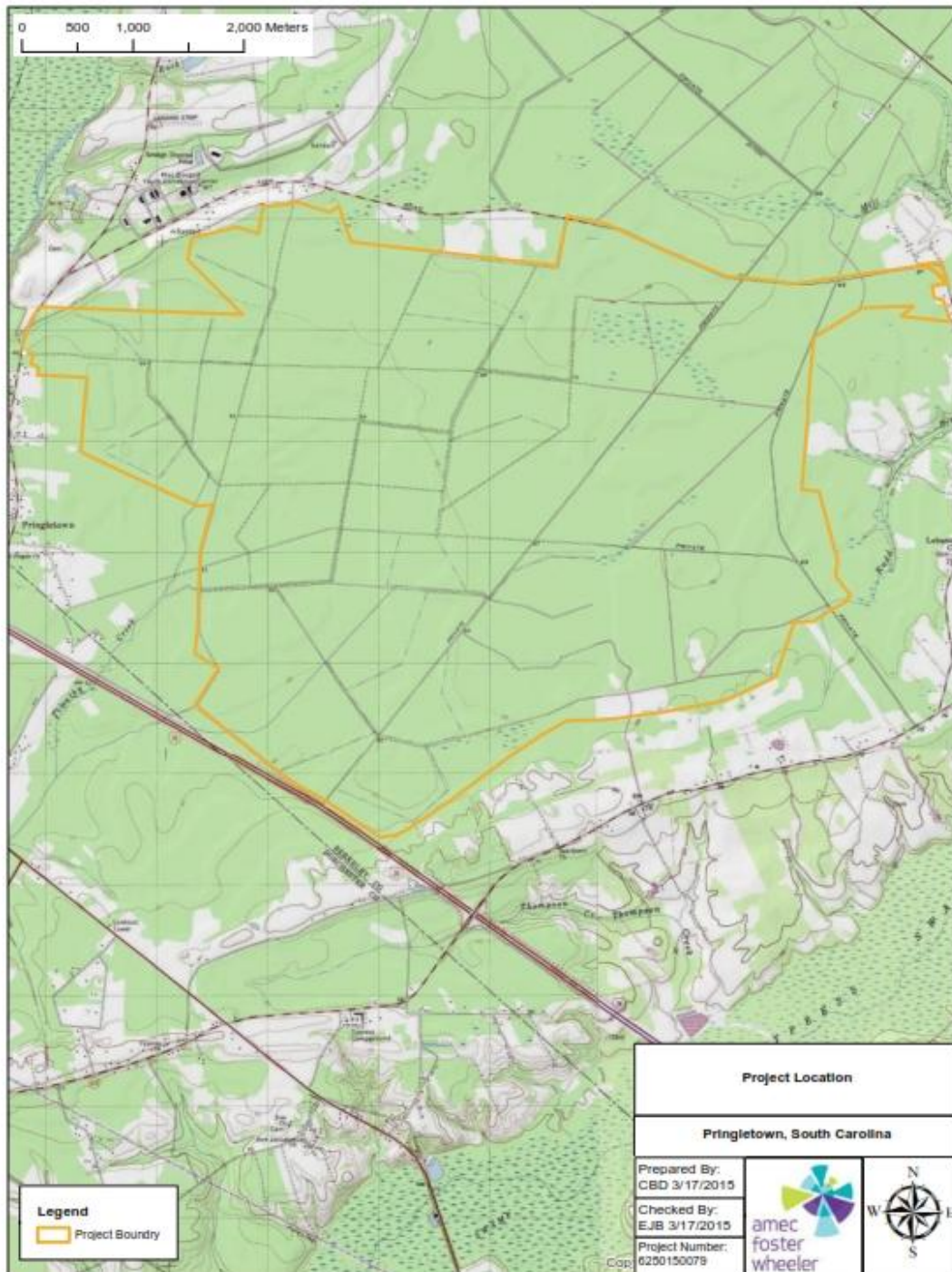
Amec Foster Wheeler Environment and Infrastructure, Inc. (Amec Foster Wheeler) under the direction of Berkeley County and the South Carolina Department of Commerce conducted a Cultural Resource Identification Survey (CRIS) of the Camp Hall Tract, approximately 6,700 acres located northwest of Ridgeville, in Berkeley County, South Carolina (Figure 1). The reconnaissance survey was conducted between March 9 and 15, 2015. For the purposes of the CRIS, the Area of Potential Effect (APE) for archaeology was defined as the 6,700-acre tract (see Figure 1). In addition, a windshield survey was conducted within a 0.5 mile radius of the two tracts to identify buildings or structures that could be older than 40 years of age. A Cultural Resources Assessment of the APE was conducted by Brockington and Associates, Inc. in 2007. The present CRIS was conducted to expand the previous Cultural Resources Assessment through limited shovel testing in the APE.

Potential impacts to the project area include land development and improvements related to future industrial development. Amec Foster Wheeler archaeologists conducted the CRIS survey following the Memorandum of Understanding between the South Carolina Department of Commerce and the South Carolina State Historic Preservation Office (revised in 2014) for the South Carolina Site Certification Program. The specific goals of this survey were to assess the potential for the APE to possess significant archaeological resources. Emmett Brown served as the Principal Investigator and oversaw all aspects of this project. The field crew consisted of three Amec Foster Wheeler archaeologists, Emmett Brown, Casey Dunn, and Kristina Poston.

Prior to the CRIS, background research was conducted at the state Site File Records, located at the South Carolina Institute of Anthropology and Archaeology, in Columbia, South Carolina. Amec Foster Wheeler reviewed the South Carolina Archaeological Site File to determine if any previously identified or previously recorded archaeological sites are present within or adjacent to the APE. Amec Foster Wheeler also reviewed the site files for any properties that are listed on the National Register of Historic Places (NRHP), or listed on the South Carolina State Register of Historic Properties. Based on the review of the archaeological site files, no archaeological sites have been previously identified within the APE. No NRHP properties, properties eligible for listing on the State register, or areas of cultural concern have been previously identified within the APE.

The APE is comprised of pine flatwoods and swamps, which generally have been converted to intensively-managed pine plantations. Additionally, the APE has been disturbed from infrastructure development (roads and transmission line corridors). Vegetation in the APE consists of dense overgrowth with stands of pine and hardwood trees.

The APE is considered to have a low probability to contain significant archaeological resources due to wet nature of the property and past disturbances from agricultural and silviculture activities. In accordance with CRIS guidelines, the fieldcrew surveyed the tract through pedestrian surveys and limited shovel testing. Placing shovel test pits (STPs) every five acres was not possible due to the wet nature of the property and from the heavy subsurface disturbance found across the property. The fieldcrew conducted pedestrian surveys throughout the APE and excavated STPs in some areas to confirm the high level of subsurface disturbance observed throughout the property. A total of 1350 STP locations were located with a total of 50 STP locations excavated. The remainder of STP locations was located in standing water or in heavily disturbed areas. All excavated STPs were negative for cultural material. No archaeological sites or structures eligible for listing in the NRHP were identified during the CRIS.



**Figure 1: Location Map Showing the APE**



## **PROJECT INTRODUCTION**

The APE totals approximately 6,700 acres located in Berkeley County, South Carolina northeast of the town of Ridgeville. The APE is bounded to the east by Highway 27/Ridgeville Road, to the south by Interstate 26, and to the north by Fish Road. A singular transmission corridor runs east/west through this tract. The city limits of Ridgeville are located approximately three quarters of a mile from the eastern boundary of this tract (see Figure 1).

## **FIELD METHODS**

The APE has a low probability to contain significant archaeological resources. This low probability model was developed based on the low, wet nature of the APE, presence of poorly drained soils, a light settlement density depicted on historical maps, previous cultural resource assessments and previous disturbances from infrastructure projects. The 1920 USGS topographical map for the APE shows that the majority of the APE was forested and lacked agricultural fields. The lack of agricultural fields may be one indication that the APE was not conducive to historical settlement and use.

The 1825 Mills map of Charleston County (Mills 1979, cited in Brockington and Associates 2007a) shows the APE as primarily swampland. Brockington and Associates (2007a and 2007b) recommended that the APE has a low potential to contain intact archaeological resources based on the low, wet nature of the property and the ground disturbance from intensive silviculture. All of the soils in the APE are poorly drained. Brockington and Associates (2007a and 2007b) did identify several areas that contained soils that were only somewhat poorly drained (Lynchburg fine sandy loam and Goldsboro loamy sands). STPs were excavated in areas that were identified by Brockington and Associates to have Lynchburg and Goldsboro soil types.

This CRIS consisted of a pedestrian survey and the excavation of shovel test pits (STPs). STPs were concentrated in those areas that had the best potential to contain archaeological resources. STPs were excavated approximately 10 cm into sterile subsoil, or until water filled the STP. All excavated soil was screened through ¼" hardware mesh to ensure



Figure 2: Location Map Showing the APE and Soil Types

standard artifact recovery. Information from each STP was recorded and the soil stratigraphy described using nomenclature from the Munsell Soil Guide Chart. All STPs were refilled after the information was recorded. STPs were not excavated in disturbed areas, existing right-of-ways (ROW), or areas of standing water. The field crew conducted a windshield survey within a 0.5 radius of the APE to determine if structures greater than 40 years of age were present. The windshield survey consisted of driving the main transportation arteries around the APE and visually inspecting structures from the public ROW.

## **SUMMARY OF RESULTS**

### **Background Research**

Background research was conducted at the South Carolina Institute of Anthropology and Archaeology to determine if previously identified National Register of Historic Places (NRHP) eligible or State eligible archaeological sites or historic properties were previously identified within the APE or adjacent to the APE. In addition, the client two Cultural Resources Assessment Reports conducted within the APE by Brockington and Associates in 2007. Brockington and Associates reviewed a variety of historical plats and maps from several sources that included the Charleston County Register of Mesne Conveyance (RMC) offices in Charleston, the RMC offices in Moncks Corner, and files from the South Carolina Department of Archives and History. The historic map research did reveal a 19<sup>th</sup> century farmstead, the John Schuler farm, located in the northwest corner of the APE adjacent to Highway 27. No previously identified or known archaeological sites or NRHP listed properties present within or adjacent to the APE. One NRHP listed property, the Cypress Methodist Campground is located approximately one mile south of the APE (see Appendix I).

Ownership of the property consisted of two tracts; the Camp Hall tract and the Shuler Farm tract. The Camp Hall tract originally consisted of an 8,000 acre property that went through several private owners between 1794 and 1906. After 1906, the Camp Hall tract was owned by several timber companies including the E.P. Burton Lumber Company, the J.K. Pretty, and Sons Lumber Company, and the Cooper River Timber Company. By 1940, the Camp Hall tract was purchased by the West Virginia Pulp and Paper Company (Brockington and Associates 2007b).

The Shuler Family tract consisted of 550 acres located adjacent to Highway 27. The Shuler farm was owned by John Shuler and the family lived at the farm until his death. After his death, the tract was sold to his nephew who lived on the property in 1860. The Shuler Family tract was sold to the West Virginia Pulp and Paper Company in 1941 (Brockington and Associates 2007b).

A survey for NRHP or State eligible resources was conducted within a mile radius of the APE by Schneider and Frick in 1989. They identified 35 resources within a mile radius of the APE. Thirty four of these resources were determined to be not eligible for inclusion in the NRHP. One NRHP listed property, the Cypress Methodist Campground (see Appendix I), is located approximately one mile south of the APE. The Cypress Methodist Campground served as a meeting place for Methodist revival services during the early 19<sup>th</sup> century. The campground is located on the south side of Cypress Campground Road and contains a wooden tabernacle and family quarters (Brockington and Associates 2007b).

### **Field Results**

The pedestrian survey of the APE revealed that the entire property has been heavily disturbed from activities associated with silviculture. These activities included the construction of roads, the construction of a drainage system, harvesting of timber, and the rowing and bedding for timber production.

A total of 1350 STP locations were observed with a total of 50 STPs excavated. The majority of STP locations was not excavated due to standing water or was located in heavily disturbed areas. STPs were excavated in areas that were identified by Brockington and Associates (2007a and 2007b) to contain soils that were only somewhat poorly drained and the area adjacent to Highway 27 where the former Shuler Farm was identified on historic maps. All areas where STPs were excavated were heavily disturbed from intensively managed pine plantation. A total of 50 STPs were excavated within the APE and all STPs were negative for cultural material. The typical soil profile consisted of a 0-15 cm thick 10 YR 3/2 Dark Greyish Brown Sandy Loam above a 10-20 cm thick 10YR 5/6 Yellowish Brown Sandy Loam. Areas that contained Lynchburg and Goldsboro soil types were heavily disturbed and have a low potential to contain intact archaeological resources. STPs excavated in the location of the Shuler farm were all negative for cultural material. This area was also heavily disturbed from silviculture activities and there is a low

potential that intact archaeological deposits associated with the Shuler Farm are present in the APE.

## **RECOMMENDATIONS FOR ADDITIONAL CULTURAL RESOURCE INVESTIGATIONS**

An Archaeological Reconnaissance Survey was conducted within the APE from March 9 - 15, 2015. The APE was considered to have a low probability to contain significant archaeological resources based on the low, wet nature of the APE, negative results from previous Cultural Resource Assessments (Brockington and Associates 2007a and 2007b), poorly drained soils, a light settlement density, and disturbances from activities associated with silviculture. STPs were excavated in the areas of the property with a higher elevation and areas that contained Lynchburg and Goldsboro soil types. Areas that were shovel tested were heavily disturbed from rowing and bedding for timber production and have a low potential to contain intact archaeological resources. No archaeological sites were identified during the CRIS. A total of 50 STPs were excavated in the APE and were negative for cultural material (see Appendix 1).

Previous building/structure surveys, conducted by Frick and Davis in 1989, identified the Cypress Methodist Campground as eligible for the NRHP. The Cypress Methodist Campground is located approximately one mile from the APE. The Amec Foster Wheeler field crew conducted a limited windshield survey within a 0.5 mile radius of the APE. No new resources were identified during this windshield survey.

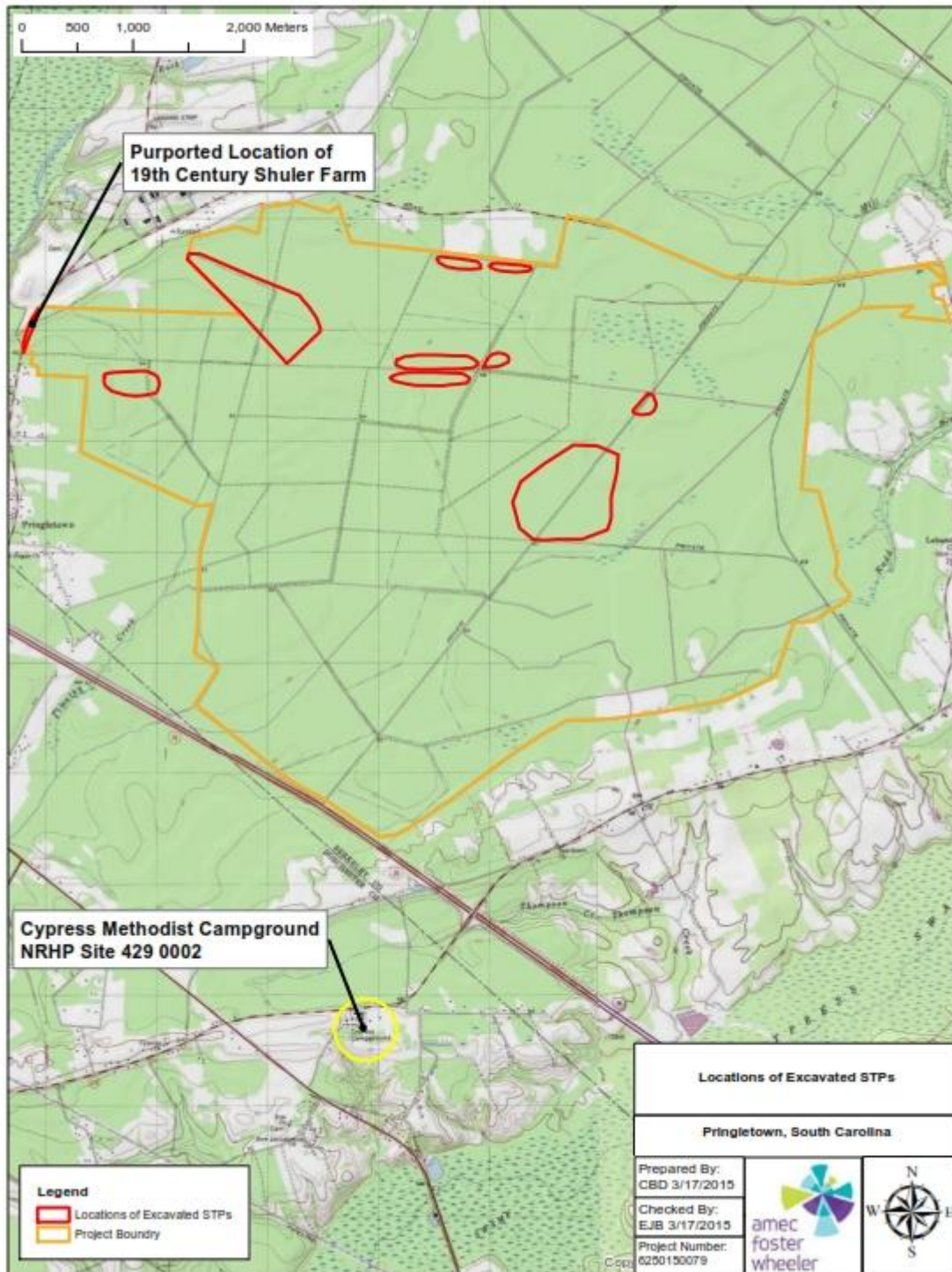
The APE has been heavily disturbed by timber and agricultural activities. At the time of the survey, the APE was very wet with large areas of standing water. Due to the disturbed and wet nature of the APE and the lack of NRHP structures within a 0.5 mile radius of the APE, Amec Foster Wheeler recommends no additional cultural resource investigations for the APE.

## **References**

- 2007a Brockington and Associates, Inc.  
Cultural Resources Assessment of the Camp Hall Tract Modification Berkeley County, South Carolina. Submitted to MeadWestvaco Corporation, Summerville, South Carolina.
- 2007b Brockington and Associates, Inc.  
Cultural Resources Assessment of the Camp Hall Tract Berkeley County, South Carolina. Submitted to MeadWestvaco Corporation, Summerville, South Carolina.

# **APPENDIX I**

## **Shovel Test Locations**



**Appendix I Figure 1. APE Showing Areas of Excavated STPs and the Cypress Methodist Campground.**

## **APPENDIX II**

### **Photo Log**





**Appendix II Figure 1. Photograph Showing Typical Disturbance in the APE.**



**Appendix II Figure 2. Photograph Showing Disturbance in the APE and Standing Water.**



**Appendix II Figure 3. Photograph Showing Standing Water in Disturbed Rows.**



**Appendix II Figure 4. Typical Soil Profile in the APE.**



**Appendix II Figure 5. Wet Area Located Near the Northwest Corner of the APE.**

**CENTERLINE ROAD INFRASTRUCTURE IMPROVEMENT  
AREA  
ADDENDUM TO  
CULTURAL RESOURCE IDENTIFICATION SURVEY  
CAMP HALL TRACT  
BERKELEY COUNTY, SOUTH CAROLINA**

**Prepared For:**

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AcbW\_g'7 cfbYf, South Carolina 29(\* %

**Prepared By:**

**Amec Foster Wheeler  
Environment & Infrastructure, Inc.  
720 Gracern Road  
Columbia, South Carolina 29210  
(803) 798-1200**



**Amec Foster Wheeler Project Number:  
6250150079**

**CENTERLINE ROAD INFRASTRUCTURE IMPROVEMENT  
AREA  
ADDENDUM TO  
CULTURAL RESOURCE IDENTIFICATION SURVEY  
CAMP HALL TRACT  
BERKELEY COUNTY, SOUTH CAROLINA**

**Report Prepared By:**

**Emmett Brown, RPA  
Principal Investigator**

**Kristina Poston  
Staff Archaeologist**

**April 2015**

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RECOMMENDATIONS FOR ADDITIONAL CULTURAL RESOURCE INVESTIGATIONS .....	7



## MANAGEMENT SUMMARY

Amec Foster Wheeler Environment and Infrastructure, Inc. (Amec Foster Wheeler) under the direction of Berkeley County and the South Carolina Department of Commerce conducted a Cultural Resource Identification Survey (CRIS) in support of road improvements to upgrade and improve vehicular access to the Camp Hall development tract. This report is an addendum to the CRIS survey that was conducted by Amec Foster Wheeler on March 9, 2015 on the 6700 acre tract located directly south of the current project area. The current project area is located northwest of Ridgeville, in Berkeley County, South Carolina (Figure 1). The project area consisted of three areas, 1) the proposed widening of Centerline Road located between Fish Road and State Road 176, 2) the widening of the intersection at Fish Road and Centerline Road and, 3) the widening of the intersection at State Road 176 and Centerline Road (Figure 2). The reconnaissance survey was conducted between March 23 and 29, 2015.

Potential impacts to the project area include soil removal and surface grading. Amec Foster Wheeler archaeologists conducted the CRIS survey following the Memorandum of Understanding between the South Carolina Department of Commerce and the South Carolina State Historic Preservation Office (revised in 2014) for the South Carolina Site Certification Program. The specific goals of this survey were to assess the potential for the APE to possess significant archaeological resources. Emmett Brown served as the Principal Investigator and oversaw all aspects of this project. The field crew consisted of three Amec Foster Wheeler archaeologists, Emmett Brown, Casey Dunn, and Kristina Poston.

Prior to the CRIS, background research was conducted at the state Site File Records, located at the South Carolina Institute of Anthropology and Archaeology, in Columbia, South Carolina. Amec Foster Wheeler reviewed the South Carolina Archaeological Site File to determine if any previously identified or previously recorded archaeological sites are present within or adjacent to the APE. Amec Foster Wheeler also reviewed the site files for any properties that are listed on the National Register of Historic Places (NRHP), or listed on the South Carolina State Register of Historic Properties. Based on the review of the archaeological site files, no archaeological sites have been previously identified within the APE. No NRHP properties, properties eligible for

listing on the State register, or areas of cultural concern have been previously identified within the APE.

The majority of the APE is considered to have a low probability to contain significant archaeological resources due to wet nature of the property and past disturbances from agricultural and silviculture activities. The majority of the APE is comprised of poorly drained soils, pine flatwoods and former swamps, which generally have been converted to intensively-managed pine plantations. Disturbance associated with these intensively-managed pine plantations includes deep sub surface rowing and bedding of the soil to promote pine tree growth in a wet environment. One small portion of the APE, located approximately 1000 feet south of the Center Line Road/Highway 176 intersection, contained well drained soils and was considered to possess a high potential to contain archaeological resources.

In accordance with CRIS guidelines, the fieldcrew surveyed the tract through pedestrian surveys and shovel testing. STPs were placed every 30 meters within the APE, unless standing water prevented their excavation. A total of 152 STPs were excavated within the APE. STPs were not excavated in areas with standing water or within the lawn of the hunting club. One archaeological site was identified during the survey.

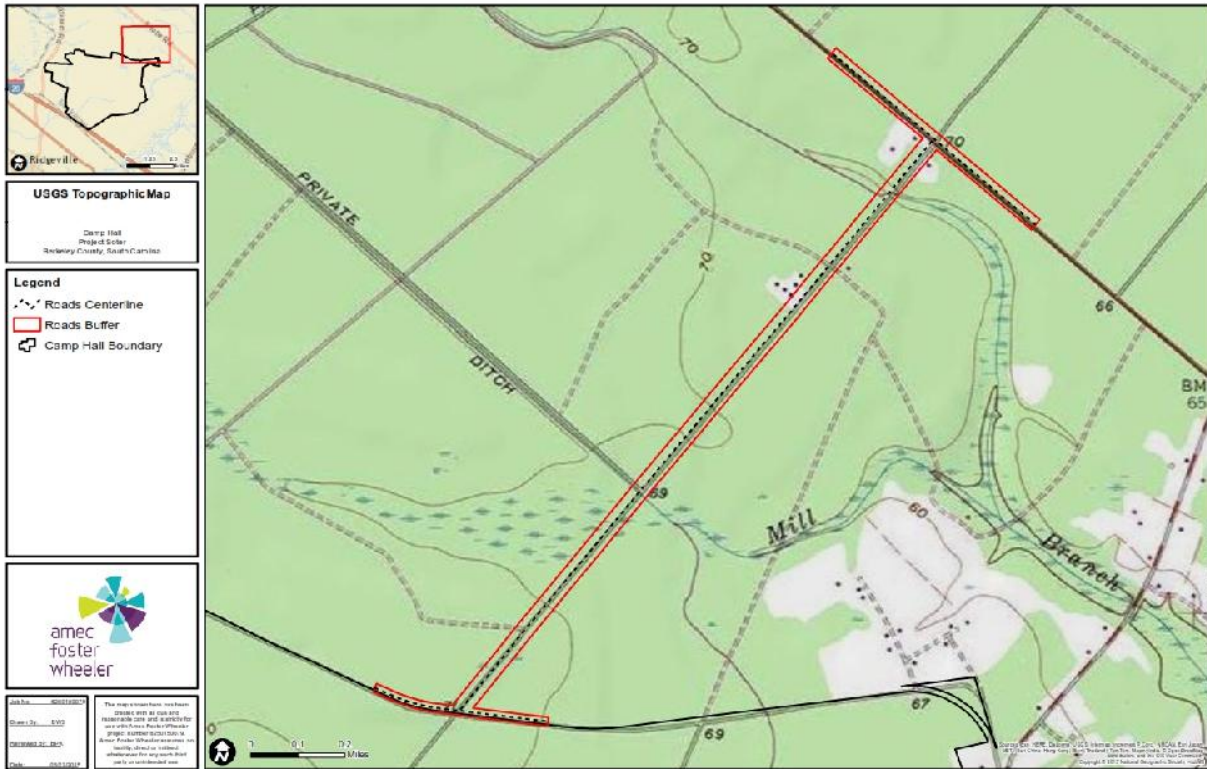


Figure 1: Location Map Showing the APE

## **PROJECT INTRODUCTION**

The APE consists of three areas (see Figure 1):

- 1) The widening of Centerline Road between Fish Road and State Road 176. This portion of the APE consists of a 200 foot wide corridor (100 feet on both sides of Centerline Road). A single STP transect was established on each side of Centerline Road approximately 50 feet from Centerline Road.
- 2) The widening of the intersection at Fish Road and Centerline Road. The proposed improvements include road widening 1000 feet in each direction along Fish Road with a corridor of 50 feet on each side. A single STP transect was established on each side of Fish Road approximately 50 feet from Centerline Road.
- 3) The widening of the intersection at State Road 176 and Centerline Road. The proposed improvements include road widening 1500 feet in each direction of State Road 176 with a 75 feet corridor on each side. A single STP transect was established on each side of State Road 176 approximately 50 feet from the center of State Road 176.

## **FIELD METHODS**

The majority of the APE has a low probability to contain significant archaeological resources, with the exception of a small high potential area located adjacent to an unnamed tributary of Mill Branch, approximately 1000 feet south of the intersection of State Road 176 and Centerline Road. This high potential area contains well drained Noboco loamy sands (NoA). The remainder of the APE consists of low probability areas characterized by low lying wet areas, poorly to somewhat poorly drained soils, and a high degree of subsoil disturbance.

This CRIS consisted of a pedestrian survey and the excavation of shovel test pits (STPs). STPs were excavated throughout the APE. STPs were excavated approximately 10 cm into sterile subsoil, or until water filled the STP. All excavated soil was screened through ¼" hardware mesh to ensure standard artifact recovery.

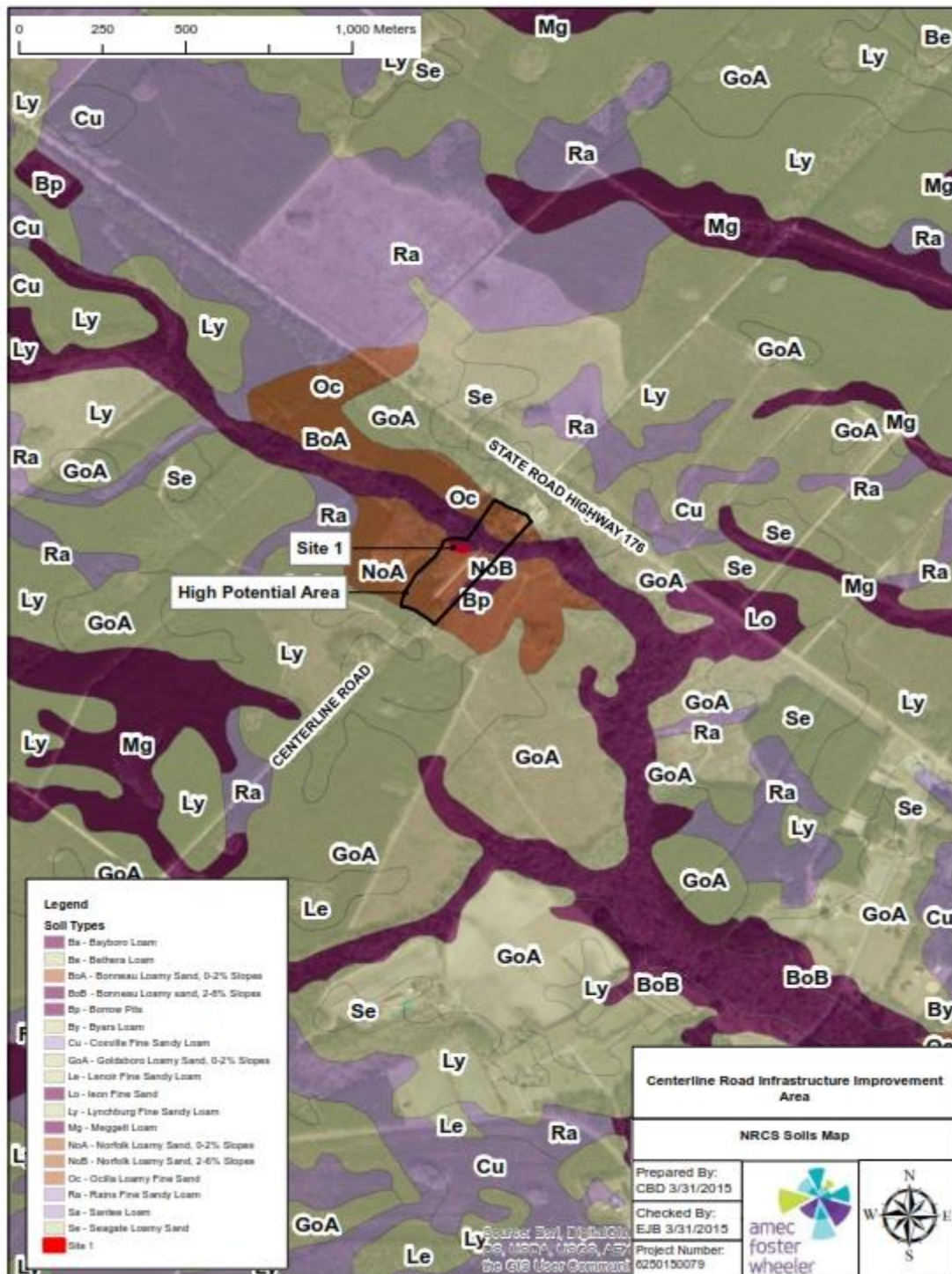


Figure 2: Location Map Showing the APE and Soil Types

Information from each STP was recorded and the soil stratigraphy described using nomenclature from the Munsell Soil Guide Chart. All STPs were refilled after the information was recorded. STPs were not excavated in disturbed areas, existing right-of-ways (ROW), or areas of standing water.

## **SUMMARY OF RESULTS**

### **Background Research**

Background research was conducted at the South Carolina Institute of Anthropology and Archaeology to determine if previously identified National Register of Historic Places (NRHP) eligible or State eligible archaeological sites or historic properties were previously identified within the APE or adjacent to the APE (see Appendix 1). No previously identified or known archaeological sites or NRHP listed properties present within or adjacent to the APE. One NRHP listed property, the Cypress Methodist Campground is located approximately one mile south of the APE.

### **Field Results**

The pedestrian survey of the APE revealed that the majority of the APE has been heavily disturbed from activities associated with silviculture. These activities included the construction of roads, the construction of a drainage system, harvesting of timber, and the rowing and bedding for timber production. The APE was surveyed through a pedestrian survey and through the excavation of STPs at 30 meter intervals. A total of 152 STPs were excavated within the APE. One prehistoric site was identified within the APE.

### **Site 1**

Site 1 is a prehistoric site located on a small rise adjacent to a tributary of Mill Branch. Centerline Road runs approximately 80 feet to the east and parallels the eastern boundary of the site (see Appendix 1). Vegetation consists of young mixed hardwoods and pine trees with sparse secondary growth. Surface visibility was less than 10 percent due to dense leaf litter covering the ground surface. A total of 20 STPS were excavated to delineate the boundaries of Site 1, with five STPs positive for cultural material. The artifact assemblage consists of 13 prehistoric pottery sherds. The sherds have a sand/grit temper and most likely date to the Late Archaic to Woodland Period. One rim sherd is decorated with a series of three fingernail

punctuations with a scraped interior wall. STP 8 consisted of two prehistoric ceramics recovered from 0-20 cm below surface, STP R2 consisted of four pottery sherds recovered from 0-20 cm below surface, STP R3 contained two pottery sherds recovered at 0-10 cm below surface, STP R11 contained one pottery sherd recovered 0-10 cm below surface, while STP R14 contained four pottery sherds recovered at 0-15 cm below surface. Based on the distribution of the findings, the site boundaries are estimated to measure 60 m by 10 m. The site is located on the well drained Noboco loamy sand (NoA), 0-2 percent slopes. A typical profile from excavated STPs consisted of a 25 cm thick dark gray sandy loam above light brown sandy clay.

### **RECOMMENDATIONS FOR ADDITIONAL CULTURAL RESOURCE INVESTIGATIONS**

An Archaeological Reconnaissance Survey was conducted within the APE between March 23 and 29, 2015. The APE was considered to have a low probability to contain significant archaeological resources based on the low, wet nature of the APE and the poorly drained soils that comprise the majority of the APE. STPs excavated within the low probability areas were negative for cultural material. One small portion of the APE, located approximately 1000 feet south of the Centerline Road/State Road 176 intersection, contained well drained soils and was considered to possess a high potential to contain archaeological resources. STPs placed in this area revealed a small prehistoric site that contained a light density ceramic scatter. Based on the light density of artifacts and the ephemeral nature of the site, Site 1 is recommended as not eligible for inclusion in the NRHP.

# **APPENDIX I**

## **Location and Site Plan for Site 1**





Figure 1. Location of Site 1.

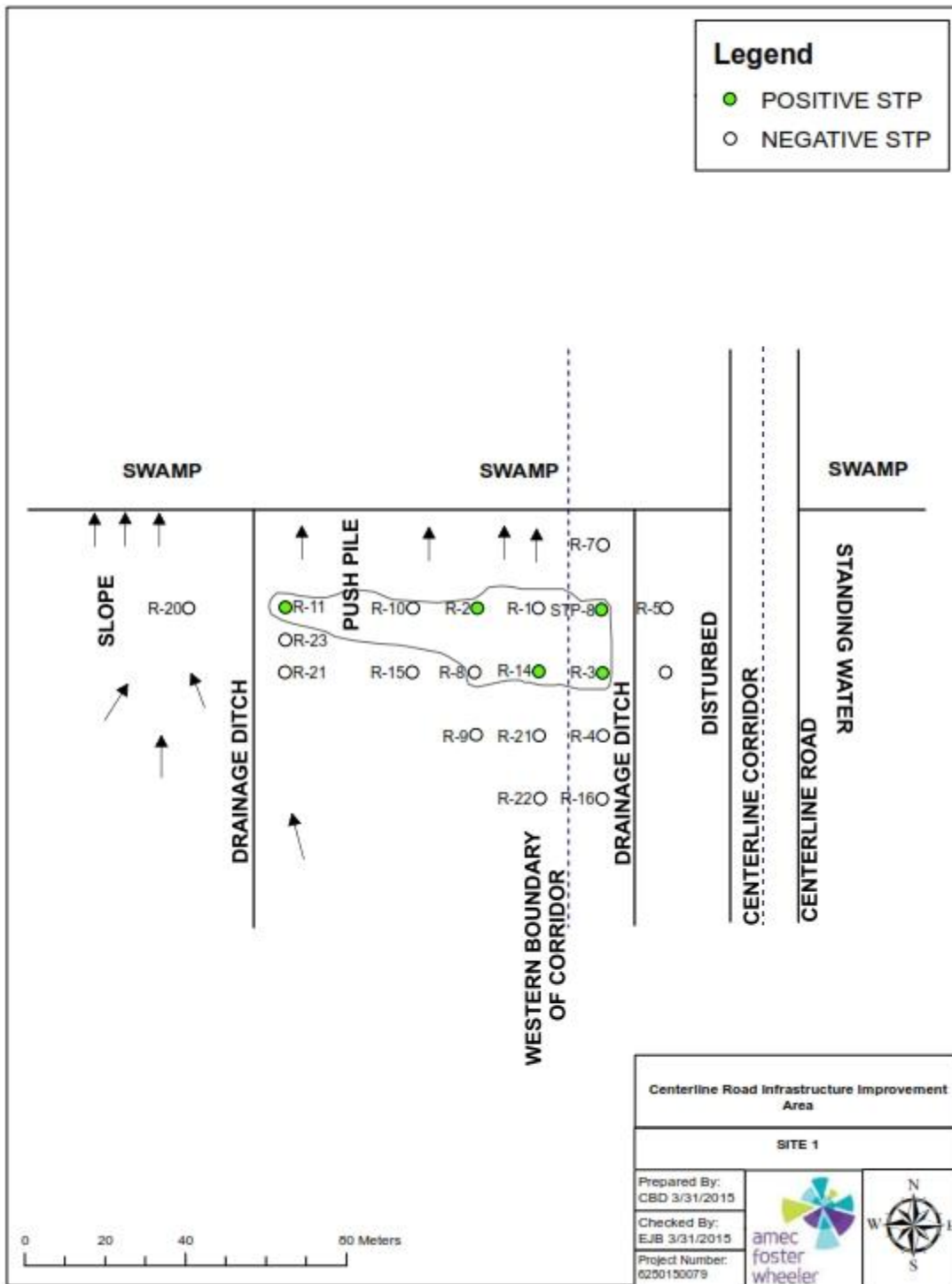


Figure 2. Plan View of Site 1 showing site boundary.

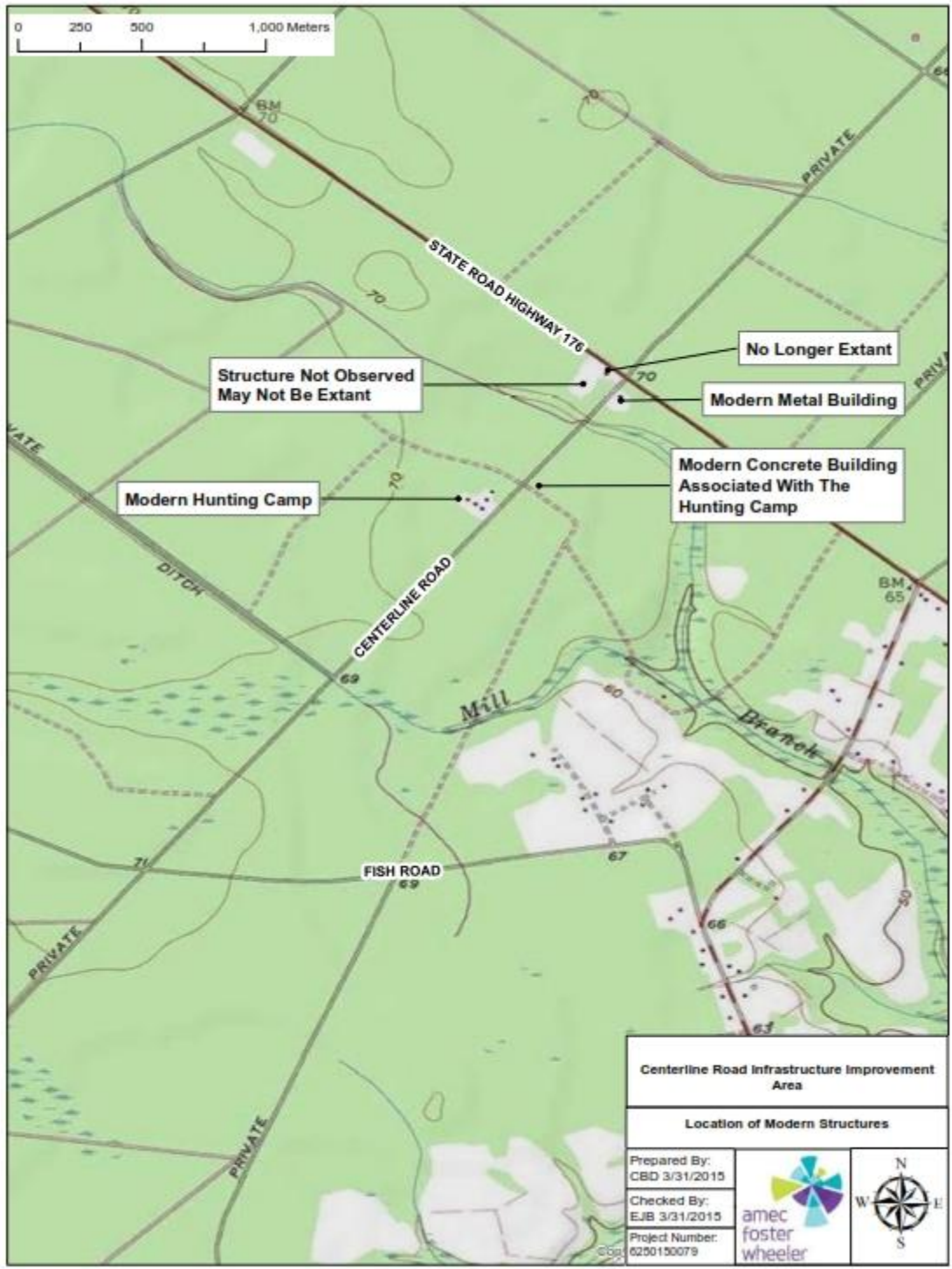


Figure 3. APE showing location of Modern Structures and Location of Former Structures.

## **APPENDIX II**

### **Photo Log**



**Photo 1. Photograph Showing Typical Disturbance in the APE (low potential area).**



**Photo 2. Photograph Showing Disturbance in the APE and Standing Water (low potential area).**



**Photo 3. Site 1, facing west.**

## APPENDIX F: ECONOMIC IMPACT ASSESSMENT



**Potential Economic Impact of a  
Proposed Advanced Manufacturing Facility  
In South Carolina**

**April 10, 2015**

**Frank Hefner, Ph.D.**

# Potential Economic Impact of a Proposed Advanced Manufacturing Facility in South Carolina

## *Summary*

### *Completion of Phase 1*

<b>Impact Type</b>	<b>Employment</b>	<b>Labor Income</b>	<b>Output</b>
F kt gev'Ghhgev	4.222	&432.753.38:	&5.887.; 45.656
Kpf kt gev'Ghhgev	5.596	&42; .479.845	& 4: .937.583
Kpf wegf 'Ghhgev	4.899	& 9.78: .597	&4; ; .442.798
<b>Vqvcrn'Ghhgev</b>	<b>8,052</b>	<b>&amp;739.579.388</b>	<b>\$4,793,859,371</b>

Ucwg'cpf 'Nqecr'Vcz gu<**\$72,387,244**

### *Completion of Phase 2*

<b>Impact Type</b>	<b>Employment</b>	<b>Labor Income</b>	<b>Output</b>
F kt gev'Ghhgev	6.222	&643.284.557	&9.553.: 68.: 89
Kpf kt gev'Ghhgev	8.96:	&63: .737.469	&3.879.652.944
Kpf wegf 'Ghhgev	7.577	&3; 7.358.956	&7; : .663.337
<b>Vqvcrn'Ghhgev</b>	<b>16,103</b>	<b>&amp;3.256.936.538</b>	<b>\$9,587,718,704</b>

Ucwg'cpf 'Nqecr'Vcz gu<**\$144,744,485**

*Construction Impact*  
(assumed \$200,000,000 facility)

<b>Impact Type</b>	<b>Employment</b>	<b>Labor Income</b>	<b>Output</b>
Direct Effect	1,988	\$93,362,276	\$199,999,999
Indirect Effect	376	\$20,677,050	\$56,004,137
Induced Effect	722	\$26,264,915	\$80,531,239
<b>Total Effect</b>	<b>3,086</b>	<b>\$140,304,240</b>	<b>\$336,535,375</b>

State and Local Taxes: **\$11,344,871**

## **Introduction**

Economic impact analysis primarily involves determining the change in economic activity in a region as a result of new business activity. This report analyzes the change in economic activity that will take place as a result of the construction and on-going production activities of a new advanced manufacturing and assembly facility that requires the presence of certain transportation, distribution, and logistics (TDL) cluster infrastructure (*e.g.*, automotive or aerospace industry sectors) and of other related activities in South Carolina.<sup>1</sup>

## **Proposed Project**

The project will be completed in two phases over a ten year period. In Phase 1, a \$600 million facility will be built hiring approximately 2,000 employees. It is estimated that the \$600 million investment will consist of \$400 million in equipment and \$200 million in land and building. In Phase 2, an additional \$400 million will be invested and an additional 2,000 jobs will be created. The estimated economic impact consists of two parts: the construction of the facility and the operations of the facility. The most relevant impact is the annual on-going impact of production from the facility. To estimate the impact, we consider the impact the facility when it is fully built in Phase 1.

## **Model Description**

The primary purpose of a regional economic impact model is to determine the inter-relationships among the various sectors of an economy. Using these relationships, the ramifications of any economic activity can be traced through the linkages within the various economic sectors. These relationships are tabulated in an input-output table (I-O table). The I-O table is the basis for regional impact analyses. The table is constructed with data on detailed inter-

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<sup>1</sup> The specific manufacturing industry is known to the author but for reasons of confidentiality is omitted from this report.

industry flows throughout an economy and information on both final demands and total output. An I-O table is fundamentally an accounting relationship for an entire economy (national, state, or sub-state), with each industry represented as both a column and a row in a matrix. In simple terms, it is a set of recipes for production in a given economy. The table provides data on industry demands and supplies to all industries. To determine regional impacts, the I-O table needs to be localized. A technique utilizing location quotients is the most common method. Location quotients are a form of top-down modeling from the national tables. An important consideration in developing regional models is the determination of leakages. Concrete, for example, purchased outside of the economic region does not exert an impact within the region. In this analysis we have assumed that none of the equipment purchased for the new plant will be produced in South Carolina. In addition, salary spent on goods and services produced elsewhere reduce the economic impacts.

Economic impacts are often referred to as “multiplier effects.” The direct spending on the construction of the new facility represents the initial or direct impact. This direct impact value is also the input into a regional impact model. The multiplier effects are often termed “ripple effect,” invoking an image of a rock tossed into a pond generating ripples across the water. These ripple effects consist of indirect and induced impacts. For example, the construction company buys concrete. The concrete company in turn may purchase gasoline for its trucks. These purchases are the “indirect impacts.” Each firm engaged in the direct construction and each firm in the supply chain (or backwards linkages) pays its employees. These employees in turn purchase goods and services locally. These purchases make up the “induced impacts.” Regional impact models measure these impacts.

In this report IMPLAN (Impact Analysis for Planning) was used. In the mid-1970s, the USDA Forest Service developed IMPLAN for community impact analysis. The current IMPLAN input-output database and model is maintained and sold by MIG, Inc. (Minnesota IMPLAN Group). According to the USDA, Natural Resources Conservation Service, over 1,500 clients across the country use the IMPLAN model (2009), making the results acceptable in inter-agency analysis within the government. IMPLAN users range from federal, state, and local governments, universities, and private companies. In South Carolina the model is used by university researchers at Clemson, the University of South Carolina, Coastal Carolina University, and the Citadel.

IMPLAN localizes the data within the state. IMPLAN contains 440 different sectors. The proposed advanced manufacturing facility is similar to manufacturing already exists within the state. By localizing the supply chain within the state of existing firms, we can estimate the ripple effects of a new plant. In a sense, what we are doing is assuming that the existing industry expands to the size of proposed plant and continues to utilize the existing supply chain. The impact of the construction of the new plant is categorized as IMPLAN 35, Construction of New Non-Residential Manufacturing Structures.

### *Economic Impact Analysis – Terminology*

<b>Term</b>	<b>Definition</b>
Economic activity	Total payments within the region.
Jobs	The number of jobs in the region supported by the economic activity associated with the project. Job estimates are not full time equivalents, but include part time positions. Seasonal jobs are adjusted to annual equivalents, e.g. four jobs for three months each equates to one job.
Income	Labor income, including wages and salaries, payroll benefits and incomes of sole proprietors.
Direct effects	Direct effects are the changes in sales, income and jobs in those businesses or agencies that directly receive the spending directly from the operations of the plant.
Indirect effects	Changes in sales, income and jobs in industries that supply goods and services to the businesses that sell directly to the plant.
Induced effects	Changes in economic activity in the region resulting from household spending of income earned through a direct or indirect effect. For example, the plant's employees live in the region and spend their incomes on housing, groceries, education, clothing and other goods and services within the region.
Total Output	Sum of direct, indirect and induced effects.
Multipliers	Multipliers capture the size of the total effects relative to the direct effects.

### **Estimated Impacts**

The proposed initial investment is assumed to \$600 million. Of this, \$400 million is equipment which we assume to be purchased outside of South Carolina and thus exerts no impact within the state. The remaining \$200 million is assumed to be for land and building, however there is no breakdown of how much will be used for construction. For the purposes of estimating an

impact, we have used \$200 million in construction costs. If this amount is reduced then the impact will be reduced proportionally.

**Construction Impact**  
(assumed \$200,000,000 facility)

<b>Impact Type</b>	<b>Employment</b>	<b>Labor Income</b>	<b>Output</b>
Direct Effect	1,988	\$93,362,276	\$199,999,999
Indirect Effect	376	\$20,677,050	\$56,004,137
Induced Effect	722	\$26,264,915	\$80,531,239
<b>Total Effect</b>	<b>3,086</b>	<b>\$140,304,240</b>	<b>\$336,535,375</b>

State and Local Taxes: **\$11,344,871**

It is estimated that the initial investment will generate a total of 3,086 during the construction phase which will support \$140,304,240 in labor income and generate a total impact of \$336,535,375. State and local taxes collected as a result of this activity is estimated to be in excess of \$11 million.



## Completion of Phase 1

<b>Impact Type</b>	<b>Employment</b>	<b>Labor Income</b>	<b>Output</b>
Direct Effect	2,000	\$210,531,168	\$3,665,923,434
Indirect Effect	3,374	\$209,257,623	\$828,715,361
Induced Effect	2,677	\$97,568,375	\$299,220,576
<b>Total Effect</b>	<b>8,052</b>	<b>\$517,357,166</b>	<b>\$4,793,859,371</b>

State and Local Taxes: **\$72,387,244**

Once the plant is up and running at the completion of Phase 1 it is estimated that 2,000 jobs will be directly employed at the plant. This will result in a total of 8,052 jobs within the state. Total labor income is estimated to be over \$517 million with a total economic impact of over \$4.7 billion. Over \$72 million will be collected in state and local taxes annually. (This amount could potentially be reduced depending on incentives offered.)

### Completion of Phase 2

<b>Impact Type</b>	<b>Employment</b>	<b>Labor Income</b>	<b>Output</b>
Direct Effect	4,000	\$421,062,335	\$7,331,846,867
Indirect Effect	6,748	\$418,515,247	\$1,657,430,722
Induced Effect	5,355	\$195,136,734	\$598,441,115
<b>Total Effect</b>	<b>16,103</b>	<b>\$1,034,714,316</b>	<b>\$9,587,718,704</b>

State and Local Taxes: **\$162,871,289**

Upon completion of Phase 2, it is estimated that the plant will have approximately doubled in size to approximately 4,000 employees. The total impacts approximately double from Phase 1 as a result. Total economic activity in the state is estimated to increase to almost \$10 billion which will support over 16,000 jobs. Over \$162 million will be collected in state and local taxes annually. (This amount could potentially be reduced depending on incentives offered.)

## **Author**

### **FRANK L. HEFNER**

Frank Hefner, Ph. D., is a Professor of Economics and director of the Office of Economic Analysis at the College of Charleston. He received his B.A. Degree in Economics from Rutgers College and his M.A. and Ph.D. Degrees from the University of Kansas. He taught at Washburn University in Topeka while he was a research assistant in the Institute for Policy and Social Research at the University of Kansas and at the University of South Carolina where he served as a research economist in the Division of Research. Dr. Hefner's research interests include regional economic development and forecasting. He participates in the Regional Advisory Committee of the S.C. Board of Economic Advisors. He is a past president of the Southern Regional Science Association. He has been quoted frequently in the press and has commented on economic conditions on local television and radio stations and before a number of organizations.

## APPENDIX G: AGENCY LETTERS

# South Carolina Department of Natural Resources

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Alvin A. Taylor  
Director  
Robert D. Perry  
Director, Office of  
Environmental Programs

May 1, 2015

Dr. Richard Darden  
U. S. Army Corps of Engineers  
69-A Hagood Avenue  
Charleston, SC 29403-5107

REFERENCE: P/N SAC-2015-0476-SIR, Berkeley County, Project Soter

Dear Dr. Darden,

Personnel with the South Carolina Department of Natural Resources (DNR) have reviewed the above referenced project and offer the following comments.

## **Background**

Berkeley County (Applicant) is requesting a Section 404 permit with a 25-year duration to facilitate development of a portion of the Camp Hall Commerce Park in Berkeley County for Project Soter, a major, advanced manufacturing facility. The proposed project includes the following wetland impacts: placement of 670,705 cubic yards of clean fill material in 194.76 acres, land clearing of 16.90 acres, excavating of 3.27 acres, and shading of 2.91 acres of wetlands and other waters in order to construct Phases 1 and 2 of the proposed project. Phase 1 will include the development of approximately 23,040,000 ft<sup>2</sup> of land for the construction of a manufacturing and production space. Phase 1 also involves the development of approximately 1,050,000 ft<sup>2</sup> of land for the construction of administrative offices and a visitor's center. The total footprint for Phase 1 is approximately 575 acres. Phase 2 will include the development of an additional 14,040,000 ft<sup>2</sup> of land for the construction of a second manufacturing, assembly, and production space occupying approximately 322 acres. All required compensatory mitigation will be obtained through off-site, landscape-scale permittee-responsible mitigation activities utilizing the watershed approach.

## **Avoidance and Minimization of Impacts to Waters of the United States**

DNR recognizes that for various and legitimate reasons, the ability of the Applicant to avoid and minimize impacts, further than the extent described in the application and supporting documents, is not practicable.

## **Mitigation for Unavoidable Impacts**

The public notice includes a permittee-responsible mitigation plan referred to as the Project Soter – Landscape Mitigation Plan. This plan was designed to achieve landscape-scale conservation objectives

Dr. Richard Darden  
P/N SAC-2015-0476-SIR, Berkeley County, Project Soter  
May 1, 2015

based on the priorities of both local and regional environmental advocacy groups and the Federal and State regulatory and resource agencies. The submitted plan will preserve, restore and enhance approximately 1,533 acres of wetlands within approximately 2,458 acres of property at three separate locations within the Four Hole Swamp watershed.

The specific aspects of the mitigation plan include the following sites:

1. Bannister Tract, consisting of 1,667 acres (431 acres of wetland preservation, 452 acres of wetland enhancement and 28,857 lf of stream preservation),
2. Singletary Tract, consisting of 112 acres (100 acres of wetland preservation and 6,402 lf of stream preservation),
3. Dean Swamp Tract, consisting of 380 acres (94 acres of wetland preservation, 159 acres of wetland enhancement and 4,480 lf of stream preservation), and
4. Walnut Branch Tracts, consisting of 337 acres (265 acres of wetland preservation and 8,193 lf of stream preservation).

DNR is familiar with the sites proposed as mitigation and recognizes they have been identified as important potential conservation/preservation tracts for several decades through various conservation plans developed by the National Audubon Society working with other conservation organizations partnering on landscape-scale conservation in the watershed. This area is of regional, national and international conservation significance, and is located adjacent to the Francis Beidler Forest (RAMSAR site no. 1773) which is one of only two such sites in South Carolina, 37 sites in the United States, and 2,000 sites globally which have been designated by the RAMSAR Convention as *Wetlands of International Importance*.

The watershed contains a variety of strategically important wetlands and coastal plain habitat; the ecological significance of which is well documented. Industrial land uses and urban sprawl pose the greatest threats to natural resources, wetlands and water quality within the watershed. These threats often result in fragmentation of vital fish and wildlife habitats and loss of traditional land uses (forestry, agriculture, wildlife management, fishing and hunting). The watershed links the ACE Basin and CAWS Basin focus areas, thereby, broadening partnership-conservation initiatives across the entire coastal plain of South Carolina. Further, this strategic linking of the greenbelt surrounding development expanding outward from Charleston, North Charleston, Moncks Corner and Summerville will buffer the watershed from future adverse impacts including impacts to wetlands, streams and water quality.

In an effort to further enhance landscape-scale mitigation efforts, the Applicant also proposes to provide \$1.5 million into an escrow account to be held by Lord Berkeley Conservation Trust. The funds are to be used for fee simple property acquisition or conservation easement support on important conservation properties. These funds are to be administered by representatives of Audubon, Lord Berkley Land Trust, and the Low Country Open Land Trust (Fund Oversight Committee – FOC). These funds likely are to be leveraged by the conservation organizations to achieve even significantly greater ecological restoration and conservation outcomes in the watershed.

On April 30, 2015, DNR staff participated in an interagency inspection of the site and the areas proposed as mitigation. DNR concludes through previously gathered information, scientific literature, conservation management experience and as confirmed through site inspections, the areas proposed for mitigation offer, at a minimum, a unique opportunity to:

1. Protect at least 2,496 acres which include opportunities to perform restoration and enhancement of coastal plain streams and wetlands on areas previously managed for intensive timber and wood fiber production,
2. Provide significant opportunity to perform long-term ecological renewal of regionally sensitive habitats important to a variety of threatened and endangered species,

3. Provide necessary buffering of wetlands and streams proposed to be protected, restored and enhanced as well as buffering of sensitive habitats important to species susceptible to disturbance,
4. Provide opportunity to significantly improve water quality within the watershed through stream and wetland restoration, enhancement and buffering as well as long-term ecological renewal and stewardship through protective easements,
5. Provide opportunity to extend preservation and conservation management benefits to adjacent properties,
6. Provide opportunity for land and conservation management efficiency and cost savings to the conservation partners, the DNR and the Francis Biedler Forest,
7. Provide opportunities for long-term, holistic, science-based management of forest ecotypes critical to the habitat requirements of neotropical migrating songbirds and a broad array of wetland dependent birds and other fish and wildlife,
8. Provide private conservation partners leverage opportunity to protect additional adjacent tracts, including significant wetlands, through fee title acquisition and/or conservation easements further linking important riparian corridors,
9. Provide for additional, traditional public use opportunities,
10. Provide for protection of cultural and historical resources that may occur on the properties proposed for preservation as well as properties that may be protected at a later date and as a direct result of the proposed actions, and
11. Provide public conservation education and outreach on the importance of protecting wetlands, streams and water quality both now and for future generations.

The Applicant's plan is uniquely positioned to protect these properties while the ability to do so exists. There is concern over the window of opportunity to complete these and other potentially related actions that remain vital to the local conservation organizations' plans to affect further landscape-scale conservation. If such conservation actions are not completed, the outcome will increase urban sprawl resulting in detrimental impacts of Waters of the United States, water quality, fish and wildlife and their habitats and diminish quality-of-life for citizens.

### **Application of The Mitigation Rule**

The Mitigation Rule (Rule) provides the District Engineer (DE) the discretion to consider mitigation opportunities through preservation as long as the following criteria are met:

1. Resources to be preserved provide important physical, chemical and biological functions and contribute significantly to the ecological sustainability of the watershed,
2. The DE determines preservation is appropriate and practicable,
3. Resources to be preserved are under threat of destruction or adverse modification, and
4. The proposed preservation sites will be permanently protected by a third party conservation easement or title transfer to a state resource agency or land trust.<sup>1</sup>

Further, the Rule provides that preservation alone may compensate for permitted impacts "where preservation has been identified as a high priority using the watershed approach...."<sup>2</sup> The Rule also acknowledges "public interest" factors in mitigation planning.<sup>3</sup>

The Applicant intends that these sites be titled to qualified land conservation organizations and/or transferred to DNR. The parcel intended eventually for DNR also may be incorporated into the Heritage Trust Program and managed as Heritage Preserve in accordance with a Dedication Agreement. The Heritage Trust Program was established in 1976 under §51-17-10 of the South Carolina Code of Laws to

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<sup>1</sup> 33 C.F.R. § 332.3(f).

<sup>2</sup> 33 C.F.R. § 332.3(h)(2).

<sup>3</sup> 33 C.F.R. §332.1(d).

protect lands with unique and outstanding natural and cultural features. The Heritage Trust Program protects, in perpetuity, natural areas that contain unique landforms to include threatened, endangered, or unique plant or animal habitats, outstanding historical or archaeological features, or other unusual or outstanding scientific, educational, aesthetic or recreational characteristics.

DNR agrees with the Applicant's proposed mitigation plan and its objectives. The plan meets the Rule's criteria of preservation mitigation as it:

1. Encompasses outstanding resources based on rigorous scientific and technical analysis,
2. Provides opportunity to protect, restore and enhance important physical, chemical and biological functions and contributes significantly to the ecological sustainability of the watershed,
3. Preserves resources under threat of destruction or adverse modification, and
4. Permanently protects the proposed preservation sites by a third party conservation easement or title transfer to a state or federal resource agency or land trust.

### **Summary**

DNR recognizes the importance of the proposed mitigation tracts in furthering conservation efforts within the Four Holes Swamp Watershed which includes the wetland nature preserve known as Francis Beidler Forest. We reiterate that the Francis Beidler Forest is a nationally and internationally recognized old growth swamp forest of International Importance and an Audubon Important Bird Area. The preserve includes over 16,000 acres of protected wetlands and adjacent upland habitats. The protection of wetland systems such as those proposed in the Project Soter – Landscape Mitigation Plan is vital to the long-term health and sustainability of the Four Holes Swamp Watershed and the Francis Beidler Forest.

DNR believes the proposed mitigation plan will result in profound natural resource benefits through protection of vulnerable wetlands and critical fish and wildlife habitats, while adding to the collective efforts of DNR and its many public and private conservation partners. Our ongoing mission of landscape-scale conservation includes the following three basic features:

1. Identification of a regional system of interconnected lands, wetlands, streams and riparian corridors,
2. Actions organized to achieve and link multiple specific conservation objectives, and
3. Stakeholders who cooperate in a concrete fashion to achieve those objectives.

The proposed project and its mitigation plan presents a unique opportunity to embrace and further this concept while providing indispensable ecological benefits to include wetland and stream protection restoration and enhancement, buffering of wetlands and riparian corridors, water quality enhancement, protection of surface and source water, flood mitigation, storm water management and erosion control, connectivity of sensitive habitats, benefits to unique species, carbon sequestration, preservation of traditional uses, and broad recreational and other public uses.

It has been conclusively demonstrated that landscape-scale conservation encourages ecological resilience and economic sustainability through the use of science-based priorities. Additionally it leverages resources and multi-functionality, is embraced by diverse stakeholders, facilitates reduced land management costs, reduces wildfire-risk potential, achieves watershed/river basin health objectives, utilizes forest products to benefit local economies, and provides public use and enjoyment of natural resources and tourism. Now, it can be used to facilitate the permitting of appropriately sited projects allowing infrastructure and development to proceed. Clearly, implementation of this mitigation plan can be one of the lasting positive legacies affecting the Four-Holes Swamp Watershed.



Dr. Richard Darden  
P/N SAC-2015-0476-SIR, Berkeley County, Project Soter  
May 1, 2015

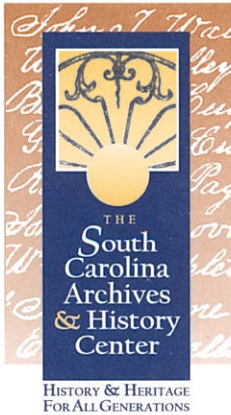
Please do not hesitate to contact me at your earliest convenience should you require additional information on this matter.

Sincerely,



Bob Perry  
Director, Office of Environmental Programs

c: Kelly Laycock – USEPA  
Pace Wilber – NMFS  
Tom McCoy – USFWS  
Heather Preston – DHEC-EQC  
Blair Williams – DHEC-OCRM  
Elizabeth Johnson – DAH  
D. Glenn McFadden – DNR Board Chairman  
Alvin A. Taylor  
Breck Carmichael  
Emily Cope



April 27, 2015

Ms. Tina Hadden  
Regulatory Division Chief  
US Army Corps of Engineers, Charleston District  
69A Hagood Ave.  
Charleston, SC 29403

RE: SC SHPO Comments, Project Soter

Dear Ms. Hadden,

This letter is in response to the request for comments pursuant to Section 106 of the National Historic Preservation Act (NHPA) regarding Project Soter. This response supersedes all other communications from this office and constitutes the agency's final comments regarding this undertaking.

On April 23, 2015, Ms. Emily Dale, Archeologist and GIS Coordinator for this agency emailed a series of comments to Dr. Richard Darden, Regulatory Division, U.S. Army Corps of Engineers, Charleston District, concerning the public notice and this project. Those comments resulted from this agency's failure to appropriately consult the cultural resource assessments previously sent to this office. Those cultural resource assessments appear under the name Camp Hall Tract and not Project Soter. Those reports include the *Draft Report Cultural Resource Identification Survey, Camp Hall Tract, Berkeley County, South Carolina* (Amec, Foster, Wheeler, March 2015); *Cultural Resources Assessment of the Camp Hall Tract Modification, Berkeley County, South Carolina* (Brockington and Associates, Inc., October 2008); and *Cultural Resources Assessment of the Camp Hall Tract, Berkeley County, South Carolina* (Brockington and Associates, Inc., 12 March 2007).

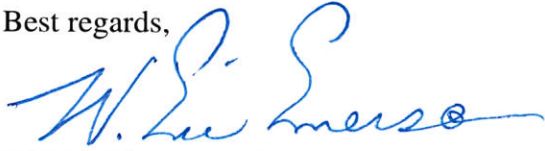
The aforementioned reports address significantly the concerns listed in Ms. Dale's email message regarding cultural resources in the area of potential effect (APE). Cypress Methodist Campground, a National Register listed property also mentioned in that message, falls significantly outside the APE, and therefore should not be impacted by undertaking.

Drawing upon the information ascertained from the previously noted cultural resource assessments and an onsite visit of the property by Ms. Elizabeth Johnson, Deputy State Historic

Preservation Officer, and Ms. Dale, this agency concurs with the Army Corps of Engineers' determination that there will be no effect on historic properties.

Thank you for your patience during this process. Please let me know if I may answer any questions regarding this letter or be of service in the future.

Best regards,

A handwritten signature in blue ink, appearing to read "W. Eric Emerson". The signature is fluid and cursive, with a large initial "W" and a long, sweeping underline.

W. Eric Emerson, Ph.D.

Director and State Historic Preservation Officer



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
REGION 4  
ATLANTA FEDERAL CENTER  
61 FORSYTH STREET  
ATLANTA, GEORGIA 30303-8960

Lieutenant Colonel John T. Litz  
District Engineer  
Attn: Mr. Richard Darden  
U.S. Army Corps of Engineers  
69A Hagood Avenue  
Charleston, South Carolina 29403-5107

Subject: SAC-2015-0476-SIR Berkeley County, Project Soter

Dear Lieutenant Colonel Litz:

This letter is in response to your request for comments on the above referenced joint public notice. Berkeley County serves as the applicant to develop a site for an interested entity to locate, build, and operate an advanced manufacturing and assembly facility that requires the presence of certain transportation, distribution, and logistics cluster infrastructure (e.g., automotive or aerospace industry sectors). According to the applicant, the project purpose is to locate, build, and operate a new advanced manufacturing facility that requires direct access to the Interstate Highway system and location within 50 miles of sea and air port facilities. The proposed work consists of placing 670,705 cubic yards of clean fill material in 194.76 acres and 8,091 linear feet of relatively permanent waters, land clearing of 16.90 acres, excavating of 3.27 acres, and shading of 2.91 acres of wetlands and other waters to construct Phases 1 and 2 of the proposed project. The majority of the proposed impact areas are currently being managed as an active silviculture site. Operating at full capacity, Phase 1 is expected to employ approximately 2,000 individuals at the manufacturing facility, administrative offices, and a visitor's center. While the timing of construction of Phase 2 is dependent on market conditions, it is expected to be constructed and operational within 10 years of the initiation of construction for Phase 1. Operating at full capacity, Phase 2 is expected to employ an additional 2,000 individuals at that facility.

The applicant proposes a permittee-responsible mitigation plan to preserve, and enhance approximately 1,533 acres of wetlands and preserve 47,932 linear feet of stream within approximately 2,496 acres of property to be permanently protected in the Dean Swamp and Walnut Branch watersheds, tributaries of Four Hole Swamp that are defined by the National Audubon Society as critical priority areas in need of protection.

As background, the Environmental Protection Agency participated in a pre-application meeting on April 15, 2015, and site visits to proposed impact and mitigation sites on April 30, 2015. During the site visits, the EPA requested additional information regarding why an onsite alternative with less impacts was not the preferred alternative. Applicant representatives explained logistical reasons that would exclude this alternative, including having to truck manufactured products across a five-lane highway multiple times during the process, which sufficiently addressed this concern. The EPA also voiced questions regarding the proposed mitigation plan which will be explained in more detail below.

The EPA appreciates the fact that, though the applicant for this project is Berkeley County, the alternatives analysis includes sites across the state of South Carolina. The applicant has very specific requirements for the project including direct access to the Interstate Highway system and location within 50 miles of sea port and airport facilities. These requirements eliminated the majority of alternative sites within the state. Once a preferred site was chosen, the applicant considered many onsite alternatives to minimize their impacts. Therefore, the EPA believes the applicant has sufficiently demonstrated their effort to avoid and minimize impacts to waters of the United States.

For the unavoidable impacts proposed, the applicant has submitted a permittee-responsible compensatory mitigation plan. The 2008 Mitigation Rule, integrated into the Clean Water Act Section 404(b)(1) Guidelines as Subpart J, gives preference to mitigation through Mitigation Banks or in-lieu fee programs before permittee-responsible mitigation. However, there are currently no banks which have sufficient credits within the impact watershed and there are no active in-lieu fee programs that service the area. The proposed plan includes multiple tracts of land referred to as the Bannister Tract, Singletary Tracts, Dean Swamp Tract, and Walnut Branch Tracts. Combined, these parcels would preserve 890 acres of wetlands and 47,932 linear feet of streams, as well as the vegetative enhancement of an additional 611 acres of wetlands. The featured landscape mitigation parcel, the Bannister Tract, is approximately a 1,667 acre forested tract on Sandy Run Creek. This tract has extensive bottomland hardwood and pine flatwood wetlands which are currently under intensive silviculture management that will be returned to natural conditions through enhancement and restoration activities. This tract will be purchased and conveyed to the South Carolina Department of Natural Resources for use as a wetland demonstration site and for use as a public access wildlife management area with the intent of designating the property as a South Carolina Heritage Trust Preserve. The Dean Swamp tracts will be conveyed to the Audubon Society or the Lord Berkeley Conservation Trust (LBCT). These tracts along with the remaining tracts will be protected through a conservation easement held by LBCT. As a special condition of the permit and to fully satisfy the parameters of this landscape-scale mitigation plan, the applicant proposes to provide \$1.5 million (herein after, "Fund") into an escrow account to be held by LBCT. The Fund is to be used for fee simple conservation property acquisition or to support conservation easements on important conservation properties. The conservation projects will be chosen and administered by the representatives of the following organizations: Audubon Society, LBCT, and the Low Country Open Land Trust (collectively, the "Fund Oversight Committee").

The applicant's plan would mitigate wetland impacts through preservation and enhancement at approximately an 8 to 1 ratio and streams at nearly a 6 to 1 ratio. Also, while the Charleston District Corps of Engineers has indicated that their Standard Operating Procedure, "U.S. Army Corps of Engineers Charleston District 2010 Guidelines for Preparing a Compensatory Mitigation Plan," is not designed to assess large landscape-scale mitigation projects such as the one proposed, the plan would generate more than the required credits calculated using that document's formulas.

The EPA believes the plan has potential to adequately mitigate unavoidable impacts to waters of the United States provided that our comments and concerns below are sufficiently addressed.

The proposed mitigation plan indicates that several plant communities will be enhanced through planting and vegetation management techniques, including bottomland hardwood, pine flatwood, and isolated pond habitat. These communities require very different management (i.e., regular burning for pine flatwood) yet only a single vegetation performance standard is given:

*Vegetative monitoring documents a minimum of 320 planted stems per acre survive at the end of year 3, and 260 planted stems per acre survive at the end of year 5, and no more than 25 percent*

*of any one species and no more than 1 percent invasive species. Height, lateral growth and root collar diameter demonstrates an increase over baseline and each prior monitoring period. Planted vegetation demonstrates an average 5 to 7 feet in height at the end of year 5. If volunteers are utilized to meet the set performance standards, species will be tagged in the field as a volunteer and the same data collected as for planted stems.*

Performance standards should be tailored to each community. For the pine flatwood communities we recommend the applicant use an approach that has been formulated by the Alabama-Mississippi Mitigation Banking Review Team for Wet Pine Flats. This team suggests using the Functional Capacity Index of the Plant community (FCI<sub>plant</sub>) derived from Rheinhardt, R.D., Rheinhardt, M.C., and Brinson, M. M. (2002), "A Regional Guidebook for Applying the Hydrogeomorphic Approach to Assessing Wetland Functions of Wet Pine Flats on Mineral Soils in the Atlantic and Gulf Coastal Plains."

Assessment of this function reflects the ability of a Wetland Assessment Area (WAA) to maintain a characteristic plant community composition and diversity. This is called the Functional Capacity Index or FCI. The Functional Capacity Index of the Plant community (FCI<sub>plant</sub>) is the average of the relative groundcover, subcanopy and pine composition as shown in the equation below. The groundcover is the maximum of the herbaceous (Herb), native bunch grass (Nbg), or sedge (Sedges) scores. The WAA is an area of wetland within a bank that is relatively homogeneous with respect to the site-specific criteria used to assess wetland functions (i.e., hydrologic regime, vegetation structure, topography, soils, successional stage, etc.). The presence of invasive and exotic species (Exotics) reduces the groundcover functional capacity index as the aerial coverage of exotic species increases. Elimination of invasive species is preferred; however, less than 1 percent aerial coverage of exotic species is not reflected in the functional capacity index as long as control measures continue.

$$FCI_{plant} = (\text{Groundcover} + \text{Subcanopy} + \text{Pines}) \div 3$$

Where;

$$\text{Groundcover} = \text{Exotics} \times \left[ \text{MAX} \left( \text{Herb}, \text{Nbg}, \sqrt{(\text{Cypress} \times (\text{Sedges} + \text{Subc}) / 2)} \right) \right]$$

The site-scale variables are assessed at one (1) fixed location and one (1) location chosen at random within each WAA or 100ha (247 acres). Random monitoring plots should be located using a grid system and random number table. Monitoring will be assessed in four (4) nested plots at each location. A permanent pole placed vertically in the ground to mark the center of the nested plots should mark the center of the nested monitoring points; 1m<sup>2</sup> plot, 2m radius, 10m radius, and 100m radius. The center of the monitoring plots should be permanently marked, preferably with a metal pipe or a steel fence post.

Herb = 1m<sup>2</sup> plot: 1 point for each species below,  
 2m radius: 0.5 points for each additional species  
 Divide the mean herbaceous indicator score of each WAA by 8.0; for Cypress/Pine Savanna (if Cypress present) divide the mean indicator score by 7.0.

<i>Aletris spp.</i>	<i>Aristida spp.</i>	<i>Balduina spp.</i>	<i>Biglowia nudata</i>	<i>Carphephorus spp.</i>
<i>Chaptalia tomentosa</i>	<i>Coreopsis spp.</i>	<i>Ctenium aromaticum</i>	<i>Dichromena spp.</i>	<i>Erigeron vernus</i>
<i>Eriocaulon spp.</i>	<i>Erygium</i>	<i>Eupatroium</i>	<i>Helianthus spp.</i>	<i>Lycopodium</i>

	<i>intergrifolium</i>	<i>leucolepis</i>		<i>spp.</i>
<i>Muhlenbergia expansa</i>	<i>Rhexia spp.</i>	<i>Sarracenia spp.</i>	<i>Schizachyrium scoparium</i>	<i>Xyris spp.</i>

Nbg = Native Bunch Grasses - 2m radius: Combined percent cover area of the following: *Ctenium spp.*, *Muhlenbergia spp.*, *Aristida spp.*, *Sporobolus spp.*, *Schizachyrium spp.*  
Divide cover by 0.50  
Average scores by WAA

Sedges = 2m radius: Combined percent cover area of the following; *Carex spp.*, *Sclaria spp.*, *Rynchospora spp.*  
Divide by 0.50  
Average scores by WAA

Cypress = Stems per hectare (2.47 acres). See alternative density calculation strategy below.\*  
Determine for density of pond cypress the following class sizes; (1) sapling >1m tall and less than 7.5 cm dbh (3 inches),  $x = \text{density}/250$  (if the resulting score is >1.0, reduce to 1.0), (2) midcanopy >1 m tall and 7.5-15 cm (3-6 inches) dbh,  $y = \text{density}/50$  (if the resulting score is >1.0, reduce to 1.0), (3) canopy >15cm (6 inches) dbh,  $z = \text{density}/100$  (if the resulting score is >1.0, reduce to 1.0). Cypress score =  $(x + y + z)/3$ .  
Average scores by WAA

Pines = 10m radius: Measure the basal area of all pine species > 1m high. Score  $\geq 0 \leq 6.25$  sq.ft = 1.0, 6.25-12.0 = 0.5,  $\geq 12.0 = 0$  (Lewis and Teaford, 1995)

Subc = Subcanopy Vegetation - 10m radius: Count all stems at one meter in height even if they originate from same plant. If Subc < 200, then Subc = 1.0, if Subc is 201-300, then Subc = 0.5, if Subc > 300, then Subc = 0 (Modified HGM)

Exotics = 100m radius: Estimate % aerial coverage of all invasive species (i.e., *Sapium Sebiferum*, *Panicum Repens*, *Imperata Cylindrica*, etc.) If Exotics < 1% then Exotics = 1.0, if >1% then Exotics =  $(1.0 - (\% \text{ coverage})/10)$ .

\*For Cypress density, another way to determine density is determine the distance to the closest individual in each size class from randomly selected points in the WAA. To do this, at each center point, measure the distance in meters from the center point to the nearest sapling, midcanopy and canopy stem of pond cypress. (Sample at least three points, more is better). Determine the average distance to individuals in each of three size classes. Calculate density as follows:  $\text{Density} = 10,000/[2 \times (\text{average distance})^2]$ .

We recommend that the applicant apply this method to the reference area and to the enhancement area for baseline data.

During the site visits to some of the bottomland hardwood preservation areas, it was noted that some of the areas had been clear-cut and the applicant planned to rely on natural regeneration. The EPA indicated that while enhancement credit was not being sought, performance standards would be required to show that these areas were trending toward reference bottomland conditions and worthy of preservation.

The applicant proposes to monitor all mitigation sites for 5 years and to supply monitoring reports to the Interagency Review Team (IRT) each year. The EPA appreciates the effort to keep the IRT involved with mitigation during the entire monitoring period. During the site visit, it was indicated that clear-cut areas proposed to be put on a burning rotation might not be burned before the monitoring period is over. If this is the case, it is unclear how the success of this management technique will be assessed. We recommend that the applicant provide additional information on how success will be adequately measured or extend the monitoring period so that management techniques can be utilized and measured.

Throughout the pre-application process, the EPA's concerns regarding avoidance, minimization, and alternatives analysis were addressed. Questions regarding the compensatory mitigation for unavoidable impacts remained after the review of the plan and site visits, but overall we find the plan to have potential to mitigate for the proposed impacts.

In summary, the EPA's concerns regarding avoidance and minimization, and alternatives analysis have been addressed. The EPA requests minor modifications and more details regarding the compensatory mitigation plan in order to alleviate our remaining concerns.

Thank you for considering these comments in your permit review and issuance process. If you have any questions, please contact Mr. Kelly Laycock at [laycock.kelly@epa.gov](mailto:laycock.kelly@epa.gov) or (404) 562-9132 for more information.

Sincerely,

A handwritten signature in blue ink that reads "Tony Able". The signature is written in a cursive, flowing style.

Tony Able  
Chief  
Wetlands Regulatory Section

cc: See Enclosed List



cc: Send Electronically

Richard Darden - USACE - Richard.Darden@usace.army.mil

Travis Hughes - USACE - Travis.G.Hughes@usace.army.mil

Mark Caldwell - USFWS - Mark\_Caldwell@fws.gov

Pace Wilber - NMFS - pace.wilber@noaa.gov

Susan Davis - SCDNR - daviss@dnr.sc.gov

Heather Preston - SCDHEC - prestohs@dhec.sc.gov

Erin Owen - SCDHEC- owenen@dhec.sc.gov>



**UNITED STATES DEPARTMENT OF COMMERCE**

National Oceanic and Atmospheric Administration

**NATIONAL MARINE FISHERIES SERVICE**

Southeast Regional Office

263 13th Avenue South

St. Petersburg, Florida 33701-5505

<http://sero.nmfs.noaa.gov>

May 1, 2015

(Sent via Electronic Mail)

Lt. Colonel John T. Litz, District Engineer  
USACE Charleston District  
69A Hagood Avenue  
Charleston, South Carolina 29403-5107

Dear Colonel Litz:

NOAA's National Marine Fisheries Service (NMFS) reviewed the projects described in the public notice(s) listed below.

Based on the information in the public notice(s), the proposed project(s) would **NOT** occur in the vicinity of essential fish habitat (EFH) designated by the South Atlantic Fishery Management Council or NMFS. Present staffing levels preclude further analysis of the proposed activities and no further action is planned. This position is neither supportive of nor in opposition to authorization of the proposed work.

<u>NOTICE NO.</u>	<u>APPLICANT</u>	<u>NOTICE DATE</u>	<u>DUE DATE</u>
2015-0476-SIR	Berkeley County	April 16, 2015	May 1, 2015

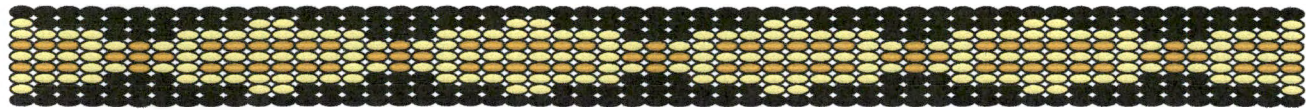
Please note these comments do not satisfy your consultation responsibilities under section 7 of the Endangered Species Act of 1973, as amended. If the activity "may effect" listed species or critical habitat that are under the purview of NMFS, consultation should be initiated with our Protected Resources Division at the letterhead address.

Sincerely,

Pace Wilber (for)

Virginia M. Fay  
Assistant Regional Administrator  
Habitat Conservation Division





May 4, 2015

Attention: Richard L. Darden  
Charleston District, Corps of Engineers  
69 A Hagood Avenue  
Charleston, South Carolina 29403-5107

Re. THPO #	P/N #	Project Description
2015-1-57	2015-0476-SIR	Permit to place fill material in jurisdictional waters near Timothy Creek

Mr. Darden,

The Catawba have no immediate concerns with regard to traditional cultural properties, sacred sites or Native American archaeological sites within the boundaries of the proposed project areas. **However, the Catawba are to be notified if Native American artifacts and / or human remains are located during the ground disturbance phase of this project.**

If you have questions please contact Caitlin Totherow at 803-328-2427 ext. 226, or e-mail [caitlinh@ccppcrafts.com](mailto:caitlinh@ccppcrafts.com).

Sincerely,

Wenonah G. Haire  
Tribal Historic Preservation Officer



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

176 Croghan Spur Road, Suite 200  
Charleston, South Carolina 29407

April 27, 2015

Lt. Colonel John T. Litz  
District Engineer  
U.S. Army Corps of Engineers  
69A Hagood Avenue  
Charleston, S.C. 29403-5107

Attn: Dr. Richard Darden

Re: P/N SAC-2015-00476-SIR, Project Soter, Manufacturing Facility, Berkeley County  
FWS Log # 2015-CPA-0082

Dear Colonel Litz:

The U.S. Fish and Wildlife Service (Service) has reviewed the above-referenced public notice dated April 16, 2015. Berkeley County has requested a Department of the Army (Department) permit pursuant to sections 401 and 404 of the Clean Water Act (33 U.S.C. 1344) and the South Carolina Coastal Zone Management Act (48-39-10 et seq.) to place fill in jurisdictional wetlands near Timothy Creek in Berkeley County, South Carolina. This report is submitted in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), and section 7 of the Endangered Species Act (ESA) as amended (16 U.S.C. 1531-1543). This report is also to serve as official comments to the South Carolina Department of Health and Environmental Control.

The proposed work consists of placing clean fill material in 194.76 acres, clearing 16.90 acres, 3.27 acres of excavation, and shading 2.91 acres of wetlands and other waters to construct Phases 1 and 2 of the proposed project. Phase 1 will affect a total of 575 acres of land and include the construction of a manufacturing facility, administrative offices, and a visitor's center. Phase 2 will encompass 322 acres and include construction of a second manufacturing, assembly, and production space. While the timing of construction of Phase 2 is dependent on market conditions, it is expected to be constructed and operational within 10 years of the initiation of construction for Phase 1. The project purpose is to locate, build, and operate a new advanced manufacturing facility that requires the presence of transportation, distribution, and logistics sector facilities and infrastructure for viability and feasibility.

The Service attended an onsite, interagency site visit on April 15, 2015. Over the past several decades, the entire Project Soter site has been intensively managed and logged for industrial pine production by MeadWestvaco. Numerous roads and associated ditches crisscross the site as a result of the silviculture activities. These ditches provide fast and effective storm water drainage for the site during rain events and have adversely impacted the existing on site wetlands. Most of the larger wetlands have been bedded and planted in loblolly pine trees. Some of the isolated wetlands retain their natural hydrology and vegetation likely because they were too wet for traditional timber harvesting and planting. Vegetation is indicative of pioneer species that includes red maple, sweetgum, and water oak. Wetlands within the Project Soter site drain to either Cypress Swamp and/or Four Holes Swamp. Cypress Swamp is a tributary of the Ashley River and Four Holes Swamp is a tributary of the Edisto River. Runoff from the site is untreated and likely contains sediments, residual herbicides, or other pollutants associated with forestry practices.

The Service concurs with a determination that this project is not likely to adversely affect any federally protected species and/or designated or proposed critical habitat. In view of this, we believe that the requirements of section 7 of the ESA have been satisfied. However, obligations under section 7 of the Act must be reconsidered if (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered, (2) this action is subsequently modified in a manner which was not considered in this assessment, or (3) a new species is listed or critical habitat is determined that may be affected by the identified action.

For informational purposes only, the Service is including a list of species that have been petitioned for listing under the Endangered Species Act as well as Candidate Species. These species are collectively referred to as "At-Risk Species" (ARS). We have included a list of the ARS that may occur in Berkeley County, South Carolina. Although there are no Federal protections afforded to ARS, we recommend the applicant consider them in the project's development plans. Incorporating proactive measures to avoid or minimize harm to ARS may improve their status and assist with precluding the need to list these species. Additional information on ARS can be found at: <http://www.fws.gov/southeast/candidateconservation>.

As stated in the permit application, the Project Soter site encompasses approximately 6,781 acres with approximately 2,880 acres reserved for development of the manufacturing facility. According to the Department's jurisdictional wetland determination in Appendix D of the application the total wetland acreage of the site is approximately 2,405 acres. If approved, the project will impact 217 acres of wetlands leaving approximately 2,188 acres of wetlands contained within the remainder of the approximately 3,900 acre portion of the property. These wetland resources remain vulnerable to loss or impacts through additional development. The Service finds this is a significant amount of wetland resources within the applicant's site that are not addressed in the project proposal. We understand that the applicant anticipates the remainder of the property will be used by services or vendors in support of Project Soter. However, omission of these wetland resources in the current proposal does not represent a master plan for the entire site nor meet avoidance and minimization requirements of section 404b(1) of the Clean Water Act. In order to meet these requirements, the Service recommends the applicant minimize

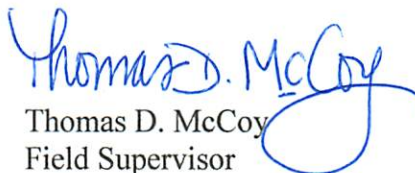
impacts to wetland resources by establishing a protective buffer around all remaining wetlands within the property boundaries.

The Service also recommends the applicant seek avoidance and minimization of wetland impacts along all proposed roadways. We recommend the applicant seek to avoid impacts through alignment shifts of the entrance road or the use of bridging where possible. In addition, for wetlands that cannot be avoided, we recommend the applicant increase all road shoulders from 4:1 to a 2:1 side slope.

In review of the applicant's proposed permittee responsible mitigation plan and the purchase, enhancement, and ultimate protection of the Bannister, Singletary, Dean Swamp, and Walnut Branch Tracts, the Service finds the plan will adequately compensate for the loss of wetlands on the Project Soter site. These tracts of land are located within the Four Hole Swamp watershed and constitute a landscape scale effort consistent with compensation for past projects where no mitigation banks were available or credit needs exceeded the capabilities of local mitigation banks. We support the current mitigation with the understanding that the plan is only to satisfy the impacts proposed by Project Soter manufacturing facility and is not to provide coverage for wetland impacts associated with future support services or vendors that may be located within the property boundaries. We recommend the Department require future projects that propose wetland impacts on the remainder of the Project Soter site must develop stand-alone compensation packages independent of Project Soter.

A multi-agency site visit will be conducted at the Project Soter site and mitigation areas on April 30, 2015, two days before the close of the comment period. Therefore, the Service provides these comments with the understanding that additional comments may be submitted after the site visit. If you have questions regarding the Service's position on this matter or need further assistance please contact Mr. Mark Caldwell at (843) 727-4707 ext. 215 and reference FWS Log# 2015-CPA-0082.

Sincerely,

  
Thomas D. McCoy  
Field Supervisor

TDM/MAC

## South Carolina List of At-Risk, Candidate, Endangered, and Threatened Species - Berkeley County

CATEGORY	COMMON NAME/STATUS	SCIENTIFIC NAME	SURVEY WINDOW/ TIME PERIOD	COMMENTS
Amphibian	Frosted flatwoods salamander (T, CH)	<i>Ambystoma cingulatum</i>	January 1-April 30	Larvae present in breeding ponds
	Gopher frog (ARS)	<i>Lithobates capito</i>	Breeding: October-March	Call survey: February-April
Bird	American wood stork (T)	<i>Mycteria americana</i>	February 15-September 1	Nesting season
	Bald eagle (BGEPA)	<i>Haliaeetus leucocephalus</i>	October 1-May 15	Nesting season
	MacGillivray's seaside sparrow (ARS)	<i>Ammodramus maritimus macgillivraii</i>	May-June	
	Red-cockaded woodpecker (E)	<i>Picoides borealis</i>	April 1-July 31	Nesting season
Crustacean	None Found			
Fish	American eel (ARS)	<i>Anguilla rostrata</i>	March 1-May 30; October 1-December 15	Temperature dependent: normally (17-20°C); can be found between 13-25°C
	Atlantic sturgeon* (E)	<i>Acipenser oxyrinchus*</i>	February 1-April 30	Spawning migration
	Blueback herring (ARS)	<i>Alosa aestivalis</i>	Mid-January-mid May	Peak: March-April
	Shortnose sturgeon* (E)	<i>Acipenser brevirostrum*</i>	February 1-April 30	Spawning migration
Insect	Rare skipper (ARS)	<i>Problema bulenta</i>	May; July-September	Two brood periods
Mammal	Rafinesque's big-eared bat (ARS)	<i>Corynorhinus rafinesquii</i>	Year round	Found in mines, caves, large hollow trees, buildings, and bat towers
	Tri-colored bat (ARS*)	<i>Perimyotis subflavus</i>	Year round	Found in mines and caves in the winter
	West Indian manatee (E)	<i>Trichechus manatus</i>	May 15-October 15	In coastal waters
Mollusk	None Found			
Plant	American chaffseed (E)	<i>Schwalbea americana</i>	May-August	1-2 months after a fire
	Boykin's lobelia (ARS)	<i>Lobelia boykinii</i>	May-July/August	
	Bog asphodel (ARS*)	<i>Narthecium americanum</i>	June-July	
	Canby's dropwort (E)	<i>Oxypolis canbyi</i>	Mid-July-September	
	Carolina-birds-in-a-nest (ARS)	<i>Macbridea caroliniana</i>	July-November	
	Carolina bishopweed (ARS)	<i>Ptilimnium ahlesii</i>	May-July	
	Ciliate-leaf tickseed (ARS)	<i>Coreopsis integrifolia</i>	August-November	
	Pondberry (E)	<i>Lindera melissifolia</i>	February-March	
	Raven's seedbox (ARS)	<i>Ludwigia ravenii</i>	June-October	
	Sun-facing coneflower (ARS)	<i>Rudbeckia heliopsisidis</i>	July-September	
Reptile	Eastern diamondback rattlesnake (ARS)	<i>Crotalus adamanteus</i>	Most of the year	Peak: April-November
	Southern hognose snake (ARS)	<i>Heterodon simus</i>	Most of the year	
	Spotted turtle (ARS)	<i>Clemmys guttata</i>	February-mid April	

